

## Biases in Science

(Please remember that my view IS biased too, as probably anyone else's view!)

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# Example topics to cover on biases in science<sup>2</sup>

## Biases regarding

- Researcher gender
- Researcher race
- Country of research(er), and academic nepotism
- How to navigate these biases

## Talk with two sections

- What others have done
- What I have found empirically (a brief version of these slides:  
[https://akbaritabar.github.io/2018/20180110\\_UNIBS\\_GECS\\_seminar.pdf](https://akbaritabar.github.io/2018/20180110_UNIBS_GECS_seminar.pdf))
- Longer text is available online (e.g., ethnicity was removed from STHV<sup>1</sup> article:  
[https://akbaritabar.github.io/CV\\_MD/UNIMI\\_thesis/genderdiversitychapter.html](https://akbaritabar.github.io/CV_MD/UNIMI_thesis/genderdiversitychapter.html))

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<sup>1</sup>Aliakbar Akbaritabar Akbaritabar, A., & Squazzoni, F. (2020). Gender Patterns of Publication in Top Sociological Journals.Science, Technology, & Human Values <https://doi.org/10.1177/0162243920941588>

<sup>2</sup>Thanks Sophie and Josh for organizing these series and suggestions on topics and references

# Clarifying some concepts

- Inequality, bias, and disparity<sup>3, 4</sup>
- Some concepts are used *interchangeably* for both gender and ethnicity:
  - Bias, disparity, gap, inequality, difference, anything else?
- It is necessary to define our intended meaning, plus, pay attention to the causal relations and your claims
- Some assumptions:
  - When you search for bias, you find bias
  - *We cannot publish what we don't receive*
  - What else?
- Updated literature (in other fields)
  - Neuroscience<sup>5</sup>
  - Political sciences<sup>6</sup>
  - Management and organization journals<sup>7</sup>
  - How representative the sample of published authors in top sociology are versus neighboring social sciences (e.g., demography, economics, political sciences)<sup>8</sup>

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<sup>3</sup>Definitions from: <https://leidenmadtrics.nl/articles/the-causal-intricacies-of-studying-gender-bias-in-science>

<sup>4</sup>See: Waltman, L. (2022, April 20). Are we all biased? The complexity of the diversity puzzle. <https://doi.org/10.5281/zenodo.6472350>

<sup>5</sup>Dworkin, J. D., Linn, K. A., Teich, E. G., Zurn, P., Shinohara, R. T., & Bassett, D. S. (2020). The extent and drivers of gender imbalance in neuroscience reference lists. *Nature Neuroscience*, 23(8), 918-926. <https://doi.org/10.1038/s41593-020-0658-y>

<sup>6</sup>Teele, D. L., & Thelen, K. (2017). Gender in the Journals: Publication Patterns in Political Science. *PS: Political Science & Politics*, 50(2), 433-447. <https://doi.org/10.1017/S1049096516002985>

<sup>7</sup>Auschra, C., Bartosch, J., & Lohmeyer, N. (2022)). Differences in female representation in leading management and organization journals: Establishing a benchmark. *Research Policy*, 51(3), 104410. <https://doi.org/10.1016/j.respol.2021.104410>

<sup>8</sup>Jacobs, J. A., & Mizrahi, N. (2020). International Representation in US Social-Science Journals. *The American Sociologist*, 51(2), 215-239. <https://doi.org/10.1007/s12108-020-09440-6>

