

To help inform the special education research community, these briefs feature information on prominent open science practices. Content comes from our series of short articles in the DR newsletter, *Focus on Research*, as well as additional content developed by DR members.



OPEN PEER REVIEW

Open-science reforms have the potential to strengthen the credibility of research, help address the replication crisis, and abridge the research-to-practice gap (Adelson et al., 2019; Cook et al., 2018). *Focus on Research* is featuring a series of articles introducing prominent open-science practices. In this article, we focus on **open peer review**; specifically, we describe the importance and limitations of traditional peer review, elucidate three primary types of open peer review, and note some purported benefits and limitations of open peer review.

Traditional Peer Review

Peer review of scholarly publications, dating back to 1665 with the Royal Society's publication of *Philosophical Transactions* (Moxham & Fyfe, 2018), "is embedded in the core of our knowledge generation systems" (Tennant & Ross-Hellauer, 2020, p. 1). Peer review is intended to help ensure scientific rigor of publications, select which manuscripts to publish, and improve submitted manuscripts (Ross-Hellauer, 2017; Schmidt et al., 2018). Although scholars generally view traditional peer review positively (Ware, 2016), it has important limitations. For example, peer review

has been found to be unreliable and inconsistent; time-consuming, resulting in delayed dissemination of scholarship; prone to inaccuracies and biases; sometimes caustic; ineffective in guarding against the publication of flawed and misleading research; uninformative to research consumers, who typically cannot access reviews; and with few incentives for reviewers, making it difficult for journal editors to attract qualified reviewers (see Ross-Hellauer, 2017, for a review).

Open Peer Review

Open peer review is intended to remediate some of the shortcomings of traditional peer review by applying the principles of openness and transparency (Ross-Hellauer, 2017; Ross-Hellauer et al., 2017). Although open peer review is often considered a core open-science practice, it is not well defined or given much attention in the open-science literature, and it lacks strong evidentiary support (e.g., Bravo et al., 2019; van Rooyen et al., 2010). Based on a systematic review of the literature, Ross-Hellauer (2017) suggested a pragmatic definition of open peer review:

an umbrella term for a number of overlapping ways that peer review models can be adapted

in line with the aims of Open Science, including making reviewer and author identities open, publishing review reports and enabling greater participation in the peer review process. (Ross-Hellauer, 2017, p. 1)

Ross-Hellauer identified seven types of open review, which are often combined in the literature, including (a) open identities, (b) open reports, (c) open participation, (d) open interaction, (d) open pre-review of manuscripts, (e) open final-version commenting, and (f) open platforms or decoupled review. Here, we focus on three types of open review—open identities, open reports, and open participation, which were

present in more than 99% of definitions in Ross-Hellauer's review.



Currently, most education journals use double-blind peer review, in which the identities of authors and reviewers are masked to one another, or single-blind review, in which the identities of reviewers are blinded to authors though authors are known to reviewers. In contrast, neither authors nor reviewers are masked in open identities, also referred to as signed peer review (Ford, 2013) and unblinded review

(Monsen & Van Horn, 2007). Blinding in the review process is intended to protect authors from potential biases (e.g., gender bias) and reviewers from concerns about retribution from authors dissatisfied with a negative review (Ross-Hellauer, 2017). However, research has indicated that blinding does not influence the rate of error detection in reviews (Godlee et al., 1998), and that reviewers can often identify authors despite blinding (Fisher et al., 1994; Godlee et al., 1998; Ross-Hellauer, 2017). In open reports, or transparent review, either full reports or summaries of reviewers' comments are published with articles, most often on the journal website. Reviewer identities can be blinded or unblinded, depending on whether open reports are combined with open identities.

Open participation—also referred to as crowdsourced peer review (Ford, 2013), community/public review (Walker & Rocha da Silva, 2015), and public peer review (Bornmann et al., 2012)—involves allowing a broad community to participate in peer review by providing either full reviews or short commentaries. Open participation can be fully open, with anyone being able to provide reviews. Alternatively, open participation can require some form of credentialing, such as being a registered user with a history of publications, for conducting a review (Tennant, 2020). Open participation is most often used in addition to, not instead of, traditional peer review (Ross-Hellauer, 2017).

