



Sexism in Science

A research-based introduction

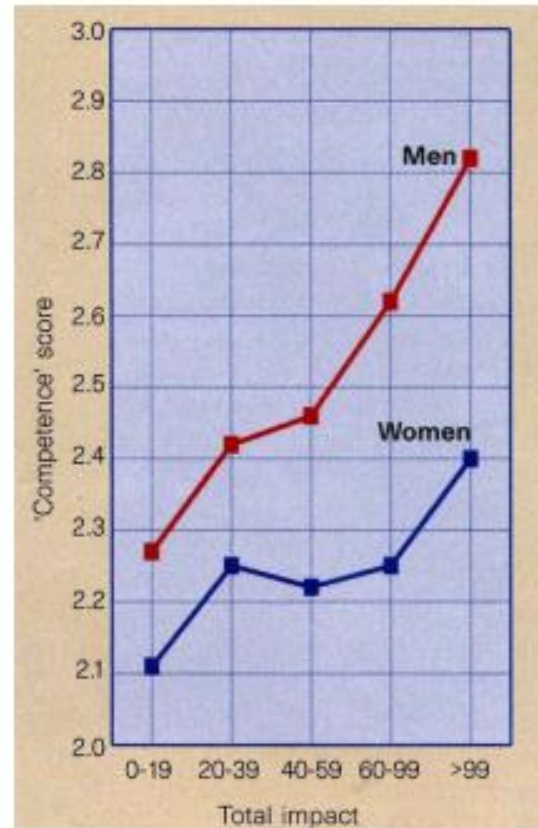
For believers and non-believers



Background – UC 2023 Faculty of Science

300 level	Female	Male
Number of students	677	337
Courses taken	1066	576
Mean GPA	6.07	5.64
A+ grades given	130	53
A+ grades (%)	12.2%	9.2%
PhD students	140	92

Men are rated higher for the same impact



Wold, Agnes, and Christine Wennerås.
"Neptism and sexism in peer
review." *Nature* 387.6631 (1997): 341-343.

Men are seen as more competent, more hireable, offered more mentoring...

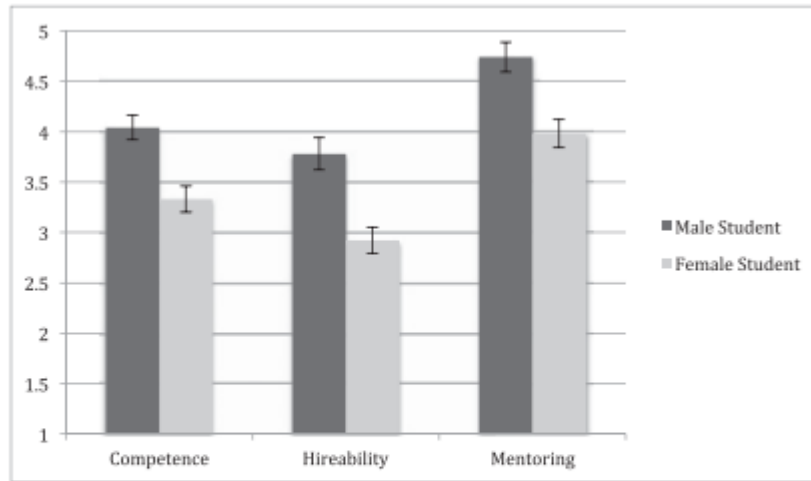


Fig. 1. Competence, hireability, and mentoring by student gender condition (collapsed across faculty gender). All student gender differences are significant ($P < 0.001$). Scales range from 1 to 7, with higher numbers reflecting a greater extent of each variable. Error bars represent SEs. $n_{\text{male student condition}} = 63$, $n_{\text{female student condition}} = 64$.

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. *Proceedings of the national academy of sciences*, 109(41), 16474-16479.

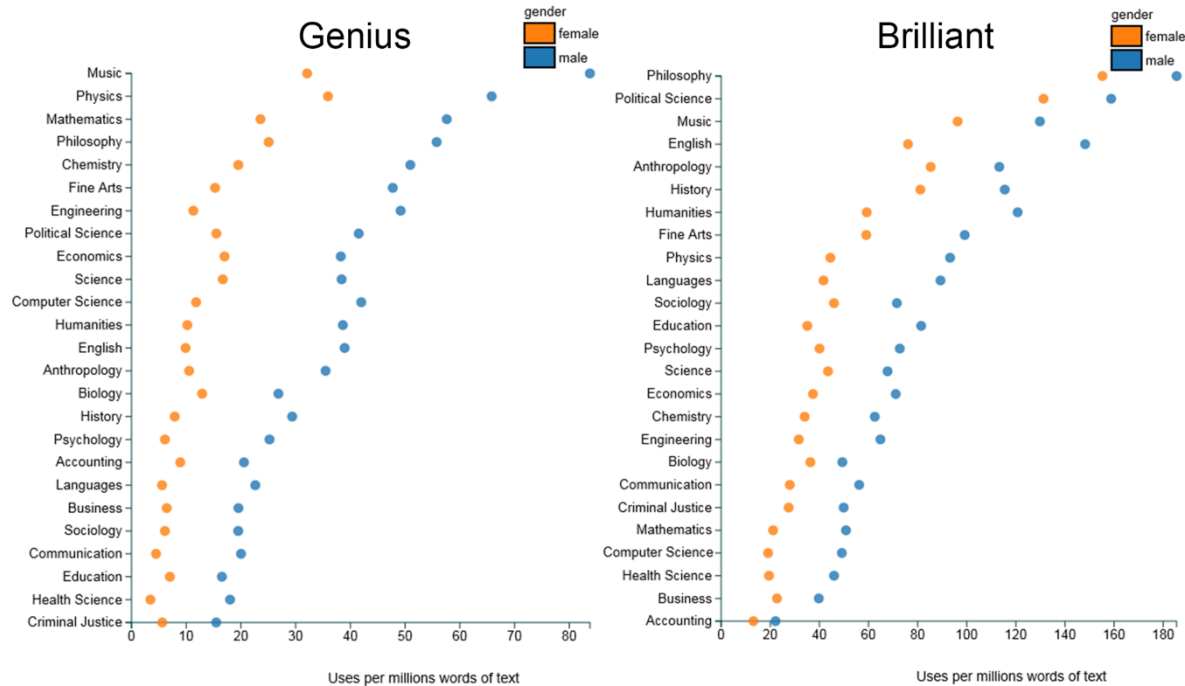
and paid more (10%)

