



Advocating for free-to-read and free-to-publish science journals amid a need to change a broken evaluation system

Promovendo periódicos científicos gratuitos para leitores e escritores diante da necessidade de mudar o sistema de avaliação acadêmico

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Abstract: Publishing is an important step for the work of any scientist. Unfortunately, academia has been using publication metrics, particularly the journal impact factor, as one of the main criteria for assessing researchers CVs when hiring and promoting researchers and evaluating grant proposals, among others. This goes against the advice of several researchers and institutions who notice a harmful effect of focusing on such publication-based metrics for the development of science itself. In addition, most journals with high impact factor have been moving to a highly commercialized form of open access publication, where readers do not pay to access those papers, but the authors do. Journals ranked high in those publication-based metrics also charge very high publications fees. Thus, those journals have become too expensive for most scientists, creating a too-large financial gap between those who can afford publishing in high-ranked journals and those who cannot. Science ranking based on publication metrics is thus no longer a question of science quality, impact, or relevance, but of the researchers' financial conditions to publish their science. Luckily, there are thousands of journals that offer the so-called diamond (or platinum) alternative that do not charge any fees from readers and writers alike. Here, I advocate that scientists should focus on those non-commercialized forms of science publication while working to change the criteria for evaluating science production currently at place in academia.

Keywords: diamond journal; open access; journal impact factor; evaluation in academia.

Resumo: Publicar é uma etapa importante para o trabalho de qualquer cientista. Infelizmente, o sistema acadêmico tem usado métricas focadas na publicação, particularmente o fator de impacto dos periódicos científicos, como um dos principais critérios para avaliar o currículo de pesquisadores ao contratar e promover professores universitários e cientistas e avaliar propostas de financiamento, entre outros. Isto vai contra o conselho de vários pesquisadores e instituições que notam um efeito prejudicial na própria ciência ao focar em tais métricas. Além disso, a maioria dos periódicos com elevado fator de impacto tem migrado para uma forma altamente comercializada de publicação de acesso aberto, onde a leitura dos artigos é gratuita enquanto que os autores têm que pagar os custos de publicação. O que ocorre é que os periódicos com alta classificação naquelas avaliações de impacto acabam cobrando taxas elevadas de publicação. Assim, a maioria desses periódicos se tornou demasiado cara para a maior parte dos cientistas, criando um grande fosso financeiro entre aqueles que podem pagar a publicação nos periódicos de alto impacto e aqueles que não podem. A avaliação da ciência baseada em métricas de impacto se tornou não mais uma questão de qualidade, impacto ou relevância, mas sim das condições financeiras de quem publica a pesquisa. Felizmente, existem diversos periódicos que oferecem uma alternativa que não cobra taxas nem dos leitores e nem dos escritores, a chamada publicação 'diamante' (ou 'platina'). Aqui, defendo que os cientistas deveriam concentrar-se nas formas não comercializadas de publicação científica, ao mesmo tempo que trabalham para mudar os critérios de avaliação da ciência no meio acadêmico.

Palavras-chave: periódicos diamante; acesso aberto; fator de impacto de periódicos científicos; avaliação na ciência.



1. Publishing Science Well Should Not Be Costly

Publishing well is often a highlight for the work of any scientist. Scientists certainly desire their results to be known and cited widely, and so where they publish becomes an important aspect of their work. This need for choosing where to publish has sadly created an expectation where one's work is regarded more or less valuable not by the quality and relevance of the work itself, but depending on where one publishes their results. And this expectation has been institutionalized by the use of journal-level metrics, such as the journal impact factor (JIF), to officially assess CVs when hiring researchers, decide on grant proposals, promote faculty members, and more. In addition, science publication in the global north has over the past decades become highly commercialized and created a very visible gap between those who can afford paying high publishing costs and those who cannot. 'Publishing well' in academia, as judging by the current assessment models, has never meant so little about the science quality *per se*. Instead, 'publishing well' now largely reflects the financial condition of the authors and their home institutions.

