Peer review in academic publishing: challenges in achieving the gold standard

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Introduction

As a long-time editor of a biomedical journal, Lanier (2022, pp. 168-175) recollects and describes 17 common types of challenging or problematic referee comments, including the "superficial and vacuous" review, the "you should have done it another way" review, and the "death by a thousand paper cuts" review. The repercussions of a low-quality peer review on an author, particularly an early career or inexperienced researcher, can be discouraging (Lanier, 2021). UK researcher Malcolm Tight (2022) expresses his concern that the current peer review process may not be fit for purpose, stating "It doesn't work well – not only in relation to the time and effort required to do a review but the emotional upset it causes amongst authors whose work is being judged" (Tight, 2022, p. 229).

The peer review process relies on the impartiality of the reviewer and editor to ensure the consistency and meritocracy of the review (Lee et al., 2013; Newton, 2010). But is full impartiality achievable? Lee et al. (2013) found that reviewer nationality, gender and discipline were elements at the individual level that could lead to biased peer reviews. They also found that biased peer reviews could result from complex social interactions of the peer reviewer such as the prestige of institutional affiliation, and confirmation and publication bias. Author nationality is another factor that can affect bias in peer review. It is easier to review studies that draw on your own context, rather than having to learn new jurisdictional contexts. (Kosmutzky & Krucken, 2014).

Peer review may be a ubiquitous and institutionalised process in the global communication of scholarly works (Fyfe et al., 2017; Hames, 2012), yet the explicit role and nature of the *discipline* as part of that process is not always clear. Were the reader to take a quick glance through the references used to write this editorial, they would be met with a list of publications from a diverse array of disciplines. While the role and purpose of peer review may be the same across disciplinary divides, how this plays out in the peer review process itself may be quite different in different discipline-focused journals.

As a conduit for scholarly communication, there are some who say there are cracks in the pipeline of the peer review system and that the system is broken (David, 2018; Malcolm, 2018). And while there is a long history of criticism of the peer review process, more recently new understandings and challenges are emerging. The aphorism "publish or perish" has long been in the lexicon of academia. Now, more than ever before, academic reward structures place a high value on research productivity (Ryazanova & Jaskiene, 2022), yet, more often than not, the review process, which is critical to the activity of publishing, is not recognised or rewarded (Dean & Forray, 2018). In 2018, the Publons (2018) survey of scholarly peer review recorded an era of significant growth in new submissions to journals, without a similar increase in the numbers of available reviewers in what Dean and Forray (2018, p. 166) call a "schism between authorship and reviewing". In an analysis of submissions, authors, and reviewers for the *Journal of Management Education* over a two-year period, Dean and Forray (2018, p. 166) found a clear disconnect between those who author and those who review, with only 7% of submitting authors also reviewing for the journal and 4% declining to review for the journal during that same time period.

A suggested consequence of the pressure-laden academic reward structure is fake peer review (Bakker & Traniello, 2019), which most often occurs by soliciting authors for suggested peer reviews that involve the use of fake email addresses and submission of fabricated peer review reports, often written by close colleagues or the authors themselves (Bakker & Traniello, 2019; Bell et al., 2022; Haugh, 2015). Manipulation of the peer review process has become such an important issue that the Committee on Publication Ethics (COPE) and *Retraction Watch* provide advice and support in what Bell et al. (2019, p. 5) call "the adjudicators of integrity in scholarly publishing". *Retraction Watch* (2022a), a public blog and database created to increase the transparency of retracted published research, recognises that there is a spectrum of reasons as to why published research may be retracted, including peer review fraud. In response to the difficulty posed to editors in identifying fake peer reviews, COPE (2017) created a guide on recognising potential manipulation of the peer review process. The guide suggests that there are tell-tale signs that manipulation exists: rapid agreement and turnaround of reviews, atypical or non-institutional email address, a vague review, or a positive review in contrast to other reviews. The *Retraction Watch* (2022b) database currently lists 3,087 journal articles that have been retracted for fake peer review.

