Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Pervasive gender bias in editorial boards of biodiversity conservation journals

Luisa F. Liévano-Latorre,a,b,⁎ Rafaela Aparecida da Silva,a Raísa R.S. Vieira,a,c
Fernando M. Resende,a,d Bruno R. Ribeiro,a,b Fábio J.A. Borges,a,b Lilian Sales,a,e
Rafael Loyola,a,s,g

a Laboratorio de Biogeografia da Conservacao, Universidade Federal de Goias, Goiânia, GO, Brazil
b Programa de Pós-Graduação em Ecologia e Evolução, Universidade Federal de Goiás, Goiânia, GO, Brazil
c International Institute for Sustainability, Estrada Dona Castorina, 124, 22460-320 Rio de Janeiro, RJ, Brazil
d Ecologia Evolutiva & Biodiversidade/DBG, ICB/Universidade Federal de Minas Gerais, CP 486 Belo Horizonte, MG, Brazil
e Departamento de Biologia Animal, Instituto de Biologia, Universidade Estadual de Campinas, Campinas, SP, Brazil
f Departamento de Ecologia, Universidade Federal de Goiás, Goiânia, GO, Brazil
g Fundação Brasileira para o Desenvolvimento Sustentável – FBDS, Rio de Janeiro, RJ, Brazil

ARTICLE INFO

Keywords:
Female editors
Gender equality
Homophily
Women inclusion

ABSTRACT

Women are underrepresented in professional spaces, particularly at leadership positions. In science, the participation in editorial boards of journals is evidence of a high reputation within a specialty or field. Therefore, female presence in editorial boards can be used as a proxy for female presence and leadership in academic spaces. Here, we assessed the gender composition in editorial boards of 31 biodiversity conservation (BC) journals included in the Web of Science and obtained information on current and past editorial boards of these journals. We found pervasive gender bias in the editorial boards of the main scientific BC journals. Current editorial boards were composed of 1251 editors, of which only 28.7% were women. Nevertheless, gender biases are becoming smaller over time. Our projections indicate that BC journals may achieve gender balance in their editorial boards by the year 2038. We argue that a diverse and inclusive editorial board has greater chances to propose innovative solutions to conservation problems. Thus, the academic community, editors and journals must take proactive measures to achieve gender balance in their editorial boards by the year 2038. We argue that a diverse and inclusive editorial board has greater chances to propose innovative solutions to conservation problems. Thus, the academic community, editors and journals must take proactive measures to achieve gender balance. Given that most editors are men, hiring women still depends on them; and these men need urgently to take their share of responsibility and be actors of change. More broadly, journals and science decision-makers must commit to their importance in the movement and start, for example, to hire and support women’s work.

1. Introduction

Women are still underrepresented in political, management and business, military, and academic spaces, particularly at leadership positions, such as politicians, CEOs, or senior professors (Boldry et al., 2001; Jalalzai, 2004; World Economic Forum, 2019, 2010). Although the gender gap has decreased in the last decades, there is still a 31.4% average gender gap in leadership positions that remains to be closed globally (World Economic Forum, 2019). The gender gap persists owing to different stereotypes about women characteristics and abilities, deeper parenting responsibilities, as well as the resulting ‘pipeline problem’, i.e. the rarity of women with appropriate education and skills (Carli and Eagly, 2001; Greider et al., 2019; Moss-Racusin et al., 2012; Salerno et al., 2019; Schein, 2001; Setzler, 2018; World Economic Forum, 2019).

