Beyond Access into Accessibility

Jonathan Schultz

Imagine, for the purposes of this Viewpoint, that the dreams of Open Access advocates and organizations like cOAlition S are realized tomorrow and all research articles published anywhere become immediately, freely available to all in a sustainable way. And, let's imagine this is done in a way that manages to satisfy the needs of all stakeholders, from publishers to librarians to researchers. Even in this possibly utopian scenario, the goal of making scientific research available to all would not be complete because "access" is just the beginning. To make an article truly available to all readers and researchers, we need to move beyond access into accessibility.

Accessibility is about ensuring that the greatest number of people not only have access, but also are actually able to use your product or service, including those with impairments or disabilities. In publishing, this is typically considered in terms of making articles and published research consumable by readers with visual impairments or cognitive disorders, such as dyslexia. This is the type of accessibility that Bill Kasdorf discusses in his article "The Important Role of the Editor in Making Science Accessible." Web technologies, including the increasingly adopted EPUB standard, are making it easier for scientific articles to have accessibility built in from the beginning, especially when compared to the omnipresent (and increasingly antiquated) PDF, but they have not been universally adopted.

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Somewhat uniquely for scientific publications, making figures accessible is also essential. It is not uncommon for a researcher say, "I mostly just look at the figures," which makes sense because for many articles, the figures contain the gist of the results or the bulk of the data. However, figures are also the least accessible part of an article as they are completely skipped by screen readers and other assistive technologies. While image alt-text provides some additional context, as Bill notes, this is often insufficient for detailed scientific figures, and scientific publications need to be using the less commonly known "extended descriptions," or <detail>

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metadata field. Extended descriptions can go through each part of the figure in detail for readers who are unable to see the image, including text that may only exist as part of the image. There is a skill to writing these descriptions, and as Bill contends, editors can play a significant role by requiring them during the peer review process and ensuring they are understandable and comprehensive. Ideally, it would be the editor's and publisher's role not only to provide access to articles, but also ensure they are accessible too.

This accessibility can also extend to guaranteeing that all components—such as data, code, and metadata—that are required for understanding and reproducing research are accessible. As with web accessibility, this becomes easier as the metadata around articles becomes richer. As we get better at tagging components and article information in a standardized manner, they can be found, read, and reused more efficiently by machine-readers and other services, expanding the usefulness of the research. There are also efforts to create a more robust metadata-rich infrastructure to track the lifecycle of a research project. An example of this can be seen in the article by Olveska and colleagues on "Ensuring Reproducible Research Requires a Support Infrastructure: The Value of Public Registries to Publishers." As described by the authors, research preregistration involves researchers outlining in a public and/or time-stamped manner their intentions, including hypothesis, protocols, and statistical analysis plan, prior to conducting the research. These records help minimize some questionable research practices and provide a transparent accounting of research that is being conducted, which is why it has been a requirement for publishing clinical trials for over a decade. Olveska et al argue that expanding this requirement, or at least recommendation, to all research will help create a more transparent and accessible scientific record.

Another form of accessibility that should be considered is whether jobs and opportunities are equally accessible to all, regardless of their race, ethnicity, gender, or other demographics. What good is having access to research publications if you can't pursue your own research due to historical inequities and prejudices? The past year has seen a reckoning at research intuitions and funders as to the role they have played in perpetuating these inequities as well as an exploration of the changes they need to make. Likewise, in scientific editing and publishing, there has been a focus on the demographic makeup of editorial boards and invited authors and a renewed interest in initiatives such as the Coalition for Diversity and Inclusion in Scholarly

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Communications (C4DISC; https://c4disc.org/). It's in this context that Melissa Schmidt writes about the importance of "Cultivating a Culture of Respect for Our Profession" in her Perspectives article "Evidence of Esteem." As Melissa notes, as we seek to diversify our workplaces, we need to simultaneously address power imbalances that may harm both individuals and the quality of scientific publications.

By making scientific publications, research workflows, and organizations more accessible to all, we are helping to make a future where the focus is less on who can access research, but how they can use that research when they do.

In their preview of the CSE Annual Meeting in May 2021, program co-chairs, Emma P Shumeyko and Brittany Swett, announce the theme of the meeting is "Shaping Our Future by Embracing Adaptability." With changes occurring at a lightning pace, being able to adapt is essential for any journal or organization to thrive. Importantly, accessibility and adaptation are intertwined because accessible infrastructures are more adaptable. We cannot plan for everything, but when we make our publications and organizations more accessible and transparent, we make them richer and more open to adaptation. As an example, articles with detailed extended descriptions are more accessible not only to a greater number of readers, but also machine-readers, which may become key in some future innovation. When the goal is making research accessible, what may seem like a narrow accommodation may unlock unknown benefits.

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Emma and Brittany have selected a chameleon as the meeting's representative image as it is nature's "quintessential example of an organism using the power of adaptation to survive and thrive." For this reason, a close-up detail of a chameleon's skin graces this issue's cover. Chameleons adapt to changing landscapes and circumstances, altering their skin colors to fit their surroundings or needs. An aspect of the adaptation that I find interesting is that recent research (https://www.nature.com/articles/ncomms7368) has shown that for many chameleons, these changes are occurring not just in a single layer of skin, but in a matrix of different layers working in unison. It's the interplay of layers that allows chameleons to quickly change in complex ways. In a sense, by working together, the layers are able to better adapt than any single layer could on its own.

We continue this Spring 2021 issue of *Science Editor*, with two new interviews of Editors-in-Chief, as Leonard Jack, Jr discusses the importance of "Preventing Chronic Disease Through Statistical Rigor" while José G. Merino expounds "On the Little Decisions That Shape the Future." For another take on being an EIC, Barbara Gastel writes about the editorship of Michael Chibnik in her review of his book "Scholarship, Money, and Prose: Behind the Scenes at an Academic Journal." Also, Jamie Teixeira da Silvia reminds us to avoid "Confusing German Eszett (β; ß) with Greek beta (β) in Biomedical Writing."

Next, Stacy Christiansen examines protecting patients' rights in "I Know That Guy: Balancing Confidentiality With Sharing Knowledge," and Jennifer Regala suggests how to manage a social media presence that is both personal and professional in "Putting Your Best Voice Forward: Considering Voice and Style in Your Social Media Posts." Finally, we close out the issue with Barbara Meyers Ford's "Gatherings of an Infovore" as she explores the post COVID landscape and asks the crucial question "What's Next?" We shall see, but hopefully it will be more accessible and equitable than what came before.