

open access journals: a sustainable and scalable solution in social and political sciences?

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Abstract

Openness is central to scientific enquiry and can enable faster and more effective return on investment in research. Open access is linked to innovation in research communication and can help increase the reliability and reproducibility of published research. Growth of open access journal publishing in the social sciences and humanities is second only to life sciences. Surveys show researchers are interested in open access publishing, but some researchers perceive that there is a lack of quality journals offering open access. However, a number of established publishers have recently launched fully open access journals for political and social scientists, such as *Palgrave Communications* and *Research & Politics*. Open access journals often operate an article processing charge (APC) or 'author pays' business model, to support making articles freely available without charging readers. The APC model could provide financial benefits to society in the long term, but can present challenges for researchers without access to grant funding in the short term.

Keywords open access; publishing; reproducibility; political science

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THE RESEARCH PROCESS AND OPEN ACCESS

Openness in research and scholarship is not a transient or new concept. Indeed, '[m]uch of the remarkable growth of scientific understanding in recent centuries is due to open

practices; open communication and deliberation sit at the heart of scientific practice' (Royal Society, 2012). The emergence of academic journals in the seventeenth century was in part driven by a need to disseminate research to a wider audience than was possible before the existence of printing presses.

The emergence of – and transition to – increased accessibility of research online is merely an evolution of this fundamental role of journals, facilitated by twentieth- and twenty-first-century technology. Moreover, the mission statements of most learned societies include words to the effect of making high-quality research available to a wide audience. But openness itself is not the goal of open access publishing. Rather, openness is a means to conduct and publish more reliable and reusable research, and to do so more efficiently.

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One cannot ignore the details – in particular, financial – of the challenges presented by implementing open access in the political and social sciences, but equally one should keep in mind the panoply of benefits unfettered access to peer-reviewed research can bring to research, and society (see Table 1).

Table 1: The benefits of open access

Benefit	Example/context
Faster, more efficient progress in research	Researchers can focus on research rather than obtaining access to knowledge, such as requesting inter-library loans. Online, open access platforms can generally coordinate the peer review and publication process more rapidly, without print restrictions.
Increased visibility and understanding of research outside the research community	There is a strong incentive for political and social sciences research – research that should affect evidence-based government policy – to be accessible outside academia.
Better return on investment (ROI) in research	Enabling maximum visibility and reuse in perpetuity through open access provides better ROI. For every \$1 invested in the Human Genome Project – an exemplar of open access to research information – \$16 is reported to have been returned (Grueber and Tripp, 2011).
Increased impact of research, as measured through bibliometrics	Numerous studies (see below) have shown increased readership of and citations to open access articles compared with similar articles behind subscription barriers.
Facilitation of interdisciplinary research and collaboration	Research questions across disciplines, for example including elements of economics, sociology and public health, are increasingly needed. Research information can be accessed regardless of a researcher's usual field of inquiry stimulating new, interdisciplinary, hypotheses.
The research literature becomes a resource for future research	Text and data mining research is enabled when open access to journal articles allows for unrestricted reuse of literature, by humans and machines (Roberts, 2001).
Driving innovation in scholarly communication	Open access publishing was born out of the web and is closely linked to innovation in, for example, bibliometrics, data publication and integration, and efforts to improve scientific reproducibility.

OPEN ACCESS TO JOURNAL ARTICLES AND ITS GROWTH

Open access enables journal articles to be read online without a subscription, although 'open access' has numerous meanings and definitions (see Suber (2012) for a comprehensive set of definitions). In this article 'Green' open access is considered to mean self-archiving by authors on institutional or personal websites or repositories, occurring pre- or post-publication – although the latter is more common and usually involves lengthy embargo periods. Green open access provides free access to the authors' own unedited, unformatted version of an article. 'Gold' open access is immediate open access to journal articles – the publisher's version of record – and is usually accompanied by liberal reuse rights in the content. This typically means the authors applying a license such as the Creative Commons attribution licence (CC BY, <http://creativecommons.org/licenses/by/4.0/>) to their work, which is now required by a number of research funding bodies' open access policies, including the Research Councils UK ('Open access funding', ND). Gold open access publishing in journals is often associated with a fee for publication – an article processing charge (APC) – as the publisher does not charge subscriptions to cover their costs. Gold open access, from a publisher's perspective, provides additional benefits over Green open access:

- It avoids multiple, citable, versions of record of one paper existing in the literature.
- The article is open access immediately without embargo (when it should be of most interest to its audience).
- With a CC BY licence, the final publisher version can be shared and built upon, in future research, as widely as possible.
- It is easier for authors to comply with open access policies and mandates of their institutions or funding bodies

'While biomedicine has produced the most open access articles of all disciplines by some margin, social sciences, arts and humanities follow'.

(the publisher often deposits work in a required open access repository on the authors' behalf).

- Typically, there are no strict length restrictions on words, tables, figures, references (space is virtually unlimited online – allowing research to be communicated at its more natural length).
- The publisher's version of record, with its standardised metadata and persistent identification, makes it more discoverable by search engines – particularly when the full text of an article is freely available.

The first commercial open access publisher – BioMed Central, a publisher of peer-reviewed biomedical journals – was launched in 2000. Commercial (and sustainable) open access publishing was initially driven by the life and medical sciences but is becoming more established in other areas of research (Figure 1). While biomedicine has produced the most open access articles of all disciplines by some margin, social sciences, arts and humanities follow. All major scholarly publishers now provide some form of open access publishing option. A 2013 Outsell report found publishers' open access revenues grew 34 per cent in 2012 compared with 2011 (Ricci and Kreisman, 2013).

OPEN ACCESS AND QUALITY

In December 2011, Palgrave Macmillan surveyed 1,259 researchers about their attitudes and behaviour towards open

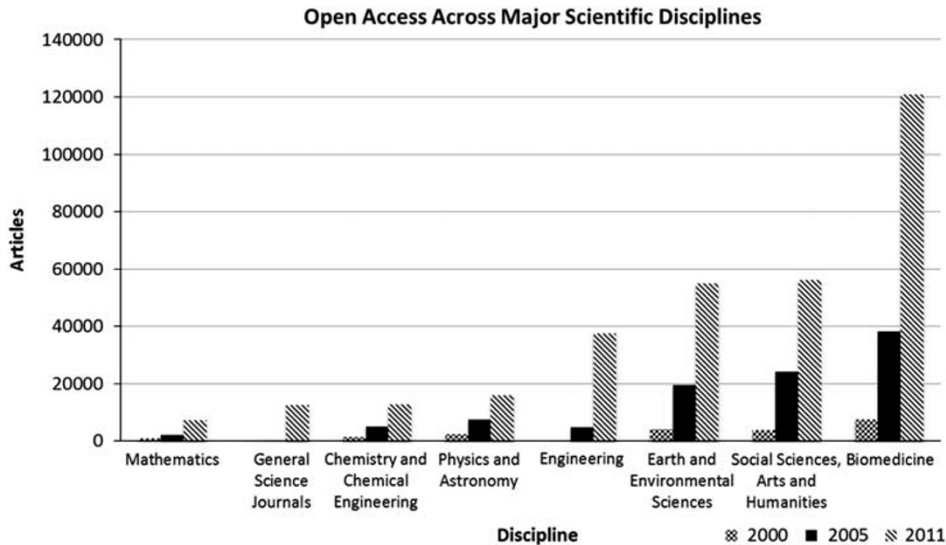


Figure 1 Growth of open access (green and gold) by discipline.

Source: Adapted from Figure 5 of Laakso and Björk (2012), under CC BY <http://creativecommons.org/licenses/by/2.0>.

access publication within the research fields of social sciences and the humanities. The survey also gathered data on sources of funding for APCs and the use of article repositories, and sought feedback on a proposed purely open access journal to be published by Palgrave Macmillan. A total of 649 responses (response rate 52 per cent) were received. Among the key findings were: that the majority (82 per cent) of respondents would publish open access if it was offered by the best or most appropriate journal; and a consensus (68 per cent of respondents) that their research area would benefit from open access journals – although only 26 per cent of respondents had so far published in an open access journal (NPG, 2014a).

