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Open Access: What is it and What Does it Mean for Academic Authors?

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by C. Jeffrey Belliston

Abstract
What is Open Access? The modern Open Access (or OA) movement has historical roots — some fairly recent and some much older. If one has a correct understanding of these historical roots, the OA movement will properly be seen as evolutionary rather than as revolutionary. In addition to this theoretical treatment of the "what is OA" question, a treatment of what John Willinsky has called the "flavors" of OA will elucidate the very practical side of the same question.

What does OA mean for academic authors? Just as with the "what is OA" question, there are multiple sides to the "what does OA mean" question. One side of this question are the practicalities of how an academic author would go about OA publishing. Because OA comes in various "flavors" there are a variety of ways a scholar can publish OA materials. As is to be expected, there are both commonalities and differences to all of these flavors and within these flavors depending upon one's discipline. Another side of the "what does OA mean" question deals with the benefit academic authors can derive from OA publishing. Were there no benefits, we would not see OA publishing taking off like it is.

This discussion of OA would not be complete without addressing current issues related to it, including the recent acquisition of BioMed Central by Springer (and the whole issue of the economics of OA publishing), the Fair Copyright in Research Works Act, the NIH OA mandate the Act is designed to overturn, Harvard's OA mandate, and others.

Introduction
Open access materials are digital materials freely available online for both access and reuse. Frequently, when you hear "open access" it will seem that it only means ability to find and read. The Budapest Open Access Initiative makes it clear that ability to reuse is also part of the definition of OA. The initiative states: “By "open access" to this literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself.”

What is OA?: Historical Roots – Evolutionary Process
Open access is one of the latest movements in the rich history of modern scholarly communication. This history stretches back to the mid-17th Century when the Royal Society of London founded the first scholarly journal, the Philosophical Transactions of the Royal Society, with its Secretary, Henry Oldenburg, as its editor. As Secretary, Oldenburg received a great deal of correspondence from the eminent scientists of the day. Prior to Philosophical Transactions, private letters were the means of scholarly communication and dissemination of experimental

results. In his introduction to volume 1 of the *Philosophical Transactions*, Oldenburg recognized the importance of this correspondence and knew that the scholarly conversation needed to be more widely shared. Oldenburg wrote, “Whereas there is nothing more necessary for promoting the improvement of Philosophical Matters, than the communicating to Such, as apply their Studies and Endeavours that way, such things as are discovered or put into practice by others; it is therefore thought fit to employ the *Press* .”

By the time the first issue of *Philosophical Transactions* appeared, the printing press had been around for more than 200 years. Oldenburg recognized its potential to facilitate scholarly exchange and progress as evidenced by these words listing the benefits to be gained: “such Productions being clearly and truly communicated, desires after solid and usefull knowledge may be further entertained, ingenious Endeavours and Undertakings cherished, and those, addicted to and conversant in such matters, may be invited and encouraged to search, try, and find out new things, impart their knowledge to one another, and contribute what they can to the Grand design of improving Natural knowledge, and perfecting all *Philosophical Arts, and Sciences* .”

Prior to the press, additional copies of important documents were made by hand by copyists in the scriptoria. By comparison to what the press offered, the cost of every additional copy made in the scriptoria was staggering and the production time frame long. The press dramatically reduced both cost and production time frame. And yet, the change was evolutionary rather than revolutionary as evidenced by the fact that, for some period of time, printed documents looked like illuminated manuscripts.

After 200 years, the press matured; books ceased to look like medieval manuscripts and took on conventions of their own. Scholarly journals also evolved conventions of their own. They ceased to be collections of letters to individuals like Henry Oldenburg and began to report results of research. Journal articles typically follow a format of introduction, methods used, results observed, and discussion. Abstracts and the citation of sources were regularized. Peer review prior to publication began and has become a mainstay to insure quality. First publication established precedence with respect to new developments or, to use Jean Claude Guédon’s words, it established a “social registry of scientific innovations.”