# 1: Miranda's personal path<sup>9</sup>

Pathways in Network Science - A seminar with Miranda Lubbers



## On gender bias in academia

- Lower access to mentoring, role models, publication opportunities and social support for female PhD students (e.g., Moss-Racusin et al. 2012)
- Lower student evaluations, centered on conformity with gendered expectations rather than teaching quality (Storage et al. 2016; Fan et al., 2019; Adams et al., 2021)
- Bias in recommendation letters; other descriptors for women ("compassionate", "productive") than for men ("brilliant", "exceptional", "leader"), raised more doubts, and addressed personal life more often (e.g., Schmader et al., 2007; Khan et al., 2021)
- Female PhD students less likely to obtain the qualification "cum laude" in the Netherlands, despite 50-50 gender distribution (Van den Besselaar et al., 2020)
- Academic hiring committees give preference to men and single women over women with partners considered "less movable" (Rivera, 2017)
- Top sociological journals (ASR and AJS) publish disproportionately more articles by men than women (Akbaritabar & Squazzoni 2020)
- Women benefit less from coauthoring in mixed-gender groups than men (e.g., Sarsons et al., 2020)
- Female-dominated areas of investigation less prestigious (PhD thesis Aliakbar Akbaritabar)
- With comparable publication records, women less likely to receive tenure (Sarsons 2015).
- Women receive fewer citations than men (e.g., Chatterjee et al., 2021)
- Women's publications less likely to be amplified on social media (e.g., Wasike, 2021)
- Fewer awards (Lincoln et al. 2012) – "Mathilde effect"
- Exclusively male panels at conference sessions ("manels")
- More generally, (not only universities), low-performing men are hostile toward high-performing women in male-dominated hierarchies (Kasumovic & Kuznekoff, 2015); in academia, "bullying" is a means for mediocre stars to raise to the top", "bullies spring into action when their targets become too successful to their liking" (Täuber & Mahmoudi, 2022)



Miranda Lubbers

Martes, 2 de febrero de 20XX

Ejemplo de Texto de pie de página

18

39:11 / 42:22

Scroll for details



<sup>9</sup>Watch here: <https://youtu.be/N9EMoig1VgY>

# Introduction

Gender and ethnic  
patterns of  
publication in top  
sociology journals

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- ▶ Publications, key for *tenure* and *promotion* (Leahey, Keith, and Crockett 2010; Long 1992; Grant and Ward 1991)
- ▶ Era of “**publish or perish**” & hyper-competition
- ▶ **Funding** agencies heavily rely on bibliometric indicators (i.e., number of publications, citations)(Edwards and Roy 2017; Nederhof 2006)
- ▶ Understanding publication patterns in prestigious journals can help reveal **possible distortions in academic credit allocation**
- ▶ Publication patterns over the **last 70 years** from the American Sociological Review (**ASR**) and American Journal of Sociology (**AJS**), the two most *prominent journals in sociology*

# Gender differences in academic success

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- ▶ Despite the rise of women in science (Cole and Zuckerman 1984; Cole and Zuckerman 1987; Young 1995)
- ▶ Women are penalized especially in **STEM** research (Cain and Leahey 2014; Lomperis 1990; Kahn 1993; Sheltzer and Smith 2014)
- ▶ Are **paid less** (Prpić 2002)
- ▶ Are preferably hired in **lower level academic positions** and in **less prestigious institutes** (Lomperis 1990; Heijstra, Bjarnason, and Rafnsdóttir 2015)
- ▶ They **publish fewer papers** and are cited less (e.g., Xie and Shauman (1998); Young (1995); Maliniak, Powers, and Walter (2013))

# Gender differences in scientific collaborations

- ▶ Women tend to establish **more homogeneous** and **smaller collaboration networks** (Grant and Ward 1991; Renzulli, Aldrich, and Moody 2000)
- ▶ This would decrease their chance to be part of the *core network of star scientists* (Moody 2004)
- ▶ They prefer **more diversified** research programs
- ▶ Their research is **less specialized**, penalizing their visibility and success (Leahey 2006; Leahey 2007)
- ▶ This could decrease their access to relevant resources for funding and promotion (Xie and Shauman 1998; Weisshaar 2017)
- ▶ Makes their academic career less stable or rewarding (Hancock and Baum 2010; Preston 1994)
- ▶ There is distortion in hiring committees due to family obligations (partner's job) (Rivera 2017)

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# Internalized gender patterns!

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- ▶ Gendered patterns could be internalized by women (e.g., MacPhee, Farro, and Canetto (2013); Brink and Benschop (2014))
- ▶ Even when women are motivated more to pursue an academic career, they have lower expectations of success (Prpić 2002; Fox and Stephan 2001; Leslie et al. 2015)
- ▶ Confirmed also by **lab experiment**, articles published by women receive lower evaluations even by **female evaluators** (Krawczyk and Smyk 2016).
- ▶ While; more gender, ethnically or culturally diverse teams perform better (Nielsen et al. 2017)

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- ▶ **All** AJS and ASR publications (extracted from **Scopus** on 20<sup>th</sup> January 2017)
- ▶ **Fields**: article title, authors' names and affiliation, and number of citations received.