Women are diligent and hard working but not excellent

apparent gender and the outcomes of their letters: ratings and letter content. Our results reveal that female applicants are only half as likely to receive excellent letters versus good letters compared to male applicants. We also find no evidence that male and female recommenders differ in their likelihood to

Dutt, K., Pfaff, D. L., Bernstein, A. F., Dillard, J. S., & Block, C. J. (2016). Gender differences in recommendation letters for postdoctoral fellowships in geoscience. *Nature Geoscience*, 9(11), 805-808.

Student evaluations



Storage, D., Horne, Z., Cimpian, A., & Leslie, S. J. (2016). The frequency of “brilliant” and “genius” in teaching evaluations predicts the representation of women and African Americans across fields. *PloS one*, 11(3), e0150194.

Women are asked to do more work (especially more teaching)

Number of requests

	Assoc Prof	Prof
Women	5.98	5.75
Men	1.72	3.00

Type of requests

Request Category	Male	Female
Research	8.0%	3.8%
Teaching	6.3%	8.1%
Student advising	17.9%	21.6%
Faculty advising	8.9%	10.3%
Professional service	29.5%	27.3%
Campus service	29.5%	28.9%

O'Meara, K., Kuvaeva, A., Nyunt, G., Waugaman, C., & Jackson, R. (2017). Asked more often: Gender differences in faculty workload in research universities and the work interactions that shape them. *American Educational Research Journal*, 54(6), 1154-1186.

Women do more “service” jobs

average. We find strong evidence that, on average, women faculty perform more service than male faculty in academia, and that the service differential is driven particularly by participation in internal rather than external service. Thus, one might generalize that women faculty are shouldering a disproportionately large part of the burden of “taking care of the academic family,” so to speak. We also

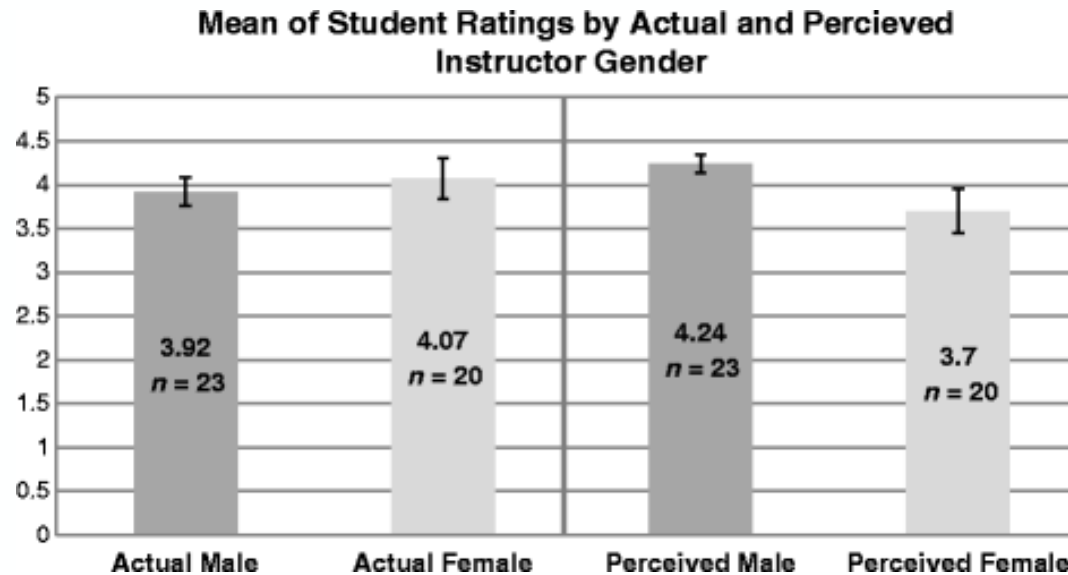
Guarino, C. M., & Borden, V. M. (2017). Faculty service loads and gender: Are women taking care of the academic family?. *Research in higher education*, 58, 672-694.

Students expect more from women

Variables	Professor gender	
	Female	Male
	<i>M (SD)</i>	<i>M (SD)</i>
1. Requesting favor	2.64 (.99) _a	2.56 (.89) _b
2. Expecting "Yes"	2.12 (.80) _a	2.05 (.66) _b
3. Negative emotions	2.38 (.93) _a	2.28 (.93) _b
4. Pleading	1.66 (.89) _a	1.50 (.78) _b
5. Perceived dislike	2.24 (1.15) _a	2.02 (1.13) _a
6. Academic entitlement	2.27 (1.00) _a	2.27 (.87) _a