The press expanded the reach of scientific thought. As Guédon, Professor of Comparative Literature at the University of Montreal, persuasively argues in his monograph, *In Oldenburg’s Long Shadow*, a concomitant of making dissemination through the press successful was the willingness of scholars to give publishers the ownership rights to intellectual property. As Guédon writes, “the first printer wanted a firmer leg than personal trust to stand on; one solution was to ‘own’ the text, and not just the paper covered with ink spots. The printer wanted the ability to claim full ownership rights over the text; and he wanted to gain access to the full repressive force of law to prevent the repeated sale of the same text to different people” or “imitation and piracy” by other printers. This transfer of right gave the original printers or stationers the economic incentive necessary to expend the funds they did on printing hard copy journals for sale or distribution to subscribers. Doing the latter is a proposition that is expensive.

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3 Ibid., 2.
5 Ibid., chap. 3, paragraphs 1 and 2.
and where costs for every additional copy can be high though considerably less than the costs of hand copying.

The next big technological change to affect scholarly communication was the Internet, specifically the world wide web, which came to public prominence in the mid-1990s—a mere blink of an eye ago when compared with the age of the press. Innovative individuals recognized the web’s potential for sharing information and began doing so almost immediately. Mainstream scholarly publications soon joined in the action. Publishers reproduced online what they put in their print publications—even to format. Just as the first printed books, or incunables, looked like the illuminated manuscripts they replaced, most current digital texts look like the printed materials they are beginning to replace. Gideon Burton, a professor of English at BYU and a colleague of mine, calls documents in the ubiquitous portable document format, or pdf, “digital incunabula.” Once again, we see that the process of change is evolutionary rather than revolutionary.

Copyright transfer from author to publisher has persisted into the present internet age when the economic reason which underlay the creation of copyright and its subsequent transfer to printers or stationers has largely vanished. Marginal distribution costs for digital materials are zero at least and negligible at most. While actual distribution is not the only cost in scholarly publication, it was a more significant cost in the print-centric world.

**What is OA?: In Practice**

Aside from this theoretical look at OA, what are its practical realities? OA comes in what John Willinsky, in his book *The Access Principle*, described as the “Ten Flavors of Open Access.”6 They are:

1. **Home page open access:** In home page open access, a scholar simply posts an article to a personal web page from which a potential reader can download it. I would note that this is often done in violation of the publication agreement the scholar signed.

2. **Open access e-print archive:** An e-print archive is an OA repository. Some OA repositories are discipline based—the most famous example being arXiv.org, the repository started in 1991 by Paul Ginsparg for high energy physics but now expanded to related fields.7 Other OA repositories are institutionally-based such as ScholarsArchive, the institutional repository at my institution which is designed to gather the intellectual output of Brigham Young University.

3. **Author fee open access:** This is OA to scholarly articles that are completely free to readers but which charges a publication fee to an article’s author. In some cases, the journal is an OA journal in which all articles are freely available; in others, the journal is traditional but authors may opt to pay to make their individual article OA. Author-fee OA is akin to broadcast radio and television where anyone may listen for free because a select group—advertisers—pays. However, there is a significant difference between advertiser-pays broadcast media and author-pays OA. Reputable author-pays OA is a post-peer-review publication fee which is not to be confused with a submission fee. Just like other scholarly journals, author-fee OA journals put submissions through peer review. Only after a decision has been made to publish an article is the fee assessed to the author.

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4. Subsidized open access: Instead of authors paying as in the previous model, some other entity subsidizes production costs. Typically, this is a scholarly society, a university college or department, or a foundation.

5. Dual-mode open access. In dual-mode OA, production costs for an OA online version are covered—either in whole or in part—by the sale of print subscriptions.

6. Delayed OA: Delayed OA publications rely on subscription income to cover costs and OA is not granted immediately upon publication but after some delay. Such delays, also known as embargoes, typically range from 6 months to 2 years.

7. Partial OA: Partial OA is achieved in two ways—either having a subset of all articles be OA or having all content be OA for a limited period of time while asking that use of the OA material adhere to fair-use principles.

