An Introduction to Peer Review

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General Information

This work is an output from the PLOTINA Project: Promoting gender balance and inclusion in research, innovation and training.

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Glossary of Terms

COPE: Committee on Publication Ethics, a membership body dedicated to educating and supporting editors, reviewers, authors and publishers concerning ethical and professional codes of publishing conduct.

COPE: Committee on Publication Ethics. An organisation committed to educating and supporting people involved in publishing, including peer reviewers, towards adoption of ethical practices.

Declined/Rejected: Submission, generally to a journal, will not progress any further through review or towards publication. May occur after the initial submission, or as a consequence of peer review.

Editor: Individual commonly, but not always, tasked with coordinating and benefitting from the advice emerging from the peer review process.

EASE: European Association of Science Editors.

HSS: Shorthand for humanities and social sciences disciplines.

Peer Review: Critical review of documents by experts external to the authoring and editorial processes.

Peer Reviewer: An individual, and nominal expert in the field of inquiry, who conducts the process of peer review, often at the instigation of an editorial team or research funding organisation.

Publons Academy: A practical online peer review training course, targeted at early career researchers.

Quality Assurance: With respect to peer review, the act of ensuring that a publication, grant proposal or conference represents a sufficiently acceptable piece of work, through expert scrutiny.

STEM: Shorthand for the scientific and commonly quantitatively based disciplines, e.g. science, technology engineering and medicine.

Introduction

> *Peer review is sometimes referred to as the "Gold Standard" of scholarly journals; it is the system by which a research article is reviewed by independent experts (the author's peers) to help the Editor-in-Chief reach a decision on publication. Although the system has been much criticized for its potential to introduce bias and unfair behaviour by reviews, and to delay publication, no one has yet come up with a better system.*
>
> (Morris et al, 2011)

The process of documents, research proposals and other scholarly work being reviewed by other people, beyond the authors' immediate colleagues, ensures any material finally produced has attained a sufficient standard of quality. This forms what is termed the peer review process and is a fundamental part of the activities involved in identifying and publishing new research findings in most fields of inquiry. Peer review plays an especially key quality assurance role in the selection of work to be published in scholarly journals and for assessing grant proposals for research funding. Many monographs and collected works also undergo elements of peer review before they see publication. Nevertheless, the peer review process also provides authors with useful feedback intended to help improve the quality of their written work alongside serving to assist in developing their scholarly voice.

This booklet is an output from the PLOTINA (Promoting gender balance and inclusion in research, innovation and training) Project, and in particular the Summer School on Peer Review, hosted by the University of Warwick in 2018 (PLOTINA, 2018a; Tzanakou, 2018). Like the summer school, this booklet represents a brief guided introduction to the concepts of peer reviewing, and discusses the associated practical processes, along with offering advice on dealing with some of the related challenges. It is particularly aimed at helping early career researchers (ECRs) who may be new to such activities, thinking or the practical aspects which are involved in contributing to an effective and professional review process. Notably, while we do refer to various uses of peer review, this guide's principal focus is on peer review within academic publishing.

This text is structured to firstly guide readers through the definition of what is meant by peer review, before considering its benefits and then practical processes involved. Next it turns to examine questions of ethics and diversity, before exploring some of the criticisms directed at peer review practices. Finally, it considers the effective approaches which can be taken by authors in responding to reviewers' comments on their own work.

> As well as providing an overview of the issues around peer review, throughout this booklet, we've highlighted in boxes like this, various some quotes, comments and insights from the literature. We've also included some material from additional contributors with a particular interest in supporting good peer review practice. We especially hope inexperienced peer reviewers find these insights useful.

Defining Peer Review and Understanding Its Role

> **What is Peer Review?**
>
> Peer review is the quality control of published research and has become the standard across the academic publishing industry. In order to decide if a new piece of research should get published in their journal, editors will find qualified reviewers to scrutinise the work and help them make a decision. Peer reviewers are researchers who have published in the same area of research as the authors of the manuscript under consideration and are deemed experts in the field.
>
> Julia Mouatt, Publons

There are numerous definitions of what peer review means. For example, according to the International Committee of Medical Journal Editors, peer review represents *'the critical assessment of manuscripts submitted to journals by experts who are not part of the editorial staff'* (Hames, 2007: 1). Gill (2017) conversely offers a rather suggestive metaphor for describing this process, stating that:

> *…a paper or a poster presented at a conference can appear like a rough block of marble; made of strong stuff, but unfinished and coarse. Good peer review is like a sculptor, chipping away at the unnecessary parts, sanding the rough edges and buffing it out to a high shine, ready to be admired by the world.*

Thus, peer review is a process wherein a scholarly work or grant proposal undergoes critical scrutiny by, ideally, objective experts, external to the author and their collaborators or institutional colleagues. Such reviews provide a crucial element of quality assurance which serves to inform and empower editors and awarding committees to, respectively, publish and support high quality research. Helpfully, Hames outlines the range of key functions which peer review should as a minimum deliver in any academic application (Table 1).

Table 1: Essential Peer Review Functions

- Prevent work which has been poorly conceptualised, designed, or executed from being published, and hence improve the publication's quality and readability.
- Check the design and methodology underlying the reviewed research.
- Ensure reported results have been correctly and completely interpreted and that they are not too speculative.
- Select work which will likely be of interest to the anticipated readership.
- Provide evidence to editors or awarding committees that the work under review meets their selection criteria.
- Improve a publication's quality and readability.

Adapted from (Hames, 2007: 2-3)

When is Peer Review Used?

> **Peer Review Report Contributions**
>
> A good peer review report offers a range of essential benefits:
>
> - Clear, unambiguous opinion on the importance and methodological soundness of the research.
>
> - Clear, unambiguous advice to the authors on how, if at all, the authors can improve their manuscript.
>
> - A recommendation to the editor (i.e. accept, reject or revise) based on the scope of their journal.
>
> Jigisha Patel

Perhaps the most frequent application of peer review is its use by scholarly journals in selecting articles to publish, in helping funding committees to select where to invest their financial resources, and by conference organising committees to determine which research should be presented. Nevertheless, peer review also takes a central role at certain stages of institutional decision-making. Butchard helpfully suggests other common peer review applications within the academy (Table 2).

Table 2: Other Uses of Peer Review.

> **The Research Excellence Framework (REF)**. In the UK review panels conduct a periodic national evaluative exercise to formally consider the quality and impact of colleagues' work. Thus, peer review plays a role in professional evaluation and the subsequent awarding of funding to institutions. Nevertheless, traditional peer reviewing is often supplemented by bibliometric data analysis in helping inform panels' judgements.
>
> **Institutional Review**. Research suggests that the use of bibliometric indications together with peer review can improve the overall assessment, however, care needs to be taken to acknowledge the limitations of bibliometric data, as a proxy for quality assessment.
>
> **Professional Advancement**. Peer review plays an important part in academic career progression within institutions. The assessment of scholars' work and its publication in high esteem or prestigious locations plays a particular key role.
>
> Adapted from (Butchard et al. (2017)

Essentially then, peer review is a process deployed within the academy, utilising expert insight, knowledge and opinion to qualify and quantify where academic work displays a suitable level of quality. Hence, it serves as a tool which editors, committees and funders deploy to support their decision-making processes. In this respect, peer review represents an essential control mechanism within the academy. Although, as discussed later, there are concerns that the process can also have suppressive or repressive qualities. Notably, peer review can be an iterative process. That is to say a cyclical process or series of review, feedback, and revision stages, before a final work emerges.

What makes someone sufficiently 'expert' to contribute to peer review is a difficult question to quantify. Arguably, the completion of a period of doctoral study and examination within a field, marks individuals as sufficiently 'expert' to be permitted entrance to the academy as a new scholar. Yet, some editors or panel chairs may expect years of post-PhD experience to have been accrued before, in their perceptions, an individual has achieved a sufficiently

'expert' status to be invited to participate. Conversely, expertise within some fields may be in short supply, meaning less accomplished scholars may be invited to participate as reviewers. In the end though, the degree of expertise a scholar must possess in order to participate in reviewing largely comes down to the expectations and policies of the journal, funder or publisher.