Journal name	# papers	Sample Starts	Sample Ends
American Journal of Sociology	1153	1946	2016
American Sociological Review	1440	1965	2016
Total number of papers	2593	-	-

# Women: AJS & ASR authors vs. ASA members

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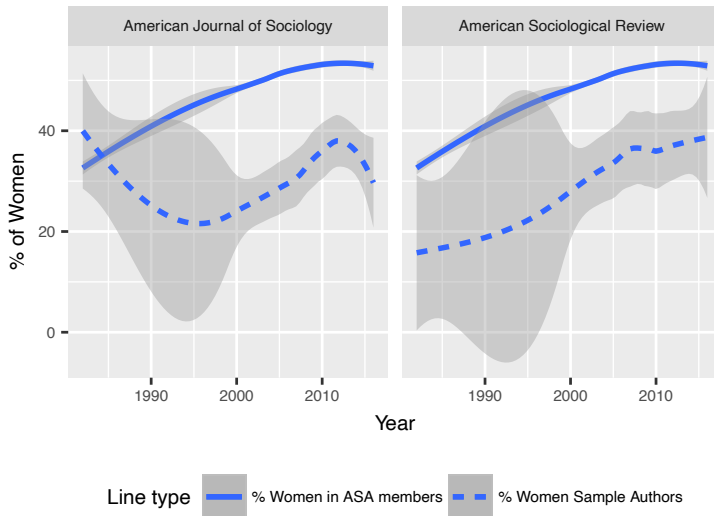
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# Co-authorship patterns

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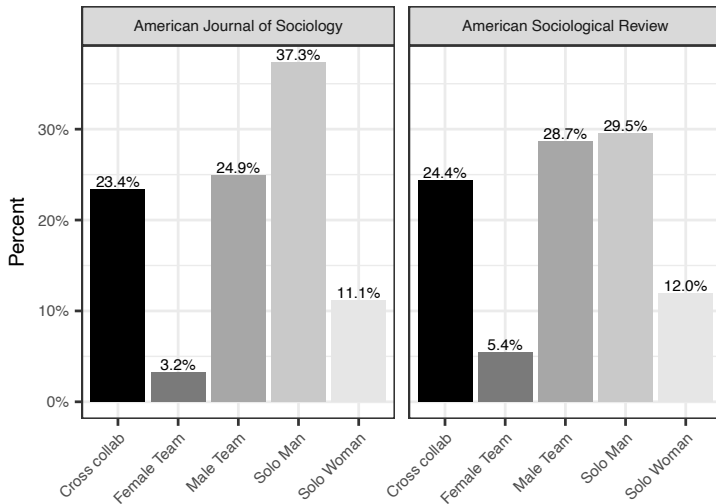
Conclusions

- ▶ **84%** of articles in AJS and ASR had **at least one** (or more) *male* author(s)
- ▶ Only **40%** had at least one (or more) *female* author(s)
- ▶ Picture approximates a 70/30 ratio, which is slightly better than what suggested by Young (1995)'s study in political sciences
- ▶ But similar to what found by Teele and Thelen (2017)
- ▶ It seems that fields such as sociology and political sciences do not dramatically differ in terms of gender patterns.

Journal Name	# All Papers	# All Authors	# Men	% Men	# Women	% Women
AJS	1153	2023	1469	72.61	547	27.04
ASR	1440	2686	1860	69.25	813	30.27
Total number	2593	4709	3329	-	1360	-

# Gender co-authorship in AJS and ASR

- ▶ Only **11%**, solo female vs. **37%** in AJS and **29.6%** in ASR of solo male
- ▶ Only **5.4%** in ASR and **3.2%** in AJS by all-female teams



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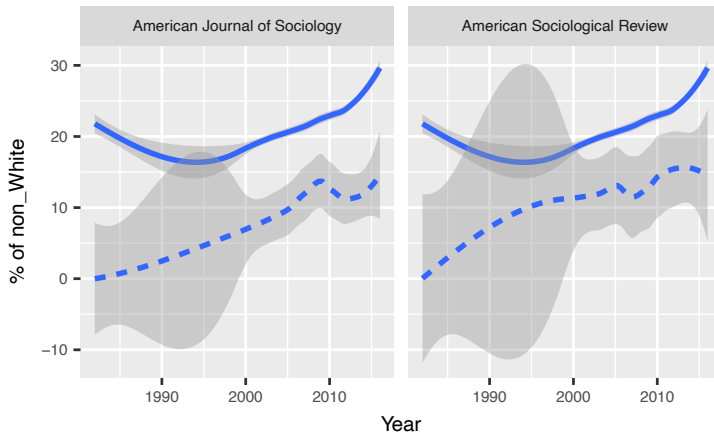
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# Non-white: AJS & ASR authors vs. ASA members

- ▶ Number of non-white authors **has increased**, but less pronounced than non-white members in ASA (a maximum 30% of members)
- ▶ The ratio was below 20% in AJS and below 25% in ASR.



