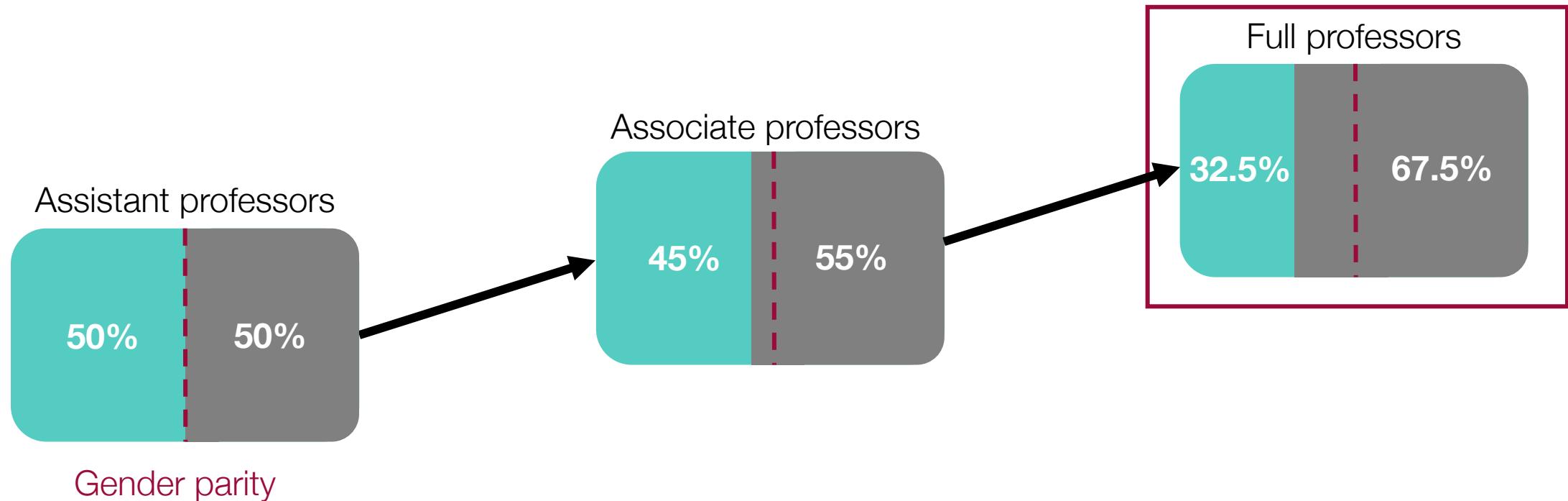


Gender and retention patterns among U.S. faculty

Katie Spoon, Nick LaBerge, K. Hunter Wapman, Sam Zhang, Allie Morgan, Mirta Galesic,
Lauren Rivera, Joanna Mendy, Maria Martinez, Bailey K. Fosdick, Dan Larremore, Aaron Clauset

University of Colorado Boulder

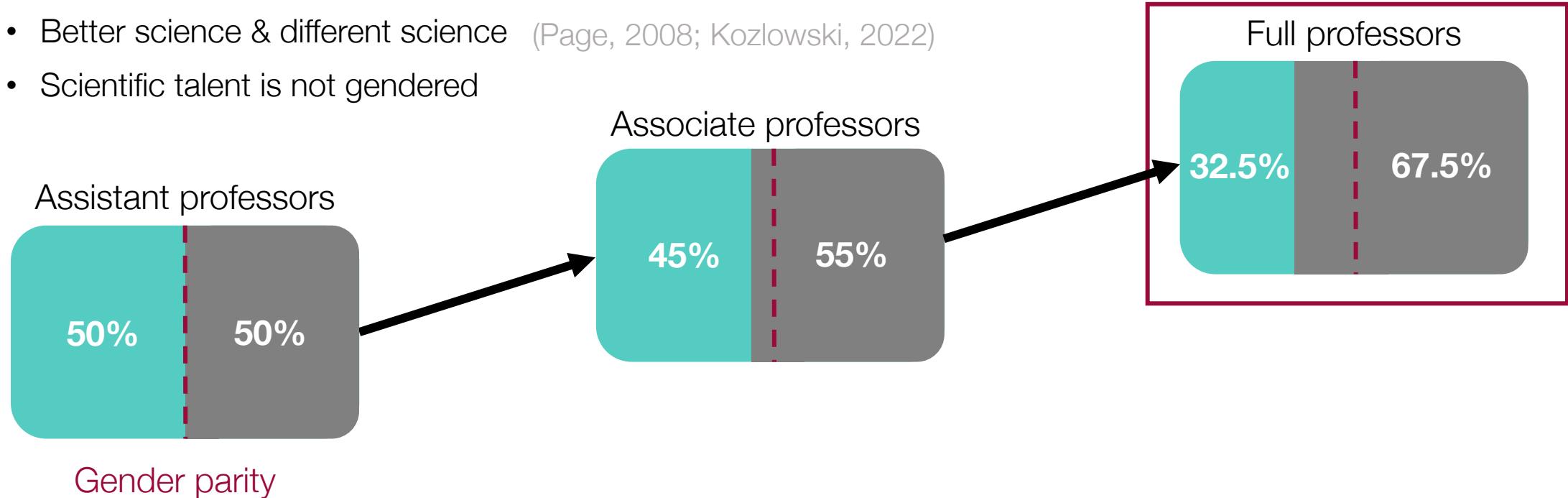
Women are still underrepresented in academia.



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Importance:

- Better science & different science (Page, 2008; Kozlowski, 2022)
- Scientific talent is not gendered



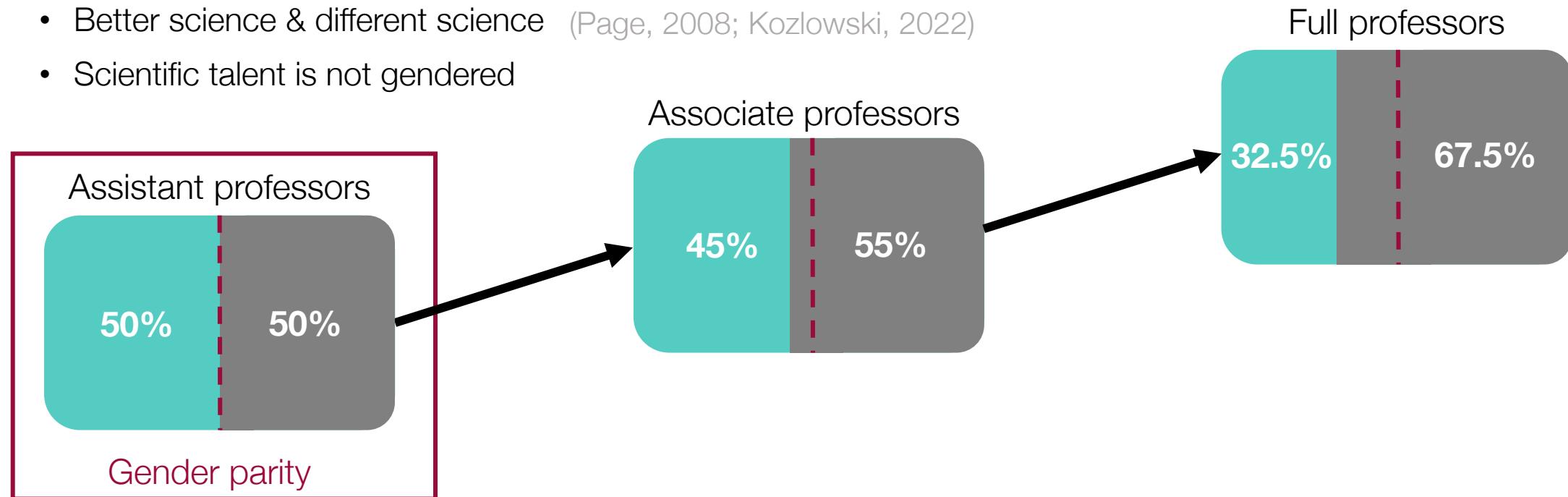
aaup
AMERICAN ASSOCIATION OF
UNIVERSITY PROFESSORS
(2020)

Women
Men

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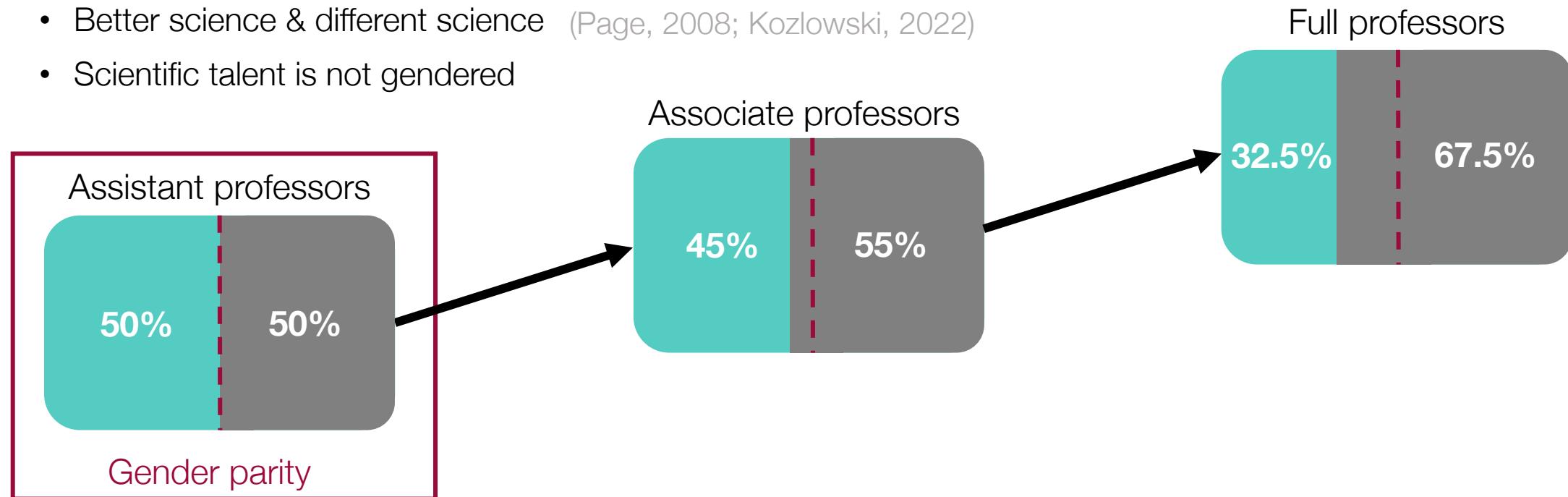
Gender parity in ***hiring*** will not lead to gender parity in ***representation*** if women disproportionately leave the system (the “leaky pipeline”) (Pell, 1996)



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gendered retention

aaup
AMERICAN ASSOCIATION OF
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Women
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D. Kozlowski et al., "Intersectional inequalities in science." Proceedings of the National Academy of Sciences 119 (2022).

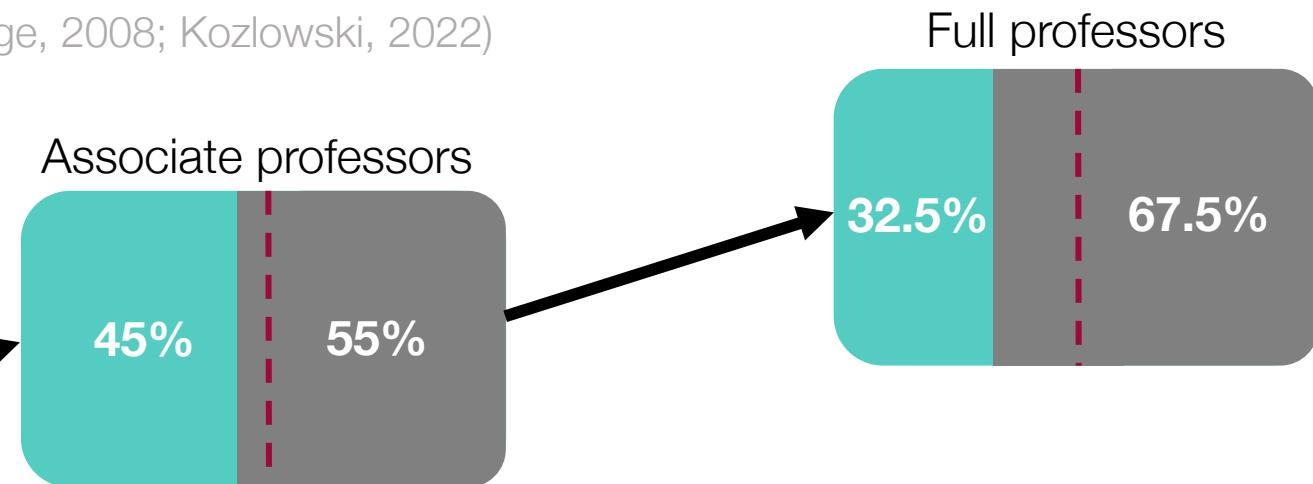
S.E. Page, The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies. Princeton University Press (2008).

A.N. Pell, "Fixing the leaky pipeline: women scientists in academia." Journal of Animal Science 74, 2843–2848 (1996).

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Gender parity in **hiring** will not lead to gender parity in **representation** if women disproportionately leave the system (the “leaky pipeline”) (Pell, 1996)
Lots of interest, but this is really hard to study!

gendered retention

aaup
AMERICAN ASSOCIATION OF
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Women
Men

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A.N. Pell, “Fixing the leaky pipeline: women scientists in academia.” Journal of Animal Science 74, 2843–2848 (1996).

Literature is deep



Literature is deep, but narrow

A screenshot of a Google Scholar search results page. The search query "retention of women in academia" is entered into the search bar. The results section shows a blue icon for "Articles" followed by the text "About 163,000 results (0.09 sec)". To the right of this text is a red rectangular box containing three white exclamation marks ("!!!").

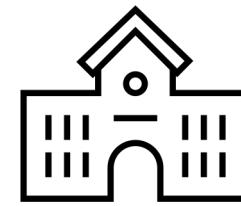
Focused mostly on:



Assistant profs



STEM



High-prestige
schools

Literature is deep, but narrow and contradictory

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No gendered differences

CULTURE, CLIMATE, AND CONTRIBUTION:
Career Satisfaction Among Female Faculty

Louise August*** and Jean Waltman*

Research in Higher Education (2004)

Women in Academic Science: A Changing Landscape

Stephen J Ceci¹, Donna K Ginther², Shulamit Kahn³, Wendy M Williams⁴

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It's complicated...

Survival Analysis of Faculty Retention in Science and Engineering by Gender

DEBORAH KAMINSKI AND CHERYL GEISLER

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Retention and promotion of women and underrepresented minority faculty in science and engineering at four large land grant institutions

Marcia Gumpertz¹, Raifu Durodoye, Emily Griffith, Alyson Wilson

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- Most studies are done at a **single institution or small group of institutions**
- Most studies are done at a **single point in time**
- Most studies are done on a **specific academic field or small group of fields**

Literature is deep, but narrow and contradictory

Similarly, the **reasons** women professors leave their jobs are also mixed.



Professional

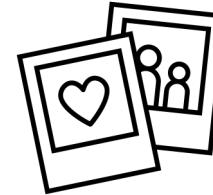
- Obtaining funding
- Admin. support

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Work-life balance

- Caring responsibilities
- Long hours

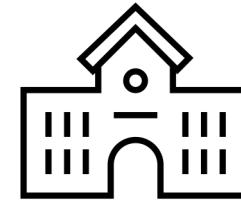
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Workplace climate

- Competition
- Not belonging

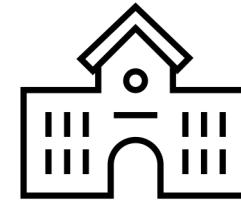
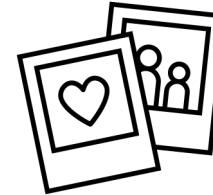
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We need a system-level, comprehensive view of academic retention to resolve the conflicting evidence.

