

Open Access and Public Peer Review – The Future of Scientific Publishing?

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In this issue of JUnQ we set out to illuminate different ways of scientific quality assurance. How do scientists from various fields of research make sure that their work (as well as the work of others) maintains a high standard of quality? How is “quality” measured in the first place?

Quality assurance in publishing is of special importance in present times, where we experience a paradigm shift in publishing: In contrast to traditional journals, which acquire money via subscriptions, more and more journals are *Open Access*, which means readable for free. The whole thing started with the arXiv server for preprints in Mathematics and Physics in 1991 and now, two decades later, ca. 25% of all articles are freely available online immediately after acceptance,^[1] just like in JUnQ. In biomedical research open access got a boost eight years after the start of arXiv, when the director of the US National Institute of Health (NIH, a main source of funding in US biomedical research) proposed an archive of free biomedical papers in 1999, which led to the founding of PubMedCentral in 2000.^[1] PubMedCentral was an immediate and exceptional success, resulting in a call for boycott of journals that did not deposit their papers on PubMedCentral six months after publication. To date more than 50% of all published articles are open access at least twelve months after publication.^[1]

Although nobody can object to free accessibility of papers there is a pitfall in this development: Unlike JUnQ – we are a nonprofit journal – or arXiv, which is funded on voluntary basis, many other open access journals, need to make money to survive. Since open access journals get no subscription fee from the reader they usually acquire publication fees directly from the author. This business model results in a dramatic shift of the journals main priority: While subscribers and thereby readers increase the revenue of “classic” subscription based journals, submissions are the only important figure for open access journals. Consequently, critics of open access point out that quality control is of lesser importance for open access journals, since, in terms of revenue, it does not matter much whether the articles are valued enough to attract readers or not. As one of the authors of the text in hand is RNA biochemist by profession the main journal of his field, *Nucleic Acids Research*, published by Oxford University Press, is an open access journal since 2005. It does not, at least in the author’s opinion, stand out by publishing low-quality content, however. The second general journal of the RNA field is “RNA” published by the RNA society. RNA articles are open access twelve months after publication, which makes articles younger than that a valued merchandise, if you get access to it. Obviously, open access combines advantages concerning availability with disadvantages, while it does not result in low-quality publishing automatically. arXiv for example could function for more than a decade without any qual-

ity control except moderators that may re-categorize submissions as off-topic. From 2004 on publication on arXiv requires the consent of an “established” arXiv author.^[2] It could be shown by Davis and Fromerth in 2007 that deposition on arXiv resulted in a decrease of downloads from the actual publisher’s website, demonstrating the rivalry of open access and conventional publishing.^[3]

So open access publishing is a successful, widely accepted approach, but it harbors a severe secondary effect: The amount of journals increases with exceptional speed, since it does neither require much expertise nor money to set up an online open access journal and as direct consequence the publication volume is exploding with a new paper published every 20 seconds (*whatever you want to publish – you will find a journal that will*).^[1] The development of reader’s tools, which are quality control and quality ranking or assessment are lacking behind in comparison. At least the author based in biochemistry tries to hold onto well-known journals and well known authors to survive the “publishing maelstrom” of the current time, where no functional compass for scientific quality seems to exist anymore that would help in finding papers worth the time required to read them. Quality control or rather the lacking of it in open access journals was tested by John Bohannon recently, who submitted over 300 versions of a manuscript dealing with a promising anticancer agent extracted from lichen.^[4] More than half the journals accepted the paper, while the revisions, if any at all, were mostly concerning the format of references or the abstract. The disaster in this story is that the studies were completely made up and so full of flaws that, according to Bohannon, “any reviewer with more than a high-school knowledge of chemistry and the ability to understand a basic data plot should have spotted the paper’s short-comings immediately”.^[4] While quality control was neglected, the financial aspect was treated with due care, resulting in timely requests to pay the author’s fee after submission from the editors.