8. Per capita OA: This is OA for developing countries whose per capita incomes fall below a certain threshold. Publishers who charge for access in the developed world participate with various United Nations agencies to make this access available. Per capita OA initiatives include HINARI (Health InterNetwork Access to Research Initiative sponsored by the World Health Organization), AGORA (Access to Global Online Research in Agriculture sponsored by the Food and Agriculture Organization), and OARE (Online Access to Research in the Environment sponsored by the United Nations Environment Programme).8

9. OA indexing: In contrast to all of the previous forms of OA, this is not OA to full journal articles. Descriptive information (author, title, publication data) and abstracts are available to anyone. Currently many indexes of this type are still behind subscription barriers.

10. OA cooperatives: OA cooperatives, such as German Academic Publishers, provide publishing infrastructure to members of the cooperative thereby reducing the need for each institution to develop its own capabilities. {{1406 John Willinsky 1950-2006; 211-216}}

What does OA mean for academic authors?: How it’s done

Gold OA

Having addressed the question of what OA is—both theoretically and practically—it’s now time to turn our attention to what it means for you as academic authors. Having finished with the practical side of the “What is OA?” question, let’s begin with the practical—or another word might be mechanical—side of the “What does it mean?” question.

One way to promote OA is to publish in an open access journal. The Directory of Open Access Journals lists 4,252 OA journals in 112 subjects published around the world.9 Many of them are newer publications. However, a growing number of established and well-respected journals with high impact factors (commonly referred to as top-tier journals) are included in the OA ranks. As noted, if you wish to publish in some OA journals, you may have to pay a fee, if your article is accepted.

Another option for disseminating your material in an OA fashion is to submit it to a traditional subscription-based, or toll access, journal but to pay for the journal’s OA option. The Sherpa RoMEO database lists 80 publishers who offer such an option including major publisher

programs like Oxford’s Open Choice, Springer’s Open Choice, Taylor & Francis’ iOpenAccess, and Sage’s Sage Open programs.\textsuperscript{10}

Costs for author-fee OA, whether in a fully OA journal or in a traditional journal, range from $500 to $5,000 with an average in the $3,000 per article price range. One may ask, “How do I cover that cost?” For those in STM (scientific, technical, or medical) fields, grant monies will often cover the costs of OA publication. In fact, some grant funders require that grant recipients make their article available open access.\textsuperscript{11}

Those who like the idea of their article being available OA but who have no source of funds to pay for the publication, whose preferred journal offers no such option, or who would rather not pay for OA publication have two viable OA options. They can select an OA journal that has no publication fee or, they can deposit their article in an OA archive.

\textbf{Green OA}

Many academic institutions are actively building an OA archive—commonly referred to as an institutional repository, or IR for short—because they support OA in principle and because they want to showcase the scholarship emanating from their institution. Generally speaking, the IR staff are located in the library. The IR staff will be only too happy to help you as an academic author—either by depositing articles for you or, for those of you who like to be do-it-yourselfers, by showing you how you can deposit articles on your own in the future. Those not affiliated with an institution of higher learning can probably find an appropriate subject-based repository, such as arXiv, to which to submit their work. The Directory of Open Access Repositories lists 186 disciplinary repositories.\textsuperscript{12}

\textbf{What does OA mean for academic authors?: Author rights management}

Regardless of how you choose to accomplish it, OA means that you must be aware of your intellectual property rights as an author. When you set something creative down in a tangible medium, you immediately own a copyright in that material. Copyright is a “bundle” of five basic rights. As a copyright owner, you possess the exclusive right to 1) reproduce the work, 2) make derivative works based on it, 3) distribute copies of the work by sale, rental, lease, or lending, 4) publicly perform the work, and 5) publicly display the work.\textsuperscript{13}

Essentially, you can do anything you desire with your copyright unless or until you sign it away to someone else. In the print scholarly communication paradigm, a tradition grew up and solidified in which authors did sign away their copyright to publishers. Why? Because publishers were unwilling to make the required monetary investment in publication and distribution unless they owned something they could legally protect.

