Open Access

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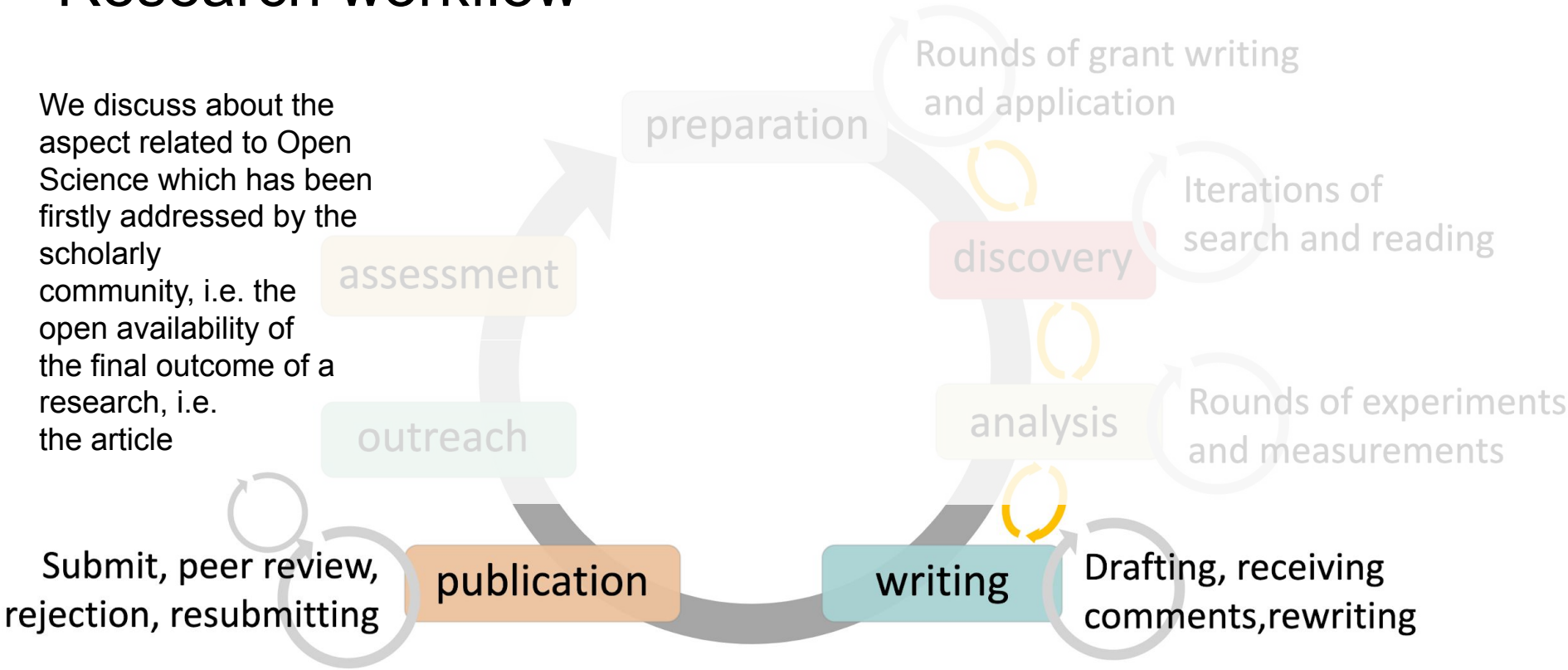
Open Science (A.Y. 2020/2021)
Second Cycle Degree in Digital Humanities and Digital Knowledge
Alma Mater Studiorum - Università di Bologna

DIPARTIMENTO DI FILOLOGIA CLASSICA E ITALIANISTICA

Research workflow

We discuss about the aspect related to Open Science which has been firstly addressed by the scholarly community, i.e. the open availability of the final outcome of a research, i.e. the article



Kramer, B., & Bosman, J. (2015, June 18). The good, the efficient and the open—Changing research workflows and the need to move from Open Access to Open Science. CERN Workshop on Innovations in Scholarly Communication (OAI9), University of Geneva, Geneva, Switzerland. https://www.slideshare.net/bmkramer/the-good-the-efficient-and-the-open-oai9

Moving towards commercialisation of knowledge

1895: Royal Society explained to the UK government that the publication of scientific research journals could not be undertaken on an ordinary commercial basis, and that should be handled by learned societies within their mission for supporting scholarship

1950: learned society journals under such severe financial strains that it seemed impossible to continue circulating scientific research on the old terms – wide circulation and uneconomic pricing