In life sciences, women and men complete similar amounts of higher education degrees in Europe, the United States and in Latin America and the Caribbean (European Commission, 2019; García-Peñalvo, 2019; National Science Foundation, 2018). Despite these trends that point to equality, other forms of gender bias limit the success of female students. For instance, male professors tend to mentor fewer female students and postdocs than males (Moss-Racusin et al., 2012; Sheltzer and Smith, 2014). Gender bias reduces female participation and competitiveness for academic leadership positions (Sheltzer and Smith, 2014). Gender
equality in science has been assessed through the participation of men and women in scientific publications, either in authorship, the peer review process, or in the editorial board of scientific journals. We found that men dominate scientific production. However, women's participation in scientific papers varies depending on the discipline (Lariviere et al., 2013). Biological and life sciences exhibit more female participation than the other Science, Technology, Engineering, and Mathematics (STEM) areas (García-Peñalvo, 2019), although gender bias is still a challenge to be addressed.

Participation in editorial boards of scientific journals is evidence of a high reputation within a specialty or field (Morton and Sonnad, 2007). Editors' selection by scientific journals is usually based on research rank, academic responsibilities, number, and quality of publications (Morton and Sonnad, 2007). Journal editors occupy a strategic position in the scientific community because they constitute a decision-making body of scientists (Braun, 2004; Mauleón et al., 2013). Further, editors' selection reflects their hierarchical position in academic rank. Thus, female presence in editorial boards can be used as a proxy for female representation and leadership in academic spaces (Mauleón et al., 2013; Morton and Sonnad, 2007).

Gender bias in editorial boards has been studied in different disciplines, such as science (Mauleón et al., 2013), medicine (Amrein et al., 2011; Haërez et al., 2019), and mathematics (Topaz and Sen, 2016). Nevertheless, editorial board gender equality remains poorly addressed in ecology and biodiversity conservation journals (see Cho et al., 2014; Fox et al., 2016). Women are underrepresented in conservation science and practice (Tallis and Lubchenco, 2014). However, as scientists support women's inclusion in conservation science and practice, women representation has been increasing globally (Tallis and Lubchenco, 2014).

Here, we assessed the gender composition of editorial boards of 31 biodiversity conservation journals (hereafter, BC journals) and identified whether gender composition has changed over time. Our intention was to quantify (1) whether gender equality initiatives in conservation practice are reflected in current editorial boards of BC journals, and (2) whether there were changes in female proportion in past editorial boards. We expected a reduction in the gender gap of current editorial boards in BC journals, as well as a trend towards equality across time.

### 2. Methods

#### 2.1. Journal selection

To search for potential biases in editorial boards of BC journals, we first compiled a list of journals categorized under the research area “Biodiversity and Conservation” and listed in the Web of Science database (WoS). We completed the search on 29th November 2018. From the 57 journals retrieved by our search, we selected 31 journals that include the word “conservation” in their scope (see Table 1). The journal *Endangered Species Research* was excluded from the analyses as it had only one editor.

#### 2.2. Data

We obtained the names of all members included as the current editorial board of the selected 31 BC journals on their respective websites. We completed the search between March and April 2019.

Additionally, to assess the temporal trend in gender balance, we acquired information on past editorial boards of the five journals with the highest impact factors and with temporal information available: *Biological Conservation, Conservation Biology, Diversity and Distributions, Ecography, and Journal of Applied Ecology* (Table 1). For these five journals, we investigated the temporal trend of the gender composition on the editorial board between 1988 and 2019. We searched manually the first issue of each journal published over five-year intervals (1988, 1993, 1998, 2003, 2008, 2013, and 2019). We searched each past issue on the JSTOR or ScienceDirect databases.

As each journal had different editorial positions, and frequently those names change over time, we considered two editorial positions in our analyses: (1) editor-in-chief and (2) associate editors, which included all the other types of editors. We did not include in the analyses editorial positions related to editorial management, handling, and/or software duties.

We categorized the gender of each editor based on the editor's name, pictures, and gender pronouns available in faculty webpages, social media (i.e. ResearchGate, Twitter), and Google Citations. We then classified all editors as male or female. We found only one self-declared transgender individual. We classified this person according to the pronoun used by the person on the website of his/her institution. We did not find any person who identifies as a non-binary individual. We also recorded the editors' affiliation, country, continent, and editorial position, as well as the impact factor and the name of the journals in which he or she served.

