



HHS Public Access

Author manuscript

Sci Ed. Author manuscript; available in PMC 2024 February 26.

Published in final edited form as:
Sci Ed. 2023 June ; 46(2): 73–77.

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

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

Erin C Landis [Managing Director],

Origin Editorial

Leonard Jack Jr [Editor in Chief, *Preventing Chronic Disease*],

Office of Medicine and Science, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention

Amy King [Senior Editorial Coordinator]

American Society of Clinical Oncology

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

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

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

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DEI and Scholarly Publishing

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

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

Following Lambert, Leonard Jack Jr, PhD, MSc, editor-in-chief of *Preventing Chronic Disease* (and a co-author of this summary), gave an overview of the rationale for and the work being done by the CSE's DEI Committee, for which Jack serves as Founding Co-Chair (at the time of the workshop). This year, the primary outcome of CSE's DEI committee is the creation of a webpage³ on CSE's website that features DEI scholarly resources. This webpage was created to make these scholarly DEI resources available in one location. Currently, over 50 resources in the following categories are available: 1) DEI Committees of Trade and Professional Organizations in Scholarly Publishing; 2) DEI and Peer Review; 3) DEI Statements and Policies from Journals, Trade and Professional Associations, and Publishers; 4) Bias, Discrimination, and Racism; 5) Data Collection on Diversity, Equity, and Inclusion; 6) Reporting Sex, Gender, and Race in Publications; and 7) Inclusive Language Communication.³ Jack pointed out that there is considerable overlap across resources available in the 7 categories. Jack concluded his presentation by sharing key takeaways from his review of resources included in the DEI resources webpage. Four key take-aways included the need to 1) ensure transparency around DEI efforts that journals undertake; 2) acknowledge delays and missteps related to DEI practices; 3) generate and make available new resources on how to identify and address bias, racism,

and discrimination in scholarly publishing; and 4) identify appropriate ways to evaluate the impact of DEI best practices in scholarly publishing.

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

Case Studies: DEI and OA

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

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

Springer Nature’s commitment to DEI in scholarly communications was also showcased during the next talk of the workshop. Jennifer Griffiths, Head of Academic Affairs, North America, and Sowmya Swaminathan, Head of Collaborations & Chair, Springer Nature Research & Solutions DEI Program, began their talk by briefly summarizing the burgeoning research showing that scholarly publishing is plagued by persistent disparities.

They then shared the 4 pillars that underpin Springer Nature’s DEI program: “1) becoming intentionally inclusive in our practices, 2) engaging our communities and stakeholders, 3) communicating our position and ambition, and 4) improving research practice through policy.” Other efforts at Springer Nature include making research accessible to researchers in low- and middle-income countries, spotting DEI issues through the content published in their journals, conferences focused on DEI issues in research, and policies that drive meaningful change.

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

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

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

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

English is the primary language of the board. The journal intends to use this data to identify potential sources of bias in the research they decide to publish.

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

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

Following Ricci was Robert Harington, PhD, Associate Executive Director of Publishing at the American Mathematical Society (AMS). Harington discussed AMS's reaction to the Nelson Memo,⁵ noting that whatever path the organization takes, it does not want to burden authors. The Nelson Memo was released by the United States Office of Science and Technology Policy in August 2022 and provides policy guidance to federal agencies with research and development expenditures on updating their public access policies. Gold OA is a model of scholarly publishing in which articles are made freely available to readers immediately upon publication, with no subscription fees or other access barriers. Authors or their institutions typically pay a publication fee to cover the costs of peer review, editing, and other production expenses. For math researchers Gold OA is not a sustainable route as there is not a lot of funding for mathematical researchers. Furthermore, TAs also are not the perfect solution as small institutions are not generally included in TAs. Harington emphasized that “one size doesn't fit all” when talking about routes to OA and that public access does not necessarily equate to equal access.

