

What do you think of peer review?



“We had not authorized you to show our manuscript to specialists before it is printed. I see no reason to address the —in any case erroneous— comments of your anonymous expert. On the basis of this incident, I prefer to publish the paper elsewhere.”

Einstein (1936, as cited in Kennefick, 2005)



This was Albert Einstein’s response to the single anonymous peer review in his career, which recommended rejection.

Interestingly, the paper was published one year later with radically altered conclusions, after adjusting for “incorrect inferences” of some equations.

Outline

- What is scientific peer review and why is it important?
- Alleged benefits of scientific peer review: Cui bono?
- The dark side of peer review: What can we learn?
- What is to be done? Developing good practices



What is scientific peer review?

- Peer review is a process by which experts evaluate and critique an authored scholarly work, research or ideas before publication (Kelly et al., 2014).
- Its origins date back to 1665, when the world's first scientific journal, *Philosophical Transactions of the Royal Society of London*, was founded as a way to ascertain ownership...
- ...though it was not until the 1960s that systematic refereeing became a standard policy (Baldwin, 2017), mostly for grant review processes and less so for the publication of journal articles.

PHILOSOPHICAL
TRANSACTIONS:
GIVING SOME
ACCOMPT
OF THE PRESENT
Undertakings, Studies, and Labours
OF THE
INGENIOUS
IN MANY
CONSIDERABLE PARTS
OF THE
WORLD.

Vol. I.
For Anno 1665, and 1666.

In the SAVOY,
Printed by T. N. for John Martyn at the Bell, a little with-
out Temple-Bar, and James Allestry in Duck-Lane,
Printers to the Royal Society.

What are the core attributes of effective peer review?



- Turner (2003) intelligently summarizes five core attributes of effective peer review in his F.A.I.T.H. model, as follows:
 - ✓ **Fairness** in reviewing involves striving to identify both the weaknesses and the strengths in a manuscript;
 - ✓ **Appropriate** expertise of suitably qualified reviewers who are ready to openly acknowledge the limits of their knowledge and skills;
 - ✓ **Identifiable** reviewers who receive public recognition for their important service, which contradicts the widespread principle of anonymous or blind review;
 - ✓ **Timely** reviews that do not delay the publication process; and
 - ✓ **Helpful** critiques that provide constructive, informative, justified, and rigorous argumentation.

Why is peer review important?



- Peer review is considered a **cornerstone** of scientific research. It is expected to serve as a **gatekeeping mechanism** in the production and dissemination of scientific knowledge (Horbach & Halfman, 2018) with significant implications for authors, journals, readers, and science itself.
- On the other hand, it has been described in controversial terms such as ‘**black box**’ (Turner, 2003) or ‘the **holy cow** of science’ (de Vries, 2001) or ‘the **Achilles heel** of scientific journals’ (Bloom, 1998, as cited in de Vries, 2001), due to its pivotal yet fragile role as a validation system we all love to hate, along with other academic publishing metrics such as IF and h-index.
- Probably peer review suffers from the effect of **Goodhart’s law**, according to which when a measure becomes a target, it ceases to be a good measure (Fire & Guestrin, 2019).



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- **Alleged benefits of scientific peer review: Cui bono?**
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Benefits of peer review for authors

- By exposing their work to peers, young researchers **increase their visibility** and boost their academic career in an antagonistic arena ruled by positivist quantitative metrics and the *publish or perish* principle (Rawat & Meena, 2014).
- Although peer review and the threat of rejection is associated with social and psychological costs for individual scholars (Horn, 2016), eventually it results in **improved quality** of published research through receiving **constructive feedback** from experts.
- Conversely, peer review can **protect the authors' reputation** in instances of flawed research, which is detected before it reaches wider audiences to their disgrace (as in the case of Einstein's single rejected paper).

Benefits of peer review for journals



- Similar to the benefits for authors, high quality of published research resulting from rigorous peer review processes can **build the reputation** of a scientific journal – unless of course in cases of *predatory* publishers prioritizing self-interest at the expense of scholarship (Grudniewicz et al., 2019).
- The above leads to **increased impact**, as depicted in related indices, since highly respected journals attract and publish high-quality research that will be widely cited.
- These benefits hold equally for traditional journals implementing blind review processes, as well as for open access journals operating under the open science framework (Ross-Hellauer, 2017).