This transfer of ownership was done with a contract passing the entire copyright “bundle” to the publisher. The author/creator typically reserved no rights for him or herself. At its worst, this regime of complete copyright transfer extended to an author having to purchase reprints or to pay for the right to reuse his or her own material in a subsequent compilation or to even distribute an article in a course pack to his or her own students. It has also meant that, in the case of public universities, have paid 2 or 3 times for the same material. First, they have paid the salary of the

\textsuperscript{10} “Publishers with Paid Options for Open Access,” \url{http://www.sherpa.ac.uk/romeo/PaidOA.html}.

\textsuperscript{11} “Publishers with Paid Options for Open Access”; “BioMed Central | for authors | Funder policies,” \url{http://www.biomedcentral.com/info/authors/funderpolicies/}.

\textsuperscript{12} “OpenDOAR - Home Page - Directory of Open Access Repositories,” \url{http://www.opendoar.org/}.

\textsuperscript{13} U.S. Copyright Office, \textit{Copyright Basics (Circular 1)}, (Washington, DC: GPO, 2008), 1, \url{http://www.copyright.gov/circs/circ1.pdf}. 
researcher who authored the article. Second, they have often paid the salary of one or more peer reviewers. And finally, they fund the library which has to purchase a subscription to the content.

As with many things that begin for a perfectly logical reason, copyright transfer is now a tradition with little, if any logic, left to support it. Practically, you should NOT blindly sign the copyright transfer agreement, or CTA, a publisher sends to you. License only the rights the publisher needs. They need the right to distribute your work and it is reasonable for them to expect to be acknowledged as the publisher of record for the work. Give them those rights but do not give them the right to be the exclusive distributor of the work. Retain the right to allow others to distribute the work and to distribute it yourself as well.

When an article has been accepted for publication, most publishers will send you their standard CTA transferring all rights to the publisher. Many publishers have already prepared alternative agreements that are not full transfers of right. If you receive a traditional agreement, ask if the publisher have an alternative agreement that would give you the right to deposit in an OA repository and to reserve others useful rights as well. If they don’t have such an agreement, use an addendum to the standard agreement. Your institution may have developed an addendum or you could use one form Scholarly Publishing and Academic Resources Coalition (SPARC) or from Science Commons. Whatever agreement you sign, be certain to retain your copy.

What does OA mean for academic authors?: Version management

Practically, OA means that you also need to maintain the necessary versions of your paper. Therefore, some words about versions are in order. The first draft you submit to a publisher is commonly referred to as a pre-print. Particle physicists routinely post pre-prints to arXiv.org where other physicists can comment on them. At the pre-print stage, you are fully vested in the copyright of your work and need no one’s permission to post the pre-print to an online repository like arXiv. Not everyone will be comfortable with this but, if it strikes you as a good idea, know that you can take advantage of the opportunity. Some publications consider the posting of pre-prints to an archive to be prior publication and will not publish anything that has previously been published but, the number of such publications has been shrinking over the past 20 years.

After your paper has gone through peer review and you have made revisions, the version you submit to the publisher is called the post-print or the author’s final manuscript. Some changes may be introduced in the copyediting process but the post-print and the published version will bear a close, if not exact, resemblance to each other.

The fully laid out version—commonly saved as a pdf—is the publisher version. Many publishers do not permit the use of their final formatted version of a paper to be deposited in an OA archive. On the other hand, some publishers require that the publisher version be the one deposited to an OA archive. By saving your versions of a paper, you should be able to deposit one or more of them in an OA archive.

What does OA mean for academic authors?: Why would I want to do this?

This is an excellent place to jump into the discussion of the potential benefits of OA publishing to academic authors. Multiple studies have been published indicating that OA articles (whether published OA or deposited into an OA archive) enjoy an advantage when compared to non-OA articles. Generally speaking the advantage is in research impact as measured by citation counts. For instance, in a 2006 article in PLoS Biology, Gunter Eysenbach of the University of Toronto, reported the results of a comparison in the citation rates of a cohort of 1,492 articles...

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published in *PNAS: Proceedings of the National Academy of Sciences* between 8 June and 20 December 2004. Of these, 212 articles were published OA and 1,280 were not. Eysenbach reported, “The average number of citations of OA articles was higher compared to non-OA articles.” And, “In a logistic regression model, controlling for potential confounders, OA articles compared to non-OA articles remained twice as likely to be cited in the first 4-10 mo[nths] after publication, with the odds ratio increasing to 2.9 10-16 mo[nths] after publication.”

