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Gender bias found in Earth-science society journals

Women publish and review less than men in American Geophysical Union journals, but have a higher acceptance rate.

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In one of the most detailed breakdowns yet of gender bias in scholarly publishing, the American Geophysical Union (AGU) in Washington DC has found that its female members submit fewer papers, and are asked to be peer reviewers less frequently, than men. The effect holds across all age ranges, from scientists in their twenties to those in their seventies.

Yet manuscripts sent to AGU journals by women were accepted 60% of the time — 4 percentage points higher than the rate for men.

“Women don’t submit as often, but when they do they have a higher acceptance rate,” says Jory Lerback, a hydrogeologist at the University of Utah in Salt Lake City. She led the data analysis while working for the AGU, and reported the findings on 28 September at a meeting of the Geological Society of America (GSA) in Denver, Colorado.

Many studies have quantified gender differences in research output, but the AGU work is rare in that the society’s database contains information not only on gender, but also on age. Lerback’s analysis can thus break the differences down according to where a scientist is in her career.

The AGU began the study at the request of Marcia McNutt, the former editor-in-chief of *Science* who is now president of the US National Academy of Sciences in Washington DC. “I was dubious at first, until we started doing it and saw what we had,” says Brooks Hanson, the AGU’s director of publications and Lerback's co-author. The society had started asking its members their gender and age in 2013, so it had a hugely useful database on its hands.

Double bind

Lerback and Hanson examined information from 97,431 people, cross-referencing their e-mail addresses with the editorial databases of the 19 AGU journals that existed at the time. About 29% of the society’s members are women.

Between 2012 and 2015, women who published in AGU journals as first authors had submitted about 1.8 papers each, compared with 2.1 papers for men in the corresponding situation. And women served as peer-reviewers just 18% of the time. The gender differences persisted across age groups, with the greatest discrepancy for the youngest scientists, in their twenties.

When asked for the names of possible peer reviewers, female first authors suggested female reviewers 20% of the time, whereas male first authors suggested women 15% of the time. Meanwhile, female journal editors suggested female reviewers 21% of the time, and for male editors the figure was 17%. “This behaviour contributes to that gap between who’s publishing and who’s reviewing,” Lerback says.

Yet women also declined invitations to serve as peer reviewers at higher rates than men, completing an average of 3.65 reviews each, compared with 4.34 for men. Scientists who miss out on the chance to participate in peer review are also missing opportunities to develop their reputation and professional skills, says Hanson. “Reviewing is a way to impress people,” he notes.

Mind the gap

But Hanson is not a fan of introducing double-blind peer review, in which both authors and reviewers are unaware of each other’s identities. Instead, he says, the AGU has been pushing to diversify the gender and geographical mix of its editorial boards, and to ensure that editorial selection committees are gender balanced. He says that training and awareness are the best ways to combat implicit bias.

The GSA, which publishes four journals, says that it doesn’t have the AGU’s level of demographic detail but works in other ways to alleviate gender bias. “Right now, our efforts have been to sustain a higher percentage of female editors and associate editors,” says

Jeanette Hammann, the society's director of publications.

Dan Lovegrove, a geology publisher for Amsterdam-based publishing group Elsevier, reported at the meeting that although 30% of contributions to Elsevier's Earth and planetary science journals come from women, only 13% of its journal editors are female. He says that the company has launched a pilot project to encourage gender equality in recruitment for its editorial boards.

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