



Open access is:

- Free: no cost to user; primarily concerned with removing price barriers
- Immediate: upon publication; no embargo period
- Unrestricted: (ideally) with reuse rights
- Research and scholarly products: primarily literature, but expanding to data, multimedia

The movement toward open access (OA) came about in response to changes in the technological environment of scholarly communication starting in the early 1990s (i.e., email and the internet), which have radically changed the way that we communicate as well as our expectations for access.

Open access was codified in 2002 with the Budapest Open Access Initiative, which gives us the formal definition of Open Access. Since then there has been consistent growth in OA repositories and OA journals. Today, OA is recognized as a mainstream approach to delivering scientific communication.



Open access benefits readers, authors, teachers, students, libraries, universities, funders, governments, and citizens, as illustrated in this graphic.

For researchers, Open access enables broad and rapid dissemination of research, informs the public, and expedites the scientific process.



Here's an example of increased visibility and global dissemination. This image shows recent download statistics from eScholarship@UMMS, the medical school's digital repository and publishing system for research and scholarship. Open access increases the global reach and impact of UMMS scholarship.



Another benefit of open access: When research articles are available to be downloaded, read, and reused, they demonstrate greater impact than articles locked behind subscriptions. Open access papers have increased visibility, dissemination, and receive more citations.

There have been a number of studies about this citation advantage. This figure from the review article by Tennant et al. shows studies that have investigated the citation advantage, grouped by their conclusion. A large majority found that there is a citation advantage. The article also includes a table listing all the studies. The increase in citation and impact is why most publishers have open access journals or offer open access.

To read about the citation advantage of open access vs subscription journals, see: Björk and Solomon BMC Medicine 2012, 10:73, <u>https://doi.org/10.1186/1741-7015-10-73</u>



In 2015 there was a Twitter thread started by Michael Eisen, co-founded of the Public Library of Science: "Raise your hand if you've ever wanted to read an article you couldn't access."

These are some of the responses, which highlight the problem faced by patient advocates, families, citizen scientists – whose taxes have funded much of the published research – and by those whose affiliated institutions do not have all of the resources that they need. People resort to workarounds to access the content they need to do science and answer questions.

These tweets illustrate the "greater good" reasons for open access: Open access benefits science, education, and society.

But why is it so difficult for so many people to access the content that they need and why is it so hard to change the system?

SCHOLARLY COMMUNICATION LANDSCAPE

Journal subscription prices have increased consistently at a rate of 5-7% per year going back twenty years

Library budgets not keeping pace

Consolidation of the publishing industry over the last 30 years has led to an increase in profits of publishers "Flat budgets, price increases, and a reliance on status journals for tenure and promotion keep familiar pressures on the serials marketplace."

- Library Journal Periodicals Price Survey 2018

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This brings us to the economics of the scholarly communication system, which favor the status quo. The status quo is a situation where content authors are insulated from costs (with libraries functioning as intermediaries) and publishers control content through their acquisition of copyright (and have managed this throughout the transition to digital). As a consequence, publishers are able to charge high prices for content that has low overhead and, now, no materials cost.

Journal subscription prices have increased consistently at a rate of 5-7% per year going back twenty years; these increases are consistently 4-8% higher than the consumer price index. At the same time, higher ed and library budgets are flat or decreased.

In addition, the consolidation of the publishing industry over the last 30 years has led to an increase in profits of publishers. Today, five publishers dominate the market with 53% share of the market. The profit margins for Elsevier, the largest publisher of scholarly journals in the world, never dipped below 30% between 1991 and 2013, and they are not alone.

