

How to Review a Scientific Paper

by Barak A. Pearlmutter

Purpose of this document: This document is intentionally brief. It is intended as a combination checklist and reminder. For more complete overviews of the review process, see the delightful document linked to in the acknowledgments, and the references therein.

This guide is not meant to be a straight-jacket, but rather something to turn to when you don't know how to start writing your review, or to check when you're not sure whether you've finished it.

What is in a review?

A scientific review consists of two parts: a confidential *cover letter* and the anonymous *referee's report*.

- The *cover letter* is addressed to the journal editor, and contains information that will not be forwarded to the authors. This includes:
 - ✓ your name.
 - ✓ the paper's title, authors, and code number.
 - ✓ a recommendation (*accept, reject, etc.*) and brief justification.
 - ✓ *No sneak attacks!*

The cover letter is also the place for you to

- ✓ describe your *expertise* in the subject area, especially if the paper is not in precisely your own line of research.
- ✓ say how *confident* you are of your views of the paper.
- ✓ mention how much *time* you put into this review.
- ✓ if you did not *actually check equations* in the paper, this is the place to say so.
- ✓ remind the editor of any potential *conflicts* of interest you may have (naturally you mentioned these earlier, before agreeing to review the paper!)
- ✓ *acknowledge* anyone who helped you with the review.
- ✓ include personal correspondence with the editor.

The recommendation belongs in the cover letter, rather than the review proper, because then your review can be forwarded to the author directly, without editing, even if your recommendation is not followed.

- The *referee's report* is usually forwarded to the authors, and sometimes to other reviewers. It can typically be divided into a number of sections:

Summary: summarizes the paper succinctly and dispassionately. This is not the place to criticize, but rather to show that you understood the paper, and perhaps discuss how it fits into the big picture.

General comments: gives the big critical picture, before sinking into the details. This is the place to take a breath, keep your perspective, and explain what the papers weaknesses are and whether they are serious, or intrinsic to our current state of knowledge, or whatever.

Constructive criticism: not only of technical issues, but also organization and clarity.

Table of typos and grammatical errors, and minor textual problems: It's not the reviewer's job to copy edit the paper, so don't go out of your way to look for typos. And if the paper is a complete mess, just say so---but please be charitable, especially if English is not the author's native language.

Reviewer Guidelines

How to Review a Journal Article: Suggestions for First-Time Reviewers and Reminders for Seasoned Experts

By *Vern L. Bengtson*, University of Southern California, and *Shelley M. MacDermid*, Purdue University

Guidelines for Reviewing

Here are 9 things you should consider as you examine the manuscript and write your review:

1. Look for the "**intellectual plot-line**" of the article. You can do this from first skimming through the manuscript and then giving it a once-over read. As you do this, ask the five major questions that are central to the research review process:
 - a. What do the researchers want to find out?
 - b. Why is that important to investigate or understand?
 - c. How are the researchers investigating this? Are their research methods appropriate and adequate to the task?
 - d. What do they claim to have found out? Are the findings clearly stated?
 - e. How does this advance knowledge in the field? How well do the researchers place their findings within the context of ongoing scholarly inquiry about this topic?
2. **Look at the organization of the article.** Can you find answers to the above questions quickly and easily? Can you trace the logic of investigation consistently from the opening paragraphs to the conclusion?
3. Then **go back to the opening paragraphs of the article.** Are the research questions specifically stated? Is it clear what the authors want to find out? Do they make the case that this is an important area for research inquiry?
4. The next section is usually **a review of the existing research literature on this topic.** Do the authors present a convincing line of argument here--or does it appear that they are just name-dropping (citing sources that may be important, without a clear underlying logic for how they may be important)? Do the authors focus on ideas, or merely on discrete facts or findings? Have they given sufficient attention to theory--the cumulative attempts at prior explanations for the questions they are investigating? Are the research questions or hypotheses clearly derivative of the theory and the literature review? In short: How well do the authors set the stage for the research problem they are reporting?
5. The **methods and procedures section** is usually next; and this is where neophyte reviewers often start (unwisely) to sharpen their knives. The selection of methods by which the researchers collect data always involve compromises, and there are few studies that cannot be criticized for errors of commission or omission in terms of textbook criteria for research design and data collection procedures. You could focus on three questions here:
 - a. Do the authors clearly describe their research strategies? Do they present sufficient detail about the sample from which they have collected data; the operationalization of measures they have attempted to employ; and the adequacy of these measures in terms of external and internal validity? In addition, there should be no surprises here: The measures should be clearly matched to the research questions or the hypotheses.