If the traditional way of publishing is changing, what does this mean for the way that guarantees the quality of these papers? The usual, classic way to guarantee quality in scientific publishing is *Peer Review*. The manuscripts submitted to JUnQ are subjected to a double peer review process, where the article is sent to two experts in the respective field of research to be confidentially checked for errors and/or (unintended) ambiguity. Most other journals do the same. The manuscript is not published until the referee’s (and the editor’s) remarks are revised to satisfaction. At first sight it is a good idea to ask other researchers to review manuscripts within their area of study. However, one problem about this way of quality assurance is the anonymity that is granted to the reviewers. Taking scientists from the same field of research as referees of scientific output is ac-

tually like asking the head of software development of the Microsoft Windows platform to evaluate the work of the competing brand Apple or vice versa. Scientists from the same field are mostly nothing less than strong competitors, a rivalry which can, in extreme cases, result in more or less arbitrary or overly critical referee reports. Thus, the rivalry between author and referee might abolish an effective quality control.

A different approach to manuscript review is *Open/Public Peer Review*, which allows immediate publication of manuscripts after a cursory quality check avoiding thereby that many months pass between submission and final publication. Still experts from the same or adjacent fields of research are addressed to review the manuscript, but peer review is done *after* publication, where stealing of data is no longer possible. The reviewers are selected and need to post their names and affiliations alongside with comments. It is not surprising that this new approach to quality control that deprived the reviewers of their anonymity was launched in a comparably small research discipline that is more driven by cooperation than by rivalry: Since 2001 the journal “Atmospheric Chemistry and Physics” (ACP) applies post-publication public peer review with great success: The “Anticipation of public peer review and discussion deters authors from submitting low-quality manuscripts and, thus, relieves editors and referees from spending too much time on deficient submissions”, while the reviewers have to identify themselves only to the authors directly.^[5]

It seems fitting that the just cited review on ACP was published in a journal of the “Frontiers” series founded in 2007 at the Swiss Federal Institute of Technology in Lausanne. According to the editor in chief of “Frontiers in Neuroscience”, Idan Segev, the group of journals originated from the urge to change the “rejection attitude” of referees that reviewed papers with the sole aim to find fundamental flaws culminating in rejection. The idea behind “Frontiers” was that reviewers and authors should be united rather by the idea to improve the paper than working against each other. When the paper passed a “threshold of excellence” in this “independent review phase” it enters an “interactive review”, as Segev stated, that consists of discussions between all authors, the still anonymous reviewers and editors using an online forum. Frontiers calls their review process the “fastest review system in publishing” and sees it as a revised peer-review process. The so-called “Frontiers Evaluation System” may then elevate a respective paper to a new tier: Based on the reading activities in the first three months after publication and on scores supplied by the “Frontiers community” articles can qualify for a second peer review step which eventually may transform them into review style articles that are targeted to a broader audience. The Frontiers Series also features special ad-hoc publications called “General Commentaries” that are subjected to post-publication review and a community network that increased article views and downloads by 30%.^[6,7]

Post-publication peer review may leave its niche eventu-

ally, since it was taken up by Vitek Tracz, chairman of a conglomerate called the Science Navigation Group and one of the most important publishers of the last decade. Tracz launched a journal called F1000Research, which is, of course, open access, but also applies a new post-publication public peer review.^[8] Furthermore, all gathered data from the study must be included in unprocessed form in the submission, allowing other researchers to dissect the manuscript down to the bone of raw data. As Tracz puts it, one does not “just want the narrative of what you think you found, but what you actually found”.^[8]