The largest-ever peer review study conducted by Publons in 2018 suggested that peer reviewer fatigue may be setting in. What lies behind this statement? In 2013, an editor needed to invite an average of 1.9 reviewers to ensure that one review was done. In 2017, that had increased to 2.4 invitations for each individual review. The survey conducted by Publons (2018, p. 45) projects that by 2025, an average of 3.6 invitations will be required to complete each individual review. It is noteworthy that these projections were made well before the advent of COVID-19 and without any prior knowledge of the impact that a pandemic would have on the higher education sector. Allen et al. (2022, p. 10) suggest that "the pandemic has amplified pre-existing challenges to scholarly peer review", and that "such challenges potentially run deep and wide across academia". These same authors also identify other problems with peer review – publication delays, an overreliance on a narrow pool of reviewers, threats to anonymity, perceived exploitation, and overworked editors.

This is by no means an exhaustive list of "problems" with peer review. We have not discussed the persistent problem of predatory or counterfeit journals (Beall, 2017), the *Reviewer Number 2* trope (Peterson, 2020; Worsham et al., 2022), the issue of reviewer training (Bakker & Traniello, 2019; Callaham & Tercier, 2007), or the relationship between peer review quality and the quality of the final published manuscript (Crijns et al., 2021; Newton, 2010; Tennant & Ross-Hellauer, 2020). But what is evident is the complexity of a system that is deeply ingrained in academia. There is no arguing the epistemological value and importance of the peer review process to scholarly communication of research and new understandings of knowledge. However, as Tennant (2018, p. 3) states, "For now, in 2018, we remain with a scholarly communication system based on a 19th Century process of peer review embedded into a 17th Century method of communication." In 2022, new social platforms, technical systems, communication methods, and changing academic environments require a revisioning of the function and processes associated with scholarly peer review.

In this Editorial, we put the peer review process in academic publishing at the centre of our discussion of the ecology of the scholarly publishing landscape. If we are to achieve the gold standard in peer review, we need to understand historically how peer review began, and what traditional forms of peer review exist today. We examine what several surveys of peer review have recognised as the benefits of the peer review process. This is followed by a discussion of how others have re-envisioned the peer review system through new, innovative approaches and review platforms. We then consider the issue of quality and integrity relating to the writing of a peer review. Finally, we suggest ways forward for a scholarly peer review process that embeds sustainability, equity, and respect within the scholarly community. We do this by looking at what each of the key actors in the peer review process can do to help improve the quality of the

peer review process – authors, reviewers, journal editors, the academic community, and the global scholarly community.

Background

Readers of this Editorial have likely submitted, or published, a manuscript for publication and have received feedback on that manuscript from unknown reviewers or scholarly peer reviewers. Throughout this Editorial, we use the term "peer review" to mean a review conducted by external reviewers of articles that are found in academic journals across a range of disciplines. This is different from scholarly peer review in the 18th and 19th centuries, which was conducted by editors supported by learned societies and later university presses, where peer review aimed to provide constructive feedback to improve manuscripts in their rhetorical style and argumentation in a context where publishing by scholars was linked to the prestige of the learned society and later, university publishing houses. Moving forward, the modern process of peer review as we know it arose in the mid-20th century, driven by the demand for expert authority in a context where specialised research was on the rise. Gatekeeping and filtering processes were introduced as the number of manuscripts submitted for publication grew. Tennant (2018) says that it was during this period that peer review became synonymous with scholarly value. Hansen (2022, p. 110) describes the gatekeeping role of peer review as "ensuring quality control and the best possible distribution of scarce resources". However, as stated by the Editor-in-Chief of this Journal in a recent interview, "we have to be very careful about how we gatekeep and assess quality, making sure to be fair and open to improving our practice" (Crawford, 2022).