Some have questioned these studies or the beneficial effects they report. The authors of a piece in the 20 February 2009 issue of *Nature* concluded that, “The influence of OA is more modest than many have proposed, at ~8% for recently published research, but our work provides clear support for its ability to widen the global circle of those who can participate in science and benefit from it.”

Why would this not be the case? These and similar findings from other studies seem entirely reasonable. As the authors of one of these studies wrote, “OA dramatically increases the number of potential users of any given article by adding those users who would otherwise have been unable to access it ….” The findings are also consistent with what scholars expect according to a Joint Information Systems Committee (JISC)-sponsored survey of authors in the life and medical sciences. To a question asking what were the two principal reasons for publishing in an OA journal, the third and fourth reasons both were about research impact—a larger readership and more citations. These were only eclipsed by 1) belief in OA as a principle and 2) a perception that OA publication times were faster than the alternative.

While citation may not be the very best measure of impact, it is an indicator that one’s work is being read and used by others. Isn’t that the goal of scholarship? Do we write in a vacuum or to hear ourselves think? No. We write with the hope of making a difference, of contributing to an increase in the level of knowledge, of participating in the scholarly conversation. As Bernardo Huberman wrote recently: “Attention is so important in the world of academia that I’d venture to state that it is often its main currency: we publish to get the attention of others, we cite so that other researchers’ work gets attention, and we cherish the prominence of great work if only because of the attention it gathers. This phenomenon has been taking place since the establishment of learned societies and academic disciplines …”

From a purely self-interested perspective, citation does impact our professional reputation. Enhancement of our professional reputation promotes the likelihood that we will be granted tenure or promotion. I don’t know of a single academic who has said, “My goal is to be an assistant professor throughout my entire career.” Enhancement to our professional reputation also increases the likelihood that we will be able to attract funding for further research.

From a less self-interested perspective, the majority of academics are academics because they believe in the academy’s mission. OA plays a critical role in achieving the academy’s mission.

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The importance of this role is captured well in the recent document “The University’s Role in the Dissemination of Research and Scholarship—A Call to Action” issued in February by the Association of American Universities, the Association of Research Libraries, the Coalition for Networked Information, and the National Association of State Universities and Land-Grant Colleges (now the Association of Public and Land-grant Universities). The document begins with “A Vision Statement for the University’s Role in Dissemination” which reads, “The creation of new knowledge lies at the heart of the research university and results from tremendous investments of resources by universities, federal and state governments, industry, foundations, and others. The products of that enterprise are created to benefit society. In the process, those products also advance further research and scholarship, along with the teaching and service missions of the university. Reflecting its investments, the academy has a responsibility to ensure the broadest possible access to the fruits of its work both in the short and long term by publics both local and global.

“Faculty research and scholarship represent invaluable intellectual capital, but the value of that capital lies in its effective dissemination to present and future audiences. Dissemination strategies that restrict access are fundamentally at odds with the dissemination imperative inherent in the university mission.” In short, OA can help us succeed because it is a dissemination strategy that promotes rather than restricts access.

**Current Issues: Mandates/OA Policies**

Now we pass to the topic of some current issues in OA that you may have heard about.

**Funder Mandates**

As mentioned above, some funders have adopted OA mandates. Worldwide, 36 such mandates have been adopted—mostly in Europe. One of the most influential of these is that of the Wellcome Trust. In the United States, Autism Speaks, the Howard Hughes Medical Institute, and the National Institutes of Health have adopted funder mandates. Of these, the NIH mandate is the most influential. This is due to the fact that the NIH funds nearly $30 billion of research that they estimate generates somewhere in the neighborhood of 80,000 scientific and medical journal articles annually. NIH is definitely one of the gorillas when it comes to research funding.

