

SCIENCE EDITOR



A PUBLICATION OF THE COUNCIL OF SCIENCE EDITORS

IN THIS ISSUE:

BEST PRACTICES FOR WRITING AND EDITING TECHNICAL REPORTS
TEN TIPS FOR A RESEARCH SCHOLAR'S FIRST SIGNIFICANT PUBLICATION
RESOURCES FOR BUILDING DEIA CAPACITY

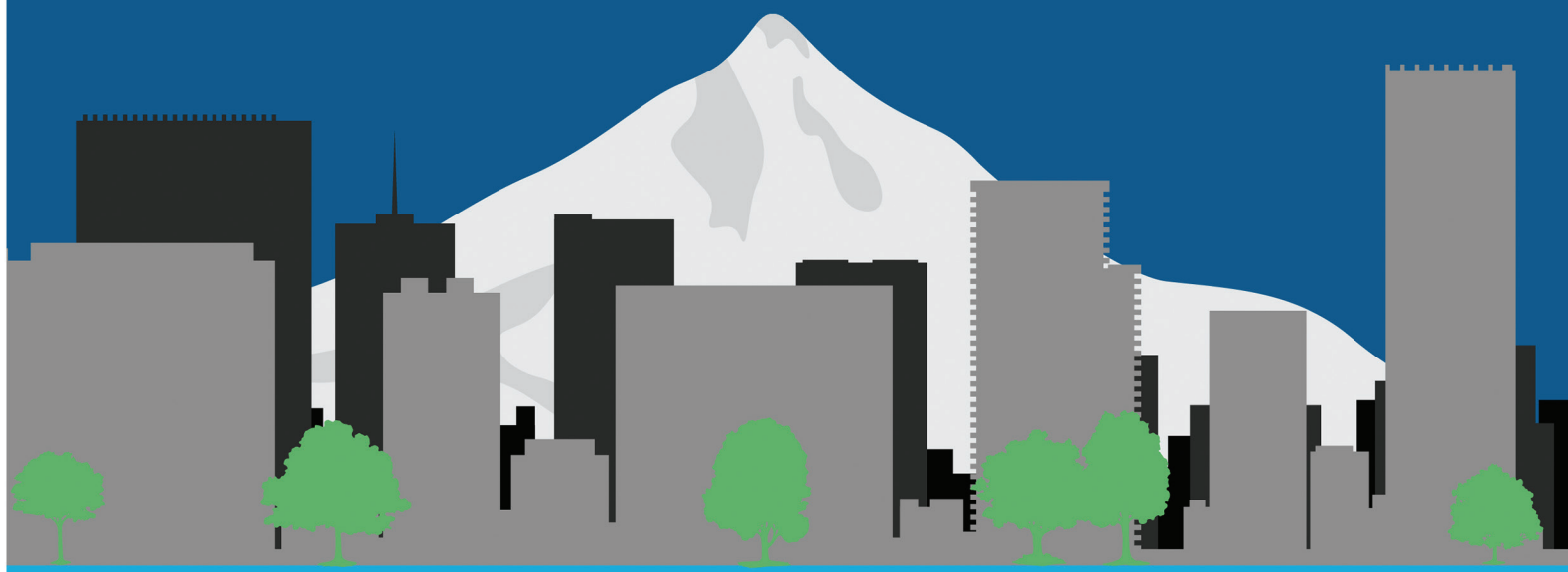
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DECEMBER 2023
VOLUME 46 • NUMBER 4

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On the cover: The cover of this issue of Science Editor is a colored lithograph, dating back to the late 1800s, showcasing a spectrum of crystalline substances as they are originally found in nature and the precious stones they become. Despite the inherent beauty of these natural wonders, a considerable amount of manual craftsmanship is required to convert them into treasured, shared, and utilitarian precious gems. **Credit:** Colored lithograph by A. Pralon after G. Pouchet. Wellcome Collection. Public Domain Mark. Source: <https://wellcomecollection.org/works/wq676my8>



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Best Practices for Writing and Editing Technical Reports

Laurette Folk and Ken Shaw

Scientific articles are complex documents, typically with multiple authors collaborating, revising, and improving the manuscript even before it goes to a journal, where it receives multiple additional rounds of review and revision. It can be a long and involved process, and much has been written about the best practices for navigating that journey. Technical reports as company deliverables are no different, and it behooves companies and journals to determine and implement the best practices for writing, editing, and publishing them. In fact, researchers, journal editors, technical editors, and consultants can learn from each other to apply best practices to writing and editing scientific articles and technical reports.

At our Tetra Tech office in Boston, we work mostly in energy project permitting, where technical reports often are written to inform government agencies how different renewable energy projects could affect the environment. Our technical reports can range in size from 4 or 5 pages, as in a Wetlands and Waters of the United States Survey, to the more formidable offshore wind construction and operations plan (COP). COPs are monster documents that include thousands of pages of text and many different elements to compile—body text, data tables, maps, images, citations and sources, and appendices—to name several. It takes dedication to organization, teamwork, diligence, and best practices to conquer the monster and meet deadlines. Editors and project managers must work on 2 levels simultaneously, the micro and macro levels, to ensure clarity and consistency and keep in mind that the overall goal is to make this complex document as straightforward and coherent as possible.

COPs for Offshore Wind Farms

With the recent record-breaking heat waves and Vineyard Wind laying foundations for the first full scale offshore wind farm in the United States, now more than ever, there is a focus on

climate change and the means to scale it back.¹ There are about 29 Bureau of Ocean Energy Management (BOEM) Lease Areas for offshore wind farms in active development for the Atlantic Outer Continental Shelf and 6 for the Pacific Outer Continental Shelf.² Although it may be obvious that the engineering design process to build these wind farms is daunting, it is lesser known that the permitting process is daunting as well.

For offshore wind, COPs include physical and environmental surveys of the proposed facility sites (located in the federal waters off the coasts of the United States along the Outer Continental Shelf), project-specific information on how the proposed offshore wind farm is to be constructed, and environmental resource information, including how the offshore wind farm will impact the environment and to what degree. The purpose of a COP is to assist the lead federal agency, BOEM, in complying with the National Environmental Policy Act (NEPA) process (i.e., the process by which a federal agency will comply with NEPA). The COP is submitted to BOEM, a government agency that manages the development of America's offshore energy and mineral resources, and the one that ultimately determines if the wind farm will be built or not.³

Creation and Planning of COPs

Offshore wind farm developers contract out the writing of COPs to companies like Tetra Tech; we have the subject matter expert (SME) knowledge and the science know-how with respect to writing the sections. Therefore, a COP has multiple authors, in other words, many different SMEs who write the different sections and appendices and are knowledgeable in the different areas of science that apply. The purpose is reiterated for every section—to inform BOEM of the parameters and impacts of the offshore wind farm and ensure compliance with NEPA, as well as make recommendations regarding mitigation.

Planning also involves knowing the audience. Is the report for public reading or is it geared toward peers in industry, or both? There are several audiences for the COP, each important at different phases of development. The client is the company we are writing the report *with* or *for*; these are the offshore wind developers and are the first audience to review and evaluate the document. The second audience includes the federal agencies (BOEM and many others in

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<https://doi.org/10.36591/SE-D-4604-08>

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support of BOEM) that process the document and ultimately make the decision as to whether the project is approved, rejected, or additional analyses need to be made, based on the NEPA process. The general public is the third audience to review the COP; BOEM publishes the COP on its website and to do so, mandates that the entire COP be fully accessible to all readers (see Style Guides and Templates).^{4,5}

Writing Is a Process

At the “micro” level, the crux of technical reports is the writing itself. Good writing is a process that involves several steps, including planning, establishing the purpose of the document, researching, gathering and presenting data, managing citations, reviewing, and revising. These steps translate to the following report elements:

- An introduction with a statement of purpose (thesis);
- Body paragraphs that include background information, research, analysis, and/or data to support the thesis/purpose (evidence);
- Correct grammar and diction, proper punctuation, and adherence to style;
- Organized, tabulated data and formatted visuals (GIS maps, photos, graphs);
- A list of reputable and industry-vetted sources; and
- A conclusion that summarizes important points, data, and recommendations.

This could be the structure of any technical report, whether it be how a wind farm impacts the environment or how a cancer treatment targets cancer cells; the elements of the scientific argument and its process/steps are the same.

Style Guides and Templates

Consistency makes for a professional document, and to ensure consistency, a comprehensive style guide and a sound compilation of templates should be created in the planning phase of writing the COP. Style guides are guidelines on how sections or appendices should be written with respect to structure, format, and terminology and may be internally created or provided by the client. Templates, either provided by a client or internally designed, have style (e.g., particular font type, type size, etc.) built into them and standardize the COP sections with minimal effort on the writer’s part. They are also created with accessibility in mind (i.e., they abide by Section 508 of the Rehabilitation Act⁶) and therefore ensure that the COP sections and appendices are capable of being read by a screen reader to assist the visually impaired.

Communication with the GIS Team, Illustrators, and/or Graphic Designers

Planning also involves knowing which maps and figures are needed and how these will be input into the report.

Figures should be in the format dictated by the style guide and/or template (with respect to dimensions and caption style), have comprehensive legends (if they are maps) with all internal text legible, and include alternative text that describe the elements of the map to a person with visual impairment. If many maps or illustrations are to be input, these should be filed in an appendix or a map book, so as not to overwhelm the text.

Sources and References

For authors in the research phase, keeping track of sources is key—easily done with a spreadsheet or software like Mendeley—and abiding by style guide formatting for in-text citations and reference entries is imperative. Every in-text citation listed in the body of the report should refer by author’s last name to the entry in the reference or bibliography list at the back of the report. Sources used should be *reputable* (written by authors with credibility and vetted by industry professionals), *current* (published within the last 5 years), and based on *industry standards*.

The Scientific Argument

Technical reports like COPs are written to provide information and to prove scientific claims being made. For instance, sections of a COP report the existing conditions of the physical resources, like water quality, air quality, ocean currents, geology, etc., as well as any impacts to these resources during the construction and operations stages of wind farm development. Particular sections of the COP make scientific claims; for instance, the in-air acoustic analysis section may stipulate a claim that a developer will comply with all noise regulations regarding construction noise. The section reports local and state noise regulations and performs an analysis with data for evidence that shows how regulatory values will not be exceeded, or if they are exceeded, how the noise will be mitigated. Data is presented in a table style already formatted in a template and should have units specified in the style guide or other agency-related guidelines. Key data values should be discussed and highlighted in the text in conclusive paragraphs and compared with standard values as a courtesy to the reader.

Managing Review of Technical Reports

A comprehensive review system is implemented once a draft is written. The first step in the review process is self-revision for authors. This entails turning on that internal editor and consulting the relevant style guide and dictionary for perfecting the text. The author implements a quick check for errors regarding syntax, diction, punctuation, mechanics, style, structure, and grammar. Although this is ultimately the job of an editor, it is important for the author (SME) to conduct this check as well; the role of self-editor brings a different

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perspective piece for the author—the reader’s perspective—and oftentimes, additional key thoughts arise to be included in revision. A good practice for report authors is to read the text aloud—errors can often be heard when not seen—and consult a writing resource like the writing lab at Purdue OWL.⁷

Subsequent steps in the review process include having a technical reviewer (peer reviewer)—a designated science or technical discipline lead—check for the accuracy of the analysis. Once this is done, the document can go to an editor for an editorial review and then finally to a project manager or senior editor for document quality control. COP sections can then flow to the client for review and may come back to the internal review cycle with comments that need to be addressed.

The Importance of Trackers

The COP document and its compilation of sections and appendices (as stated, COPs are often thousands of pages) needs to be presented to the reader as straight-forwardly as possible. This is the challenge at hand, juggling the many sections and appendices, and one that editors, SMEs, and project managers must work as a team to achieve. The editor and project manager work on the “macro” level and determine how to achieve coherence and consistency of the document as a whole; this entails not only having a well-written style guide particular to the COP and comprehensive templates to ensure that the style of the document and its formatting are the same (these are primarily the editor’s tasks), but also tracking the flow of each document through the writing and review processes (this is primarily the job of the project manager) with a comprehensive spreadsheet tracker. The tracker should be constructed with one axis for the sections and appendices, and the other axis mimicking the flow of the document from SME to technical reviewer, to

editor, to project manager, to client. The tracker should be constructed in such a way that the whereabouts and status of any section or appendix is known at any point in time. Trackers can also include separate tabs for global edits or edits that are carried through the entire document from section to section.

Conclusion

The key to best practices in writing technical reports is to know your process and the staff available, and to recognize that the act of writing itself is a collective process with key players. Only then will the optimum outcome of a well-written, well-researched technical report or COP be most attainable.

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Hiring and Thriving in the Remote Work Era

Jenna Jakubisin

In May 2023, the WHO ended¹ the global COVID-19 health emergency. Today, nearly 4 years after many U.S. workplaces became remote overnight, the working world is still evolving. While estimates about remote work vary, the Pew Research Center² reports that many employees have embraced a hybrid schedule (combining on-site and off-site work). About 35% of employees work remotely full time. Not all work can be done remotely, but a flexible work arrangement is a top motivator for job seekers and a crucial factor in retaining employees, as highlighted by the Reimagined Workplace 2023 Survey.³

The March 2023 issue of *Science Editor*⁴ discussed the value of remote work and strategies for success. At the Radiological Society of North America (RSNA), we have seen this success in action: approximately 22% of our staff are full-time remote, many of whom were hired remotely and have not yet visited our Oak Brook, IL, headquarters. Virtual hiring and onboarding come with their own set of challenges—and possibilities! This article will share some best practices drawn from our experiences in the RSNA Publications department, where we produce and publish 5 peer-reviewed journals.

Use an Applicant Tracking System

By definition, remote-friendly work attracts a wider and more diverse talent pool than does local work. At RSNA, most positions we post are not advertised as full-time remote, but many job responsibilities for knowledge workers can be performed remotely. Hiring managers who choose to consider remote employees may have a larger pool of candidates because location is not a factor for initial screening. An applicant tracking system (ATS) can help employers manage a larger talent pool by automating processes and making it easy to communicate

with candidates. An ATS can also improve the candidate's experience with the organization and increase speed to hire. At RSNA, we use ADP. I especially appreciate the feature that allows you to select candidates to “keep on file” for future opportunities, including freelancing.

Conduct Virtual Interviews—Thoughtfully

Virtual interviews offer various advantages for employers and candidates. First, videoconferencing is convenient! Virtual interviews can be arranged on short notice, without disrupting routines or requiring travel. Time zone compatibility can be easily managed with scheduling apps like Calendly or Outlook add-ins like FindTime, reducing back-and-forth emails. In addition, virtual interviews are more eco-friendly and cost-effective than in-person meetings. Accessibility features like closed captioning may level the playing field for candidates with disabilities and non-native speakers. Virtual interviews also reduce the risk of transmitting contagious diseases, as seen during the pandemic.

Videoconferencing has its drawbacks, however. Some people prefer in-person interviews for the opportunity to build stronger rapport and experience the workplace firsthand. Technical difficulties, like unstable internet connections, can add stress to the process and hinder conversations. All stakeholders need to be comfortable with the tools. Whether you use Zoom, Microsoft Teams, Google Meet, or something else, practice with the tech and have a backup contact method in case of issues. Be patient and compassionate about factors outside a candidate's control, like interruptions or background noise. Be mindful of your surroundings, too.

Beware of unconscious bias,⁵ which can influence decision-making. To ensure an equitable interview experience for everyone, allow the same amount of time for each interview and ask questions to help you understand whether remote work is the right fit. For candidates with prior remote work experience, inquire about past challenges and successes, as well as the candidate's preferred work setup and schedule. What collaboration tools have they used? How do they structure their workday? How do they handle unexpected disruptions? For candidates new to remote work, focus on communication skills and accountability. How will they

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<https://doi.org/10.36591/SE-D-4608-09>

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manage the transition to remote work? Finally, consider panel interviews to involve multiple perspectives and backgrounds (and save everyone time during the interview process). For example, you could include a peer to speak to the day-to-day experience. Overall, the goal is to evaluate not only the technical skills but also the soft skills and habits essential for thriving in a virtual work environment.

Rethink the Skills Test

Not every position requires a skills assessment, but it is standard for positions where you need a sense of the candidate's technical proficiency, like copy editor or proofreader. Skills tests are particularly useful for remote positions where independent work and self-motivation are key (although again, bias must be carefully managed). It is also a great opportunity for candidates to showcase their talents!