2002: the investment bank Morgan Stanley describe journal publishing as an industry worth US$7 billion, offering good returns to investors

This transformation had two components:

1. an increased involvement of commercial firms in journal publishing after 1945 (speedy production)
2. changing attitudes toward the economics of journal publishing among the learned societies

The dominance of modern research journal publishing by international media conglomerates has motivated many of the current campaigns for the reform of academic publishing

Fyfe, A. (2021). Self-help for learned journals: Scientific societies and the commerce of publishing in the 1950s. History of Science, 007327532199990. https://doi.org/10.1177/0073275321999901

What happens in the publishing system

Goal of academia
to share knowledge

in direct competition with

Goal of publisher
to make a profit

When a paper is accepted at a journal, it will be put behind a paywall (i.e. require a journal subscription to read)

University libraries pay an average $5000 per article on researchers' behalf through subscription fees – only individuals at institutions that can afford journal subscriptions can read the research, making the whole process as a form of indirect discrimination

Most of the time, publishers pay nothing for the product (the journal article written by the authors and their research often supported by public funds) or the services involved in the peer review of the product (e.g. volunteer editor and peer reviewer time), and then they sell such research back to academia at a profit

2008 estimation: the global academic community contributes £1.9 billion per year in kind so their researchers can serve as peer reviewers

Logan, C. J. (2017). We can shift academic culture through publishing choices. F1000Research, 6, 518. https://doi.org/10.12688/f1000research.11415.2

A new restaurant

“For researchers, it’s like going to a restaurant, bringing all of your own ingredients, cooking the meal yourself, and then being charged $40 for a waiter to bring it out on a plate for you”

Tennant, J. (2018). What do penguins, Gimli, and cobras have to do with Open Science? DARIAH Annual Event 2018, Paris, France. figshare. https://doi.org/10.6084/M9.FIGSHARE.6326339.V1

Open Access arises

Open Access (OA) refers to the removal of major obstacles to accessing, sharing and re-using the outputs of scholarly research

Rationale: the research process is facilitated by ensuring rapid and widespread access to research findings such that all communities have the opportunity to build upon them and participate in scholarly conversations

Short history since 1990 (after the advent of the Web):

- With increased availability of Internet bandwidth, print articles have become virtually redundant, and sharing of information has never been cheaper
- The costs per research article should have potentially decreased as a result of not investing material resources in publications printing and distribution
- Widespread dissatisfaction with the expensive traditional publishing model has increased, resulting in the OA movement and concomitant innovations in scholarly publishing
- As a result of the 2001 conference on “Free Online Scholarship” the Budapest Open Access Initiative (BOAI) was released
- Rise of (for-profit and non-profit) OA-only publishers, who publish exclusively digital content and have demonstrated that such a business model is financially feasible

Tennant, J. P., Waldner, F., Jacques, D. C., Masuzzo, P., Collister, L. B., & Hartgerink, Chris. H. J. (2016). The academic, economic and societal impacts of Open Access: An evidence-based review. F1000Research, 5, 632. https://doi.org/10.12688/f1000research.8460.3

Definition: Budapest Open Access Initiative

"World-wide electronic distribution of the peer-reviewed journal literature and completely free and unrestricted access to it by all scientists, scholars, teachers, students, and other curious minds [...] this kind of free and unrestricted online availability, which we will call open access"

Chan, L., Cuplinskas, D., Eisen, M., Friend, F., Genova, Y., Guédon, J.-C., Hagemann, M., Harnad, S., Johnson, R., Kupryte, R., La Manna, M., Rév, I., Segbert, M., de Souza, S., Suber, P., & Velterop, J. (2002). Read the Budapest Open Access Initiative. https://www.budapestopenaccessinitiative.org/read

Definition: European Commission

"Open access (OA) refers to the practice of providing online access to scientific information that is free of charge to the end-user and reusable"

European Union. (2015). Open access. https://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/open-access-data-management/open-access_en.htm

Definition: UNESCO

“Open Access means free access to scientific information and unrestricted use of electronic data for everyone [...] expensive prices and copyrights will no longer be obstacles to the dissemination of knowledge [...] free to add information, modify contents, translate texts into other languages, and disseminate an entire electronic publication”

UNESCO. (2013). UNESCO Open Access Publications. https://en.unesco.org/open-access/

Definition: OASPA

"Open Access is about more than access [...] most liberal Creative Commons license is CC-BY, which allows for unrestricted reuse of content, subject only to the requirement that the source work is appropriately attributed"

