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Current Peer Review Practice and Perceptions: The View from the Field

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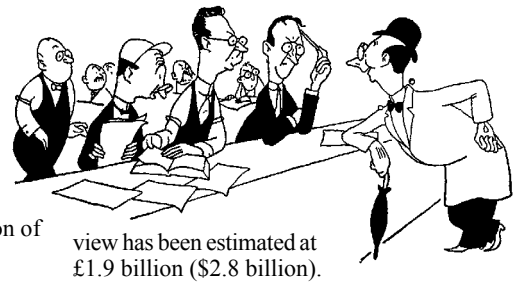

Peer review is so much part of the established fabric of scholarship that it may sometimes be taken for granted. This article examines the current practice of peer review and the attitudes of authors, reviewers and editors towards its current implementation and some possible future developments. It is based largely on an international survey commissioned by the **Publishing Research Consortium**[1] and focuses exclusively on scholarly journals (rather than other uses of peer review such as for conferences or for awarding grants).

The peer review system used in journals today has identifiable roots in the earliest journals in the 18th century, although it only developed its present formalised and systematic structure after WW2, partly in response to the relentless growth in output of papers.

There are two main types of peer review currently used: in *single-blind review* (the most common in most fields) the author's name is known to the reviewer but not vice versa. In *double-blind review* (more common in the humanities and social sciences (HSS) and to a lesser extent in clinical fields) the author's and reviewer's identities are both concealed from the other, primarily with a view to eliminating potential biases.

A newer approach to dealing with bias is *open peer review*, in which author's and reviewer's names are known to each other, and the reviewer's name (and optionally, their report) is published alongside the article.

Finally, electronic publishing technology has allowed a variant of open review to be developed, in which all readers, not just the reviewers selected by the editor, are able to review and comment on the paper and even to rate it on a numerical scale following publication. This *post-publication review* could occur with or without conventional pre-publication peer review.

The most common critiques of peer review are addressed in the introduction to this feature, so here we shall just summarize some of the key criticisms to put the perceptions of researchers into context.

There is, for example, said to be a lack of evidence that peer review actually works, that is, that it ensures quality in publication. (Most editors, reviewers and authors set a lower bar, though, and (as for instance demonstrated in the survey reported here) believe that it improves the quality of published articles.) Some studies have shown that it is not very reliable (i.e., reviewers' responses are not consistent) and that it is poor at detecting errors. A strong criticism (particularly of single-blind review) is that there is too much scope for bias, with evidence presented for nationality bias, language bias, specialty bias, and perhaps gender bias, as well as the recognised bias toward the publication of positive results.

A Word About Methodology

The snapshot of practice and perception presented here is an international one. Responses were received from over 3000 academics from around the world who completed an online survey in late 2007. The academics involved were recruited by email using lists of authors from the **Thomson Reuters (ISI)** database, supplemented with an additional list of journal editors. The response rate was about 8% and there was a good spread by age, position and discipline.

Basic Reviewer Demographics and Metrics

To start with, most authors were also reviewers, with over 90% of authors having reviewed in the last 12 months, and the more active authors were also more active reviewers. On average, reviewers completed reviews of eight papers a year, and reviewed for 3.5 journals regularly and a further 4.2 journals occasionally. These averages conceal some substantial variations, with reviewers in life sciences and clinical fields performing nine and those in HSS about six reviews per year. A subset of active reviewers (those completing more than six reviews a year) comprised fewer than 45% of reviewers but completed about 80% of all reviews. These core reviewers were more likely to be based in Anglophone regions and less likely in Asia, presumably reflecting the predominant home bases of journals covered by the **ISI** database.

Reviewers said that they were willing to undertake a maximum of nine papers a year on average, which is conveniently greater than the eight done on average. Active reviewers, however, completed 14 reviews compared to their stated preference of a maximum of 13, so this core group appears overloaded.

According to reviewers, it took an average of 24 days to complete a review. Those reviewing for higher impact factor journals reported shorter times than for lower impact factor journals. The average acceptance rate as reported by Editors was about 50%, which is consistent with other studies.