When hired as a *Radiology* manuscript editor in 2017, I was given a paper copyediting test following my interview, with instructions to complete it within 60 minutes. The test included math questions like "Convert 3 inches to metric." In 2020, the shift to remote work allowed us to rethink our approach. Today we administer a "closed-book" copyediting test via email. We create a short sample article, obscuring key details like titles and author names, and ask candidates to edit in a set time frame with Track Changes enabled. Here is a sample of typical copyediting test instructions for *Radiology*:

- This test is "closed book." We're looking to see how you approach a manuscript and your thought process behind the changes you make. If you would query the author or consult a reference text or website, please indicate by inserting a comment in the margins.
- Copyedit the text for clarity and consistency.
- Correct any misspelled words, grammatical mistakes, or other errors you find.
- You should assume the manuscript does not require a heavy edit or rewrite.

The hiring team evaluates each copyediting test to reach a consensus on next steps.

Designate an Onboarding Buddy

Onboarding a virtual employee can be downright hard. Consider logistics: Was their computer shipped on time and configured properly? How should first-day "paperwork" be

handled? How will training be conducted? Integrating the new hire into office culture is especially challenging without traditional activities like a building tour or team lunch. Virtual employees may struggle to pick up on unwritten norms, like communication styles or the level of social interaction that might be expected of them. Enter the onboarding liaison.

In 2022, the RSNA Pubs department launched an initiative in which new hires are partnered up with more experienced team members. The onboarding buddy helps the new hire feel welcomed, included, and supported. Onboarding buddies are on hand to answer questions and may even schedule time for short, casual conversations (which can be tough in a virtual environment). We think of it as the new employee's first friend in the office. An onboarding buddy can be valuable for all new hires, but the support is especially important for fully remote employees who need to feel connected to the organization and its mission. Since the launch of the Pubs onboarding buddy initiative, feedback has been positive, especially from our fully remote teammates.

Remote work is a game changer, reshaping our perceptions of productivity and job satisfaction. With the right care and planning in place, workplace flexibility can be a win-win for both employers and employees.

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Board of Editors in the Life Sciences Announces Certification Maintenance Program

Lisa Kisner

Nearly 2000 people across the globe hold the Editor in the Life Science (ELS) credential, but few know that the ELS has been linked with the Council of Science Editors (CSE) since the beginning. Founded by a group of 10 CSE—then known as the Council of Biology Editors—members in 1991, the Board of Editors in the Life Sciences (BELS) was established to evaluate the proficiency of manuscript editors in the life sciences through a certification examination and to award credentials like those obtainable in other professions.

Now, more than 30 years later, BELS continues to maintain and promote a standard of proficiency in editing in the life sciences. However, since launching the credential, technology has reshaped how we work and what skills we need. In addition, style guides, ethical guidance, and reporting guidelines have expanded; scientific publication practices have evolved; and scientific and medical advances have burgeoned. Editors must keep up with these advances to be effective in their work.

Thus, to ensure the ELS credential remains a relevant and accurate indication of skill and to bring the program in line with current best practices, BELS is introducing certification maintenance.

The concept of certification maintenance is industry standard within the credentialing community, and other programs in medical communications, such as those offered through the American Medical Writers Association and the International Society for Medical Publication Professionals, already require ongoing education and professional development.

BELS has considered the possibility of certification maintenance for several years. A task force, and later a committee, conducted research on the credentialing programs of peer organizations and other professional groups. Their work resulted in the recommendation to the BELS Board of Directors that certification maintenance

be adopted as a core component of the ELS program. The Board agreed, and BELS will launch a certification maintenance program on January 1, 2024.

Certification maintenance will elevate the ELS credential by encouraging professionals to seek continuing education; to stay current with new trends, evolving guidelines, and best practices; and to be better engaged through demonstrated service and contributions where appropriate. ELS-certified individuals, regardless of the year of certification, must complete qualifying activities (e.g., attending webinars, workshops, and conferences; membership in professional societies; teaching and mentoring others) to maintain their credential.

Renewing certification will involve pursuing and documenting professional activities in 5-year periods. Such activities are grouped into the categories of Education and Professional Development, Service, Contributions, and Experience. Each activity has a point value (for example, a 1-hour educational activity is worth 1 point), and a total of 50 points will be required to renew certification for another 5 years. Many activities offered by CSE can fulfill these recertification requirements, such as attendance at a meeting or short course, or participation in the mentoring program. The CSE website has a full listing of all offerings and ways to be involved: <https://www.councilscienceeditors.org/>.

Full details, including a list of FAQs, are on the BELS website, under the “Certification Maintenance” tab, at <https://www.bels.org> (<https://www.bels.org/certification-maintenance>).

Not BELS Certified?

The 2.75-hour examination is offered quarterly during the months of January, April, July, and October each year. Candidates may take the online, multiple-choice examination anytime throughout the offered months in the comfort of their homes or at an authorized test center. Editors who successfully pass the certification examination may use the ELS credential after their names to demonstrate to employers or clients that they have established a high level of credibility. Learn more at <https://www.bels.org>.

Lisa Kisner serves as secretary on the BELS Board of Directors.

<https://doi.org/10.36591/SE-D-4604-12>

Ten Tips for Research Scholars Aiming for Their First Significant Publication

Ravi Murugesan

In many scientific disciplines, research scholars not only hope to get published but aspire for a prominent authorship position on a journal paper. There is nothing vain about this; for a research scholar, a first-author publication opens doors to advancement because it shows that they can contribute substantially to a research project.

But first, who is a research scholar? Definitions and notions vary. For this article, I define a research scholar as a student in a PhD program or a research-intensive Master's program, or a research assistant in a similar league. If you are an early-stage research scholar in a scientific discipline, you might have some experience with research and even gained authorship credit, but have you played a major role in a collaborative project? Such a role is essential if you hope to see your name as the first author on a published research paper or obtain weighty authorship credit in another form.

In this primer, I concentrate on the outcome—which I call “first significant publication”—and provide a set of tips to help you navigate your way.

1. Leadership: Take the Initiative to Lead

By “lead,” I mean leading a research project, or a particular aspect of a project, under the direction of your research advisor.

Perhaps everything has been agreed on and you find yourself playing a lead role without much deliberation. But sometimes—especially in research groups with many students, scholars, and postdocs—you should put yourself forward. You might have to be competitive.

The first step is to discuss the lead role you are hoping for with your research advisor. Do they have an opportunity for you? Or can you think of an opportunity?

Ravi Murugesan (<https://orcid.org/0000-0002-1898-0559>) was once a bewildered research scholar, and he is now a freelance science editor with training responsibilities in the AuthorAID project.

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<https://doi.org/10.36591/SE-D-4604-04>

Research scholars in many scientific disciplines often work within a team. Some research colleagues could be less experienced than you and some could be senior (e.g., faculty members). How are you going to convince your team that you are the right leader (or one of the leaders)? Having a positive attitude and a collaborative spirit will go a long way.

2. Teamwork: Agree on Research Questions, Goals, and Authorship

Research scholars do not usually form their project team; this is the responsibility of the research advisor (along with research funding, assistantships, and other matters). However, as a lead project member, you should have a say in the following matters and reach a consensus with your team:

- **Research questions or hypotheses.** What exactly are you going to investigate in your research project? Why does it matter? Reading relevant publications (covered in Tip 6) will help you come up with good research questions.
- **Goals.** This primer is focused on one of the typical goals of a scientific research project: publication in a scholarly journal. In which journal do you hope to publish the paper (or the first paper) emerging from your project? And why? Identify a few target journals at the start of your project, recognizing the many factors to consider.¹ Read the instructions for authors given by your target journals to find out if you need to be aware of anything that concerns the research process. These instructions often cover a lot more than how to format your paper.
- **Authorship.** Use authorship guidelines, such as the International Committee of Medical Journal Editors guidelines,² to determine who is eligible to be an author. Then comes the tricky question of the order of authors. Often, the biggest question is who should be the first author? There are many viewpoints and norms on this matter (and much vexation), which you can find online. Authorship pieces in *Science* and *Nature* are

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particularly instructive (e.g., Google *site:science.org authorship*). Discussing the order of authors, at least provisionally, at the start of the project can prevent authorship disputes later.

3. Timeline: Be Realistic and Avoid Haste

When you take up a significant role in a collaborative research project, it can be unreasonable to expect that you will reach your publication goal by a certain date. Master's students should be especially careful because they tend to have a graduation date in mind and may not have much flexibility.

Working with your team members and your research advisor, draft a project schedule in the form of a Gantt chart³ or some other approach. Clarify who is responsible for what. It is likely that not everything will go as per the plan. Update the project schedule as needed; don't give up on it! When a research project seems to drag on indefinitely, it is not necessarily because the research is difficult. Perhaps the research was not treated as a project.

4. Support: Seek Fellowship and Mentoring

By "fellowship," I mean collegiality and a sense of belonging. You will hopefully find this within your own research group but look for it elsewhere too. Join scientific societies in your field and see how you can become an active member. Are there networking or volunteering opportunities?

A mentor is different from your research advisor. A mentor is not formally responsible for your work, and you do not report to your mentor. A mentor is someone who can capably and willingly guide you when you need support and might even be proactive in helping you progress. Is there someone in your research group who can mentor you?

Finally, take care of your health. Burnout is real.⁴ Speak with your advisor or mentor if you are struggling to cope. Check if your institution provides support for wellness and mental health.

5. Ethics: Practice Responsible Conduct of Research

Responsible conduct of research (RCR) is a big deal. It encompasses protections for research participants, handling research data, writing and publication practices, dealing with conflicts of interest, and other matters. Another name for RCR is responsible and ethical conduct of research.

Consider this: From July 2023 onward, *all* researchers named on proposals submitted to the US National Science Foundation—not just students as before—must complete RCR training.⁵ This shows that RCR is not just something for research scholars to learn. After all, high-profile cases of research misconduct are in the news every now and then.

Even if you are not required to undergo RCR training, it is your responsibility to learn about RCR and practice it. The US Office of Research Integrity provides a detailed introduction to RCR.⁶ Your university might provide further guidelines, and you should look up guidelines given by your target journals as well.

6. Reading: Learn How to Read Science

A basic goal of a scientific research project is to advance knowledge. So early on, you need to have a strong grasp of the knowledge that already exists—in other words, the knowledge and findings disseminated through publications (and other sources perhaps, but primarily scholarly publications). With this foundation, you can develop your research questions, make a case for why your research is relevant, design your research methodology, compare your research findings with previous findings, and so on.

Good reading skills are essential to carry out a research project. But it can be hard work to make sense of scientific research papers. What's more, a study in 2017 found that the readability of scientific texts is decreasing.⁷

Instead of assuming you somehow need to get smarter to make sense of papers, look for resources online: there are many; for example, a *PLOS* "ten simple rules" article⁸ and a guide published in *Science*.⁹

Upstream from the reading stage is the research access stage. To read research publications, you need to be able to access them. How can you locate the most relevant publications in the ocean of scientific literature? And how can you read publications that are behind a paywall or available only to subscribers? A subject librarian or reference librarian at your university can help you with both. You can also look for online library guides (commonly called "libguides") published by your university or others.

While accessing research, build your own collection of research publications using a reference management tool. Compare the popular tools¹⁰ and find one that works for you. When you write your paper, use the same tool to cite the publications you have used.

7. Focus: Keep the Research Questions in Mind

Recall Tip 2: agreeing on the research questions before you start your research project. Exploratory research has its place, but to orient a research project toward an outcome, such as a publication, you need to set up research questions or hypotheses in advance. The questionable practice of HARKing—hypothesizing after the results are known—was described in 1998,¹¹ and you can find more recent commentaries online.

A research project can go on for months or even years, and during this journey with all its ups and downs, it is

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possible to lose track of the research questions. Make it a point to always keep the research questions at the center of your project. One easy way to do this is to include them in status updates about your work to your team. This way, you can also gauge how far you have progressed toward answering the questions.

8. Writing: Don't Wait Until the End

"A paper is not just an archival device for storing a completed research program; it is also a structure for *planning* your research in progress," is the advice in a classic essay on scientific writing.¹² Consider using the "outline method" described in that essay to develop your paper.

If you want to learn the nuts and bolts of scientific writing, such as how to write the different sections of a paper or how to write effective sentences and paragraphs, you can find books, library guides, and online courses on this topic. But it can be difficult to get feedback on your own writing beyond what your research advisor offers. If your university has a writing center, do they offer feedback for research scholars? If you have a research mentor (see Tip 4), ask if they can give you feedback on your writing. If you do not have much support locally to improve your writing skills, look at the training or mentoring offerings from the AuthorAID project.¹³ (Disclaimer: I work for this nonprofit project.)

When developing your paper, your target journal's instructions for authors can be your friend or your enemy, depending on when you refer to these instructions and how seriously you follow them. Referring to these instructions only after you finish writing your paper will likely result in much frustration and lost time. Keep the instructions handy throughout your research-and-writing journey, and do not ignore anything in the instructions.

Finally, do not forget to cite as you write, making use of a reference management tool (see Tip 6). A good citation habit can be a bulwark against plagiarism.¹⁴

9. Visuals: Master Tables and Figures

Tables and figures are crucial elements of scientific communication in many disciplines. Tables, well, present data in a tabular format. They can be complex, but figures are certainly more diverse: images obtained from scientific processes or equipment, diagrams of experimental setups, charts showing data, etc. A sustained reading of scientific papers (see Tip 6) will help you get a sense of how tables and figures are presented and how they are referred to in the text.

Designing effective figures can be especially challenging. Researchers in the biological sciences (and possibly other disciplines) will benefit from the large collection of articles on data visualization available on the *Nature* website.¹⁵ Guidelines can also be found in style guides such as *Scientific*

*Style and Format*¹⁶ and in the instructions for authors given by journals.

Be careful to avoid image manipulation, a matter of increasing concern¹⁷ and related to RCR (see Tip 5).

10. Peer Review: Keep Calm and Carry On

Once you have completed your research-and-writing journey and double-checked that your paper complies with your target journal's instructions for authors, you will submit the paper and wait for the peer review process to run its course. (Rejection before peer review can happen, but let's stay positive.) You should then be prepared to get a variety of comments from multiple peer reviewers. These comments can be minor, major, constructive, affirming, annoying, upsetting, disheartening ... as you go through your research career, you will likely attach further adjectives.

Dealing with reviewers' comments can sometimes be easy, and it can sometimes require not just much revision to your paper but also much tact in responding to the comments. The first thing to recognize is that the first author should not automatically be saddled with the bulk of the work. All the authors should be involved in this effort, taking responsibility for the part of the paper (and the related part of the research) in which they had a role to play.

Responding to reviewers' comments is often the last mile to publication, and the going can get tough. You are not alone: the complexity and emotional toil of this stage is understood, and you can find advice online.¹⁸

Closing Words

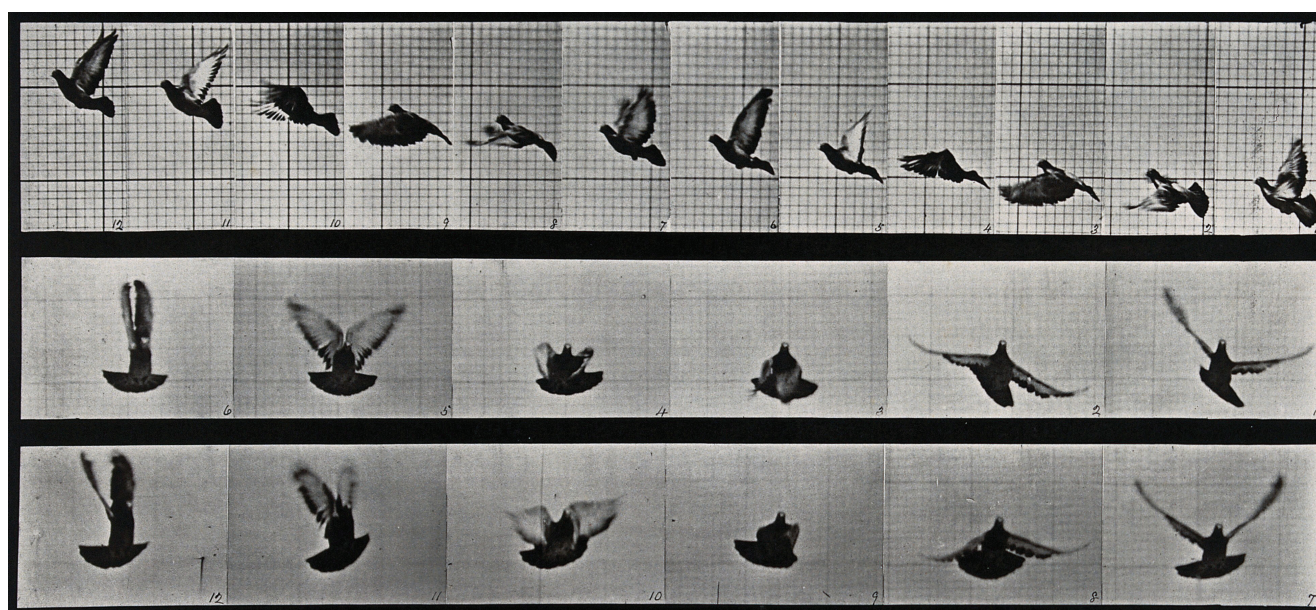
Your first significant publication is a milestone—and something you want to be proud of. I hope this primer is of some use in helping you get there.