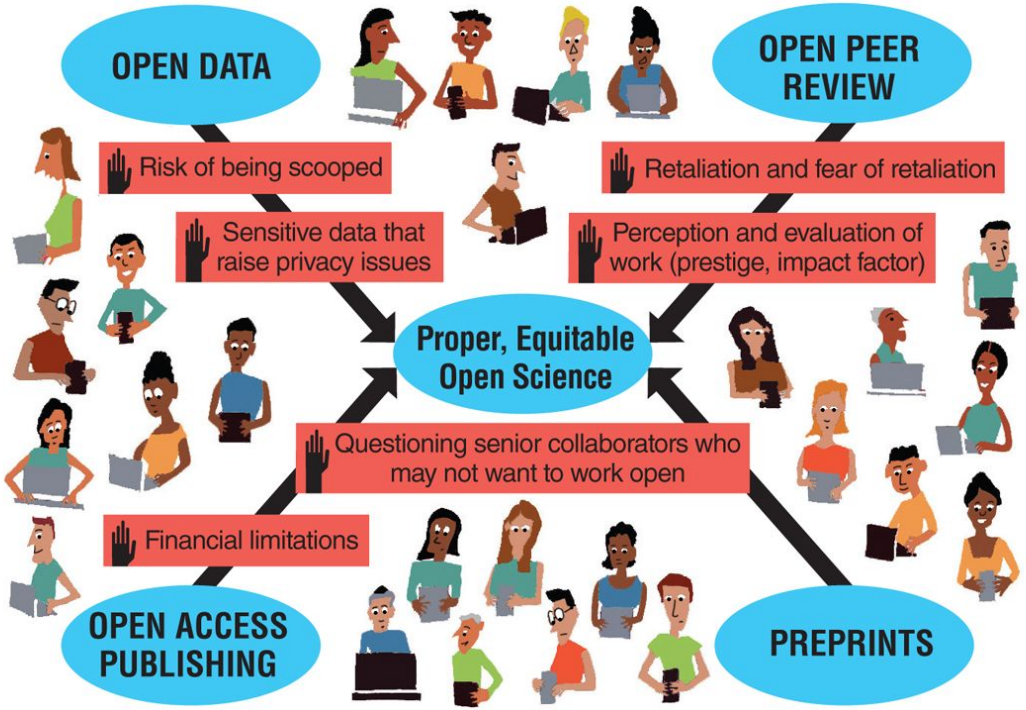
Redhead, C. (2012, October 23). Why CC-BY? Blog of the Open Access Scholarly Publishing Association. https://oaspa.org/why-cc-by/

Envisioned risks of open access

1) “Fees to be paid out of a scientist’s personal funds [...] is not accessible to everyone”

2) “Preprints [...] achieve the same goals as gold-open-access publishing [...] [but] do not meet most funding bodies’ open-access requirements [...] [and] are not available or widely used in all scientific fields”

3) “Making data openly available is often seen as high risk because of the possibility of someone publishing analyses with your data before you can”



Bahlai, C., Bartlett, L., Burgio, K., Fournier, A., Keiser, C., Poisot, T., & Whitney, K. (2019). Open Science Isn’t Always Open to All Scientists. American Scientist, 107(2), 78. https://doi.org/10.1511/2019.107.2.78

Levels of open access

Libre: extends user's rights to read and also to reuse literature for purposes like automated crawling, archiving, or other purposes (similar to BOAI)

Gratis: Gratis extends only rights to read articles

Gold: all articles are open directly on the OA journal website in exchange for an an article processing charge (APC) paid by authors

Diamond: like Gold, but with no APC

Green: articles published in a toll-access journal, but self-archived in an OA archive

Hybrid: articles published in a subscription journal that are immediately free to read under an open license in exchange for an article processing charge (APC) paid by authors

Delayed: articles published in a subscription journal, but are made free to read after an embargo period

Black: articles shared on illegal pirate sites, primarily Sci-Hub and LibGen

Piwowar, H., Priem, J., Larivière, V., Alperin, J. P., Matthias, L., Norlander, B., Farley, A., West, J., & Haustein, S. (2018). The state of OA: A large-scale analysis of the prevalence and impact of Open Access articles. PeerJ, 6, e4375. https://doi.org/10.7717/peerj.4375

Article Processing Charges

Article-processing charge (APC) is a business model in which authors are charged to publish rather than to read, and it is used in Gold OA and Hybrid OA