Potential Benefits of Open Peer Review

Each model of open peer review seeks to address limitations of traditional peer review by making the peer review process more open, potentially leading to increased accountability, transparency, and validity of the peer-review process (Ross-Hellauer, 2017; Ross-Hellauer et al., 2017). Open identities are theorized to reduce the likelihood of biased, perfunctory, inaccurate, and caustic reviews by increasing visibility and accountability (Ross-Hellauer, 2017). That is, if reviewers' identities are known, they may be more likely to submit thorough, constructive, and objective reviews (e.g., Bornmann et al., 2012). Such accountability may be heightened by combining open

identities with open reports. Indeed, Bruce et al.'s (2016) review found that open identities improved the quality of peer review and decreased rejection rates. Public availability of reviews with the reviewers' identities could also provide recognition for high-quality reviews, with reviews potentially becoming citable products, thereby incentivizing scholars to serve as reviewers.

Open peer review can also lend greater transparency to the review process. The transparency in open identities and open reports has been suggested as a mechanism for making the overall system fairer (Ross-Hellauer, 2017), as it allows for potential

conflicts of interest and opposing theoretical stances between authors and reviewers to be made open and thus subject to public scrutiny. Finally, open peer review has been suggested as a means for increasing the quality of published articles and enriching their scientific record. Open participation can provide researchers and editors considerably more feedback on manuscripts than with traditional peer review. Open reports can provide readers with important context for interpreting publications and understanding how reviews influenced the published article. Open reports and open participation can be combined to amplify their benefits.



open peer review seeks to address limitations of traditional peer review by making the peer review process more open, potentially leading to increased accountability, transparency, and validity of the peer-review process

Potential Limitations and Obstacles

Open peer review also has important potential limitations and obstacles. A primary concern is the removal of blinding in open identities. The potential power dynamics between reviewers and authors, especially between more senior scholars and early career researchers, may lead to bias and retaliation, and therefore potentially compromise the integrity and rigor of the peer review process. Further, reviewers may be hesitant to conduct reviews if their identities or reviews will be made known to the authors or the public (van Rooyen et al., 2010). This may deplete an already small

pool of qualified reviewers. Open participation could also result in unqualified reviewers generating invalid reviews. Moreover, studies suggest only between 5 and 20 percent of submitted articles are actually commented on using open participation (Fitzpatrick, 2011; Pöschl, 2012), thereby limiting the approach's potential benefits. These authors found traditional, solicited reviews more effectively supported the selection and improvement of manuscripts than open participation reviews.

Conclusion

Despite proposed benefits, research on open peer review shows mixed and inconclusive findings regarding efficacy and practicality. For example, combining open identities and open reports did not improve quality of reviews, in comparison to just using open identities, and increased refusal rates among potential reviewers (e.g., van Rooyen et al., 2010). Bravo and colleagues (2019) found that using open reports with the option for open identities did not influence willingness to review, review quality, or the time to complete reviews; and only 8.1% of reviewers elected to post their review reports unblinded. Further research is needed to understand the potential fit of open peer review in special education scholarship and determine whether and how open review can be

implemented in a manner that protects the integrity of the review process. Care in balancing the potential benefits and drawbacks of open peer review may be especially important for early career researchers and in other situations when power dynamics are at play. To this end, we suggest considering a mixture of open and traditional practices (see Bravo et al., 2019), such as using open participation alongside traditional referred reviews, or posting peer reviews with the option for reviewers to self-identify. Perhaps these types of approaches can help address some of the shortcomings of traditional peer review while retaining its strengths (see Ross-Hellauer & Görögh, 2019 for helpful guidelines).