Benefits from Peer Review

> *Reviewing is a great learning experience and an exciting thing to do. One gets to know super fresh research first-hand and gain insight into other authors' argument structure. I also think it is our duty as researchers to write good reviews. After all, we are all in it together. The soundness of the entire peer-review process depends on the quality of the reviews that we write.*
>
> (Selenko, quoted in Pain, 2016)

As you might expect, the peer review process is often a time-consuming process, and reviewers do not generally receive any material incentive for their work. This contribution of intellectual labour by scholars to the academy as a whole, has long been perceived as a key developmental contribution expected of scholars as part of enhancing their academic career trajectories. That said, in some cases commercial publishers have been known to pay a fee or offer a publication incentive in return for reviews, for example. However, it can be argued (Johnson, 2018a) that the introduction of tangible rewards in return for contributing a review, risks introducing an undesirable element of bias into these quality assessment processes.

Nevertheless, particularly for ECRs, the experience of being a peer reviewer can be of itself an extremely valuable opportunity in terms of developing in experience, knowledge and prestige. It can also lead to an enhanced perception of an individual as a domain expert, which in turn may yield further invites to peer review, along with other potentially advantageous career opportunities. However, while the value each reviewer may personally extract from engaging with these processes will vary, there are a range of key benefits on offer (Table 3).

Table 3: Key Peer Review Benefits.

- **Authorial**: Critiquing others' research narratives develops reviewers' understanding of clarity, style and voice, which can be utilised in enhancing their own professional writing skills.

- **Collegiality**: Encourages the establishment of relationships between researchers, alongside recognition of potential areas of collaboration or future exploration.

- **Esteem**: Development of professional reputation and relationships with editors and the publishing community. Additionally, offers the opportunity to improve reviewers' academic and professional profile.

- **Insight**: Enhanced appreciation of contrasting views or challenging scholarship from outside personal research focus, can serve to challenge or reassesses reviewers' preconceptions.

- **Knowledge**: Early exposure and access to original thought and research, expands reviewers' awareness of current work, and can also spur their own insights and work.

- **Satisfaction**: Helping authors improve their papers through one's own professional expertise can give the reviewer a sense of prestige and personal satisfaction.

- **Shaping**: Through maintaining the rigorous process of selecting and publishing the most valuable research, reviewers serve to shape, direct and focus research direction and discourse.

Material incentives are not usually offered to peer reviewers by most editors or review panels, although in the latter case expenses for attending meetings may be covered. Senior figures in a field can also be inundated with requests for review and, understandably, may choose to contribute only to those endeavours with the most perceived prestige in their field. Consequently, for some publications the absence of any tangible return on reviewer participation, means they can struggle to attract sufficiently expert or senior figures to contribute. As a counter for this, some may choose to reward their reviewers through a number of incentives, such as offering discounts on Open Access publications, or providing recognition through awards. There are also suggestions that exposing reviewer metrics or publishing acknowledgements for contributions annually, can be used to incentivise and recognise reviewers' contributions (Cully, 2016; Hauser & Fehr, 2007). Others suggest that adopting more open (Morey et al, 2016) rather than traditionally anonymous, approaches to review, can also permit greater professional recognition and incentive to participate as a peer reviewer.

How Peer Review Benefits you as a Researcher

Most PhD students and postdocs will have been offered courses or workshops from their institution on how to get their research published. Yet, most researchers will not have received any formal training in peer review before they receive their first invitations to referee for a journal. Understanding how the peer review process works and what is expected of a peer reviewer is important in helping journals publish sound and high-quality research, but it will also give researchers a better understanding of the process that their own manuscripts will go through.

By reviewing your own work prior to submitting it to a journal, you can increase the chance of it going out for review. The manuscript may even go through review quicker, meaning a shorter time to publication and the dissemination of your latest findings. Further, by reviewing you help uphold the quality and trust of research published in your field, including the findings that you build your own research on.

Julia Mouatt, Publons

Overview of Publication & Peer Review Process

Figure 1: Journal Peer Review - Example Model
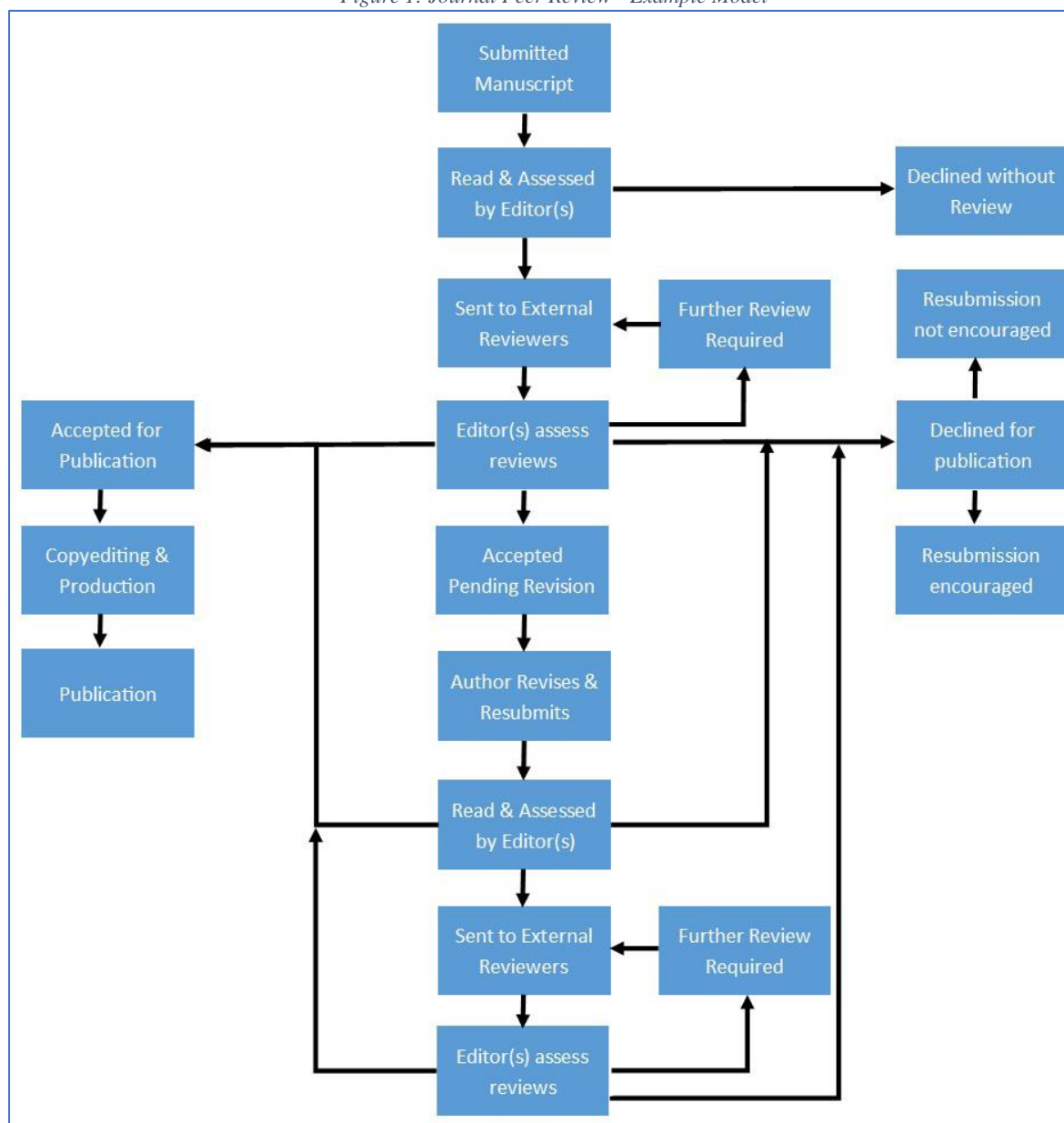
Diagrammatically peer review sits within the general publication process as shown (Figure 1). Nevertheless, this is a somewhat idealised representation and there are many variants or subtle alterations to this model in use within academic publishing, some of which derive from established disciplinary practices and others from long established preference. As we will discuss shortly, this is also a model predicated on editorial mediation, which while a common approach is not always an integral part of a review process. Additionally, some publications require a far more cyclical review process than is shown here (Deem, 2018a), where manuscripts pass through a number of review and modification rounds. Notably, this particular example model also assumes all reviewers approached by editors agree to

participate, a desirable situation which is however far from the experience of many editors. Nevertheless, this framework does provide a useful outline of the typical workflows in scholarly publishing, while illustrating peer reviewing's central importance within them.