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

societies, and libraries. Lim concluded her talk by explaining the UMD's response to the call for open scholarship, including examining new publishing models, Green OA, and opportunities for open science, research data, and education.

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

Integrating DEI into OA Requirements

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

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

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

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

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

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

Summary and Key Takeaways

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

- Establishing systems to collect baseline data to better document the demographic make-up of peer reviewers, editorial board, and authors.
- Training editors, editorial board members, journal staff, and other volunteer groups to recognize and intercept biases in peer review, selecting papers for publication, and/or the application of editorial processes.
- Journals would benefit from creating and adopting actionable diversity building plans.
- Taking action steps to avoid editorial boards' lack of representation of women and racial and ethnic groups.
- Establishing action steps to include participation among small academic and research institutions.
- Journals should remain committed to avoiding gender, racial/ethnic, and geographic disparities in scholarly publishing.
- Maintaining an intentional focus on using policies and procedures to advance diversity, equity, and inclusion in OA publishing.
- Taking steps to make research accessible to low- and middle-income countries.
- Taking steps to provide better opportunities for researchers from and in low- and middle-income countries to be able to publish their work without a high-cost burden.
- Adopt, implement, and utilize findings from author surveys to identify diversity strengths, weaknesses, and barriers to participation among authors, editorial board members, and journal staff.
- Ensuring open access to scholarly information can be achieved through cross-sector partnerships between government, international organizations, higher education, philanthropic organizations, learned societies, and libraries.

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

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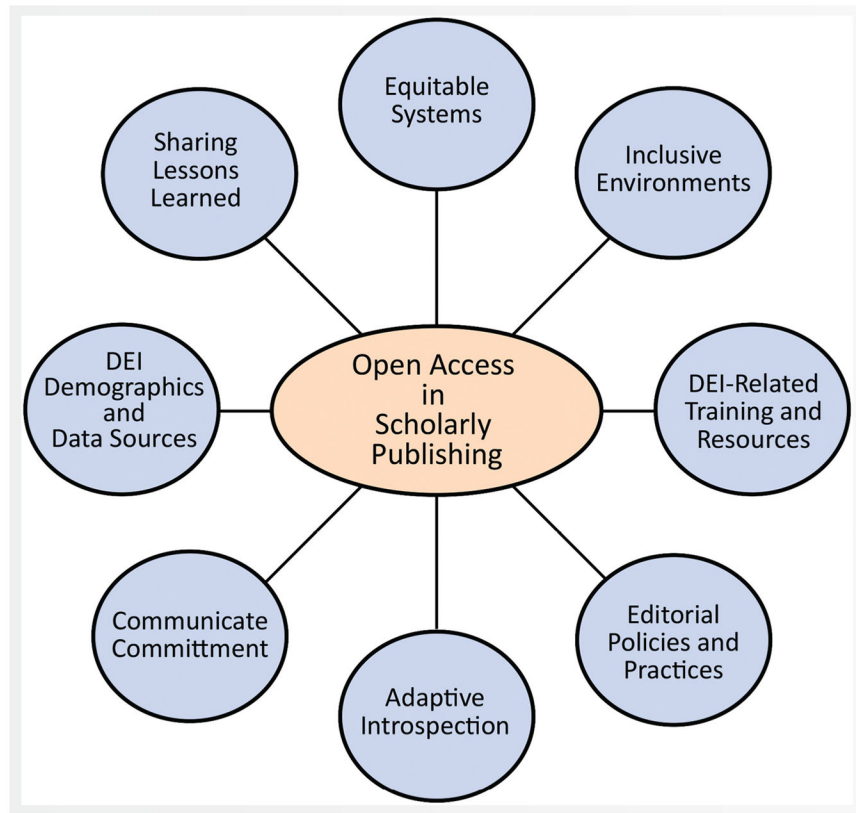


Figure. The Intersection of Diversity, Equity, and Inclusion and Open Access in Scholarly Publishing.

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