Peer review is considered essential in validating the technical correctness and novelty of journal articles. For the reviewers themselves, however, the review process is often time-consuming and may appear to have few direct rewards. To find ways to enhance the experience of reviewers, the OSA Publications Council established an ad hoc committee to conduct a survey of several thousand OSA reviewers. The suggestions that emerged from the research are detailed in this article.

Several years ago, the OSA Publications Council noted that the peer-reviewed journal system was undergoing changes, including a gradual transformation in reviewer-base demographics (today’s reviewers tend to be younger, international, less academic) and the fact that the number of published journal articles was growing faster than the number of optics researchers was increasing. In response to these and other trends, the council formed an ad hoc committee\textsuperscript{*} to assess the peer review process with the goal of answering questions such as:

- Is peer review important to optics researchers?
- Is reviewing a substantial burden?
- What problems do reviewers see in the editorial process?
- What motivates reviewers to perform this essential service?
- What might be done to further motivate reviewers?

**Survey results**

The committee surveyed reviewers for OSA’s journals and analyzed the records of the OSA Publications Department. There were 44 questions in the survey: 16 on demographics (including age, education, employment and number of reviews per year) and 28 on respondents' attitudes about the review process. Through a cross-correlation analysis, connections were made between attitude and demographics.

The online survey was completed by 989 of the 6,404 OSA reviewers invited via e-mail to participate. Of those responding: 62 percent indicated they had reviewed for more than six years; 35 percent said they reviewed for one OSA journal; 48 percent said they reviewed for multiple OSA journals; 55 percent said it took them 2–6 hours to review a manuscript; 58 percent were OSA members; 51 percent said they had published in multiple OSA journals; 52 percent worked in academia; almost 44 percent were from North America; nearly 35 percent were from Europe; 90 percent had a doctoral degree.

\textsuperscript{*}The members of the committee were: Anthony Campillo, John Childs, Charles Clark, Kelly Cohen, Marwood Ediger, James Fienup, Deborah Herrin, Paul Kelley, Joseph Mait, Curtis Menyuk, Robert Menzies, John Murray and Joseph Richardson. Mark Dixon was a consultant to the committee on survey methods and data analysis.
Thirteen of the questions on attitudes elicited a particularly strong response from survey participants. Among the most significant findings:

- Publishing in peer-reviewed journals is considered important to respondents’ careers.
- Peer review is seen as an important professional activity.
- OSA journals are highly valued.
- Reviewers appreciate receiving feedback on authors’ responses and editorial decisions.
- Reviewers are willing to take time with technically difficult papers but do not appreciate reviewing papers that are hard to read because of poor English.
- Respondents are in favor of online access to references, e-mail reminders to reviewers and a Web-based reviewing system.

Reviewer overuse, lack of feedback to reviewers, neglect of reviews by topical editors, poor paper quality and low paper relevance, while not a great problem for the majority, did trouble enough respondents to cause concern. From the responses the committee inferred that, while reviewers do not feel they are asked to review too frequently, by a small margin they think reviewing takes too much time.

The data were analyzed in an attempt to correlate demographic data with the responses to attitude questions. Among the most significant findings:

- Compared with older reviewers (over 61 years) younger reviewers (under 30) were more interested in the idea of having their names published if they returned their reviews on time.
- Younger reviewers (under 40) were more interested than older ones in being rewarded for reviews in the form of credit toward future OSA purchases.
- For reasons the committee did not fully understand, reviewers based outside North America were much more interested in having access to a Web-based review system.

The results show that reviewing is overwhelmingly viewed as a professional responsibility. For OSA and other scholarly societies, this perception is a valuable commodity; whatever is done to develop an acknowledgment/reward system for reviewers should not undermine it in any way.

**Reviewer performance**

Using the Society’s records for Applied Optics, JOSA A and B, and Optics Letters, the committee determined: the average time for review; the time for review of the slowest quintile of reviewers; the fraction of potential reviewers who, when pre-contacted, declined to review; the fraction of reviewers who did not complete reviews of articles that were sent to them; and trends in the number of times a year reviewers were used.