The Main Peer Review Models

> **Know Your Peer Review Models**
>
> **Single blind**: Peer reviewers know who the authors are, but authors don't know who the peer reviewers are.
>
> **Double blind**: The authors don't know who the peer reviewers are, and the peer reviewers don't know who the authors are.
>
> **Open**: The authors know who the peer reviewers are, and the peer reviewers know who the authors are. Open peer review reports may or may not be published along with the article. If published, the peer reviewers' names may be published with the report.
>
> Also, collaborative, post-publication and more….
>
> Jigisha Patel, Springer Nature

Peer review through is not a singular model or process and there are various approaches which can be used, each of which confer different advantages and drawbacks. The choice often depends largely on the publishing cultures or disciplinary norms, along with editorial or publisher views on the various models' efficacy, value and desirability. A simple way to breakdown the most popular approaches is as Butchard suggests (Table 4).

Table 4: Common Peer Review Models in Scholarly Publication.

Type	Author Identity	Reviewer(s) Identities
Double-blind (DB)	Anonymous	Anonymous
Single-blind (SB)	Known	Anonymous
Open (O)	Known	Known to author, but not published
Post-publication (PP)	Known	Readers comment following publication

Adapted from Taylor and Francis's Peer review in 2015: A Global View (Butchard et al, 2017)

It is common to hear peer reviewing referred to as utilising a 'double or single-blind model', so considerations around reviewer and author anonymity are important. Heywood (2017), suggests something similar to Butchard, although introduces more consideration for different reviewer engagement configurations. However, while useful illustrations these are both simplifications of the reviewing process' mechanics. Helpfully the Committee for Publication Ethics (COPE) provides a far more nuanced consideration to clarifying how models of peer review can be configured. Within their approach (Figure 2), aspects for each of seven key reviewing characteristics can be mixed and matched to create the most desirable model for the publisher, editor or title.

Figure 2: Configuring Peer Review Models

TIMING	PrePrints	Pre-publication	Post-Publication
IDENTIFIABILITY	Double blind	Single blind	Open
MEDIATION	Editors mediate all interactions between reviewers and authors	Reviewers interact with one another openly	Reviewers and authors all interact with one another openly
PUBLICATION	Peer reviews are not published	Peer reviews are published but not signed	Peer reviews are published and signed
FACILITATION	Review facilitated by a journal	Review facilitated by a third-party	Review facilitated by authors
OWNERSHIP	Review owned by a journal or third party	Review owned by the authors of the reviews	Shared or mixed ownership of reviews

Following COPE's guidance, if you are responsible for configuring a peer review model for a conference, journal or review panel, then ideally you need to account for more than the degree of anonymity employed. Questions around process mediation and coordination, review transparency and intellectual property (IP) ownership need to be agreed upon and publicly documented. In this way submitting authors, reviewers and readers alike can understand how all key aspects of the reviewing process operate for your particular activity.

Open peer review approaches can be quite daunting for first-time reviewers, as they may find it intimidating to comment publicly, in an attributed environment, on the work of key figures in their field. It is an approach which also raises some interesting concerns around what comprises the 'definitive' version of a text, the degree to which reviewer comments form an adjunct to the core work or an integral part of its discourse, along with issues of appropriate citation. Typically, though, most peer review continues to be conducted under one of the anonymous approaches. Nevertheless, open peer review is beginning to grow in popularity in some disciplinary traditions (Fresco-Santalla & Hernández-Pérez, 2014; Morey et al, 2016), with supporters arguing that the open model offers a chance for increased transparency of author and reviewer interactions. As a result, this contributes to diminishing any suppressive practices which may have been concealed under an anonymous approach.

Many peer review models, anonymous and open alike, also favour the adoption of the pre-publication review approach. Under this, reviewers read submitted work prior to publication and deliver their comments, along with providing their recommendation on whether or not the research should be published. In contrast, the post-publication peer review allows public submission of comments on a work following formal publication. This post-publication approach can still be preceded by a formal pre-publication or simple editorial review, as

some journals value the additional interaction and discourse around a published work, even if it has undergone prior quality assurance measures.

The results of most peer review reports form the basis for a recommendation for acceptance, revision or decline of a piece. However, the final decision is often mediated by an editor, who reaches an informed decision based on the input from all reviews. Crucially, this means no single reviewer should have the ability to reject a submitted paper, although it does centralise considerable power over scholarly discourse in the editor's hands. Nevertheless, this use of multiple reviewers is one way to diminish the risk of potential bias within the quality assurance process.

Finally, some journals opt to publish reviews alongside the published papers, although these reviews are not always attributed to specific authors. This is a matter of choice by editors, arguably offering an increased transparency to their quality assurance processes, while also permitting the reviewers' insights to be publicly acknowledged as part of the research discourse. This raises some interesting questions concerning the ownership of review text, as well as how this may increase professional recognition for the reviewers' efforts. Where editors have not followed the COPE guidance in configuring their approach, the ownership of reviewer IP may be unclear[i], complicating this consideration. It also underscores for potential reviewers the importance to fully appraise themselves of the model under which they've been asked to review, and what degree of exposure might result from their efforts.

Reviewing for Journals, Grants, and Conferences

While we have mostly concerned ourselves with reviewing for journals, it is worthy briefly contrasting the differences between reviewing for other key area of the academy. As the table below illustrates, the overall processes are similar, but there still remain a number of crucial differences (Table 5).

Table 5: Key Differences Reviewing for Articles, Grants and Conference Abstracts

Journal articles	Grant applications	Conference abstracts
Generally, the most complex and time-consuming, as it requires compliance with the journal's instructions for reviewers.	Reviewing grant applications means deciding whether a research proposal is going to represent a good investment for the funding body and the society in general.	Reviewers might have to use a scoring system or checklist, but in most cases, reviewers are only asked whether a piece should be accepted or rejected – revisions are not usually suggested.
Reviewers must carefully consider the particular rules & expectations adopted by the publisher/title in question.	The reviewers should evaluate whether the study is truly needed (e.g. is it original?) and whether the methods used are appropriate.	Typically, reviewers will have much less information about the work they are reviewing.
Reviewers are sometimes expected to look at manuscripts again after	Increasingly a key part of the review is to assess whether the proposal addresses the	Reviewers should be able to decide from the abstract whether the research

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authors make any suggested revisions based on their initial comments.	funder's published selection criteria.	addresses an interesting question and whether the methods proposed are sound.

<div align="right">Adapted from (Wager et al. 2002: 16-22)</div>

Interestingly, in recent decades the shift towards digital publishing has begun to open up the question of what is a book, a chapter or an article (McCall & Bourke-Waite, 2016), as page and word limits enforced due to physical media constraints have become, technically speaking, irrelevant. However, for peer reviewers, length remains a crucial consideration in terms of the time commitment to conduct their assessment. A concern which likely contributes to rationalising why there is less divergence from traditional formats of scholarly communication within a digitally enabled field than might be expected.

Disciplinary Differences

This leads to the question of what are the key differences between peer reviewing in Humanities and Social Sciences (HSS) and in Science, Technology, Engineering and Medicine (STEM) journals? As noted above, one of the key differences can be the models favoured. There are some suggestions that STEM subjects may more frequently favour single-blind approaches, with humanities and social sciences more likely to employ a double-blind ones (Wiley, 2018). However, this can vary considerably between publishers, editors and publications, so it is a key aspect to identify for yourself if approached to review.