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Credit: A cockatoo flying. Collotype after Eadweard Muybridge, 1887. Source: Wellcome Collection .

Freedom of Information Requests and Peer Review Reports

Jaime A Teixeira da Silva and Panagiotis Tsigaris

In this commentary, we briefly assess the legal context of Freedom of Information (FOI) requests, such as the Canadian Freedom of Information and Protection of Privacy Act (FIPPA), within peer review. FOI/FIPPA requests to government institutions need to be carefully vetted, while the privacy of both the applicant and subject should be protected. FOIs related to misconduct are valid, but those that are based merely on inquisitiveness or that seek access to confidential emails and information, are contentious. We believe that access to “research material”, including emails, should be limited to misconduct investigations.

In some countries, it is possible to request information from a government institution such as a public university, via FOI requests, about records at such institutions. FOI requests are associated with issues of accountability and transparency of government operations,¹ but they may also encompass clauses regarding the protection of privacy, both of the applicant and of the subject of the FOI request, such as the FIPPA in each Canadian province, for example, in British Columbia (BC).²

FOI requests cover records that are only under the public body's control and custody, such as the operation and administration of a governing body. Researchers who work at a public university conduct their own research, teach students, and spend time for service. These 3 functions result in records that belong to the researchers and are not the property of the public university, and so should be excluded from FOI requests to protect the researchers' academic freedom and intellectual property. In academic publishing, FOI requests might be associated with misconduct investigations, such

as to gain access to raw data or email communications in an ethics investigation, or to gain insights such as through investigative journalism.³ As one example, FOIA/FIPPA requests were used to find evidence of deceitful articles, careless coauthors, and editors that violated Committee on Publication Ethics (COPE) standards.⁴ In this opinion paper, we briefly discuss whether journals' peer review reports can or should be accessed via FOI requests.

Journals that claim to be peer reviewed, and where open peer review is not used, protect such reports by confidentiality clauses. According to COPE, this confidentiality may apply to peer reviewers, who should not disclose such reports publicly during peer review and are encouraged to request permission from the journal and/or authors when posting after the article has been published.⁵ Many COPE member journals and publishers expect the complete confidentiality of peer reviewer reports by all parties (authors, peer reviewers, editors), including, for example, the Public Library of Science,⁶ Springer Nature,⁷ and Wiley.⁸ The International Committee of Medical Journal Editors (ICMJE) encourages the protection of the confidentiality of all documents related to the peer review process (see clause II. C. 2. a. of the ICMJE Recommendations).⁹

An FOI request for peer reviewer reports from a public university is not the appropriate channel to access such information. Rather, the information should be requested from the publisher, via the journal's editor. If applicants of such FOI requests should contact the authors directly and request reports, it is then up to the authors to decide whether they are willing to share these with the requesting party. However, if authors do so, would they not be violating the publisher's confidentiality agreement?

In addition, FOI exemption of research material protects faculty's academic freedom and scholarly communication in order to pursue new knowledge without the risk of harassment and intimidation.¹⁰⁻¹³ The exchange of information between authors, reviewers, and editors of journals are one such record. For example, the BC FIPPA (2022) Act does not apply to any record that contains research material of a faculty member, as per section 3.(3)(i).² Unfortunately, the FIPPA Act does not define what constitutes “research material”. Materials are typically used to create or to develop research and include any tangible medium such as data, documents, records, email exchanges, software programs, and

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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-4604-07>

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outcomes.¹⁴ Certainly, peer reviewer reports are research material and are thus exempt from FIPPA requests. In fact, the public body should not have control nor custody over any research material, including peer reviewer (i.e., referee) reports and emails.

Even government agencies that conduct research should be protected from intrusive FOI requests for research material and peer review reports. The U.S. Court of Appeals, District of Columbia Circuit court case *Formaldehyde Institute v. Department of Health & Human Services (HHS)* No. 88-5383 in 1989 ruled in favor of the HHS withholding the disclosure of a research review letter as part of the FOIA.¹⁵ Because the letter was pre-decisional and a part of the agency's deliberative process, exemption 5 applied.¹⁵

We are of the opinion that requests for information related to peer review reports of journals that do not practice open peer review are incompatible with confidentiality clauses that are in place by such journals and are not under the custody or control of the public body because they are research material and the property of individual reviewers because they typically do not sign over copyright.¹⁶ FOI requests are increasingly being associated with politicized acts of harassment and intrusiveness, so they threaten the stability of academic research institutes, at least in the United States.¹³

Disclaimer

The authors, the first being an independent scientist and the second working at a Canadian public university, declare no conflicts of interest. The second author has been the subject of FIPPA-based requests.

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Balancing Academic Confidentiality and Transparency: The Peer Review Dilemma

Ryan Jessup

Transparency, or the idea of governments and businesses being open and honest, is crucial for society, and the United States' Federal Freedom of Information Act^{1,2} (FOIA) as well as Canada's Freedom of Information and Protection of Privacy Act³ (FIPPA) have been key safeguards allowing citizens to access records from federal agencies that would otherwise be unavailable. The center of the discussion since 1967 has been how the U.S.'s FOIA legislation mandates federal agencies to disclose requested information unless it falls under 1 of 9 exemptions that safeguard interests like personal privacy, national security, and law enforcement. In the academic sphere, a tension currently exists between confidentiality and transparency, particularly concerning confidential peer review reports, which are essential for maintaining the quality of scholarly work and ensuring academic integrity. This article explores the complex issue of balancing the public's right to know and the need for confidentiality in the academic sphere as the pivotal question emerges: Should confidential peer review reports⁴ be subject to public disclosure and governed by FOIA/FIPPA?

One reason we empower individuals to seek information from government entities, including public universities, is to augment transparency and accountability within the public sector, for example, government contracts. These contracts, paid to private citizens by the government, are common at federal, state, and local levels. They serve various purposes but are primarily linked to governance and administrative functions like maintaining a public park, performing research, or serving a specific constituent interest such as feeding the homeless. Requests for disclosure records regarding these government contracts are different from private organization requests because they encompass records that are under

the control and custody of public bodies, even though a private citizen has performed the work.

This distinction is particularly relevant in academia, where researchers may be associated with public, nonprofit, or private universities. These scholars undertake multifaceted roles or contracts, encompassing research, teaching, and service, generating records intrinsically tied to the researchers themselves rather than solely belonging to the public university. Omitting such records from FOIA requests becomes essential to safeguard academic freedom and intellectual property.

However, FOIA requests possess legitimate applications, particularly in the realm of academic publishing. They can be instrumental in cases of alleged misconduct, offering access to unprocessed data or electronic correspondence for ethical investigations or investigative journalism. FOIA/FIPPA requests have played a significant role in unveiling deceptive articles, negligent coauthors, or editorial lapses that contravene ethical standards. One example of a FOIA request for a confidential peer review was The Fourth Assessment Report⁵ of the Intergovernmental Panel on Climate Change (IPCC), which was targeted by climate change skeptics as they denied the truthfulness of the reports conclusions. The FOIA request was denied—but in 2009, a hacker obtained and unlawfully distributed a large number of records from the University of East Anglia's Climatic Research Unit.⁶ Commonly referred to as "Climategate", the records contained private peer review drafts and emails between climate experts. Climate change skeptics then twisted the traditional peer review discussion and suggested scientific fraud and data manipulation. Even though the release of these confidential peer review reports were *not* delivered through a formal disclosure request of any type, it sparked debate and moral dilemmas regarding the privacy and confidentiality of scientific communication.

For a request to be honored, it is *vital* to distinguish publicly funded/nonprofit institutions⁷ from private entities/nonprofit companies which are not subject to FOIA when considering any request for a peer review report.⁸ Two persuasive examples include:

1. H 3931 General Bill, By Herbkersman,⁹ which attempted to amend the code of laws of South Carolina to require that

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<https://doi.org/10.36591/SE-D-4604-06>

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any nonprofit receiving more than \$100 in public funds must make their expenditure reports publicly available.

2. Sec. 31.054 Public Access to and Removal of Papers,¹⁰ in which Texas legislators scrutinized a contract between the state of Texas and two 501(c)(3) nonprofit organizations, including one charged with preserving and maintaining the Alamo, and raised concerns about transparency. They eventually decided that government contracts are open to scrutiny and public access, whereas nonprofit organizations engaged in such contracts operate differently.

Now, what we see in example 2 is that although nonprofit organizations are obligated by the IRS to submit annual Form 990 informational returns, donor information remains confidential. Furthermore, nonprofit organization board meetings are not open to the public, prompting legislators and citizens to question the influence on these organizations.¹¹

In the realm of academic peer review, akin to the Alamo contract case, state governments confront a substantial loophole that permits state agencies and nonprofit organizations to potentially exploit taxpayer trust and money. This underscores the importance of striking a balance between confidentiality and transparency to ensure accountability across all sectors in which taxpayer funds are at stake. As governments increasingly contract with private nonprofits¹² and publicly funded or for-profit academic research institutions, the equilibrium between the public's right to know how its money is spent and the contractors' right to safeguard proprietary and confidential information warrants continued examination.¹³

In conclusion, the question of whether confidential peer review reports should be subject to FOIA/FIPPA laws, or other public disclosure requests, is intricate and is also impacted by the state in which the request is generated (in U.S. cases). Although transparency holds undeniable value, it necessitates a delicate balance with the preservation of academic research and individual privacy. Traditional indications lean toward scholars and organizations concurring that peer review reports should remain confidential even in a publicly funded/nonprofit academic research setting; however, maybe things are changing.

Accordingly, if you want to see peer review reports, you should try a careful approach. Instead of only using FOIA and disclosure requests, consider other options such as talking to publishers about their internal policies and consider how your local state laws might impact your request. If we don't find a balance between transparency and confidentiality, it could be risky for academic research institutions, which would have to limit the academic freedom or privacy of faculty members in public universities.

Below are some tips to find out more about the process of acquiring disclosure of confidential peer review reports under FOIA or similar public disclosure requests—please

note that each process can vary depending on the specific circumstances and the laws in place in a given jurisdiction. The following are some general considerations:

1. **FOIA or similar laws.** Confidential peer review reports may be directly subject to FOIA or similar public disclosure requests depending on the relevant jurisdiction's laws. FOIA laws typically apply to federal, state, or local government agencies, but exemptions and requirements can vary.¹⁴
2. **Exemptions.** FOIA is subject to 9 exemptions that safeguard interests like personal privacy, national security, and law enforcement. Similar laws from state to state often contain other exemptions, exceptions, or loopholes that can be another path to pierce safeguards for specific types of information traditionally kept from public disclosure. This can include confidential peer review reports, deliberative process, personnel records, and business information. These exemptions will vary from federal to state to local agencies as well.¹⁵
3. **Balancing test.** Agencies may provide confidential peer review reports if they find a need to balance public interest with confidentiality based on case facts and potential harm or benefit.
4. **State and local laws.** State laws and local jurisdictions can differ, so it is crucial to understand your jurisdiction's specific laws, as some have unique public records laws similar to FOIA style requests.¹⁶
5. **Protecting privacy and confidentiality.** Like the public interest vs. confidentiality balancing test in item 3 above, there is also a balance between privacy and confidentiality in which peer review processes often involve sensitive information, requiring confidentiality protection to ensure candid assessments and evaluations. This test can be another option to acquire disclosure of confidential peer review reports.
6. **Legal counsel.** When deciding whether peer review reports should be disclosed, it is advisable to seek legal counsel familiar with FOIA or relevant public disclosure laws, as legal experts can provide guidance on these complex issues and how the state or local policies impact your request.
7. **Redaction.** Peer review reports can be redacted before release in response to FOIA requests, protecting sensitive information while still allowing some level of disclosure. A federal, state, or local jurisdiction can be encouraged to redact some information if it helps meet any of the balancing tests that have been applied but failed.

**DISCLAIMER: Confidential peer review reports' subjectivity to FOIA or public disclosure requests depends on laws,*

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report nature, and public interest. Consulting legal experts and following regulations is crucial for handling such requests.

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CSE 2023 Fall Symposium: Research Integrity and Artificial Intelligence

Alex Kahler and Amanda Ferguson

The CSE 2023 Fall Symposium took place on October 24–25, 2023, offering CSE members the opportunity to attend a virtual conference exploring a variety of current topics in research integrity, artificial intelligence (AI), and intersections between the two. A general session kicked off both days of the symposium and after each of the general sessions, attendees joined one of two didactic presentations, followed by 90-minute work groups in which panelists from the didactic sessions answered questions from meeting attendees.

Day one began with a general session moderated by Fall Symposium co-chair and Director of IFT Scientific Journals, Amanda Ferguson, entitled “AI, Accessibility, and Research Integrity: Opportunities and Challenges”. Ferguson was joined by Mohammad Hosseini, a postdoctoral researcher based at Northwestern University Feinberg School of Medicine and associate editor at the *Journal of Accountability in Research*, as well as Scholarly Kitchen executive author and editor Hong Zhou, who leads the Intelligent Services Group at Wiley Partner Solutions. Their session explored the opportunities and challenges of AI for scholarly publishing, from the use of fine-tuned generative AI for research integrity to transforming the research ecosystem into an accessible and inclusive place.

Following the general session, Tony Alves, SVP of Product Management at HighWire Press, hosted a didactic session and work group combination titled “AI and ML Tools that can be Used to Ensure Research Integrity”. The panelists included Adam Day, founder and CEO of Clear Skies Ltd, a company that offers several unique methods to detect paper mill products before peer review, thereby preventing the publication of fraudulent literature. They were also joined by Josh Nicholson, co-founder and CEO of scite.ai,

a next-generation citation index gives context to citations and provides scholarly references to ChatGPT, and Patrick Starke, the founder of imagetwin, a software company that focuses on the automated detection of image integrity issues in academic papers. After sharing information during the didactic session about the tools they designed, each panelist engaged with audience members in the follow-up work group to explain how their tools could be used to address challenges attendees are currently facing in their journals.

Jill Jackson, Managing Editor of *Annals of Internal Medicine* and CSE’s Editorial Policy Committee co-chair, moderated another of the two didactic sessions on offer for day one titled “Evolving Policies and Opportunities for Generative AI”. Jackson’s panel included Charlotte Huag, Executive Editor of NEJM AI; Annette Flanagan, JAMA Network VP of Editorial Operations; Timothy McAdoo, APA Style editor; and Silverchair’s Stuart Leitch. Panelists explored ways in which generative AI can be used to improve editorial and publishing processes, such as by assisting authors with language, references, and statistical analyses, and reporting standards, and assisting publishers with submission screening, triage, reference validation, and discoverability.

Day two’s general session, titled “Large-scale Threats to Research Integrity”, was moderated by Alex Kahler, Director of KGL Editorial and co-chair of the Fall Symposium. She was joined by Dr Michael Pemberton, a professor of English at Georgia Southern University and co-principal investigator of the Text Recycling Research Project, a National Science Foundation-funded research study of text recycling ethics, practices, and policies in STEM journals. The panel also included Renee Hoch, manager of the PLOS Publication Ethics team, and Luigi Longobardi, Director of Publishing Ethics & Conduct at IEEE. The panelists explored a variety of tactics used by paper mills that threaten the integrity of the scientific record, such as selling content, fabricating or plagiarizing content, selling authorship, and manipulating peer review. While Michael focused on the difference between text that is ethically versus unethically recycled, Luigi and Renee shared their organizations strategies

Alex Kahler is Director, KGL Editorial. Amanda Ferguson is the Director of IFT Scientific Journals.