#### 2.3. Analyses

We compared gender proportion in the editorial boards of the 31 studied journals, gender proportion among continents, and gender proportion in editors-in-chief and associated editors.

We ran three separate Chi-squared tests: (1) we assessed whether the male and female proportion of editors was equal, comparing a balanced distribution of male and female editors as the expected value with the observed values of editors' gender proportion; (2) we assessed whether female editors' proportion was different among continents. We compared a balanced distribution of male and female editors among continents as the expected value with the observed values of gender balance found in BC journals for each continent; and (3) whether the

### Table 1

Selected biodiversity conservation journals.

| Journal | Period available | Impact factor (2019) |
|---------|------------------|---------------------|
| Conservation Letters | 2019 | 7.279 |
| Conservation Biology | 1988 to 2019 | 5.890 |
| Journal of Applied Ecology | 1988 to 2019 | 5.740 |
| Ecography | 1993 to 2019 | 5.400 |
| Diversity and Distributions | 1998 to 2019 | 4.614 |
| Biological Conservation | 1988 to 2019 | 4.600 |
| Conservation Physiology | 2019 | 3.460 |
| Global Ecology and Conservation | 2019 | 3.140 |
| Biological Invasions | 2019 | 3.064 |
| Animal Conservation | 2019 | 2.889 |
| Biodiversity and Conservation | 2019 | 2.828 |
| Natureza & Conservacao / Perspectives in Ecology and Conservation | 2019 | 2.565 |
| Urban Ecosystems | 2019 | 2.493 |
| Oryx | 2019 | 2.333 |
| Environmental Conservation | 2019 | 2.290 |
| Avian Conservation and Ecology | 2019 | 2.138 |
| Management of Biological Invasions | 2019 | 2.037 |
| Conservation Genetics | 2019 | 2.025 |
| Polar Biology | 2019 | 2.002 |
| Journal for Nature Conservation | 2019 | 1.971 |
| Nature Conservation | 2019 | 1.360 |
| Wildlife Society Bulletin | 2019 | 1.290 |
| Tropical Conservation Science | 2019 | 1.149 |
| Koedoe | 2019 | 0.919 |
| Revista Mexicana de Biodiversidad | 2019 | 0.917 |
| Animal Biodiversity and Conservation | 2019 | 0.891 |
| Biota Neotropica | 2019 | 0.842 |
| Conservation Genetics Resources | 2019 | 0.742 |
| Human-Wildlife Interactions | 2019 | 0.717 |
| Eco mont-Journal on Protected Mountain Areas Research | 2019 | 0.488 |
| Pachyderm | 2019 | 0.318 |

* Journals with temporal information available.
proportion of women occupying the editor-in-chief position was equal to the proportion of women occupying the associated editor position, comparing a balanced women’s proportion in each editorial position as the expected value with the observed values of female editors’ proportion found in BC journals.

Further, we did a linear regression to assess if the journal’s impact factor explained the variation in observed gender proportion. For that, we used gender proportion as the response variable and journals’ impact factor as the explanatory variable. Chi-squared and linear regression analysis were conducted using the ‘chisq.test’ and ‘lm’ functions in the stats v3.6.2 package (R Core Team, 2019) at the R Studio v3.6.2 environment (R Core Team, 2019).

Finally, we compared how gender proportion in the five selected journals has changed over time. For that, we built a linear mixed-effect model, using the Restricted Maximum-Likelihood Method (REML) and a Gaussian distribution. We used the proportion of female editors for each journal in each year as the response variable, and the selected years as the explanatory variable. We controlled the journal effect using the journal’s identity as a random effect, and by-journal random slopes for the explanatory variable. We obtained \( p \)-values by likelihood ratio test of the full model with the effect against the model without the effect in question, and the marginal pseudo \( R^2 \) value using the method proposed by Nakagawa et al. (2017).

