

Peer review by the Peers, for the Peers: response to Hettyey *et al.*

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Open discussion and participation of the scientific community are vital to the evolution of Peerage of Science and, therefore, the letter in *TREE* by Hettyey *et al.* [1] is much appreciated. Here, we reply to the three conceptual concerns that they raise. Other responses and open discussion can be found on the Peerage of Science blog (<http://www.peerageofscience.org>).

The worry about pilfering owing to pre-publication exposure has been a common concern in discussions with our colleagues. Because of a founder effect, the current majority of Peers in the service are ecologists and evolutionary biologists. Had Peerage of Science started in, for example, physics or bioinformatics, where scientists frequently make use of services such as arXiv or *Nature Precedings* to secure priority claims, concerns about pilfering would be rare. It is more difficult to steal an idea when a large number of colleagues have seen it already. If necessary, priority dispute can be resolved because Peerage of Science maintains a complete audit trail.

The concern that it becomes difficult for reviewers to judge how stringent to be in their assessment without knowing the target journal is somewhat disturbing. Peer review should be equally stringent regardless of the impact factor of the target journal; if this is not the case in the traditional system, it is a defect, not a desirable quality. Peerage of Science seeks more clear separation of responsibilities between reviewers and editors: reviewers evaluate the science of an article, whereas editors evaluate its suitability for their journals. If authors wish to restrict their options, they are naturally free to identify a target journal name in the manuscript file.

Hettyey *et al.* [1] claim that the traditional peer-review system benefits from decentralization effectively protecting it from abuse. Given the concerns of misconduct in the traditional system [2–5], we find this claim tenuous. Because manuscripts in Peerage of Science can be considered by any participating editor, and all Peers freely choose what to review, decentralization is, if anything, magnified compared with the traditional system.

We do share the concern of any single entity having disproportionate influence in scientific publishing, and the question ‘Who would watch the watchers’ [1] is also relevant to the traditional system [2]. With Peerage of Science, there is a simple answer: You and your Peers will watch. Peerage of Science has a Board of Governors composed of scientists, which holds the executives accountable to the legally binding primary purpose of Peerage of Science, and

the Board itself is accountable to the community of Peers (<http://www.peerageofscience.org/public/articles.php>).

The recent UK House of Commons inquiry into peer review [6] offers a weighty summary of the current concerns regarding peer review (see also [7]). We are convinced that Peerage of Science offers better peer review for all parties involved, introducing innovations that change some traditional concepts. We wish to highlight two important conceptual leaps from the confines of tradition.

In Peerage of Science, an editor is not a manager of the peer-review process. Editors get data and tools to automatically find and make use of any peer-review process available in Peerage of Science for their decision-making, instead of being restricted to organizing peer review for manuscripts that authors choose to submit to the journal. This accentuates an editor’s control and responsibility as decision-maker and steward of the journal.

The second conceptual leap is the change in manuscript submission. Currently, authors often ‘aim high’, fully aware that the manuscript fits better to a less general journal. Aiming high leads to several peer-review iterations as the manuscript descends the journal prestige ladder, unnecessarily burdening the scientific community and publisher resources.

In Peerage of Science, authors no longer submit to a journal; instead, they send their manuscript into the Peerage of Science peer-review process, which is accessible to editors of all participating journals. Editors can send a publishing offer to any manuscript, and can define the terms of their offer. Authors are free to accept or decline. Alternatively, authors can export the peer reviews to accompany traditional submission to a journal of their choice. Overall, Peerage of Science offers a vastly more efficient and transparent mechanism for matching manuscripts with appropriate journals.

‘Will it work?’ Peerage of Science is at work already and the first manuscripts are being peer reviewed. The service will continue to evolve and contributions from the community are essential for this. Peerage of Science can only succeed if the scientific community wants it to. We therefore invite you to contribute: join the community, use the service, share your ideas and engage in discussions on how to make it better for you as an author, referee or editor.