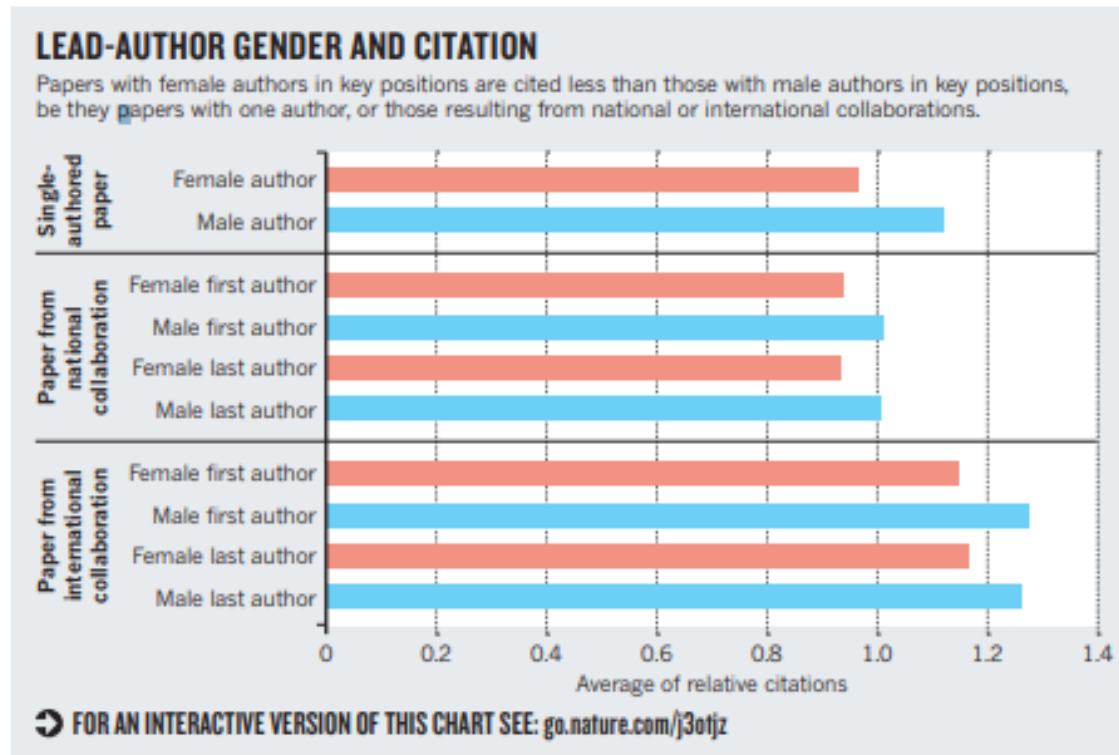
El-Alayli, A., Hansen-Brown, A. A., & Ceynar, M. (2018). Dancing backwards in high heels: Female professors experience more work demands and special favor requests, particularly from academically entitled students. *Sex Roles*, 79, 136-150.

Students rate (perceived) female instructors lower



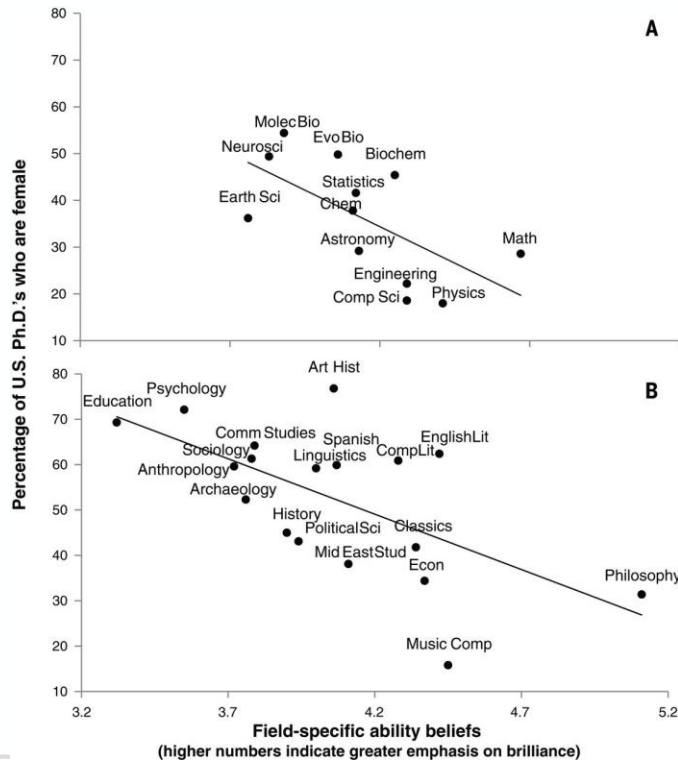
MacNell, L., Driscoll, A., & Hunt, A. N. (2015). What's in a name: Exposing gender bias in student ratings of teaching. *Innovative Higher Education*, 40, 291-303.

Papers by women receive fewer citations



Larivière, V., Ni, C., Gingras, Y., Cronin, B., & Sugimoto, C. R. (2013). Bibliometrics: Global gender disparities in science. *Nature*, 504(7479), 211-213.

Male-dominated fields require brilliance



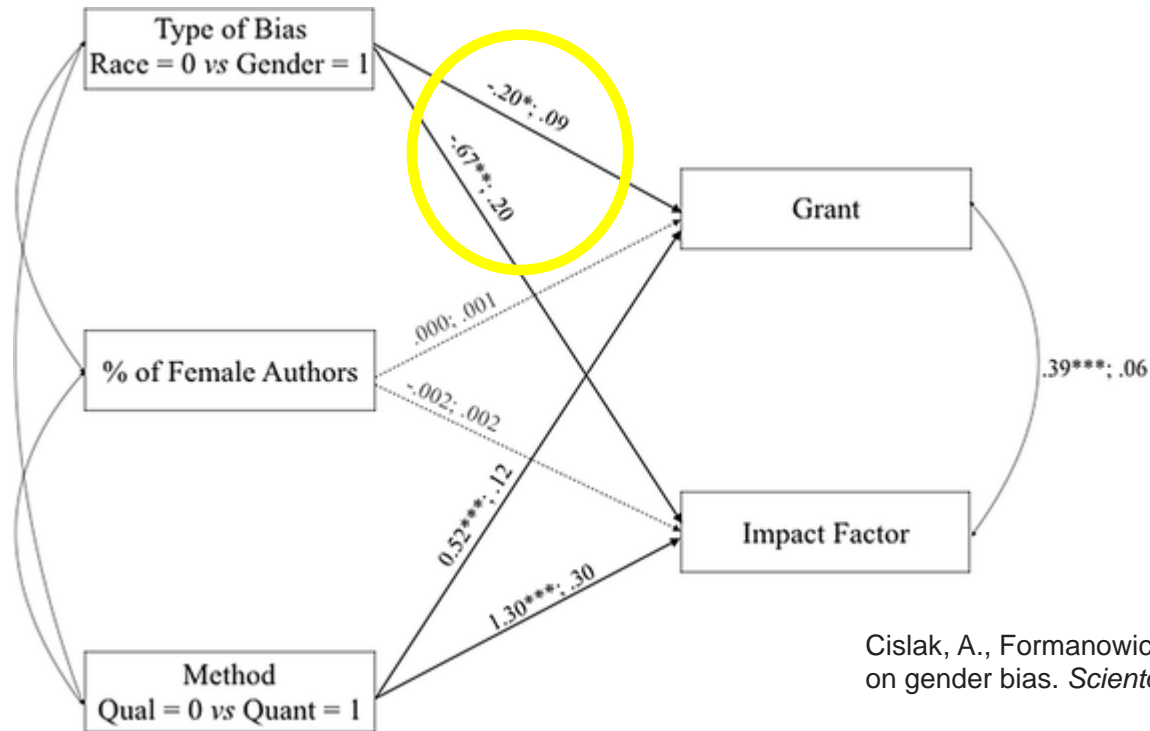
Leslie, S. J., Cimpian, A., Meyer, M., & Freeland, E. (2015). Expectations of brilliance underlie gender distributions across academic disciplines. *Science*, 347(6219), 262-265.