Part 1: Administrative analysis

Are retention rates gendered?

Part 2: Survey analysis

Are the reasons faculty leave gendered?

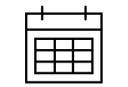
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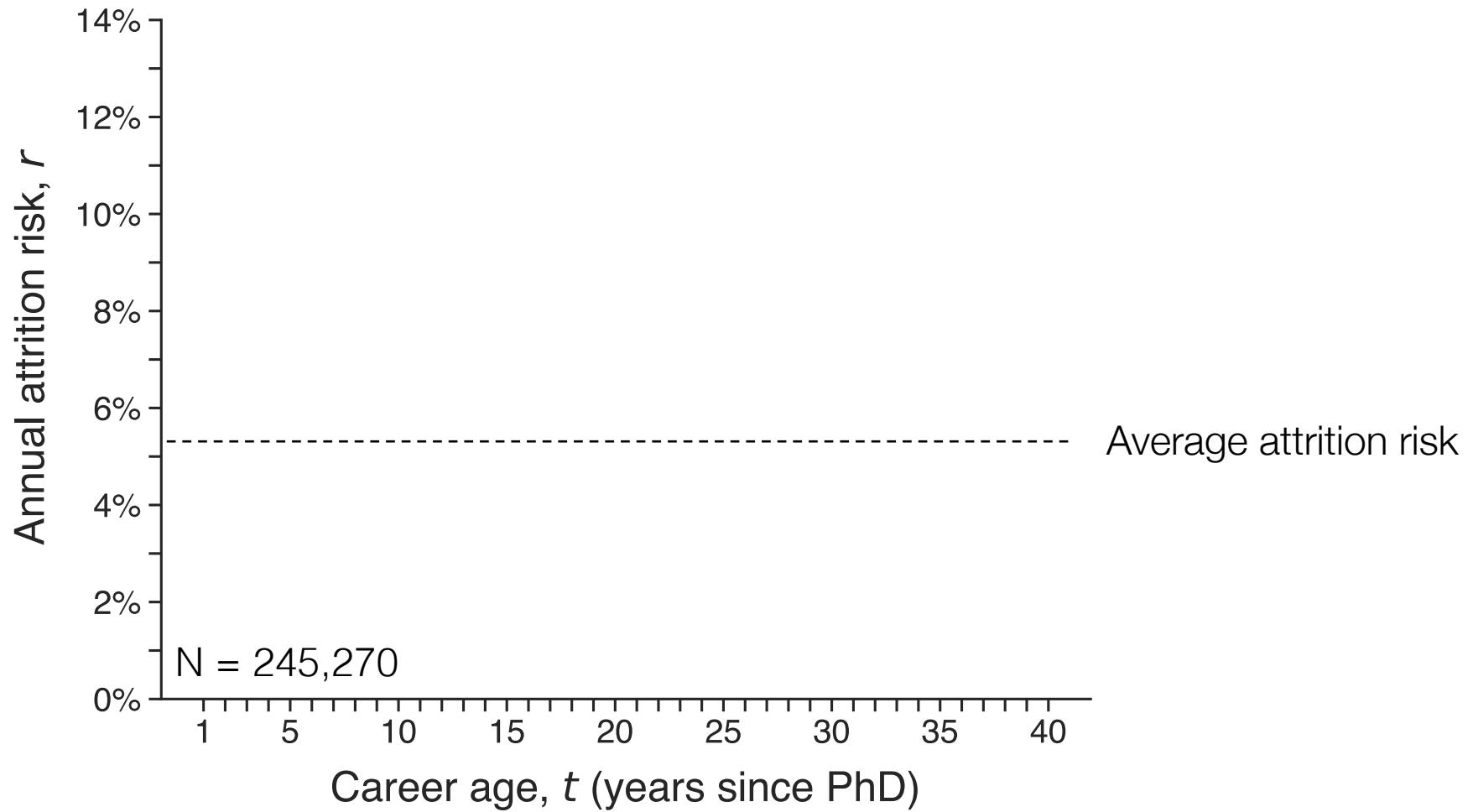
Are the reasons faculty leave gendered?

Longitudinal Data

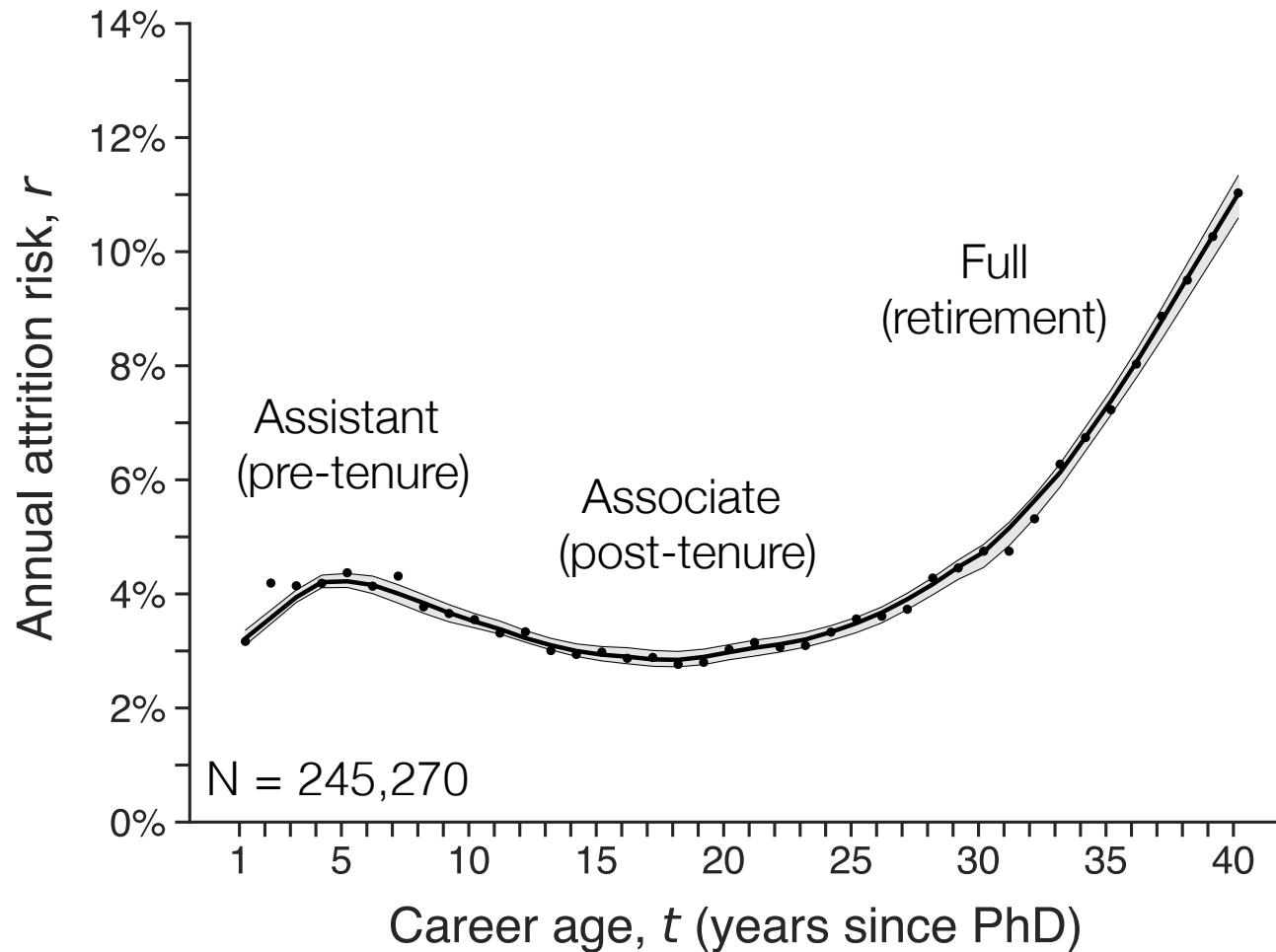
-  245,270 U.S. tenure-track & tenured faculty
-  391 U.S. PhD-granting institutions
-  111 academic fields, grouped into 9 high-level domains
-  10 years, 2011-2020

From Academic Analytics Research Center **AARC**

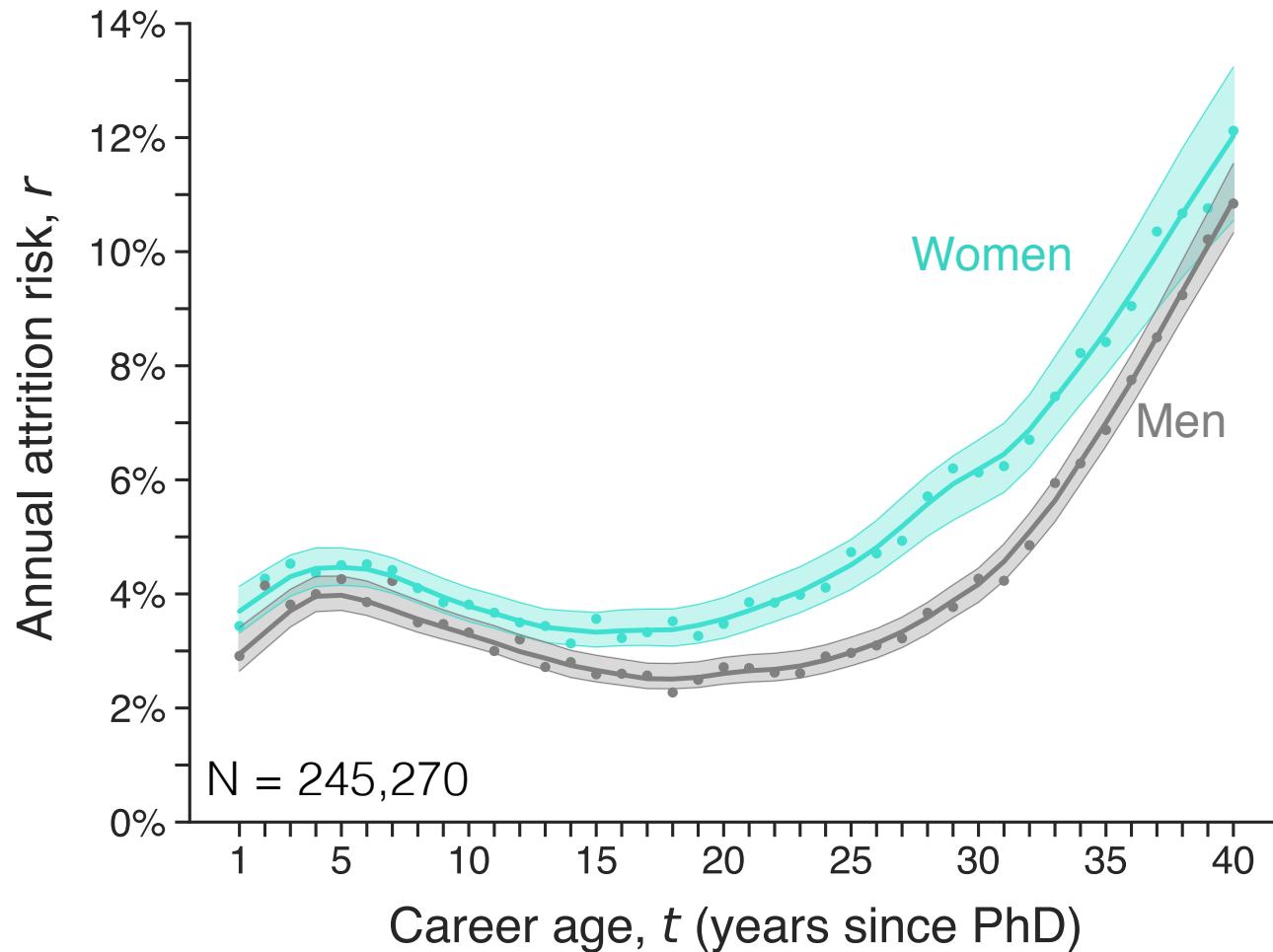
What is an academic's risk of leaving across their career?



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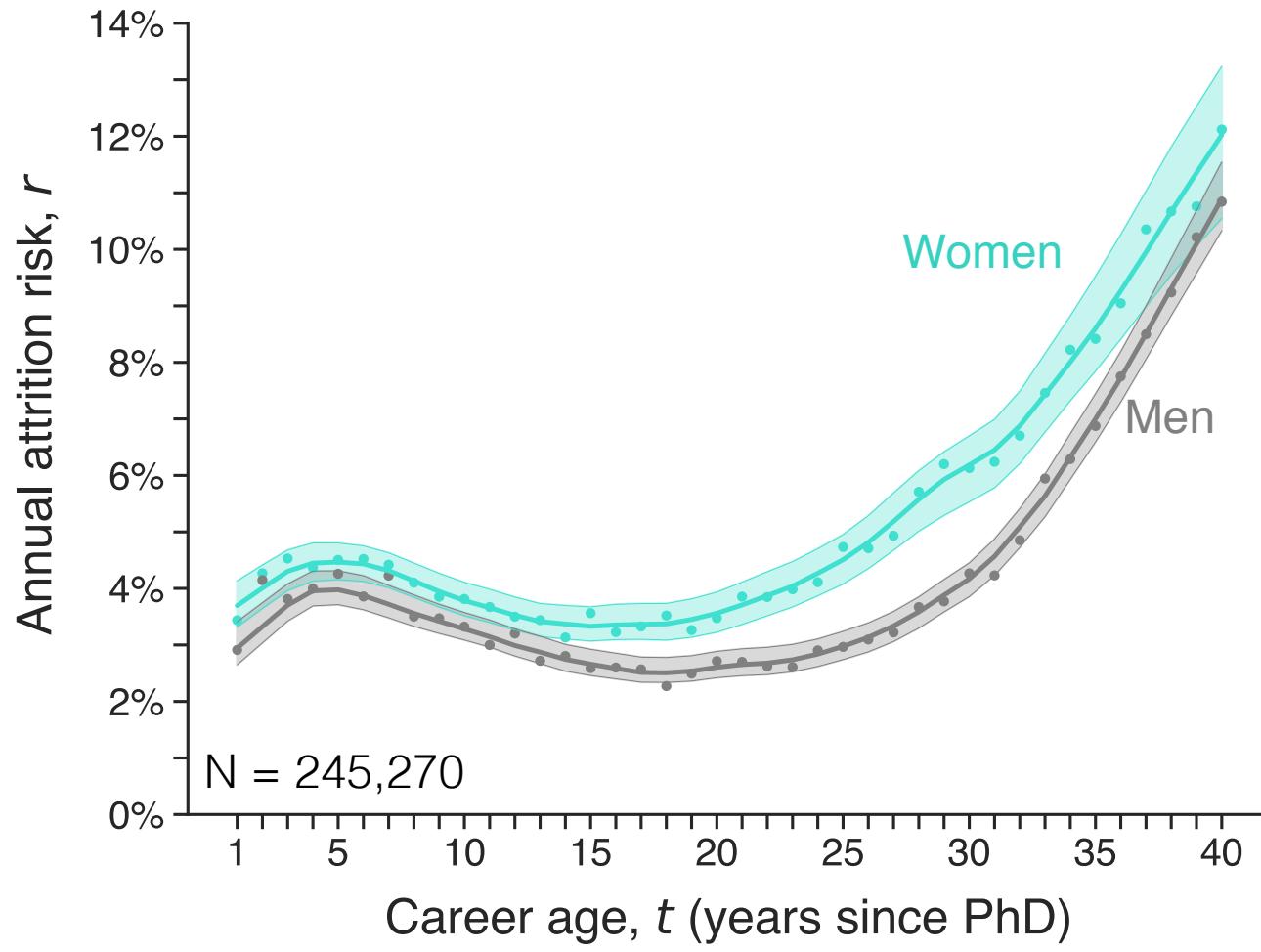


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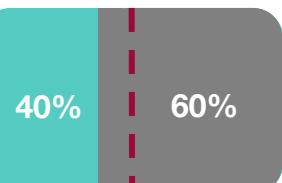
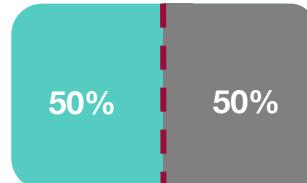


Women are more likely to leave their jobs than men at every career age.