We also derived a linear mixed-effect model equation to predict when gender equality would be achieved. We built the linear mixed-effect model using the ‘lmer’ function in the lme4 v3.1.1.21 package (Bates et al., 2015) and obtained the \( R^2 \) using the ‘squaredGLMM’ function in the MuMIn v.1.43.15 package (Barton, 2016) at the R Studio v3.6.2 environment (R Core Team, 2019).

3. Results

We found that the editorial boards of the 31 BC journals were composed of 1251 editors in 2019 (mean = 39.1 editors per journal; min = 5 and max = 114), from which 71.3% (n = 857) of the editors were men (Fig. 1a). Despite some variation among journals (Fig. 1b), a biased gender ratio occurred across all continents (Fig. 1c; \( \chi^2 \) (5, \( N = 1199 \) = 6.04; \( p = 0.30 \)), and throughout a range of journal’s impact factor (adjusted \( R^2 \) < 0.001; \( p = 0.32 \)).

Women were underrepresented as senior editor, irrespective of the distinction between editor-in-chief and associate editors. Thus, the proportion of women as editor-in-chief (19% of the total) did not differ from the percentage of women that hold the position of the associate editor (29%; Fig. 1d; \( \chi^2 \) (1, \( N = 1202 \) = 1.55; \( p = 0.21 \)).

For those journals with available temporal data on the editorial board, we found female editor-in-chief up to the year 2018. From 2013 to 2018, a total of seven women became editor-in-chief, which represented 19% of current editor-in-chief positions in the field (Fig. 2).

Linear mixed model showed that editorial board composition changed over time (\( \chi^2 = 24.59, \text{d.f.} = 4, R^2 = 0.50, p < 0.01 \), with an increase of women proportion of 0.01 by year (SD = ± 0.002, Fig. 3). We found a clear and similar trend of increasing the participation of women in their editorial board over the last decades (Figs. 2 e 3). Considering such a temporal trend in the gender composition (Fig. 3), we predicted that gender equality in editorial positions would be achieved around 2038.

4. Discussion

We found prevalent gender bias in editorial boards of the main BC journals. Women are underrepresented as associate editors in nearly all journals, occupying less than one-third of all editorial positions, regardless of journals’ impact factor. Female editors-in-chief are even less frequent; for every five editors-in-chief, only one is a woman. Nevertheless, gender bias is shrinking over time and our projections indicate that conservation journals may become gender-balanced by the year 2038. Our prediction assumed that female editors will be increasing on editorial boards at the same rate, as well as that journals will not promote new proactive measures to balance gender equity. Even when gender bias is diminishing in editorial boards, conservation journals must review urgently their editorial boards’ composition, adopt policies, and promote initiatives to ensure gender equity at a faster rate.

Women occupy <30% of journals’ editorial boards in science disciplines other than biodiversity conservation, such as medicine, ecology, and mathematics (Amrein et al., 2011; Cho et al., 2014; Hafeez et al., 2019; Mauleón et al., 2013; Topaz and Sen, 2016). As editorial boards reflect the prominent researchers in a field, gender bias indicates that female’s work is still less recognized than men’s work. Considering our results, it seems that gender bias strengthens at high-leadership positions: only 19% of editors-in-chief were women, and in most of the cases, women shared the editor-in-chief position with male editors. This has strong implications for female scientists. First, gender inequality in science results in men achieving higher productivity and visibility, thus more likely to be appointed as potential editors (Cho et al., 2014).

Second, acceptance rates and positive reviews can be gender-specific: according to the Royal Society of Chemistry (2019), male reviewers tend to allocate positive reviews for papers written by male authors. This finding alone should be enough for journals to adopt a double-blind review system, as adopted by several journals published by Elsevier over the last 2 years, for example.