HSS fields are typically considered to be ones where historically monographs (books) have a greater degree of professional esteem associated with their publication, than STEM subjects. Consequently, in these disciplines, scholars sometimes prefer to publish their work in the form of a book, rather than a journal article. Nevertheless, academics in HSS still publish a significant amount of their research in journal articles. Their submissions are generally longer, especially when contrasted with mathematical journals where short communications are favoured. This means HSS peer reviewers are more likely to face extensive work in reviewing lengthy submissions. Furthermore, HSS articles tend to be more descriptive and make use of constructed arguments, meaning as a result reviewers may need to pay greater attention in considering the intellectual validity of submissions which do not use any established theoretical or analytical framework, a flaw which is less likely to arise with STEM publications.

On the other hand, STEM publications generally require a more specific understanding of a particular field, in particular those utilising specialised notation such as mathematical formulae or chemical structures, for example. There is also more generally an expectation on STEM reviewers to be able to fully appreciate any methods or methodologies used and their reliability, especially where they rely more on quantitative rather than qualitative analytical principles. Furthermore, peer reviewing STEM articles often requires an investigation of whether the author has done enough to explain the methodology used, as much-needed in-depth explanations may often be sacrificed for the sake of parsimony or

brevity. Empirical work utilising quantitative methods likely includes calculations or other numerical analytical techniques. Where these occur, reviews are expected to check the calculations' validity, along with their reported outcomes or graphical representations.

This, however, is not to say that a similar level of empirical investigation is not necessary in HSS publications, but rather these works are more likely to use qualitative than quantitative analysis, leaving more possibility for a subjective interpretation. Nevertheless, some HSS research also relies on quantitative data. Hence, reliability, validity and replicability of any presented results are an important aspect for reviewers to consider, regardless of the field in which they were produced. Notably, those journals which publish interdisciplinary or multi-disciplinary work may find it far harder to find reviewers who are able to review articles in their entirety and can often attempt to spread the load across reviewers drawn from a range of methodological traditions.

How to Become a Peer Reviewer

> **In an Ideal World**
>
> The researcher, editor and peer reviewer should work in collaboration. Everyone should be objective, honest and constructive. The relationship is a form of scholarly collaboration; everyone should consider each other as equals.
>
> Jigisha Patel, Spring Nature

How a publisher or review board handles peer review is an important consideration for reviewers in establishing the expectations on them. Yet, before you can consider the implications the particular models in use for a title, you firstly need to be able to be selected to become a reviewer.

The route into peer reviewing can often be challenging for ECRs with relatively limited expertise and professional prestige in their fields. However, peer review represents an important key step in a scholar's journey to academic success, allowing researchers to improve their own work, to build connections with other academics in the same field and to establish and develop their reputations. Therefore, it is highly advisable for ECRs to proactively seek opportunities to peer review. There are a number of good approaches which can be employed to successful receive an invitation to write a peer review:

1. **Publishing papers:** Being a published researcher allows you to get noticed by editors. Some publishers operate a rule that once you have published with them, you will have the option to be added to their peer reviewers list. If you have already published some papers, it will be worthwhile revisiting the publisher or journal's website to identify if they recruit from past authors automatically, or if you need to notify them of your interest.

2. **Approaching your mentor or supervisor:** Your mentor, supervisor or more senior colleagues are highly likely to already be in touch with editors, and they can help recommend you to them. Personal introductions are a very effective approach and

can be an excellent way to side-step around issues of limited professional visibility to become a new reviewer.

3. **Contacting journal editors:** Journal editors are crucial people to get to know and approaching them directly at conferences or via email are good ways to indicate your interest in reviewing for their title. Larger publishers sometimes offer more automated systems to handle this, for example, Elsevier (2018) provides a tool to match would-be reviewers with appropriate journals. By contrast smaller journals, like Warwick's Exchanges, will often have their editors make open calls for new reviewers (Exchanges, 2018). Hence, keeping an eye on journals of interest's announcements, or following their social media pages, is strongly advisable.

4. **Get involved in post-publication peer reviewing:** A number of online journals and platforms currently allow registered users to freely comment on published articles. Sharing constructive comments could allow you to practice your reviewing skills whilst engaging in discussions with fellow researchers. They may also get you noticed by editors, and hence invited to become involved in peer review.

How to Get into Reviewing

Many early career researchers get into reviewing by co-reviewing with their PhD supervisors or PIs. Co-reviewing is when you review a manuscript that was assigned to your supervisor together with them, similar to how you review in the Publons Academy with your mentor. Journal editors are not always informed when a manuscript is co-reviewed with a junior colleague and the co-reviewer's name is often not included in the report submitted to the journal. On Publons co-reviewers can also get recognition for their work.

To increase your chances of getting your own review invitations:

- Publish in your field as first or corresponding author - this is the main way editors find new reviewers

- Co-review with your PI and make sure your name is also on the report, or ask them to transfer their review invitations onto you

- Create a free Publons account to build your profile as an expert reviewer in your field - add all reviews performed by yourself, as a co-reviewer, and any post-publication reviews of papers you find interesting and want to weigh in on

- Volunteer to be a reviewer for a journal through Publons, or by contacting editors directly with your CV

- Showcase that you have completed the Publons Academy and been endorsed as a competent reviewer - we also recommend graduates to our partner journal editors

Julia Mouatt, Publons

Writing Peer Reviews

I consider four factors: whether I'm sufficiently knowledgeable about the topic to offer an intelligent assessment, how interesting I find the research topic, whether I'm free of any conflict of interest, and whether I have the time. If the answer to all four questions is yes, then I'll usually agree to review.

I usually consider first the relevance to my own expertise. I will turn down requests if the paper is too far removed from my own research areas, since I may not be able to provide an informed

> *review.*
>
> (Chambers & Walsh respectively, quoted in Pain, 2016)

For an early career researcher, being invited to write a peer review, be it for an academic journal, a conference, or a grant for the first time can feel like both an honour, but also a daunting prospect. It likely represents a personal milestone in your academic career, and an acknowledgement that you are now perceived by your disciplinary peers as someone capable of contributing to shaping the future direction of research and scholarship in your field.

Nevertheless, as experienced reviewers will tell you, this activity is not one to be engaged with trivially, as alongside shaping the future literature it also comes with a considerable time commitment. Typically, a four to eight-week period is used when setting a review deadline by many journals and being able to acknowledge that you will be able to meet these required deadlines is crucial. Moreover, while the manuscript might be in your field, the topic itself or the research methods used might go beyond your particular areas of expertise.

Accepting or Declining an Invitation

Hence, if you are invited to review a manuscript, there are a number of questions you must ask yourself before agreeing to do so. COPE (2017a & 2017b) propose a number of key questions worth addressing to yourself, in respect of issues such as the legitimacy of a title, peer review models and conflicts of interest. Reviewers must also consider their own ability to deliver on the review, both in terms of their expert knowledge and the feasibility of the timescale available. Remember, you will likely be conducting reviews alongside your other academic activities, and hence scholars often have to utilise their own time in order to deliver on schedule for their editors and panel chairs.

Establishing a journal's legitimacy can be quite complex, so it might be better to consult a librarian or senior colleague especially if you are unfamiliar with the journal. However, as a bare minimum it is important to visit the journal or publisher's website and see what information is presented. For example, can you establish who the editorial board and editor-in-chief are? What are the title's submissions and review policies and who publishes it? Additionally, does it produce credible looking work which may be cited and indexed within journals and services you use (ThinkCheckSubmit, 2018)? In considering models too, an inexperienced reviewer may be less comfortable conducting an open peer review or one where the attributed review will be published afterwards. Having your comments and name associated with the review will offer benefits in professional recognition terms, but consider how comfortable you would be openly challenging a senior figure in your field's scholarship? While a blind-review process may seem more attractive to many novice reviewers, you should also consider how iterative the process is likely to be, as you may be required to engage in assessing progress on revised author manuscripts. (Deem, 2018; Johnson, 2018b).