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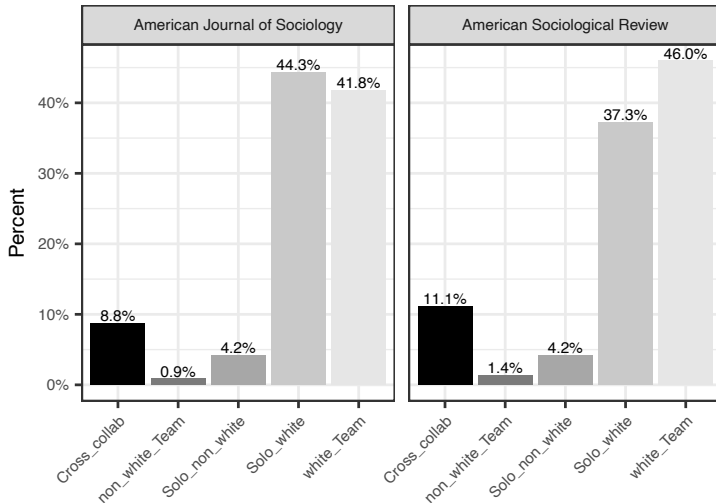
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# Ethnic co-authorship in AJS and ASR

- ▶ More than **80%** authored exclusively by white authors, alone or by all-white co-authors
- ▶ Only **1%** published by a team of *non-white* co-authors



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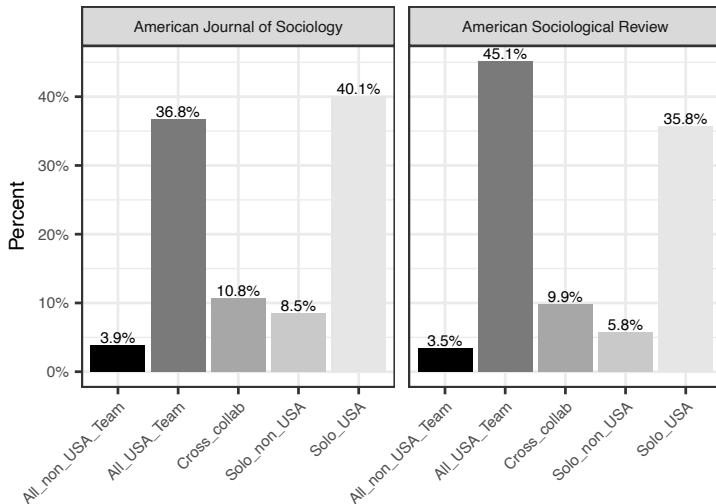
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# American vs. non-American in AJS and ASR

- ▶ **80%** solo-American or teams of American authors
- ▶ Penalties are even probably higher against non-white, female scholars *outside the U.S.*