What is an academic's risk of leaving across their career?

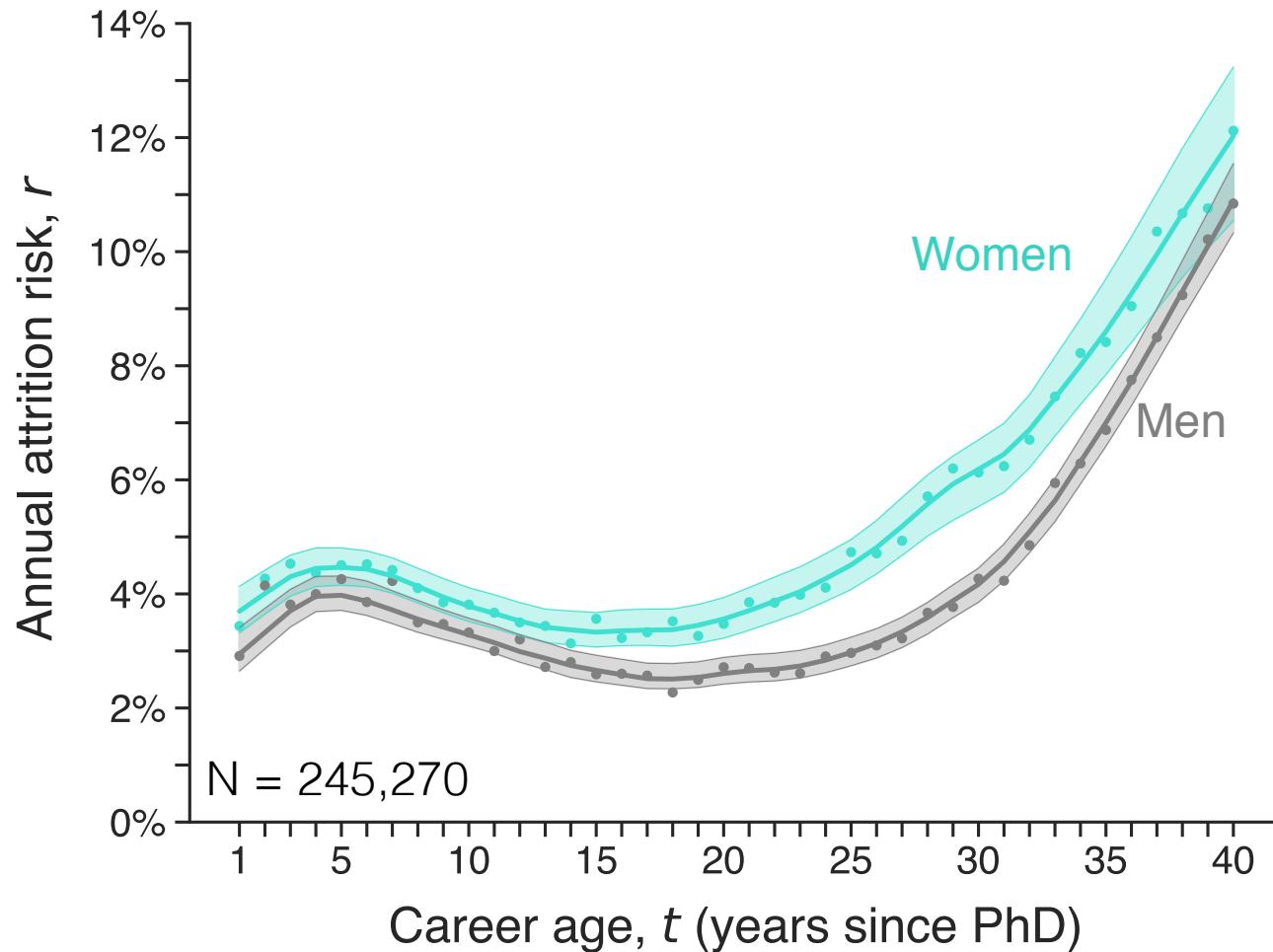


Hired at parity



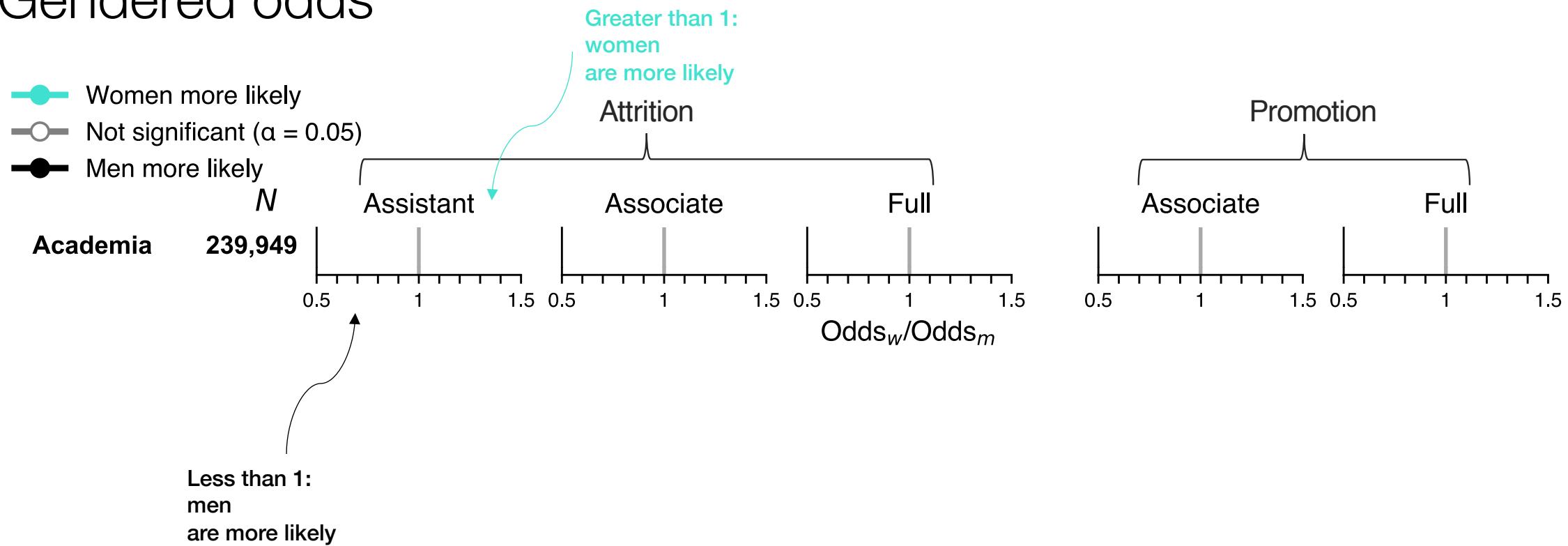
An additional loss of
1 in every 5 women
over a career

What is an academic's risk of leaving across their career?



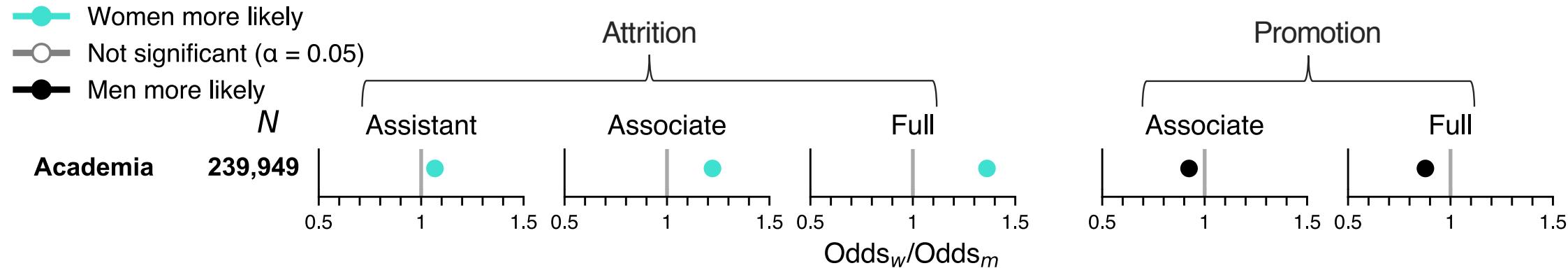
We are averaging across people with different training & environments –
are any of these factors influencing the gendered pattern we see?

Gendered odds



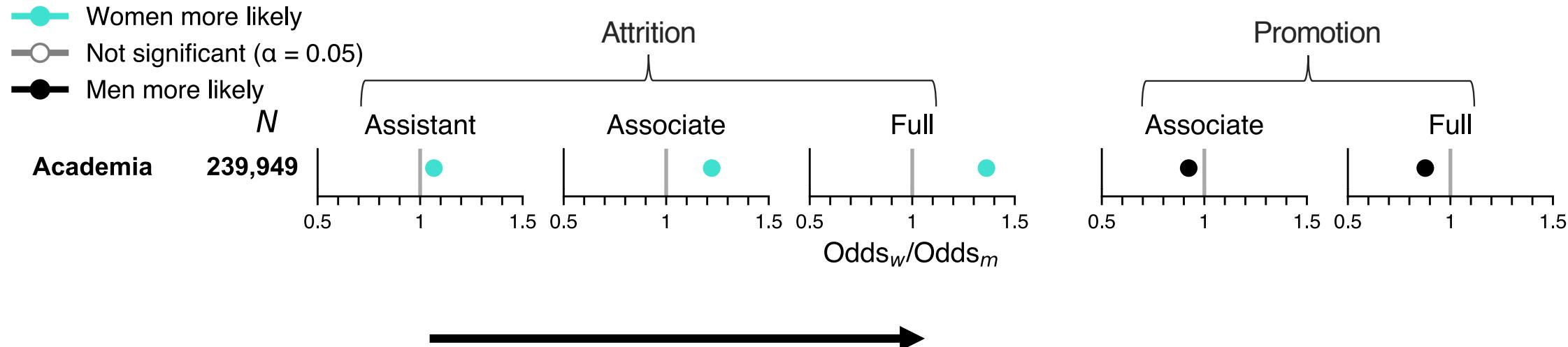
Adjusting for career age, employer prestige, and PhD training...

Gendered odds vary across career stage



Adjusting for career age, employer prestige, and PhD training...
 women are still more likely to leave their jobs and less likely to be promoted, than men, at every career stage.

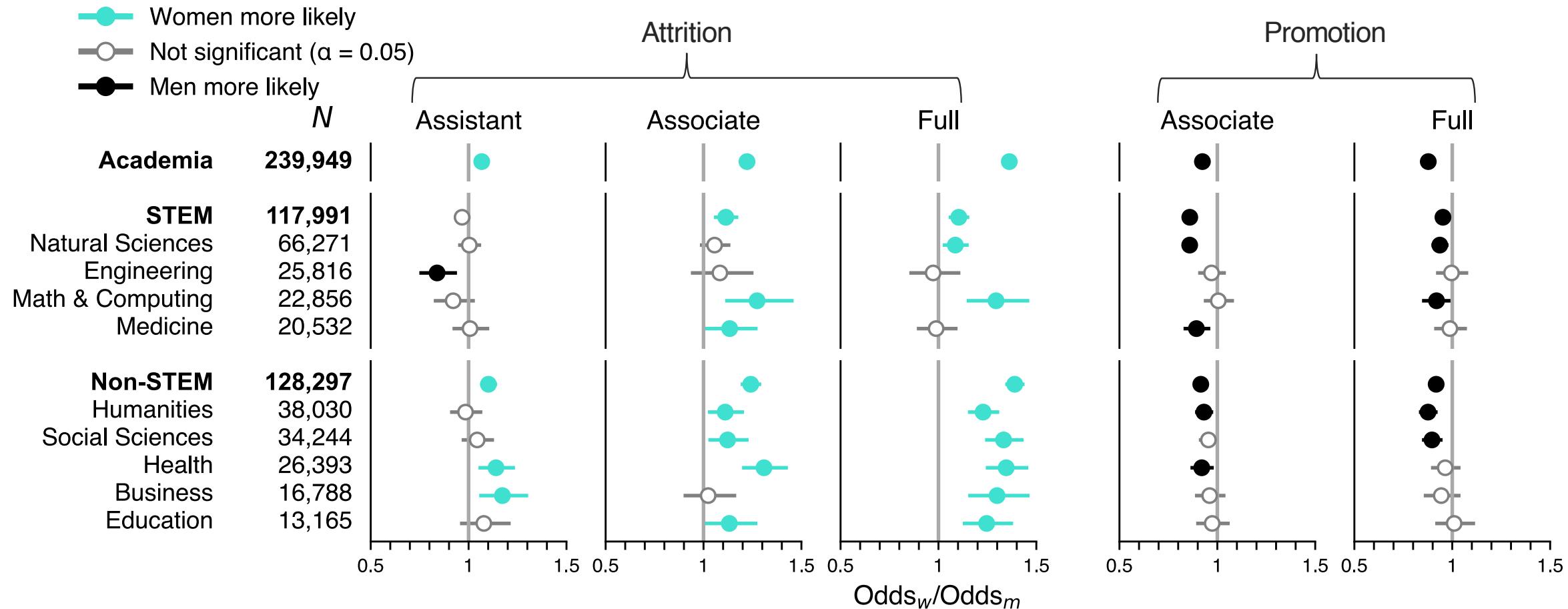
Gendered odds vary across career stage



Gender gaps increase with rank,
largest for **tenured faculty** (esp. Full)

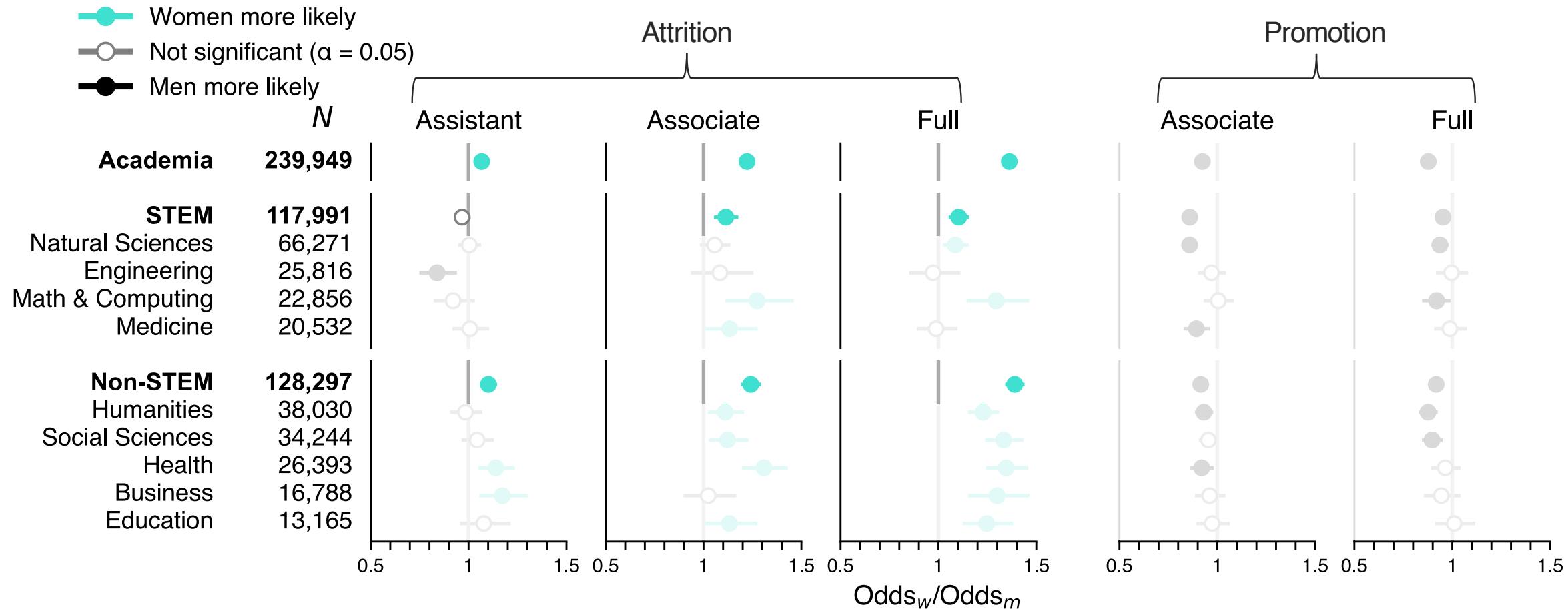
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Gendered odds vary across career stage, domain