Competing or conflicting interests in an article are strong reasons why a potential reviewer should consider declining to review it. Potential conflicts can take many forms and may be intellectual, ethical, moral, ideological, political or even spiritual in nature. Most commonly though, they may arise as a result of a prior professional relationship. For example, you may work or have worked closely with or are in a direct competition with the author. Typically, if you recognise an author's work, even under a blind-reviewing processes, and realise you have collaborated with them, or even they are based at the same institution as yourself, then you should consider standing down (Hames, 2007). Speak to the editor though about this, as some fields are quite small, and it may be necessary, if less desirable, to still review a work, albeit with an acknowledgement that your review may contain a greater than desirable degree of bias.

Finally, having the necessary time and expertise to complete the review within the specified deadlines is a crucial consideration. For inexperienced reviewers this can be an especially challenging question to answer, as it may be that the normal period set aside for conducting the review may be insufficient for you the first few times you conduct one. You also have to balance the other professional and personal commitments within the specified deadline. Again, discussing any concerns you may have about this with the editor is advisable as they may be able to make exceptions or permit extensions to allow less experienced reviewers to still contribute.

Before Accepting an Invitation Consider

- Do you have the expertise to do this peer review?

- Do you understand what type of research the journal will publish? (Check the journal's website for its scope. Is it looking for research that is just methodologically sound or research that is novel or ground-breaking?)

- Do you understand the peer review model? Would you be happy to have your peer review report with your name published?

- Have you checked the deadline to return a report and do you have enough time?

> • Do you have any potential conflicting interests?
>
> Jigisha Patel, Springer Nature

One of the easiest approaches to working through all these considerations in a logical and efficient manner, is to make use of the decision tree provided by COPE for just such an occasion (Figure 3) to reach an answer.

Figure 3: Considerations When Invited to Peer Review a Manuscript
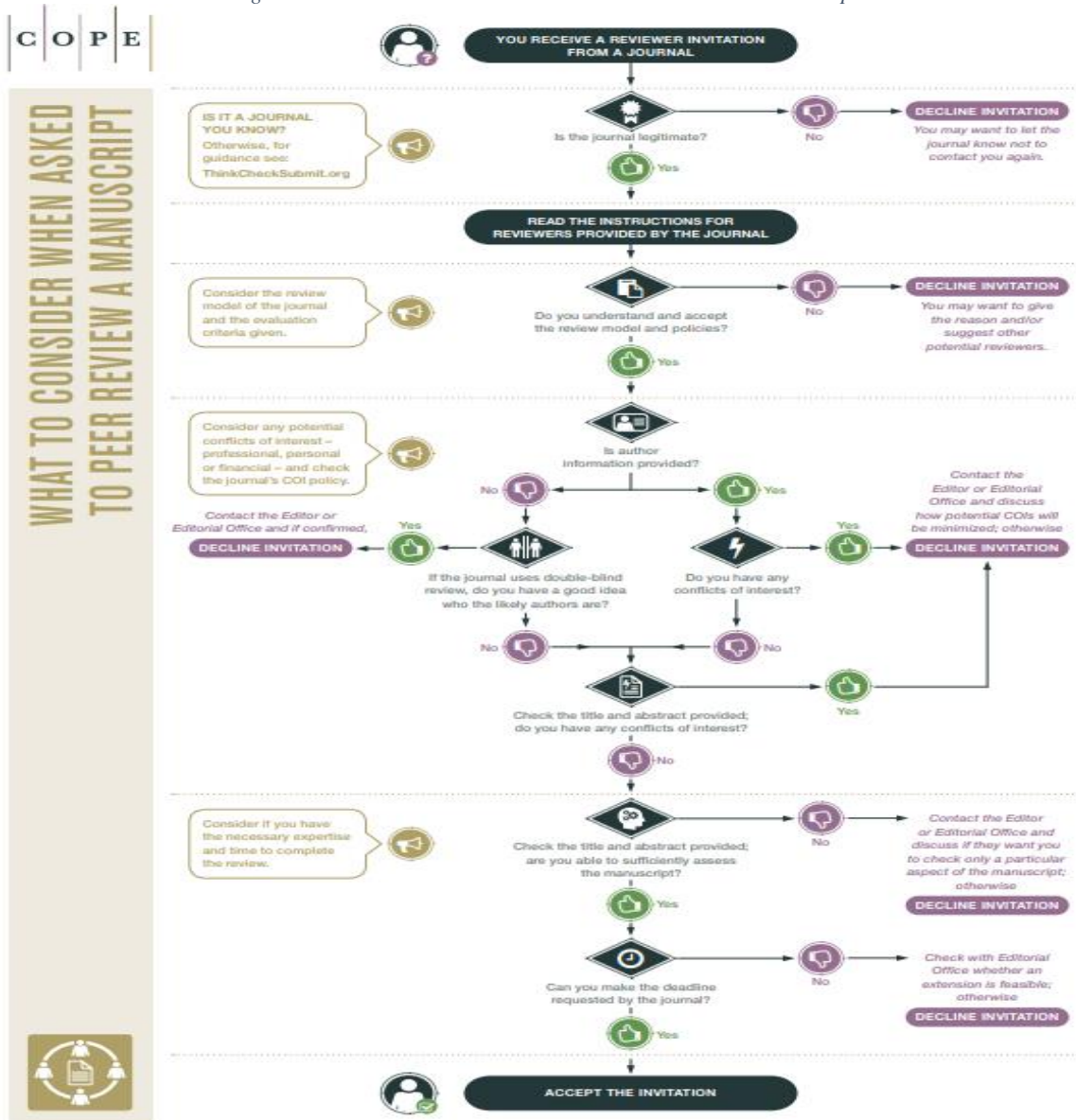
In general, potential reviewers should always keep in mind that accepting to review a manuscript means they are agreeing to provide a fair, robust and timely critique of the work. It is best to decline the invitation to review and inform the editor if the time frame

offered is insufficient or cannot be negotiated; if your expertise is limited and impedes you from offering a well-grounded review; or if there is a conflict of interest arising. Poor communication with an editor in regard to your ability to meet a deadline, as well as failure to communicate a potential conflict of interest, will likely hurt your professional reputation far more than merely declining an invitation to review.

What Should Reviewers Look for in a Manuscript?

Assuming you have considered the issues above, the question shifts to considering what you as a reviewer should be looking for within a manuscript. All reviewers generally have to have look at a number of key criteria when evaluating a paper, such as the importance of the questions addressed, the originality of the work, the suitability of the methods used, the quality of the data analysed, and the reliability of the conclusions. Many journals have extensive guides which delineate exactly what they expect peer reviewers to consider in their review. Wager et al. (2002) suggest when assessing any manuscript, reviewers should start their considerations by asking three basic questions (Table 6):

Table 6: Initial Review Considerations

1. **Do I understand it**? It is important to assess whether the argument and the methodology are clearly explained.
2. **Do I believe it**? A reviewer should always check whether the conclusions reached are justified by the data and whether the methodology used is valid.
3. **Do I care**? Lastly, the relevance of the research presented needs to be evaluated in all circumstances.
Adapted from (Wager et al. 2002: 15)

Additionally, a key question for many journals is that of originality, essentially: does this submission represent a valuable addition to the literature? For many journals, manuscripts failing these criteria may be rejected by reviewers, or in some cases may even have already been declined by the editor without submitting the manuscript for review. In terms of peer reviewing in the fields of natural sciences and engineering Wilson,(2012) , suggests a broader range of questions reviewers should be asking themselves when reading a manuscript under consideration (Table 7):

Table 7: Reviewer's Checklist

• Does the paper fit the standards and scope of the journal it is being considered for?
• Is the research question clear?
• Was the approach appropriate?
• Is the study design, methods and analysis appropriate to the question being studies?
• Is the study innovative or original?
• Does the study challenge existing paradigms or add to existing knowledge?
• Does it develop novel concepts?

