

Special Article

How to Review a Scientific Article?

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Introduction:

Article in a scientific journal is one of the most important way of communication with reader and author. A critical review evaluates the clarity, quality and originality of research, as well as its relevance and presentation.¹ Like any skill, the art of reviewing manuscripts is one that improves with practice. Although a person is not born with the knowledge or ability of how to be a good reviewer, the characteristics (e.g., fairness, thoroughness, integrity) of that person certainly contribute to the activity.² A good review carefully analyzes an article's strengths and weaknesses before assessing its overall value. Black and colleagues have suggested that quality of authors might be improved if journals trained their reviewers.¹

The quality of reviews of scientific articles submitted for publication varies widely¹.

There has been substantial recent interest in the quality of the peer review system in biomedical publication, with several International Congresses. Some of us have learned by doing reviews, by fielding reviews of our own submissions, and by comparing own reviews with other reviews of the same articles.³ The main purpose of a scientific paper is to identify issues and ethics of the review process, not to provide a comprehensive set of guidelines for all aspects of the review process.

During submitting a paper, the author is asked to fill out contact details and area's of expertise and/or keywords. Journal editors can screen the journal database for potential reviewers with research expertise matching that of the paper.⁴ The editors of peer-reviewed journals supply "Instructions to reviewers" and/or evaluation forms to structure the reviewer's comments.

The purpose of review

- to inform the editors whether the paper is suitable for publication or not.

- to identify any faults with the current paper (technical and presentational).
- to confirm that this is an original work.
- to give constructive feedback to the authors so that the author can modify as per reviewers comments.

A scientific review consists of two parts⁴:

- A confidential *cover letter*
- 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 which includes:

- the reviewer's name
- the paper's title and code number.
- a recommendation with brief justification (accepted, rejected or accepted after modification).

The cover letter is also the place for the reviewer to

- describe expertise in the subject area, especially if the paper is not in precisely his/her own line of research.
- say how *confident* reviewers about the views of the paper.
- mention how much time a reviewers can place into this review.
- if he/she did not actually check equations in the paper, this is the place to say so.
- remind the editor if there is any potential *conflicts* of interest present in the paper (naturally mentioned these earlier, before agreeing to review the paper!)
- *acknowledge* anyone who helped with the review.
- include personal correspondence with the editor.

The recommendation belongs in the cover letter, rather than the review proper.

The Referee's report (Anonymous)⁴

It 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 reviewer could understand 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 explain what are the weaknesses of paper and whether authors are serious, or intrinsic to 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 is not the reviewer's job to edit the paper, so do not go out 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.

The challenge to the reviewer is to see what the authors themselves have not seen. It requires scientific expertise of two main sorts,

1. awareness of the literature, i.e., being right up to date, and knowing the old stuff and
2. mastery of the relevant science, i.e., being able to apply and relate scientific principles and findings to the new science.

Reviewer's Responsibilities:

It is important to remember that a reviewer is asked to provide an informed opinion about a manuscript. The decision whether the manuscript will be published is made solely by the editor. Thus the editor must be able to discern very precisely the reviewer's thoughts and weigh that opinion with or against those of the other reviewers and his/her own.

The responsibilities of a reviewer can be summarized as follows⁵

1. The reviewer should provide an honest, critical assessment of the research. The reviewer's job is to analyze the strengths and weaknesses of the research, provide suggestions for

improvement, and clearly state what must be done to raise the level of enthusiasm for the work.

2. The reviewer should maintain confidentiality about the existence and substance of the manuscript. It is not appropriate to share the manuscript or to discuss it in detail with others or even to reveal the existence of the submission before publication.
3. The reviewer must not participate in plagiarism. It is obviously a very serious transgression to take data or novel concepts from a paper to advance authors own work before the manuscript is published.
4. Reviewer should always avoid or disclose, any conflict or interest. The reviewer should also avoid biases that influence the scientific basis for a review.
5. The reviewer should accept manuscripts for review only in his/her areas of expert. It is unfair to the authors and to the overall review process if the referee does not have the expertise to review the manuscript adequately.
6. The reviewer should agree to review only those manuscripts that can be completed on time. The reviewer also has the unpleasant responsibility of reporting suspected duplicate publication, fraud, plagiarism, or ethical concerns about the use of humans in the research being reported.