Reviewer Attitudes

An empirical piece of evidence of academics' wide support for peer review is their willingness to undertake it. Reviewers reported spending a median of five hours (mean 8.5 hours) per review which equates to a working week per year for the average eight reviews. Indeed, the global non-cash cost of peer review has been estimated at £1.9 billion ($2.8 billion).

In terms of perceptions and attitudes, academics remain committed to peer review. In our survey, over 90% disagreed that peer review was unnecessary and similar levels of support have been shown in other surveys. About 85% said that it helped scientific communication and a similar proportion agreed that without peer review there would be no control in scholarly communication.

Being committed to peer review is not the same thing as being satisfied with its operation, of course. Satisfaction levels were reasonably high, however, with about two-thirds of academics satisfied and only 12% dissatisfied with the current operation of peer review. Academics in HSS were generally a bit less satisfied overall than in physical sciences and engineering, and were less likely to support other positive statements about peer review.

Why do reviewers make this time commitment? The most frequent reason given is some variant of it simply being part of the professional life of an academic: in our survey, for instance, over 90% said they reviewed to play their part as a member of the academic community. Most reviewers are likely also to be authors, at least at key stages of their careers, so the reciprocal nature of the obligation is obvious, and around 70% said they reviewed to reciprocate the benefit gained when others had reviewed their papers. Reviewers also cite motivations such as enjoying being able to improve the paper and seeing work ahead of publication.

Some respondents did agree that self-interested reasons played a part (for instance, enhancing their professional reputations, increasing the chance of getting on an editorial board, currying favour with an Editor), but these were far less common. Such differences as there were between respondents appeared to be largely personal matters; there was in particular little variation in the responses by field of study.

On the specific point of whether reviewers should be paid, respondents were divided fairly evenly, with 35% for and 40% against payment. There was a recognition that payment would add to the costs of publishing and it seems likely that at least some of the support for payment may be largely a reflection of a desire for the contribution to be acknowledged. There was, for instance, substantial support for the proposition that simply being acknowledged by name (perhaps in an annual list of review-

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ers) would motivate reviewers to work for that journal.

Turning to the question of whether peer review works, 90% of respondents said that the main area of effectiveness of peer review was in improving the quality of publications. Fewer thought that peer review was effective at detecting plagiarism, fraud and other academic misconduct, though academics in physical sciences and engineering had somewhat more confidence in this regard than their clinical colleagues.

We separately asked authors to consider just their last published paper (to avoid generalisations) and say whether or not review had improved that specific paper. Overwhelmingly (90%) authors said that it had done so, and although the most common area for improvement was in language and presentation, large proportions reported substantive improvements including identifying scientific and statistical errors and missing or inaccurate references.

Authors reported that the peer review of their last published paper took on average some 80 days. They were divided evenly on whether their peer review time had been satisfactory, though this meant that nearly 40% of authors overall were dissatisfied with peer review times. Satisfaction levels varied strongly with the time experienced: up to 30 days most authors were satisfied, but beyond this satisfaction dropped sharply, with most being dissatisfied once review time exceeded two to three months. Authors in the humanities and social sciences were the most tolerant of longer peer review times, followed by physical sciences/engineering and life sciences, with clinical researchers being the least patient.

We were interested in exploring views on the different types of peer review. Although single-blind review was the most commonly experienced type, double-blind review was seen to be more effective, and more than twice as many respondents selected it as their preferred system compared to single-blind (56% versus 25%).

There were strong disciplinary differences. A majority of those in HSS disagreed that single-blind review was effective, while the reverse is true in other disciplines. HSS academics were most likely to say that double-blind review was effective and expressed substantially the strongest preference for it. The reasons given for preferring double-blind review were principally to do with objectiveness and fairness, reducing the scope for potential bias linked for instance to the author's institution, race or country, or simply personal bias.

Those who preferred single-blind review cited the benefit of anonymity as a reviewer, allowing one to act independently without fear of reprisal, while knowing the author's identity allowed checking their track record or verifying that the article did not simply rework earlier publications by the same author. Many also pointed out that double-blind review simply did not work because it was too easy for experienced reviewers to identify authors from internal clues.