• Does it matter?	
• Are the methods described clearly enough for other researchers to replicate?	
• Are the methods of statistical analysis and level of significance appropriate?	
• Could presentation of the results be improved, and do they answer the question?	
• If humans, human tissues or animals are involved, was ethics approval gained and was the study ethical?	
• Are the conclusions appropriate?	
	Adapted from (Wilson, 2012: 8)

Not all of the abovementioned questions can be addressed by a reviewer directly from their experience. It is likely that they will need to conduct some additional literature searching themselves, especially when considering questions of originality or contribution to the scholarly discourse. This is another reason why reviewers need to ensure they have sufficient time to conduct such background work, before agreeing to accept the review assignment.

How Should You Structure a Peer Review?

While not all of these questions apply across the disciplines, they do provide a useful starting point for the reviewer in their quest to establish the veracity and value of any manuscript. Nevertheless, having started to address such consideration within the evaluation of the manuscript, the next step for a reviewer is to begin structuring their response. As with journal submissions, theses or essays, there are common structures which are expected in any good review. Whilst some journals might give you a predefined structure for submitting the review, as Hames suggests (Table 7) an ideal report should always contain a number of essential features:

Summary: A review should start with a brief summary, which puts the paper in the context of existing literature and indicates the overall significance of the work and its level of novelty. The summary should also indicate the strengths of the work and give an idea of its quality, as well as mention whether there are any major flaws. The summary also provides an editor with insights into the reviewer's mind-set, preconceptions and epistemological framework. In this way, should there be an element of unconscious bias event in the review, this alerts the editor to consider the comments in this light.

Major issues: The review should mention any flaws (technological, design or interpretation) and explain how severely they impact the overall quality of the work. It should also discuss whether similar work has already been published on the topic that has not been acknowledged by the author. Lastly, it should identify any ethical issues. While these often concern the data collection methods, there may be political, societal or ideological normative practices within the particular field to be considered.

Minor issues: The reviewer can also point to more minor issues in the paper, such as paragraphs that are ambiguous or unclear, mistakes in referencing, factual errors, or numerical or unit errors. Typographical errors are not a reason to reject a paper out of hand, although some of the higher prestige titles may use this as a winnowing process due to the sheer volume of submissions they receive. Nevertheless, frequent spelling, grammatical or other typographic errors should be drawn to the editor's attention.

Opinion: All reviews should end with a brief summary of the reviewer's opinion of the work. A recommendation should only be made if the journal requests one.

Adapted from (Hames, 2007: 78-82)

It should be noted that not all reviewers will manage to include absolutely everything a title expects its peer reviewers to include. This doesn't invalidate the review, as in some cases the paper may already be very good and only minor comments needed. For first-time reviewers, it is worth trying to include at least a mention of all required aspects though. Some editors have been known to require additional input from their reviewers, if it is perceived their originally submitted reviews are not sufficiently detailed. If in doubt, it is always worth consulting the title's editor before submitting your review to avoid making this kind of error and having to revisit your work. Today, online reviewing submission systems commonly allow the inclusion of a 'note' to the editor, which appears alongside the review text. This is where you can add any caveats, clarifications or explanations to your submitted review, and are well worth utilising whenever you feel the necessity.

Tips on Peer Reviewing

- Always be professional and courteous even if you think it's a very low-quality manuscript
- Stick to the deadlines set by the editor or request an extension - this is how you can help speed up science!
- Check what is required of your review in the editorial management software, for example do you need to provide a certain rating on the soundness of the paper in addition to your recommendation towards publication, revision, or rejection?
- Start a review by summarising the paper's findings in your own words, and include a few sentences on the strengths of the paper before listing weaknesses
- Be specific enough in each numbered point of your review, we recommend using

As noted earlier, reviewing is an iterative process, and there is often an expectation on reviewers to re-review a manuscript after the author has taken account of earlier comments. This is generally a briefer exercise for reviewers, as you will already be familiar with the text, and ideally what editors are most interested in is the degree to which authors have improved their work along suggested lines. Authors will often address comments from various reviewers so you cannot expect that the revised version will satisfy all reviewers' suggestions. Indeed, as we discuss towards the end, authors sometimes will challenge reviewer comments. Nevertheless, you should expect to see demonstrable improvements over the earlier manuscript version, in which case you may only need to make minor comments or even take the opportunity to congratulate the author for redeveloping their work. However, where in your expert opinion the manuscript still falls below the expected professional standard, then you should ensure your re-review comments highlight this for the editor's attention.

A useful framework for writing a review is provided in Appendix A.

Ethics, Obligations & Responsibilities

As we've explored, peer reviewing can be a challenging intellectual task requiring a considerable commitment of time. Reviewers often have the great responsibility of deciding the fate of any manuscript under their scrutiny. Their comments and recommendations can help decide whether a journal should publish a particular piece of research, as well as improve the overall quality and readability of a paper. Therefore, it is important that peer reviewers are trustworthy and honest in their assessments.

Moreover, there is an expectation on reviewers to conduct themselves within an ethical and professional code of conduct while reviewing. Editors and review panels base their reputations and quality assurance processes largely on the back of a sometimes-unwritten expectation that reviewers will conduct themselves in a professional, responsible and ethical academic manner. For example, if you are reviewing a manuscript you cannot simply share or discuss the piece with any other scholars, colleagues, peers or students at any point without violating these expectations. If you do wish to share it with a peer, or a graduate student for example, you must seek the author's permission (via your editor) to do so first.

While the majority of peer reviewers conduct their contributions within such framework, some may deviate from it, to varying degrees. In considering what represents acceptable conduct, there is a lot of guidance in the literature, on publishers' websites and from

learned societies. Hames, for example, highlights a number of suggestions as to how reviews should ideally conduct themselves (Table 9):

Table 9: Peer Reviewer Conduct

Reviewers should:

1. Declare any conflict of interest, either real or perceived, to allow the editor to decide whether this should disqualify them from review as it may inappropriately influence their actions. It is important for reviewers to signal any such potential conflicts, whether or not they believe that the relationship could cause any bias. Ideally reviewers should ask whether if disclosed the relationship could cause any embarrassment or recrimination. A potential for bias exists whether or not someone believes that a certain relationship could affect their judgement.

2. Reviewers should also signal any unforeseeable circumstances which might emerge, impeding their ability to respect the deadline. Read all accompanying material, instructions and guidelines sent with a manuscript.

3. Reviewers should also always signal if they would be benefitting from the expertise of a colleague when writing their peer review. This is particularly important for the purpose of avoiding any potential conflict of interest, but also in order to acknowledge the contribution of co-reviewers.

4. Keep manuscripts and accompanying material confidential. After the review is finished, any paper or digital copies of the manuscript should be deleted.

5. Be objective and constructive and refrain from making personal comments of defamatory remarks. Any judgement or recommendation made should be supported with evidence. Furthermore, any suspicion of plagiarism, fraud or misconduct should be signalled to the editor.

6. Review their fair share of manuscripts, for when they are authors other scientists will be acting as reviewers for their manuscripts. Peer reviewers are advised to try to honour as many invitations to review as possible, given their time constraints, and to give a reason for declining, as some journals might choose to refuse to publish the work of an author based on repeated, unjustified, refusal to act as a peer reviewer.

Adapted from (Hames, 2007: 162-164)

Most panels and journals will have written guidelines for their reviewers to follow, which will spell out these obligations more precisely. Remember, by agreeing to review you have also agreed to abide by and conduct your reviewing activities within these requirements. Hence, ensure you read them before agreeing to conduct a review. Publishers also draw guidance themselves from the COPE (2017a) framework of ethics and responsibility. This framework provides an ideal mode of responsible reviewer conduct during the review process in greater detail and is well worth reviewing before conducting your first few reviews.

