



BIG PUBLISHERS, BIGGER PROFITS: HOW THE SCHOLARLY COMMUNITY LOST THE CONTROL OF ITS JOURNALS

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How should research be disseminated? This question is central to the research community. Before the creation of the scientific journal 350 years ago, knowledge was usually shared directly with those who could experience it firsthand. For example, The Royal Society of London, founded in 1660, held public demonstrations of experiments in which Robert Hooke and other *curators of experiments* would provide visual evidence of a new phenomenon or offer a new description of reality. Written accounts of new knowledge were also transmitted, in the Republic of Letters, through the important correspondence exchanged amongst scientists, as well as through the pre-journal “editorial” role that was played by *passseurs* of letters, such as Father Marin Mersenne and Henry Oldenburg (Gingras 2010). With the rise of the printing press, the production and dissemination of scientific knowledge became faster, and journals, with their exponential increase (de Solla Price 1963), gradually replaced letters and monographs as the primary means for transmitting research results (Harmon and Gross 2007), especially in the natural and medical sciences (Larivière et al. 2006).

While the *Philosophical Transactions* and many of The Royal Society’s other journals have been a financial burden for most of their existence (Garner 2015), today a large and profitable market exists around scientific journals. Commercial academic publishers are not a new phenomenon, however. By the Victorian era, a large number of journals were being published by commercial companies, whose distribution channels were considered to be more efficient than those of scientific societies (Brock 1980). While scientific societies and commercial publishers have co-existed for a long time, few studies have looked at their relative importance in scholarly publishing as a whole and, particularly, at the impact of the digital era on the scholarly publishing landscape. The

digital age may have further democratized the dissemination of scholarly work by making open access possible, but also provides profitable opportunities for powerful corporations.

At the end of the 1990s, some authors were of the optimistic (and perhaps slightly naïve) opinion that the digitalization of academic publishing would provide a solution to the ongoing budgetary problems faced by libraries (Abramson 2008; McGuigan and Russell 2008). Indeed, as digital technologies make it easier to update, reuse, access, and transmit scientific documents, researchers would no longer need publishers and journals to disseminate knowledge. *The Financial Times* even predicted in 1995 that the publisher Elsevier would be “the internet’s first victim” (Cookson 2015). Created by a group of researchers at CERN in Switzerland, the Web was now offering them “a way of sharing their research online for free. What need would anyone have for fusty, expensive journals?” (Cookson 2015). Indeed, many people saw digital publishing as a way of disseminating knowledge at a much lower cost, an exciting prospect for institutions facing cyclical budget cuts, many of which continue today.¹ Other authors more pessimistically speculated that digital distribution would in fact only exacerbate the problem, or at the very least, provide no solutions (Solomon 2002; Halliday and Oppenheim 2001). Based on a paper recently published in *PLOS ONE* (Larivière, Haustein, and Mongeon 2015), this short paper describes the growth and importance of major academic publishers by looking at nearly 45 million articles indexed in the *Web of Science* from 1973–2013.

Figure 1 presents the extent of the consolidation of the publishing industry. More specifically, it shows the proportion of papers published by the top five publishers that account for the largest number of papers published in 2013 in the natural and medical sciences (NMS) and social sciences and humanities (SSH), along with the proportion of papers published by other publishers. In both NMS and SSH, Reed Elsevier, Wiley-Blackwell, Springer, and Taylor & Francis are included in the top five publishers list. For NMS, the fifth publisher in the top five is the American Chemical Society, a scientific society, and in SSH the top five includes Sage Publications.

For both NMS and SSH there is a significant decrease in the percentage of articles published by other smaller publishers, especially since the advent of

¹ For example, because of such budget cuts and above-inflation increases in subscription prices, the Université de Montréal has recently stopped subscribing to the Wiley *big deal*, only keeping the subset of journals from publishers that were accessed above a certain threshold. More details can be found at <http://www.bib.umontreal.ca/communiqués/20131104-DB-nouvelle-ere-collections.htm>.

the digital era in the mid-1990s. In NMS the top five publishers were responsible for 20% of articles in 1973; that percentage grew to 30% in 1996, 50% in 2006, and then 53% by 2013. Three of the five publishers alone accounted for over 47% of all publications in 2013: Reed Elsevier (24.0%), Springer (11.9%), and Wiley-Blackwell (11.3%). A similar pattern can be observed in SSH. During the period from 1973 to 1990, the five major publishers represented less than 10% of publications. This percentage began to increase in the mid-1990s and has continued to do so since, reaching more than 51% of all publications in 2013. Thus, in both major scientific domains, five publishers control more than half of all scholarly articles.

