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## The Peer Review Process - a Tutorial

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### Abstract

Peer reviewers play a crucial role for scientific journals today. The review process is a critical view on the submitted work and should be evaluated by peers within the same scientific area. The experts perform this task outside normal working hours and will typically receive no compensation. The task is to improve the articles' quality prior to publication.

The objective of this tutorial is to describe the peer reviewer process and provide a practical framework for current and future peer reviewers.

### Introduction

The peer review is perceived as a critical assessment on novelty, methodology, knowledge, and skills performed by peers working within the same or related scientific area. It is widely used and accepted by journal editors who invite experts in the same field to assess and critique the scientific research before publication. The peer review process has in many decades been perceived as the *gold standard* and is an unpaid task (1, 2). The first scientific journal which used a form of peer review was launched in 1665 by the Royal Society in London (3), however the peer review process was more like a sorting process meant to choose which of the submitted articles should be published without an evaluation of the

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quality of the manuscripts. Peer review, as known to today began in the middle of 1970s and has become the standard or norm within a short period of time (4). Currently, many journals find it increasingly difficult to find peer reviewers to perform this task (5). Many journals provide online guidelines on their website to help reviewers, but it is up to the reviewer to find and spend time to learn each individual journal guidelines. No international guidelines exist (6), and it can be a difficult task to become a reviewer and provide high quality peer review. Peer reviewers are most often self-taught.

The most common reason for retraction of papers was compromising peer review (7) e.g. bias such as gender, affiliation (8-10) self-citation request (9-11) and methodology (12). Meaning that the reviewers in some cases requested specific references to be included in the paper, to highlight their own work. In general, this is perceived as inappropriate behavior. Furthermore, reviewers may be less critical towards a paper if the paper is submitted by a person from their own institution or department. Another reason why it is highly recommended that reviewers are blinded for author information.

Marcoci et al (2022) highlights editors' difficulties to find experts reviewers (13). Although it may be commonly believed that a skilled author will always be a competent reviewer, this is not always the case (14). Jauregui et al (2022) found in a survey that 15 % of the respondents used a template for feedback to authors (15). Hosseini and Horbach (2023) found the use of ChatGPT to play a part in the review process as they may provide higher quality review and address the current problem many journals currently faces with reviewer shortage (16). Types of peer reviews are listed in Table 1.

After a scientific manuscript is submitted to the journal, the editor or perhaps the editor-in-chief evaluates to ensure compliance with journal guideline. If assessed within the journal aim and scope and contributes with novelty to the existing literature, the editor will send the manuscript to qualified reviewers. Several factors influence the selection of reviewers, including area of interest and expertise, availability, and track record. It should be avoided to overburden frequently reviewers, as this could affect the reviewer's motivation to perform reviews for the journal. Typically, reviewers will be selected from the journals database. Some journals also requires that the authors suggest potential reviewers, but it will always be up to the editor to select to whom the invitation is sent to. The Editor sends an invitation to reviewers by e-mail including a deadline. Two up to 4 reviewers per manuscript is normal for editors to invite. It is also possible for reviewers to volunteer by writing to the editor-in-chief of a journal. The editor will take the comments from all the invited reviewers into account, before any decisions is done; acceptance without any revisions (this is very seldom), minor or major revisions, or rejection. If the manuscript needs to undergo major revision, the editor will provide a deadline to resubmit. The changes need to be highlighted in the resubmitted version of the manuscript. The deadlines can vary significant form journal to journal often from 14 up to 90 days.

**Table 1.** Types of peer reviews

Type of Peer review	Degree of anonymity
Single-blinded peer review	Only the reviewers are anonymous
Double-blind peer review	Authors and reviewers are anonymous
Open peer review	Names of authors and reviewer are disclosed, and the reviewers' comments are published with the article.

## Why become a reviewer

Some reviewers feel that they have an academic duty, as they also submit articles that will be reviewed by others. Other are reviewers to keep up to date with the latest development in their field (17). Another advantage is getting a certificate and the opportunity to include reviewing work on the resume as evidence of service to the profession. Some publishers offer free access to journals and/or discount for book purchase to reviewers as a token of gratitude. Figure 1 illustrates different requirements one should reflect on when deciding to review a manuscript, and one should respond positively to at least two requirements.

## How to peer review

When you receive the invitation to peer review a manuscript start by reading the included abstract to understand if you can accept the task. Then read the journal guideline and follow their advice and criteria e.g., some journals ask a rating score of the manuscript. Read the manuscript more than one time, before you make a decision.