Benefits of peer review for the (scientific) community



- Peer review is a well-established self-regulating mechanism that **safeguards** the scientific integrity of published research by revealing misconduct (e.g., plagiarism, data manipulation) and questionable practices (e.g., inappropriate methodologies, inaccurate referencing) (Horbach & Halffman, 2018).
- By filtering out ‘bad’ science, peer review assures the scientific community, policy makers, and lay (non-expert) people that scientific research is **trustworthy, relevant, and valuable** (Kelly et al., 2014).
- The critical evaluation of research submitted for publication is fundamental to **scientific advancements** which have substantial **social impact**, for example by informing legal decisions and public policies (Alberts et al., 2008).



Benefits of peer review for referees

- **What motivates peers** to accept an invitation to become reviewers, especially since this is a highly demanding role in terms of personal resources (time, energy, stress) without offering any direct reward?
- By acting as peer reviewers, referees can **gain a better understanding of how the peer review process works**, what editors and reviewers look for, and how to improve their own manuscripts for submission.
- Peer review allows referees to **stay up-to-date with the latest research in their field** and identify emerging trends and research directions.
- Through peer review, referees learn how to provide constructive feedback and critically evaluate research, which can help them **improve their own writing and research skills** (Kelly et al., 2014).



Benefits of peer review for referees

- Peer review is a perfect opportunity to **practice** a wide array of skills, including analytical thinking, critical reading, coherent argumentation, and succinct writing. In Roman philosopher Seneca's words, "by teaching we learn".
- It is considered a process of **observational learning**, especially for young referees. Exposing oneself to multiple experts' views (i.e., those of authors, editors, and fellow reviewers) is a particularly refreshing and enriching experience.
- By demonstrating their expertise and contributing to the peer review process, referees can contribute to the advancement in the field and **enhance their reputation** (Bornmann & Daniel, 2010).
- Peer review provides referees with **opportunities to network with editors and other researchers in their field**, which can lead to future collaborations.

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- What is to be done? Developing good practices

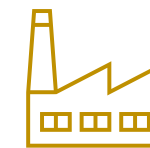


Has peer review failed?

