

Scientific Life

Journals must expand access to peer review data

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Empirical studies on peer review bias are primarily conducted by people from privileged groups and with affiliations with the journals studied. Data access is one major barrier to conducting peer review research. Accordingly, we propose pathways to broaden access to peer review data to people from more diverse backgrounds.

Authorship of research on peer review bias

Peer review is biased, yet few empirical studies evaluate the extent of bias or potential policies to combat it [1]. Lack of research fuels debate as to whether peer review bias is even a problem (e.g., [2]). In turn, few journals are actively trying to combat bias [1].

One major barrier to conducting empirical research on peer review is data availability [3–5]. Peer review data are held by journal owners and are generally unavailable to unaffiliated researchers [3–5]. Due to data inaccessibility, studies on peer review may be primarily conducted by people

affiliated with journals and publishers. Publishers, journals, and editors are concentrated in highly developed, English-speaking countries [1,6], and editors are predominantly men [7]. Accordingly, research on peer review bias could be heavily dominated by people favored by peer review. This could lead to an incomplete picture of peer review bias and solutions that do not benefit the authors most disadvantaged by peer review bias.

Here we examine who is conducting peer review bias research in the biological sciences and suggest pathways to make peer review data available to more diverse scientists, which should facilitate novel solutions to help reduce peer review bias [8].

Who is conducting research on peer review bias?

We systematically searched for published literature to document who is conducting empirical research on peer review bias. We updated the literature search from Smith *et al.* [1] through October 2022 following their inclusion criteria, except we included studies for which they could not extract data, studies that used the same datasets, and experiments conducted outside of actual peer review. Our search yielded 44 studies (see the supplemental information online). For each, we screened authors' disclosed affiliations with the studied journal(s) (i.e., journals data were drawn from) and/or their publisher(s). We also documented undisclosed affiliations through web searches for the first, corresponding, and last authors (see the supplemental information online). We used web searches to assign the corresponding authors' genders and used their institutional affiliations to assign their countries' continent, primary language, Human Development Index (HDI), and their institutional rankings (following [9,10]; see the supplemental information online). Last, we compared the demographics of the corresponding authors of studies on peer review bias with overall demographics of authors of biological

sciences articles accepted for publication using data from [1] (see the supplemental information online).

Studies are conducted by authors affiliated with journals

Most of the 44 publications included authors who were editors at the journal(s) studied during the time of the study: 55% explicitly indicated this in the manuscripts and 14% were determined from other sources. At least one author listed an affiliation with the publisher of the journal(s) in 9% of publications. Thirty-eight manuscripts (86%) identified the journal(s) studied and 68% of those were published in a journal included in the study. Overall, 18% of studies declared a competing interest related to a journal or publisher affiliation or funding sources.

Diverse researchers are under-represented in bias research

Most corresponding authors publishing empirical research on peer review bias are from privileged groups. Across all studies, 70% of corresponding authors were male; 91% had affiliations in Europe, North America, or Oceania; 93% had affiliations in countries with very high HDI (i.e., HDI ≥ 0.800); and 77% had affiliations in countries where English is a primary language (Figure 1).

Despite their general under-representation, some historically excluded demographics have greater representation in peer review bias literature compared with their baseline authorship rates in the biological sciences. For example, female corresponding authors comprised 20% of authors of 7292 accepted manuscripts across the biological sciences in Smith *et al.* [1]. However, we found that female corresponding authors comprised 30% of all 43 peer review bias studies for which we could assign author gender, 41% of 22 studies focused on gender bias in peer review, and 50% of 16 studies focused on solutions to reduce gender bias in peer review (Figure 1A).

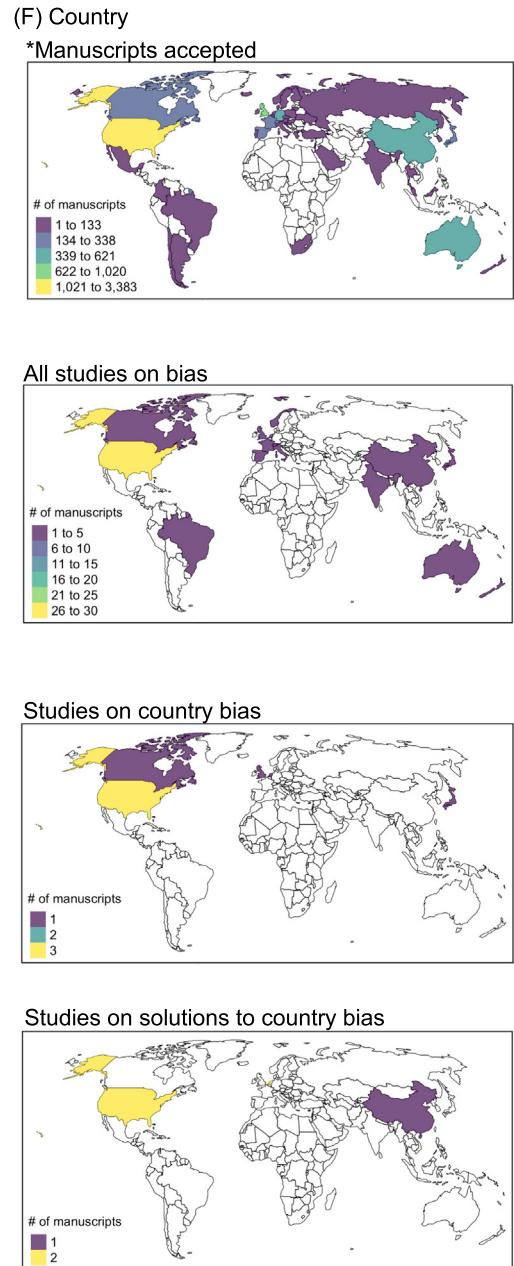
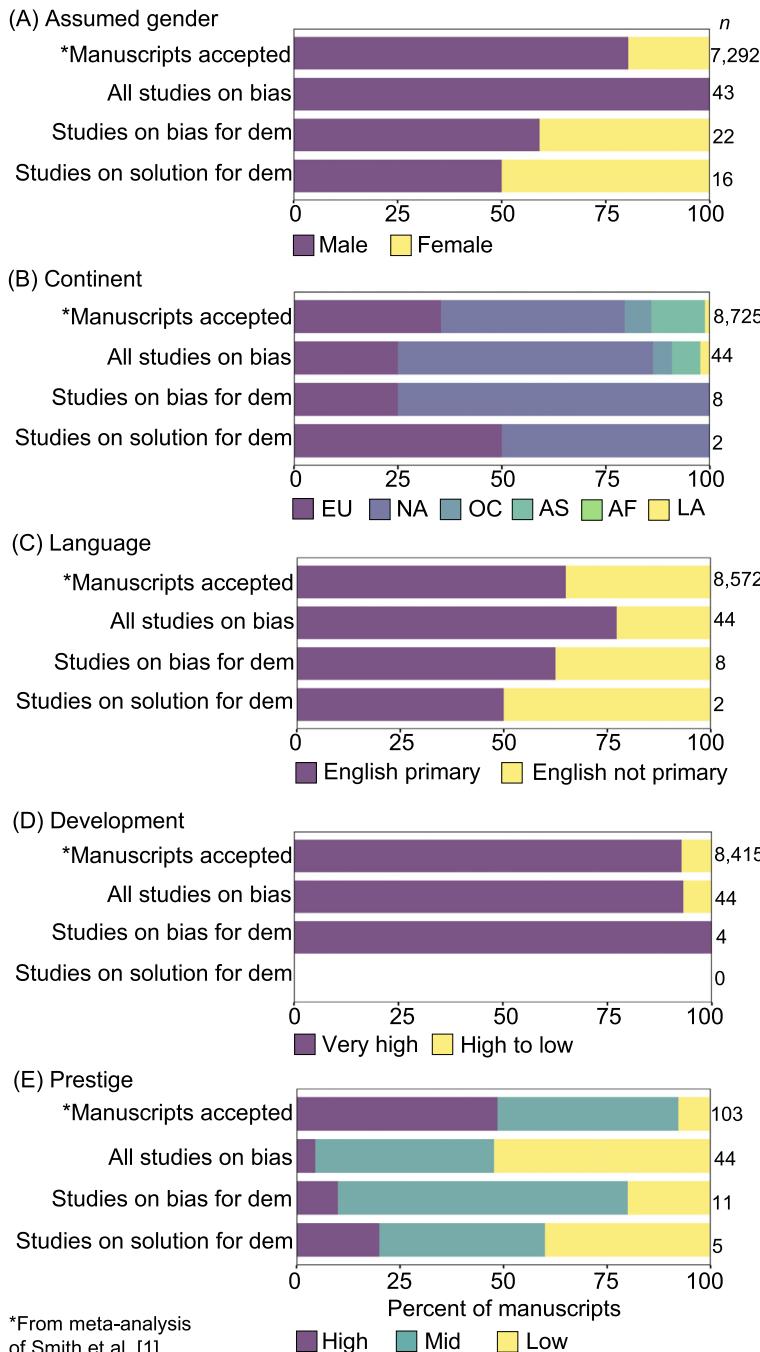


Figure 1. Historically excluded groups are the minority of corresponding authors in peer review bias literature. Corresponding authors' (A) assumed gender; country of institutional affiliation's (B) continent, (C) primary language, and (D) development; (E) prestige; and (F) country. For each demographic category, the figure compares baseline rates of corresponding authors by demographic in the biological sciences (from Smith et al. [1]; top bar of each panel) with the demographics of corresponding authors conducting peer review bias research (from this study; bottom three bars of each panel). Bars within panels from top to bottom show: (1) the percentage each demographic comprised of all corresponding authors in the biological sciences from Smith et al. [1] whose manuscripts were accepted for publication ('manuscripts accepted'). (2) Data from this study showing the percentage of all corresponding authors of peer review bias studies by demographic ('all studies on bias'). Bars 3 and 4 provide demographic data of corresponding authors of peer review bias studies but only show authorship for studies conducted on the

(Figure legend continued at the bottom of the next page.)

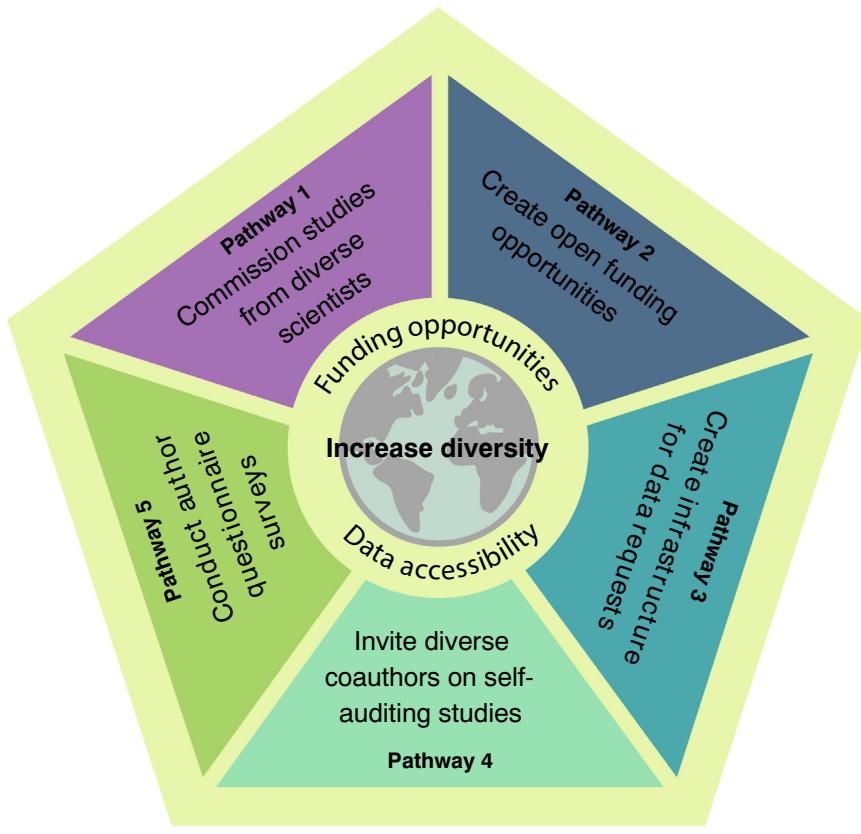
Conversely, the under-representation of some groups was magnified in peer review bias literature. Corresponding authors with affiliations in Africa, Asia, or Latin America comprised 14% of authors of 8725 accepted manuscripts in Smith *et al.* [1]. However, we found that corresponding authors with affiliations in these continents comprised 9% of all 44 peer review bias studies and 0% of eight studies focused on bias against authors based on continent (Figure 1B).

Pathways to expand peer review data access

Data access is one reason authorship on peer review bias studies is skewed towards those affiliated with journals and from privileged backgrounds. Because peer review data are held by journal owners, they are generally unavailable to unaffiliated researchers [3–5]. Accordingly, we suggest five pathways to expand peer review data accessibility (Figure 2). Our suggestions are not exhaustive and pathways will vary among publishers and journals. Data sharing pathways must abide by international law regarding the transfer of data including Personally Identifiable Information (e.g., General Data Protection Regulation in Europe; see [4] for an example of an initiative compliant with privacy concerns).