<https://doi.org/10.36591/SE-D-4604-10>

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for detecting and preventing the activity of paper mills and discussed resources available to journals from the Committee on Publication Ethics and the STM Hub to assist both detection and prevention.

Following day two's general session, Patty Baskin, Senior Director of Publications at the American Academy of Neurology and a founding member of the Coalition for Diversity in Scholarly Communications (C4DISC), moderated and presented a didactic/work group session pair entitled "Partnerships of Institutions and Journals in Scientific Integrity Issues: Viewpoints of Research Integrity Officers, Editors, and a Legal Advisor". Baskin was joined by a large panel of experts, including Debra Parrish, who previously worked as an attorney at the Office of Research Integrity; Luran Qualkenbush, Senior Director for Research Integrity and Training and the Research Integrity Officer at Northwestern University; Dr Christina Bennett, Assistant Director and Publisher of Editorial Development at the American Chemical Society; and Dr Susan Garfinkel, Associate Vice President for Research Compliance and Research Integrity Officer at The Ohio State University. The panelists discussed how institutions and journals are working together to improve transparency and collaboration between institutions and journals to better ensure the validity of the research record, allow earlier communications between the two groups, and raise author awareness for how journals manage and report potential research misconduct concerns. The group also

discussed the legal risks journals may face during a research misconduct allegation and the need for journals to exercise caution during investigations.

The second didactic/work group session pairing on day two, "Licensing Content: Navigating Permissions, Copyright, and Site License Agreements", was moderated by Amy King, Senior Managing Editor at KGL Editorial and chair of the CSE Marketing Committee. Amy was joined by Aileen McHugh, Senior Associate Publisher and Director of Sales and Circulation at the American College of Physicians; Elliott Hibbler, Head Librarian at Boston College; and Lauren Tulloch, Vice President & Managing Director at Copyright Clearance Center. Panelists discuss how publishers and authors can better navigate rights and permissions for their content in the landscape of site licensing agreements, text and data mining, and copyright regulations, particularly with the advent of AI tools.

Altogether, the general sessions, didactic sessions, and work groups presented attendees with a wealth of information regarding both research integrity and AI, two areas at the forefront of today's quickly evolving scholarly publishing landscape. While there was some discussion of journal policy regarding the use of AI, many participants in the work groups were focused on how journals and publishers can use AI tools to both improve publishing processes and to detect and prevent threats from paper mills and other large scale threats. Following on the success of these sessions, we may expect to see further follow up at CSE's upcoming Annual Meeting in May 2024.

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ScienceWriters2023: Some Highlights for Editors and Others

Madison Brown, Francesca Landon-Harding, Sanjida Akter, Abdurrahman Radwan, Julianne Hodges, Christina B Sumners, and Barbara Gastel

Conferences with online and in-person components have been taking varied forms. ScienceWriters2023, a joint meeting of the National Association of Science Writers and the Council for the Advancement of Science Writing, consisted of an online-only phase (September 26–October 3, 2023) and an in-person phase (October 6–10, Boulder, CO). The former focused almost solely on communicating science, and the latter included sessions on science. Individuals could register for the full conference or only the online portion. The current report presents highlights of some communication-related sessions from both phases.

Artificial Intelligence Tools: Promises, Prompts, and Pitfalls

By Madison Brown

The opening plenary session of ScienceWriters2023 focused on a topic of considerable current interest: the use of artificial intelligence (AI) tools in science writing and related realms. Moderated by freelance writer and editor Ellen Kuwana, the session featured a panel including journalists, an ethicist, and a technology expert.

Kuwana began by asking how current AI systems differ from previous ones. The panel indicated that current AI systems (such as ChatGPT and DALL-E) are pre-trained for a variety of tasks, do not need supervision from their creators, and can be more creative than earlier systems. It was noted that ChatGPT is programmed to predict the next word in text, based on the dataset on which it was trained and information gleaned from users.

Debra Mathews (John Hopkins bioethics researcher), Aimee Rinehart (Associated Press), Jeffrey Perkel (*Nature*),

Melissa Heikkilä (*MIT Technology Review*), and Michael Madaio (research scientist, Google) spoke largely on the ethics surrounding AI, and how to determine whether something is AI-generated. Currently, Madaio said, it is mainly the user's task to catch "hallucinations" (instances in which AI generates false information and presents it as fact). The panelists urged journalists to diligently fact check any information from an AI source, and to indicate to their audience that AI was used. They also noted that copyright issues are arising because AI tools are trained on datasets containing books and other materials without the copyright holders' consent. Kuwana said the need to verify AI-generated content provided "job security for editors and fact checkers."

Another area the panel identified as being of concern was the reinforcement of racism and sexism, for example, when AI tools generate images based on their training with internet content. Heikkilä, who is part Asian, discovered that when she used an AI image generator to create pictures of herself, a large proportion were sexually explicit. In contrast, her White colleagues tended to be shown in empowering images. The panelists indicated that responsibility for fighting biases in AI lies in the companies creating the AI.

The panelists cautioned writers to avoid the "hype" of AI and be wary of humanizing this technology. Madaio recommended using the tool for what is best suited for: language-based rather than knowledge-based assistance. Rinehart said an example of suitable use was using AI to draft headlines as starting points to consider. Heikkilä said "excited but skeptical" is the best approach to AI.

How Editors Can Advance Diversity, Inclusion, Equity, Accessibility, and Justice

By Barbara Gastel

Fairness in various regards has become an increasing priority for editors in the sciences. Accordingly, at this session, a panel of editors and writers discussed ways editors can advance diversity, inclusion, equity, accessibility, and justice. Moderated by Shraddha Chakradhar (deputy news editor, diversity, *Science* magazine), the panel also included Laura Helmuth, editor-in-chief, *Scientific American*; Ellen Kuwana, freelance writer and editor; Pakinam Amer, journalist based in Cairo; and Siri Carpenter, editor-in-chief of the science journalism resource *The Open Notebook*.

Madison Brown, Francesca Landon-Harding, Sanjida Akter, Abdurrahman Radwan, Julianne Hodges, and Christina B Sumners are graduate students, and Barbara Gastel is a professor, at Texas A&M University.

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<https://doi.org/10.36591/SE-D-4604-11>

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Chakradhar described the *Science* news section's policies on diversity of interviewed sources. At *Science*, stories of at least 1000 words, which usually have 4 or more sources, must avoid homogeneous sourcing (such as only male or only White sources). Also, any story about a community must include a source from it. Reporter and editor brainstorm to identify suitably varied sources. "It's really a partnership between the reporter and the editor," Chakradhar said.

Others also addressed diversity. Amer noted that source choice should be based on merit, not tokenism. She also said that when local journalists collaborate on work by outside journalists, they need to receive credit, such as through shared bylines. Kuwana encouraged considering diversity of location and career stage. Noting that various issues intersect, Carpenter touched on considerations such as using gender-affirming language, avoiding ableist language, choosing and framing topics suitably, and selecting art. She said *The Open Notebook* website has many resources on diversity and related subjects.

Helmuth discussed equity in paying freelancers. She said editors should be proactive in raising pay rates rather than waiting until writers request increases. She and Carpenter emphasized that the pay should be the same regardless of where the writer is located. "Pay as much as you can afford," Helmuth said.

Discussing podcasts, Amer said to embrace various accents rather than restricting speakers to those with standard American or British English. Ways to help speakers for whom English is difficult, she said, include sending questions in advance and being willing to re-record answers. If an accent is heavy, she noted, part of a recorded answer can be used and the rest can be paraphrased.

Other advice from the session included the following:

- Place expectations about matters such as diversity in writing, for example, in writers' guidelines and assignment letters.
- Guide photographers and artists regarding diversity.
- Remember that different locations have different time zones, holidays, and days of rest.
- Create a culture of inclusivity at your publication.

A Word Problem: The Hows and Whys of Mathematical Communication

By Francesca Landon-Harding

Many people feel alienated from the mathematical world because of its dry numbers, complex equations, and technical language. This session's panelists addressed how to navigate these issues to foster a sense of mathematical belonging in everyone.

What does it mean to communicate math? Noelle Sawyer is now a communications manager at Michigan State University, broke it down. Drawing on audience answers, Sawyer characterized communicating math as explaining and applying mathematics without unnecessary numbers and jargon. Using "kernel" as an example, she noted that words can mean different things in math than in everyday life.

Sawyer also advised writers to use analogies and images. She said it is fine to use "the black box" rather than presenting every detail. For example, she noted, you do not need to know how to assemble an engine to drive a car. If there is no way around jargon, she said, do your best to define the terms simply.

Examples are also powerful tools for effective mathematical communication. Sam Hansen, mathematics and statistics librarian at the University of Michigan, Ann Arbor, discussed splitting a cake as a running example to present mathematical approaches to dividing a resource fairly. For complex mathematical problems, Hansen suggested using just one example but solving it in different ways. Hansen suggested using multilevel examples to cater to varied levels of understanding, as has been done in *Quanta Magazine*. Hansen also recommended including images whenever possible, either making the images oneself or asking mathematicians to create simplified versions. Sawyer added that images give people the intuition and agency to engage with the material.

Relating mathematical concepts to concrete experiences is another effective strategy. Kenna Hughes-Castleberry, public information officer at the physics institution JILA and freelance writer, said she has found herself lost in the math of quantum computing. She explained that seeing how the math applies to the world around her helped her get grounded. Hughes-Castleberry advised looking at the beginnings and ends of mathematical papers to find those real-world applications. When writing, she suggested phrasing things with "inaccurate accuracy"—in other words, in a way that is easier to grasp even if it is not as exact. For example, instead of saying "the population increased by 90%," she advised saying "the population almost doubled." Hansen advised starting pieces with the application to capture interest before introducing the math.

In closing, Hansen borrowed an idea from mathematician and mathematical mime Tim Chartier of Davidson College, advising writers to leave the reader with at least one good mathematical memory. Doing so can distract readers from dredging up doubt about what they might not know.

(Read remainder of article online.)

Plenary Report: A Stand-up Comedian's Guide to Science Communication

SPEAKER:

Kasha PatelDeputy Weather Editor
The Washington Post

REPORTER:

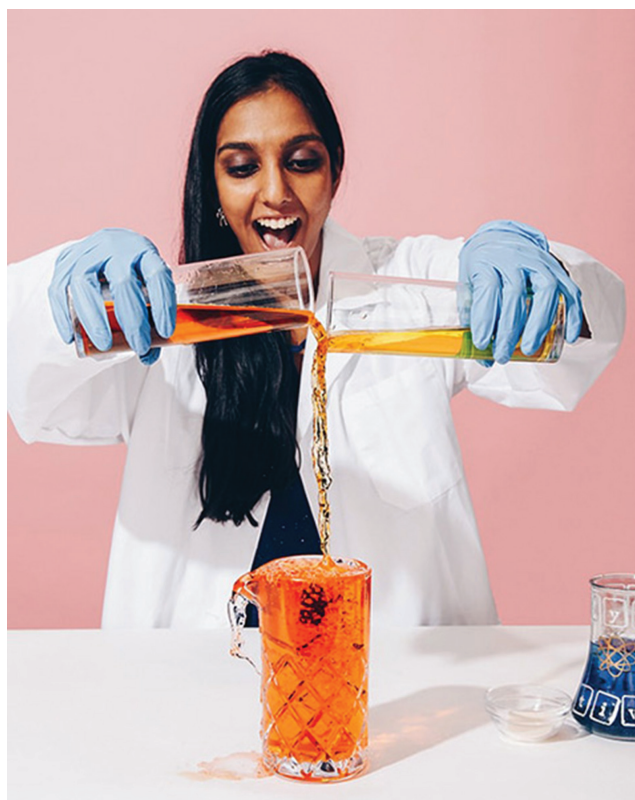
Peter J Olson

JAMA Network

Science editors are a lot like cats: they spend most of their time on computer keyboards and only annoy writers in the process. [Insert laughter here.]

That one-liner may or may not strike you as funny—but regardless of whether it made you giggle or groan, I couldn't resist employing one of the comedy tactics suggested by Kasha Patel during her Plenary Address at the CSE 2023 Annual Meeting in Toronto, particularly given her assertion that just about anyone can craft a joke if they really put their mind to it. A science journalist by day and comedian by night, Patel kicked things off with a lively, rib-tickling routine that focused on her formative years as a self-described nerd—including naming her phone charger "Mitochondria" (because it's the powerhouse of her cell) and taking on a dubious position in the world of sports (as treasurer of her ultimate frisbee team)—and highlighted a previous and pivotal stint at a "small science startup called NASA." The latter experience yielded a wellspring of content for her burgeoning career as a stand-up comic; beyond that, it would inspire an extensive empirical endeavor that would help her assess the connections between comedy and science and explore the use of humor as a tool for effective communication of scientific principles.

A chemistry major in college, Patel enrolled in a master's program for science journalism at Boston University while preparing for a run at medical school. One fateful day, a colleague invited her to a local comedy club where a mutual acquaintance was performing—an experience that would ultimately inspire her own foray into stand-up comedy. The typical Tuesday-night open-mike crowds didn't respond all that well to science jokes; yet Patel persevered, and it wasn't long after her move to NASA that, with the support of her new colleagues and the D.C. Science Writers Association, she performed her first science comedy show in Washington, DC, in 2014. The show, simply called Science



Kasha Patel

Comedy Night, quickly garnered an audience—and to this day, the science-focused variety show features comedians and scientists alike, as well as the occasional noncomedian/nonscientist who wants to throw their hat in the ring.

As much as Patel enjoyed the early successes of her show, the scientist in her wanted to know: Are science jokes actually funny? To find the answer, she took an appropriately analytical approach. Using a sample of 500 of her jokes, she measured the amount of time it took her to say the premise of each joke, then measured the number of seconds of laughter that followed to come up with an efficiency ratio. The results? Although her science jokes represented only 25% of her sample and generally had longer setup times, Patel found that they performed better overall when it came to tickling audience members' funny bones.

<https://doi.org/10.36591/SE-D-4603-02>

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Like any good scientist, Patel shared her interpretation of her findings. “I think science and comedy have a lot of things that complement each other very well,” she said. “For instance, science is all about truth and facts, and comedy allows you to exaggerate those elements... [and] nothing is funnier than the truth.” Opining that “a lot of people just don’t realize the inherent humor that you can find in certain science topics,” Patel suggested that applying a comedic edge to the scientific enterprise could serve to ameliorate its seemingly unwavering reputation—among scientists and nonscientists alike—as an innately rigid and humorless field. Not only that, a separate, subsequent Twitter poll she conducted revealed that most respondents viewed science comedy as an effective means of science education.

The literature further supports the harnessing of humor to promote effective science communication; at least one study has shown that where scientific topics are concerned, an audience’s perception of a comedian’s expertise in a particular topic goes up the funnier the comedian is.¹ Patel decided to expand on this concept in her own experiment: She trained several comedians to perform her own science comedy routine, then introduced some of them as “a scientist” and others as “a comedian” before their performances. The audience feedback was telling. If a joke was generally funny, the audience felt the speaker’s communication of the joke was effective regardless of whether they were a scientist or a comedian; however, if a joke fell flat, the scientist was tagged as the worse communicator. Here again, Patel referenced the aforementioned stigma of science as a potential reason for this general perception.

These data provide strong support for including comedy as a component of science communication—the trick is finding the right mechanisms for doing it. In an interview with climate change communicator John Cook on her podcast *Science Comedy Paradox*,² Patel and Cook discussed the concept of *parallel argumentation* and explored how incorporating humor into an argument can be a powerful means of combating misinformation. By simply extracting the logic of a situation and applying it to a different, more ridiculous situation, the ludicrous result will not only elicit laughs, it may also help you make your point. Cook applies this tactic in his ongoing efforts to combat climate change denial, and he also used it in an attempt to dispel antivaccination sentiments during the COVID-19 pandemic, often in the form of cartoons. In one depiction, Cook equated the common pandemic-era sentiment of “The curve is flattening—we can stop social distancing” to a skydiver deducing that “The parachute has slowed my fall—I can take it off now.”³

Cook’s creative approach of injecting humor into science communication is just one of many. Comic books are becoming a popular means of reaching new audiences.

Social media outlets offer a steady stream of science comedy, and even science-oriented government agencies are getting in on the fun: in particular, the Washington State Department of Natural Resources and the Oklahoma Department of Wildlife Conservation are renowned for posting clever public service announcements on Twitter. And of course, there’s YouTube, which is rife with comedic content designed to educate the general public about science-based topics—from middle school students rapping about vaccines⁴ to the US Consumer Product Safety Commission discouraging the deep-frying of turkeys⁵ to Patel’s own expedition to Antarctica to determine whether penguins have a sense of humor,⁶ there’s no shortage of science-themed laughs to be found online.

But let’s get down to brass tacks: How do you make science funny?

It may be unsurprising to hear that there is a science to comedy. Peter McGraw, a professor at the University of Colorado Boulder who directs the Humor Research Lab (HuRL, of course), developed the theory of *benign violation* with his coinvestigator Caleb Warren.⁷ Benign violation theory suggests that if you take a situation that defies accepted social mores (i.e., a *violation*) and frame it within the context of an acceptable norm, the situation is then perceived as being perfectly fine (i.e., it becomes *benign*) and consequently humorous. And although odds are low that comedian Chris Rock would ever be mistaken for a scientific researcher, his lifelong, real-world experimentation has provided him with an insight about comedy that Patel recognized as a vital one: The most important part of a joke is not the punch line, it’s the premise. If an audience doesn’t understand the premise of a joke, there’s no way they’re going to follow you to the punch line. Communication is key, and this holds true for both science and comedy—combine the two, and communication becomes an even more critical factor when engaging in science comedy.

Patel closed by offering a few tactics for those who might want to try their hand at science-inflected humor:

- **Alternative explanations.** “A Pew Research survey says that 80% of Americans say science has improved their eating habits and overall well-being. The other 20% are PhD students.” The all-important premise here is the survey respondents who think science is a good thing. As for the punch line, it’s rooted in the unexpected: What is a surprising group of people who might think science is bad?
- **Comparisons and metaphors.** Patel noted that you most often see this approach in the form of memes.
- **Analogies.** Patel often weaves amusing analogies into her articles at *The Washington Post*, as when describing a moon-like crater in Canada: “Much like most of my

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dating life, the remote location of the crater is isolated from most humans and mimics the aloneness felt on the moon.”⁸ Patel crafted this quip by first listing the realities of dating, then listing the properties of a crater—and then looking for the similarities between the two.

- **Wordplay.** Patel noted that the universal appreciation of wordplay is why article titles such as “Uranus Might Be Full of Surprises”⁹ appeal to audiences, thus making them more inclined to actually read the full article.

Finally, Patel invited her audience to tap into their inner comics via a game of fill-in-the-blank:

“_____ are a lot like cats: _____.”

Go ahead, give it a shot. It’s fun to try, even if the result doesn’t kick-start a second career in stand-up science comedy. Then again, you never know...

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COMMUNICATING SCIENCE
FOR A SUSTAINABLE FUTURE

Implementing Accessibility: Pathways to Success

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SPEAKERS:

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As scholarly publishing professionals, we all understand the importance of making our content technically accessible for all who wish to engage with it. Through relevant and relatable case studies from publishing experts who have implemented accessibility in various forms, this session provided useful information on making content more accessible.

The first speaker, Michael J Cannon, described the 5 lessons learned by his organization when working on increasing accessibility of their content. These 5 lessons are:

- Start early and do something. This includes understanding context and knowing your processes and capabilities.
- Recognize the magnitude and ongoing commitment of accessibility, including your capabilities, as well as needs, and understanding the landscape of what compliance will look like for your organization.
- Audit, test, and iterate. These tasks include, but are not limited to, consulting with your publisher/platform provider, sketching out a road map, and ensuring that article templates are updated to support accessibility.
- Educate. This may include updating and developing new author resources and investing in production services that will display high-quality, accessible content.
- Align including being accessible everywhere (e.g., social media, marketing, etc.) and involving your users to provide feedback.

Jennie Pajerowski spoke next and provided their organization's experiences in supporting accessibility. They

reminded the group that accessibility is not just a platform or just a content issue, and they suggested a “bake it in vs. bolt it on” approach (Figure). This means considering accessibility needs early in the publishing process. They also mentioned that accessibility is also not the responsibility of just one person; rather, working toward accessibility requires bringing people together and synthesizing information from various places.

Pajerowski stated that their organization migrated from 3 publishing platforms down to 1, and that they took the opportunity to undertake a complete, more accessible redesign. Some specific ways that the organization worked to increase and ensure accessibility include keyboard accessibility, alt-text for figures, text styling (including headings and structure within articles, font type and size, color contrast, and link styling), and display of figures and captions.

The final speaker, Sylvia Izzo Hunter, discussed considerations to keep in mind when taking accessibility from a passion project to a strategic priority. Reasons for wanting to increase accessibility of content may include broadening reach, removing the need to remediate content later, fulfilling legal obligations, and most importantly, being the right thing to do.

But when proposing broadening accessibility to one's organization, Hunter mentioned that there may be challenges in getting buy-in. These challenges may include budgetary and staff bandwidth considerations, additional work that may be required from authors, and lack of understanding of the need for accessibility. However, she reminded the group that nearly 16% of the world's population has a significant disability, and that “researchers/staff” and “people with disabilities” are not mutually exclusive—the discourse is shifting.

Hunter then presented 4 tools in an individual's toolbox that can be channeled to convince an organization to expand accessibility:

- Connecting accessibility to the organization's mission. For example, how does accessibility help to advance the organization's mission?
- Making a business case for accessibility. Questions to consider include: 1) What opportunities and whose perspectives are you missing if content and systems are not accessible? 2) Is content truly Open Access if it is not accessible?
- Addressing the need for legal compliance. Ask your organization what are the legal risks if content is not accessible?

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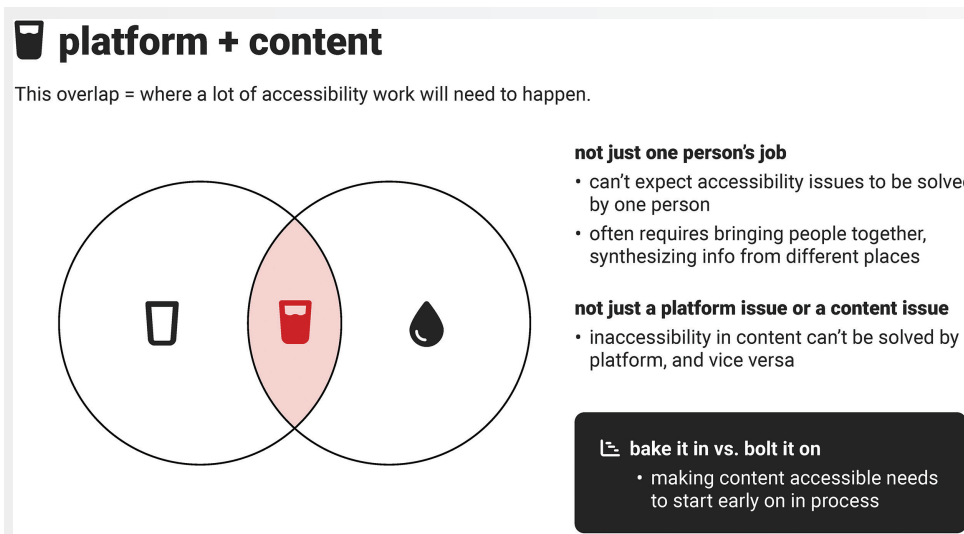


Figure. Bake it in vs. bolt it on.

- Meeting the needs of readers and users? For example, whose needs are not met and what message is being sent if content is not accessible?

Hunter's presentation acknowledged that when considering expanding accessibility, there may be conflicting

access needs and design gaps, but that one should not give up on accessibility. She concluded that accessibility is an ongoing process, and one may never feel finished, but she encouraged the group to find a place to start and begin the process.



CSE has launched a repository of journal and organizational statements related to diversity, equity, and inclusion.

Many journals have begun working to improve editorial board diversity, evaluate peer review processes for implicit bias, revise guidelines for authors, or develop training opportunities, while others are struggling with where to start.

Has your journal or organization issued a statement about policies and practices related to diversity, equity, and inclusion? Please consider sharing your efforts with our community by completing the [DEI Resources Submission Form](#) on the CSE homepage under "Resources."

Submitted resources will be publicly available on the CSE website.



Author Experience: Building a Framework for Successful Author Engagement

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How do we provide an excellent author experience (AX) when there are differing author and editor expectations, limited resources, and shifting publishing models? In this talk, 3 speakers presented tips on providing the ultimate AX—what to focus on, what tools are necessary, and why AX is important. There also was some focus on marketing, which greatly affects AX.

First, Colleen Scollans of Clarke & Esposito presented the Six Pillars of AX Maturity: (1) differentiate strategy and brand; (2) elevate marketing and invest in MarTech; (3) measure, track, and understand AX; (4) embrace experience design; (5) align editorial and marketing; and (6) build an AX roadmap (Figure, online only). In this segment, the key takeaway was to listen to authors. Authors are often also readers, members, and board members, so demonstrating a positive customer experience and loyalty is important. Keeping things fast and simple and proving clear communication are helpful in putting authors first and ensuring that they have a positive experience.

Next, Julia Kostova of Frontiers discussed the holistic customer experience (CX) approach at her organization. Frontiers was founded by 2 researchers who were frustrated with their experiences with the existing publishing process, so the company was built with the researcher's priorities in

mind. Kostova pointed out that researchers interact with Frontiers in a variety of capacities—as authors, reviewers, editors, or readers—and as such, Frontiers' approach to CX encompasses all of these journeys across the entire workflow, from presubmission through peer review and research integrity, through production to post-publication services like marketing. CX at Frontiers pivots around quality, intuitive and cutting-edge technology, timely and transparent communication, operational excellence, personalization; and a focus on metrics to allow for objective and consistent progress tracking.

Finally, Romy Beard of ChronosHub gave 5 tips for offering a better AX through workflow organization: (1) have one login for authors, (2) take time to decide what should be manual versus automated, (3) have a logical workflow sequence, (4) keep it simple, and (5) have a we-do-it-for-you attitude. One real-life example of how keeping it simple can pay off is Burbn, Instagram's predecessor. This app was complex and had many features that were not useful, so it was rebranded as Instagram, and the rest is history. Beard talked about how it is important to think about what is automated, which can save time, versus what is manual, which adds a personal touch that can enhance the AX.

The importance of metrics and measuring the AX was also emphasized. In the Q&A, someone brought up the challenges of controlling the AX when outsourcing publishing to a third party. In this case, clarity, communication, and data are key. A happy author experience is usually better for everyone involved, so everyone should have the same goals.

Also, it is important to note that the AX includes rejected authors. All authors should have a positive experience, whether their paper is ultimately accepted or not. Authors often have a choice of many publications to submit to, and you want to provide the best experience if they decide to resubmit or refer their colleagues. Authors and their experience are more important today than ever before in the growing scholarly publishing community.

<https://doi.org/10.36591/SE-D-4604-01>

Building Diversity, Equity, Inclusion, and Accessibility Capacity: Resources to Promote Best Practices Among Professionals in Scholarly Publishing

Leonard Jack, Jr, Peter J Olson, Patricia K Baskin, and Orito F Iwuchukwu

The Council of Science Editors (CSE) is an international organization of more than 500 editorial professionals in the scientific, scientific publishing, and information science communities. The organization's goal is to serve as an authoritative resource on current and emerging issues in the communication of scientific information.¹ Similar to other scholarly publishing organizations, CSE continues to facilitate important conversations and training regarding why, how, and

where principles of diversity, equity, inclusion, and accessibility (DEIA) should be integrated into scholarly publishing. With guidance from CSE members with expertise in DEIA in scholarly publishing, and the approval of CSE's Board of Directors, the organization established the DEI Committee in 2021 (which was expanded to the DEIA Committee in 2023). The purpose of the DEIA Committee is "to support the organization in building capacity among its leadership, members, and the profession at large to deliver programmatic activities and training that integrate [DEIA] best practices in science editing, publication management, scholarly publishing and communication, member recruitment, participation, and engagement."²

Since the committee's inception, CSE has implemented and/or participated in 8 broad-ranging DEIA-related activities: 1) adding new content to CSE's *Recommendations for Promoting Integrity in Scientific Journal Publications*³ related to DEIA best practices in scholarly publishing; 2) completing a DEIA sensitivity review of *Scientific Style and Format*,⁴ the CSE style manual, for its upcoming 9th edition, scheduled for publication in 2024; 3) a DEIA-related symposium to update members on CSE's progress in achieving DEIA-related objectives and activities identified in CSE's Strategic Plan²; 4) establishing a DEIA column in *Science Editor*,⁵ CSE's quarterly magazine; 5) implementing an inaugural 1-day DEIA short course to a range of professionals in scholarly publishing; 6) implementing its Ethics Clinic on Diversity, Equity, and Inclusion⁶; 7) actively serving as a member organization for the Coalition for Diversity & Inclusion in Scholarly Communications (C4DISC)³; and 8) establishing CSE's DEIA Scholarly Resources web page.⁷

Collectively, these activities help publishers, editorial leadership of journals, journal editors, editorial teams, peer reviewers, and authors gain access to numerous resources, tools, educational materials, and training opportunities. This access allows scholarly publishing professionals to develop the knowledge, skills, and abilities to increase equitable participation and decision-making among diverse groups of

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

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the American Academy of Neurology.

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-4604-05>

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individuals, increase trust among stakeholders, encourage civility, and support fairness throughout all aspects of the industry. The road to fully realizing equity, diversity, inclusion, and accessibility requires persistent attention, collaboration, and introspection from professionals and organizations in both the early stages (e.g., deciding who to invite to the table) and more advanced stages (e.g., deciding to use data collected to revise policies and procedures) of that realization.⁸

Fortunately, there are several published and publicly available DEIA-related resources to assist professionals working in the field of scholarly publishing. The formation of CSE's DEIA Scholarly Resources web page⁷ has yielded a one-stop repository that provides access to more than 50

current resources in 7 categories: 1) DEIA Committees of Trade and Professional Organizations in Scholarly Publishing; 2) DEIA and Peer Review; 3) DEIA Statements and Policies from Journals, Trade and Professional Associations, and Publishers; 4) Bias, Discrimination, and Racism; 5) Data Collection on Diversity, Equity, Inclusion, and Accessibility; 6) Reporting Sex, Gender, and Race in Publications; and 7) Inclusive Language Communication (Figure).

The resources in these 7 categories are briefly described below and were identified through various approaches, including literature searches, resources identified by CSE DEIA members, and resources submitted via the web page from CSE members. Resources identified for inclusion ranged from peer-reviewed papers, position statements,

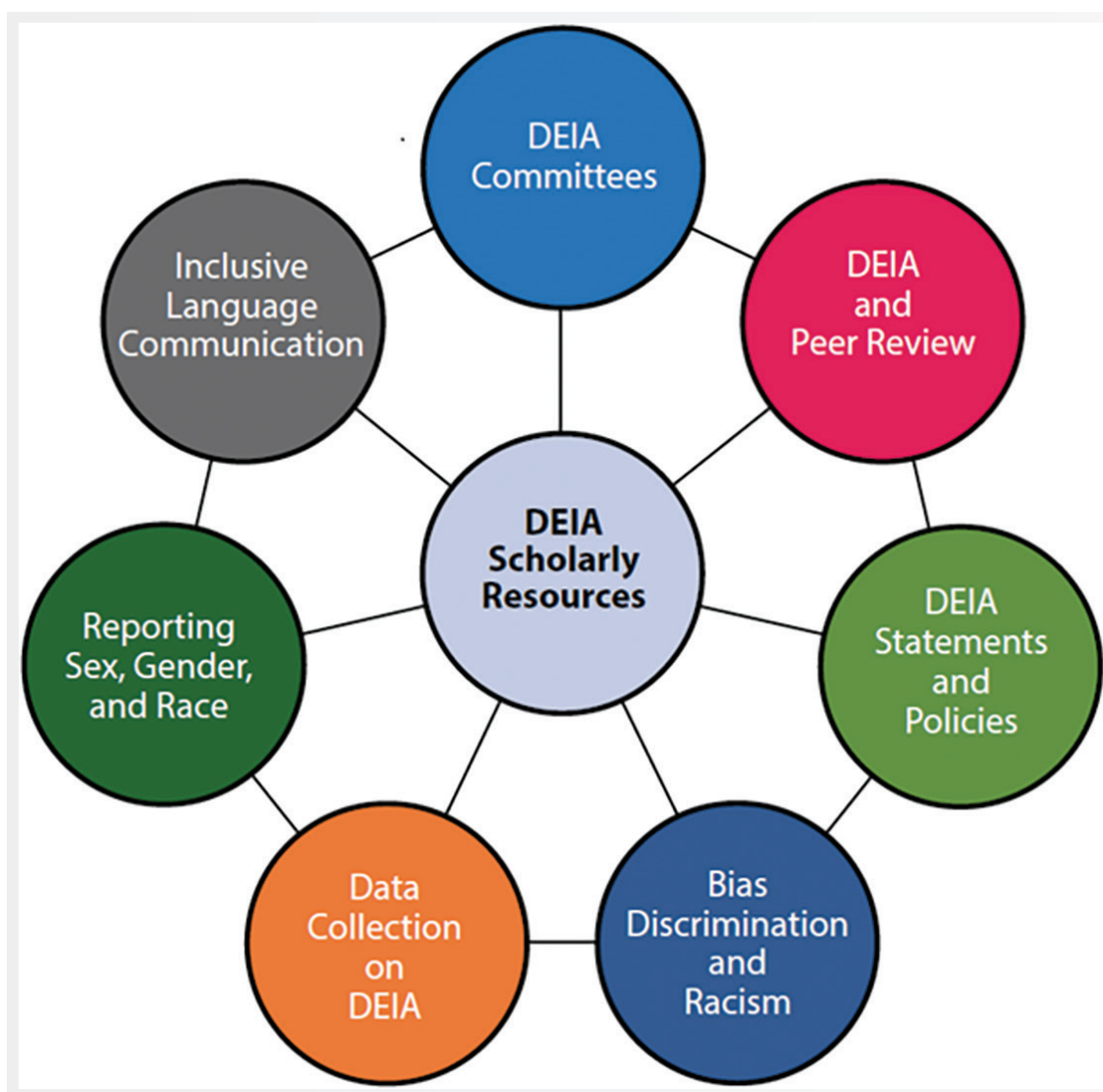


Figure. CSE's 7 categories of Diversity, Equity, Inclusion, and Accessibility Scholarly Resources.

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guidance documents, online training webinars, and more. The content provided within each of the 7 categories is by no means comprehensive, and the inclusion of a particular resource does not necessarily represent endorsement by CSE or the Centers for Disease Control and Prevention. As stated on CSE's website: "The categories are broad, and information may overlap more than one category."⁷

1. DEIA Committees of Trade and Professional Organizations in Scholarly Publishing

Various trade and professional associations within the scholarly publishing arena are committed to addressing issues of diversity, equity, inclusion, and accessibility in their communities.⁹ They have formed coalitions and committees to provide resources to individuals and organizations that provide information about DEIA-related activities such as training, networking, changing organizational culture, and use of best practices in language usage, editing, and organization of editorial boards and teams.

Resources in this category describe the formation of DEIA-related committees of trade and professional organizations in scholarly publishing as well as their purposes, composition, and activities undertaken by their membership. Activities undertaken by DEIA committees include establishing toolkits for allies and organizations, establishing guidelines for inclusive language and images, implementing a series of discussion sessions to share knowledge solutions for accessibility, disseminating strategies to diversify editorial boards, and ways to improve the peer review process and the content of published articles. These resources also describe ways in which DEIA committees collaborate with their organizations' leadership and other organizational committees to ensure that DEIA best practices are used in creating program and conference planning, identifying speakers, recruiting members, and promoting unbiased science editing among the member journals. In addition, outside of their own organizations, DEIA committees describe ways in which they have worked collectively to assist in planning seminars, educational opportunities, and other events for the field of scholarly publishing in general.

2. DEIA and Peer Review

Journals depend on subject area experts to help assess the strengths and weaknesses of content submitted for consideration.¹⁰ Journals are expected to continuously review guidance provided to peer reviewers to help minimize biases that may occur during the review process. This guidance is necessary to help scholarly journals screen and provide authors with feedback that positions those journals to disseminate evidence-based, culturally-appropriate, trustworthy content. The resources found in this category provide information

about implementing strategies to overcome inequities that may be unintentionally built into the peer review process. If not addressed, these inequities could result in publishing content that lacks rigor and credibility.

The content in this category offers examples from journals and publishers that present ways to diversify volunteer groups that comprise editorial boards, associate editors, and peer reviewers. Several resources provide insight into how journals can establish commitments through policies and procedures that encourage best practices in developing diverse, equitable, and inclusive peer review teams. Resources are also available that provide examples on how to collect demographic data to track diversity, how to use such data to monitor progress, and, if necessary, how to identify when it is necessary to implement a shift in approaches to address areas requiring improvement.

3. DEIA Statements and Policies from Journals, Trade and Professional Associations, and Publishers

It's all well and good to say that you believe in the principles of DEIA; it's another thing to commit to them. In recent years, many journals, trade organizations, professional associations, and publishers have not only acknowledged the need to advance DEIA practices within their institutions but also have published position statements or publicly declared their intent to do so.¹¹ This section of the DEIA Scholarly Resources page provides access to published statements on developing DEIA frameworks; guiding principles for addressing bias based on race and ethnicity, gender, religion, disability, and other aspects of self-identification; DEIA-based editorial policies; and strategies to cultivate organizational practices that promote inclusion and diversity.

These statements and declarations go beyond abstract advocacy of DEIA principles. They are prudently crafted, comprehensive statements or declarations that describe demonstrable initiatives, communicate immediate policy updates, and divulge detailed progress reports. Many of these resources cite supportive data to substantiate the need for—and the potential impact of—actions designed to dismantle systemic bias, discrimination, and racism within an organization's infrastructure. Many take the additional step of including links to ancillary resources that provide further guidance for implementing DEIA-related practices that can inspire institutional change.

4. Bias, Discrimination, and Racism

Systemic inequity is a deep-seated, pervasive concept that has been responsible for immeasurable societal historical challenges that persist to this day.¹² These challenges are no less prevalent or problematic in scholarly publishing; fortunately, many scholarly publishing entities are taking

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bold steps forward to address the systemic frameworks of bias, discrimination, and racism that exist in every corner of the industry.¹³ This collection of resources includes large publishers that have codified their commitment to inclusion and equity and the elimination of systemic racism in scientific research and health affairs.

The resources in this category provide important information and perspectives on how bias, discrimination, and racism can permeate an institution's infrastructure, its editorial processes, and any content it may produce and/or publish. Additionally, they reflect the difficulty of having discussions and asking the questions that will actionably address the existence of bias, racism, and discrimination within the scholarly publishing industry, including: How do bias, racism, and discrimination negatively impact a journal's and/or a publisher's ability to avoid publishing content that perpetuates historical harm? What opportunities exist for diverse participation on volunteer boards? What are the persistent representational issues in scholarly publishing?

Many of these resources offer pragmatic examples of how an institution can address and avoid systemically hierarchical, discriminatory, and biased frameworks within its operations and redefine its best practices to ensure both equity and integrity in its mission to publish scientific content. In addition, they offer examples of what journals in medicine, health care, pediatrics, and genomics are doing to establish an antiracist posture in scientific publication. Many of these statements offered by journals are geared toward establishing commitments to taking proactive steps to establish an antiracist future in scholarly publishing.

5. Data Collection on Diversity, Equity, Inclusion, and Accessibility

Documented lack of diverse representation among editorial leadership, editorial boards, peer reviewers, and authors remains a major barrier to achieving the aims of advancing DEIA principles in scholarly publishing.¹⁴ There are increasing expectations for publishers and journals to not only identify, implement, and publish plans to advance DEIA-related activities but also to increase accountability by collecting, using, and publishing demographic data of its editorial boards, peer reviewers, and authors.¹⁵ Collecting demographic data can provide key metrics useful in understanding who is deciding what is published.¹⁶ There may also be instances when it is deemed helpful to collect demographic data regarding organizational leadership and staff composition.¹⁶ This category provides information and resources on the importance of collecting demographic data, tools for collecting those data, and ways to use it to guide strategic planning and day-to-day decision-making. The resources in this category provide examples of ways journals can collect demographic questions during

manuscript submission; in addition, they discuss barriers to the collection of demographic data and strategies to overcome those barriers.

6. Reporting Sex, Gender, and Race in Publications

Historical harm from faulty studies can be caused by many factors, including limited and unchallenged research questions, flawed methodological approaches, misaligned statistical testing and reporting, and unaddressed/uncorrected publication bias.¹⁷ As a result, journals have moved to publishing author guidance requiring greater reporting details on sex, gender, race, and ethnicity in published papers. This category provides examples of such journal guidance to authors to improve research integrity and transparency. Several resources are available, ranging from a checklist for reporting race and ethnicity in medical and science journals to reporting classification variables for individual characteristics (e.g., race, indigeneity, national origin, gender, sexual orientation, and socioeconomic status). These resources discuss the importance of including an explanation in published articles of who identified participants' classification, stating the sources of the classifications (e.g., self-report, investigator observation, database, electronic health record, survey instrument), and the reasoning behind using race and ethnicity categories. The resources in this category continue to emphasize that journals must remain vigilant in updating guidance to authors to prevent methods and statistical analyses from being poorly described, making it difficult to replicate research and prove or disprove hypotheses or findings.

7. Inclusive Language Communication

Inclusive language is evolving at an unprecedented rate.¹⁸ Acceptable usage of certain terms, phrases, or concepts are constantly being reassessed, and many publishers and journals are diligently—and frequently—incorporating requisite updates regarding inclusive and nonbinary language into their style manuals and author guidelines.¹⁹ The resources in this category provide invaluable information and guidance from several prominent and well-respected institutions within the scholarly publishing industry, all of which are at the forefront of the effort to promote the use of language that is respectful toward authors, study participants, and readers alike.

An important ripple effect of this effort is that authors are more likely to feel included, invited, and motivated to submit their work to publications that have clearly demonstrated a commitment to inclusivity and sensitivity in scientific reporting. From policy toolkits to editorial style recommendations to study methodology guidelines, these resources stand at the cutting edge of inclusive language conventions and best practices, and the institutions that

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developed them continue to play a critical role in advancing and keeping pace with this ever-evolving aspect of the scientific enterprise.

Conclusion

As with any field of interest, the number of DEIA-related resources continues to increase as publishers and journals learn from and build upon previously released guidance. As such, resources on CSE's DEIA Scholarly Resources web page will continue to increase. These resources can assist journals at various stages of implementation of DEIA-centered activities. Journals, editorial offices, and publishers are in the best position to decide which resources are of best use and why. Determining where to start requires asking important and often difficult questions, including: Is there an understanding of why DEIA in scholarly publishing is important? Are there groups, networks, organizations, experts, or other stakeholders who are willing and available to engage and ask questions about where best to get started? Are there training opportunities available that can help increase knowledge, skills, and abilities among leadership, decision-makers, staff, and volunteers? The key is to identify a reasonable plan of action, encourage participation from a wide range of stakeholders, and adopt patience to execute the plan over time.

The CSE DEIA Committee has envisioned a process of curating and maintaining the Scholarly Resources web page over time to provide access to current content housed in one location. The committee encourages visitors not only to explore the contents and their evolution, but also to consider submitting resources for inclusion as they become available. Authors, journals, creators of training opportunities, and other scholarly publishing professionals are encouraged to submit requests²⁰ to include resources for consideration in any of the 7 categories.

Acknowledgment

Dr Leonard Jack, Jr, was responsible for conceptualizing and leading the creation of CSE's DEIA Scholarly Resources web page. Special thanks are extended to members of the DEIA Committee for their feedback and support in building this web page.

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Ask Athena: Artificial Intelligence in Editing and Publishing

In academic publishing and peer-reviewed journal landscapes, many challenges confront the functionality of smooth processes and overall success. From processing submissions in a timely manner and encouraging diversity on editorial boards to resolving authorship conflicts, adhering to embargos, and understanding the positive/negative implications of artificial intelligence—publishers must find resources to help them stay adaptive and innovative and survive by implementing tailored approaches to their specific needs. In Ask Athena, we tackle tough subjects, bring in industry experts, and provide resources to publishers, societies, and editors to foster success, whether in internal office issues or external journal-wide challenges. Submit your questions to scienceeditor@councilscienceeditors.org.

This month's Ask Athena column delves into artificial intelligence (AI) and large language models in editing and publishing and will be followed by a webinar ("Breaking Barriers: Supporting Authorship using Large Language Models") on January 25, 2024, at 11:00 AM EST, hosted by Dr Sunil Moreker, a National Award winner for Wolfram Language AI in Papilledema and a repeat presenter on plagiarism detection software at the Committee on Publication Ethics.

Dear Athena,

With all the pressures facing science publishing, I'm interested in tools that can help, such as AI, but how can we preserve the "human judgment and integrity model" vs. "how to streamline peer review, plagiarism detection, and content landscape architecture"?

—Wary of AI

Dear Wary,

It sure seems like AI is reshaping the publishing industry, offering efficient and cost-effective solutions for various tasks related to the publication process, whether we desire

Answers to this Ask Athena question were provided by Ryan James Jessup (SWB Consultants) and Amy Shapiro (Frontiers) in collaboration with the CSE Education Committee.

<https://doi.org/10.36591/SE-D-4604-13>



it or not. Moreover, AI has the potential to revolutionize academic publishing in various ways.

The potential of AI can be overwhelming, so here are some tips on ways AI can be harnessed effectively, tools that align with specific needs, and resources for training staff:

Harnessing AI Effectively in Academic Publishing

Automating Editorial Processes

- Peer review management: AI algorithms can match submitted manuscripts with appropriate reviewers, speeding up the review process.
- Plagiarism detection: AI tools can efficiently scan documents for plagiarism, ensuring the originality of submissions.
- Language editing: AI-driven language tools can assist non-native English speakers in improving the language quality of their manuscripts.

Content Curation and Recommendation

- Content tagging: AI can analyze and tag articles based on their content, aiding in better categorization and search optimization.

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- Personalized recommendations: AI algorithms can suggest relevant articles to readers based on their interests and previous reading patterns.

Data Analysis and Visualization

- Data extraction: AI can extract valuable data from research papers, speeding up the process of data analysis.
- Automated graphs and visuals: AI tools can create charts and visuals based on the data presented in research papers, enhancing the reader's understanding.

Tools Aligned with Specific Needs

Natural Language Processing (NLP) Tools

- IBM Watson Natural Language Understanding: Analyzes text for sentiment, entities, concepts, emotion, relations, and more.
- Google Cloud Natural Language API: Provides syntax analysis, entity recognition, sentiment analysis, and content classification.

Machine Learning Platforms

- TensorFlow: An open-source machine learning framework developed by Google for various machine learning tasks.
- PyTorch: An open-source machine learning library developed by Facebook's AI Research Lab, known for its flexibility and dynamic computation graph.

Data Analysis Tools

- R and RStudio: Widely used for statistical analysis and creating visualizations.
- Python Libraries (Pandas, NumPy, Matplotlib): Popular tools for data manipulation, analysis, and visualization.

Research Assistance Tools

- Research Rabbit: Reimagines research with its Discovery app, connecting researchers to global opportunities.
- Elicit: Automate time-consuming research tasks like summarizing papers, extracting data, and synthesizing your findings.

Resources for Training Staff and Ensuring Transparency

Training Resources

- Online courses: Platforms like Coursera, edX, and Udacity offer courses on AI, machine learning, and natural language processing.
- Workshops and webinars: Organize workshops and webinars conducted by AI experts to train staff members.
- In-house training: Collaborate with AI professionals to conduct on-site training tailored to your organization's needs.

Ensuring Transparency

- Explainable AI (XAI) techniques: Utilize AI models and algorithms that are transparent and provide clear explanations for their decisions.
- Regular audits: Conduct regular audits of AI systems to ensure they align with ethical guidelines and standards.
- Transparency reports: Publish transparency reports detailing the use of AI in the publishing process, ensuring openness about the methods employed.

Effectively harnessing AI, selecting the right tools, and investing in staff training empower academic publishers to accelerate processes, enhance accuracy, and ensure transparency—ultimately benefiting the entire industry. Additionally, many publishers and journals have policies regarding AI and authorship. We recommend considering these policies when creating new guidelines or deciding how to appropriately integrate AI into your processes.

Always,
Athena

Sign up for the CSE webinar¹ on January 25, 2024, at 11 am EST on *Breaking Barriers: Supporting Authorship using Large Language Models*,² National Award winner for Wolfram Language AI in Papilledema and a repeat presenter on plagiarism detection software at the Committee on Publication Ethics.³

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Instagram as a Valuable Scholarly Publishing Social Media Tool: This Platform Is Not Just for Influencers Anymore

Jennifer Regala

One of the highlights of my career was working with Mary Williams, Features Editor of *The Plant Cell*, and Katie Rogers, formerly Community Engagement Administrator, at the American Society of Plant Biologists (ASPB). I consider them to be true leaders and innovators in a meaningful social media community. I will never forget when they presented at an all-staff lunch-n-learn about ASPB's social media strategy, which included their 3 peer-reviewed journals, the overall organizational presence, and the unique digital ecosystem and membership experience, Plantae.org. They shared their secret sauce for successful virtual involvement, which was simple yet brilliant: plan your content thoughtfully and well in advance and then focus on fluid and organic engagement. Look for opportunities to connect with your audience sincerely in the places they want to be found. Instagram, a social media network that relies on images and videos to enthrall its users, is the perfect place to perfect this approach.

Angela Cochran recently wrote a post for The Scholarly Kitchen considering the question of whether X (formerly Twitter) is worth the time.¹ This thoughtful article, and many conversations I've participated in within our community, all focus on the question of what happens to our publications, our organizations, and our own personal and/or professional presences on the social media platforms available to us.

I propose that we all gather on Instagram. It's a well-curated, mostly polite, aesthetically pleasing haven. Need to showcase your beautiful journal covers? Have a great intro video of an impactful article? Want to share a behind-the-scenes glimpse of your Ed Office? Want to share key takeaways of a recent meeting? Then Instagram is your platform. If you're trying to reach your audiences in a more intimate way, you might be surprised at what's possible.

Jennifer Regala is the Director of Publications/Executive Editor at the American Urological Association.

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.

<https://doi.org/10.36591/SE-D-4604-14>

Another important point is that our work is serious business. We are mired in deadlines and editorial policies and Open Access mandates and platform woes. Our editorial boards are burdened with handling submissions and simultaneously hoping for more yet dreading the thought of more. Our authors have so many choices of where to publish before they perish. Dare I say that Instagram can offer everyone a brief respite from the grind and allow for accessibility to content and community in an entirely different way?

Below, I share some tips as a 12-year devoted Instagram user. I first created my Instagram account as a personal spot to share amusing pics of my kids, crock pot meals, my rehab efforts after my hip replacement, and lots and lots of hot pink shenanigans. After my Threads debacle I chronicled in this space this past summer, my personal account has since blurred into a hybrid of IRL friends, scholarly publishing colleagues, and authors/editors/reviewers I've worked with both in the past and currently.² Now I have many of my editors and authors following my @mommyjennyblog adventures on Instagram—they'll just have to love me through it.

The American Urological Association (AUA) has 3 journal-related Instagram accounts for our peer-reviewed journals, *The Journal of Urology*®, *Urology Practice*®, and *JU Open Plus*. We've found great engagement on these handles from places and people we were not expecting, which has made it fun for our team to create content in new and unique ways.

On Being Organic and Fluid... and Using Instagram to Do It

Anyone can schedule articles to post on Facebook, Instagram, and X, and I encourage you to come up with a robust editorial calendar to do so. But the great fun of Instagram is how much opportunity there is—add still photos, dress your photos up with a filter or some background music, post a video, show some personality! When you're thinking about using Instagram in a professional setting, though, I do caution you to consider tone and voice when you think about what to post.³

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How to Have the Prettiest Squares in Town

Instagram launched in 2010 as a spot to share your photos in aesthetically pleasing rows of squares, arranged 3 in a row, with captions meant to highlight the meaning of each image.⁴ Selfies quickly ruled the platform, as did shelfies (swoon-worthy bookshelves), food pics, nature shots, and pets—lots and lots of pets. As the app evolved, more features were introduced, but even today, thoughtfully curated squares rule.

How do beautifully arranged images help your publication, though? Look no further than *Science Editor's* own account (@csescienceeditor), where you can see the captivating covers of recent issues. What a great way to lure your audience into your important work (Figure 1, online only)!

Video Content

Video content is another way to grab your audience's attention. And as Instagram has evolved, they've figured out more ways to share videos.

Stories, Highlights, and Reels

An Instagram story is a fleeting 24-hour video glimpse into anything you choose to share. For our AUA journal Instagram handles (@journalofurology, @juopenplus, and @urologypractice), we post quick links to articles, short video snippets, and sneak peeks of interesting events and people. A story disappears after 24 hours, but not to fear. It can be captured in a highlight. Collections of highlights can be curated on your profile page and viewed for as long as you keep it in that collection. You can sort highlights in any way you choose—ideas included by issue, by topic, or by contributor.

A reel is a TikTok-style video, often including music, that remains as a permanent video presence in your collection of Instagram squares.

How Do You Get Video Content?

My best advice to get interesting video content is ask for it. Here are things we've done at the AUA that work like a charm:

- Ask your Editor-in-Chief to film a short video each issue highlighting the most important items published in the journal's pages.
- Reach out to a reviewer of a newly accepted paper to ask for their take on why that paper is impactful from their point of view.
- Invite an author to explain the importance of the work.
- Get on the video yourself and explain your editorial processes or some other behind-the-scenes information. Your community likely doesn't know as much about peer review or production as you think they do!

Instagram Takeovers

An Instagram takeover is a next-level approach to providing a transparent experience for your devoted Instagram followers. Here's how to do it: Invite a tech-savvy editor to video 24 hours (or more!) of their life; what their professional life looks like, what their editorial workload looks like, the whole enchilada. Have them share their honest insights and the challenges they're facing. They can record the videos and send them to you to post. You'll get relatable content that hooks your followers and inspires others to want to take over the account in the future. You can then share these takeovers as a highlight in your profile. Hearing directly from editorial leadership and other key contributors is rare, but if you can make these takeovers happen regularly, you will be offering a unique accessibility to your processes and content that will be appreciated by your community.

Promote Yourself, Your Organization, and Your Events

Look no further than one of the AUA's favorite doc stars, most prolific authors, social media sensation, and wonderful human, Dr Giovanni Cacciamani (@gecacciamanimd), for how to do Instagram RIGHT to promote yourself on social media (Figure 2). He is sure to post his published work on Instagram along with expertly used emojis and brilliant layperson summaries of his important work. And it's all visual and easy to digest! And notice how he uses his caption to acknowledge the contributions of others—perfect chef's kiss.

Silverchair also does a phenomenal job of promoting a community vibe on Instagram. Look no further than their Thanksgiving post to see their heartfelt message to their followers.

Don't Forget to Repurpose Your Content!

As you create your Instagram content, don't forget to sprinkle it far and wide. Post your photos and videos to other platforms as suitable. And you can post your TikToks, X posts, and other social media posts back to Instagram. And of course Instagram is linked to Threads, which makes it super easy to cross-post.

Pay Attention to Who You're Following

Find your people and follow them. And quickly, you'll find that they follow you. You'll get to know your community more quickly than you ever believed to be possible.

Why Should You Care About Doing Any of This Crazy Stuff?

It's easy. Do you want to stand out? How will you be different in this maddening time of X imploding, decreased staff resources, and no time and no energy to get the

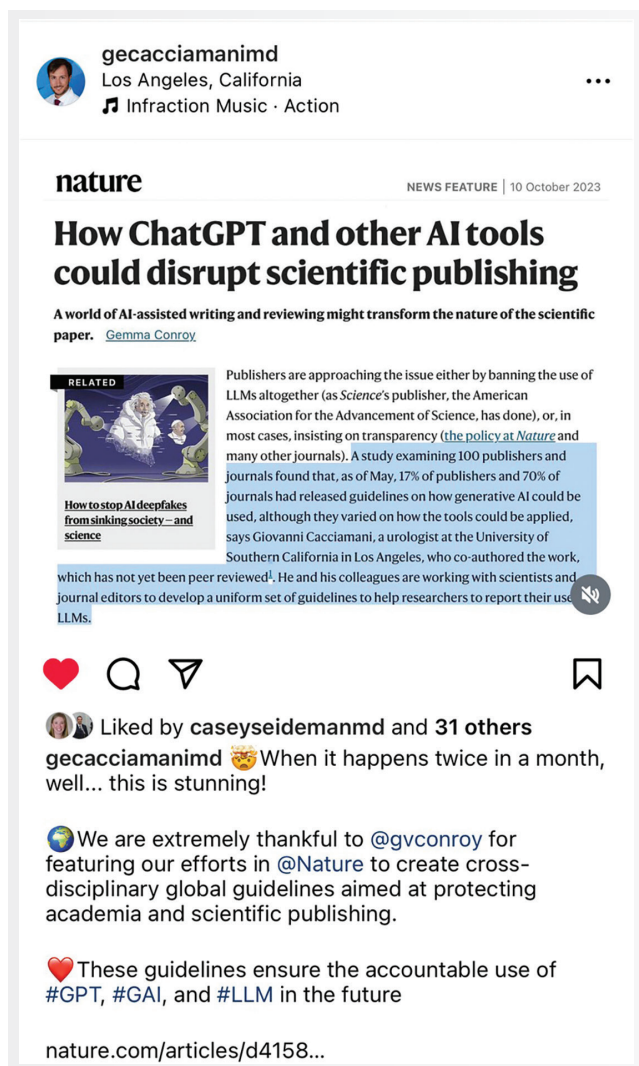


Figure 2. Dr Giovanni Cacciamani on Instagram.

job done? Instagram is your answer. And trust me when I say your community is looking for an escape, too. Give them something pretty and interesting and fascinating to consume, and you'll have them hooked.

Bonus Story: Buyer Beware

It wouldn't be a Jennifer Regala-penned article without a little personal insight on the platform. I happen to love Instagram on a molecular level. It's entertaining, people are generally really nice, and you're catching people at their very best. You got a new car? Show it to me. You remodeled your kitchen? I'm going to need to see multiple photos of that with video footage of your organized spices. New puppy? Say less, I'm glued to your feed.

Instagram is also masterful at serving up the very best targeted ads. At the time of this writing, I am getting ready to take a day off from the AUA to head to my annual neighborhood ladies' holiday lunch. This year it's Barbie-themed... ZOMG. Amazing. Instagram barrages me regularly with pink clothing ads, but somehow my phone heard me talking about this party, so the fancy hot pink party dresses started coming. I found the perfect hot pink, one-sleeved, faux feather-trimmed dress. I ordered it from that Instagram ad on the spot and waited patiently for it to arrive. It showed up and was high-quality material trimmed with the most beautiful feathers. As I went to try it on, I noticed something off about it. It wasn't until I slipped it over my head that I discovered there was no hole for my right arm. Yes, my right arm will be trapped beneath that luscious dress, allowing only my left hand to eat and take my Insta pics and TikTok videos that day. Please allow this cautionary Instagram ad tale to guide your future purchasing decisions.

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Collaborative Copyediting: Helping the Author Help You

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On the first full day of sessions at the 2023 CSE Annual Meeting, Jessica LaPointe, Managing Copy Editor at the American Meteorological Society, kicked off the “Collaborative Copy Editing: Helping the Author Help You” session. Her presentation, titled, “Editing when English Is a Foreign Language: Best Practices and Keys for Efficiency,” took a broad approach to working with authors. She noted that we should respect authors’ language skills as well as their expertise. With a wide variety of linguistic diversity among authors, there’s a real need for quality copyediting. Publishers, authors, and copy editors are all part of the same team with the same goals, which is all the more reason to work together to achieve quality writing.

LaPointe offered several tips for copy editors in these scenarios: (1) contact the author early in the process to establish a relationship and rapport; (2) edit with confidence—by trusting your instincts and using your best judgment—in order to minimize queries to the author; (3) tap your knowledge base of colleagues and friends to help answer questions that arise; (4) automate wherever possible, such as with Word’s search function, to improve efficiency and reduce errors; (5) learn when it is appropriate to let problems go and relax rigid guidelines; and (6) be patient and courteous, and remember how confusing English can be for even native speakers.

Peter Olson, Freelance Manuscript Editing Coordinator at the JAMA Network, spoke next with a presentation titled, “Effective Author Querying.” He began with a reminder of the challenges authors face, including busy schedules, tight deadlines, and a wide range of expectations and publishing experience. He noted that, “Writing an effective

author query is not unlike writing an effective short story,” because queries must often contain complex concepts with minimal text. For maximum effectiveness, author queries should be clear, concise, consistent, accurate, and professional—taken together, these are the core tenets of author querying. Olson provided the example of changing a query of “Please provide.” to “Please provide an exact date of access for reference 23 (month, day, year).” Copyediting can be eased with the use of standard queries (which have the added benefit of reducing edit time and ensuring that each author receives the same message) and global queries (to reduce an overwhelming number of queries).

Copy editors should also be careful to avoid “mixed bag” queries, which Olson defined as “queries that address multiple specific requests”; this is particularly the case if the queries are lengthy and/or unrelated. Furthermore, consider the format in which the author will view the queries; for instance, a clean-copy PDF with no tracked changes might require different wording than a Word file showing tracked changes. At the end of editing, Olson noted, always double check queries for completeness and accuracy; if anything in the text has changed, such as reference numbering, the queries might need to be updated to avoid author confusion.


Iris Lo, Assistant Deputy Managing Editor at the JAMA Network, continued the session with the presentation, “Respectful Query Resolution,” to address problems that occur after initial querying. One potential scenario is when errors are unintentionally introduced early; in this case, the copy editor should learn to pinpoint how the error happened and double check the work, and then briefly describe the workflow to the author to explain how the error was introduced—without overexplaining. A second common scenario is when an author may not understand why certain edits were made; if so, the copy editor should offer an explanation of the edits, potentially using style guide excerpts. She noted that copy editors should remember to be flexible, as not every style rule holds the same weight. In later rounds of edits, an author might need more context, such as when the copyeditor can implement a requested change but must revise it per style or when the copy editor cannot accommodate a change and must let the author know why. Communicating with empathy is key and can go a long way (Figure). “Every query and every email,” she said, “is an opportunity to build a positive relationship with an author.”

<https://doi.org/10.36591/SE-D-4604-02>

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Communicate with empathy

- Thanking the author for their time can go a long way.
- If an author is not being particularly kind, consider what else they might have going on: burnout, other professional obligations, family, etc.
- Remember the human aspect of editing.
- Why is professional empathy a useful skill?
 - Resolve queries more efficiently
 - Authors will be more likely to cooperate
- Every query and every email is an opportunity to build a positive relationship with an author.

JAMA Network

Emerging Markets Association

May 1, 202315

Figure. Iris Y. Lo's suggestions for communicating with author with empathy.

Moderator Amy McPherson, Director of Publications at the Botanical Society of America, wrapped up the session with a reminder of the importance of global collaboration and opening borders in scholarly publishing. She then launched a question-and-answer period with the audience, which addressed the balance of breaking editing rules versus following style, how a manager can best support copyediting employees and freelancers in tough situations, and what copy editors can expect from authors up-front.

Inclusive Language in Scientific Style Guides

MODERATOR:

Stacy L Christiansen
JAMA

SPEAKERS:

Stacy L Christiansen
Emily L Ayubi
American Psychological
Association

Sabrina J Ashwell
Chemical & Engineering News
American Chemical Society

Leonard Jack, Jr

Preventing Chronic Disease
Journal
CDC

REPORTER:

Michele Springer
Caudex

Incorporating inclusive language into scientific communications helps establish respect for all people and promote inclusion. Without inclusive language, communications can perpetuate bias based on personal characteristics, background, and stereotypes. The purpose of this session was to share examples of how different organizations are incorporating inclusive language into their style guides to improve inclusivity across all communication.

Stacy Christiansen opened by providing examples of how the *AMA Manual of Style* is incorporating inclusive language guidance. In addition to being Managing Editor for *JAMA*, Stacy is the Chair of the *AMA Manual of Style* Committee. The 9th edition of the *AMA Manual of Style*, published in 1988, was the first edition to provide examples of inclusive language terms, policies, and guidance. Since then, it has been updated multiple times, with the most recent updates on race and ethnicity guidance added in August 2021.^{1,2}

Currently, the Committee is updating the sections on sex, gender, and sexual orientation. Guidance on language used to discuss age, socioeconomic status, and abilities, disabilities, conditions, and diseases will be updated in turn. Current guidance for reporting on sex and gender includes the following:

- “Sex” should be used when reporting biological factors; “gender” should be used when reporting gender identity or psychosocial/cultural factors.
- Explain methods used to obtain information on sex, gender, or both.
- The distribution of study participants or samples should be reported in the Results section.
- All categories should be reported, not just those that constitute the majority of the sample.