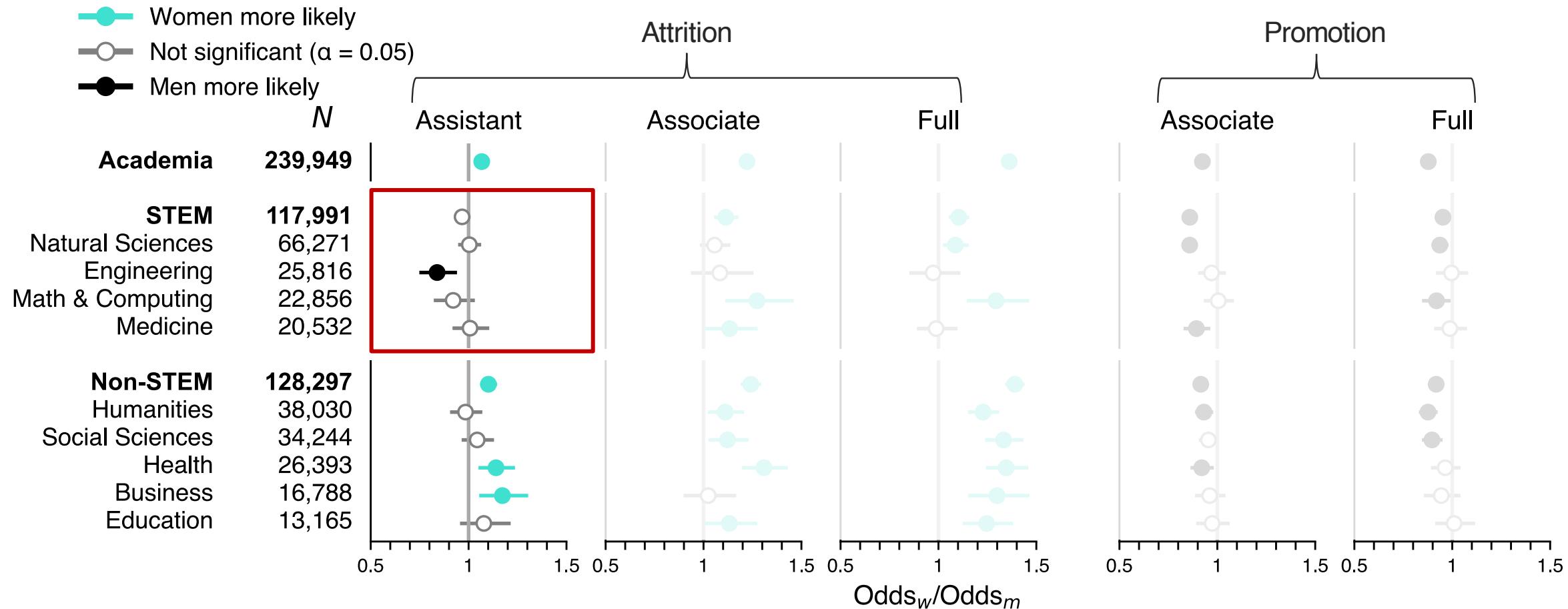
When we split by domain there's even more variation!

Gendered odds vary across career stage, domain



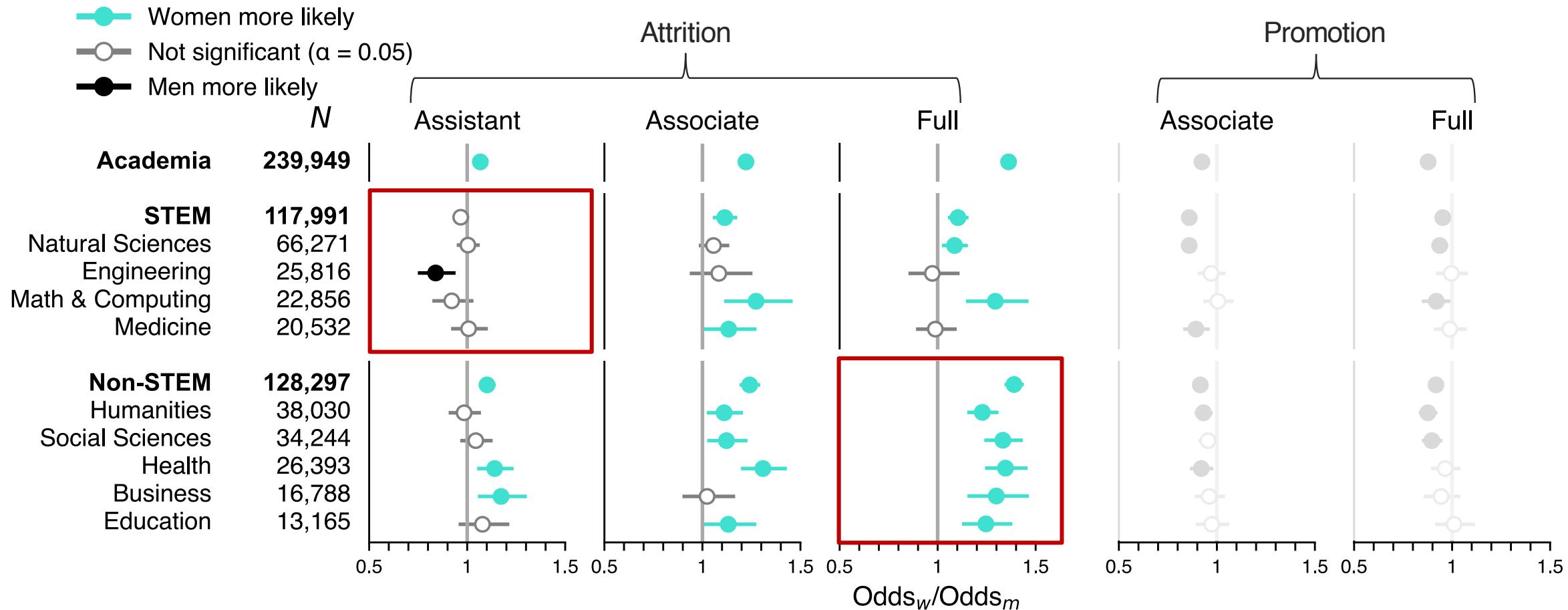
The gendered retention gaps are **larger in non-STEM domains** than in STEM domains

Gendered odds vary across career stage, domain



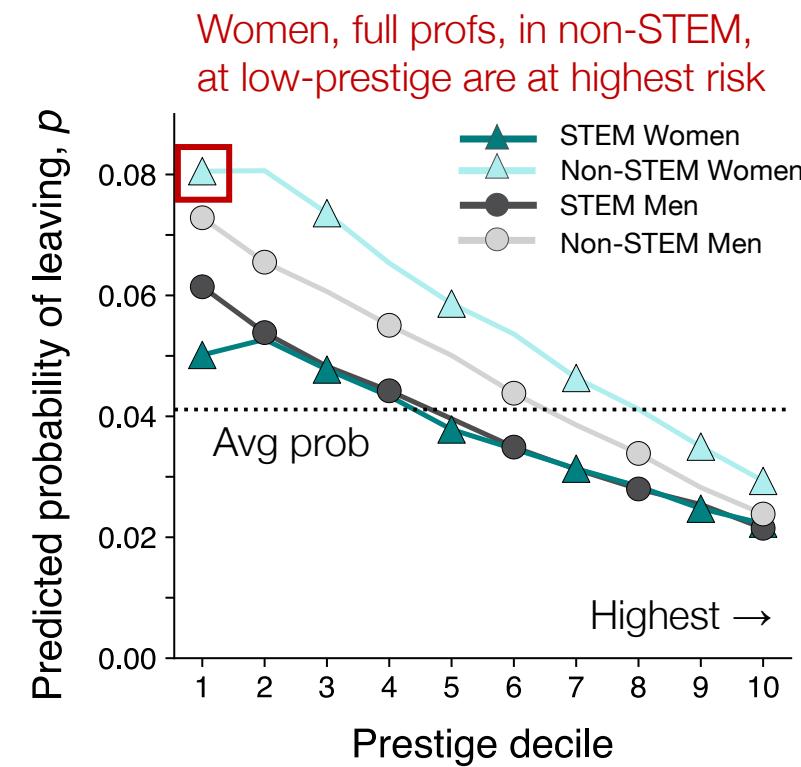
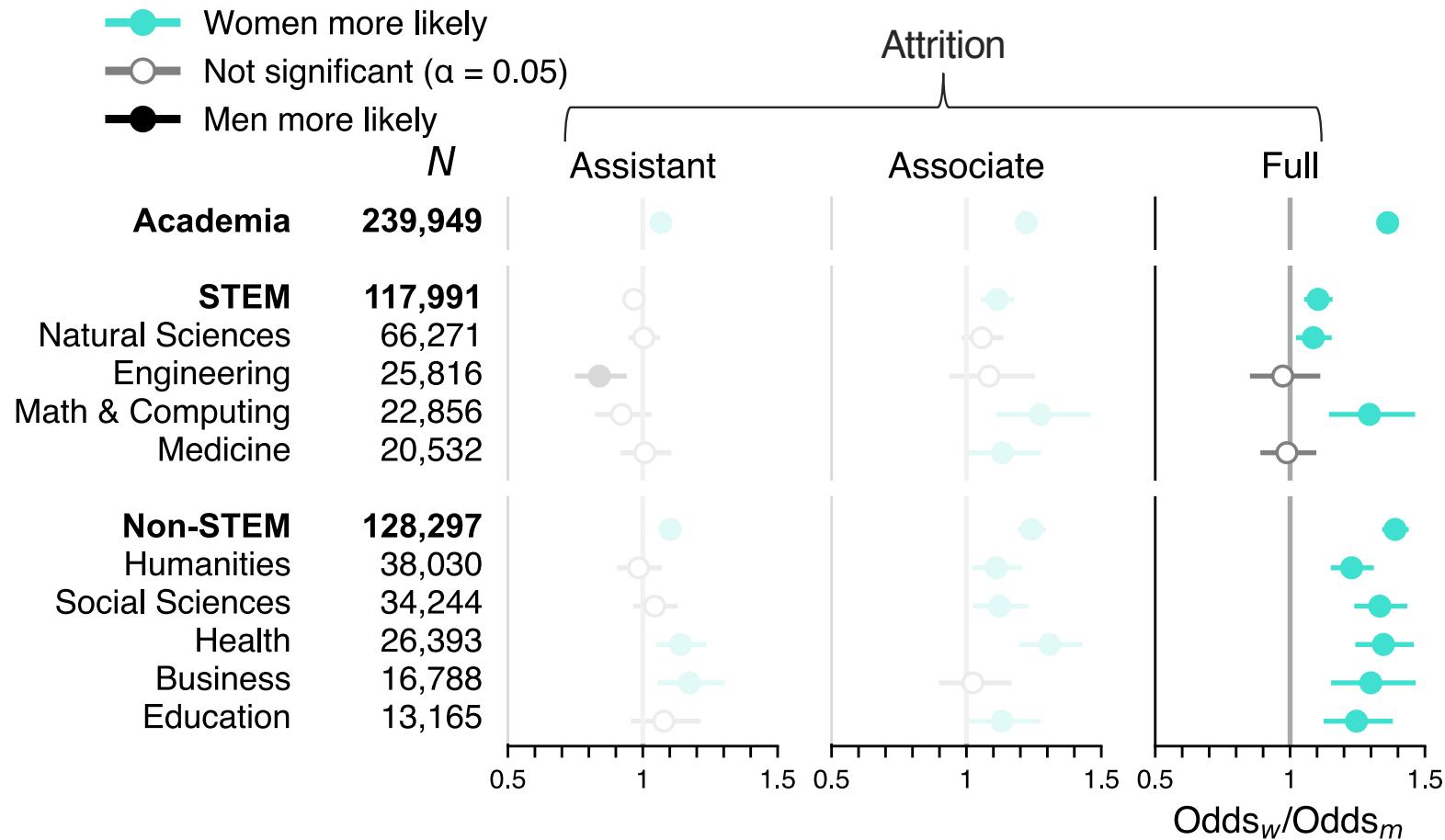
There are **no** STEM domains where women assistant profs are more likely to leave than men

Gendered odds vary across career stage, domain

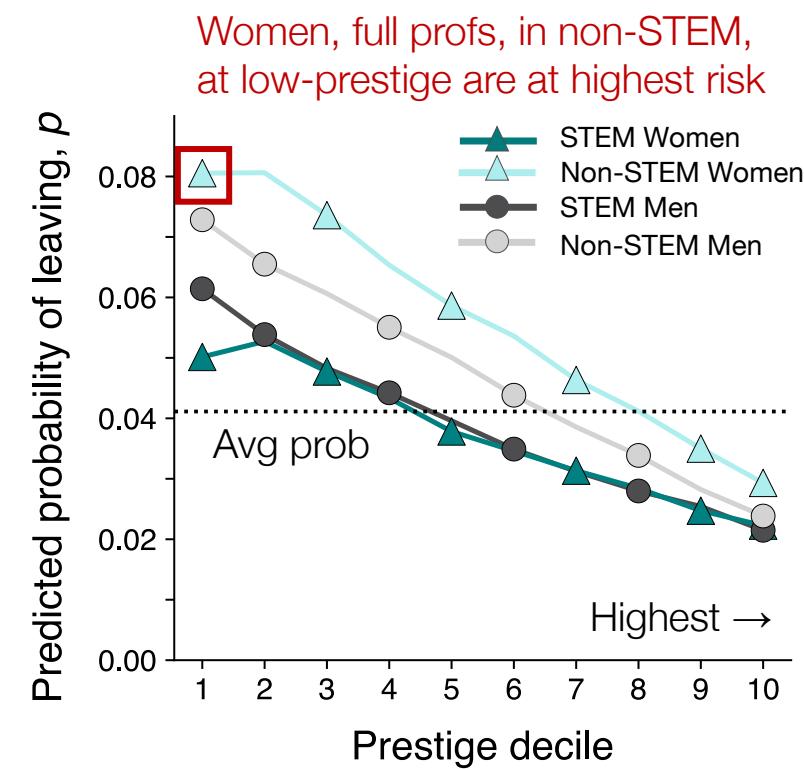
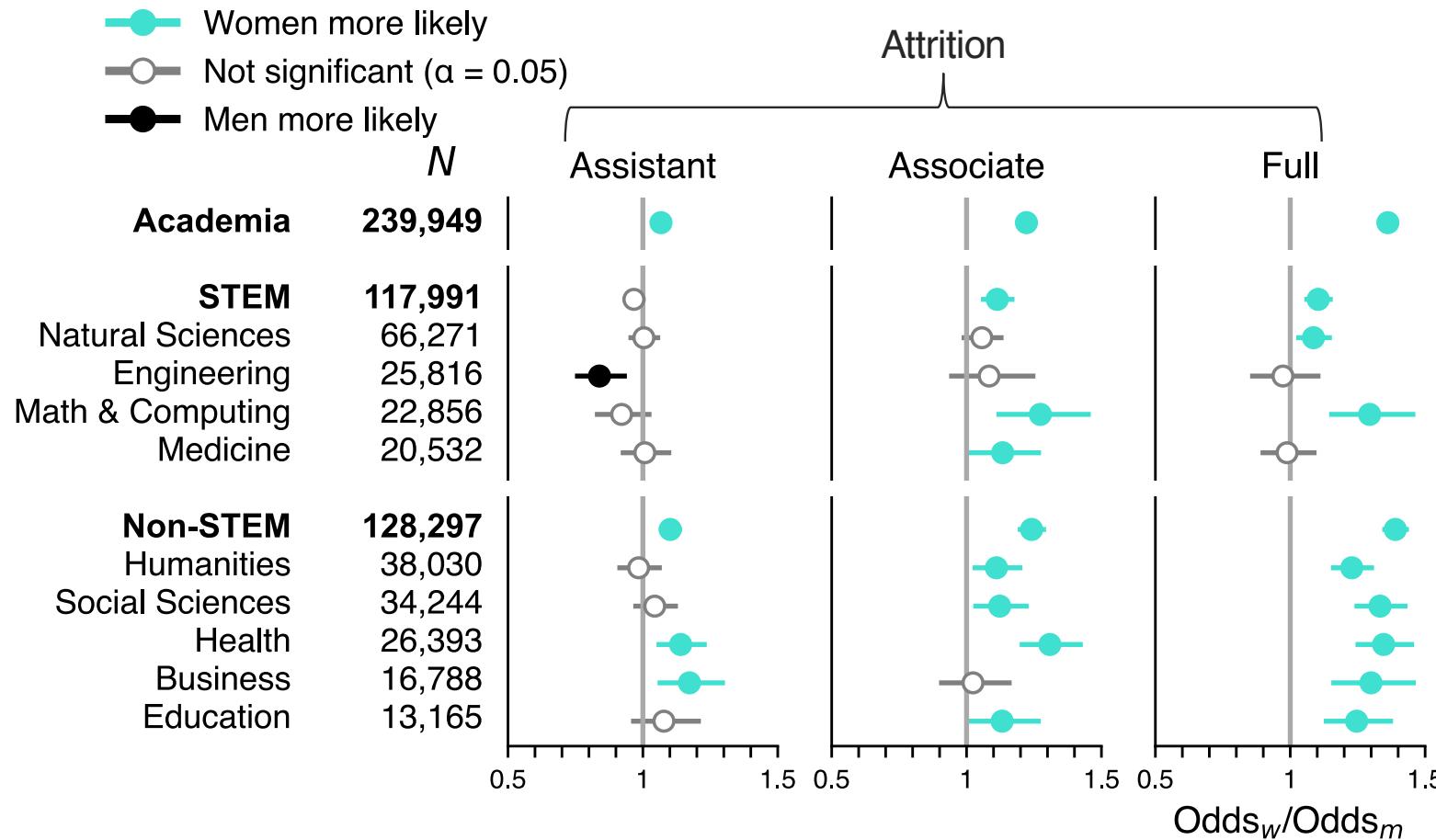


In contrast, women full profs in **every** non-STEM domain are more likely to leave than men

Gendered odds vary across career stage, domain and prestige

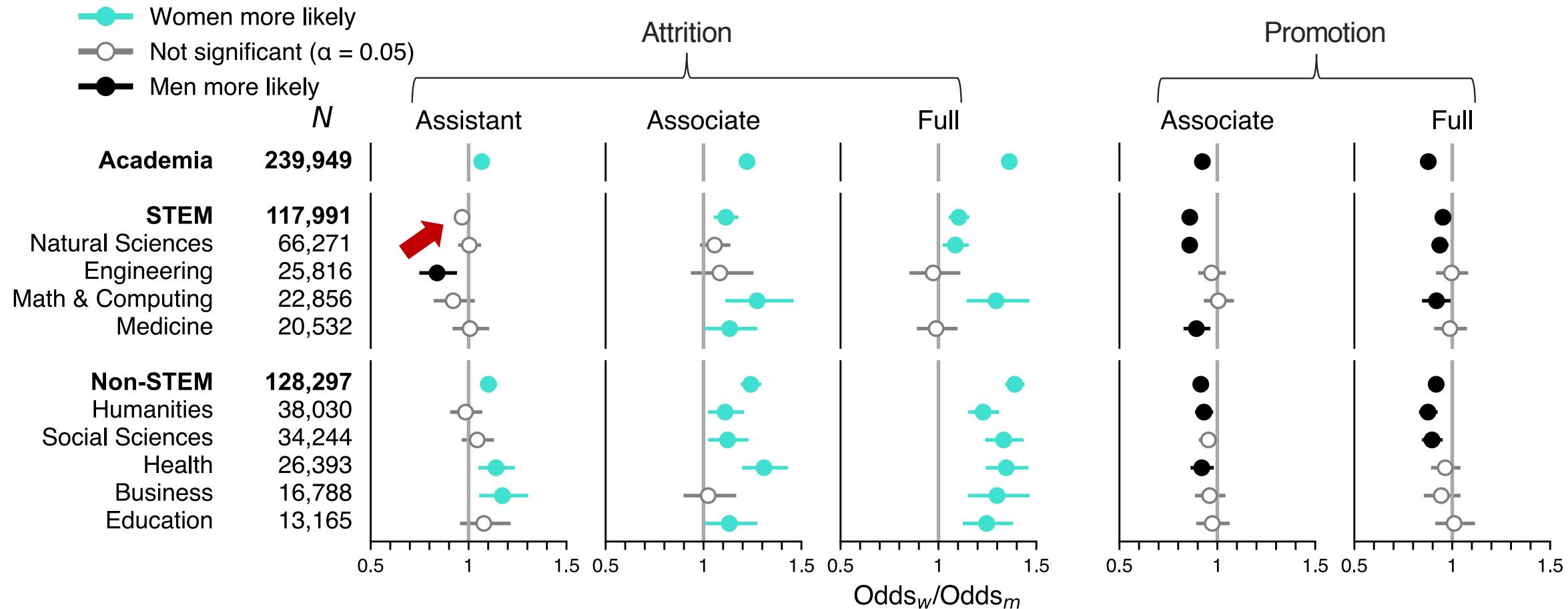


Gendered odds vary across career stage, domain and prestige



All of this variability helps explain the “contradictory” results in the literature! **Most studies are consistent, given their samples.**

Gendered odds vary across career stage, domain and prestige



These rates tell an important part of the story, but not the whole story. **Example: early-career STEM faculty!**

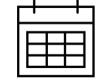
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Are retention rates gendered?

Part 2: Survey analysis

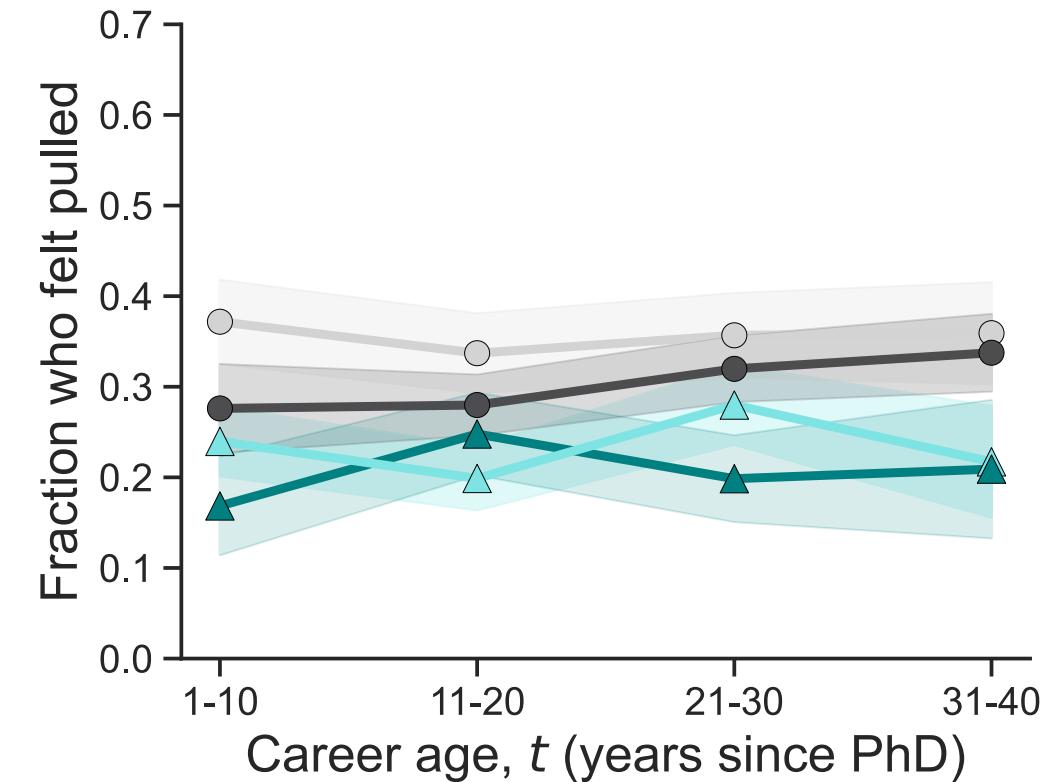
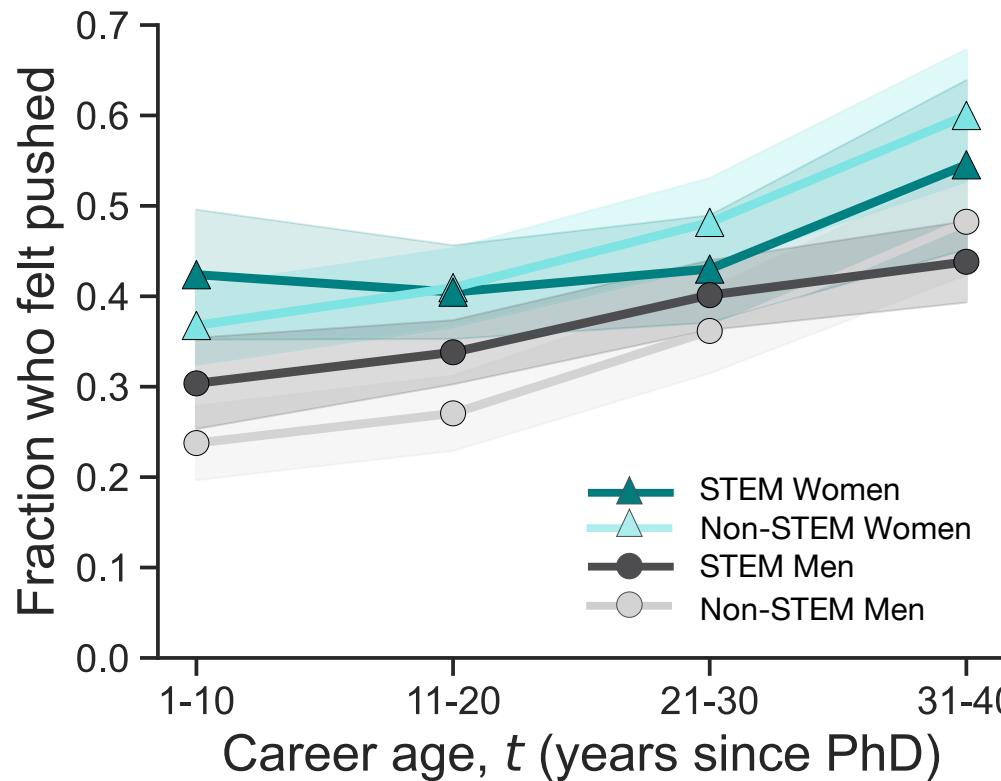
Are the reasons faculty leave gendered?

Survey Data

-  10,050 responses from current + former U.S. faculty, sampled from Part 1 dataset
-  325 U.S. institutions
-  25 academic fields
-  Fall 2021

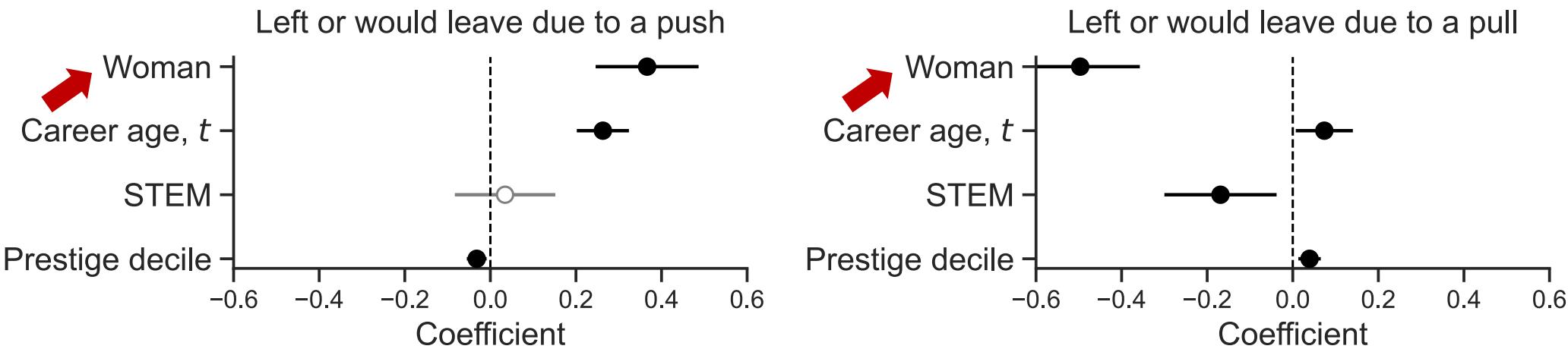
Which forces (push or pull) and what reasons, led or would lead faculty to leave their jobs?

1. Women and men leave in response to different forces



Both STEM & non-STEM women were more likely to feel pushed & less likely to feel pulled, than men, at every career age.

1. Women and men leave in response to different forces

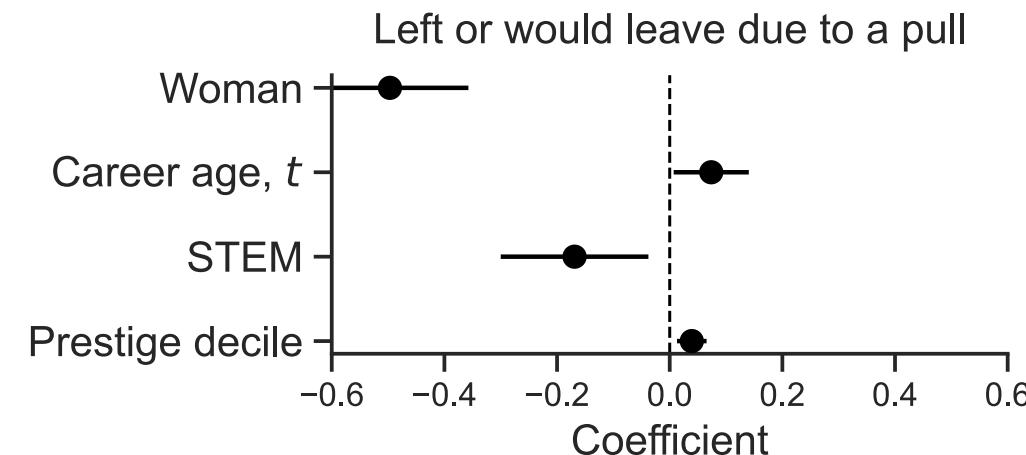
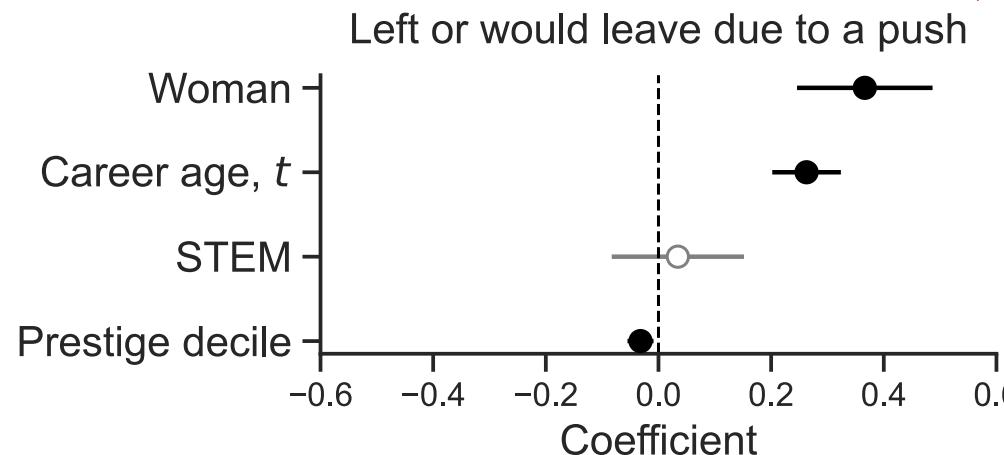


Gender was the **strongest predictor** of feeling pushed/pulled, out of gender, STEM & prestige, controlling for career age

Very few differences across domains

1. Women and men leave in response to different forces

What types of pushes?



Gender was the strongest predictor of feeling pushed/pulled, out of gender, STEM & prestige, controlling for career age

Very few differences across domains

2. Women and men leave for different reasons



Professional

Funding, admin. support, etc.



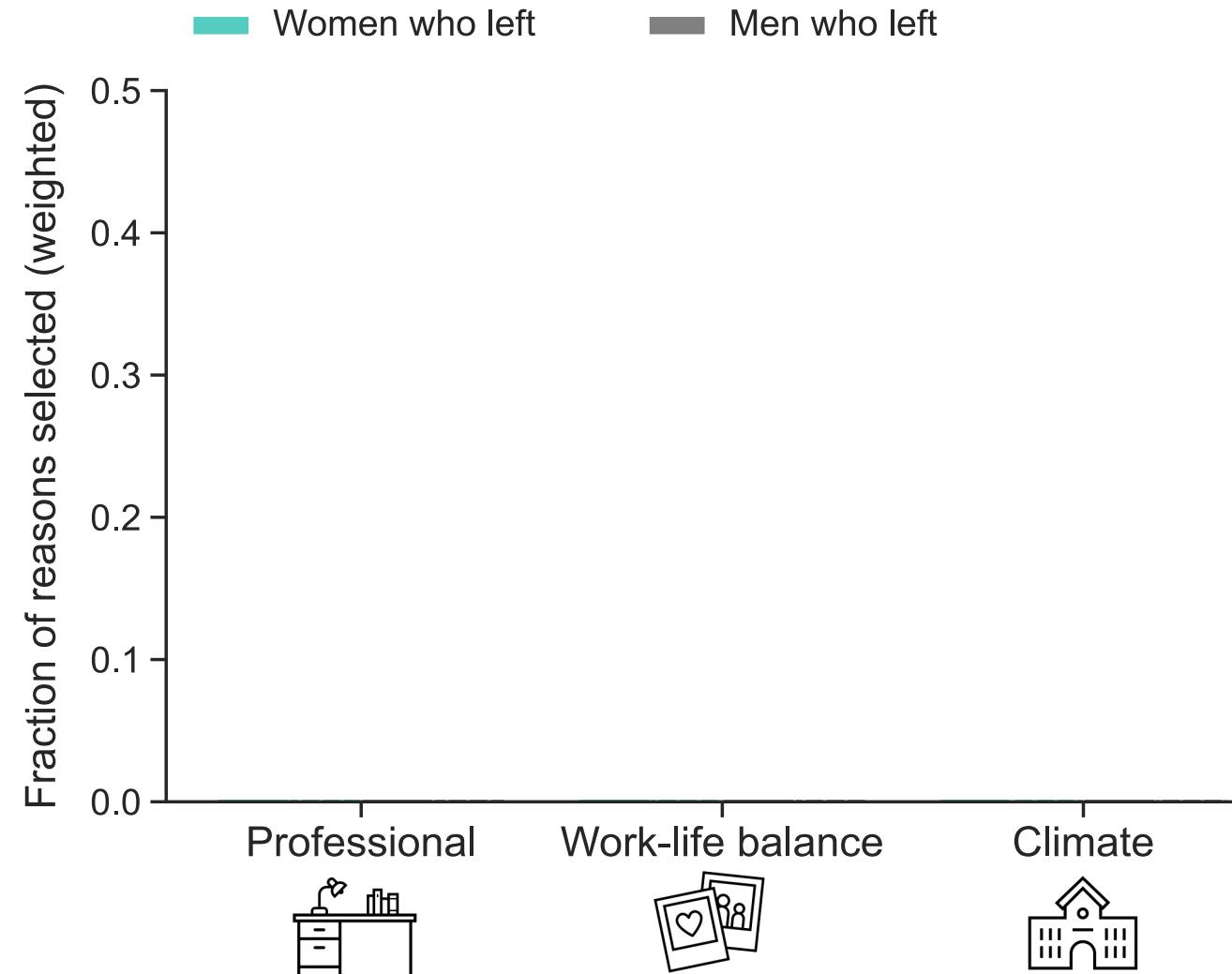
Work-life balance

Kids, hours, etc.



Workplace climate

Competition, not belonging,
etc.



2. Women and men leave for different reasons



Professional

Funding, admin. support, etc.



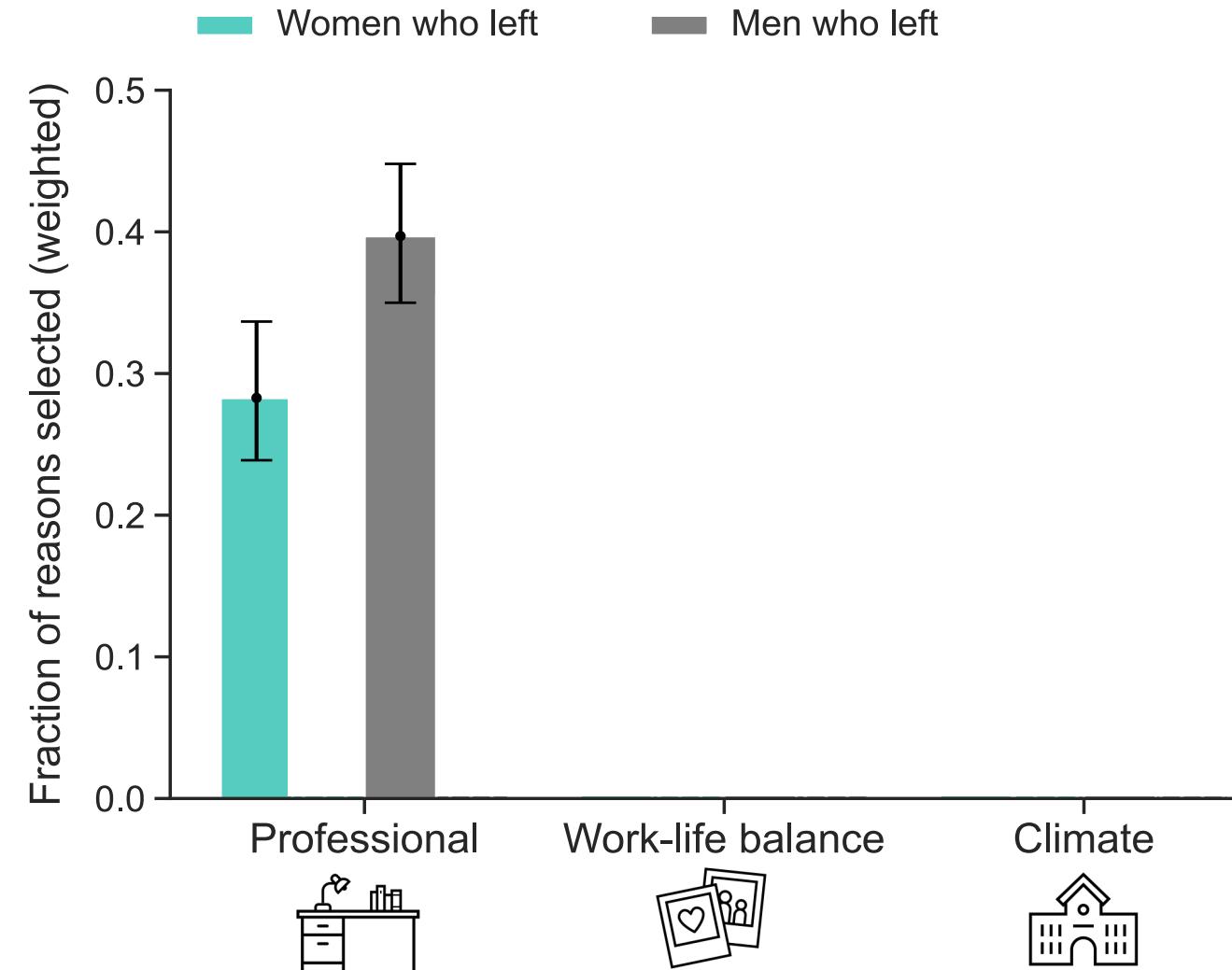
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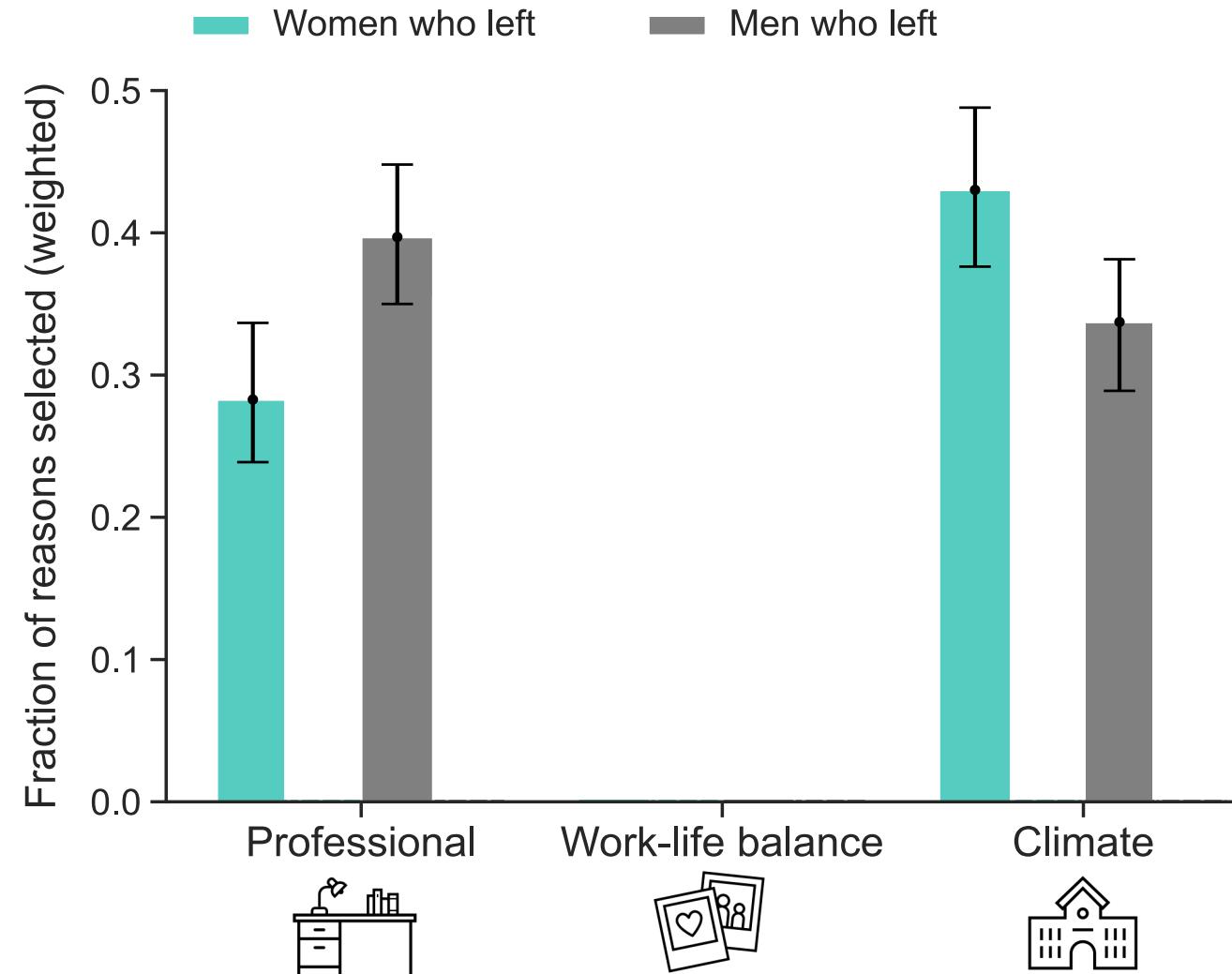
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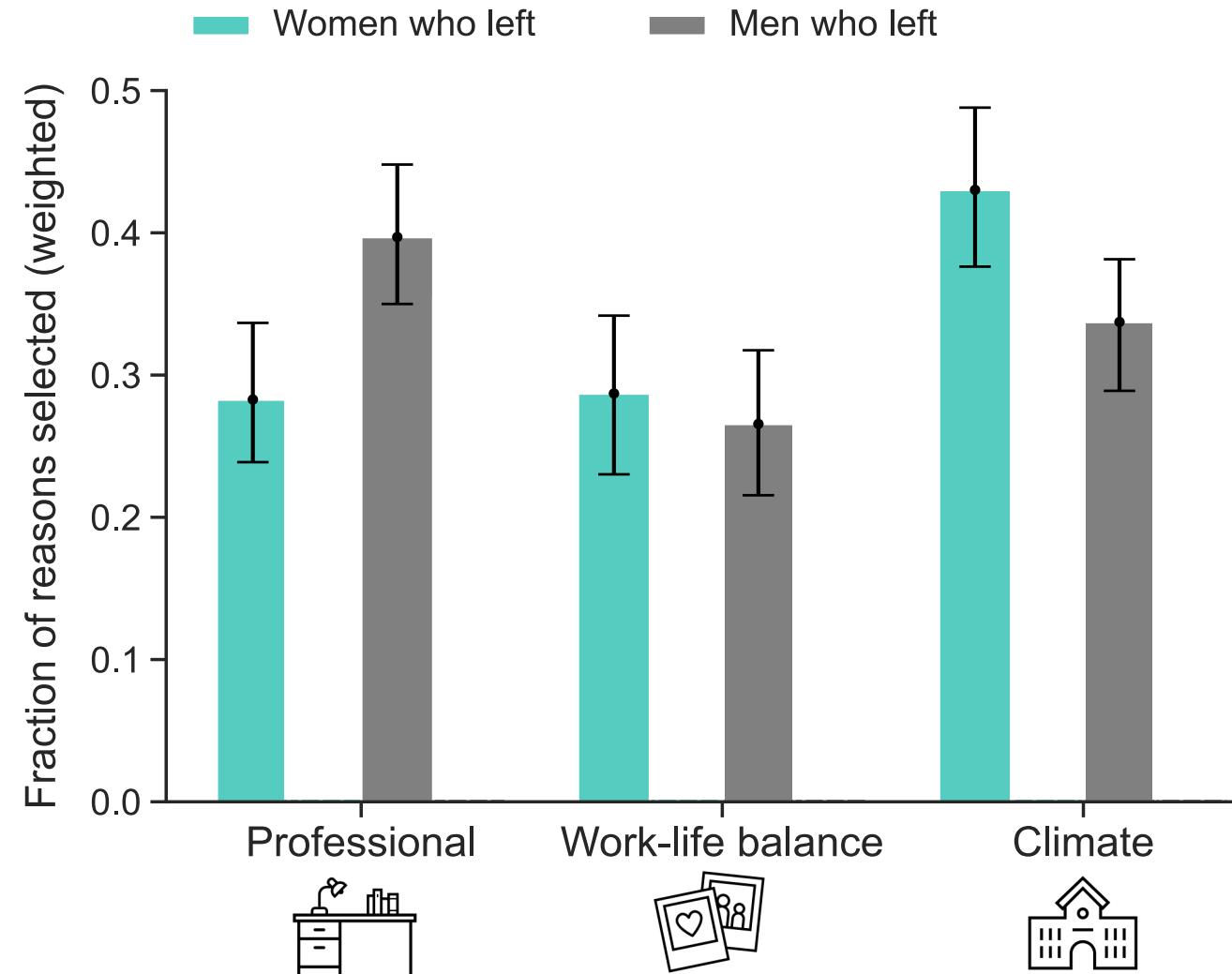
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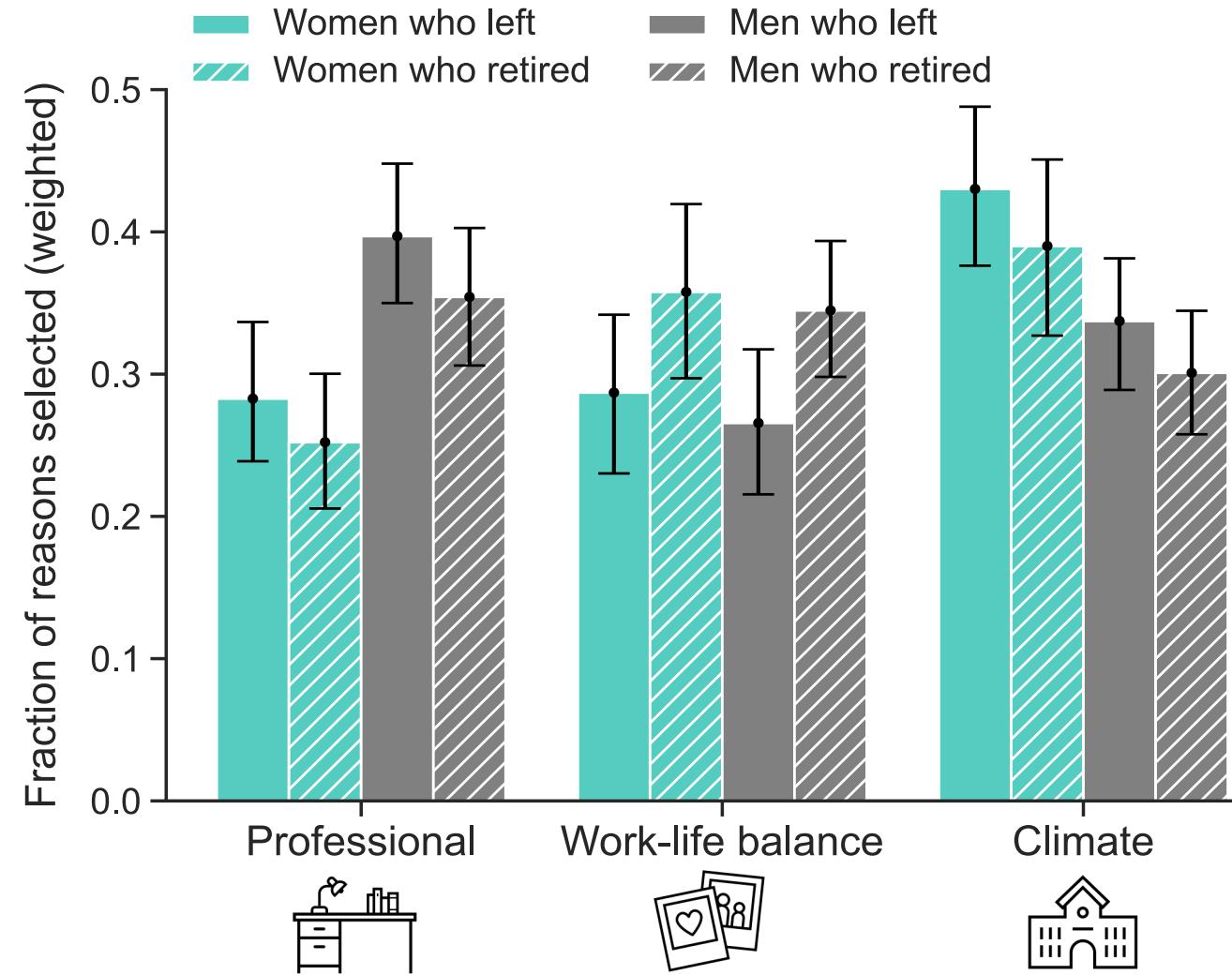
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3. Women and men consider leaving for different reasons