Too often, OA gets conflated with just one route to achieving it: Gold OA

However, there are a number of routes to OA, e.g. identified by Green OA, or Diamond OA, that do not charge APCs

Sherpa/Romeo allows one to check if a journal enable Green OA

The Directory of Open Access Journal (DOAJ) lists all the OA journal available and allows one to filter the Diamond OA journals (as of 20 March 2021, there are 11,524 Diamond journals)

Tennant, J. P., Crane, H., Crick, T., Davila, J., Enkhbayar, A., Havemann, J., Kramer, B., Martin, R., Masuzzo, P., Nobes, A., Rice, C., Rivera-López, B., Ross-Hellauer, T., Sattler, S., Thacker, P. D., & Vanholsbeeck, M. (2019). Ten Hot Topics around Scholarly Publishing. Publications, 7(2), 34. https://doi.org/10.3390/publications7020034

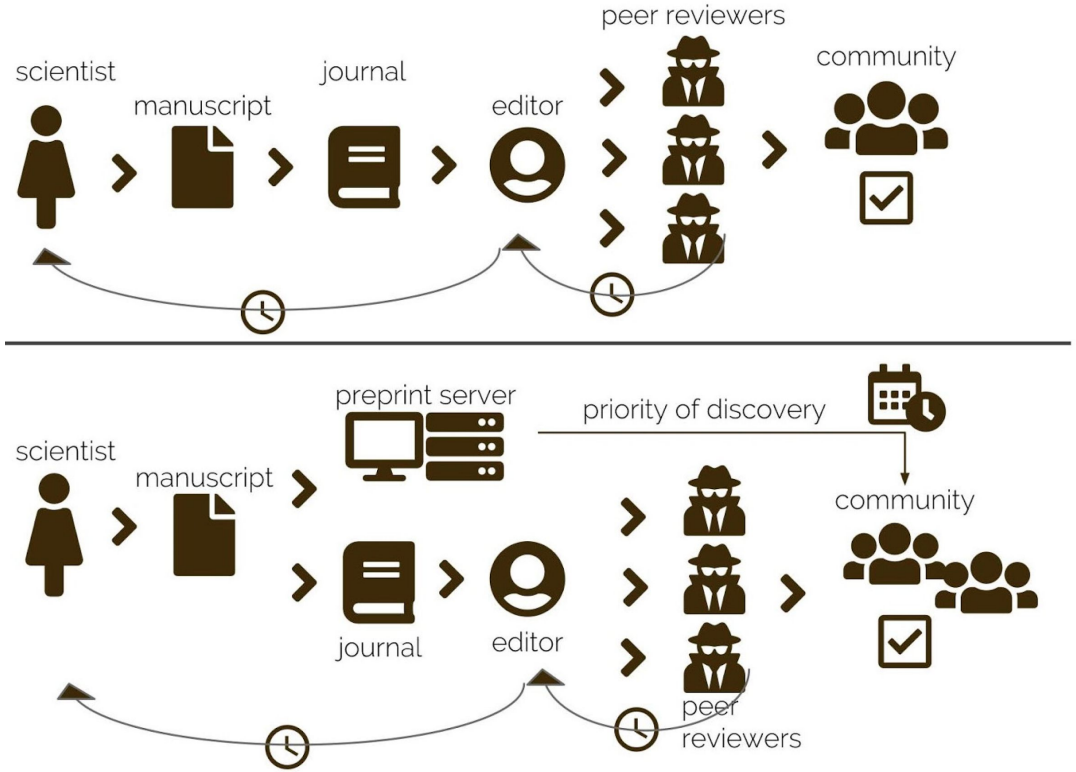
Preprints and Green OA

Traditional editorial process

Pros: copy-editing, fonts and layout, interlinking with data collections related to the study, formal peer review process
Cons: slow discovery

Traditional editorial process accompanied with preprint deposit

Pros: all those above + involving the community in peer review (open peer review), fast and efficient sharing of the outcomes of the study fostering discovery
Cons: learning new tools (e.g. preprint servers)



Tennant, J. P., Crane, H., Crick, T., Davila, J., Enkhbayar, A., Havemann, J., Kramer, B., Martin, R., Masuzzo, P., Nobes, A., Rice, C., Rivera-López, B., Ross-Hellauer, T., Sattler, S., Thacker, P. D., & Vanholsbeeck, M. (2019). Ten Hot Topics around Scholarly Publishing. Publications, 7(2), 34. https://doi.org/10.3390/publications7020034