Male scientists don't believe this research

quality of the research. Results across experiments showed that men evaluate the gender-bias research less favorably than women, and, of concern, this gender difference was especially prominent among STEM faculty (experiment 2). These results suggest a relative reluctance among men, especially faculty men within STEM, to accept evidence of gender biases in STEM. This finding is problematic because broadening the participation

Handley, I. M., Brown, E. R., Moss-Racusin, C. A., & Smith, J. L. (2015). Quality of evidence revealing subtle gender biases in science is in the eye of the beholder. *Proceedings of the National Academy of Sciences*, *112*(43), 13201-13206.

And it's hard to get published/funded

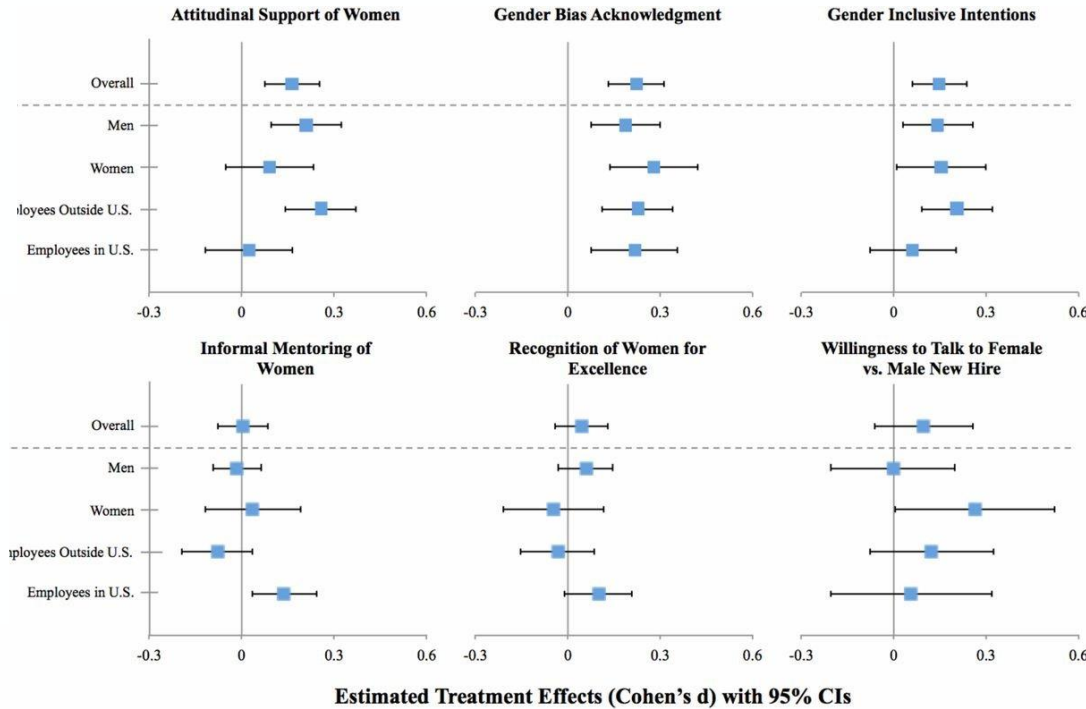


Cislak, A., Formanowicz, M., & Saguy, T. (2018). Bias against research on gender bias. *Scientometrics*, 115, 189-200.