Further, male researchers tend to prefer publishing with other men (Salerno et al., 2019) and to mentor more men as well (Moss-Racusin et al., 2012; Sheltzer and Smith, 2014). Most review invitations are made by men to other men, and papers with male leaders have higher acceptance rates (Fox and Paine, 2019). This trend of favoring male reviewers, which is known as homophily (Brashears, 2008; McPherson et al., 2001), is evident when female-led papers receive harsher reviews and fewer acceptance rates than male-led papers. Homophily also suggests that the promotion of women in leadership roles can generate more inclusion of female scientists worldwide (Mauleón et al., 2013; Sar delis and Drew, 2016). Female editors could invite other female reviewers, whose feedback tends to be more gender-balanced (Amrein et al., 2011; Cho et al., 2014).

There is a growing body of literature recognizing the urgency of more inclusive conservation plans and actions, considering not only gender but also race, ethnicity, and age (Maas et al., 2019; Gay-Antaki and Liverman, 2018; Tallis and Lubchenco, 2014). Focusing on gender balance, proactive measures, such as promoting women in leadership roles, are a crucial step towards a gender-balanced scientific communities. Recent initiatives dedicated to building and supporting women leaders throughout science fields, such as “500 Women Scientists” organization (500womenscientists.org) and the “Women in Ecology Mentoring Scheme” from the British Ecological Society (tinyurl.com/y3yundm9), offer gender-specific opportunities for networking, mentoring, and supporting on work-life balance. Although the present study focused on gender inequalities in editorial boards, we reinforce that other minorities, as researchers from the Global South and persons with disabilities, are also underrepresented in editorial boards. Diverse and inclusive teams tend to be more productive and conduct high-impact research (Maas et al., 2020).

Similarly, several international agreements recognize women’s role as key agents of change, and the importance of including women in national and international policies and conservation programs (Convention on Biological Diversity - CBD, 2018; United Nations, 2017, 2015a, 2015b). However several scientific discussions about women’s role in conservation happen in conservation journals, where we found that male editors occupy most editorial positions. Therefore, we found an ideological incongruence in the conservation journals: discussions about women’s active role in biodiversity conservation seem to be led by male editors. Increasing women’s participation in conservation editorial boards guarantees different points of view to conservation challenges and can help us to promote effective solutions for those
challenges. In this sense, journals as PNAS, have made deliberate efforts to include gender diversity into its editorial board structure (Berenbaum, 2019). Insofar that editorial boards become gender-balanced, women can participate actively in the discussion of conservation problems and propose solutions. Biodiversity conservation is a global debate that affects all people in the world. As solutions to conservation problems come only for one part of the population (male scientists), we are ignoring the different points of view and paying no attention to possible solutions (Jimenez et al., 2019).

Policies and initiatives that promote gender balance can act at different levels: publishing companies should adopt policies that promote actively women inclusion in editorial boards; editors can promote women inclusion in their workplaces, and academy members should value women’s work and improve work conditions to ensure that women can occupy leadership positions. Some activities that can be executed by all academic members should include an equal distribution
of communal tasks, recognition of individual and communal work, and strengthening of diversity, equity, and inclusion measures in academic spaces (Maas et al., 2020). Furthermore, academic leaders can promote actions that ensure retention in a scientific career, as securing funding, scholarships, and other resources (Maas et al., 2020), and promoting grants designed to support academics with families (Staniscuaski et al., 2020). As women achieve more security and stability in their academic careers, they improve their life quality and can compete more equally with men for leadership positions.

Our study offers a broad-scale analysis of gender bias in editorial positions in BC journals. Our results show a strong gender bias against female editors, although, gender bias is shrinking over time. Affirmative actions towards the inclusion and retention of female editors may prove useful for alleviating gender biases across academic hierarchies and leaking pipelines. However, since most editors are men, urgent action is called upon them. Journals and institutions must support the best science and to curtail barriers that may hinder it, such as gender gaps and biases that can affect research outcomes. Conservation science and practice need ingenious solutions to deal with conservation problems, and a diverse and inclusive scientific community is more innovative and productive (Jimenez et al., 2019; Maas et al., 2020).