NIH’s public access policy went into effect on 7 April 2008. The policy mandates that all researchers funded by NIH provide the peer-reviewed manuscripts of articles stemming from their funded research for deposit into PubMedCentral, or PMC, and grant NIH a license to make them publicly available. The policy was enacted:

- to provide fast, free, electronic access for anyone (specialist or lay person) who can use the research results,
- to create a permanent archive,
- to create a new information resource for scientists to use in innovative ways to advance science, and
- to allow NIH to manage its research portfolio more effectively and with greater transparency.

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A “subset of the publishing community … oppose the NIH Public Access Policy” claiming that this mandate is in conflict with copyright law. In response, Rep. John Conyers, Chairman of the Judiciary Committee in the U.S. House of Representatives, introduced the Fair Copyright in Research Works Act. This bill, officially H.R. 801, would effectively reverse the NIH Public Access Policy and it would forbid any other federal agencies from adopting similar policies.

Just yesterday, “Senators Joseph Lieberman (I-CT) and John Cornyn (R-TX) … introduced the Federal Research Public Access Act (FRPAA), a bill to ensure free, timely, online access to the published results of research funded by eleven U.S. federal agencies. FRPAA would require those agencies with annual extramural research budgets of $100 million or more to provide the public with online access to research manuscripts stemming from such funding no later than six months after publication in a peer-reviewed journal.”

**Departmental/Institutional Mandates**

Funders are not the only ones adopting OA policies. Universities and other research institutions—and, in some cases, constituent departments or colleges within these organizations—are also adopting such policies. As with funder mandates, European institutions have been at the forefront of institutional policy adoption. Earlier this week the Faculty Senate of the University of Kansas approved the second institution-wide OA policy in the United States, the other being MIT’s. Ten different departments or colleges within US universities have adopted departmental OA policies including 3 at Harvard, 2 at the University of Oregon, and single departments at 5 other institutions.

**Current Issues: OA Publishing**

What about the economics of OA publishing?

**Commercial OA Ventures**

Several large commercial publishers have ventured into the OA arena. Springer, “the world’s second largest publisher of commercial STM (science, technology, and medicine) journals” purchased BioMed Central, a “pioneering” OA publisher in October 2008. “This acquisition reinforces the fact that we see open access publishing as a sustainable part of STM publishing, and not an ideological crusade,” Derk Haank, CEO of Springer Science Business Media, said in a statement, adding that the company’s experience with its version of OA, Springer Open Choice in 2004, has been positive. “This acquisition strengthens Springer’s position in the life sciences and biomedicine,” he said, “and will allow us to offer societies a greater range of publishing options.” The agreement maintains all of BMC’s publications as OA.

In 2007 Sage, another major commercial publisher, joined in a partnership with Hindawi, an exclusively OA publisher operating profitably, to promote existing and new OA journals. The venture, is owned equally by the two entities. Sage “will have sole responsibility for the editorial development, marketing, and promotion of the new journals, while Hindawi will provide the technology and expertise needed to run the publication process from the point of submission,
through the peer-review process, to the point of final publication.” Currently, the Sage Hindawi partnership is publishing 18 journals.28

Not-for-profit OA publishing
Many OA journals are published independently at universities or by societies who underwrite the production costs of the journals. For instance at my institution, the library is using the Open Journals Systems (OJS), an open source software package written by the Public Knowledge Project, to support the editorial workflow and publishing of scholarly journals produced, or edited by a faculty member, at BYU. More than 2,000 journals—many of them fully OA—are being produced worldwide using OJS.29

Cooperative publishing
A very interesting development is a move to transfer a disciplinary group of journals from being toll-access to being OA. The movement is known as SCOAP3, which stands for the Sponsoring Consortium on Open Access Publishing in Particle Physics. SCOAP3 proposes to have libraries and research institutions redirect what they are currently paying in subscriptions to the Consortium which will then put out tenders to publishers to manage the peer review and production processes for the corpus of high energy physics (HEP) literature. The literature would all be open access at that point.30

Conclusion
As the foregoing demonstrates, there is much going on with respect to OA. As you continue your academic writing, please consider making it available in an OA fashion whether that means OA publishing in journal—whether full OA or OA in a traditional journal—or depositing in an OA repository.