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Editorial note

Pros and cons of open access journals: paying to read or paying to publish?

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By principle, science should be open to all: even the most remote researcher (or even citizen) must be able to access scientific articles and books. This asset should motivate researchers, who act as both producers and main consumers of scientific documents, to preferably publish under an open access (OA) framework.

The market value of scholarly publishing content is estimated more than €10 billion per year, mostly paid by academic libraries. Scholarly OA accounts for a relatively small amount of this value while globally involving over one-third of all the published scientific articles and books.

There are over 5,000 publishers of scientific journals and books, but just very few accounts for most of the published material, and, albeit to varying degrees, all of them have embraced OA, as a long-term business more profitable than subscriptions.

The pathway to OA begun in the 1990s with journals created by individual scientists as an alternative to subscription-based journals: such journals were initially demised by most academics, since there were doubts about their long-term sustainability. Subsequently, transformations of some long-established subscription-based journals owned by scientific societies in OA journals followed. More recently, a new phase started with two new publishers entering the market, BioMedCentral and Public Library of Science, who pioneered article processing charge (APC) as the main mean of financing professional publishing of scientific journals. After their success, commercial (and sometimes "predatory", *sensu* Beall, 2012) publishers have entered in the OA market.

Five main routes (non-mutually exclusive, at least in part) towards scholarly OA exist: gold OA (research output published in journals that make all of their content OA via payment of an APC, and that do not rely on subscriptions); hybrid OA (research output published in subscription-based journals, that is made OA with a clear license, typically based on payment of an APC); bronze OA (like hybrid OA but without a license); platinum OA, also known as diamond OA or gold no-APC OA (research output published in OA journals that do not charge any APC, being managed by scientific societies or governmental agencies which cover publishing costs); green OA (research output published in journals that is also made available for free public use, e.g. after an embargo period, under OA institutional or subject repositories, like arXiv or PubMed).

Commercial OA publications are characterized by widely varying levels of APC fees, ranging between less than €500 to above €3000, with mean values about €1,500 for gold OA and €2,500 for hybrid OA. Journals with high impact factors tend to have the highest APCs.

Governmental funders, especially in Europe, and several non-governmental funders had foreseen that, as of 2020, the results of research they fund should be published only under OA mechanisms. Indeed, in the last two decades, the relative volume of OA peer-reviewed research articles has grown at a much faster rate than the increase in total annual volume of all peer-reviewed research articles. However, this growth has recently slowed, due to various reasons, one of which seems connected to the increasing concern about the rightness of commercial OA.

Distinctively, APC shifts the burden of payment from readers to authors, which might sound a rather strange mechanism: as facetiously noted by Borghetti (2019), it is like going to the bookstore, buying a book and sending the bill to the writer! Indeed, it is usually not the researcher who pays the APC: ultimately, the agencies that finance the research will pay or the institutions to which the researchers belong.

The major concern of shifting the burden of payment from readers to authors (or their funders) is that if a publisher makes a profit from accepting pa-

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pers, it has an intrinsic incentive to accept anything submitted, harming the perceived neutrality of peer review rather than selecting and rejecting articles uniquely based on quality. Indeed, my overall impression, stemmed from past experience as a reviewer for some commercial OA journals (currently I no longer accept to act as a reviewer for them), is that such publishers seem to see the peer-review just as a nuisance standing between them and their APC fee.

Of course, APC-based approach is also likely to increase expenditure for the most research-intensive institutions, i.e. those which publish more papers and publish on the journals with higher impact factors.

Another concern is that researchers from disadvantaged areas or less funded research fields can read APC-based OA journals while having trouble to publish on them. Journals may reduce or remove APCs in some cases, but these are always concessions to be negotiated on a case by case basis. Hence, the APC mechanism might result in excluding authors from developing countries or from less funded research fields! On the other hand, it should be acknowledged that even the prohibitive costs of some journal subscriptions already place a heavy burden on the less wealthy research communities.

A final concern is that payment for OA publication may boost publishing more and more articles (even eventually lowering peer-review standards, as stressed above). In some ways, this same argument can apply to the subscription-based system since publishers often justify price increases on the grounds of an increase in the number of journal articles published. Conversely, OA journals managed by (some) commercial publishers have very largely increased the number of published articles in recent years: there are OA mega-journals which publish more than 10.000 (or even more than 30.000) articles a year (Cherubini, 2019). Some questions arise: who read them? Are they effective tools for true scientific advancements or just for opportunistic academic careers? Distinctively, it is evident the viciousness of the too many special issues spread each month by some OA publishers (even over ten special issues per journal, simultaneously!).

Early-career scientific investigators often claim the appeal of OA because OA articles are significantly more cited: as a matter of fact, across all the scientific disciplines the citation increase is around 30%, on average. However, the effect is largely not due to gold (commercial) OA but rather to green OA, i.e. to research outputs made available for free public use under institutional or subject repositories.

There are clear indications that the subscription market is not effective under various aspects (e.g. oligopolistic concerns, excessive competition, barriers-to-enter) to deliver widespread access to scientific research outputs. Hence, the virtual elimination of technical barriers to dissemination of scientific knowledge through OA has consequently received a growing recognition as a global public good. However, the current OA scenario has many shortcomings too, e.g. the invasion by predatory publishers.

Under such a contradictory framework, the primary concern should be to publish on highly reputable and rigorous journals. For free access, there is no need to resort to those applying APC mandatory, especially if managed by groups just oriented to business. The availability of platinum OA journals should be stressed: there is a certain number of such journals in each discipline, even in relatively small ones like the Forestry subject category. In the same perspective, another relevant option to be fostered is the practice of OA archiving (the green OA).

Finally, the relevance of scholarly journals that make available, or even require, public data repository is to be stressed as one of the most important steps towards a truly open and credible science: true OA should not just mean full free access to research outputs, but also full free access to the data upon which such outputs are built.

The current transition to OA will take a still unknown amount of time and efforts to distill proper practices into the academic and publishing worlds. On the other hand, as always, “in the middle of difficulties lie opportunities” (A. Einstein), and certainly there are more pros than cons under reasonably expected OA scenarios.

References

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