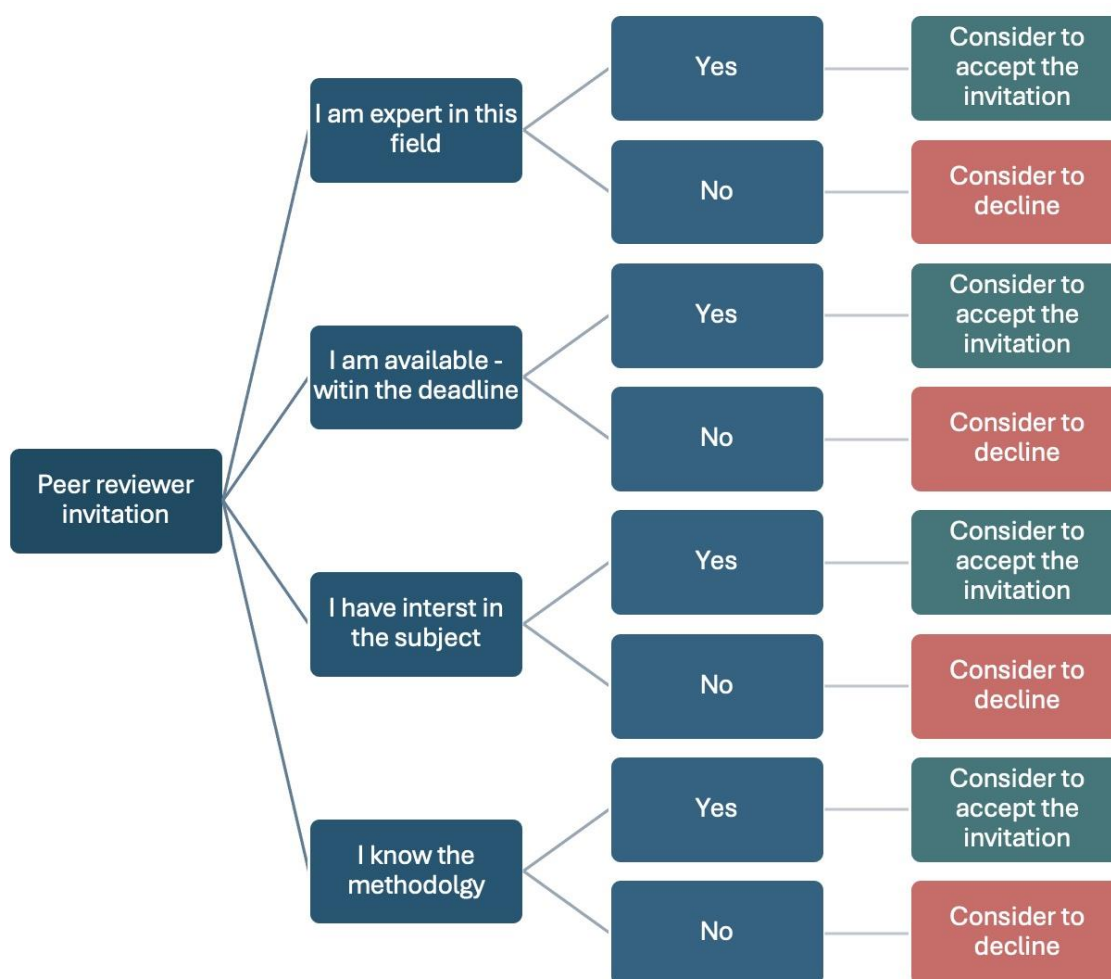
The report to the editor should start with a couple of overall comments on the manuscript concept, novelty, your personal assessment. The peer reviewers' comments help the editor to perform decision making on publication (18, 19). The review comments should be stated in a positive and constructive way and avoid any inappropriate comments to the author(s).

The report may include the following checklist:

- ✍ Is the paper interesting? Is the title and manuscript length appropriate?
- ✍ Is there a clear aim? Is it relevant, interesting, or novel?
- ✍ What does this paper add to the scientific topic?
- ✍ Is the manuscript well written, in English grammar?
- ✍ Does the introduction highlight why there is a need for this manuscript, i.e., is the rationale well described?
- ✍ Is the methodology appropriate, clear, and replicable? Is the data sufficient?

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- ✍ Do the tables and figures add relevant value to the manuscript?
- ✍ Is there an ethic approval section?
- ✍ Are there any factual errors or invalid arguments?
- ✍ Does the data support the conclusion?
- ✍ Does the manuscript include a strength and weakness section?
- ✍ Are the references appropriate, valid, and up to date?
- ✍ What do you recommend? Rejection, major or minor revisions or acceptance?