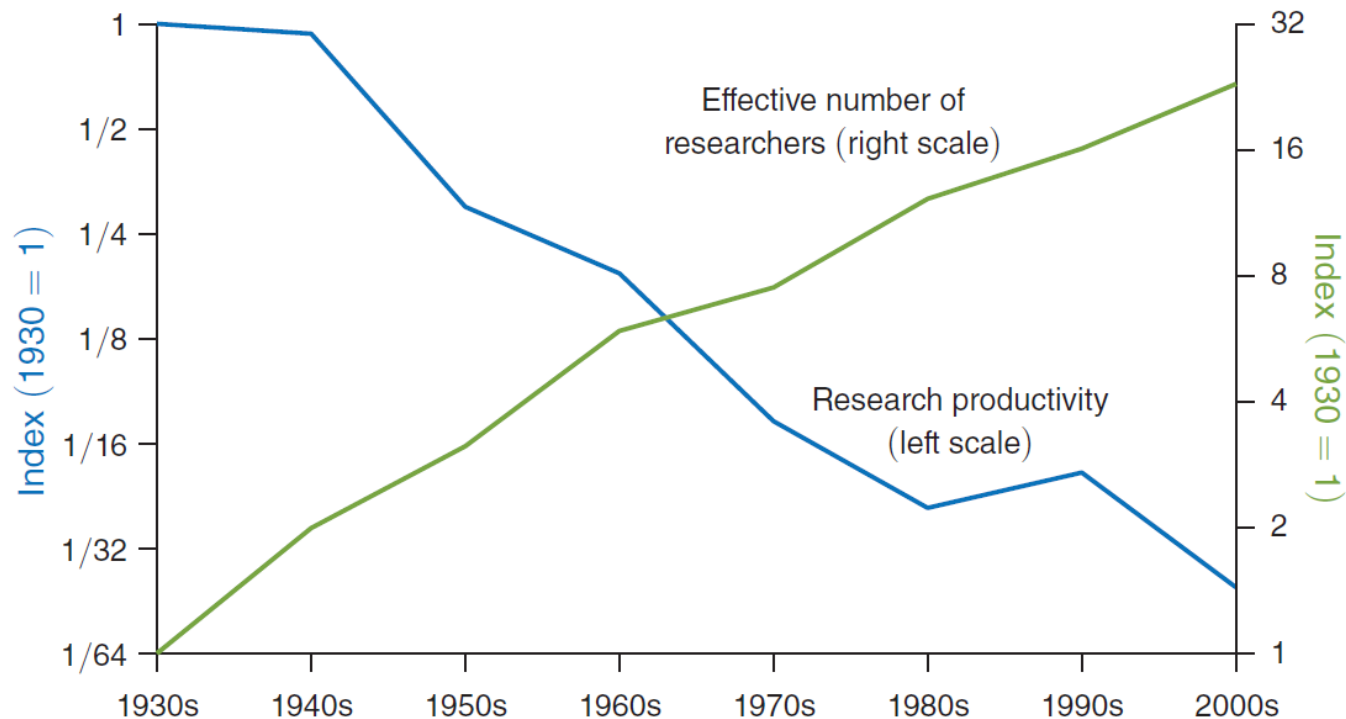


- Mastroianni (2022) describes peer review as the greatest experiment in the history of science, a very expensive one, with no randomization and control group, no consistent measurements, and no real hypothesis testing since its arbitrary truth has always been taken for granted. Yet, there are several signs that it has failed:
 - ✓ Peer review has not helped increase research productivity; rather, it may even **undermine the rise of new ideas**.
 - ✓ Peer review suffers from **bias, subjectivity, and distorted evaluations**, which are not relevant to the content of the manuscripts being reviewed.
 - ✓ Peer review does not seem to have protected from **fraudulent publications** and **misconduct practices** of authors.
 - ✓ Frequent failure to reproduce the results of peer-reviewed studies has led to a **replication crisis** in many disciplines, including psychology.

Peer review and research productivity



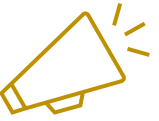
From "Are ideas getting hard to find?", by N. Bloom et al., 2020, *American Economic Review*, p. 1111, <https://doi.org/10.1257/aer.20180338>, Copyright 2020 by the American Economic Association.



- While research effort has been rising substantially in the past decades, **research productivity is declining sharply** (Bloom et al., 2020).

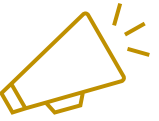
- Strong **competition** for more citations leads authors to largely reproduce existing ideas, rather than focus on new ones (Chu & Evans, 2021).
- In the **fear of rejection**, authors are more willing to regress towards the mean, instead of challenging established science and taking risks.

Bias and subjectivity in peer review



- Lee et al. (2013) summarize various reasons for non-intentional violation of impartial evaluation of a submission:
 - ✓ Bias as **deviation from “true quality”**. Low reliability, i.e., low inter-reviewer agreement, is indicative of subjective interpretations of established criteria.
 - ✓ Bias as a function of **author characteristics**. Universalism in peer evaluations can be compromised by status/prestige, affiliation, nationality, gender, or language.
 - ✓ Bias as a function of **reviewer characteristics**. Evaluative strictness or leniency can be due to disciplinary affiliation, culture, or level of experience.
 - ✓ **Content-based bias**. Cognitive cronyism, confirmation bias (against inconsistent to expected results), publication bias (favouring positive or significant findings).

Bias and subjectivity in peer review



- Peters and Ceci (1982) resubmitted **12** recently published research articles in highly respected psychology journals after giving fictitious names to institutions and authors. Only **3** papers were detected by editors or reviewers. Of the rest, **8** papers were rejected on grounds of “serious methodological flaws”.
- In another experimental study using fictitious manuscripts (Schroter et al., 2008), only **29%** of deliberate errors were caught by the reviewers. Short training had only a slight impact on improving error detection.
- Le Sueur et al. (2020) content-analyzed 596 reviewers’ reports across 10 BMC journals. They identified three latent types of reviewers: **nurturing** (22%; responding quickly, giving detailed constructive comments), **begrudged/unhelpful** (34%; less constructive, more harsh), and **blasé/indifferent** (44%; quickest to respond, generally positive but not constructive).