REFERENCES

- Adelson, J. L., Barton, E., Bradshaw, C., Bryant, B., Bryant, D., Cook, B. G., ... Troia, G. A. (2019, February 18). A roadmap for transparent research in special education and related disciplines. <https://doi.org/10.35542/osf.io/sqfy3>
- Bornmann, L., Herich, H., Joos, H., & Daniel, H. D. (2012). In public peer review of submitted manuscripts, how do reviewer comments differ from comments written by interested members of the scientific community? A content analysis of comments written for Atmospheric Chemistry and Physics. *Scientometrics*, 93(3), 915-929. <https://doi.org/10.1007/s11192-012-0731-8>
- Bravo, G., Grimaldo, F., López-Iñesta, E., Mehmani, B., & Squazzoni, F. (2019). The effect of publishing peer review reports on referee behavior in five scholarly journals. *Nature Communications*, 10(1), 1-8. <https://doi.org/10.1038/s41467-018-08250-2>
- Bruce, R., Chauvin, A., Trinquart, L., Ravaud, P., & Boutron, I. (2016). Impact of interventions to improve the quality of peer review of biomedical journals: A systematic review and meta-analysis. *BMC Medicine*, 14(1), 85. <https://doi.org/10.1186/s12916-016-0631-5>
- Cook, B. G., Lloyd, J. W., Mellor, D., Nosek, B. A., & Therrien, W. J. (2018). Promoting open science to increase the trustworthiness of evidence in special education. *Exceptional Children*, 85(1), 104-118. <https://doi.org/10.1177/0014402918793138>
- Fisher, M., Friedman, S.B., & Strauss, B. (1994). The effects of blinding on acceptance of research papers by peer review. *JAMA*, 272(2), 143-146.
- Fitzpatrick, K. (2011). *Planned obsolescence*. NYU Press.
- Ford, E. (2013). Defining and characterizing open peer review: A review of the literature. *Journal of Scholarly Publishing*, 44(4), 311-326. <https://doi.org/10.3138/jsp.44-4-001>
- Godlee, F., Gale, C. R., & Martyn, C. N. (1998). Effect on the quality of peer review of blinding reviewers and asking them to sign their reports: A randomized controlled trial. *JAMA*, 280(3), 237-240. <https://doi.org/10.1001/jama.280.3.237>
- Monsen, E. R., & Van Horn, L. (2007). *Research: Successful approaches*. American Dietetic Association.
- Moxham, N., & Fyfe, A. (2018). The Royal Society and the prehistory of peer review, 1665-1965. *The Historical Journal*, 61(4), 863-889. <https://doi.org/10.1017/S0018246X17000334>
- Pöschl, U. (2012). Multi-stage open peer review: Scientific evaluation integrating the strengths of traditional peer review with the virtues of transparency and self-regulation. *Frontiers in Computational Neuroscience*, 6, 33. <https://doi.org/10.3389/fncom.2012.00033>
- Ross-Hellauer, T. (2017). What is open peer review? A systematic review. *F1000Research*, 6, 588. <https://doi.org/10.12688/f1000research.11369.2>
- Ross-Hellauer, T., Deppe, A., & Schmidt, B. (2017). Survey on open peer review: Attitudes and experience amongst editors, authors and reviewers. *PLoS ONE*, 12(12), e0189311. <https://doi.org/10.1371/journal.pone.0189311>
- Ross-Hellauer, T., & Görögh, E. (2019). Guidelines for open peer review implementation. *Research Integrity and Peer Review*, 4(1), 1-12. <https://doi.org/10.1186/s41073-019-0063-9>
- Schmidt, B., Ross-Hellauer, T., van Edig, X., & Moylan, E. C. (2018). Ten considerations for open peer review. *F1000Research*, 7, 969. <https://doi.org/10.12688/f1000research.15334.1>
- Tennant, J. P. (2020, February 26). *Review instructions for ScienceOpen*. ScienceOpen. <https://blog.scienceopen.com/2016/06/review-instructions-for-scienceopen/>
- Tennant, J. P., & Ross-Hellauer, T. (2020). The limitations to our understanding of peer review. *Research Integrity and Peer Review*, 5, 1-14. <https://doi.org/10.1186/s41073-020-00092-1>
- van Rooyen, S., Delamothe, T., & Evans, S. J. (2010). Effect on peer review of telling reviewers that their signed reviews might be posted on the web: Randomised controlled trial. *BMJ*, 341, c5729. <https://doi.org/10.1136/bmj.c5729>
- Walker, R., & Rocha da Silva, P. (2015). Emerging trends in peer review-A survey. *Frontiers in Neuroscience*, 9, 169. <https://doi.org/10.3389/fnins.2015.00169>
- Ware, M. (2016). Peer review survey 2015. https://www.elsevier.com/_data/assets/pdf_file/0007/655756/PRC-peer-review-survey-report-Final-2016-05-19.pdf



A special thank you to the following DR members for their contribution to this OPEN SCIENCE BRIEF, ISSUE 8:

- Andrew Heuer, Corey Peltier, Bree Jimenez (Eds).
- Sarah Emily Wilson & Bryan G. Cook, *University of Virginia*