Implicit bias training changes attitudes but not actions

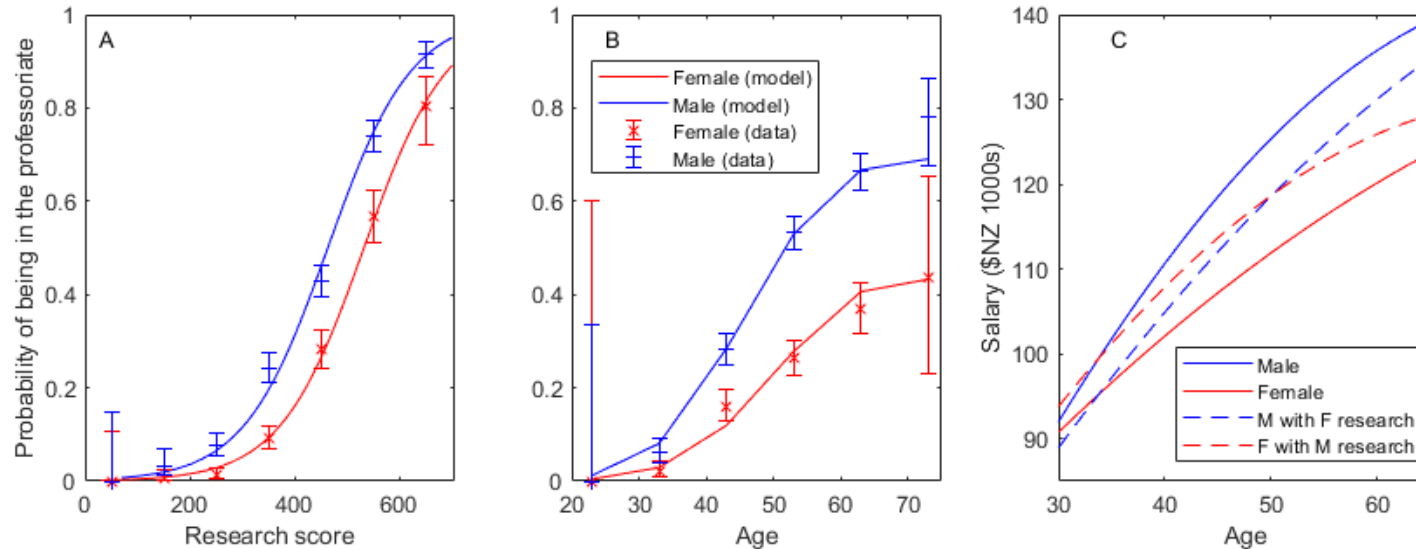
Attitude

Actions



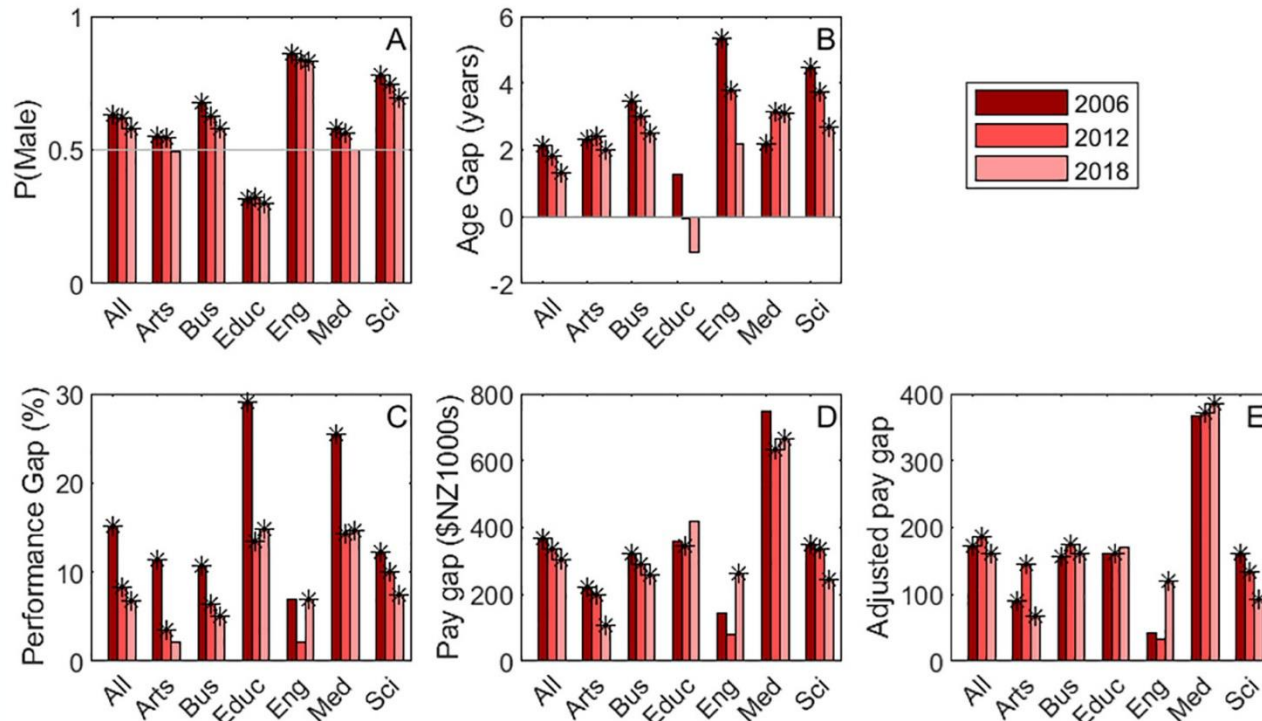
Chang, E. H., Milkman, K. L., Gromet, D. M., Rebele, R. W., Massey, C., Duckworth, A. L., & Grant, A. M. (2019). The mixed effects of online diversity training. *Proceedings of the National Academy of Sciences*, 116(16), 7778-7783.

What have we done?



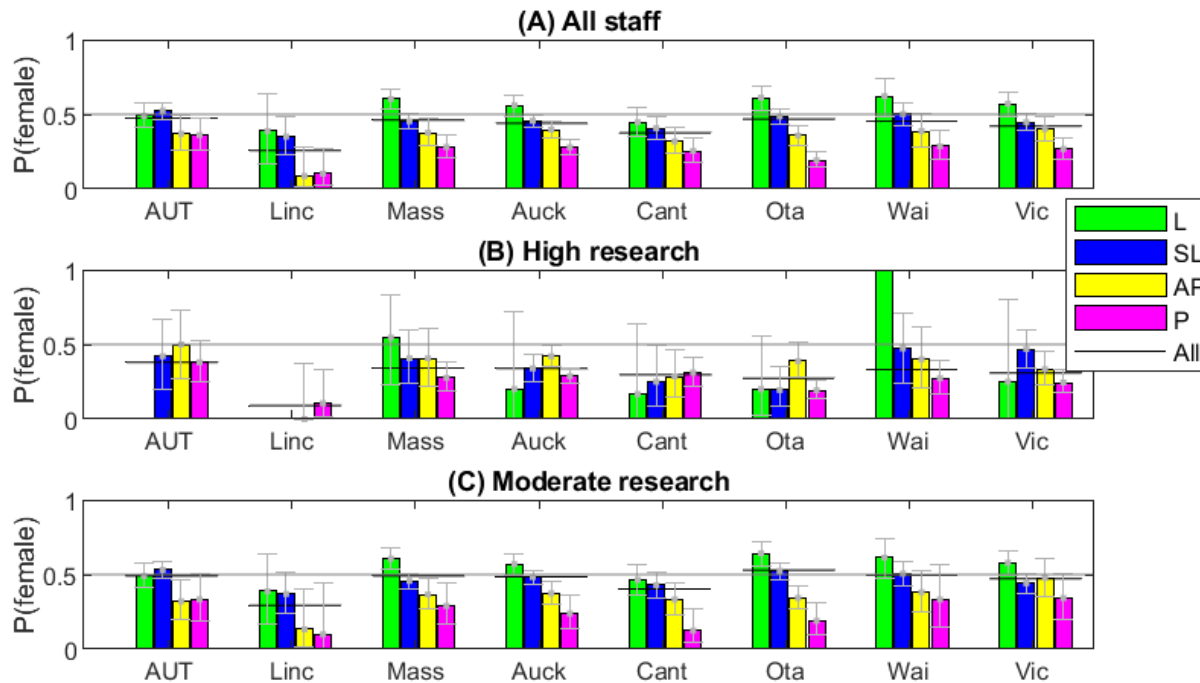
Brower, A., & James, A. (2020). Research performance and age explain less than half of the gender pay gap in New Zealand universities. *Plos one*, 15(1), e0226392.