Public or not: The scientist doing literature research is still faced with a steadily and fast increasing number of journals and publications and thereby in a never more urgent need of a powerful quality compass. How to evaluate science is a question that was reflected already by Prof. Konradin Metze in JunQ ca. 18 months ago in JUNQ’s 2nd issue.^[10] The best known criterion to date is the impact factor generated by the Thomson Reuters database “Web of Science”, which tries to estimate the “mean citedness” of an article published in a specific journal. Metze sees the impact factor as detrimental to science and as “nonsense (...) to measure something” and even calls for caution if one uses the citation count of the very article under investigation to evaluate its impact, since especially pure “methodological papers” may get high citation counts if compared to revolutionary and paradigm changing papers of e.g. Einstein or Watson and Crick. Metze attests “counting citations (...) to be the best proxy available at the moment (...) [but that it] should be used with great caution”.¹ Even if we do not use the impact factor to direct our reading habits or decide where we publish, many will admit that they categorize journals in a more or less subjective “ranking system”. Brembs *et al.* recently wrote about “unintended consequences of journal rank” in, where else could it be, a Frontiers journal.^[9] The authors state that journal rank is a weak to moderate predictor of perceived importance, meaning that only few papers that are published in high ranked journals get highly cited, while others don’t although published at high rank. In addition Brembs *et al.* see journal rank as a “moderate to strong predictor of intentional as well as unintentional scientific unreliability” that is expensive, delays science and frustrates researchers. Similar to Konradin Metze^[10] Brembs *et al.* criticize that the impact factor violates “most basic scientific standards” while generating a “subjective judgment of journal quality”. The surprising conclusion of the review: A return of scholarly communication “back to the research institutions”, culminating in a transformation of scientific publishing into an “archival publication system” that would be run by librarians. Professional editors could have their place in this new system by being paid for selecting especially important work post-publication. The authors envision a publishing system where the “products of our [the scientist’s] labor is back under our own control”, where open evaluation, metrics and social networks control quality, but see that “almost anything appears superior to the

¹Editorial note: For another approach on rating scientific output take a look at Michael Schreiber’s text about the Hirsch index on page 5 in this issue of JUNQ.

status quo". The work of Brembs *et al.* clearly demonstrates how remote from the current system visions on scholarly publishing are already, alarming us to take action for the better.^[9]

Thinking of a future in publishing consisting of open access and public peer review – everyone is thrilled, everything is working. Of course, as it always is in scientific publishing, the next endeavor awaits: Reproducibility of experiments and the “publish or perish” vicious cycle are most likely to be the next construction sites. As usual, final answers and definite truths cannot be provided here. Just one thing remains true: One has to be aware of the strengths and weaknesses of the current (and always changing) publication strategies and must not trust ratings blindly.

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Publishing in the Humanities – Interview with Jörg Meidenbauer

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The Frankfurt-based Peter Lang GmbH is part of the Peter Lang International Academic Publishing Group, which is domiciled in Berne/Switzerland. The company has been engaged in academic publishing for more than 40 years, focusing primarily on the humanities and social sciences. Some 1,200 works are published in Frankfurt each year in electronic and hard copy format, together with some academic journals. To find out more about the view of publishers on quality, JUnQ editorial board member David Huesmann sat down with Dr. Jörg Meidenbauer – CEO of Peter Lang GmbH – to discuss the role of publishers in the quality assurance process.



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JUnQ: Let us start with a controversial question: Why do we need publishers in times of the world wide web? Can we not just upload all our research ourselves and make it available for everyone?

Meidenbauer: Well, of course everyone can simply upload her or his research onto some server, and at the end of the day we will see if it is then visible for everyone or rather lost in the depths of the internet’s ocean of information. But seriously, I think the role of publishing companies has not changed, even if the environment that they operate in has been changing dramatically. The role of publishers has always been to make content visible, to put it into proper context and to make it accessible. A publishing company operates in five dimensions – and I think this is true for all disciplines:

1. It creates products (different from content), which today means books or journals in printed and electronic forms.
2. It adapts contents, e.g. for databases. This field is growing rapidly, as databases are becoming more and more important in the social sciences and in the humanities.
3. A central task of publishing is quality assurance. A publisher should check the formal quality of a scholarly work, whereas peer experts can deal with the quality of its content. I am a historian by training, but I wrote my dissertation a long time ago. I still am familiar with the methods of the discipline, but I do not know what the current issues are. So I can check if the formal quality of the content is ok, but I

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