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EDITORIAL OPINION

The tragedy of the reviewer commons*

The onset of the electronic revolution in scientific publishing and a continual increase in manuscript submission rates has created a serious issue for the editorial process – the need to reduce burdensome demands placed on reviewers. This root cause of this emerging problem is reminiscent of the 'Tragedy of the Commons' (Hardin 1968). Briefly, the Tragedy occurs when individualistic behaviours inadvertently lead to the eventual detriment of the group. The aim of this essay is to increase awareness of two main facets of the 'Tragedy of the Reviewer Commons' that we believe should be of concern for both authors and journal editors.

The first facet of the Tragedy results from our desire to publish our work in the highest quality journal possible. Pressure from employers and competition with other research groups are forces that nourish this. We are all naturally confident about the quality of our own work, and the chances that it will be accepted for publication. Sometimes, however, we may overestimate publication chances for reasons that are only revealed during peer-review. In cases of manuscript rejection, the question then is to what extent was rejection due to avoidable weaknesses in manuscript preparation or to journal choice itself?

The problem of authors targeting inappropriate journals is exacerbated by an over-reliance on quantitative measures by reviewing bodies at granting institutions, universities and government agencies. Too little emphasis is placed on reading and appreciating the impact of work, rather than focusing on measures such as the journal in which it is published. Thus, authors often try to 'shoehorn' their manuscripts into a journal format that is not best suited for developing their work. This is to the detriment of authors and the field alike, because the work may in fact have less impact if it is not fully developed in an attempt to reach a particular journal, or is presented in pieces. The latter issue – attempting to publish the smallest acceptable unit – truly puts strains on the editorial process.

In our estimation, top international journals are rejecting *c.* > 60% of submissions, and consequently the average paper is handled by two or more journals. Assuming that the probability of rejection is not correlated between journals and that different reviewers are used for each submission, we suspect that the mean number of reviewers required for a manuscript to get published lies between 5 and 10. If the figure of > 5 reviewers on average per manuscript is correct, then some reviewers are spending unnecessary effort on repeatedly rejected manuscripts. Herein lies the Tragedy. Repeated submissions of the same manuscript lead to an overburdened reviewer pool, which feeds back negatively on the entire review process and, in turn, on the quality of what we eventually see in print.

Moreover, the refereeing burden is not evenly distributed across the scientific community – some but not all scientists who are active in publishing tend to be the least responsive to requests to review. Again, this hurts the overall community in two ways. It puts unfair burdens on those who do agree to review. It makes it more difficult for editors to obtain reviews from individuals with appropriate expertise, perhaps reducing the overall quality of the scientific literature. The issue of individuals not bearing their share of the overall refereeing responsibility is a complex one and currently there is no easy way to deal with it. Eventually, sharing of reviewer databases among journals might help to expand the pool of reviewers, but still does not force all scientists to do their share of reviewing.

The second facet of the Tragedy is what becomes of the reviews of rejected manuscripts. Expert assessments of manuscripts serve two purposes: to inform the editor of the manuscript's acceptability and to offer authors critical feedback so that the manuscript is free from errors of fact, attribution, and interpretation, and will be defensible when it is published. Sometimes these improvements are tailored to the specifics of the journal in question, but usually they would apply to any journal. Yet our experience as editors has shown that there is little assurance that authors consider reviewers' opinion. The implication of this facet of the Tragedy is that by not incorporating reviewer comments in a new submission, the chances of manuscript acceptance in other venues remains poor, and more reviewer effort is finally spent. When a manuscript rejected from one journal is eventually accepted by another, neglected comments could mean lower quality of the final paper.

Many authors seem to view anonymous peer review as a stochastic process: if the outcome was not successful with one journal, try again elsewhere and perhaps a new reviewer will have a different reaction. The reality is usually quite different. Different reviewers frequently focus on the same persistent set of criticisms of a manuscript. Moreover, it is likely that some of

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the same reviewers will be burdened with a request to review the same manuscript for a different journal. Nothing makes reviewers more angry and hostile than to see that their earlier comments were ignored. Again, a negative feedback loop emerges, so that reviewers are less willing to invest time in a process that appears inherently flawed.

Concerns about these issues lead us to propose two ideas on how we as a scholarly community might begin to conserve a critically important resource in publication – the Reviewer Commons.