The traditional form of peer review is what is also called pre-publication review, of which there are distinct types – single-blind, double-blind, and triple-blind peer review. The former is most common in science, technology, and medical journals (Hames, 2012). In single-blind review processes, the reviewers know the names of the authors, but the authors do not know the identity of the reviewers. In double-blind peer review, the form commonly used in the humanities and social sciences, reviewers and authors do not know the identities of one another. In triple-blind peer review, reviewers remain anonymous, and the author remains anonymous to both reviewers and the editor. Obviously, there is more complexity associated with this type of review (Elsevier, 2022). Open peer review, with a greater emphasis on transparency and interactivity, is also associated with pre-publication review. We examine this type of review later in this paper when we look at more innovative and futuristic approaches to peer review.

Benefits of peer review

Ware (2008) states that authors, reviewers, and journals all benefit from peer review. For the author, peer review offers a "critical friend" to assess, question and clarify the quality and accuracy of the manuscript prior to publication. For the reviewer, engaged for their methodological and/or disciplinary expertise, there is the benefit of building knowledge and capacity in the author while also supporting the publication process. As one of the first external reviews of the manuscript, peer reviewers are often at the cutting edge of research in the discipline, and this, in turn, can have positive benefits for their own research and scholarly writing. For the journal, peer review acts as the gold standard of quality assurance in scholarly communication and also has the potential to increase citations and journal rankings and build recognition, esteem, and respect, which leads to further manuscript submissions.

Hames (2012) suggests that peer review is a critical and key element in journal publishing, not just for editors, but also for the research community. He proposes that scientific communication is improved significantly by peer review and that without it "there would be no control" (Hames, 2012, p. 16). Peer review is purported to lead to improvements in accuracy and quality and builds trust in the findings of the research. The essential role that peer reviewers play in maintaining research quality is celebrated in an annual distributed global virtual event called

Peer Review Week (2022) which aims to share the message of its critical importance to scholarly communication.

Several surveys about peer review conducted over a period of a decade confirm the benefit of the process and practice. The Publishing Research Consortium in the United States compared opinions and attitudes to previous studies in 2007 and 2009, as well as a Taylor and Francis study conducted in 2015. Ninety percent of the responders (n = 2,004) to the survey acknowledged that peer review had definitely improved the quality of their most recent publication (Publishing Research Consortium, 2016, p. 6). In the Taylor and Francis Online (2015) survey published just a few months prior, respondents had specifically defined what this quality improvement meant in practice: a quality peer review process checked methodology, made a judgement about the novelty, determined the importance of findings, suggested changes to improve readability, checked the relevance of the paper to the journal's scope, and highlighted omissions in the manuscript. These sentiments are in stark contrast to Lortie et al.'s research (2013, p. 1) which focused on citation rates for manuscripts in ecology and evolution journals. This study found that "citation rates of manuscripts do not correlate with the number of individuals that provided reviews" and that external peer review is no better than reviews done by journal editors, which is how early peer review began.

New approaches to peer review

The more traditional forms of peer review discussed earlier in this paper are being challenged by the proliferation of innovation in peer review processes: Open peer review; post-publication peer review; payment for peer review; portable peer review; community peer review; and cascading peer review. Each of these terms is discussed below.

Open peer review

Open peer review is a review process where authors know the identities of the reviewers and the reviewers know the identities of the authors) and is considered to be a transparent and accountable approach (Hames, 2012). The process has been called community-organised peer review by Tennant (2018) because it relies on a community of global scholars to evaluate, legitimise and govern the peer review process. In contrast, Ross-Hellauer's research on open peer review (2017, p. 7) calls out open peer review as a contested concept that at best is an umbrella term for a number of overlapping innovations in peer review. He cites at least seven traits of open peer review which are summarised in Table 1 below.