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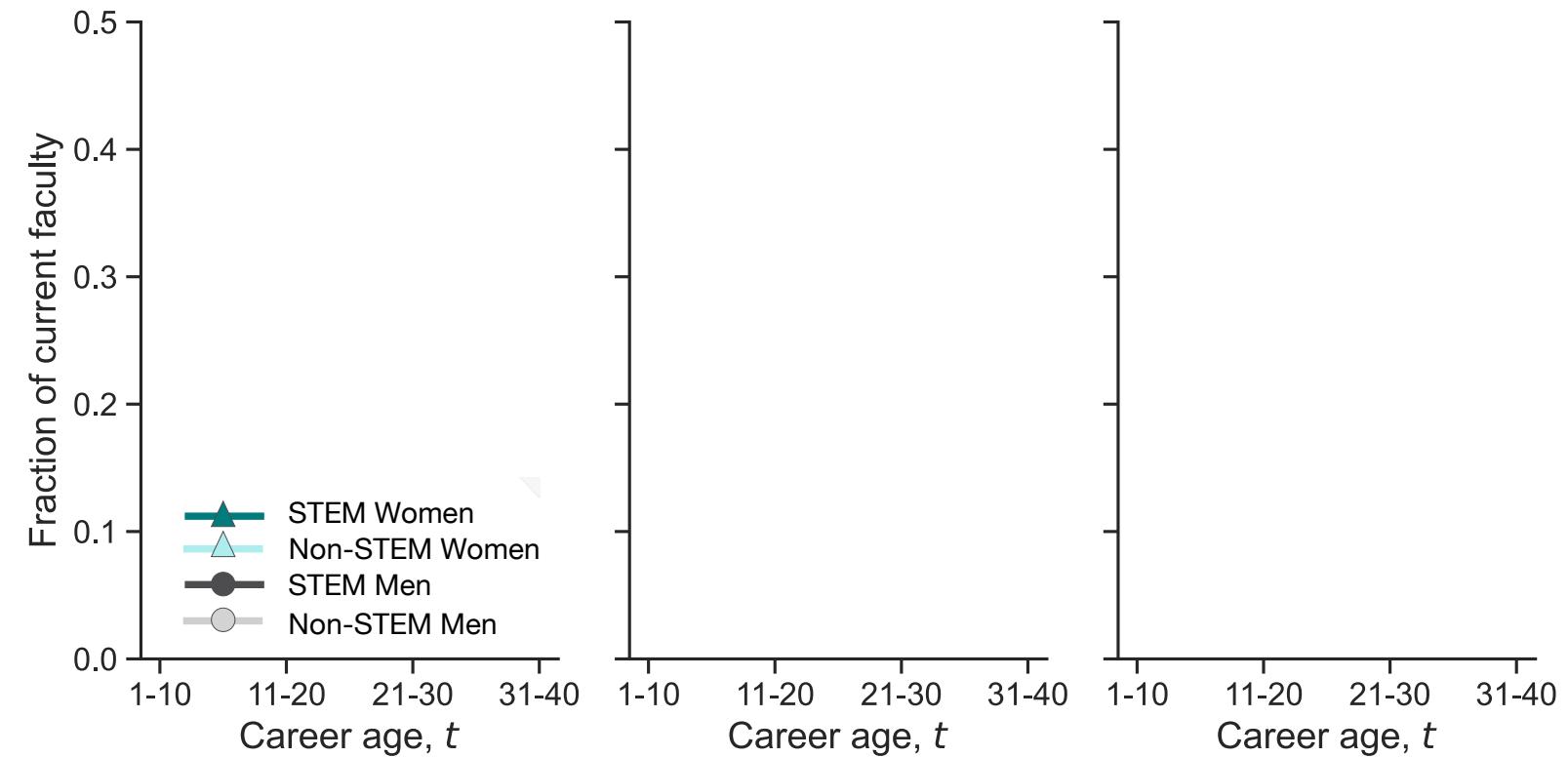
Professional



Work-life balance



Climate



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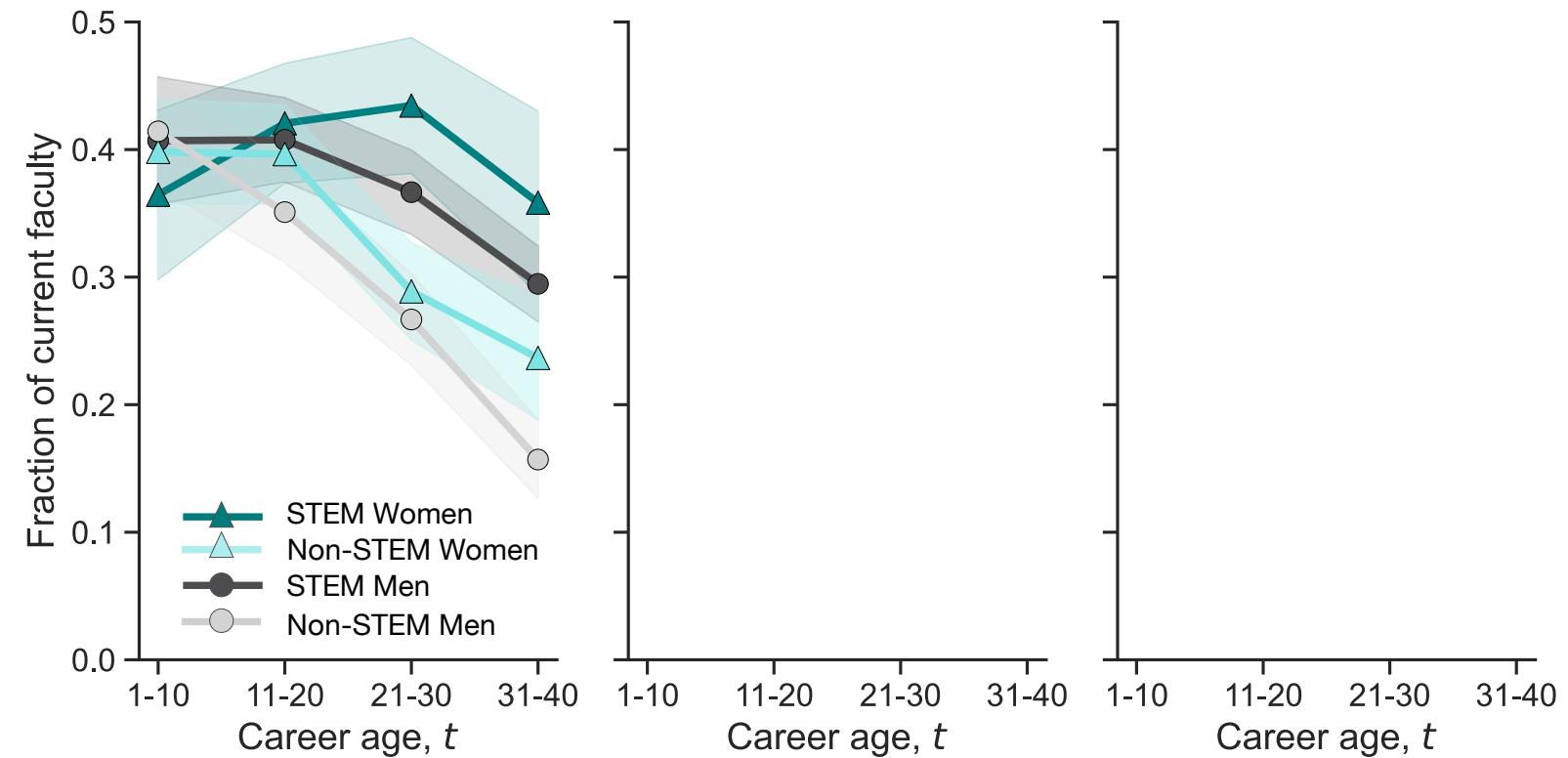
Professional



Work-life balance



Climate



Professional: higher for late-career STEM faculty, especially women in STEM

3. Women and men consider leaving for different reasons



Professional

Funding, admin. support, etc.



Work-life balance

Kids, hours, etc.



Workplace climate

Competition, not belonging, etc.



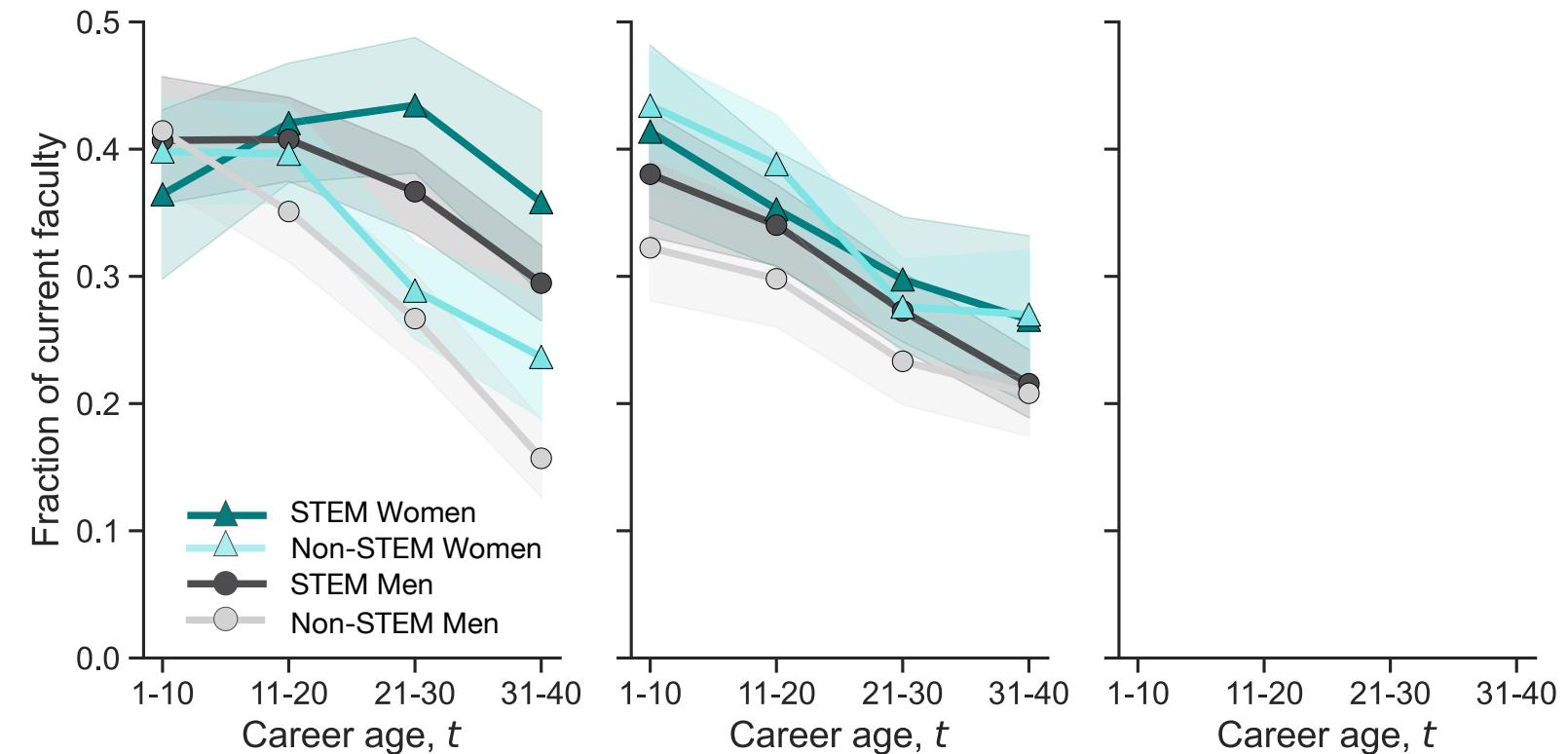
Professional



Work-life balance



Climate



Work-life balance: higher for all early-career faculty (especially women), falls sharply over time

3. Women and men consider leaving for different reasons



Professional

Funding, admin. support, etc.