Inclusive editorial boards can integrate different discussions and propose effective solutions to conservation challenges. Hence, better policies for diversity promotion and retention in academic spaces are crucial, as well as policies against harassment, which should be treated as scientific misconduct (Greider et al., 2019). Societal crises, such as the recent COVID-19 pandemic, have the potential to promote changes in thought and behavior, but we need to speed up the culture of change. Journals and decision-makers need to assume their part in the movement and start, for example, to hire and promote women’s work.

CRediT authorship contribution statement

Luisa F. Liévano-Latorre: Conceptualization, Methodology, Software, Investigation, Formal analysis, Validation, Writing – Original Draft preparation, Writing – Review & Editing, Visualization

Rafaela Aparecida da Silva: Conceptualization, Methodology, Investigation, Writing – Original Draft preparation, Writing – Review & Editing

Raisa R. Vieira: Conceptualization, Methodology, Writing – Original Draft preparation, Writing – Review & Editing

Fernando M. Resende: Conceptualization, Methodology, Software, Validation, Formal analysis, Writing – Original Draft preparation, Writing – Review & Editing

Bruno R. Ribeiro: Conceptualization, Methodology, Writing – Review & Editing

Fábio J. A. Borges: Conceptualization, Investigation, Writing – Review & Editing

Lilian Sales: Investigation, Writing – Original Draft preparation, Writing – Review & Editing

Rafael Loyola: Conceptualization, Writing – Review & Editing, Supervision

Declaration of competing interest

We declare no conflict of interest.

Acknowledgments

We thank to Bea Maas for her thoughtful comments on an early version of the manuscript and Richard Primack for reading the manuscript prior to its submission. We also thank to an anonymous reviewer, who contributed to improve our manuscript. R.R.S.V., R.A.S., F.J.A.B., and F.M.R. work was supported by CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico). LS is funded by the CNPq (Programa Nacional de Fôs-Doutorado, in Portuguese) at the University of Campinas. RL research is funded by CNPq (grant #306694/2018-2). This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brazil (CAPES) - Finance Code 001. This paper is a contribution of the INCT in Ecology, Evolution, and Biodiversity Conservation founded by MCTIC/CNPq (grant #465610/2014-5) and FAPEG (grant #201810267000023).

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.biocon.2020.108767.

References

Amrein, K., Langmann, A., Fahrleitner-Pammer, A., Pieber, T.R., Zollner-Schweitz, I., 2011. Women underrepresented on editorial boards of 60 major medical journals. Gend. Med. 8, 378–387. https://doi.org/10.1016/j.gend.2011.10.007.

Bates, D., Mächler, M., Bolker, B.M., Walker, S.C., 2015. Fitting linear mixed-effects models using lme4. J. Stat. Softw. 67, https://doi.org/10.18637/jss.v067.i01.

Bolstry, J., Wood, W., Kashy, D.A., 2001. Gender stereotypes and the evaluation of men and women in military training. J. Soc. Issues 57, 689–705. https://doi.org/10.1111/0022-4537.00236.
Brashears, M.E., 2008. Gender and homophily: differences in male and female association in Blau space. Soc. Sci. Res. 37, 400–415. https://doi.org/10.1016/j.ssr.2007.08.004.

Braun, T., 2004. Keeping the gates of science journals. Gate keeping indicators of national performance in the sciences, in: Handbook of Quantitative Science and Technology Research. Kluwer Academic Publishers, Dordrecht, pp. 95–114.

Carli, L.L., Eagly, A.H., 2001. Gender, hierarchy, and leadership: an introduction. J. Soc. Issues 57, 629–636. https://doi.org/10.1111/0022-4537.00232.