Sources:

- Larivière V, Haustein S, Mongeon P (2015) The Oligopoly of Academic Publishers in the Digital Era. PLoS ONE 10(6): e0127502. https://doi.org/10.1371/journal.pone.0127502
- Stephen Bosch, Barbara Albee, & Kittie Henderson. Death By 1,000 Cuts: Periodicals Price Survey 2018. Library Journal. Apr 23, 2018. https://www.libraryjournal.com/?detailStory=death-1000-cuts-periodicals-price-survey-2018
- EBSCO 2019 Serials Price Projection Report, https://www.ebsco.com/blog/article/2019-ebscoserials-price-projection-report, and Five Year Journal Price Increase History (2014-2018). https://www.ebscohost.com/promoMaterials/EBSCO_Five_Year_Journal_Price_Increase_Histor y_2014-2018.pdf



This is what a that kind of profit margin looks like in comparison to other goods. The publishing market is not shrinking; it is growing.

Ramifications of this

- Full text access is limited to those who can afford it
- Scholarly publishing is entrenched in legacy systems and in very successful companiesjournal pricing system remains largely unchanged
- This current system is perpetuated by the academic reward system which is based on getting published in high impact journals
- The publishers have much more leverage than the creators of the content, much more leverage than libraries

WHY OA - SUMMING UP

Altruistic

- Better visibility, improved dissemination, and higher impact for scholarship
- More knowledge leads to better patient outcomes
- Return on the public's investment in taxpayer-funded research
- To help achieve science's full potential by removing price barriers
- Improved education

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Practical

- Expectations around access have changed
- Mechanisms for communication and dissemination have evolved
- Article-level metrics have emerged
- Journal pricing and academic reward systems have remained largely unchanged

The scholarly publishing system is out of balance.



There are two main mechanisms for making scholarship open: Green Open Access and Gold Open Access.

Green: OA through self-archiving in open access repositories, dependent upon journal policies to determine when self-archiving can take place (typically 12 months after publication by the journal).

Gold: OA through publication in open access journals or in toll journals that offer an open access option to authors, immediately open access (but sometimes with license restrictions)

The choice of making scholarship open via one of these two methods will impact how immediately content will be available. The distinction between the two methods is important, primarily because one method (green) is free not only to the user but also to the author, where the other (gold) is free to the user but relies on financial support from the author or their institution.



There are more than 12,000 fully open access, peer-reviewed scholarly journals in the world, about a third of all peer-reviewed journals. These journals are published in more than 100 countries, and contain over 3.7 million articles. (DOAJ statistics, 11 February 2019)

OPEN ACCESS PUBLISHING (GOLD OA)

How it works

- 1. Select OA journal (free, paid, or hybrid) to submit your article
- 2. Pay Article Processing Fee (if required) for immediate open publication
- 3. Select license (if applicable) to allow broadest dissemination and reuse possible

See: How To Make Your Own Work Open Access (Harvard Open Access Project)

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The is how gold OA publishing works, very simple in outline.

The hard part is selecting the journal; not all OA journals are created equal.



DOAJ is an online index of high quality, peer-reviewed, open access journals, established in 2003. In 2014 they updated their criteria for indexing in response to a maturing OA market, with minimum requirements for inclusion that come from the Principles of Transparency and Best Practice in Scholarly Publishing (https://doaj.org/bestpractice). In doing so, they removed 3,000 questionable journals from their index. They now have over 12,000 vetted open access journals in their directory.

The DOAJ Seal is a mark of certification for open access journals, awarded by DOAJ since 2014 to journals that achieve a high level of openness, adhere to Best Practice and high publishing standards. To receive the Seal, the journal must comply with the following 7 conditions:

- use DOIs as permanent identifiers;
- provides DOAJ with article metadata;
- deposits content with a long term digital preservation or archiving program;
- embeds machine-readable CC licensing information in articles;
- allows generous reuse and mixing of content, in accordance with a CC BY, CC BY-SA or CC BY-NC license;
- has a deposit policy registered with a deposit policy registry;
- allows the author to hold the copyright without restrictions.