Are things improving?



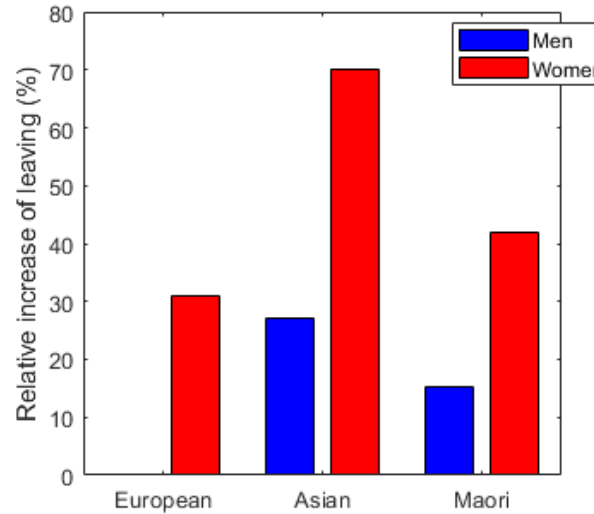
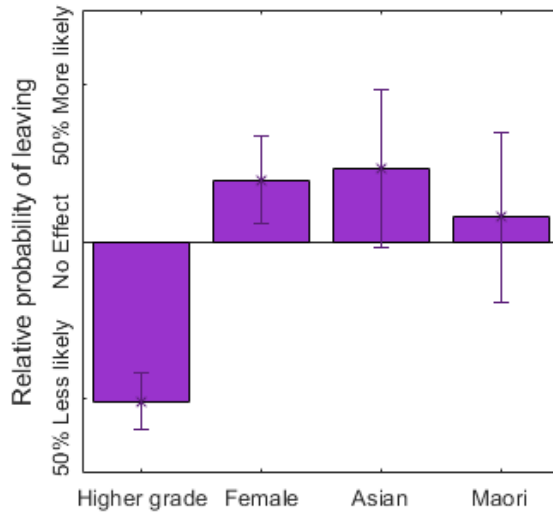
Brower, A., & James, A. (2023). Sticky Floors, Double-Binds, and Double Whammies: Adjusting for Research Performance Reveals Universities' Gender Pay Gap is Not Disappearing. *SAGE Open*, 13(3), 21582440231192323.

Representation



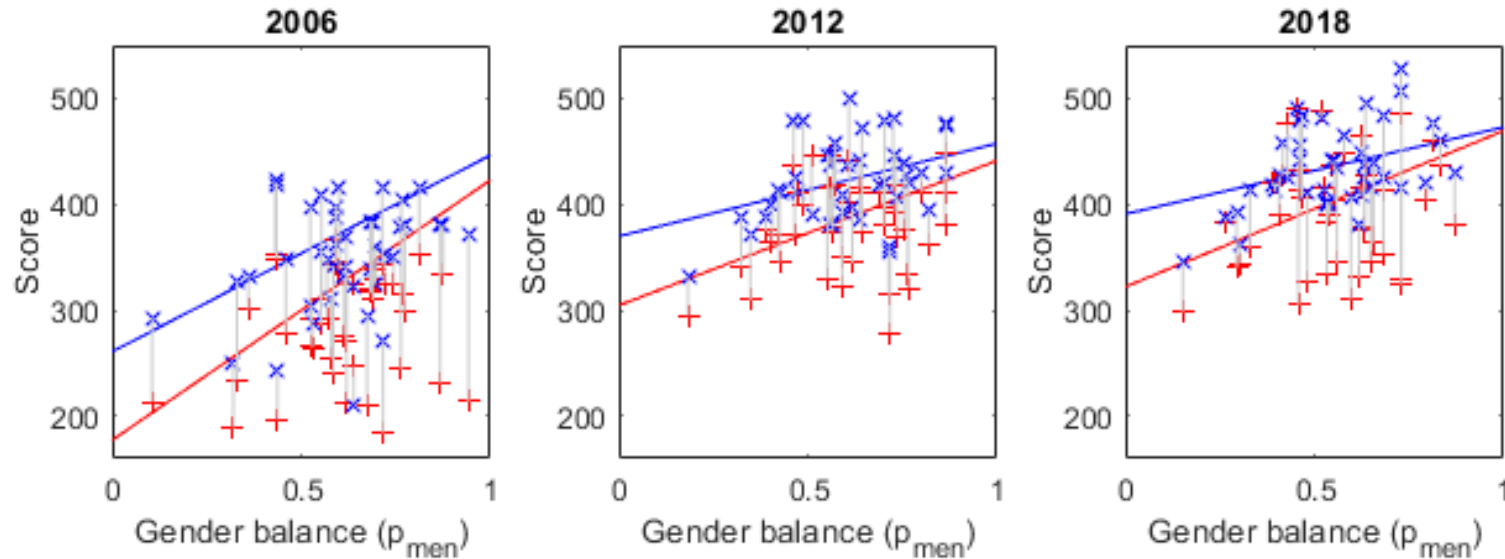
James, A., & Brower, A. (2022). Levers of change: using mathematical models to compare gender equity interventions in universities. *Royal Society Open Science*, 9(9), 220785.