Fraud and misconduct in peer review



- Despite the rigorous process of scientific peer review, instances of **fraud** and **misconduct** have been reported. Some examples include falsified or fabricated data, plagiarism, and conflicts of interest.
- **Fake peer reviews**, i.e., authors caught setting up reviews or even reviewing their own papers, is a special form of scam that exploits loopholes in automated peer-review platforms such as ScholarOne (Ferguson et al., 2014).
- Minimum, superficial or no peer review at all are common exploitative practices of **predatory** journals (see <https://predatoryreports.org/>).
- Between 2018-2022, more than **260** published papers in psychology journals were retracted for dozens of reasons related to scam, according to Retraction Watch database (<https://retractionwatch.com/>).

Fraud and misconduct in peer review



- In 2011, former professor of social psychology Diederik Stapel was caught fabricating data sets and making up entire experiments for at least 65 published papers and 10 dissertations. This caused an unprecedented **crisis of confidence** in psychological science as the investigation report pointed, among others, to “the remarkable failure of the relevant national and international peer community” (Drenth et al., 2013, p. 81).
- A few years earlier, a meta-analysis of 18 surveys had concluded that **1.97%** of scientists admitted to have fabricated, falsified or modified data at least once, while **33.7%** admitted other questionable practices (Fanelli, 2009), which by large were ignored by peer reviews.
- The main **motivations** for committing misconduct are reported to be career pressure, ease of fabrication, and monetary gain (Goodstein, 2002).

The replication crisis and peer review



- Replication issues, i.e., when the results of scientific studies are hard or impossible to reproduce, are also related to peer review.
 - ✓ Statistical analyses are fine-tuned to **obtain desirable significant results** in order to maximize the probability of a paper being accepted for publication (Ioannidis, 2012).
 - ✓ Replication studies are thought to be undervalued by editors and by peer reviewers, who tend to focus too much on the **perceived significance** of research (Nosek et al., 2012).
- A number of replication studies in psychology have yielded poor replication rates ranging between **29%** (Open Science Collaboration, 2015) and **62%** (Camerer et al., 2018). These findings potentially undermine the credibility of the field.

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Can peer review be improved?



- Blind peer review is supposed to **protect from power asymmetries** between younger and senior researchers; on the other hand, it may **reduce accountability** (de Vries et al., 2009).
- Suggestions for improving peer review include **transparency** and **open review** processes, such as disclosing the identities of author and/or reviewer, and publishing reviewer reports alongside articles (Ross-Hellauer, 2017).
- **Open science** standards, including pre-registration of studies and data sharing through an open repository (Vicente-Saez & Martinez-Fuentes, 2018), can reduce bias in peer review and help identify fraud.
- **Preprint servers**, such as [PsyArXiv](#), host manuscripts yet to be reviewed. They intend to balance between accelerated dissemination of knowledge and scientific rigour as feedback is provided by community members (Horbach & Halfman, 2018).

Can peer review be improved?



- **Non-selective review** focuses on papers' (ethical) soundness and validity, rather than on their perceived importance and novelty (Horbach & Halffman, 2018). This shift in the review criteria was introduced by PLoS ONE, and other open access journals followed (e.g., BMJ Open, Sage Open).
- Publons emerged as a platform to **reward reviewers** for their time and effort, and as a form of **public recognition**, although its integration into WoS raised skepticism as to whether this is one step back in democratizing and popularizing peer review (Teixeira da Silva & Nazarovets, 2022).
- New **online tools** aided by artificial intelligence are available to reviewers assisting with tasks such as plagiarism detection, image manipulation, and correct use of statistics. Some even vision a future where the publishing process will be fully automated, which is admittedly a slippery road (BioMed Central, 2017).