Review Process

Journal articles can be challenging to read. As a reviewer, read it carefully and try to identify the following for each part of the article:

Title

This provides the first impression to the reader. Title should correctly represent the content and extent of the study reported and should not be misleading. It should be clear, concise and informative. It should contain keywords, that capture attention of reader. Try to avoid long titles and the lengths of the title is recommended between 10 -12 words⁶.

Abstract

The abstract is one of the most central elements of a scientific article An abstract must describe the purpose of an article. The abstract is typically followed by key words. A reviewer should check the answering of the following questions in their review:

- What topic are the authors studying?

- What was their primary finding?
- What are the practical implications of this research work?

Introduction

The purpose of the introduction is to stimulate the reader's interest and to provide background information which is pertinent of the study. The statement of the research questions is the most important part of the introduction. It is sensible to write the introduction in a form of logical funnel, where more general information are told first and sentence-by-sentence the text should proceed into narrower detail. A reviewer should check the following content of the introduction during review⁷:

What is known or unknown about the topic?

What are the findings of the relevant studies?

What is the importance of the topic?

What about the specific research question/hypothesis? Is it clearly defined and appropriately answered?

Literature Review

- What are the most important past findings on this topic?
- How have these past studies led the authors to do this particular study?

Methods

- Who were the participants in this sample? What makes them unique?
- Is the sample size sufficient for the entire population? If not, how are they different?
- Is the Study design compatible with the objectives of the study?
- Is the study qualitative (based on interviews, ethnography, participant observation, or content analysis), quantitative (based on statistical analysis), or multi-method (includes both qualitative and quantitative analysis)

Results

- What were the authors' main findings? Does it answer the research question?

Please note: Reviewers are not expected to be able to read the tables/graphs or to understand the numbers provided by the authors. Instead, he/she should focus on the text of the results section.

Discussion/Conclusion

- What were the authors' overall findings?
- Why were these findings important?
- What limitations of the study do the authors identify (if any)?
- What suggestions for future research do the authors make (if any)?

As a general check-list, consider the following points (taken from the BMJ website)⁸:

- Is the paper important?
- Is the work original? Does the work add enough to what is already in the literature?
- Is there a clear message?
- Does the paper read well and make sense?
- Is this journal the right place for this paper?
- References — are they up to date and relevant?
- During first reading: Reviewers make notations on the text, in the margins, or on the backs of the opposite pages. These include broad and narrow, substantive and trivial issues, citations that he/she wants to check, and to run something by. The reviewer may pose questions which may be resolved later in the paper.
- During second reading: review the front-page lists, notations, and relevant parts of the text.
- Then proceed to make judgments; the ultimate outcome, i.e., acceptance or rejection.

The Write-UP²

- The **summary**, in three or four sentences, identifies the topic of the study, indicates the basic approach, selects the main findings, and paraphrases the authors' main conclusions.
- Then list several **main criticisms/questions** in descending order of importance. These are selected from among the list on the front page.
- Consider recommending a major revision if you feel the paper would become acceptable for publication if your suggestions are adequately addressed. If you feel that the manuscript would be insufficient for publication even after revision, e.g. based on limited novelty, rejection would be more appropriate.
- Finally, indicate and characterize the **recommendations**, e.g., "This is a novel idea", worth inviting major revision.

As a reviewer, it is your task to objectively assess the strengths and weaknesses in a manuscript, provide constructive criticism and list suggestions for improvement.

How does the review process work? ^{8,9}

- The editor and ultimately editorial board decide on the fate of the manuscript.
- After a manuscript is assigned to an editor, it is read by the editor and he or she decides if the paper is sent out for peer-review.
- Occasionally, a triage review is commissioned, where an external reviewer is asked for an opinion.
- Reviewers are invited and receive an abstract of the manuscript. Usually, 2 or more reviewers are sought.
- After acceptance of the invitation for review, reviewers receive the full manuscript. If a reviewer then discovers that he or she is not suitable for the review the manuscript then he/she can return that article to the editor.
- The reviewers write their reviews. Usually, this consists of a) filling out a form with scores (for novelty, technical excellence, appropriateness of manuscript preparation, etc.), b) comments to the authors, and c) comments to the editor.
- After the editor has received the reviewer comments, he may decide to commission another reviewer, particularly if reviewer’s opinions are contradictory or if there is a need for specific expertise, e.g. additional review by a statistical expert.