Asian, female, Māori, lower grade => leave earlier



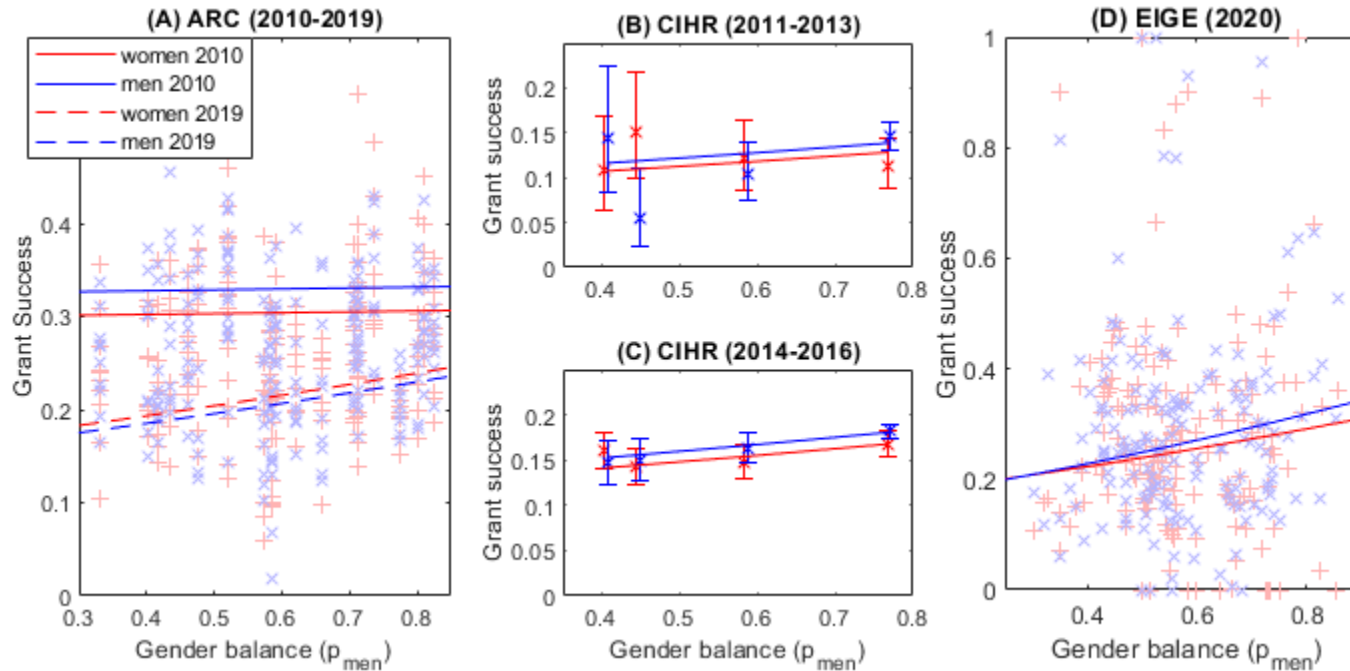
James, A., Barret-Walker, T., MacDonald, L., Buelow, F. & Brower, A. (2023). Stochastic modelling of intersectional pay gaps in universities. *Royal Society Open Science*, In submission.

Why the lower scores?



Alex James, Franca Buelow, Liam Gibson, Ann Brower (2024) Female-dominated disciplines have lower evaluated research quality and funding success rates, for men and women eLife 13:RP97613.
<https://doi.org/10.7554/eLife.97613.3>

Why the lower scores?