Several general conclusions were drawn from the data. First, the average time to completion of a review, the “tardy tail time” (time to completion for the tardiest quintile) and the fraction of reviews completed did not show marked long-term change during the five-year period 1997-2001. Second, the number of overburdened reviewers (those who completed more than five reviews per year) had declined. Despite the decline, the committee believes that overuse of reviewers is a matter that requires serious attention.

In Fig. 1, the timeliness of reviewers for the past seven years is examined. (Data for 2002 and 2003 are included in this article to depict recent activity.) The figure shows the average review days overall along with the number of review days for the slowest 20 percent of reviewers. The results for JOSA A, JOSA B and Applied Optics were combined because they were similar. The average number of review days and the performance of the slowest 20 percent of reviewers for Applied Optics and JOSA A and B have improved during the past seven years. Optics Letters has remained reasonably steady.

The frequency of use of reviewers is shown in Fig. 2. As mentioned above, the number of reviewers who completed more than five reviews per year declined slightly between 1997 and 2000. However, the percentage of...
Reviewers who completed more than one review per year has increased since 2001. Reviewers for Applied Optics and JOSA A and B are contacted before papers are sent to them for review. Between 2001 and 2003, the number of potential reviewers who declined to review papers for Applied Optics was 40 percent, while the number of potential reviewers who declined to review papers for JOSA A and B was 43 percent. The percentage of reviewers who completed reviews after receiving a manuscript is shown in Fig. 3. Since Optics Letters reviewers are sent papers without being asked if they are willing to review them, OL has a lower rate of review completion.

Figure 4 shows the reasons cited by potential reviewers for not completing a review. Of the 10-15 percent of reviewers who did not complete a review after initially agreeing to, nearly 60 percent never responded to reminders or inquiries from OSA staff.

Recommendations

To improve reviewer satisfaction, the committee made the following recommendations:

- Journal editors should give reviewers more feedback on how the author responds to the review and whether or not the paper is ultimately published.
- OSA members and the optics community at large should be periodically reminded of the value the profession places on the peer review system.
- The OSA reviewer database should be further improved so editors can perform more effective reviewer searches.
- Web-based reviewer services and e-mail communication should be fully exploited.
- The manuscript management system should be designed to discourage overuse of reviewers.
- A modest reward system for reviewers should be considered.

Recognition of reviewers' contributions by means of automatic feedback is part of the present manuscript management system used for Optics Express and the Journal of Optical Networking. Based on the responses to the survey, the committee strongly supports extension of the feedback system to all OSA journals. Topical editors should strive to provide personal feedback to reviewers, especially when the paper is difficult to review, the review is of high quality or the reviewer is being overburdened. Public forms of recognition, such as annual lists of reviewers in journals and letters to reviewers' supervisors, should also be considered.

Reviewers should be informed prior to publication regarding editorial decisions on manuscripts. In addition, editors should respond to requests from reviewers that they be allowed to re-review an article after corrections have been made by the author. To ease the work of reviewing, before sending papers out for review, topical editors and OSA staff should ensure that the quality of the English is acceptable. Online access to references and an electronic reviewing system would also help reviewers. Reviewer rewards, such as page-charge reductions and speedier publication, should be introduced on an experimental basis, perhaps in just one journal. After a year, OSA could assess whether the rewards are, in fact, improving performance.

The results of the survey show how much reviewers and authors value peer review and demonstrate the extent of their commitment to it. This finding is consistent with the lack of significant change in average reviewer performance found from the study of OSA records.

The survey led the committee to suggest a number of enhancements to the peer review process that can be made by topical editors and by OSA. These improvements could lessen the burden placed on reviewers and give them a sense of how highly their work is valued.

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The survey results in their entirety are posted at www.osa.org/pubs/peer_review.

Paul Kelley (pkelley@tufts.edu) is retired from Tufts University and MIT Lincoln Laboratory. He has been the editor of Optics Letters. John Childs is the director of publications and Kelly Cohen is the director of manuscripts at OSA. Mark Dixon is associate professor of behavior analysis and therapy with the Rehabilitation Institute at Southern Illinois University.