- After all reviews have been completed, the editor and editorial board decide to either a) accept the manuscript, b). accept the manuscript after (minor) revision, c).reject the article, but invite to revise the manuscript, or d) reject the manuscript.

Typically, an advice regarding overall priority for publication and/or acceptance is asked for, which is blinded to the authors. Reviewer has the opportunity to provide both “confidential comments to the editor” and “comments to be shared with the authors”.

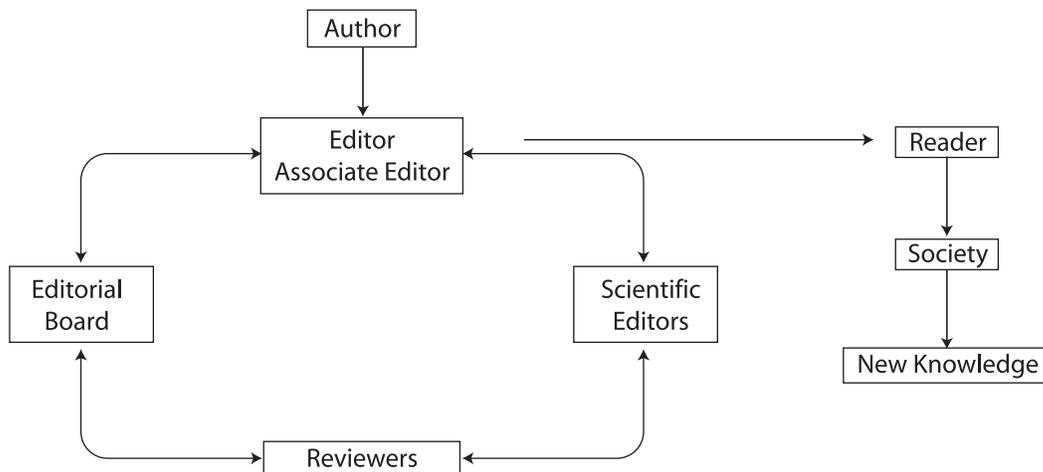
An editor generally reserves the right to edit reviewer comments to the author. Over-enthusiastic compliments may be removed if the editor eventually decides to reject the paper. Also, the editor may pass reviewer comments to the authors if he/she feels this is appropriate. If a manuscript is resubmitted after revision, it is usually resent to the original reviewers.

A reviewer’s identity is never revealed to authors or other reviewers ¹⁰.

Important points which are essential to keep in mind in reviewing:

- *Be kind.* Even a ‘bad’ paper has generally required substantial investment of time and effort by the authors. Reviewer should not be tempted to make unkind remarks.
- *Be fair.* Reviewer should try to objectively critical. He/she should not hesitate to identify flaws in the manuscript, but keep an eye for balancing criticism with potential strengths of the manuscript, technical limitations and the nature of the journal.

Function of reviewers



- *Be concise.*
- *Be 'action-able'.* Reviewer should provide practical suggestions for textual changes or additional experiments which would improve the manuscript better than simple criticism.
- Line-by-line comments on grammar are not necessary;
- Timeliness in the completion of review is essential. Kindly extend the courtesy of informing the editor immediately if he/she cannot review the manuscript in the allotted time
- Respect that the manuscript is a privileged communication, is confidential, and for eyes only; Please always keep confidentiality in mind.
- Each scientific journal has printed standards and protocols that must be followed.

If reviewers seriously question his/her ability to review the manuscript,⁸

- If feels too inexperienced, then he/she may consider accepting the review and asking a more experienced colleague to assist him with the review. Also, it is an excellent way to learn how to peer-review an article by first assisting colleague in their reviews.
- Contact the editor if there is any question arises.

Conclusion

Reading scientific articles with a critical eye requires specialized skills and techniques which may be learned with practice. Good reviewers have a resolute sense of responsibility to their colleagues and a strong conviction that the archival literature, with high standards set by peer review is critically important to the progress of science.

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