| | GOLD BUSINESS MODELS | | | | | |
|----|---|--------------|------------------------------------|---------|---|--|
| | OA Model | Subscription | Article Processing Charge | Embargo | Example(s) | |
| | Full OA | No | Yes* | No | BMC Family Practice, BMC Medicine, Annals of Family Medicine, Family Medicine, Journal of Global Radiology* | |
| | Hybrid OA (fee to make an individual article OA) | Yes | Yes (on top of subscription costs) | No | The Lancet, Epidemiologic Reviews, American Journal of Public Health, American Journal of Preventive Medicine | |
| | Embargoed OA | Yes | No | Yes | JAMA Internal Medicine, New England Journal of Medicine | |
| | None (Toll Access) | Yes | No | No | Annual Reviews of Public Health | |
| ©) | | | | | *Not all Full OA journals will require an APC | |

But OA publishing is complex – it is not easy to just go to the DOAJ and find the right journal for you. Here is some information to know about the varieties of Open Access Publishing.

| A (A | RTICLE F \PCs) | PROCESSING CH | ARGES |
|------------|-------------------|--------------------------------------|----------------|
| | Fee | Publisher | |
| | \$0 | Society and library-based publishers | |
| | \$550 | Ubiquity Press | |
| | \$1,595-\$3,000 | PLOS | nature |
| | \$860-\$3,680 | BioMed Central | COMMUNICATIONS |
| | \$1,500-\$3,000 | SpringerOpen | \$5,200 |
| | \$150-\$5,000 | Elsevier | |
| | \$1,380-\$5,200 | Nature Publishing Group | |
| ® • | | | |

Article Processing Charges (APCs) are meant to cover the cost of the publishing process up front, including editing, peer-review, archiving, etc. But APCs are highly variable across publishers, and across journals from a single publisher.

See BMC comparison chart: https://www.biomedcentral.com/getpublished/articleprocessing-charges/biomedcentral-prices NPG: https://www.nature.com/openresearch/publishing-with-npg/nature-journals/



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FUNDING OPTIONS

| Funding Source | Description | Example | |
|--------------------------|--|--|--|
| Institutional membership | Authors receive a discount on APC when their institution is a member | BioMed Central, Nucleic Acids Research, Hindawi | |
| Site license discounts | Authors receive a discount on APC when their institution has a site license | PNAS, Science Advances | |
| Institutional Accounts | Pre-funded accounts to pay APCs | SpringerOpen | |
| Open access funds | Institutions/libraries/departments put aside funds to support faculty APCs University of Massachuse Amherst, UMMS FMCH | | |
| Individual membership | | PeerJ | |
| Out-of-pocket | Author pays APCs out of pocket | Individual | |
| Grant funds | Author use funds from their grants to support payment of APCs | Individual | |
| | Red exam | ples are available through UMMS | |

Where does the money come from?

Institutional membership discounts (not the same as a subscription): BioMed Central 15%; NAR 50%

Site license discounts - PNAS (discounted fee of \$1000) and Science Advances (30% discount)



The bottom line: Gold OA – specifically hybrid OA -- allows publishers to continue to grow a product category in which they have existing economies of scale (e.g. composition, workflow systems, platform hosting), while at the same time opening up revenues from new sources. UMMS and other institutions are already paying for subscription access through their libraries, and some of that money comes from the indirect costs to the university. The institution is paying twice for this content!

Sources

- "... overall revenue from hybrid APCs outstrips that from pure OA journals two to one, in part because hybrid APCs are generally higher." http://www.copyright.com/blog/howwell-do-you-know-hybrid/
- Björk B. 2017. Growth of hybrid open access, 2009–2016. PeerJ 5:e3878 https://doi.org/10.7717/peerj.3878. "The number of journals offering the hybrid option has increased from around 2,000 in 2009 to almost 10,000 in 2016. The number of individual articles has in the same period grown from an estimated 8,000 in 2009 to 45,000 in 2016."



There have always been vanity presses and publishers who are more interested in their bottom line than in upholding ideals of research and scholarship. Open access is simply one avenue along which questionable publishers have been evolving (from https://www.lib.umn.edu/openaccess/myths-about-open-access#myth6). We now have what are typically called "predatory" publishers, who are scam publishers seeking to exploit the "author pays" economic model of OA, and authors' need to publish, for their own gain. These scam publishers seek out content and will publish as long as you pay the publication charge. Probably many of you (maybe all of you) have been solicited, our students are solicited, librarians are solicited.

Common tactics include:

- Accepting articles with little or no peer review
- Informing authors about article fees only after a paper is accepted
- Aggressively soliciting for article submissions
- According to a 2015 study, there's been a big increase in these tactics the findings are rather stunning, as illustrated in the figure on the slide

| | QUALITY OF OPEN ACCESS JOURNALS | |
|----|---|--|
| | Most open access scholarly journals are peer-reviewed. | |
| | There are high impact open access journals in a wide range of disciplines, e.g. BMJ, PLOS Medicine, BMC Medicine, Annals of Family Medicine, Journal of the American Board of Family Medicine, BMC Family Practice | |
| | "Our findings indicate that the methodological quality of studies published in OA and non-OA journals, as well as the quality of reporting, are comparable." Pastorino, R. et. al. 2016. Quality Assessment of Studies Published in Open Access and Subscription Journals: Results of a Systematic Evaluation. PLoS One 11(5): e0154217. doi: 10.1371/journal.pone.0154217 | |
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Because of predatory practices, there is the perception that open access journals are intrinsically low in quality. But in fact:

- Most open access scholarly journals are peer-reviewed. Most scholarly journals, whether open access or controlled-access journals, are peer-reviewed. There are both open and controlled journals that are not peer-reviewed. Most major publishers now have an open access option for individual articles (hybrid OA). This does not change the submission, peer review, or editorial process for those journals or articles.
- Some open access journals have high impact factors. There are high impact factor open access journals in a wide range of disciplines. Examples: BMJ, PLOS Medicine, BMC Medicine, Annals of Family Medicine, Journal of the American Board of Family Medicine, BMC Family Practice are all in the top 10 for their disciplines.
- We are beginning to see studies that attempt to determine the quality of OA journals as compared to traditional subscription journals. The most recent one, cited on the slide, found that OA journals in the field of oncology are comparable if you look at the methodological quality of the papers.



Not all OA journals are predatory. They are an aggressive exception. Authors should evaluate each venue they consider for publication before submitting a manuscript. There are several resources to help authors distinguish an ethical publisher from an unethical one.

For instance:

- Think-Check-Submit (https://thinkchecksubmit.org/) is a campaign to help researchers identify trusted journals for their research. It is supported by DOAJ, BMC, and the Open Access Scholarly Publishers Association, which also has a code of conduct that their members (OA publishers) are expected to follow. The checklist is very useful.
- The Open Access Journal Quality Indicators site (https://www.gvsu.edu/library/sc/open-access-journalquality-indicators-5.htm) maintained by Grand Valley State University has an excellent list of positive and negative indicators of journal quality.



Here are some very specific criteria that an author should consider. However, objective and comprehensive criteria to differentiate predatory from legitimate journals can be elusive. There is overlap with small legitimate publishers who are seeking to support research in underrepresented parts of the world, for example, the Journal of Global Radiology, https://escholarship.umassmed.edu/jgr/. Many of these journals are newly founded so won't be in indexing databases like PubMed or have an impact factor yet.



This is the browser view of a an solicitation email received by a UMMS librarian. The subject line was: "Only 100 USD APC: British Journal of Education, Society & Behavioural Science". Highlighted items are things that made it suspicious.

GOLD OA - SUMMING UP

Pros:

- Immediate dissemination of research results
- Contextualized access point
- Version of Record
- May have re-use rights

Cons:

- Expensive for authors and funders
- Rights may be limited to read only
- Does not satisfy NIH Public Access Policy
- Subject to "predatory" practices

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Now let's talk about self-archiving or green open access.

Depositing a copy of a paper in an open archive or repository – other than the subscription publisher's website – is called "green open access." The act of depositing is called "author self-archiving." These repositories are generally disciplinary/domain or institutional repositories. They don't perform peer review but simply make their contents freely available to the world. Our repository at the medical school, eScholarship@UMMS, is an example of an open access repository. PubMed Central (PMC), the archive of biomedical and life sciences journal literature hosted by the NIH's National Library of Medicine, is another open access archive.

| DEFINITIONS | Submitted version Author's original Pre-print Peer review |
|---|--|
| Preprint: author-created version first submitted to publisher, before peer review | Edit |
| Postprint: author-created version after peer review, the "accepted manuscript" | Accepted version Post-print AAM |
| Publisher's version/PDF: copyedited version with publisher's formatting and paging | Copy-editing and typesetting |
| Embargo: a fixed delay between the time a publication (or data) is deposited into a repository and the time it is made public | Published version Version of record Publication |
| @ () | |

Before we go further let's review definitions of terms that come up in lot in open access in terms of self-archiving. There are generally accepted definitions for a journal article in its various versions as it moves through the publication process. It's important to understand the differences.

The postprint is the version mandated in the NIH public access policy and in most institutional open access mandates.

The other concept that comes up a lot is "embargo". Publishers often impose embargoes as a condition for self-archiving, requiring authors to wait 6 months or longer after publication before a preprint or postprint can be self-archived. The NIH public access policy allows publishers to set an embargo period of up to 12 months before an NIH-funded paper must be publicly available in PMC.

| | SELF-ARCHIVING (GREEN OA) |
|----|---|
| | How it works |
| | Find out the status of your work's copyright and publisher policies for archiving |
| | 2. Identify an appropriate Open Access repository |
| | 3. Deposit your work (or have someone deposit it for you) |
| | See: How To Make Your Own Work Open Access (Harvard Open Access Project) |
| ©• | |

Author has to be self-motivated! (or compelled by funder mandates or local policies)

Librarians can help determine the publisher policy and an appropriate repository, and can even help you deposit your paper.



The SHERPA/RoMEO website is a searchable database of publisher's policies regarding the self- archiving of journal articles on the web and in open access repositories. Self-archiving is dependent upon journal policies to determine when self-archiving can take place, and which version of the manuscript. Many publishers – about 81 % currently – allow authors to self-archive some version of their manuscripts in an institutional repository like eScholarship@UMMS without having to ask for their permission. Generally it's the postprint version that is allowed, although some publishers do allow their formatted PDFs to be self-archived. Often publishers impose other conditions, such as waiting 6 -12 months after publication – or as long as 48 months in some cases! -- before being able to post in a repository (i.e. an embargo).

For example, from the New England Journal of Medicine (https://www.nejm.org/authorcenter/permissions): "Following initial publication at NEJM.org, the *New England Journal of Medicine* (NEJM) is pleased to grant authors rights to reuse published versions of their articles as follows: ... Deposit for display at author's academic institution's online repository six (6) months after publication"

Librarians can help in understanding what the publisher policy is and which version of the document you can deposit.



There has been a slow but steady growth in green open access - much of it driven by funder mandates and institutional policies. In this graphic you can see the steady increase in free full text articles in PubMed Central due to the NIH public access policy that compels NIH-funded authors to self-archive in order to comply with the policy. PMC added 600,000 items and surpassed a milestone of 5 million total items in 2018. (Funder mandates frame research as a public good, seek return on taxpayer investment, and accelerate research through a compliance mechanism. But they do this at the price of a lot of confusion, which can detract from the perceived value of OA.)