- b. Are their choices of methods adequate to find out what they want to find out in this study? Would other methods provide a substantial improvement; if so, would employing these methods be feasible or practical?
 - c. Do they provide some justification for the methods they have chosen? Does this appear to be adequate?
6. The **section presenting research results** is surely the heart of the article--though not its soul (which the reader should find in the opening paragraphs and in the discussion section). Reviewers might consider four questions here:
- a. Does the results section tell a story--taking the reader from the research questions posed earlier to their answers in the data? Is the logic clear?
 - b. Are the tables and figures clear and succinct? Can they be "read" easily for major findings by themselves, or should there be additional information provided? Are the authors' tables consistent with the format of currently accepted norms regarding data presentation?
 - c. Do the authors present too many tables or figures in the form of undigested findings? Are all of them necessary in order to tell the story of this research inquiry; or can some be combined? Remember that tables and figures are very expensive (from the standpoint of the journal) and that undigested data obscure rather than advance the cumulative development of knowledge in a field.
 - d. Are the results presented both statistically and substantively meaningful? Have the authors stayed within the bounds of the results their data will support?
7. The **discussion section** is where the authors can give flight to their findings, so that they soar into the heights of cumulative knowledge development about this topic--or crash into the depths of their CV's, with few other scholars ever citing their findings. Of course few research reports will ever be cited as cornerstones to the development of knowledge about any topic; but your review should encourage authors to aspire to these heights. Consider the following as you evaluate their discussion section:
- a. Do the authors present here a concise and accurate summary of their major findings? Does their interpretation fairly represent the data as presented earlier in the article?
 - b. Do they attempt to integrate these findings in the context of a broader scholarly debate about these issues? Specifically: Do they integrate their findings with the research literature they presented earlier in their article--do they bring the findings back to the previous literature reviewed?
 - c. Have they gone beyond presenting facts--data--and made an effort to present explanations--understanding? Have they responded to the conceptual or theoretical problems that were raised in the introduction? This is how theory is developed.
 - d. Do the authors thoughtfully address the limitations of their study?
8. The **writing style** is important. Consider the three guidelines for successful communication--to be clear, concise, and correct---and whether the authors have achieved it:
- a. Is the writing clear? Do the authors communicate their ideas using direct, straightforward, and unambiguous words and phrases? Have they avoided jargon (statistical or conceptual) that would interfere with the communication of their procedures or ideas?
 - b. Is the writing concise? Are too many words or paragraphs or sections used to present what could be communicated more simply?
 - c. Is the writing correct? Too many promising scientists have only a rudimentary grasp of grammar and punctuation that result in meandering commas, clauses in complex sentences that are struggling to find their verbs and adjectives or even nouns that remain quite ambiguous about their antecedents in the sentence. These are not merely technical issues of grammar to be somehow dealt with by a copy-editor down the line. Rather they involve the successful communication of a set of ideas to an audience; and this is the basis of scholarship today.

9. **Your evaluation to the editor:** Should this paper be (a) rejected for this journal? (b) or does it show sufficient promise for revision, in ways that you have clearly demonstrated in your review, to encourage the authors to invest weeks and months in revision for this journal?

Your bottom-line advice to the editor is crucial. Make a decision; state it clearly (in your confidential remarks to the editor on the page provided).

Remember that only a few of the articles submitted to a journal will result in publication. Rates vary from 5% to 25% of initial submissions (for *JMF* it has averaged 15% over the past few years).

Some reasons to reject a manuscript: (a) The research questions have already been addressed in prior studies; (b) the data have been collected in such a way as to preclude useful investigation; (c) the manuscript is not ready for publication--incomplete, improper format, or error-ridden. Most rejected articles do find a home in other journals. Don't tease authors with hopes for publication in this *Journal* if you feel it is not likely.

Good Reviews and Bad Reviews

A good review is supportive, constructive, thoughtful, and fair. It identifies both strengths and weaknesses, and offers concrete suggestions for improvements. It acknowledges the reviewer's biases where appropriate, and justifies the reviewer's conclusions.

A bad review is superficial, nasty, petty, self-serving, or arrogant. It indulges the reviewer's biases with no justification. It focuses exclusively on weaknesses and offers no specific suggestions for improvement.

Note:

Peer-Review

peer (noun)

1. a person of the same legal status: a jury of one's peers.
2. a person who is equal to another in abilities, qualifications, age, background, and social status.
3. something of equal worth or quality: a sky-scraper without peer.