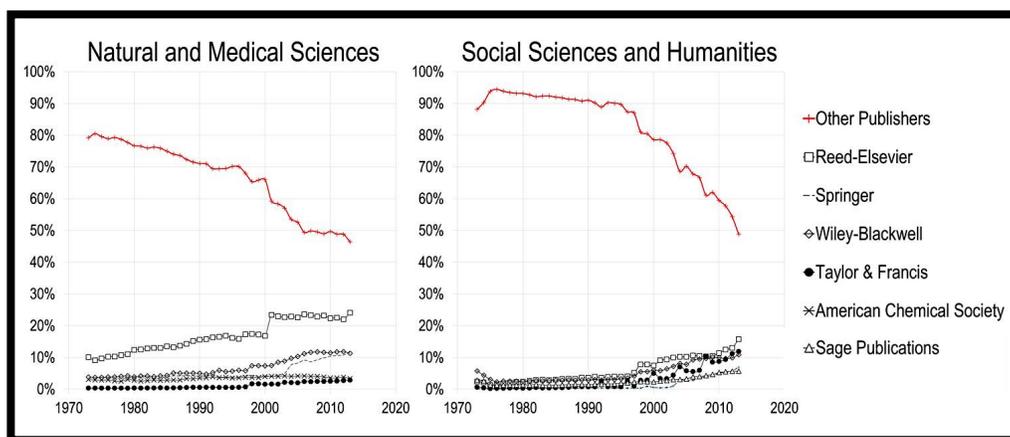


Figure 1. Percentage of natural and medical sciences (left panel) and social sciences and humanities (right panel) papers published by the top 5 publishers, 1973–2013.

The proportion of articles controlled by five major publishing houses varies among fields (see *Figure 2*). For example, the vast majority of articles in the arts and humanities are published in journals not belonging to the five major publishers. The relatively low subscription prices, the low number of journal articles published, and the continued importance of monographs have all factored in to make the arts and humanities a much less appealing domain for large publishers to invest in.² On the other side of the spectrum, in recent years the major publishers have heavily invested in the social sciences, which include disciplines such as sociology, economics, anthropology, political science, and urban studies. While the top five publishers accounted for 15% of social

² Big publishers have, however, been traditionally been quite active in publishing monographs, which can also be quite lucrative. See: <http://www.theguardian.com/higher-education-network/2015/sep/04/academics-are-being-hoodwinked-into-writing-books-nobody-can-buy>.

sciences articles published in 1995, this percentage leapt to 66% in 2013. Worse still, the three largest publishers—Reed-Elsevier, Taylor & Francis, and Wiley-Blackwell—account for nearly 50% of all published documents in 2013. Psychology follows a similar trend, with the top five publishers responsible for 71% of publications in 2013, while this percentage was only 17% in 1995.

In NMS, chemistry is the most concentrated field (71%), which is not surprising given the presence of the American Chemical Society (ACS)³ among the top five publishers. Physics, on the other hand, follows a different model: after increasing from 20% in 1973 to 35% in 2000, the trend has stabilized. Today, physics is the field where the top five publishers account for the lowest proportion of articles published. The importance of scientific societies in physics, such as the American Physical Society (APS), the American Institute of Physics (AIP), and the Institute of Physics (IOP), the arXiv preprint server, and free-access agreements like SCOAP3⁴ have made this field less profitable and therefore less attractive to commercial publishers.

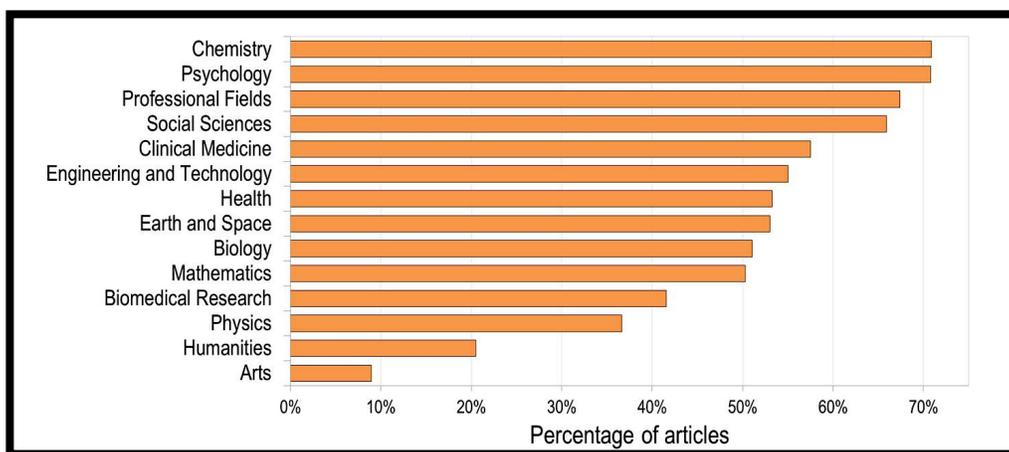


Figure 2. Percentage of papers published by the five major publishers, by discipline, 2013.

