Open access for and against

Charles Day

In 2013 the Obama administration mandated that scientific papers reporting the results of federally funded research be freely available one year after publication. This past December rumors spread that the Trump administration is considering reducing the embargo time to zero. Although the White House has yet to confirm a new mandate, the rumors were sufficiently substantiated that two coalitions of scholarly publishers promptly sent letters to President Trump urging him to reconsider.

The case for immediate open access (OA) is strong. NASA, NSF, and other federal agencies disburse research grants that are funded by US taxpayers. Tuition revenue and state taxes fund scientists at public universities. Why, having helped pay for a research project, should a US taxpayer face the choice of either waiting 12 months to read the corresponding paper or paying for prompt access?

Whether immediate OA becomes mandatory will depend in part on the opposing arguments. How persuasive are they?

The 18 December letter to Trump organized by the Association of American Publishers (AAP) and signed by 135 professional societies builds its case around upholding US leadership in science. While I accept that invoking patriotism is sometimes necessary when appealing to politicians, I find the practice unsavory. Science is an international enterprise.

Still, how strongly is a country's scientific prestige tied to its homegrown journals? Weakly, in my view. None of the top physics journals is Japanese, yet Japan is a physics powerhouse. In 1994 Stuttgart-based Holtzbrinck Publishing Group bought a controlling stake in London-based Macmillan Publishers, owners of *Nature*, arguably the world's foremost scientific journal. *Nature* and its swelling number of stablemates remain under German ownership. The UK's standing in science has not fallen nor has Germany's risen as a result.

The AAP letter asserts that peer-reviewed articles are "licensed to users in hundreds of foreign countries, supporting billions of dollars in U.S. exports." The United Nations recognizes 195 countries. Given that "hundreds" is an exaggeration, I suspect "billions" is too. Still, the authors of the AAP letter are right to point to the economic impact of immediate OA. The question of who pays is paramount.

An 18 December letter to Trump signed by 62 scholarly publishers points out that scientific societies use subscription revenue to fund worthy activities. "One particular area of importance," the letter says, "is strengthening U.S. STEM infrastructure through education, career, and outreach programs." The transfer of money from libraries to societies is defensible. But it seems to me unfair to expect, say, the University of Tokyo or the Max Planck Society to subsidize programs that benefit the US.

In its 2018 industry overview, the International Association of Scientific, Technical and Medical Publishers reported that its members incur expenses of around $4000 to publish a peer-reviewed paper in an archival journal.[1] When publishers offer authors the option to make their papers freely and instantly accessible, the fee is also around $4000. Journal subscriptions are of the same order. Online-only subscriptions to the two biggest astronomy journals by volume, *Astrophysical Journal* and *Monthly Notices of the Royal Astronomical Society*, cost $2175 and $10 249 a year. (*ApJ* levies page charges to offset publishing expenses; *MNRAS* does not.)

With those numbers in mind, you can see how the impact of immediate OA depends on how prolific an institution's researchers are. If an astronomy department publishes more than four or so papers a year, buying subscriptions could be cheaper than paying author fees. Kent Anderson made that point last year in *The Scholarly Kitchen*: The subscription model, he contends, is significantly more cost-effective than the OA model because publishing expenses are borne by both readers and authors.[2]

Despite its advantages, the subscription model is overstretched. As diagnosed by Aileen Fyfe and her coauthors,[3] the underlying problem is that academics are evaluated on research published in traditional journals despite the existence of alternative outlets. So they publish more, and scholarly publishers, whether for-profit or nonprofit, respond by launching more journals. Libraries' bills keep going up.

Immediate OA would bring relief to libraries and compel researchers to be more judicious in what they publish, but at what cost?

References

1. R. Johnson, A. Watkinson, M. Mabe, *The STM Report: An Overview of Scientific and Scholarly Publishing*, International Association of Scientific, Technical, and Medical Publishers (2018).
2. K. Anderson, "Guest Post: The Surprisingly Low Burden of Subscriptions at Institutions," *The Scholarly Kitchen* (21 May 2019).
3. A. Fyfe et al., "Untangling Academic Publishing: A History of the Relationship . . . ," *Zenodo* (25 May 2017).

PT