First, have colleagues pre-review your manuscript before submission. This was a time-honoured norm in publishing, but has diminished in recent years. Its decline could be due to increased pressure to publish quickly, competition between colleagues, increases in the numbers of co-authors on papers, and ironically, less time available to comment on our colleagues' papers because we are submitting and resubmitting more of our own papers. Side-stepping this important feedback process may not seem to tangibly reduce the reviewer burden, but it does. Getting frank assessments from colleagues helps authors orient articles toward appropriate journals (a check-and-balance on the potential for over-estimated publication chances); by identifying and helping to correct flaws in the communication of information or analyses, pre-reviews make it more probable that the study will be accepted in the first journal to which it is submitted.

This leads to our second proposal, namely that authors should carefully revise previously rejected manuscripts based on reviewer comments. It seems reasonable that journals themselves should play a more proactive role here, without obliging authors to declare whether or not their submission was previously rejected by another journal (which could prejudice the evaluation of the new submission). Rather, journals could require a statement in the cover letter such as 'We confirm that should our study have been previously submitted to another journal, we have taken all reviewers comments into account in revising our manuscript for submission to…', has the merit of increasing author awareness and responsibility, without biasing editors because all submissions, whether or not previously rejected, would have to carry this statement.

Our aim is to increase awareness and foster discussion amongst scientists on how we can conserve the Reviewer Commons. Our proposal is that authors make it a special point to ask colleagues to comment on papers and on journal choice, and should rejection occur, address reviewer comments before submitting to the next journal. These may seem too simplistic or even obvious to many readers. However, it is our experience that these are often neglected by authors in the race to publish.

Journals too are adapting their policies to meet the demands of increasing submissions and increased reluctance of over-solicited reviewers to assess submissions. Editors of many journals have adopted 'reject without review' policies, which consist of limiting external assessments to the most promising submissions. Authors are often upset by this approach, but it is an unfortunate necessity in order to save reviewer time, and evaluations are often based on the 'fit' of the paper to the journal, rather on the quality of the science. Moreover, some journals are now asking authors of rejected manuscripts for permission to forward the reports of consenting reviewers to the journal where the authors intend to submit the revised study. Finally, a recent proposal by Hauser & Fehr (2007) is to employ measures based on positive and negative incentives.

Editors, like authors, must also consider the Commons. One recurrent problem is that the network of potential reviewers is too small, and we are not always making good use of senior graduate students and post-docs as potential reviewers. This is inevitable because these young scientists have not yet established a prominent publication profile so that editors will recognize their work. However, senior scientists who are asked to review manuscripts should consider offering the names of qualified graduate students and post-docs as potential reviewers. Our experience has been that, when they are chosen appropriately, students and post-docs are very conscientious and thorough in preparing reviews. Moreover, this is a route by which a busy senior scientist can still participate in the review process, and can mentor younger scientists in the craft of writing a good manuscript review.

In sum, because reviewers are often overburdened with manuscripts to review from many different journals, the time they are able to invest on any given paper diminishes, and as such, the possibility of misinterpretation or hasty decisions increases. Rejection after multiple rounds of revision, rejection despite authors' having their manuscripts read by colleagues prior to submission, despite care in journal selection, and even though authors addressed reviewers' concerns, leads to author frustration and is to the detriment of the image of publishing. The extent to which this can be alleviated by our proposal remains to be seen. We believe that editors from different journals now need to work together and explore additional ways to improve the review process and author experience.

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Michael E. Hochberg,[1*] Jonathan M. Chase,[2] Nicholas J. Gotelli,[3] Alan Hastings[4] and Shahid Naeem[5]

[1]*Institut des Sciences de l'Evolution, Université Montpellier II – CNRS UMR 5554, CC065, Place Eugène Bataillon, 34095 Montpellier, France*
[2]*Department of Biology, Washington University in St. Louis, St. Louis, MO 63130, USA*
[3]*Department of Biology, University of Vermont, Burlington, VT 05401, USA*
[4]*Department of Environmental Science and Policy, University of California, One Shields Avenue, Davis, CA 95616, USA*
[5]*Department of Ecology, Evolution and Environmental Biology, Columbia University, Schermerhorn Extension, 10th Floor, Mail Code 5557, 1200 Amsterdam Avenue, New York, NY 10027, USA*

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