In the global north, most of the traditional society journals have been purchased by three big publishing houses – Elsevier, Willey-Sons, and Springer-Nature. What a few decades ago was a rainbow of society-driven journals publishing at low costs (from a global north perspective, at least) became a situation where scientists started paying thousands of euros/dollars from public grants to publish their papers in those same journals. And this situation has only gotten worse with the adoption of free-to-read (but expensive to publish) open access (OA) publications. Recently several countries in Europe and North America have signed agreements with those individual publishers where the OA publishing costs are subsidized directly or indirectly by the state's budget, the so-called Plan S (Kelly, 2019). But the publishing costs may comprise a large fraction of several countries' national budget for science itself even among the richest countries, and negatively affect funding availability for science.

The adoption of the current OA model is certainly beneficial to readers that can access science publications without any costs. But the adopted OA model increases the financial gap between the few richest countries on the planet that can afford paying exorbitant fees and all the other countries that can no longer afford publishing their science

in well-known journals (Peterson et al., 2013; Smith et al., 2021), and thus may have to content themselves with reading what is published elsewhere: that is a new layer of colonialism in place, where only what the rich countries produce is worth reading. Existing waivers in those journals are either too limited in their geographical coverage or too small to make a difference for most scientist around the world (Smith et al., 2021). This system has unfortunately led well-intentioned scientists to start publishing in questionable outlets (so-called predatory journals), and, in some very sad cases, to use private savings to pay for their dream journal publication (n.d., personal communication; Solomon & Björk, 2012). The financial inequalities across global south and global north countries bear ethical considerations when one realizes that the cost of one single science paper in some of those high-profile journals could easily cover the salary of a post-doc or even a senior scientist for half a year or more in most countries on Earth.

Recent uprising by a group of editors who left one large Nature journal in protest over author processing charges (APC) indicates that scientists in the global north are also not happy with current publishing costs either (Sanderson, 2023), and are trying to find alternatives (Bourguet et al., 2022). Even the European Union, which is the largest multi-national science funding today, with more than 100 billion Euros reserved for research projects in the period 2020-2030, is revisiting its publishing policies. The EU is adopting strong guidelines where publicly funded projects should prioritize free-to-read and free-to-publish journals, the so-called diamond (or platinum) journals, for publication.

There are certainly costs for publishing a paper. Estimates from the European Union indicate that in 2023 those costs in Europe were around € 820 per paper, including the full suite necessary for publication, from peer-review management, platform development, to marketing (European Commission, 2023). But the current publishing industry is charging much more, often from around US\$/€ 2000 to US\$/€ 4000 to publish a single science paper (Widener, 2019), resulting in some of the highest profit rates for any industry on the planet (Hagve, 2020). Why should we pay so much public money to publish in expensive private-owned and profit-driven journals, given that all the work, from research proposal, to writing, and even reviewing is done by the scientists themselves without any costs for the publishing houses?

Luckily, several journals around the world offer alternatives where both publishing and reading are free of charge (Becerril et al., 2021; Dufour et al., 2023; Kramer, B. & Bosman, J., 2021). To name one, there is the society-driven *Acta Limnologica Brasiliensis*, which is published by the Brazilian Limnology Association with zero costs for both readers and authors. This and many other science journals are hosted by the highly valuable and recommended SciELO initiative (Packer, 2010; Packer et al., 2014; Vessuri et al., 2014), which provides a platform for thousands of science journals which are all free for readers and for authors.

With SciELO and similar initiatives as Redalyc among several other high-quality journals around the world with diamond-style policies (see the inventory by Kramer & Bosman, 2021), why would scientists choose to publish so expensively, then? The short answer is that publication has to do with reputation and visibility, but also with reliance on questionable metrics to evaluate one's work for grant proposals and hiring committees, in particular the use of JIF, a metric used to estimate the impact of a journal (but not of an author). And the quest for high JIF is encouraged by an evaluation system that uses those metrics to hire, fund, and promote scientists around the world.

2. The Need to Change a Broken Evaluation System

Publishing in well-known journals has certainly some advantages. It helps disseminating one's findings more broadly, and it may help early career scientists become competitive for academic positions abroad when evaluations are made based on some favorite journals used by the target countries. It certainly increases international visibility of a researcher or a group of researchers, opening for possibilities of collaboration, research visits, grant proposals, and more. Being visible in an international outlet of broad spectrum is obviously positive.