Changing the System? Attitudes Toward Open Peer Review

We found relatively little support for open peer review. Although about a quarter thought it was effective, only 13% would prefer it to other systems. As reviewers, about half said that a policy of publishing their signed report would discourage them from acting for a journal. The reasons that were given for preferring it were to do with accountability (standing by your words), transparency and reducing the scope for conflicts of interest.

The lack of support was consistent with most trials of open peer review and post publication review. For instance, *Nature* reported that despite a lot of interest in their trial, only a small proportion of authors chose to participate, and only a few comments were received, and many of these were not substantive. Feedback suggested "that there is a marked reluctance among researchers to offer open comments."

Respondents in our survey did give some support to the idea of post-publication review as a *supplement* to conventional peer review but did not see it as an alternative. They agreed that it tended to encourage instant reactions and discourage thoughtful review.

The open access journal *PLoS ONE* encourages post-publication review in the form of comments and user ratings. An analysis in early 2009 showed that some 18% of all *PLoS ONE* articles had received comments. The comments were generally substantive. About 40% were from the authors themselves, for instance corrections or updates or in some cases replies to other comments.

A similar analysis of the comments left on the open access **Biomed Central** journals since 2002 showed that only 2% of all articles had received comments. The reasons for the lower proportion may be due to **BMC** launching earlier when the ideas of "Web 2.0" were much less well known generally. *PLoS ONE* also has a community manager whose job is partly to encourage participation. The *PLoS ONE* interface is also a little easier to use, for instance with a simpler registration form.

The most likely reasons for the low rates of participation in open peer review are a lack of time, an unwillingness to participate in something that appears (at present) to make little difference, and caution about making critical statements in public that might have negative repercussions.

One of the tenets of the Web 2.0 viewpoint is the "wisdom of the crowds" — the idea that the aggregated opinions of large numbers of non-experts could be as good as, or even better than, the experts. This is the idea behind **Wikipedia**, for instance, and it has also been suggested that a similar process could be used to filter scientific papers. **Chris Anderson**, the editor of *Wired* magazine, writing in *Nature* in 2006 made the case for making more use of such methods alongside conventional peer review.

Researchers in our survey certainly did not see such methods as being capable of replacing conventional peer review. None of the suggested alternatives — citation data, usage data or reader ratings — was supported as an alternative to peer review by more than 5-7% of respondents overall.

The importance of peer review does vary by discipline. In general, fields with high co-authorship levels and/or very specialised fields where the work of individual researchers will be known to most readers place less importance on peer review. High energy physics is an obvious example, where it is normal to use and cite non-peer reviewed papers from the *arXiv*. Conversely, where there is low co-authorship and/or high non-research readerships, such as in clinical fields, there is high importance attached to peer review.

Summing Up

Overall, though, we see a picture of academics committed to peer review, with the vast majority believing that it helps scientific communication and in particular that it improves the quality of published papers. They are willing to play their part in carrying out review, though it may be worrying that the most productive reviewers appear to be overloaded.

Within this picture of overall satisfaction there are, however, some sizeable pockets of discontent. Perhaps predictably, there were concerns as authors about the length of time the process takes, and as reviewers with overloading. Other surveys have found reviewers to say they were unable to review as thoroughly as they would like owing to time constraints. One possible solution to such overload is to share reviews between journals; the **Neuroscience Peer Review Consortium**, established in January 2008, is one such experiment.

In addition, we saw considerable support for double-blind rather than single-blind review, with support apparently driven by concerns about bias and lack of fairness. The support appears grounded in personal experience rather than theoretical insofar as those with experience of double-blind review were more likely to prefer it.

By contrast academics appear to support the idea of post-publication review as a supplement (though not as an alternative) to conventional review but seem reluctant in practice to take advantage of it when offered.

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Endnotes

1. **Ware, M**. & **Monkman, M.** (2008) Peer review in scholarly journals: Perspective of the scholarly community – an international survey. A **Publishing Research Consortium** report.