Table 1

7 Traits of Open Peer Review

Trait	Description
Open identities	Authors and reviewers are aware of each other's identities.
Open reports	Review reports are published alongside the relevant article.
Open participation	The wider community are able to contribute to the review process.
Open interaction	Direct reciprocal discussion between author(s) and reviewers and/or between reviewers is allowed and encouraged.
Open pre-review manuscripts	Manuscripts are immediately available via pre-print servers in advance of formal peer review procedures.
Open final-version commenting	Review or comment on the final version of the manuscript.

Trait	Description
Open platforms or "decoupled review"	Review is facilitated by a different organisational entity than the venue of publication.

Post-publication peer review involves an article being published before peer reviewers are sought. This approach to peer review has close ties to the Open Science movement, focusing on the future of knowledge creation and dissemination (Fecher & Friesike, 2014) Although largely arising from the science disciplines, post-publication peer review is growing in the social sciences and humanities, often termed "open research" or "open scholarship" (Ross-Hellauer, 2017). Examples of post-publication peer review drawn from the research of O'Sullivan et al. (2021, pp. 4-7) are shown in Table 2 below.

Table 2

Types of Post-Publication Peer Review

Type	Explanation
Letters to the Editor commentaries, and academic social networks such as blogs, social media and online platforms	Email, blog posts, Twitter posts, ResearchGate, Academia.edu, LinkedIn
Primary post-publication peer review	Occurs when the whole of the peer review activity takes place following the publication of the article
Secondary post-publication peer review	Occurs when peer review is complementary to the traditional pre-publication peer review process, following the publication of the article

One example of a scholarly publication platform that facilitates post-publication peer review is known as *F1000 Research* (F1000Research, 2022). Manuscripts submitted to the platform go through an initial review process to ensure policies and ethical guidelines have been adhered to, before moving to the publication phase which also involves the invitation of peer reviewers to complete a review of the manuscript. Peer reviewer names and reports are then published alongside the article, with author comments and registered user comments visible to the reader. Authors are then encouraged to revise their article, with all revisions publicly available and linked to the original version available on the scholarly publication platform (F1000Research, 2022). Campbell et al. (2012) note that editors play a key role in the post-publication review process by moderating comments and requiring information about reviewers so that readers can judge the reliability and trustworthiness of contributions.

Payment for peer review

In 2020, it was estimated that over 130 million hours were spent by reviewers globally working on peer review, equivalent to almost 15 thousand years (Aczel et al., 2021, p.5). Predominantly, reviewers are not paid to conduct reviews, their time is commonly paid for by their university, research centre or institution (Thompson et al., 2010). In Australian universities, peer reviewing is regularly counted as part of the service component of an academic's workload. However, payment for peer review, whether in the form of direct monetary compensation or the gifting of resources such as eBooks, access to journals, or discounts on future journal submissions, has been in place for some time now, mostly for reviewers of statistical methods and some finance journals (Aczel et al., 2021; Garcia et al., 2021; Thompson et al, 2010). Paying reviewers is thought to increase motivation, encourage a diversity of reviewers, and increase the speed and quality of peer review reports. However, there are concerns over the impact of payment on conflicts of interest and on the entire academic reward system (Vines & Mudditt, 2021, para. 9-11). Table 3 provides more information about these potential conflicts of interest.

Table 3

Potential Negative Impacts of Payment on The Peer Review System

Potential Conflict	Explanation
Payment to complete peer review regardless of the outcome	If reviewers are paid even if they reject the manuscript there is a risk that editors will want to find reviewers who will accept the article so that costs can be recouped.
Paid peer reviews completed outside of expertise / positive reviews	Reviewers may be incentivised to complete reviews outside of their area of expertise or to provide reviews that are positive in order to be hired again and receive payment.
Paid peer reviews would add an additional incentive to the academic reward system	Payment for peer reviews would incentivise quick, vague reports that do not provide quality feedback to authors. Potential to see the emergence of "review factories" and a spike in review fraud.