<https://doi.org/10.36591/SE-D-4604-03>

- Avoid using sex- or gender-specific pronouns when irrelevant.
- Use a person’s identified pronouns if known; if unknown, the singular “they” may be used.
- The terms “identified pronouns”, “self-identified pronouns”, and “pronouns” are suggested; avoid using “preferred” or “chosen” when referring to pronouns.
- In non-research reports, choose sex-neutral terms that avoid bias, suit the material, and do not intrude on the reader’s attention (e.g., “chair” instead of “chairman”). Do not attempt to change all words with “man” to “person” (e.g., manhole). If possible, choose a sex-neutral equivalent such as “sewer hole”.
- Studies addressing pregnancy should follow these recommendations: If the gender identity of participants was not assessed, use the terms “pregnant participants”, “pregnant individuals”, “pregnant patients”, etc, as appropriate.

Christiansen discussed that sexual orientation is different from gender or gender identity. The following guidelines for language discussing sexual orientation were shared:

- Sexual orientation should be indicated in a manuscript only when scientifically relevant.
- It is preferred to use sexual orientation terms as adjectives and not nouns (e.g., gay men, bisexual individuals, heterosexual women); however, it is acceptable to use “lesbian” as a noun or an adjective.
- Inclusive abbreviations such as LGBTQ, LGBTQ+, and LGBTQIA, as well as other versions of this acronym, are acceptable, and are best for referring to groups. Individuals should be referred to by their specific sexual orientation, when relevant.

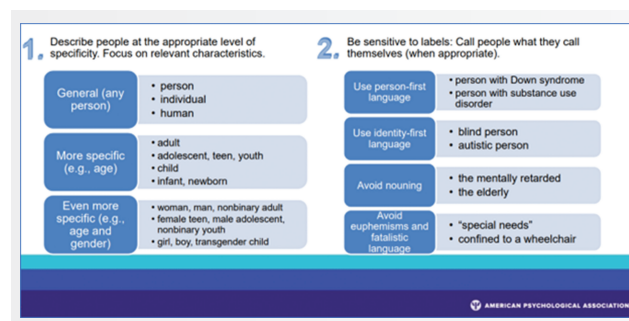


Figure. General principles for avoiding bias (provided by the American Psychological Association).

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The following guidelines on age were shared:

- Individuals and groups can be described by the age range of the group (e.g., participants younger than 21 years, adults aged 20 to 64 years).
- Collective terms can be used if the age range is described at first mention (e.g., younger patients, older adults, etc).
- Avoid terms that could be considered ageist or connote discrimination or a negative stereotype (e.g., senior citizens, the elderly, etc).

Additionally, Christiansen shared the following guidelines on language regarding socioeconomic status (SES):

- Avoid labelling people with their SES (e.g., the poor, the unemployed); instead, terms such as “low income” or “no income” are preferred.
- When referring to countries, the terms “limited-income”, “low-income”, “resource-limited”, “resource-poor”, and “transitional” are preferred.
- Avoid the terms “first/third world” and “developed/developing” when describing or comparing countries or regions.

Lastly, Christiansen shared the following guidelines on discussing patient conditions, diseases, abilities, and disabilities:

- Avoid labelling people with their disabilities or diseases (e.g., the blind, schizophrenics).
- Person-first language is generally preferred; however, identity-first language is preferred when discussing autism or deafness.
- Avoid describing persons as “victims” or with other emotional terms that describe helplessness (e.g., afflicted with, suffering from).
- Avoid euphemistic descriptors (e.g., physically challenged, special, special needs).

The updated guidelines on race and ethnicity terms have been added to the Inclusive Language section of the *AMA Manual of Style: A Guide for Authors and Editors*, have been published in *JAMA*,² are linked to from all JAMA Network journals’ Instructions for Authors, and are available as a free PDF on the AMA Manual of Style website.³ Plans are in place to update the additional inclusive language sections.

Next, Sabrina Ashwell from the American Chemical Society (ACS) spoke about the ACS Inclusivity Style Guide.⁴ This was developed by a cross-organizational team and was based on resources from journalistic groups, advocacy organizations, and the people ACS wants to write about. In addition to being available for free online, the guide is an Open Access chapter in the ACS Guide to Scholarly Communication.⁵

The ACS Inclusivity Style Guide is meant to guide decisions around language and images and help ACS meet

its strategic goal to embrace and advance inclusion in chemistry. Its sections include general guidelines, language for specific topics and formats, guidelines for images, basic guidelines on accessibility, and related resources, such as documents to practice using inclusive language and images.

Ashwell discussed the following general guidelines:

- **Involve a diverse group of people.** She advised that communicators trying to create a diverse team should avoid putting people on the spot. Other pitfalls to avoid include treating team members as spokespeople for a particular identity and asking someone’s opinion only as it relates to their identity.
- **Be appropriately specific.** Being too general can ignore important differences within a group, but being too narrow can exclude people. Try to name the groups you are talking about (e.g., “Black, Hispanic, and Indigenous people”).
- **Avoid labelling people by a characteristic, as this emphasizes one trait above others.** Do not use “the” plus an adjective (e.g., “the disabled”) or other labels (e.g., “alcoholics”). Adjectives with nouns should be used instead (e.g., “disabled people”, “people with alcohol use disorder”).
- **Ask people how they want to be described and follow through.** The ability to choose self-descriptors is powerful, and using the language people ask you to use shows respect. If you can not ask the individual or group, seek advice from organizations that advocate for the identity you are trying to describe.
- **Recognize when to include personal information—it should be included only when relevant.** Ask yourself if you are doing it evenly for everyone you are talking about or if the wording you are using implies an outlier (e.g., “male nurse”).
- **Recognize and avoid words that assume a cultural norm or a universal standard (e.g., “exotic”).** Look for idioms, consider your audience, and be as specific as appropriate.
- **Recognize when to use “diverse.”** The term should not be used with “person” or to mean “underrepresented” or “not dominant”; rather, it should be used to describe something that contains elements that differ from one another.

Ashwell finished by stating that it is important to commit to continuous learning, as language and people’s preferences change.

Next, Emily Ayubi, Senior Director of American Psychological Association (APA) Style, spoke about the APA’s approach to inclusive language in scientific style guides. She shared the history of inclusive language at APA: APA Style was founded in 1929, and in 1977 guidance to avoid sexist

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language was introduced. Guidance has been added and updated multiple times since then, with the comprehensive bias-free language guidelines⁶ first being introduced in 1994 and an inclusive language guide⁷ being published in 2021, with a revision expected later this year. The APA works with numerous committees and advocacy groups to develop the guidelines.

Ayubi then spoke about the APA's two main principles for avoiding bias: (1) describe people at the appropriate level of specificity and focus on relevant characteristics, and (2) be sensitive to labels and call people what they call themselves, when appropriate (Figure).

Next, Ayubi provided additional detail regarding the topics covered in the inclusive language guidelines. In terms of age, use terms that show aging is a normal part of the human experience, separate from disease and disorder and not an obstacle to be overcome. Decade-specific (e.g., octogenarian) and generational descriptors (e.g., millennials) are appropriate. When discussing disability, both person-first and identity-first language convey respect for disabled persons—use the approach that the person or group prefers. Avoid euphemistic language or statements like “such an inspiration”.

Gender-inclusive language should be used when gender is irrelevant. Avoid assuming gender or a gender binary. Avoid using “females” and “males” as nouns (“women” and “men” are preferred); “female” and “male” should be used as adjectives. The terms “birth sex” and “natal sex” should be avoided; “assigned male at birth” or “assigned female at birth” are preferred. Use parallel labels (e.g., “trans women and cis women” as opposed to “trans women and women”), and avoid gendered occupational terms (e.g., “server” instead of “waitress”). In terms of pronouns, use a person's identified pronouns when discussing specific people. When discussing hypothetical people or people of unknown gender, use the singular “they” as opposed to alternating gendered pronouns or combining pronouns (e.g., s/he, she/he, etc) to help move thinking away from a gender binary and toward gender inclusivity.

Racial and ethnic descriptors, such as Black, White, Asian, Latine, and Indigenous Peoples, should be capitalized. When possible, specify the region or national origin of the people you are discussing.

In terms of sexual orientation, the umbrella term “sexual orientation and gender diversity” should be used. LGBTQ+ (or variations thereof) should be used for people who are not straight and/or cisgender. The term “homosexuality” should be avoided as it promotes stereotypes, and “homosexual and heterosexual” should be avoided as it conveys a false dichotomy, given that there are many different types of sexual orientations.

For language discussing SES, keep in mind that SES involves not only income but also educational attainment,

job prestige, and perceptions of social status and class. When discussing SES, use terms to describe what people have rather than what they lack (e.g., “people with some high school/college education” instead of “high school/college dropouts”).

Guidance on neurodiversity, pregnancy, body size, religious discrimination, and casual ableist language is forthcoming.

The APA is committed to ensuring accessibility for all users.⁸ Additionally, they offer an Equity, Diversity, and Inclusion (EDI) Toolkit⁹ for journal editors, authors, reviewers, and publishing industry professionals looking to strengthen EDI efforts.

Next, Leonard Jack, Jr, discussed inclusive language that will be included in CSE's *Scientific Style and Format (SSF)*, Ninth Edition, scheduled to be published in late 2023 or early 2024. The majority of the changes will affect Chapters 7 and 8, and Jack provided some examples.

In section 7.4.3, “Race, Ethnicity, Nationality, and Citizenship” readers can anticipate the following updates:

- When pertinent to a study, terms based on color and customary usage should be capitalized (e.g., Black, White, Indigenous, Latinx, etc).
- The relevance of race and ethnicity should be justified explicitly in studies, and the method of measuring the variable should be stated.
- Because race does not have a precise definition, descriptions of human populations or large social groups should draw instead on sharply definable criteria whenever possible (e.g., country of birth and self-described identity).

In section 8.3, “Human Groups”, the following guidance will be added:

- Terms for race should be capitalized.
- Capitalize the names of groups of humans if they are derived from proper names of geographic entities or if they are names for ethnically or culturally homogeneous groups (e.g., Asian, Hispanic, Nordic, New Yorker).
- Avoid terms like “American Indians” and “Native Americans”; rather, refer to individuals by their specific communities or nations (e.g., Sioux, Choctaw, Shoshone, and Iroquois [United States]; Ainu [Japan]; First Nations, Inuit, and Métis [Canada]; Sami [Nordic countries]).
- Do not hyphenate “American” when it is part of two-word terms.

Because these guidelines are constantly evolving, CSE has added the following disclaimer to the preface to allow editors and authors flexibility to accommodate changing preferences between editions:

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- “The changes in the ninth edition were made with the understanding that societal standards will evolve.”
- “The guidelines in this edition reflect the revision team’s advice at the time of publication.”

All updates to the manual were vetted by the CSE Diversity, Equity, and Inclusion (DEIA) Committee and *SSF*’s Advisory group. The guiding principles for DEI review include:

- Avoiding repeating or adding to historical trauma
- Recognizing that representation matters during all stages of decision-making
- Understanding that language is built from rules and frameworks
- Providing honest versus passive feedback
- Focusing on strength-based versus deficit-based lens
- Fostering respect at the core of DEI: inclusive language must be intentional

Jack then discussed some other guidance and updates implemented to address DEI issues:

- The “Bias-Free Language” section was renamed “Inclusive Language”.
- Common gender terms should be used instead of masculine or feminine referents (e.g., “meteorologist” instead of “weatherman”).
- Avoid coining awkward terms by substituting “person” for “man” or “woman”.
- Use the singular “they” sparingly and judiciously.
- Avoid depersonalizing terms that categorize people according to health problems.
 - Use person-first descriptions.
 - Use “disability” instead of “handicap” except when referring to environmental and attitudinal barriers.
 - Avoid “mentally ill”, “insane”, and “mental defect”.
- The section entitled “Difficulties for Authors for Whom English Is a Second Language” was renamed to “Scientific English: Idiomatic Style for Multilingual Authors”.

- Many examples throughout the manual were replaced in order to highlight female scientists and researchers from around the world and investigators from a wide variety of disciplines.

Christiansen summarized the session by highlighting common themes across all guidelines, including being specific, avoiding labels, considering content, and committing to continuous learning. Preferences and guidelines are constantly evolving, and it is important that both are reflected in scientific communications.

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Community Peer Review: How It Is Evolving and What It Can Do for You

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Peer review has changed since the *Philosophical Transactions of the Royal Society* set the standards in 1665. In this session, 4 community peer review models were presented that differed from traditional peer review in that the journal does not solicit reviews; rather, members of the scientific community volunteer to review. Although they have several differences, each model starts with the author uploading a preprint, then reviews are posted publicly (usually anonymously) for the authors to respond to until they are ready to publish a final version. Note that there is no accept or reject; authors decide what is the version of record. This is a hot new trend in scholarly publishing. When eLife tweeted about their workflow change, the tweet garnered over 1 million views.

To start, Thomas Lemberger of the European Molecular Biology Organization (EMBO) talked about Review Commons,¹ which was founded in 2019. In this model, Review Commons commissions the in-depth peer review of preprints *before* they are submitted to a journal. The reviews and the reply from the authors are posted next to the preprint. There are clear benefits to this model, namely accelerating access to peer reviewed research in the form of reviewed preprints and eliminating cycles of peer review, sparking a culture shift and promoting open science. However, journal-agnostic peer review can be challenging for editors who may be left unsure about the fit of a paper for their journal in terms of advance and audience.

Next, Fiona Hutton of eLife presented information on their new publishing model, introduced in 2023, that builds on

their policy of only publishing papers previously posted as a preprint. The preprint is reviewed via an eLife Assessment,² and authors decide what will be the version of record. The author's response to the review is also published. One notable benefit of this is that the article processing charge is \$2000 instead of \$3000. Fiona also emphasized the benefits of free, immediate access to research and mentioned the rise of preprint servers such as bioRxiv and medRxiv.

Monica Granados, herself a researcher and peer reviewer, talked about PREreview³ and how community peer review is challenging the idea of who a reviewer is. Traditionally, the pool of reviewers available in a particular field is small and homogenous, with little-to-no formal training provided. Community peer review extends this pool of reviewers and opens up opportunities that might not have been available to certain groups (Figure). PREreview, founded in 2017, also creates a community centered around peer review mentoring, open platforms (i.e., anyone with an ORCID can join), and live-streamed preprint journal clubs, which use video calling platforms to bring people together virtually to collaboratively review a preprint. The training focuses on debiasing reviews and being collaborative.

Next, Katherine Brown of the Company of Biologists talked about preLights,⁴ introduced in 2018. preLight posts are commentaries on preprints provided by a select group of early career researchers, called preLighters. These posts typically summarize the preprint, explain why the preLighter found the paper exciting, and include some questions for the authors about the work, to which the authors can respond. Like PREreview, preLights builds a sense of community. Although most preLighters post only once or twice a year, there is a Slack group, and they are working on forming more of a community. Of the roughly 1300 preLighted preprints,

PREreview works to make open preprint peer review more equitable and sustainable for all.

We work to:

- **Increase the number and diversity of reviewers** available to authors, editors, and journals seeking preprint review.
- **Lower the barriers to participation** for early career researchers and researchers from historically marginalized communities.
- **Provide training and mentorship** for reviewing preprints and running journal clubs.
- **Increase the acknowledgement, recognition, and shared power** of preprint reviewers.
- **Sustain open practices and values** in scholarly communications and research.



 PREREVIEW

Figure. PREreview works to make open preprint peer review more equitable and sustainable for all.

<https://doi.org/10.36591/SE-D-4603-09>

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64% have been picked up by bioRxiv's algorithm as having been published in journals. A new initiative from preLights, postLights, aims to explore the journey from preprint to final published paper by providing commentary on how the paper changes between versions.

In response to some interesting questions raised during a Q&A, Monica clarified that PRereview allows reviewers to remain anonymous if they want. Thomas talked about how the time-to-publication went from 300 days down to 70 with community peer review. The 70 days was before journal submission, however.

One of the takeaways was how it is necessary to promote the importance of peer review. Researchers may ask: What's

in it for me? This led to a mini discussion about the invisible work of academics, including peer review, tenure review, and mentoring. Additional communication may be needed to clarify this to the public, and rewards or recognition may help in securing reviewers. It is a lot of extra work for academics and researchers to take time to peer review, and we want to thank them for their efforts.

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