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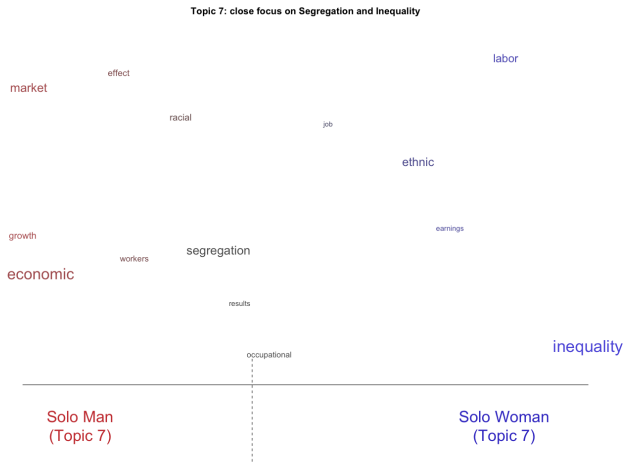
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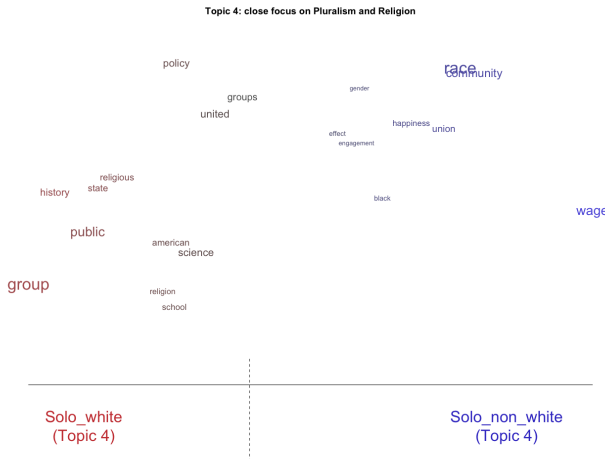
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# Conclusions and discussion

- ▶ Prestigious journals especially **favor white male authors** and their exclusive co-authorship ties
- ▶ Situation has improved since 2000, but, these gender and ethnicity penalties seem to have persisted even after considering the influence of academic affiliation
- ▶ The 'Ivy-League' effect greatly **benefits only white male authors**
- ▶ Conventional standard of collaboration is the solo-male author or all-male teams, whereas women are less involved in co-authorships (Renzulli, Aldrich, and Moody 2000; Moody 2004).
- ▶ Top journals in sociology seem more favorable to cross-gender collaborations than political sciences journals.

# Conclusions

- ▶ Estimating publication bias and its sources would require **more in-depth data** and analysis on **journal submissions**, referees and editors (Østby et al. 2013; Siler and Strang 2014)
- ▶ It is difficult to understand whether these outcomes incorporate **endogenous self-selection bias** tracing back to education, type of research, funding and career (e.g., González-Álvarez and Cervera-Crespo (2017); Hancock and Baum (2010); Sheltzer and Smith (2014)).
- ▶ Examining these differences is also key to discuss the role of diversity in academia
- ▶ **Encouraging diversity is beneficial** to avoid group thinking and mainstream attitudes (Nielsen et al. 2017), detrimental especially in periods of uncertainty as they reduce epistemological and methodological pluralism
- ▶ These patterns could be less pronounced in average and less competitive journals

# Limitations (Success stories only!)

- ▶ Our data **do not cover** the entirety of all of the academic domain, from *education to funding and promotion*
- ▶ Looking only at publications does not help to understand even the gate-keeping role of journal editors, editorial boards and referees
- ▶ Our results cannot help understand editorial measures that might counterbalance these patterns
- ▶ A more in-depth attention to *topics, methods* and *fields* could help reveal vicious circles and self-reinforcing distortions in intellectual capital investment, which could point to education and training more than publications (Kahn 1993)
- ▶ Women and ethnic minorities may have fewer chances to be published in these top journals because they **do not perform** the type of research that these journals prefer (Teele and Thelen 2017)

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# What to do?

- **Ask yourself**, what can I, as a PhD student, an early career, a senior, a white, a non-white researcher do to increase inclusiveness in academia?
- Read example code of conduct and DEI documents (<https://improvingpsych.org/sipsinaction/code/>)
- Practice them in writing, believe me, it is hard:
  - **Choose your words wisely**
  - <https://www.staffnet.manchester.ac.uk/equality-and-diversity/training/inclusive-language/>
  - <https://wgbh.brightspotcdn.com/ff/53/bef446844efebdc3c212a4df8083/wgbh-inclusive-language-guidelines.pdf>
- Consider them while organizing events
- My experience is that people usually make their judgement right when they see you and few are ready to change or update it later, sigh, preserve your energy and focus on your work
- If you are inclusive, be, don't make those *included* feel less for it
- Search for collaborators who are inclusive, who enjoy working with you and who value your skills (I know it is much harder in the early stages of career when you want a contract to pay the bills and publications to get the next job)
- Be careful of the **trouble maker** image as these are sensitive topics to study, you need to use the right language

# Thanks for your attention!

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- (Special thanks to Ugofilippo Basellini for beamer tricks<sup>10</sup>)

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<sup>10</sup><https://github.com/ubasellini/LaTeXpresentations>