Portable peer review

Portable peer review is an attempt to reduce reviewer workload by uncoupling peer review from the submission process (Bakker and Traniello, 2019), allowing authors to take their peer reviews with them to a different publisher if their manuscript was not accepted. *Axios Review*s founded in 2013 was an external, portable peer review provider that charged authors in the ecology and evolution discipline a fee of $250 USD to have their manuscript reviewed, before transferring the manuscript and peer review reports to a participating journal for publication (Davis, 2017). *Axios Reviews* closed its doors in 2017 citing a lack of uptake of the process by authors and "a deep inertia in the researcher community in adopting new workflows…" (Vines, as cited in Davis, 2017, para. 4). *Peerage of Science* is another example of an external portable peer review provider facilitating peer review and manuscript submission to subscribing journal, but this time charging the journal publisher for the peer review process rather than the author (Seppänen, 2016). *Peerage of Science* went out of business in 2018 with little information to be found about what led to its demise.

Cascading peer review

While some experiments in portable peer review have failed, others are gaining traction, notably cascading peer review. This form of peer review occurs when a manuscript is rejected and the authors are given the opportunity to have it passed on to another journal from the same publisher (for instance, via the Springer Transfer Desk), along with the peer reviews (Hames, 2012). Essentially, cascading peer review is the reuse of reviews from journals that have rejected the manuscript in question (Björk, 2015). This is a process usually only facilitated by the larger publishing houses and "mega journals" in the science disciplines.

It is clear that there is rapid evolution occurring in journal publishing. Each of these peer review processes is by no means mutually exclusive, and they each have advantages and disadvantages, relative to discipline, country, language, publisher, accessibility and so on. And while each of these peer review processes is attempting to circumvent perceived problems and challenges inherent to the peer review system, they are not attempting to change the peer review model, per se, but the *administration* of the peer review system (Bell et al, 2022). In a system driven by

diverse and sometimes competing influences, the need for and reliance on quality peer review becomes vital.

Quality peer review

Most authors understand that an article they submit to a journal will be scrutinised by independent peer reviewers. What is sometimes forgotten is that papers are also assessed by the editors of the journal. Before a submission reaches independent peer reviewers, in the processes followed by many journals, the article will have been scrutinised by the editor-in-chief, senior section editor, and an associate editor. At every stage, the submission is considered for how it fits both the journal's aims and scope and if it meets the journal's threshold for quality. It is this process that assures quality and rigour (Bro & Hammarfelt, 2021).

The primary purpose of a reviewer is to uphold the integrity of the journal and publisher (Taylor & Francis, 2022). As a first step, reviewers need to review the journal guidelines and the scope of the journal. Many journals will ask a reviewer to respond to specific questions or give criteria statements and ask for a rating and a comment about how the manuscript performs against those. At the *Journal of University Teaching and Learning Practice*, reviewers rate a manuscript against a set of criteria indicated in the statements below:

- Has a clear educational focus or application
- Provides important critical and/ or analytical insights for learning and teaching practice
- Is grounded in a clearly stated context of interest to an international readership
- The issue or problem is comprehensively referenced in the appropriate literature
- The methods and findings are sound
- Reflects on implications for practice and/or policy
- Is well-structured, coherent, and succinct, with information clearly presented in tables and figures
- Adheres to publication guidelines, including format, referencing and Australian English spelling.

After rating the manuscript against these criteria, reviewers are asked to provide more details on areas they have noted in their ratings. Collectively, these criteria help the reviewer structure the narrative of a quality review. They are also useful to authors to apply to their own manuscripts as a form of self-review prior to submission to a journal.