Cho, A.H., Johnson, S.A., Schuman, C.E., Adler, J.M., Gonzalez, O., Graves, S.J., Huebner, J.R., Blaine Marchant, D., Riffai, S.W., Skinner, I., Bruna, E.M., 2014. Women are underrepresented on the editorial boards of journals in environmental biology and natural resource management. PeerJ 2014, 1–11. https://doi.org/10.7717/peerj.542.

Convention on Biological Diversity - CDB, 2018. Decision adopted by the conference of the parties to the Convention on Biological Diversity, in: COP 14 Decision 34. p. 9. https://doi.org/10.1002/ece3.4993.

Fox, C.W., Burns, C.S., Meyer, J.A., 2016. Editor and reviewer gender influence the peer review process but not peer review outcomes at an ecology journal. Funct. Ecol. 30, 140–153. https://doi.org/10.1111/1365-2435.12529.

Fox, C.W., Burns, C.S., Meyer, J.A., 2016. Editor and reviewer gender influence the peer review process but not peer review outcomes at an ecology journal. Funct. Ecol. 30, 140–153. https://doi.org/10.1111/1365-2435.12529.

European Commission, 2019. She figures 2018. Report. https://doi.org/10.2777/936.

García-Peñalvo, F.J., 2019. Women and STEM disciplines in Latin America. The W-STEM European project. J. Inf. Technol. Res. 12, v–viii.

Jimenez, M.F., Laverty, T.M., Bombaci, S.P., Wilkins, K., Bennett, D.E., Pejchar, L., 2019. Underrepresented faculty play a disproportionate role in advancing diversity and natural resource management. PeerJ 2014, 1–11. https://doi.org/10.7777/936.

Jalalzai, F., 2004. Women political leaders: past and present. Women Polit. 26, 85–108.

Jansen, J.M., Joshua-Tor, L., McDowell, G.S., Metcalf, J.L., McLaughlin, B.A., Olivarius, A., O'Shea, E.K., Raymond, J.L., Ruebain, D., Steitz, J.A., Stillman, B., Tilghman, S.M., Valian, V., Villa-Komaroff, L., Wang, J.Y., 2019. Increasing gender diversity in the STEM research workforce. Science (80-.3), 366, 692–695. doi:https://doi.org/10.1126/science.aaz649.

Hafez, D.M., Waqas, A., Majeed, S., Naveed, S., Aftab, Z., Khosa, I.A., 2019. Gender distribution in psychiatry journals’ editorial boards worldwide. Compr. Psychiatry 94, 152119. https://doi.org/10.1016/j.comppsych.2019.152119.

Jalalzai, F., 2014. Women political leaders: past and present. Women Polit. 26, 85–108. https://doi.org/10.1300/J014v26n01_04.

Jimenez, M.F., Laverty, T.M., Bombaci, S.P., Wilkins, K., Bennett, D.E., Pejchar, L., 2019. Underrepresented faculty play a disproportionate role in advancing diversity and inclusion. Nat. Ecol. Evol. 3, 1030–1033. https://doi.org/10.1038/s41559-019-0911-5.

Lariviere, V., Ni, C., Gingras, Y., Cronin, B., Sugimoto, C.R., 2013. Global gender disparities in the production of research. Nature 504, 211–213.

Maas, B., Toomey, A., Loyola, R., 2019. Exploring and expanding the spaces between research and implementation in conservation. Biol. Conserv. 240, 108290. https://doi.org/10.1016/j.biocon.2019.108290.

Maas, B., Grogan, K.E., Chirango, Y., Harris, N., Liévano-Latorre, L.F., McGuir, K.L., Moore, A.C., Ocampo-Ariza, C., Palta, M.M., Perfecto, I., Primack, R.B., Rowell, K., Sales, L., Santos-Silva, R., Silva, R.A., Sterling, E.J., Vieira, R.R.S., Wyborn, C., Toomey, A., 2020. Academic leaders must support inclusive scientific communities during COVID-19. Nat. Ecol. Evol. https://doi.org/10.1038/s41559-020-1233-3.