Institutional OA policies provide the cultural and policy framework for collective participation in OA at the institutional level. The Registry of Open Access Repository Mandates and Policies (ROARMAP), http://roarmap.eprints.org/, is a searchable international registry charting the growth of open access mandates and policies adopted by universities, research institutions and research funders that require or request their researchers to provide open access to their peer-reviewed research article output by depositing it in an open access repository.

| | A WO & AC | | | | | SEARCHGATE |
|------------|--------------|---|-----------------------------|---|---|---|
| | | | Open access repositories | Academia.edu | ResearchGate | |
| | | Supports export or harvesting | Yes | No | No | See: A Social |
| | | Long-term preservation | Yes | No | No | Networking Site Is No an Open Access |
| | | Business model | Nonprofit (usually) | Commercial. Sells job posting services, hopes to sell data | Commercial. Sells ads. job posting services | Repository (Office of Scholarly |
| | | Sends you lots of emails (by default) | No | Yes | Yes | Communication, |
| | | Wants your address book | No | Yes | Yes | University of Californi |
| | | Fulfills requirements of UC's OA policies | Yes | No | No | |
| @ : | | (a) er http://cr | eativecommons.org/li | censes/by/4.0/ Univers | ity of California OSC | |

Librarians are often asked about ResearchGate, Academic.edu or other academic social networking sites. Uploading your articles to ResearchGate or Academic.edu is NOT selfarchiving. These are commercial social networking platforms, like Facebook or LinkedIn for the research community, that are not run by higher education institutions. They are not committed to open access and do not allow re-use of data. They are for-profit companies that could shut down at any time (and disavow any duty to warn users if they do so) and make no commitment to preserve your data long term, unlike open access repositories, which are usually hosted and get their funding from universities or government agencies. They want to use your contacts and personal data, just like Facebook, etc., and can be very aggressive with daily or more emails being sent to you by default. Academic social networking sites might be valuable for trying to find collaborators, but open access repositories are a more useful way of sharing papers without mining your address book.

GREEN OA – SUMMING UP

Pros:

- Increased dissemination of research results
- Cost-effective for authors and funders
- Applicable to wide range of scholarly output
- Managed repositories ensure long-term access
- Disciplinary influence on deposit
- Supported by 81% of publishers (Sherpa/RoMEO)

Cons:

- Decentralized access
- "Degraded" version of article
- Few re-use rights, typically read-only
- Effort required to understand journal policies
- Effort required to identify appropriate repository
- Mediated deposit is common
- Difficult to quantify

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| DEBUNKING OA MYTHS |
|---|
| "Open access journals are the ONLY option for open access" (No, they're not) |
| "Open access journals are of poorer quality than toll access journals." (Not necessarily) |
| "Access is already easy." (No!!) |
| "Publishing in traditional journals disallows open access." (No, it doesn't) |
| |

Hopefully this presentation has debunked these and other myths about open access.

See:

- Sarah Hoey (October 2015). Debunking the myths of open access. https://blog.mendeley.com/2015/10/22/debunking-the-myths-of-open-access/
- BioMed Central. Common myths about open access...busted! https://www.biomedcentral.com/oamyths

| WHAT YOU CAN DO |
|---|
| Know your author rights |
| Retain your right to post open access versions of your articles in open access repositories |
| 🗸 Publish open access |
| \odot |

It is possible to have open access without paying for it – and certainly without paying twice (hybrid). OA will improve only if the producers and consumers of scholarship participate. This means actively engaging in the publishing process, recognizing and calling out predatory practices, and taking the time to comply with funder mandates. OA is a goal worth pursuing.

Know your author rights

- Read your copyright transfer or license agreements before you sign!

- Review https://sparcopen.org/our-work/author-rights/ from the Scholarly Publishing & Academic Resources Coalition (SPARC)

Retain your right to post open access versions of your articles in open access repositories

- The Library can help you understand publisher agreements

- The Scholar's Copyright Addendum Engine at http://scholars.sciencecommons.org/ is easy to use

- Copyright is an author's right, not a publisher's right - don't sign it away

Publish open access

- Publish in OA journals and/or self-archive your work
- Utilize Directory of Open Access Journals, https://doaj.org/

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