How a review is presented, particularly the tone and approach is something to be carefully considered by reviewers. Many authors have experienced receiving reviews that are negatively framed or even confrontational. Even if a paper is of poor quality, authors deserve a respectful and constructive response to their submission. Getting the right tone when writing a review is essential – if you imagine a friendly conversation with a student about their writing, a similar tone should be adopted in writing a review. Authors should be able to read and appreciate reviewers' feedback as *formative* feedback, enabling them to further develop the manuscript to a publication standard. Taking on a reviewer's role can also help the reviewer-as-author to gain a reciprocal understanding of both roles and needs (Vanderstraeten, 2022).

The large, well-known academic publishers all invest in resources to support high-quality reviews. Examples of these resources are found in the Elsevier Certified Reviewer Course (Elsevier, 2022) and video resources with detailed guidelines from Sage (2022).

Conclusion

McPeek et al. (2009) remind us of the reciprocal altruistic nature of peer review – authors are willing to review manuscripts because they know that they will benefit in the future from similar contributions by others. Wallace (2019) further suggests that while the ultimate goal of peer review is peer mentoring - to strengthen your community of researchers - it is also important to gain recognition for your valuable contributions, time and effort. Platforms such as Publons (powered by Web of Science) provide a way for reviewers to keep track of their reviews, verify their contributions, and measure the impact of their work (Reilly, 2021).

As an active force for advancing scholarship, Davis (2014) suggests that journals accomplish three things: certifying articles as having made it through the vetting process; convening interested and engaged scholars in a community, and curating articles in a published format that are worth reading. Davis (2014) further proposes an optional fourth function that journals can offer – they can serve a civilising function through their editorial practices, enhancing the legibility of arguments and findings, and training new authors in how to write for an audience. Writing a good peer review plays an essential role in the scholarly communication enterprise, and it is for this reason that McPeek et al. (2009, p. e1567)) advocate that reviewers adhere to the "golden rule" of peer reviewing – "review for others as you would have others review for you."

Peer review is a bi-directional process – authors, reviewers and journals all stand to benefit from it (Tennant & Ross-Hellauer, 2020). It is also a tradition in academia, deeply embedded in the social fabric of our scholarly communication system, only more recently disrupted by new and emerging technologies, platforms and communication methods. Peer review still remains the "gold standard" for ensuring the validity and reliability of research, while also maintaining and protecting the reputation of the people within the system (Bakker & Traniello, 2019; Tennant, 2018; Tennant & Ross Hellauer, 2020). We contend that regardless of the shifts and changes that we are seeing in the peer review system, humans and relationships are at the core of the scholarly publication system.

To conclude this Editorial, we offer critical considerations to key stakeholders in the scholarly peer review process. Given the inherent complexity and diversity of influences on the peer review process, our considerations are necessarily broad in context, with the aim of encouraging the continuing pursuit of overall quality in the peer review process.

- To **authors** – Follow the journal guidelines for authors and clarify any issues you do not understand with the journal editor you are in contact with before you submit your manuscript. If you need to discuss the peer reviewers' comments, contact the editor.

- To **peer reviewers** –Adhere to the journal reviewer guidelines which may include both a relatively short inventory of criteria and an opportunity to specifically focus comments on individual aspects of the paper. Follow the "golden rule" of peer review mentioned above. If you need more time or cannot complete a review, contact the editor and let them know. You can ask the editor for feedback on your review before you submit it.

- To **journal editorial teams** – Take the time to come to a shared understanding amongst the team as to the meaning of a "quality peer review". Provide clear reviewer guidelines, templates and other resources, and update these regularly. Offer feedback on a peer review to reviewers who request this before they submit their review, noting that different disciplines and academic communities have different requirements.

- To **the academy** – Support the value of peer review by providing training and mentoring research students and early career researchers to engage in peer review and to do so in a constructive, meaningful way. Support academics in their service roles to engage as peer reviewers within their disciplines.

- To **the global scholarly community** – Start some critical conversations about the ecology of the peer review landscape in your scholarly community. Embrace the annual Peer Review Week, mentioned earlier in this Editorial, that "celebrates the role peer review plays in maintaining research quality" (Peer Review Week, 2022).

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