When we started with preprints

Since 1991, physicists and mathematicians have been using the arXiv preprint repository to circulate articles and ideas

However, the first (before the Internet!) adopted large-scale circulation of preprints happened from 1961 to 1967 when the National Institutes of Health (NIH) in the United States pioneered a system known as the Information Exchange Groups (IEGs)

Idea: enable researchers working on a research area to send documents to the NIH, where the memo would be physically reproduced and then circulated by the postal service to a group of subscribers (NIH covering all the costs), with the goal of increasing informal communication between scientists and avoid the delays imposed by traditional publishing

By the end of 1965, 3,663 researchers, from 46 different countries, were involved, and 2,561 different memos (about 80% of them were articles) had been physically mailed out, involving millions of pages of paper

Publishers struck back: no article that had been circulated as an IEG memo would be accepted for publication, resulting in the IEGs eventually fell victim to a campaign by journals and learned societies, who considered the organized circulation of preprints to be a threat to their financial interests and to their perceived status as guardians of scientific integrity

Cobb, M. (2017). The prehistory of biology preprints: A forgotten experiment from the 1960s. PLOS Biology, 15(11), e2003995. https://doi.org/10.1371/journal.pbio.2003995

Plan S and Gold OA

In 2018, an influential group of research funders (the cOAlition S) announced a bold pledge, named Plan S: from the 1st of January 2021 (but each funder differs on how it will apply its policy), the scientists with grants from these funders must make resulting papers immediately free to read and publish them under a liberal licence so that anyone can download, reuse or republish the paper

The scientists' final paper must be published (a) in OA in a journal or (b) they must make the accepted, peer-reviewed version of their manuscript available online in an approved repository (a.k.a. Rights Retention Strategy)

Publishers reacted by announcing new OA-publishing options, and some have increased per-paper fees considerably (Nature € 9,500, Cell € 8,500, etc.)

After July 2022, cOAlition S says that only publishers who provide data to explain their OA fees under price and service transparency frameworks will be eligible for their support, and that cOAlition S will support only OA publication fees that are fair and reasonable

Else, H. (2021). A guide to Plan S: The open-access initiative shaking up science publishing. Nature, d41586-021-00883–00886. https://doi.org/10.1038/d41586-021-00883-6

Perceived risks of Gold OA

Typically, the median APC is about $ 2,600 per article for publishing in Gold OA; a complete shift to open access could lead publishers to boost publishing fees even further, to try to make up for lost subscription revenues – in 2019, subscriptions accounted for > 90% of publishers' revenues

In multiple surveys, authors have ranked open access publishing below their need to publish in prestigious, high-impact journals to gain tenure and promotion

Making most articles gold open access could strike the library budgets of research-intensive universities whose scientists publish the most papers – in these cases, redirecting funds from journal subscriptions does not cover the open access fees of all the published articles

If paying for open-access publication becomes the default route for scientists, and publishers increase prices, publishing will become a luxury that only better funded researchers can afford – creating a self-reinforcing cycle in which well-funded researchers publish more, potentially attracting more attention and more funding

Brainard, J. (2021). Open access takes flight. Science, 371(6524), 16–20. https://doi.org/10.1126/science.371.6524.16

Current availability of Diamond OA

Landscape: a wide archipelago (29,000) of relatively small journals (25 articles a year each) serving diverse multilingual and usually national communities (in all disciplines), but disseminating their output to a largely international audience

Compliance with Plan S: OA diamond journals are on the road to full compliance with Plan S – 37% use a CC-BY license, 49% embed machine-readable licenses in their metadata, 55% use DOIs for their articles, 68% have no preservation policies, 75% provide only PDF

Dynamics: a mix of scientific strengths and operational challenges, e.g. half of the journals have no legal document to establish the ownership to research institutions and societies, 46% do not provide download statistics and 54% provide no statistics related to production management, 67% use double-blind peer review but half of them manage the process through e-mail and struggle with finding reviewers, 55% use an anti-plagiarism software, 60% use Open Journal System (OJS)

Sustainability: an economy that largely depends on volunteers, universities and government – 65% reported either a breaking even or a loss, 60% depend on volunteers to carry out their work, 70% declared less than € 10,000 annual costs (around the same amount Nature asks for publishing one article in Gold OA…)

Bosman, J., Frantsvåg, J. E., Kramer, B., Langlais, P.-C., & Proudman, V. (2021). OA Diamond Journals Study. Part 1: Findings. Zenodo. https://doi.org/10.5281/ZENODO.4558704

End

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