Good practices: Checklist for authors

- ✓ **Choose the right journal** on the basis of scope, type (open-access vs. subscription-based), and target audience. Do not overestimate metrics but do avoid predatory publishers.
- ✓ Explore the journal profile and **make your manuscript relevant** – otherwise, choose another journal. Read the instructions to authors carefully and adhere to all requirements (length of manuscript, formatting style, data sharing, etc.).
- ✓ Be prepared for **revisions**, sometimes more than once!
- ✓ When resubmitting a revised manuscript, write up a **cover letter** that explains **how you addressed all editor and reviewer comments**.
- ✓ Do not get frustrated by **rejection** – according to APA (2022), you belong to the silent majority of 65%-73%! Use any valuable **feedback** to improve your work.



Good practices: Checklist for reviewers

- ✓ **Accept** an invitation to review a manuscript or grant. This will open up your opportunities to benefit from being a reviewer.
- ✓ Read carefully and take into serious consideration the **reviewing guidelines** of the journal. Not all journals have the same expectations from reviewers.
- ✓ Provide a **meticulous, free from known biases, organized, and constructive critique** of the work. This involves thorough reading, critical thinking, sometimes cross-checking with the literature, and accepting your limitations.
- ✓ Check for **ethical violations**. The quality of a paper can range from excellent to poor, but it should not deviate from the code of ethics. Also, disclose any conflicts of interest and do not share the study findings. **Ethics apply to you as well!**
- ✓ Make sure all necessary information is included for **replication** studies.



Good practices: Checklist for reviewers

- ✓ Highlight both the **strengths** and the **weaknesses** of the work. Acknowledge the former, provide alternatives and make useful suggestions for the latter.
- ✓ You can opt for a professional or more informal writing style – in any case, **watch your tone!** Think twice before you provide strong evaluative comments (e.g., “The study contains fatal flaws,” “the paper is of no use”).
- ✓ **Do not substitute the editor.** Your role is to provide useful recommendations for publication, not to decide yourself.
- ✓ Give yourself time, but make sure you submit your review **on time** – optimally, well before the deadline!
- ✓ Abide by the **golden rule** of peer review: “Review for others as you would have others review for you.” (McPeck et al., 2009, p. E157)

Review opening

Thank you for giving me the chance to read and comment on this interesting manuscript. The paper examined [...] The study was carefully designed and adequately conducted. The findings are clearly presented and discussed. The above merits being acknowledged, I'd like to draw the author(s)' attention to the following: 1... 2... 3...

Comment regarding hypotheses building

Research questions/hypotheses related to immigrant background are clearly missing, although the relevant literature is reviewed in the Introduction and the respective variable is included in the SEM model.

Comment regarding measures

Consider including information regarding linguistic/cultural adaptation of the scales used (along with respective references).

Comment regarding statistics

Another issue that puzzled me is the scoring and statistical handling of the personality scale. I was surprised to see that a total score was calculated for the big five. [...] The author(s) may wish to test models that include each of the big five as separate variables, but not a non-interpretable big five aggregate.

Comment regarding discussion

I like the summary of findings at the beginning of the Discussion (p. 16). There is a bit of jump from theoretical to practical implications on p. 17.

Cover letter opening

We are grateful to the reviewers for their insightful comments. We have revised the manuscript to reflect the comments that they provided. Changes are highlighted within the manuscript. Here is a point-by-point response to the reviewers' comments:

Comments from Reviewer 1

- Comment 1: [*Paste the original comment, preferably in italics or in different font color*]
- Response: ...

Response to individual comments

Thank you for this useful suggestion! We agree it is important to [...]. We have now revised / inserted / provided / modified / elaborated on [...]. We hope this clarifies [...].

Cover letter closing

We also ran a careful grammar and spelling check to correct for errors pointed out by the reviewers. We look forward to hearing from you and to respond to any further questions you may have.
Sincerely,

Conclusion



- Scientific peer review has both **benefits** and **dangers**; it is important for researchers, journals, and the public to be aware of both.
- So far, peer review has been “**the least imperfect way** of upholding the quality of scientific publications” (Dewitt & Turner, 2001, p. 93). Improvements and innovations are necessary to ensure its continued effectiveness in maintaining scientific integrity.
- Peer review developed as a **self-regulating mechanism** to improve research. It is not realistic to expect that it will act as a sort of ‘science police’ in the fight against fraud and misconduct.
- Since peer review largely depends on the “kindness of strangers”, **be a kind stranger yourself!**

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