Mauléon, E., Hilián, L., Moreno, L., Gómez, I., Borondo, M., 2013. Assessing gender balance among journal authors and editorial board members. Scientometrics 95, 87–114. https://doi.org/10.1007/s11192-012-0824-4.

McPherson, M., Smith-Lovin, L., Cook, J.M., 2001. Birds of a feather: homophily in social networks. Annu. Rev. Sociol. 27, 415–444.

Morton, M.J., Somad, S.S., 2007. Women on professional society and journal editorial boards. J. Natl. Med. Assoc. 99, 764–771.

Moss-Racusin, C.A., Dovidio, J.F., Brescoll, V.L., Graham, M.J., Handelsman, J., 2012. Science faculty's subtle gender biases favor male students. Proc. Natl. Acad. Sci. U. S. A. 109, 16474–16479. https://doi.org/10.1073/pnas.1211286109.

Nakagawa, S., Johnson, P.C.D., Schielzeth, H., 2017. The coefficient of determination R2 and intra-class correlation coefficient from generalized linear mixed-effects models revisited and expanded. J. R. Soc. Interface 14, 20170213. doi:https://doi.org/10.1098/rsif.2017.0213.

National Science Foundation, 2018. Doctorate Recipients from U.S. Universities. 2014. R Core Team, 2019. R: A language and environment for statistical computing. Royal Society of Chemistry, 2019. Is Publishing in the Chemical Sciences Gender Biased? Driving change in research culture, Cambridge.

Salerno, P.E., Flores-Vacas, M., Guayramina, J.M., Stynski, J.L., 2019. Male principal investigators (almost) don’t publish with women in ecology and zoology. PLoS One 14, 1–14. https://doi.org/10.1371/journal.pone.0218598.

Sardelis, S., Drew, J.A., 2016. Not “pulling up the ladder”: women who organize conference symposia provide greater opportunities for women to speak at conservation conferences. PLoS One 11, 1–20. https://doi.org/10.1371/journal.pone.0160015.

Schein, V.E., 2001. A global look at psychological barriers to women’s progress in management. J. Soc. Issues 57, 675–688. https://doi.org/10.1111/0022-4537.00235.

Setzler, M., 2018. Measuring bias against female political leadership. Polit. Gend. 15, 695–721. https://doi.org/10.1017/S1743923X18000430.

Sheltzer, J.M., Smith, J.C., 2014. Elite male faculty in the life sciences employ fewer women. Proc. Natl. Acad. Sci. U. S. A. 111, 10107–10112. https://doi.org/10.1073/pnas.1403341111.

Snisansciski, F., Reichert, F., Wernick, F.P., Oliveira, L., Mello-Carpes, P.M., Soletti, R., Almeida, C.L., Zandona, E., Ricachenevsky, F.K., Neumann, A., Schwartz, L., Tamajusuku, A.S.K., Seixas, A., Knetzach, L., Parent in Science Movement, 2020. Impact of COVID-19 on academic mothers. Science 368, 724. https://doi.org/10.1126/science.abb2740.

Tallis, H., Labchenko, J., 2014. A call for inclusive conservation. Nature 515, 27–28.

Topaz, C.M., Sen, S., 2016. Gender representation on journal editorial boards in the mathematical sciences. PLoS One 11, 1–21. https://doi.org/10.1371/journal.pone.0161357.

United Nations, 2015a. Sustainable Development Goals [WWW Document]. Sustain. Dev. Goals Knowl. Platf.  https://sustainabledevelopment.un.org/?menu=1300, Accessed date: 11 December 2019.

United Nations, 2015b. Paris Agreement.

United Nations, 2017. Establishment of a Gender Action Plan - Paris Agreement, in: Decision -/CP.23. Paris. pp. 6.

World Economic Forum, 2010. The Corporate Gender Gap - Report 2010. Geneva.

World Economic Forum, 2019. Global Gender Gap Report 2020. Geneva. https://doi.org/10.1002/ece3.4993.