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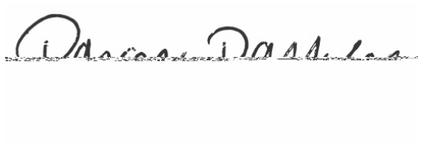
Chemistry should be for everyone. For the chemical sciences to prosper and deliver against global challenges, we must attract, develop and retain a diverse range of talented people. That's not merely an opinion – diverse teams deliver better results.

As a professional and membership body and a leading voice for the chemistry community, we have a responsibility to promote inclusivity and accessibility in order to improve diversity. When we audited the diversity landscape of the chemical sciences, we uncovered a lack of data and a need for greater transparency.

That is why we undertook this study to assess gender bias in our publishing activities. We are a global not-for-profit chemical science publisher – reinvesting any surplus we make back into the chemistry community. Analysing and making data available from our own publishing, supports the community by bringing to light the hidden inclusion challenges that need tackling.

We found that there is a complex interaction of subtle biases occurring throughout the publishing pipeline, which combine to put women at a disadvantage when disseminating their research. We must recognise where this happens. We are committed to further scrutinising our own processes at each stage – and we are calling on other publishers to do the same. We want to work together to make scientific peer-reviewed publishing fit for the



What are the consequences for female authors?

Our findings show that biases do exist both pre- and post-publication.

These subtle biases, which occur throughout the publishing pipeline, combine to put women at a disadvantage when disseminating their research. Female authors are less likely to benefit from the visibility provided by being a corresponding author.

of papers accepted by editors and sent for peer review are by female corresponding authors

of papers accepted for publication after peer review are by female corresponding authors

of citations have a corresponding author who is a woman

What can we do about it?

Only by recognising the biases that are introduced at decision points by authors, reviewers, editors and publishers, can we act to reduce them.

We will therefore contaits by a w0 1 10767D 119sua wi3s60no1su owB0.86 0.2 0.32 0.5

Increase transparency

Undertake comprehensive analysis and reporting of our authors, reviewers and editorial decision makers by sub-discipline – and publish this annually. We call on other publishers to do the same.

Reflect our research community

Recruit and train reviewers, editorial board members and associate editors to reflect the current gender balance of our research community: our target for 2022 is at least 36% women.

Empower and innovate

Provide new training and resources to empower our editors to eliminate bias. We will test new models throughout the publishing profile to address bias from submission to publication.

Encourage intervention

Partner with others and lead the development of a new

to set the standard for driving change within the academic publishing industry.

*Is there a gender gap in chemical sciences scholarly communications? Day, Corbett and Boyle, *available from ChemRXiv*, Under Review

3.

Background to this study

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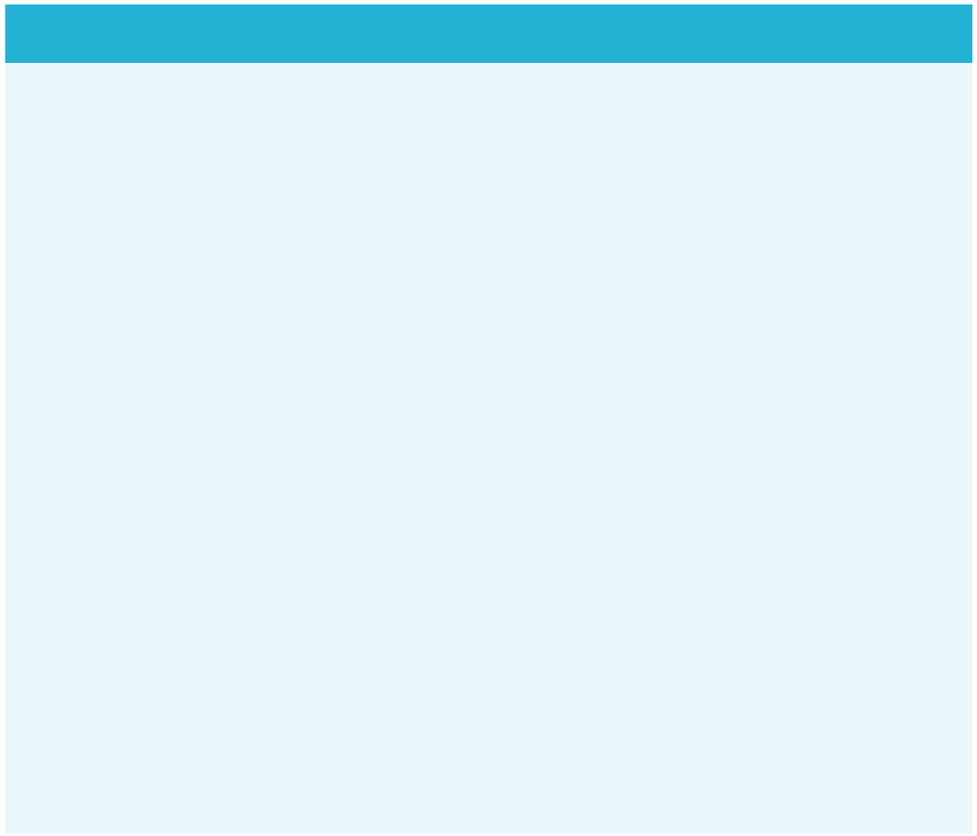
In this study, we analysed the gender profile of authors of 717,108 manuscript submissions across all our journals from January 2014 until the end of July 2018 and 141,073 citations between our journals from August 2011 until September 2018. Gender was assigned to names by following the approach used in the Gender Profiles in UK Patenting report authored by the UK Intellectual Property Office[7]. One limitation of this approach is that gender could only be assigned in binary terms. Calculations reflect the percentage of the population with known gender, so that people with unknown gender were removed from the data set[8].