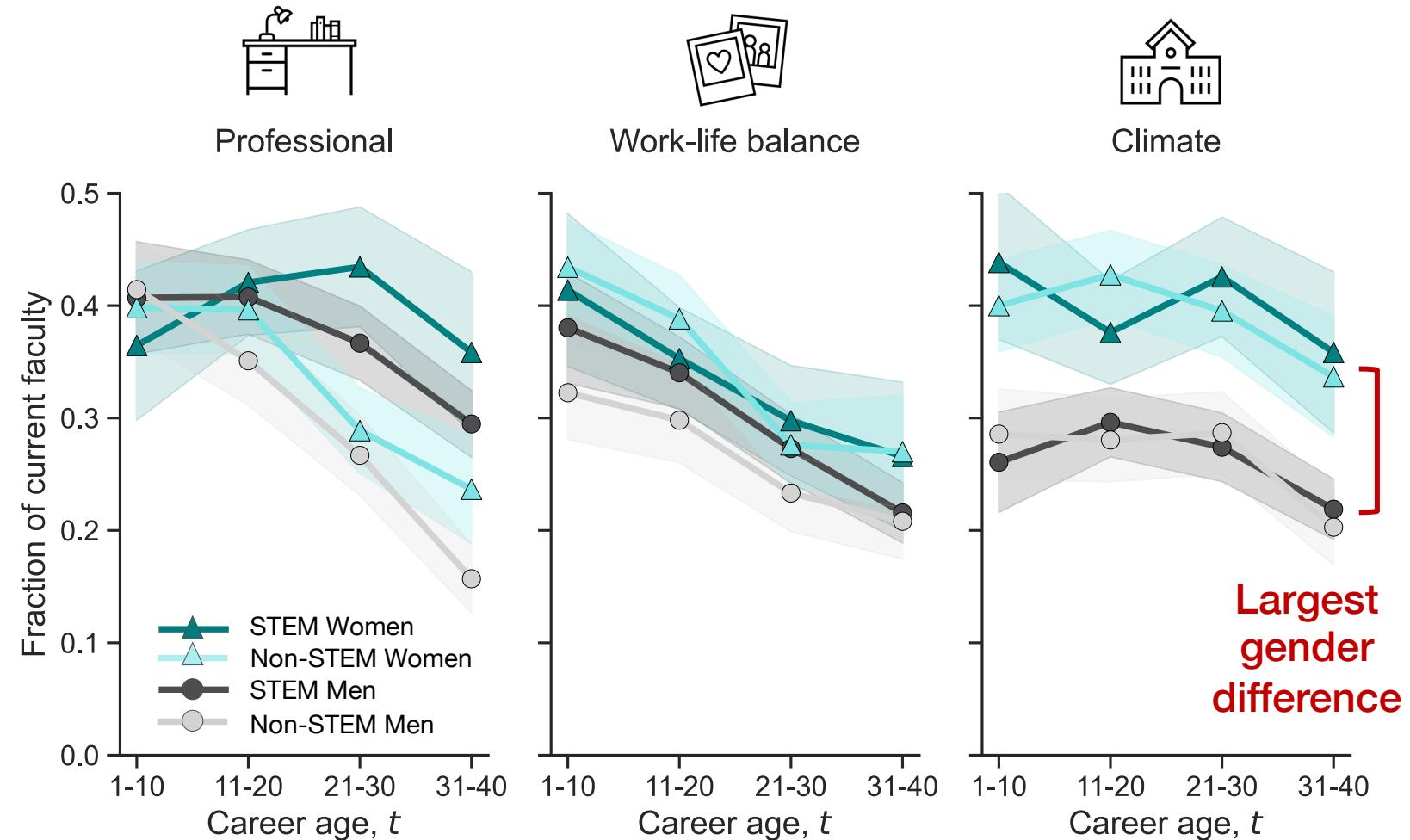
Work-life balance

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Workplace climate

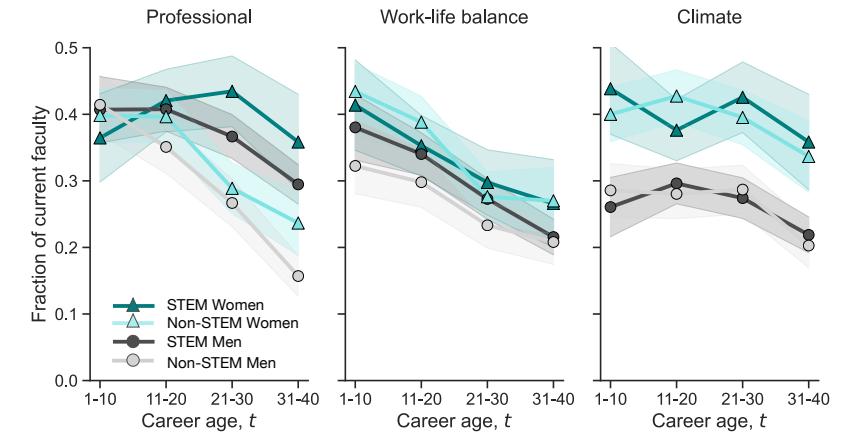
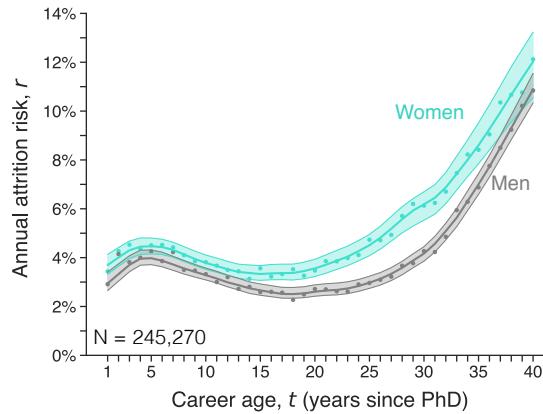
Competition, not belonging, etc.



Climate: consistently higher for women across an academic career

Implications

Part 1: Administrative analysis
Are retention rates gendered?



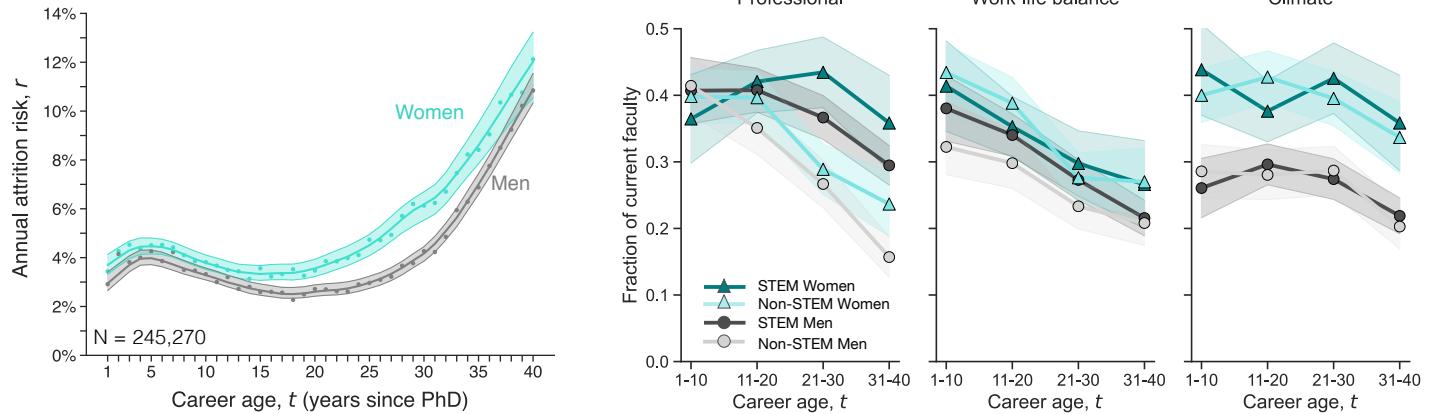
Part 2: Survey analysis
Are the reasons faculty leave gendered?

Implications

Part 1: Administrative analysis
Are *retention rates* gendered?

- **Women are more likely to leave & less likely to be promoted than men**
- **BUT women who are tenured, in non-STEM fields, or at lower-prestige institutions are at highest risk**

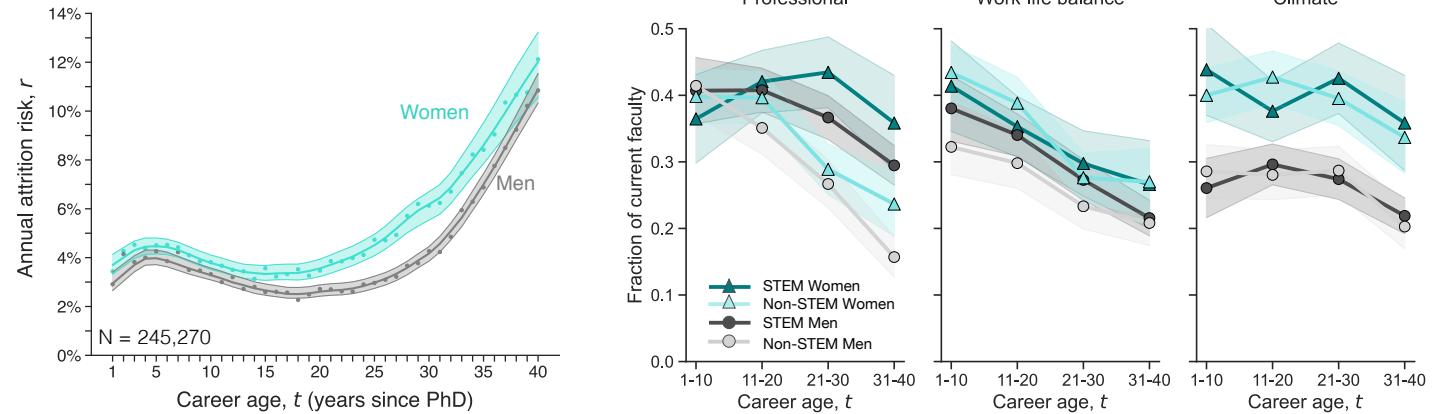
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- Women are more likely to leave & consider leaving due to workplace climate
- BUT this doesn't mean we should ignore work-life balance

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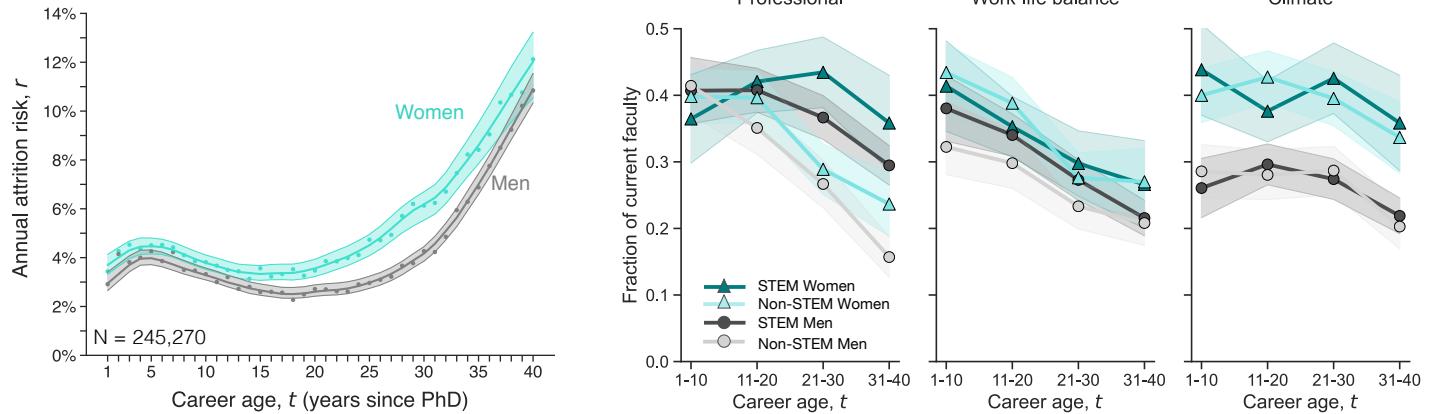
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Takeaway: Even for subpopulations with no visible gender gap in retention, women still leave for different reasons than men, so we should focus on reasons, not just rates, to improve gender equity

→ let's ask & listen to historically excluded academics, and address the specific reasons they bring up



A final note on the value of people's stories

- **Ongoing qualitative follow-up study:** 7000 free-text responses about policy recommendations that would have improved their retention
- Very preliminary, but overwhelmingly, women & gender-diverse faculty feel systemically devalued in academia → **It's about climate.**
- These stories are not “just anecdotes”.

Thanks!

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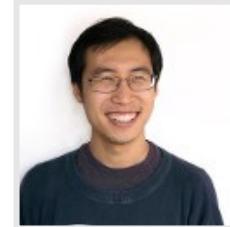
 @thekatiespoon



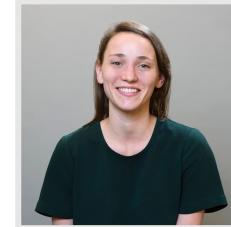
Nick LaBerge



Hunter Wapman



Sam Zhang



Allie Morgan



Joanna Mendi



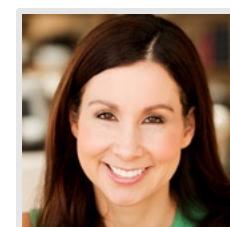
Maria Martinez



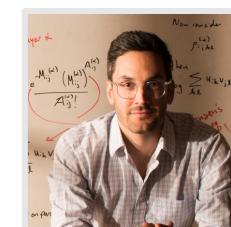
Mirta Galesic



Bailey Fosdick



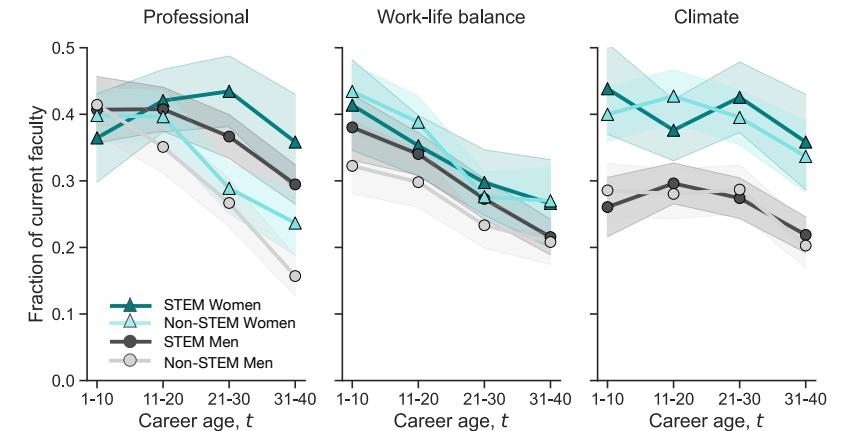
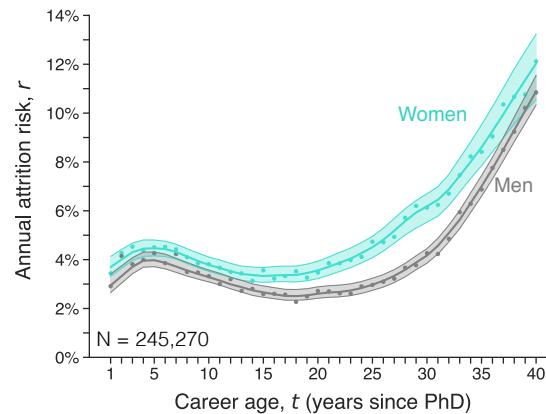
Lauren Rivera



Dan Larremore



Aaron Clauset



& all of our survey respondents for their valuable time



University of Colorado **Boulder**



Paper under review
Preprint out!