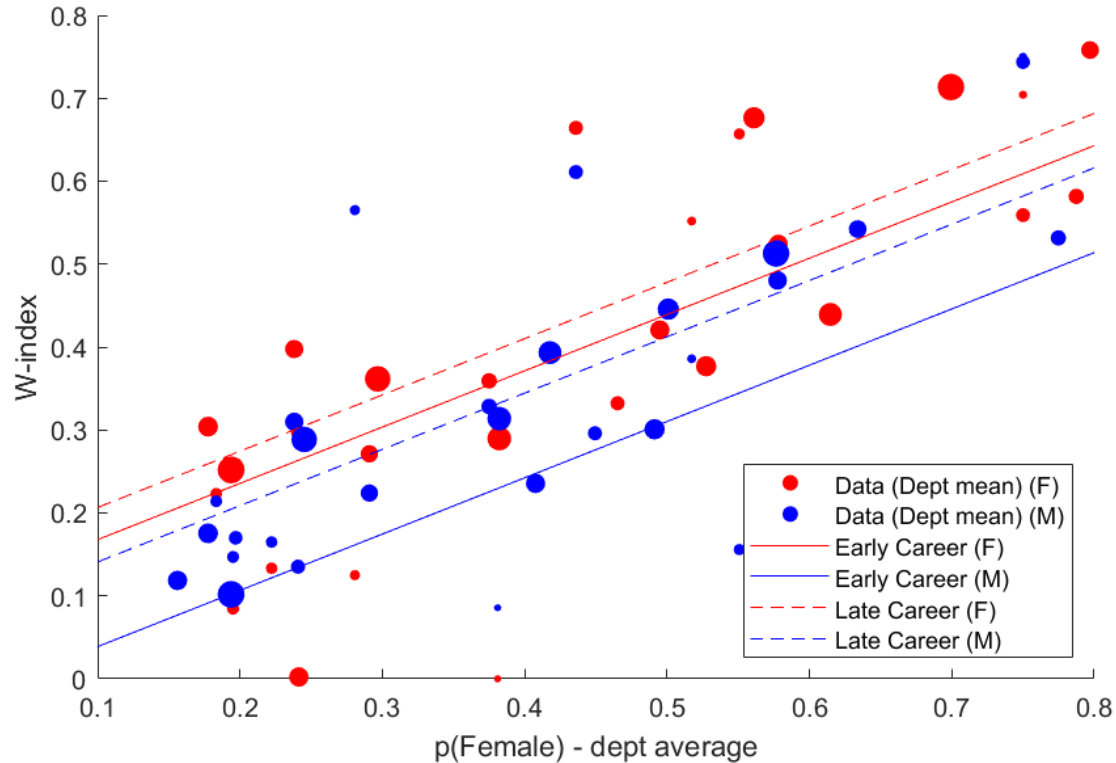
A solution



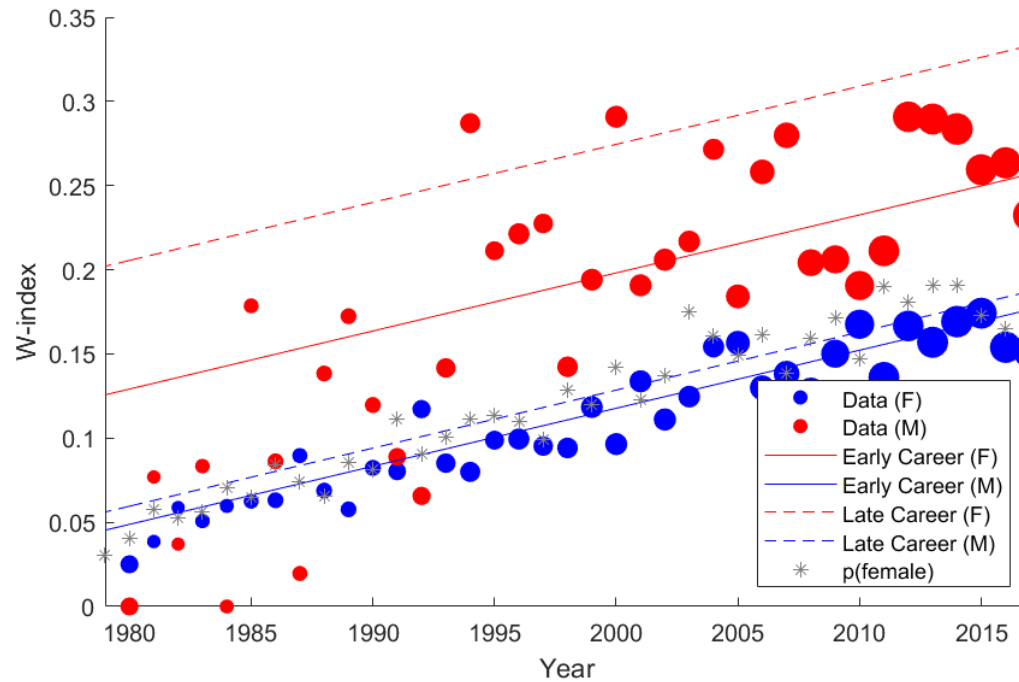
W-index

polish the glass ceiling
until it is crystal clear,
before smashing it into
tiny pieces.

W-index by internal co-authors

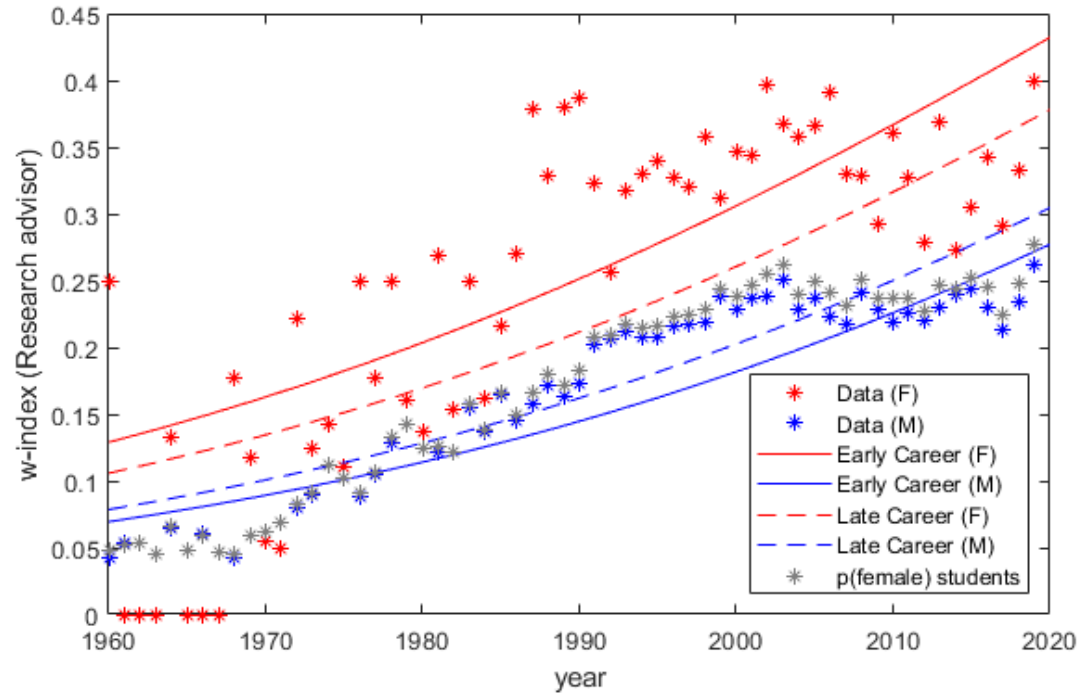


W-index for a journal



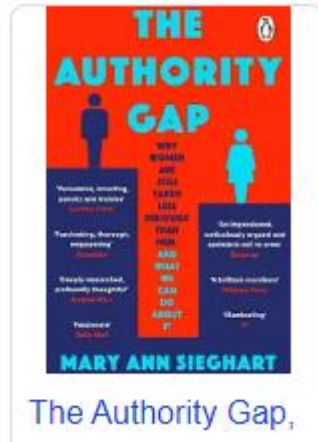
What proportion of your co-authors are women?

W-index for PhD supervision



What proportion of your students are women?

Further Reading



The People Who Could Have Done Science Didn't

Because they were women, and they were told, at every stage, that they weren't good enough. It
was a lie



Thank you!