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Reduce, reuse, recycle scientific reviews

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A throw-away mentality in the industrialized world has placed a strain on natural resources and the environment. To lessen this strain, societies worldwide now promote the so-called three Rs: reduce, reuse and recycle. There is also strain on the scientific review process, a service crucial to science and society but reliant on a laborious system of reciprocal altruism ([1–3]; *Nature's* peer review debate, <http://www.nature.com/nature/peerreview/debate/>; Peerage of Science, <http://www.peerageofscience.org/>). Indeed, editors often nominate 10 referees to secure just three reviews, the average manuscript receives between five and ten reviews before being published [1,2], and referees are almost never compensated for their efforts. The burden of the review process is not limited to journals; as of 2012, programs within the Biological Directorate of the US National Science Foundation (NSF) have shifted to required pre-proposals and a once-a-year grant submission process partly because of the burden on reviewers (IPAMM Final Report, http://www.nsf.gov/od/ipamm/ipamm_jtornow_finalreportnsb_070808.pdf). Here, we propose that the strain on the scientific review process could be partly alleviated if we recycle rather than throw away scientific reviews.

We propose the following approach to review recycling. After having a manuscript or grant proposal rejected, an author would decide whether or not to forward the reviews, and a detailed response to the reviews, to a subsequent journal or granting agency or panel. The journal or granting entity would then choose to (i) ignore the previous reviews and secure different reviews, (ii) consider the previous reviews and secure more reviews, but perhaps fewer than they would if previous reviews were not provided, or (iii) make an editorial or funding decision based solely on the reviews and associated revisions supplied. We advocate options (ii) or (iii) because they use rather than ignore the expertise and effort of the previous reviewers, editors and grant panels, because they decrease the workload for any subsequent review process, and because they allow researchers to spend more time doing science than tinkering with manuscripts and grants.

Review recycling requires little change to the scientific infrastructure. Rather, it increases efficiency by getting the most out of the reviews that have already been conducted and disseminating scientific discovery more quickly. Indeed, if options (ii) and (iii) become common practice, then

review recycling should decrease time to publication. This benefit is surely something that publishers would support because metrics of journal quality, such as impact factors, are based partly on publication rates. Society too would benefit because new knowledge would be available sooner. Although some researchers might balk at the thought of forwarding critical but fair reviews, the incentive would be that forwarding any reviews could accelerate publication of their work. Moreover, forwarding of reviews should reduce the likelihood that two grant panels would conflict over a proposal, a problem that sometimes arises at funding agencies that do not explicitly consider past reviews.

Now more than ever, review recycling should be beneficial because pressure to publish in the highest-impact journals is enormous and funding rates at most major granting agencies are exceptionally low [1,3]. For some journals, rejection rates routinely exceed 80%, and even papers and grants that receive favorable reviews are commonly rejected [3]. Review recycling from high-impact journals might be especially valuable because it is these journals that are probably best able to secure reviews from leaders of fields. Hence, review recycling might have the additional benefit to lower-impact journals of enhancing both the efficiency of their review process and potentially even the quality of science, cost-free.

Review recycling will be beneficial but it might have some drawbacks that should be considered before it is put into action. First, publishers and granting agencies might have to revise any policies regarding who owns reviews and some publishers might be unwilling to allow reviews to be forwarded if this enhances the reputation of their competitors (although the benefits might be reciprocal at all but the highest-impact journals). Second, manuscripts and grants would receive fewer reviews, which could reduce the quality of science if having many reviews genuinely improves a scientific contribution. However, a study by the NSF suggests that the quality of peer review improves as the burden on reviewers declines (http://www.nsf.gov/od/ipamm/ipamm_jtornow_finalreportnsb_070808.pdf) and thus the net effect of review recycling on the quality of science remains uncertain. Third, review recycling might foment fabrication of positive reviews, but stiff penalties for any fraud would provide a substantial deterrent to this deception.

In sum, we feel that review recycling will have distinct positive impacts on the efficiency and quality of the scientific review process, unique to proposed alternative

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