But over all the relevant points mentioned above, arguably the main reason for scientists to pay exorbitant prices to publish their papers has been to have high JIF in their CVs to help them in their own national academic systems. That is to say, scientists in Brazil feel a constant need to publish in expensive journals (and sometimes in journals of questionable quality) so that their CVs are better evaluated by their own home institutes and national science agencies (e.g., CAPES and CNPq in Brazil). And the reason for this lies primarily on the use of JIFs and other similarly misleading metrics by

those same national funding agencies, universities, and research institutes when hiring researchers or university professors, deciding on distribution of grants and stipends, and so on.

In Brazil, to continue with this country in our example, the JIF is bundled in the CAPES Qualis system that distributes journals in broad groups based on journals JIF, giving equal points to all journals included in each category. Initially, the Qualis system was created to evaluate academic production across the national graduate schools, but it is often adopted to evaluate a researcher's individual production, against Qualis own advice (Brasil, 2023). But because scoring high in that rank is important for the national graduate schools, individual researchers end up following that evaluation criteria so that they too can score well within their own institutes.

Although with a presumably good goal in mind, Brazilian Qualis and other systems that rely on JIF for assessing science are not effective measures of a scientist quality and may cause more harm than good for the development of science itself (ABN, 2010; Ferreira et al., 2013). The use of JIF is so negative for science that a recent international declaration on research assessment (DORA) signed by universities and scholars around the world urged academic institutions to stop using JIF “[...] as a surrogate measure of the quality of individual research articles, to assess an individual scientist's contributions, or in hiring, promotion, or funding decisions” (DORA, 2012).

A change in the criteria for assessing candidates and grant proposals is thus highly needed to fix this broken evaluation system. Fixing it will certainly require some hard work from all involved given the universe of possibilities for fixing the system (Hatch et al., 2019). But tools are being developed to help solve this issue (Saikia, 2023). For example, Schmidt (2022) redefines impact using a two-dimensional scale, where both the extent of contributions' influence (i.e., how the science is being used) and new types of audiences reached (i.e., how far has that science reached) are taken into account. Several other tools are presented and made available by the DORA (2012) initiative.

The existing initiatives to change how academic assessments work remind us that science can be published and evaluated in multiple ways, and publishing in international science journals is not always the best way of disseminating or evaluating one's results. For example, much of the science produced in global south countries is certainly of high relevance for their own populations, and in those cases, publishing in their native languages should be more relevant than publishing in English.

Even then, much of the science is published using highly specialized vocabularies (jargons), distancing those results from the target population. Given its potential societal impact and the difficulty in conveying one's work precisely but without use of jargon, publishing lay-person communication that reaches a broad audience could be evaluated not only as relevant, but perhaps at par with publishing internationally in some cases. And publishing internationally, when necessary, shouldn't be seen as the holy grail of a scientist's output, but a normal consequence of one's work. Thus, focusing less on publication metrics, and more on the content of the work could already help fix some of the problems seen in science (DORA, 2012).

Eliminating the current system that uses JIFs for evaluating production is an important first step. Other criteria that goes beyond science publications can also be considered as highly relevant for faculty hires, and include public communication, societal impacts, collaboration within and outside their institute or country, teaching and mentorship, service in academia (as editorial boards, conference organizer, and others), and more (DORA, 2012; Hatch et al., 2019; Schmidt, 2022). An open and fair discussion about which evaluation criteria to be used should really take place, keeping in mind that using public money to pay for international publishers to achieve high JIFs in CVs is certainly not a smart use of public money.

In conclusion, here I argue that:

- (i) Publishing in selective journals is important for increasing one's visibility internationally, which can be translated in invitations to join international projects, research visits, and more;
- (ii) However, publications in those journals are often exorbitantly expensive, and because they are highly competitive and pricey, scientists can become easy victims of predatory journals that offer faster and cheaper solutions;
- (iii) Scientists should seek to promote free-to-read and free-to-publish high-quality science journals in their home countries and elsewhere;
- (iv) Science publications still need to be read internationally (with English as current lingua franca in science) but need to pay attention to communicate well with the local public which can more directly benefit from that science;

- (v) National funding agencies and national education boards need to (1) implement important changes to their guidelines, particularly regarding the assessment of scientists, and (2) help promote other forms of publication and scientific outreach that are currently neglected in assessment panels, but which are extremely relevant for the development of science, education, management, and policy.

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