These figures suggest that the problem is more to do with supply (of the ‘right’ journals in open access form) than demand, something that is echoed in the large (53, 890 responses including 38,358 published researchers, around 20 per cent of which in humanities, social science and business disciplines) 2011

European Commission Study of Open Access Publishing (SOAP) (Dallmeier-Tiessen *et al*, 2011). A scarcity of quality open access journals was the second most frequent reason given for not having published open access (stated by 30 per cent of the 4,976 respondents who had not published open access).

A so-called ‘sting’ on open access journals’ peer-review standards was reported in *Science* in 2013 (Bohannon, 2013), although its methodology has been discredited (Eisen, 2013) for lacking controls and objectivity. The Bohannon article did highlight, however, that issues with editorial standards and the quality of peer review exist, as do ‘predatory publishers’. However, inadequacies in the effectiveness of peer review in filtering out poor research (Smith, 2010) exist irrespective of whether a journal is open access or subscription-based. It is the rapid growth in the number of new journals since 2000 that has put the spotlight on open access journals since most new journals are now launched under the open access model. More efficient and scalable web-based

publishing technology and lower costs – and the removal of the need to sell subscriptions in advance of launch to become sustainable – makes launching a new journal under an open access model a more logical option for many publishers and scholarly societies. Established journal, publisher and society brands will likely continue to provide proxies for reliability or quality of information for readers when they discover new open access journal articles. However, there is growing recognition of the need to assess the quality of research at the level of the article rather than the journal – and its Impact Factor (Bladek, 2014). For open access journals, other measures of quality include: whether the journal is included in the Directory of Open Access Journals (DOAJ); whether the journal's publisher is a member of the Open Access Scholarly Publisher's Association (OASPA); and, for all journals (subscription and open access), whether the journal or publisher is a member of the Committee on Publication Ethics (COPE). The ability to assess individual article quality – via citations, downloads and social media mentions – is also increasing with freely available tools such as Google Scholar and article-level metrics or Altmetrics data (<https://www.altmetric.com/article-level-metrics.php>).

In addition, more journals, of all access models, are now utilising email marketing to invite submission of papers. Common to both many open access and subscription journals are rigorous standards of peer review, high editorial and ethical standards, indexing in major databases (such as the Web of Knowledge and Scopus), and the involvement of professional editors and prestigious Editorial Boards. As far back as 2004, Thomson Reuters, who produce the Journal Impact Factor, found that in every field of science there was at least one open access title ranked at or near the top of its field in terms of citation impact (Suber, 2013).

'... most new journals are now launched under the open access model'.

NEW OPEN ACCESS JOURNALS IN THE POLITICAL AND SOCIAL SCIENCES

New open access journals serving the political and social sciences in 2014 include *Research & Politics*, with financial backing from SAGE. Also in 2014, the Institute of Development Studies' journal *IDS Bulletin* announced (Georgalakis, 2014) it was not renewing its contract with Wiley-Blackwell and will pursue an open access model. And Brill publishers have launched a collection of four broad scope open access journals covering Humanities, Social Sciences, Law and Biology. *SAGE Open* was probably the first open access 'megajournal' established for social sciences. Megajournal is a term established since the rise in 2007 of *PLoS ONE*, the world's largest journal in life sciences. Megajournals, of which there are now more than 20 (Solomon, 2014), tend to be very broad in scope and to have an inclusive publication policy and low rejection rates, as peer review focuses on the methodological rigour – scientific soundness – rather than assessments of interest, impact or importance. Selective, broad scope open access journals with higher rejection rates do exist, however. *Nature Communications*, from Palgrave's sister publisher Nature Publishing Group, is ranked third of multidisciplinary science journals in the 2013 Journal Citation Reports (JCR) and rejects more than 80 per cent of submissions. The lack of high-quality fully open access journals in the humanities and social sciences, as identified by the Palgrave Macmillan researcher survey ((NPG), 2014a), was one of the drivers for the launch in 2014 of *Palgrave*