While scholarly literature in both SSH and NMS has undergone a clear increase in the concentration of papers in the hands of a few publishers

³ With a 158,000 members and assets of about \$1.3 billion, the American Chemical Society (ACS) is considered as the world's largest and richest scientific society (<http://www.acs.org/content/acs/en/about.html> and <http://www.acs.org/content/acs/en/about/aboutacs/financial/overview.html>). Despite being a scientific society, the ACS is known to have a strong stance against open access (Giles 2007).
⁴ SCOAP3 is an agreement between libraries, journals, and research funders to convert journals into full open access, at no charge for authors. More details can be found at <http://scoap3.org/>.

(reaching 50% in recent years), a clear distinction was observed between NMS and SSH. In the former group of disciplines, the size of scientific societies—which is a consequence of the size of disciplines in general—managed to keep the literature less dependant on commercial publishers. For example, scientific societies such as the ACS or the APS publish many journals in the specialties of chemistry and physics, respectively, and they have successfully managed the shift from print to electronic dissemination. On the other hand, the social sciences are much more fragmented: anthropology, communication, criminology, demography, economics, and sociology can all be considered social sciences. Yet, there is no large scientific society that regroups researchers from these disciplines and that also publishes the various journals covering these different disciplines. There are, rather, many different associations for each discipline, which are often divided into specialities. Therefore, topics in SSH are more often local in scope, and thus less international, leading to decentralized (and smaller) scientific societies. As a consequence, these scientific societies did not have the means to adapt to the digital era and therefore were more likely to be acquired or have agreements with big commercial publishers for the publication of their journals.

Hence, since the arrival of the digital era, large commercial publishers have increased their control over scholarly communication, which increased their sales volume and, consequently, their profits. For example, Reed-Elsevier's profit reached more than US \$2 billion in 2012 and 2013, thanks to a profit margin of nearly 40% for its Scientific, Technical & Medical Division.⁵ Similar profit margins were obtained by Springer Science+Business Media⁶ in 2012 (35.0%), in 2013 by the Scientific, Technical, Medical and Scholarly of John Wiley & Sons⁷ (28.3%), and Taylor & Francis (35.7%). These very high profit margins are due to the peculiar economics of scholarly publishing, in which authors provide their goods without financial compensation, while consumers (readers) are isolated from the purchase. Along these lines, there is no substitution of goods for the knowledge contained in a given paper, as each journal has control over the papers it publishes. In other words, a paper published in the journal *Science* cannot be considered an alternative to a paper published in *Nature*; the papers, rather, complement each other, which obliges libraries to subscribe to a larger number of journal titles.

⁵ Compiled by the authors from annual reports:

<http://www.reedelsevier.com/investorcentre/pages/home.aspx>.

⁶ http://static.springer.com/sgw/documents/1412702/application/pdf/Annual_Report_2012_01.pdf.

⁷ http://www.wiley.com/legacy/about/corpnews/fy13_10kFINAL.pdf.

One might argue as well that, despite their profits, the value added by publishers has decreased in the digital era. In the print world, the publisher's role of formatting, printing, and distribution was essential, but in the digital world, the ease with which these functions can be performed—even rendered obsolete—begs the questions: What services do the big publishers provide? What role do the big publishers play in the scientific community? And what justifies their ever-increasing share of university budgets? Although it could be argued that publishers coordinate the evaluation of manuscripts, we must not forget that it is the researchers themselves who perform the evaluation, and that they do so for free as a service to the scholarly community. Therefore, the essential quality control of published work is not value added by publishers but by the scientific community itself.

The scientific community is becoming more sensitive to the abusive behaviour of some for-profit publishers. In 2012, The Cost of Knowledge⁸ campaign, initiated by the mathematician Timothy Gowers, protested against the business model of Elsevier and asked researchers to boycott its journals by ceasing to submit to and evaluate for them. Analogously, several university libraries, including the University of California (Howard 2010) and Harvard University (Sample 2012) have threatened to boycott the big for-profit publishers. Others, such as the University of Konstanz in Germany, have simply cancelled all subscriptions to Elsevier, reporting that they were not able to follow the company's aggressive pricing policy, including a price increase of 30% over five years (University of Konstanz 2014; Vogel 2014). Recently, the editorial board of the journal *Lingua* stepped down to boycott Elsevier's open access author publishing charges (Jaschik 2015). But these pushbacks remain the exceptions. Unfortunately, researchers are still quite dependent on publishers, essentially for a symbolic reason: the award of "academic capital" and prestige. Young researchers must publish in prestigious journals, often associated with major publishers, in order to cement their academic status, while established researchers do the same to keep their research funding. In this context, publishing in an internationally renowned journal from Elsevier or Springer "counts" much more than publishing in a local or national independent journal, though the latter is much less expensive and as easily disseminated. In this context, the role of universities and research councils cannot be over-emphasized, as they are at the heart of the research evaluation system and decide what has value. Should they create incentives for scholars to publish in open access, not-for-profit journals—rather than focusing on Impact Factors or

⁸ <http://thecostofknowledge.com/>.

university rankings, which clearly favour big publishers—the research community could regain control of the scholarly communication system.

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