



Education

How to Write An Effective Manuscript Review

BY DAVID H. BRAINARD

The editorial process serves two important functions. The first is to maintain high scientific standards for published papers. The second is to help authors improve their work. An effective review helps the editor decide whether the paper should be published and provides feedback to authors. Yet graduate training often includes little if any discussion of the review process. This column is intended to provide guidance for first time reviewers.

Review structure

There are many satisfactory ways to structure a review, but here is one suggestion. Begin with a short summary of the paper (1-2 paragraphs) which describes the scientific question being addressed, how the paper approaches the question, and what conclusions are drawn. The summary helps orient the editor and serves to assure the authors that you understood their basic points.

After the summary, give a general evaluation. This can also be quite short. Is the question interesting and important? Is the approach reasonable? Are the conclusions justified by the data? Does the work represent a significant advance? As an editor, I find it helpful if the review clearly

states an overall recommendation (e.g., publish with minor revisions, substantial revision required before possible publication, or reject).

Following the summary and evaluation, provide specific comments. These can come in several flavors. Sometimes you will have serious concerns about scientific correctness and the comments should explain the concern. In other cases, you will have a suggestion as to how the paper could be made clearer (e.g., some data could be replotted to good effect). Finally you may want to point out related literature that should be considered.

Standards

Perhaps the most difficult issue facing a novice reviewer is how to set the criterion for publication. Here, it is important to consider the big picture. After you have studied the paper and made critical specific comments, step back and ask whether you learned something worthwhile. If you did then perhaps others will as well, even when technical considerations limit the scope or security of the conclusions. Ultimately it is the editor who will make the judgment on borderline papers. If you are uncertain, then indicate explicitly what factors mediate your uncertainty.

Different journals publish different types of papers. For example, some journals target brief reports of recent discoveries while others seek thorough descriptions of mature work. If you are reviewing for an unfamiliar journal, browse a few issues to get a feel for what it publishes.

A spoonful of sugar

It is natural in a review to focus on the aspects of a paper that can be improved, and this often leads to a negative tone. A paper with no redeeming qualities is rare and it is usually possible to bring out the positive aspects in your overall evaluation. If you make a point of doing this, your review is more likely to be taken as constructive. Although reviews are typically anonymous, write as if the authors were aware of your identity.

It's the authors' paper

There are many issues, particularly at the forefront of knowledge, about

which there can be reasonable disagreement. Although it is fine to offer your opinion on such matters, you should not use your position as a reviewer to force your personal views into the paper. Along similar lines, a manuscript review is not the appropriate place to insist that the authors redesign their entire research program. You can make suggestions for future research, but the focus of the review should be the evaluation and improvement of the paper in hand. Finally, you will often review papers on topics related to your own research. You may be tempted to require that the authors cite your work. If you cannot resist this temptation, at least recognize your bias and make the suggestion with a soft touch.

Miscellaneous advice

Authors tend to assume that if they address or refute all of your points, then you will judge the revision acceptable for publication. Do your best to make your review meet this expectation. Thus, if the fundamental reason you are opposed to publication is that the paper is not novel or significant, be sure to say so explicitly, in addition to commenting on any technical concerns. You should also try to be thorough. In my experience a typical review takes about two single spaced pages, but longer reviews are quite common.

If possible, provide a page number for each specific comment and detail what would need to be done to address it. If you also number your comments it is easier for the authors to refer to them in a response. Identify which of your comments are major points that must be responded to in a revision and which ones raise minor points. When suggesting literature that should be considered, provide the citation.

At some point, you may find yourself reviewing a paper in which you are unable to follow every detail of a derivation. This does not disqualify you from reviewing the paper, but you should identify in the review the portions you did not understand and venture a guess as to whether the problem was with the presentation or due to a gap in your

own technical expertise.

Make sparing use of confidential comments to the editor. Confidential comments are appropriate if you want to alert the editor to a personal bias or offer advice about whether a revision would require re-review. But it does not help the editor justify a decision if you say confidentially that you do not believe the results and then provide only minor comments to be conveyed to the author.

Obligation to review

You are under no obligation to agree to review every paper for which your opinion is solicited. But once you agree, you should strive to return your review in a timely manner. Do keep in mind that you benefit from the reviews of your own work, so that you have an obligation to do your share of reviewing. A rule of thumb is to provide at least as many reviews as your own papers consume.

In some cases you may agree to review a paper and then discover upon closer reading that you do not feel qualified to evaluate it. In such cases it is important to contact the editor as soon as possible. He or she may decide to seek another reviewer or ask you to evaluate only those aspects of the paper that fall within your area of expertise.

Ethics

The Optical Society of America provides guidelines for ethical practice in the publication of research, as do many other professional societies. These guidelines are published periodically in OSA journals and include a description of the obligations of reviewers. Space prohibits a complete summary here, but it is worth emphasizing that you should be alert to potential conflicts of interest. For example, if the author is a close collaborator you may not be able to evaluate the work objectively. If in doubt, discuss the matter with the editor before taking on the review. It is also helpful to notify the editor if you have already reviewed an earlier version of the paper for another journal.

Acknowledgments

As I noted at the start of this column, a key function of reviews is to help authors improve the quality of their work. Thus I would like to end by thanking the following individuals who provided suggestions or feedback on early drafts: Glenn Boreman, Paul Callan, Kelly Cohen, Aaron Ettenberg, Jim Fienup, Norma Graham, Denis Pelli, and Sabina Wolfson.

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many different claims as possible, since these serve as "hooks" to snag potential infringers. While infringement may be easy to avoid for one type of claim, it may be very difficult to avoid for a claim of another type.

A case in point is apparatus claims vs. method claims. As mentioned above, a properly drafted method claim has very few, if any, apparatus limitations. Thus, where the apparatus claim will be limited in scope by the recitation of elements making up the invention, a method claim is only limited in scope by the steps recited in carrying out the method. These two types of claims can be complementary, so that where avoiding infringement of one may be easy, avoiding infringement of the other may be very difficult. In Amazon.com's case against Barnesandnoble.com, the judge did not examine the underlying software code or "how" the ONE-CLICK® patent was implemented. Rather, it was the *method* of ordering using a single click, without regard to the specific software implementation or computer "apparatus," that served as the basis for the preliminary injunction.

The 4-dimensional invention

The point of this month's column is that a single invention can be viewed as and claimed up to four different ways relating to the "types" of inventions as defined in the patent statute. Accordingly, every invention should initially be viewed four-dimensionally. Some inventions will only be claimable as a single type, while others will be claimable as several types. By remembering this point, a particular invention can be developed and patented in a manner that covers as much IP space as possible and that increases the probability of it providing value, *i.e.*, preventing others from making, using, selling or importing the invention without permission from the patent owner.

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