Critiquing Peer Review

Peer Review & Diversity

While great progress has been made, diversity remains an important issue in peer review, as bias often results in journal editors preferring certain reviewers over others. For example, a study by Markus Helmer (Moylan & de Ranieri, 2017) reported that 48% of contributing

authors were women across various journals they investigated . A figure, notably slightly in excess of the proportion of women researchers in the UK academy, although there are notable variances across the disciplines (Thompson, 2018). However, by contrast they discovered only 38% of reviewers and 28% of editors were female. It is worth highlighting not all scholars approached to review will accept the invitation, and hence this reviewer percentage does not necessarily represent the potential involvement of women in peer review. Nevertheless, the figures suggest that there is more work to be done before a satisfactory level of representation, particularly at editor level, is achieved. A recent study on the journal Functional Ecology found that *'editor gender, seniority and geographic location affect who is invited to review for Functional Ecology and how invitees respond to review invitations, but not the final outcome of the peer review process'* (Fox et al., 2016: 140) and suggests that academic journals should increase the diversity of their editorial boards in terms of gender, age and geographic diversity.

SAGER (*Sex and Gender Equity in Research*) guidelines highlight the importance of considering matters of sex and gender carefully within the peer review process (GPC, 2016). They emphasise the conflation of these two terms, is one of the most common issues noted within the review process. Drawing on the work and thinking of the EASE (European Association of Science Editors) Gender Policy Committee[ii], the guide provides recommendations for reviewers to accommodate within their professional reviewing practice. It also challenges reviewers to explore how matters of sex and gender are handled throughout a reviewed submission, especially with respect to the generalisation and applicability of findings within clinical practice (De Castro, 2018; Marsh, 2018). Additionally, such efforts should help ensure authors rethink how their work addresses these topics in the future. The table below briefly summarise the SAGER guidelines (Heidari et al. 2016).

Table 10 Sex and Gender Equity in Research (SAGER) guidelines

General principles	
• Authors should use the terms *sex* and *gender* carefully in order to avoid confusing both terms.	
• Where the subjects of research comprise organisms capable of differentiation by sex, the research should be designed and conducted in a way that can reveal sex-related differences in the results, even if these were not initially expected.	
• Where subjects can also be differentiated by gender (shaped by social and cultural circumstances), the research should be conducted similarly at this additional level of distinction.	
Title and abstract	If only one sex is included in the study, or if the results of the study are to be applied to only one sex or gender, the title and the abstract should specify the sex of animals or any cells, tissues and other material derived from these and the sex and gender of human participants.
Introduction	Authors should report, where relevant, whether sex and/or gender differences may be expected.

Methods	Authors should report how sex and gender were taken into account in the design of the study, whether they ensured adequate representation of males and females, and justify the reasons for any exclusion of males or females.
Results	Where appropriate, data should be routinely presented disaggregated by sex and gender. Sex- and gender-based analyses should be reported regardless of positive or negative outcome. In clinical trials, data on withdrawals and dropouts should also be reported disaggregated by sex.
Discussion	The potential implications of sex and gender on the study results and analyses should be discussed. If a sex and gender analysis was not conducted, the rationale should be given. Authors should further discuss the implications of the lack of such analysis on the interpretation of the results.

Adapted from (Heidari et al., 2016)

Many editors also mention the challenges they face in maintaining a good balance of both native and non-native English speakers in their journals. There are also related questions as to the necessary steps to decolonialise scholarly discourse, and enhance representation by authors, reviewers and editors from outside the global north. The pursuit of diversity often means that some perfectly publishable articles, may be rejected in favour of equally good work, but has the added benefit of enhancing the diversity of perspectives in the field. Nevertheless, this remains an area where much work remains to be done.

Peer Review Criticisms

Whilst its importance in selecting, publishing or funding the most relevant and important research available remains undeniable, there are various criticisms of peer review. Kingsley (2016), writing on behalf of the University of Cambridge's Office of Scholarly Communication highlights a number of peer review's shortcomings, which they identified during discussions with local academics. Principally these were expressed as being:

1. **Uneven Workloads:** Whilst many scholars never get asked to review, the few that are approached can often be dealing with a high number of requests. This results in a very hierarchical reviewer community. Some editors have also been known to show a preference for reviewers from top research universities.

2. **Training Deficit**: The lack of training or assessment, as well as the lack of incentive, can impact on the quality of peer reviews. If reviewers are insufficiently motivated to contribute to the quality assurance process, then the publication process as a whole can be slowed or distorted.

It is notable that COPE's (2017a) guidelines emphasise the importance of mentoring or training programmes for new and established reviewer to hone their skills, although in practice this may be sporadically applied. This is one reason why the Publons (2018) Academy online programme represents an attractive and vital resource for many who are new to peer review. Eve (2017) too underlines further shortcomings in the peer review system (Table):

Table 11: Peer Review Shortcomings

1. A number of studies have traced how a number of Nobel prizewinning articles have been previously rejected by academic journals.
2. More than half of the rejected papers end up being published elsewhere – encouraging a hierarchy of journal exclusivity and creating fruitless work for reviewers.
3. To question peer review as a researcher is in some ways to put one's reputation on the line: suggesting authors could be perceived as 'attacking peer review' only because their own 'work wasn't good enough', within the academic community.
Adapted from Eve (2017)

Nevertheless, in an era of digitally mediated communication many scholars argue the processes associated with pre-publication peer review, are a laborious and time-consuming relic of the traditionally printed journal age. Pre-publication peer review can be a lengthy process, with even popular online journals like PLoS-ONE having nearly a six-month submission to publication turnaround[iii]. For some fast-moving disciplines, this means 'traditional' peer review represents a barrier to the progress of scholarly discourse. Gowers (2017) suggests a route to resolving this through increased 'crowdsourced' post-publication peer review, where editorial quality review provides a light and timely route to publication of most worthy papers. Subsequently, within the online public sphere published articles become critiqued within the social media domain, with those deemed worthy by the community highlighted and promoted to a greater prominence. Arguably this approach represents a time-efficient route to public publication, without loss of quality assurance, as the critique forms an integral part of the post-publication discussions.

Arguably too, for new scholars entering a field and publishing for the first time, peer review can be viewed as a source of resistance or an obstacle to introducing new thought. The reluctance of some scholars to embrace heterodox thought represents a concerning source of resistance and bias against the development of new scholarly discourse. Notably, an international peer review conference organised by the Netherlands Organisation for Scientific Research (NWO, 2017) found that peer review could sometimes limit the publication of new, innovative research, with some topics or methodologies dismissed for being outside the mainstream, accepted or normative discourses. Participants argued that

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novelty should be included as a criterion in the evaluation process, which given the importance of originality within published works is a fair assessment. It is here that the role of editors in monitoring peer reviewers for such suppressive acts is critical to address this concern. Alongside this, the entrance of new and early career scholars into the peer reviewer community is crucial in helping to bring fresh insights and thinking into the quality assurance processes as well as the published literature.

Finally, like many aspects of scholarly communication, peer review is predicated on the immaterial 'free labour' contributions from scholars globally (Johnson, 2018). Peer reviewers are not contractually obliged to contribute or even complete reviews they have agreed to, although professional ethics suggests they should (COPE, 2017a). While reviewers may agree via a click-through process to complete a review, any legal ramifications from breaking such 'contractual arrangements' are likely too trivial to be worth perusing for most editors. The disengagement of reviewers by removing themselves from consideration or failing to complete their assigned reviews by the agreed deadline, represents a further impact on the timely progress of submitted article or funding proposal through quality assurance processes.

While scholars like Gowers (2017) argue for post-publication review, others have suggested the introduction of incentives or reviewer recognition and esteem marker approaches as routes to overcome this reluctance to contribute. For example, Publons (2018a) reviewers' database offers such a degree of public recognition and demonstrable scholarly metric for reviewer contributions. As Jay (2018a) notes, this is one area where reviewing for panels contrasts with scholarly publishing reviewing, in that a small fee is paid. Nevertheless, for others the introduction of additional metrics or financial incentives into the scholarly communication domain remains emblematic as a further and problematic step towards the neoliberalisation of the academy.