Pathway 1. Commission studies from diverse scientists

Rather than conducting their own bias assessments, publishers and journals could commission scientists from historically excluded backgrounds to ‘audit’ their peer review process. This could include assessment of bias intervention trials. For example, some publishers collect author and reviewer demographic data (e.g., [11,12]) and could commission diverse researchers



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Figure 2. Five proposed pathways to expand peer review data access to a broader range of researchers. These pathways are not an exhaustive list of possible options but are meant to be a starting point to increase the diversity of researchers conducting research on peer review bias. Ultimately, these pathways could increase peer review equity by expanding the body of research available, while also increasing the diversity of ideas and experiences represented in finding solutions.

to assess if increasing the diversity of reviewers can promote peer review equity. Commissioned researchers should be given funding.

Pathway 2. Create open funding opportunities

Publishers and journals could create open call grants for unaffiliated researchers to investigate peer review bias. Unlike Pathway 1, these open calls would be an opportunity for less prestigious or well-known researchers to conduct peer review

bias research. These opportunities would lower barriers for researchers who may lack access to funding for equity, diversity, and inclusion research. Some publishers are already creating such opportunities: 14% of the studies we reviewed declared funding from the publisher or society that owned the journal studied.

Pathway 3. Create infrastructure for data requests

Publishers could develop better infrastructure and formalized procedures for

demographic corresponding to the panel label. For example, in panel (A) assumed gender, bars 3 and 4 show the percentage of corresponding authors of peer review bias research that were male or female that (3) assessed possible bias in peer review based on author gender ('studies on bias for dem') and (4) assessed possible solutions to mitigate gender bias in peer review ('studies on solution for dem'). The data underlying this figure and further detail on methods are available in the supplemental information online. Abbreviations: AF, Africa; AS, Asia; EU, Europe; LA, Latin America; OC, Oceania; NA, North America.

independent researchers to request peer review data. For example, publishers and journals could have explicit guidelines on their websites outlining requirements for data access (e.g., Institutional Review Board approvals), links to data transfer agreements, and information on who to contact for requests.

Pathway 4. Invite diverse, unaffiliated coauthors on internal studies

It is commendable that some journals have conducted self-assessments of peer review equity. However, studies conducted by affiliated authors would benefit from including critical perspectives from unaffiliated coauthors from historically excluded backgrounds. Studies conducted internally by journals or publishers should be rigorously peer reviewed by diverse reviewers (but note that we did not directly assess either of these suggestions in this study).

For internally conducted studies, anonymized data should be available for reanalysis and meta-analysis. Publicly archiving anonymized data after publication would allow other researchers to re-evaluate the data with unique perspectives and analyze data from multiple journals to conduct more comprehensive research.

Pathway 5. Conduct author questionnaire surveys

If unable to access peer review data directly, researchers with appropriate ethical approvals could disseminate author surveys that ask respondents to trace an article's peer review history and provide author demographic information (e.g., [13,14]). Questionnaires would allow researchers to consider difficult-to-collect data, such as self-reported demographics [13] and the consequences of peer review outcomes [14]. Questionnaire surveys would provide a complementary and more comprehensive

picture of peer review bias than journal-provided data alone.

Realizing solutions to remove barriers

We found that research on peer review bias is primarily conducted by people favored by peer review and with potential conflicts of interests with the journals studied. We suggest five general pathways to expand peer review data access to people from more diverse backgrounds. While we can synthesize knowledge from prior studies, we do not have the lived experience to understand the diverse issues researchers around the world face to suggest exhaustive solutions. Our pathways are not an all-inclusive means to reduce the cultural, privilege, and gender inequalities among researchers who study peer review bias. Journals and publishers should engage with broader communities to refine these pathways and better align with their specific policies. They should, for example, hold workshops and panels with diverse people to determine additional pathways to reduce the full range of barriers to conducting research on peer review bias. We hope that expanding the diversity of voices and breadth of peer review bias literature could help build the scientific foundation to effectively reduce peer review bias.

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Supplemental information

Supplemental information associated with this article can be found online at <https://github.com/CourtneyLDavis/Peer-Review-Data-Access> and <https://doi.org/10.1016/j.tree.2024.02.003>.

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