Communications (<http://www.palgrave-journals.com/palcomms/>). *Palgrave Communications* was established as the first selective open access journal for original peer-reviewed research across all areas of the humanities, the social sciences and business (HSS). The journal published its first edition in January 2015 (Hrynaszkiewicz and Acuto, 2015), including a contribution from the political sciences (Shaw, 2015).

In the journal, peer reviewers are asked to consider not just whether methods used were sound but also that strong evidence is provided for the conclusions, whether the results are novel, and whether the manuscript is important to specific fields and/or is important in interdisciplinary terms (<http://www.palgrave-journals.com/palcomms/referees>). Providing a venue for, and promoting and enabling, interdisciplinary research is another goal of *Palgrave Communications*. Interdisciplinary research is crucial in helping to solve – inherently multidisciplinary – global social, environmental and economic problems and can potentially enable a higher order of research (van Eeden, 2011). Traditional research assessment – for promotion and tenure – criteria for academics can also perpetuate traditional disciplinary approaches by, for example, valuing more highly particular discipline-specific journals or particular orders of authorship on a paper.

The 2014 Nature Publishing Group author insights survey (NPG, 2014b) found that reputation and relevance continue to be the most important factors for authors when choosing a target journal. Journals are also judged on the service they provide to authors, particularly under an open access model where authors and their funding agencies are arguably a journal's customers more directly than with subscription journals' publishers, who deal more with librarians. The quality and speed of the peer review and publishing service a journal provides to its authors and readers,

as well as the quality of the publisher, are important reasons for journal choice (Solomon, 2014). The potential for increased citations was another area quoted by respondents to the 2011 Palgrave Macmillan survey (NPG, 2014a) as a reason for choosing open access. By publishing on online-only, open access platforms, born digital publications should be well placed to deliver a good service to authors on speed, presentation/format of content, quality and visibility of work. Publication times tend to be reduced as articles are not subject to print or page budgets or constraints. Articles that have been accepted and edited can be published as soon as they are ready, making submission to publication, including peer review, possible in an open access journal typically within 3–4 months. Given there are often several journals, including open access journals, for an author to choose from when selecting a target journal in terms of scope, author service becomes a differentiator for journals – along with the cost of the APC for the service provided.

THE APC MODEL AND PAYMENT

Several analyses – conducted in several different years – have come to a similar conclusion with regard to the typical revenue that publishers gain from an article published under a subscription model: US \$5,000 (Van Noorden, 2013). This figure has been calculated from the consulting firm Outsell in Burlingame, California, based on the revenue generated by the science-publishing industry – of \$9.4 billion in revenue in 2011 – based on 1.8 million English-language articles being published. This equates to roughly \$5,000 per article (Van Noorden, 2013). The average APC charged for publishing an article under an open access model has been reported to be notably lower, at £1,500 (\$2,300 approximately) (Houghton *et al*,

2009). Although the per-article revenues in each model are not supporting the same activities or profit margins, and thus may not be directly comparable, a UK economic analysis has found that a wholesale shift to open access publishing under an APC model would result in substantial savings to academia (Houghton and Swan, 2013), potentially by more than £800 (\$1,230 approximately) per article (Houghton *et al*, 2009). For the publication of primary, grant-funded research, the APC model offers several advantages over subscriptions in addition to the high visibility of the published article. Under the APC model costs are more transparent and represent the costs associated with providing publishing services, such as organizing peer review, copy editing, typesetting, archiving and indexing, promotion of content, and website maintenance and development. As the costs and charges are largely based on individual articles, they provide economies of scale with increasing numbers of articles published. While overheads of different publishers vary widely, another economic analysis, the Publishing and the Ecology of European Research (PEER) study (*PEER Economics Report*, 2011), provides a cross-publisher analysis of the costs associated with each article submitted to a peer-reviewed journal. The costs associated with administration of peer review, in the PEER study, were \$250 per submitted article. Formatting, editing and typesetting (publication costs) were \$170–\$400. Note that peer review administration costs are per submitted rather than published article, meaning higher rejection rates increased the cost per published article. A journal rejecting 50 per cent of its submissions would equate to \$500 per published article for administration of peer review, according to these data.