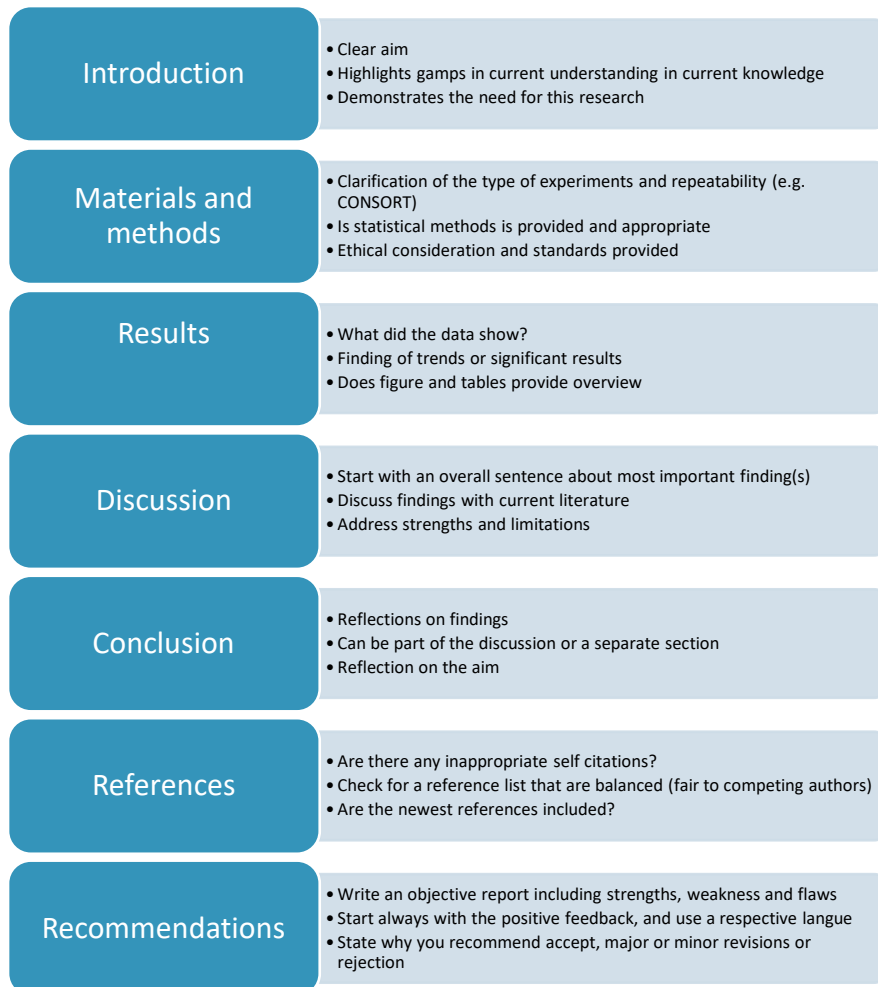


**Figure 1.** Decision tree to accept or decline reviewer invitation.

Many journals provide a check list for reviewer. Song et al (2021) investigated number of check list items suggested by journals between none up to 65 items (6). Figure 2 provides outline and recommend check list for reviewer. Furthermore, is may also be advised that the reviewer is aware of the manuscripts follow standard reporting guidelines e.g., consolidated criteria for reporting qualitative research (COREQ) (20).

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Clase and colleagues (2022) published a paper recommending peer reviewers to show kindness and provide supportive reviews (21). They found that peer review often lacks constructive and positive feedback to the authors, and often unhelpful feedback is given to authors often based on the reviewers' own style and preference. On the webpage to Annals of Internal Medicine, a short information video about how to peer review can be viewed (<https://www.acpjournals.org/journal/aim/reviewers>) (22). Winck et al (2011) stated that one of the reviewer main tasks is to provide a collegial and constructive feedback (1) and helpful perspectives to the authors.



**Figure 2.** Checklist on what to consider in each manuscript section.

## Discussion and conclusion

What makes good criteria to choose expert as peer reviewers in journals? The journals have various criteria, and it is often possible to be added to the journals reviewer database by applying to the journal website or e-mailing the editor-in-chief. Formal criteria have been suggested such as first authors ships in at least five articles (23), but this approach may exclude many experts and should be used carefully.

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The English language is often a challenge for non-native speakers. Reviewers are not expected to correct spelling or language mistakes, but rather provide an overall assessment by advising authors to have the manuscript checked by a native speaker (24), or use the journal's editing service if available. Peer review needs to be an awarding task and journals have started with sending annually reviewer certifications, continuing medical education (CME) credits, providing open online reviewer databases, or open credits through the database Publons/Web of Science (25). Furthermore, it is important that the reviewer has some knowledge about the subject being investigated in order to have constructive feedback about appropriate valid references including up-to-date references. References are often not being addressed by reviewers.

The peer review process is not perfect. Herron (2012) investigated reviewers' ability to find errors in manuscripts and found they averagely identified 1/3 of errors (26). The reviewers should always consider if they are the best choice to review a manuscript. If not they can propose a more suitable reviewer to the editor. Tandon highlights that the reviewer also needs to take into account if they are committed to provide a thorough review (27), as it can be a time-consuming task.

Editors are responsible for identifying the expert reviewers, but the pool of reviewers are often limited (25). Reviewers must spend time on the specific journal guideline on how to assess a manuscript as a peer reviewer. We recommend the peer reviewer to incorporate the journal's checklist and templates during the peer review process. It is important to keep in mind that reviewing scientific manuscripts is a privilege and a responsibility. Remember that the review process is confidential(ly), and it is not allowed to share or disclose any information.

## **Statements and Declarations**

### **Competing Interests**

The authors declare that there are no conflicts of interest regarding the publication of this article.

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