Training

One of the most frequent criticisms of peer review is the lack of training which new, and established, academics undergo before beginning their career as reviewers. While many journals and funding bodies make available guidance notes for their reviewers, in terms of specific training they tend to expect this to be picked up by the scholars themselves as part of their ongoing professional development. Naturally, this means that there is a strong variance between reviewers in terms of the opportunity they may have had to enhance their skills. Reading booklets such as this is an excellent adjunct to such training, as too is making use of the various online courses, summer schools or workshops on the topic which are available to upskill new reviewers (PLOTINA, 2018a; Publons, 2018b). Additionally, if you are especially fortunate to know an academic who is an editor or serves on a funder review panel, it may be a profitable use of your time to ask if they would be prepared to work with you to better develop your peer review skills.

| **Learn to Review in the Publons Academy** |
| Most reputable journals will have guidelines for their reviewers on their website, and some of |

the bigger publishers offer online courses. Publons also has a free, online course in peer review, the Publons Academy (Publons, 2018b). Publons is a platform to help researchers verify and easily keep track of all the peer review and editorial activities they do for journals, and to summarise it all in a report which can be added to their CVs for job and grant applications. Publons also awards annual certificates to top reviewers worldwide.

The Publons Academy was developed together with editors and top reviewers to prepare early career researchers for their first review invitations. It's a practical peer review course in that you practice what is taught in the course on real published papers or preprints that you choose from your field of expertise. The course consists of 10 modules. The first four modules cover:

    1) What is covered and how the course works

    2) Academic publishing and different types of peer review

    3) What editors look for in reviewers;

    4) Biases, ethics, and conflicts of interest in peer review.

The following five modules each cover how to review different sections of a manuscript, such as the introduction, and what to look for in each of those sections. The final module teaches how to structure your review comments into a full review report using our Peer Review Template, which is provided in the course. In this module you will write two practice reviews on published papers or preprints in your field, and then invite a mentor to provide feedback on them. Mentors can be your actual PhD or postdoc supervisor, or you can ask to get matched to a pre-screened Publons community volunteer mentor in your field. Once both reviews have been approved by your mentor you graduate with a peer reviewer certificate.

Julia Mouatt, Publons

Responding to Peer Reviewers

Few if any scholarly works are likely to see publication without reviewer recommendations for amendment. Yet, peer review can often be an interactive cycle of reviewer comments and author amendments, rather than a linear process. Thus, being able to manage and respond to peer review comments on your own work is also a crucial scholarly skill. Both Deem (2018) and Jay (2018b) suggest adopting a measure of emotional detachment from the process can pay significant dividends. It is important to keep in mind that peer review represents a process of *critique* rather than outright *criticism*, with the goal of enhancing the quality of scholarly discourse and clarity of authorial voice. Nevertheless, it can be all too easy to perceive feedback and comments on your work as personal criticism.

As Deem (2018) suggests, this can be managed through initially engaging with the comments, before laying them to one side for a period. Then, upon returning to them, progress through the comments systematically, considering how each could serve to enhance your work's intellectual content and clarity. There may also be times when an author needs to question, challenge or even refute a reviewer's comments on their work. This is a key reason why peer review can be a dialectic process of exchange between scholars, albeit one often mediated by editors and anonymously. It is important that scholars on both sides of the review process engage with clear, concise and constructive language, rather than sniping at one another. Again, a systematic approach can be beneficial, with scholars making clear but insightful sequential responses to comments on

their work, ensuring that all involved can understand which points are being addressed and what issues are being raised.

Throughout it all though, editors and experienced reviewers generally agree on the most important considerations in responding to review comments. That is ensuring all exchanges are handled politely, congenially and with the same measure of professionalism you would bring to addressing a respected colleague in person.

Concluding Remarks

Hence, while peer review does offer many benefits in achieving a quality assurance process for academic literature, grant applications and conference papers, its practice is understandably one which continues to evolve. It is by no means a perfect process, as its many critics have pointed out. Yet, it remains a central part of the scholarly communication process with which new scholars should ensure they become familiar. It is the hope of this booklet's authors, that we have highlighted the processes, considerations and concerns in this respect. To find out more, we strongly recommend consulting the references and resources highlighted in this work or through contacting particular editors and editorial boards directly for further illumination.

In particular, we would strongly encourage readers striving to become more effective peer reviewers to visit the Committee on Publication Ethics and Publons Academy websites, along with accessing the information resources and training materials they have made available. Finally, as this booklet represents an output from the PLOTINA (2018a) Summer School, we would also suggest reviewing the materials some presenters have made available. Readers may find these talks digestible nuggets of valuable and specific insight into the aspects of the peer review process as offered by editors, scholars, funders and publishers.

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Appendix A: Starting the Review

Writing a Review: A framework

Check the format needed (for example is it like Figure 4 or something different?)

Read through the entire article first.

You should ask yourself whether the manuscript is understandable, and you have all the information you need to make a judgement. If the manuscript is not understandable, or there is missing information, you can tell the editor the manuscript is not suitable for peer review at this stage. Don't waste your time trying to struggle through a badly written manuscript.

Read the manuscript again (you may need to read it again a number of times)

This is what you should think about.

Background:

- Is there an aim, research question or reason for doing the research, and has this research been put in the context of previous work?

Methods:

- Is the study design appropriate for the study aim, research question, or reason for doing the research?
- Has the study been conducted with the appropriate materials or participants?
- Have appropriate methods been used and variables been measured?
- Is there a need for a control? Has an appropriate control been used?
- Have appropriate statistical tests been used?

Results:

- Have the results been presented clearly and completely?
- Do the results presented match the methods described?
- Are there any results missing?
- Do the results support the authors' conclusions?
- Have the authors made exaggerated claims that are not supported by their findings or put a 'spin' on the way they discuss their results to suit a particular point of view?
- Do you think there might be competing interests?

Ethical Considerations:

- If the study involves human or animal participants, have the correct approvals, permissions and consents been obtained?
- Do you have any concerns about the ethics of the study?
- If there are competing interests, do you think the authors have been objective in their interpretation of the results?
- Have the authors complied with any specific requirements of your field, for example data deposition?
- Have the authors provided appropriate references?

Writing the Report

See Figure 4 for common standard format of a peer review report

A peer review report should not just be a list of what's wrong with the article. It needs to be useful to the authors and editor and make a recommendation on whether to reject, accept or revise

If you have any ethical concerns, requests for clarification about the ethics of a study can be addressed directly to the authors, but any suspicion of research or publication misconduct should be addressed directly to the editor in confidence.

Figure 4: Sample Peer Review Format

The format of a peer review report

Title and authors:

Summary: A short summary of the study findings with a comment on whether the findings are sound and novel or interesting.

Major essential revisions: These are issues that you feel are so important that the authors *must* address because they affect the validity or interpretation of the study.

Minor essential revisions : These are issues that are so important that the authors must address because they are good practice, are field specific requirements or part of internationally accepted convention for reporting scientific research.

Discretionary revisions: These are revisions that would improve the manuscript, but you don't think are essential to the validity or interpretation of the study.

Confidential comments: This section is where you can raise concerns about the ethics of the study or share any information with the editor that you do not wish the authors to see.

Recommendations : This is a very important section where you tell the editor whether you think the manuscript should be rejected, accepted without further revision (rare) or could be published after revision.

Jigisha Patel, Springer Nature

Endnotes

[i] Under UK copyright law, the *economic rights* over a work may be transferred or sold by the rights holder but never acquired without their consent. Rights holders here are usually the creator of the review, the reviewer, although the terms of their employment contract may dictate their employer has a potential ownership claim, which can complicate the issue. Nevertheless, unless reviewers have signed some form of copyright transfer agreement as a mandatory condition of review contribution, beyond the licencing their comments to be shared with the author, the rights over any reproduction or publication of reviews remain with original owner: the reviewer.

[ii] More information on EASE's Gender & Policy Committee, their origins and current work can be found at: http://www.ease.org.uk/communities/gender-policy-committee/

[iii] Source: PloS ONE's record on the DOAJ (Directory of Open Access Journals) https://doaj.org/