While there are potential savings and other benefits with the APC model, there are, recognisably, also challenges. The availability of grant funding in political

and social sciences for research and for the funding of APCs is highly variable. Less social science research receives grant funding than life sciences research, but an increasing number of institutions have open access policies and some of these provide central funds for the payment of APCs ('Open access funding', nd). Some publishers waive or discount APCs for authors - including those in HSS disciplines - who lack access to funding to pay APCs (<http://www.nature.com/open-research/about-open-access/policies-journals/>). Solomon's analysis found that social scientists were more likely to pay APCs out of their own funds (Solomon, 2014). However, interdisciplinary funders are among those introducing open access mandates, including RCUK and the European Commission's Horizon 2020 fund. While open access is growing rapidly, a mixed marketplace of closed access and open access research publishing (which is inevitable for the foreseeable future and is, in fact, already in place) will involve transitional costs - as library and research budgets have to support both models. In an age of diminishing library budgets and print circulations we are already, however, seeing examples of society-owned journals flipping to open access, including the introduction of APCs. Some society journals in biomedical research that have made the switch to open access have reported year-on-year increases in their citation share and Impact Factors (Busch and Langhanke, 2014).

Numerous studies, with different methodologies, have reported a citation advantage for open access articles, including studies of papers in economics (Wohlrabe and Birkmeier, 2014) and in political science (Atchison and Bull, 2015) (http://sparceurope.org/oaca_table/). A study of *Nature Communications'* articles (the journal operated a hybrid open access model until October 2014 before moving to open access only) (*Nature Communications: Citation Analysis*, 2014). The citation

advantage of open access, in some research fields, has been debated (for a bibliography of studies, see <http://sparceurope.org/oaca/>), but the increase in readership of open access articles demonstrated is undisputed – and largely self-evident.

BEYOND OPEN ACCESS

The next decade will present numerous opportunities for political and social science researchers and their learned societies as open access publishing and the APC model becomes more common. There are also challenges, for publishers, who may operate legacy systems designed and built to deliver subscription content. Author education is also important, in relation to matters such as the availability of funding for APCs from institutions and the implications of Creative Commons licences, as well as what this means for reuse of third-party material.

Beyond the many benefits of open access described earlier, online – predominantly open access – publishing is a driver for innovation in tackling even more fundamental issues in science and science communication. Journals such as *Palgrave Communications* (<http://www.palgrave-journals.com/palcomms/about/editorial-policies#Availability>), *Research & Politics* (<http://www.uk.sagepub.com/researchandpolitics/default.htm#replica>

'Numerous studies, with different methodologies, have reported a citation advantage for open access articles ...'

tion) and *Nature* and *Scientific Data* are also innovating in accessibility and reproducibility of research data. Journal collaborations with online tools for researchers such as the data repositories figshare and Dataverse may also enable more reproducible and transparent research. Reproducibility and bias are issues affecting all fields of science, and in the political and social sciences are being prominently debated (Pepinsky *et al*, 2014). While problems of reproducibility begin in the field, lab or clinic, publishers should help the research community derive the most benefit from their research, which means enabling reproducibility in a variety of ways (Hrynaszkiewicz *et al*, 2014). Content licensing (to enable efficient sharing and reuse), content format (to present methodology in sufficient detail to be reproduced) and incentives (through editorial policy, publication types and citations to and integration of underlying research data) are all enablers of reproducibility that publishers can influence – and are all better enabled by publishers able to embrace, fully, open access.

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