We used these data to:

The results that follow have been compared to the baseline of female chemistry researchers in the Royal Society of Chemistry's author community.

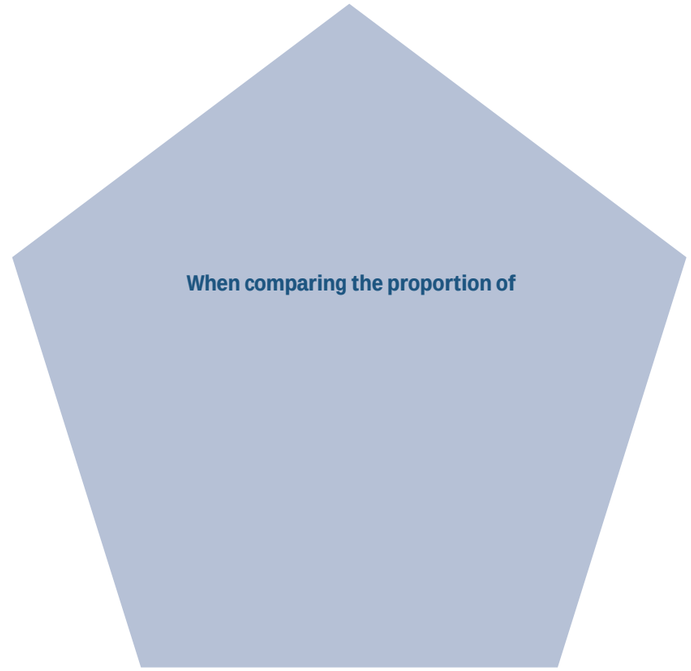
5.

Gender balance in our publishing community



6.

What are the gender patterns of manuscript submissions?



Does gender affect article review and acceptance rates?

The academic publishing process relies on the ability of editors, reviewers and other stakeholders, such as editorial boards, to act as gatekeepers in order to uphold the quality and t
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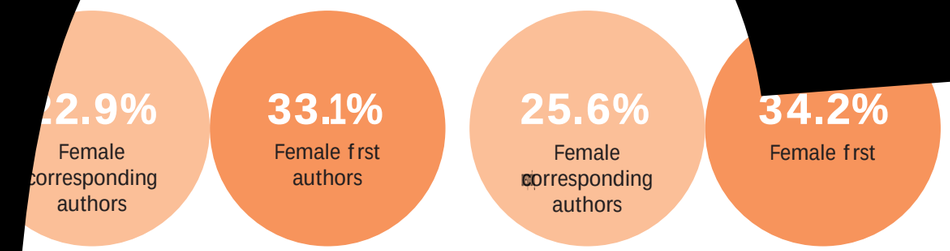


These trends agree with the analysis of article submissions[6], which showed that both editors and reviewers favour manuscripts from authors of the same gender and same country.

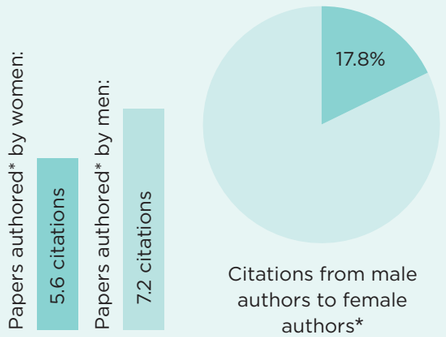
As a larger percentage of reviewers are male this meant that acceptance rates for male authors were higher than for women, especially if the reviewers were all men.

The impact of biased reviews might be even more profound if the res.voSpan ⁄ men.

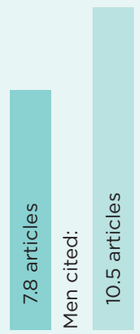
8.

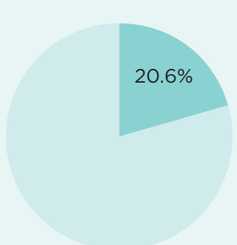
Are female authors cited less?

- Papers by female corresponding authors are cited less than those from male corresponding authors (papers by female corresponding authors are cited on average 5.6 times; papers by male corresponding authors are cited 7.2 times)
- Men cite female corresponding authors less than male corresponding authors (17.8% of citations from male corresponding authors are to female corresponding authors)
- Women cite fewer articles overall (on average women cited 7.8 other papers, men cited 10.5)
- Women corresponding authors cite papers by female corresponding authors more than men do (20.6% of citations from female corresponding authors are to female corresponding authors)



Citations from male authors to female authors*





Citations from female authors to female authors*

These results were mirrored by the experiences of some interviewees:

“

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As part of our strategy on inclusion and diversity, we are committed to continuing to scrutinise our own publishing processes, in order to address gender bias at each stage of the publishing pipeline. This report is just one part of an ongoing conversation about inclusion and diversity across our publishing activities. We aim to increase awareness of these issues and drive change among all those involved in, and impacted by, our publishing processes.

References and acknowledgments

References:

1. The Royal Society of Chemistry, 2018. *Diversity landscape of the chemical sciences*. Available: