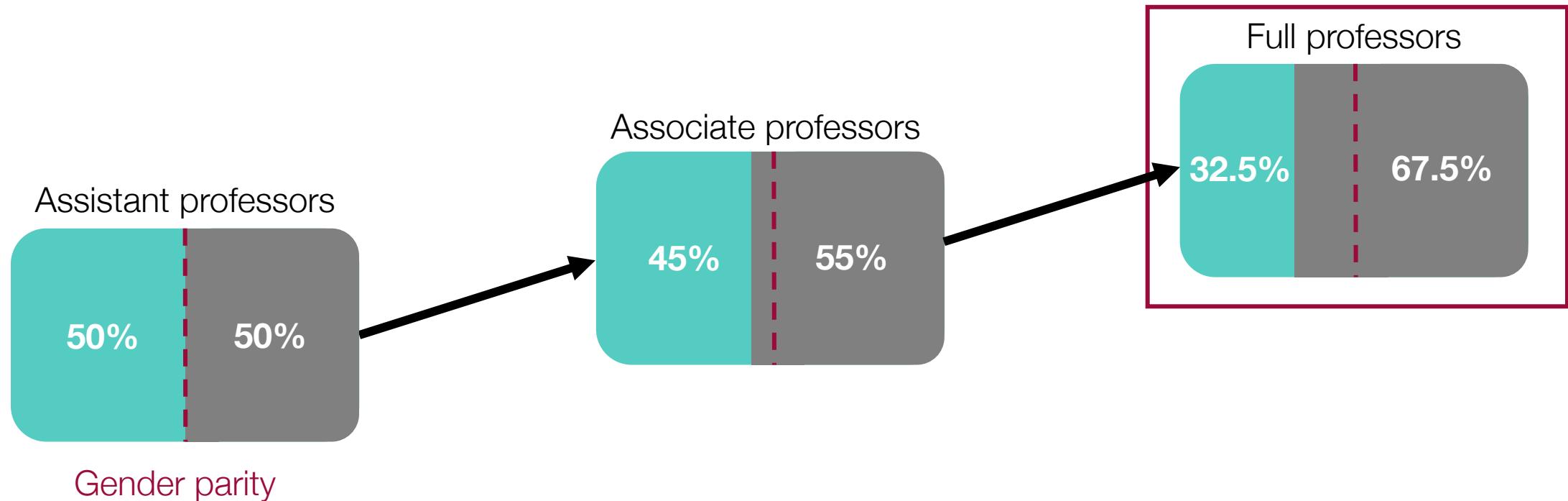


# Gender and retention patterns among U.S. faculty

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

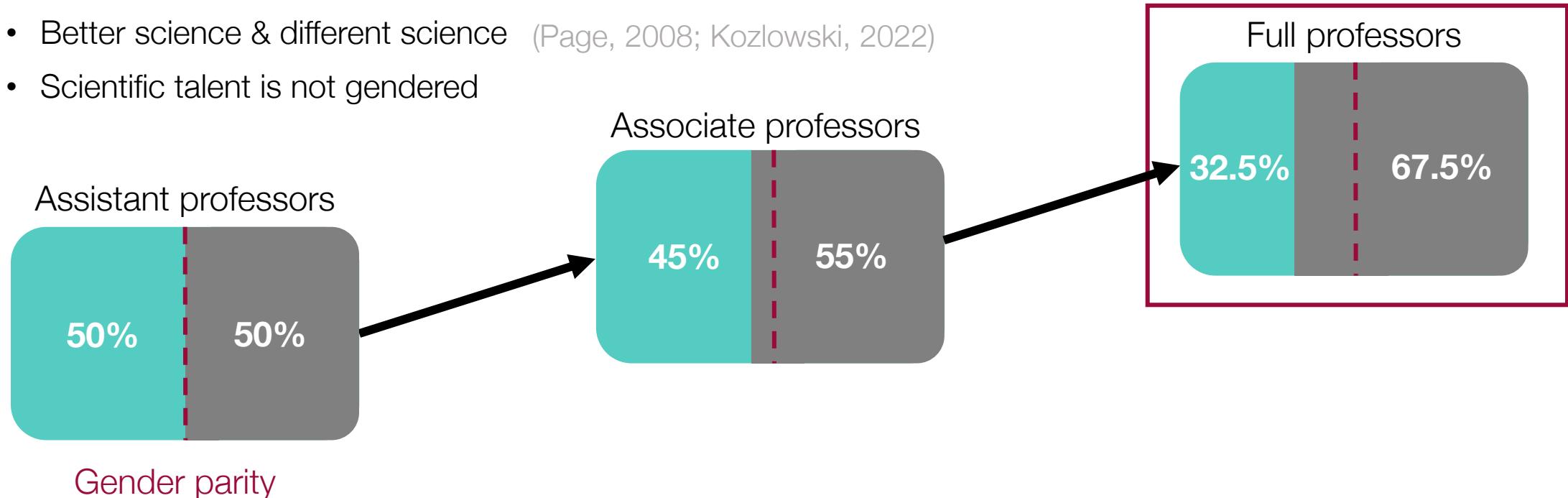
# Women are still underrepresented in academia.



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## Importance:

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



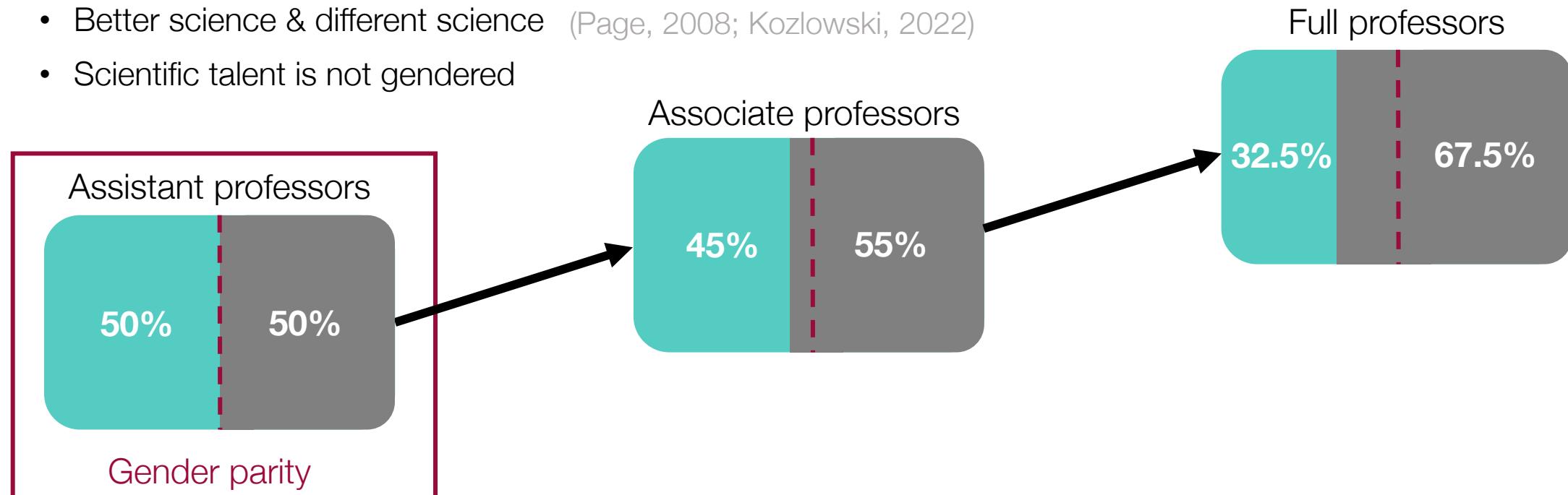
**aaup**  
AMERICAN ASSOCIATION OF  
UNIVERSITY PROFESSORS  
(2020)

**Women**  
**Men**

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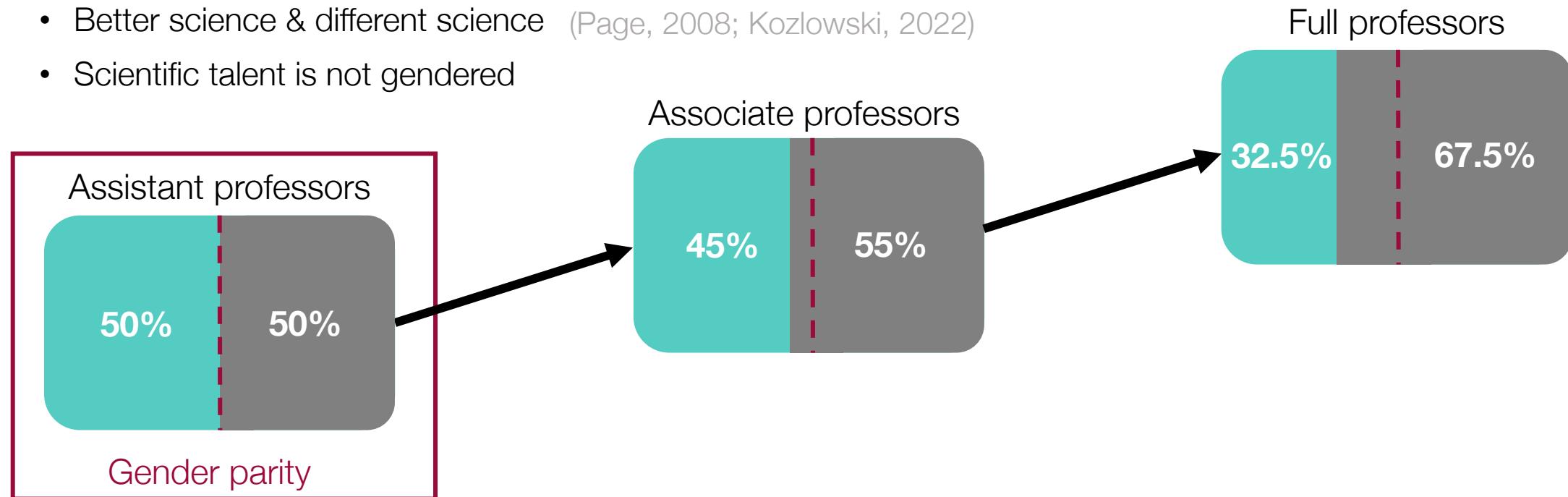
Gender parity in ***hiring*** will not lead to gender parity in ***representation*** if women disproportionately leave the system (the “leaky pipeline”) (Pell, 1996)



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gendered retention

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

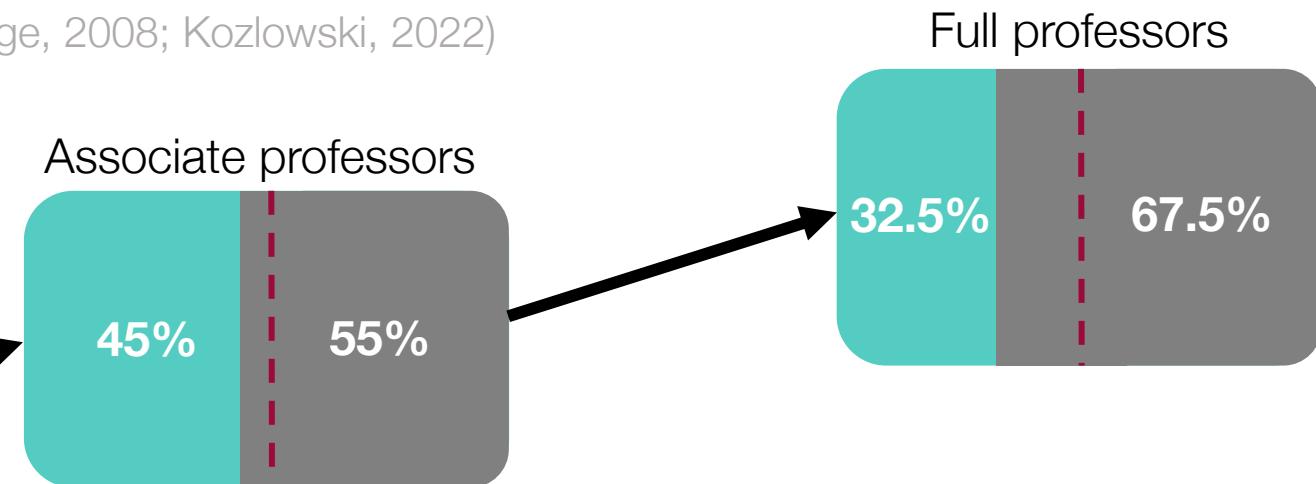
S.E. Page, The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies. Princeton University Press (2008).

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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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# 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 in the search bar. The results section shows a blue icon for "Articles" and the text "About 163,000 results (0.09 sec)". A red box highlights the result count. To the right of the result count are three red exclamation marks (!!!).

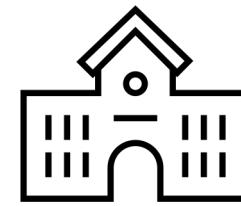
Focused mostly on:



Assistant profs



STEM



High-prestige  
schools

Literature is deep, but narrow and contradictory

# Literature is deep, but narrow and contradictory

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 Ceci<sup>1</sup>, Donna K Ginther<sup>2</sup>, Shulamit Kahn<sup>3</sup>, Wendy M Williams<sup>4</sup>

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- Most studies are done at a **single institution or small group of institutions**
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# Literature is deep, but narrow and contradictory

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



## Professional

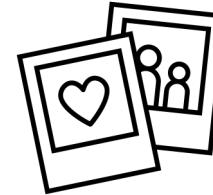
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- Admin. support

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- Admin. support

## Work-life balance

- Caring responsibilities
- Long hours

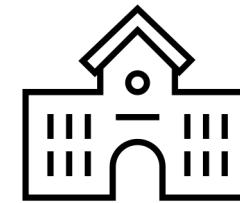
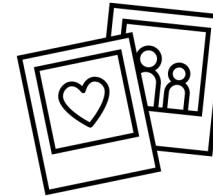
→ Most common

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- Not belonging

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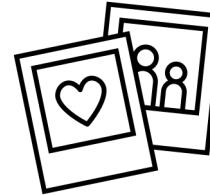
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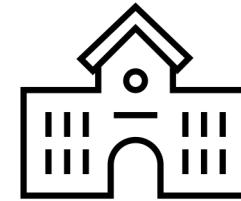
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**We need a system-level, comprehensive view of academic retention to resolve the conflicting evidence.**

Part 1: Administrative analysis

*Are retention rates gendered?*

Part 2: Survey analysis

*Are the reasons faculty leave gendered?*

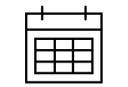
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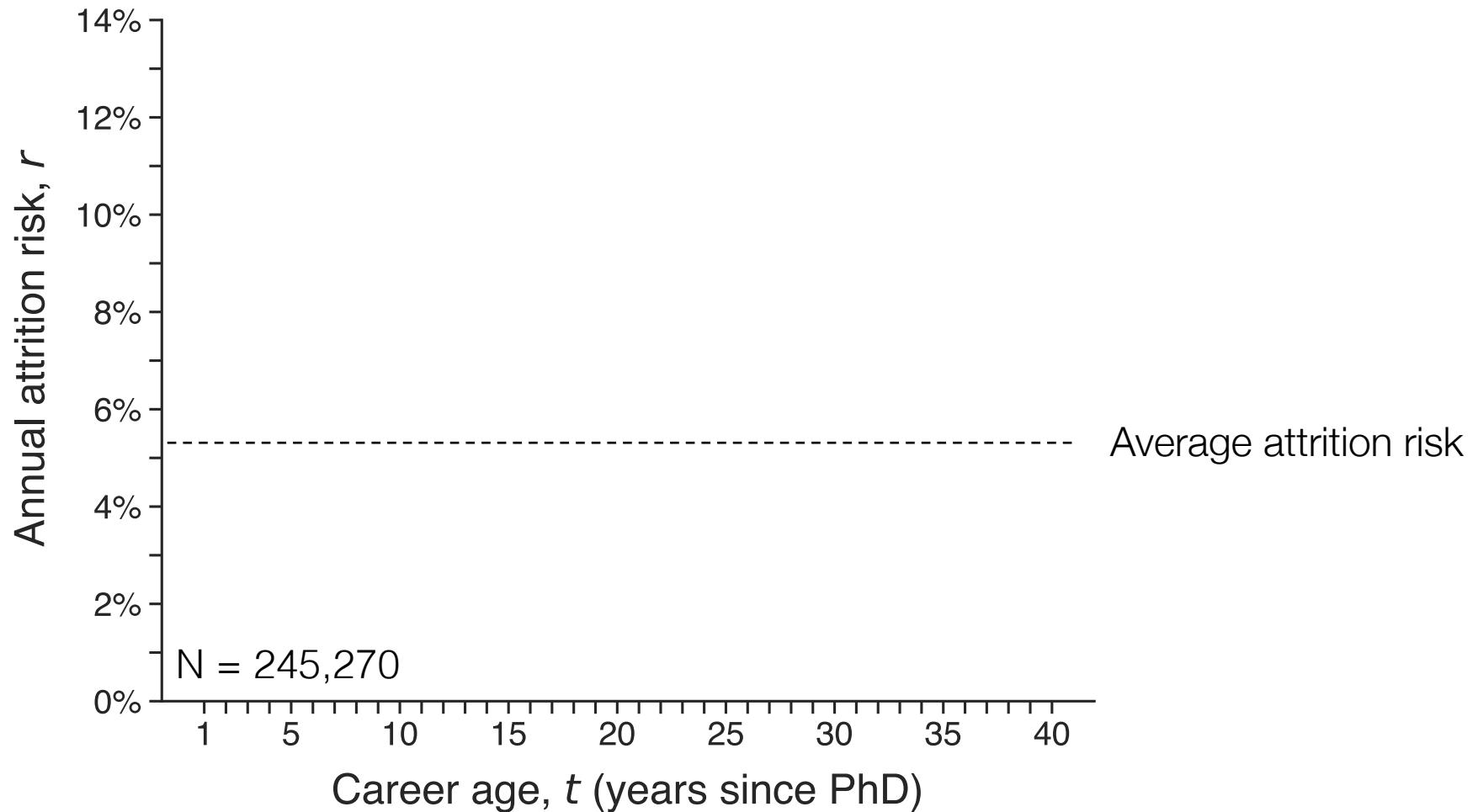
*Are the reasons faculty leave gendered?*

# Longitudinal Data

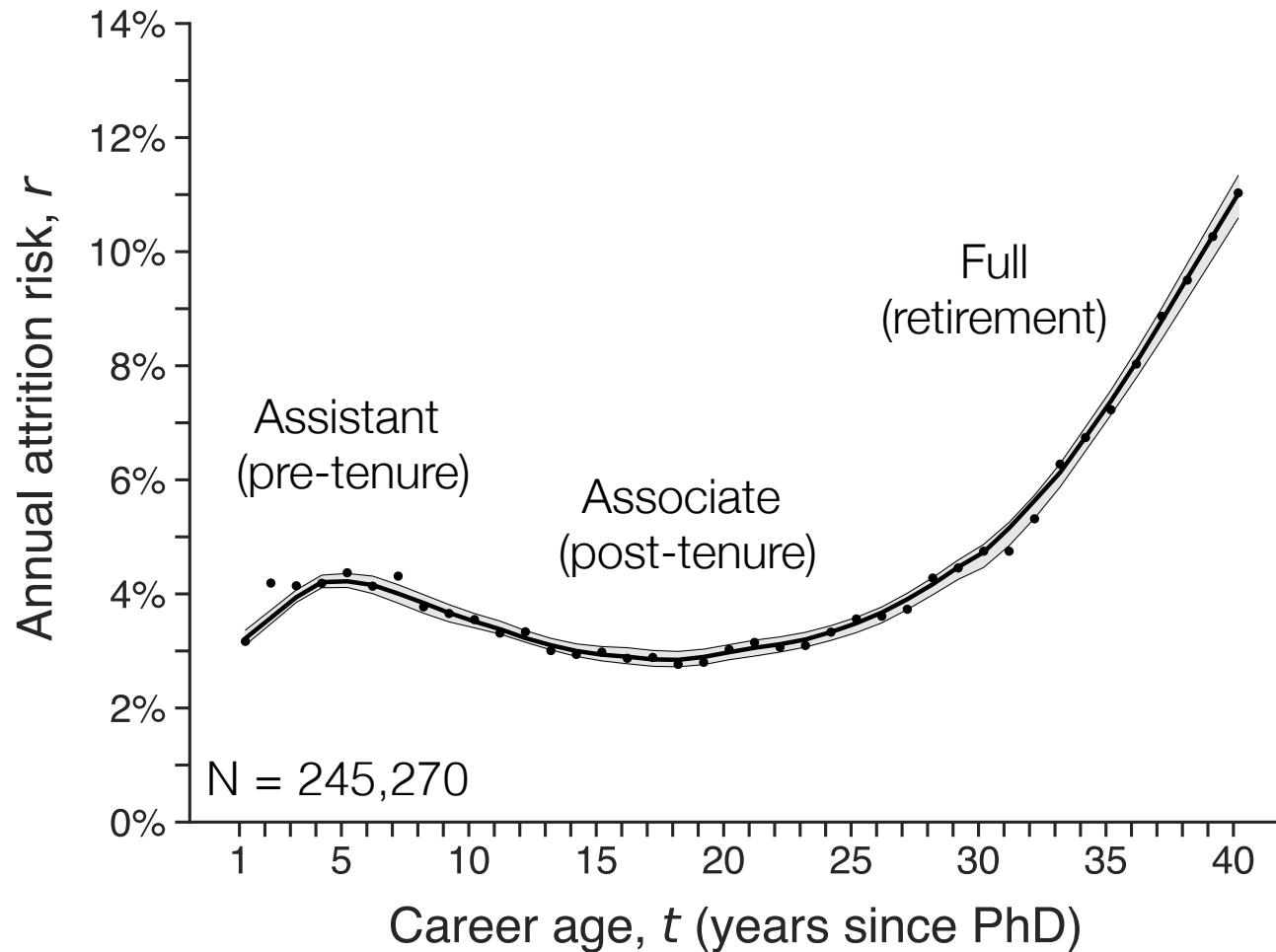
-  245,270 U.S. tenure-track & tenured faculty
-  391 U.S. PhD-granting institutions
-  111 academic fields, grouped into 9 high-level domains
-  10 years, 2011-2020

From Academic Analytics Research Center **AARC**

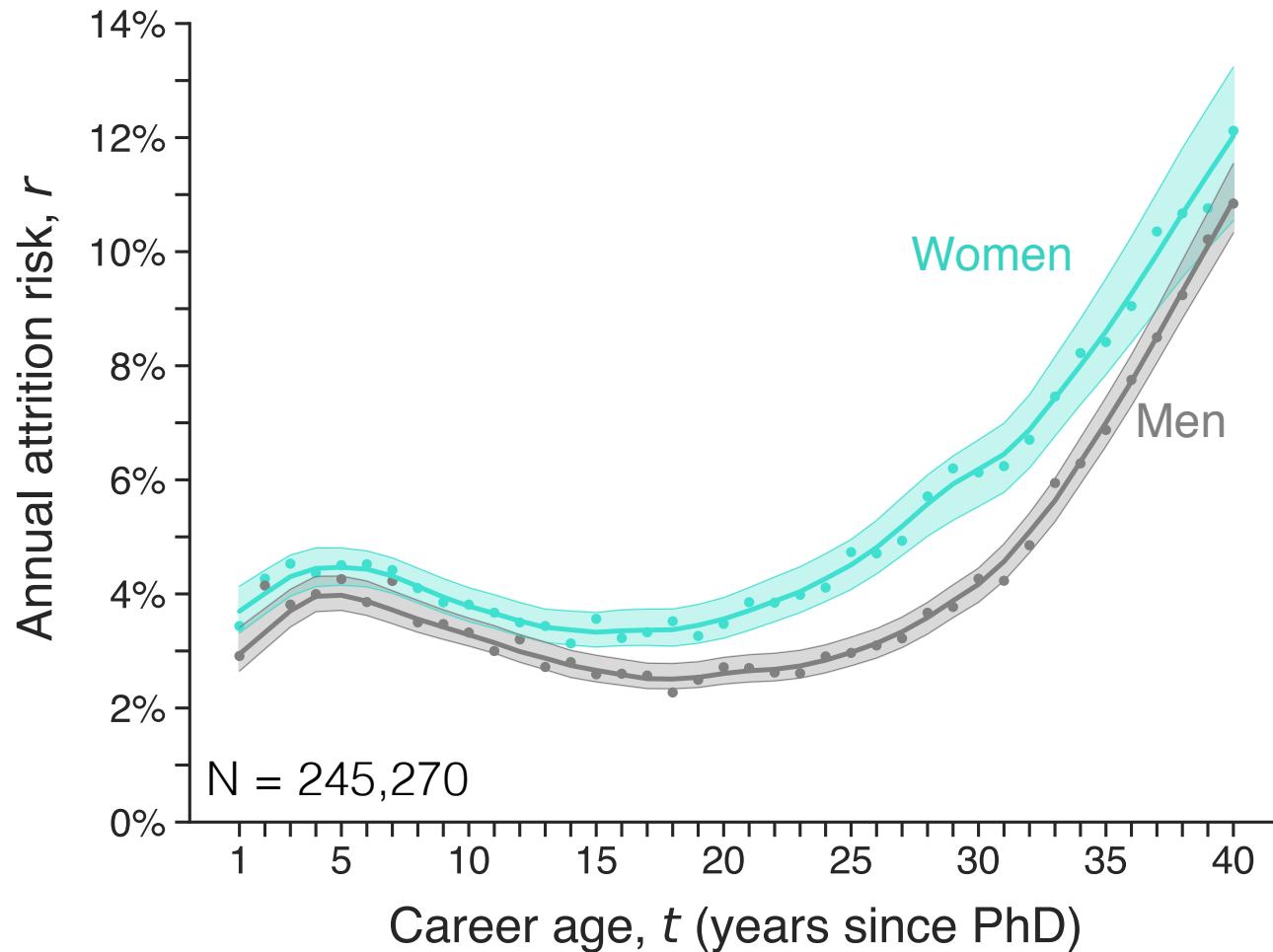
# What is an academic's risk of leaving across their career?



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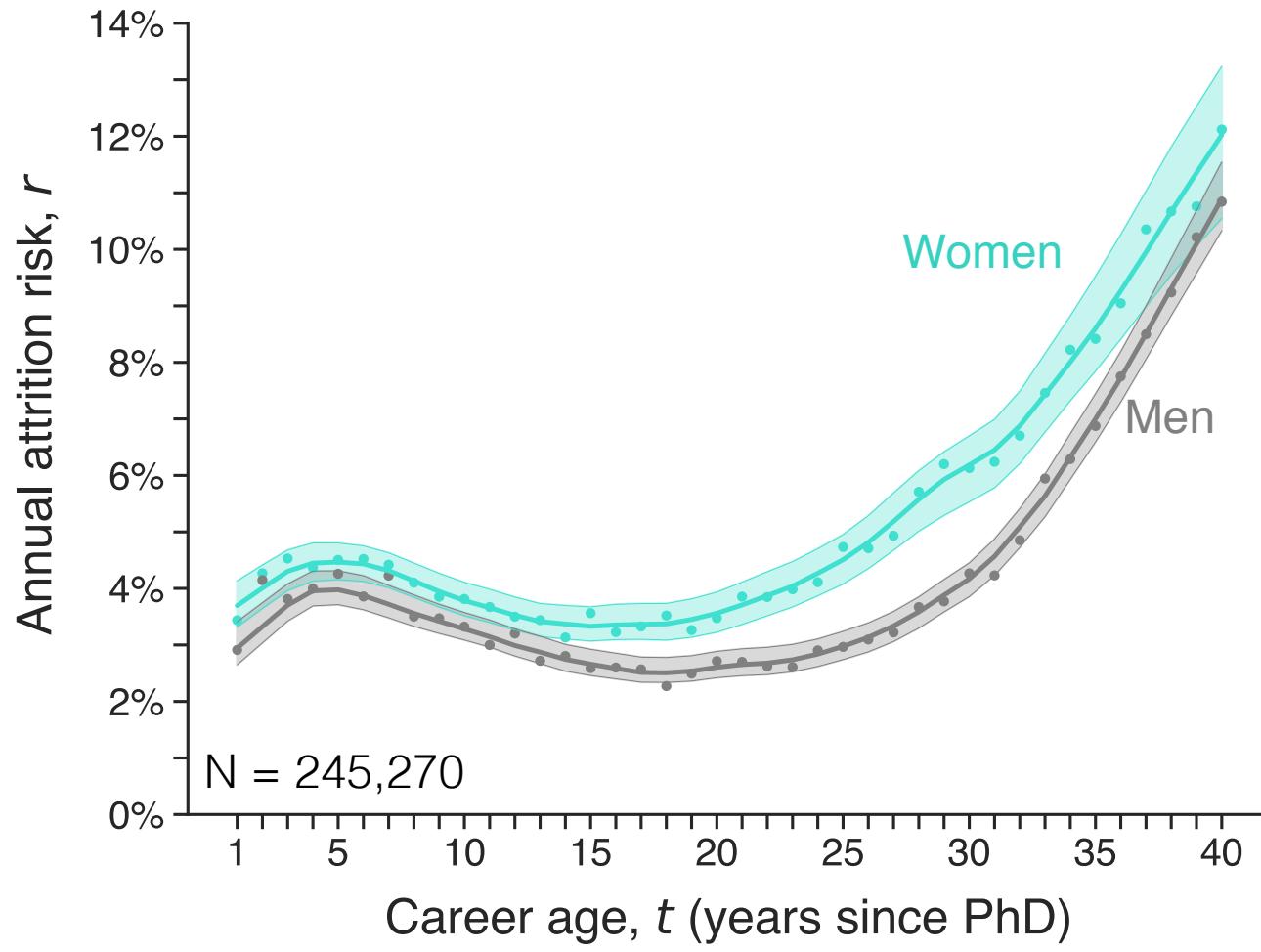


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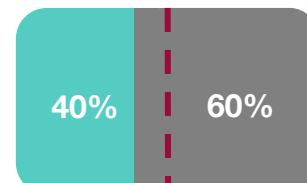
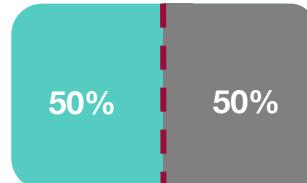


Women are more likely to leave their jobs than men at every career age.

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

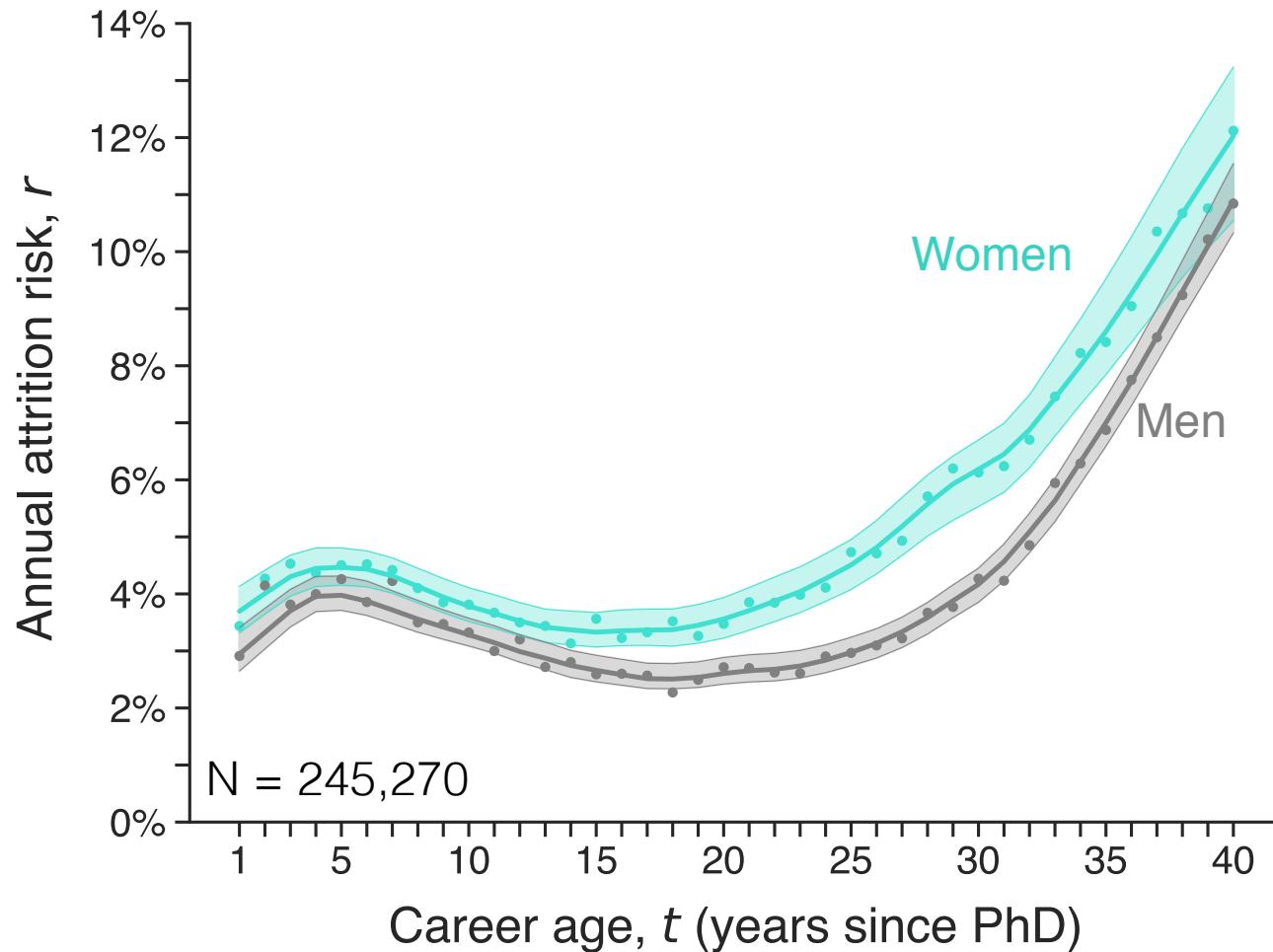


Hired at parity



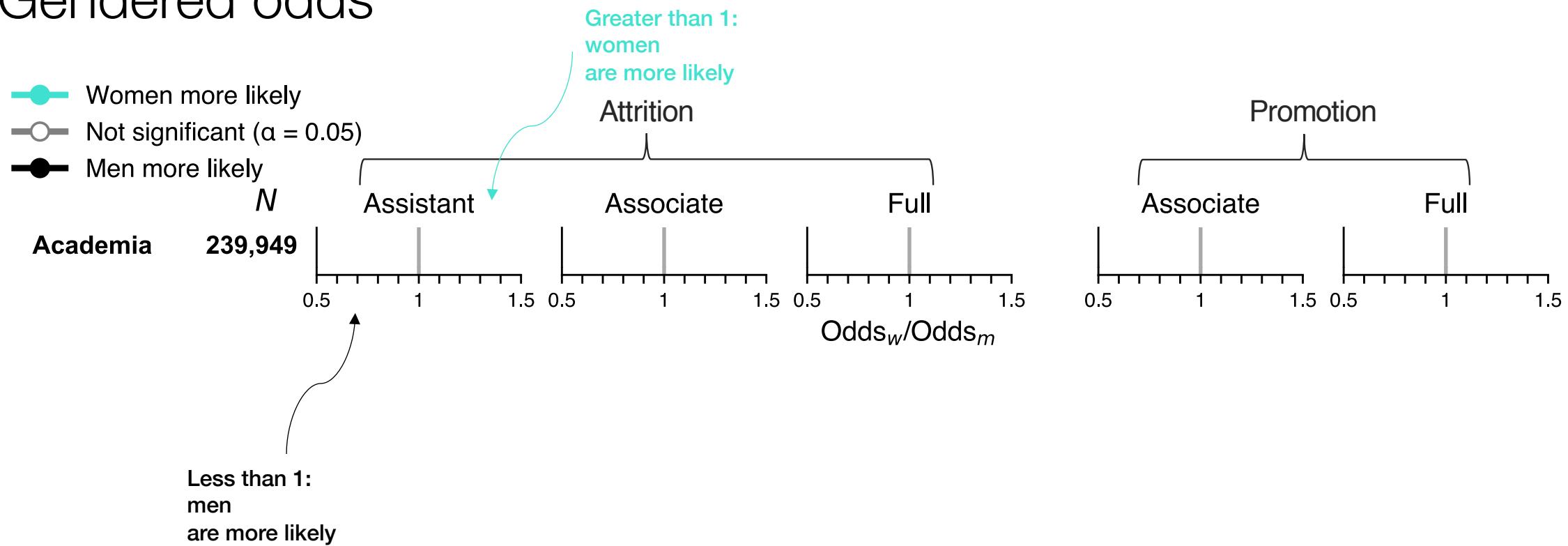
An additional loss of  
**1 in every 5** women  
over a career

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



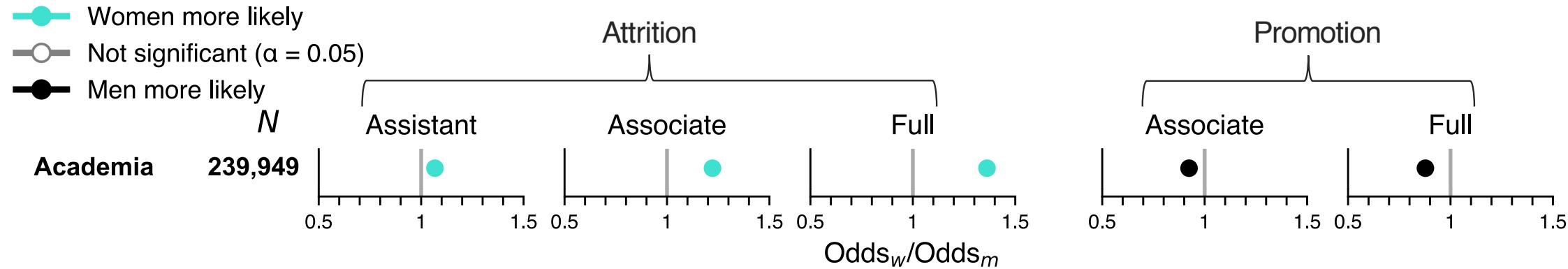
We are averaging across people with different training & environments –  
are any of these factors influencing the gendered pattern we see?

# Gendered odds



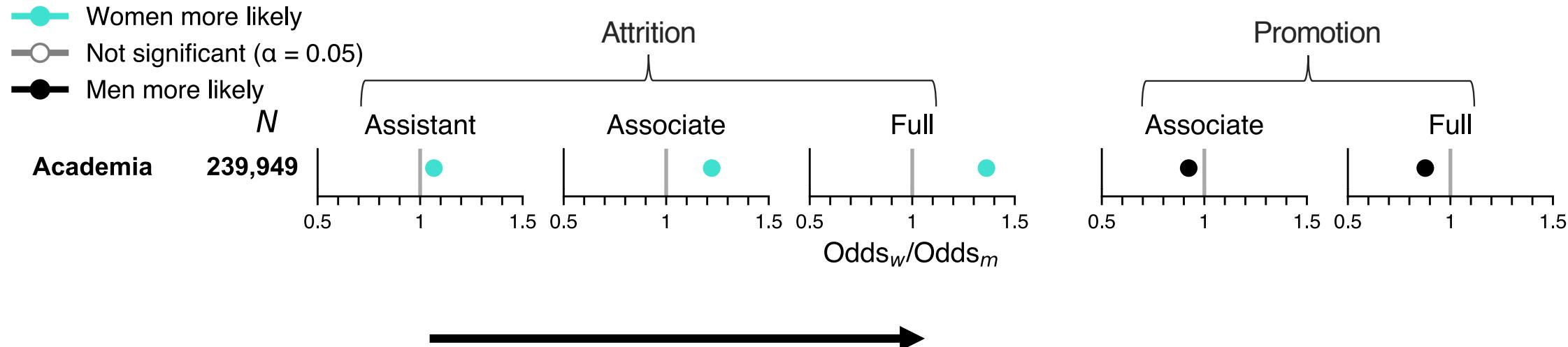
Adjusting for career age, employer prestige, and PhD training...

# 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.

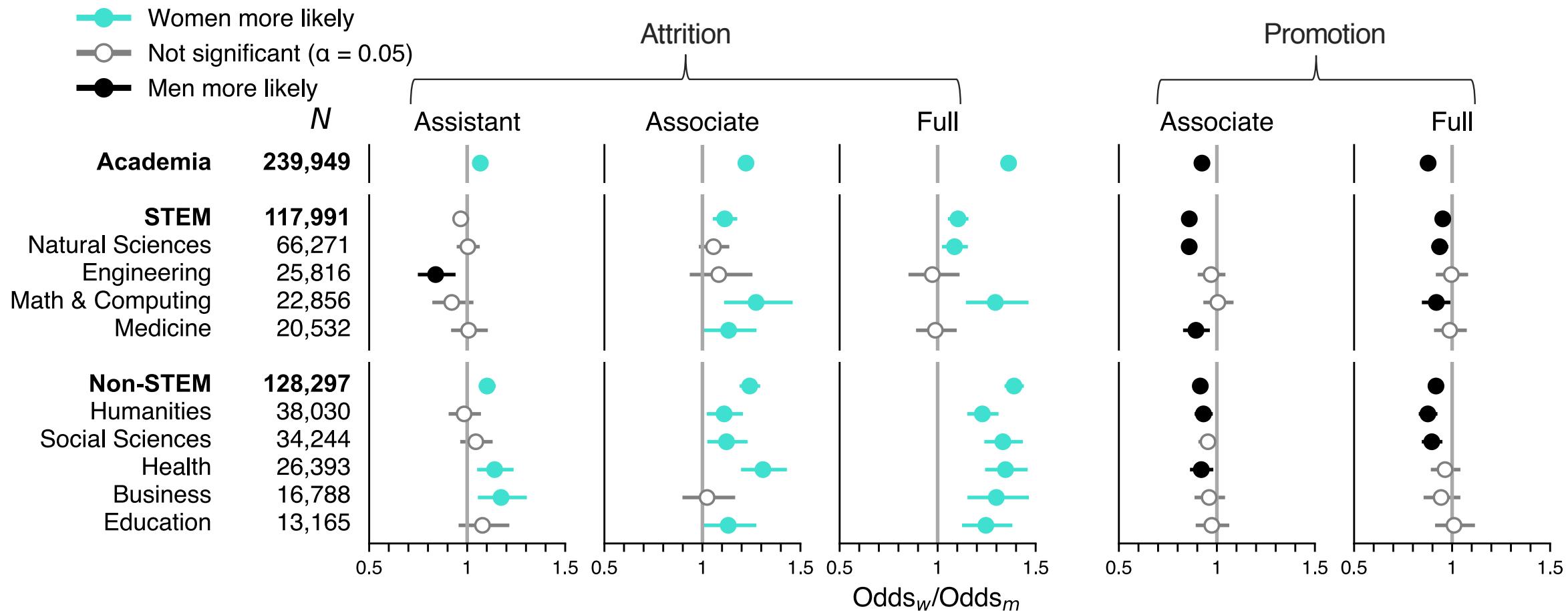
# Gendered odds vary across career stage



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

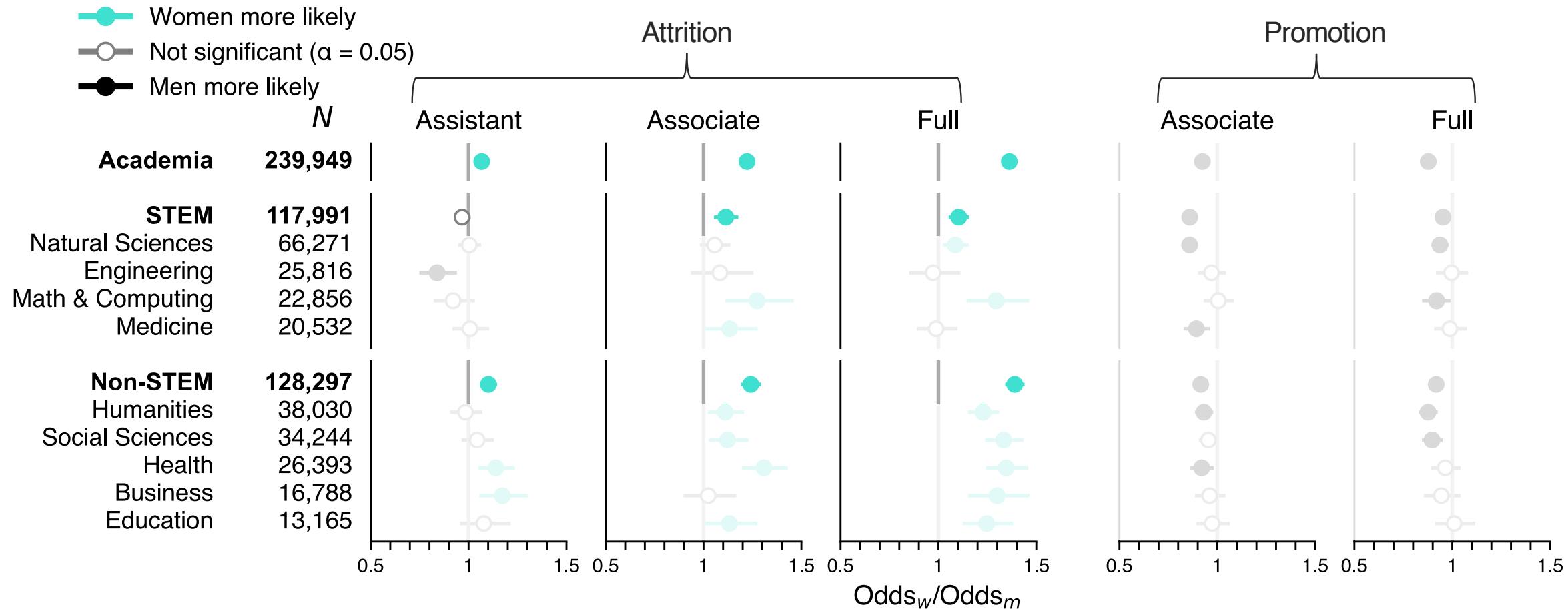
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# Gendered odds vary across career stage, domain



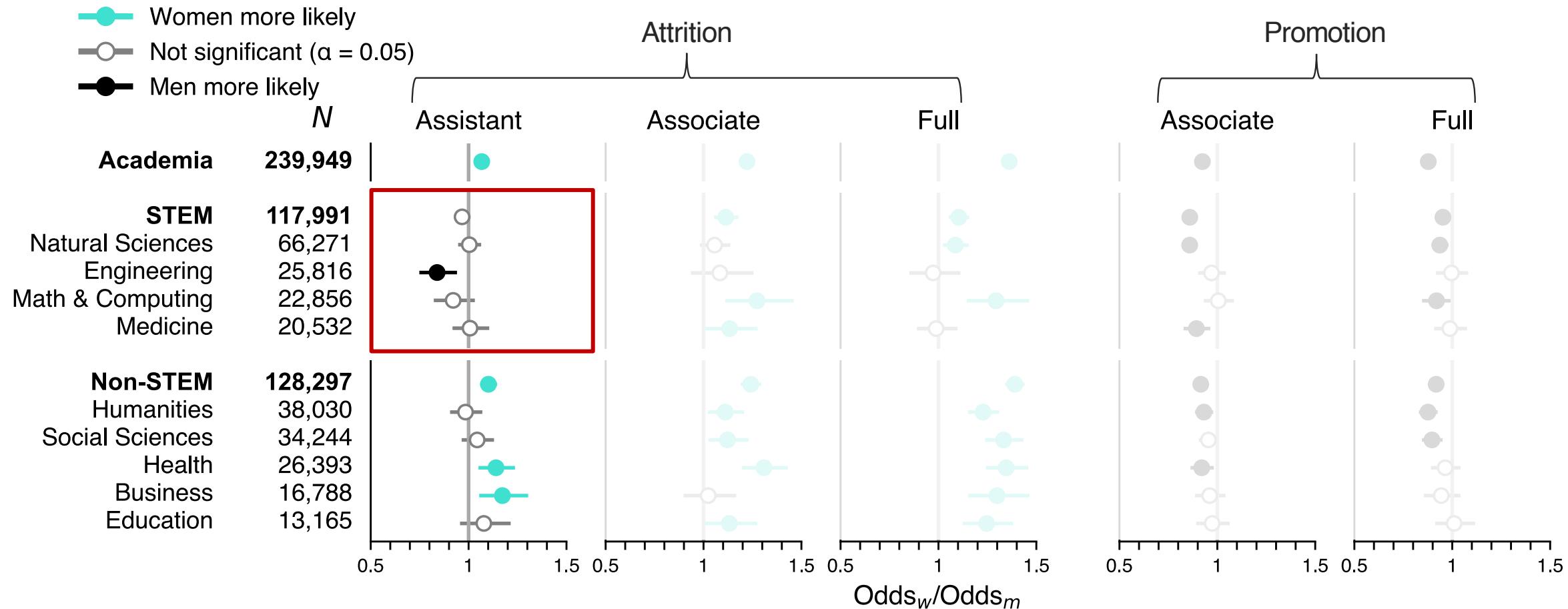
When we split by domain there's even more variation!

# Gendered odds vary across career stage, domain



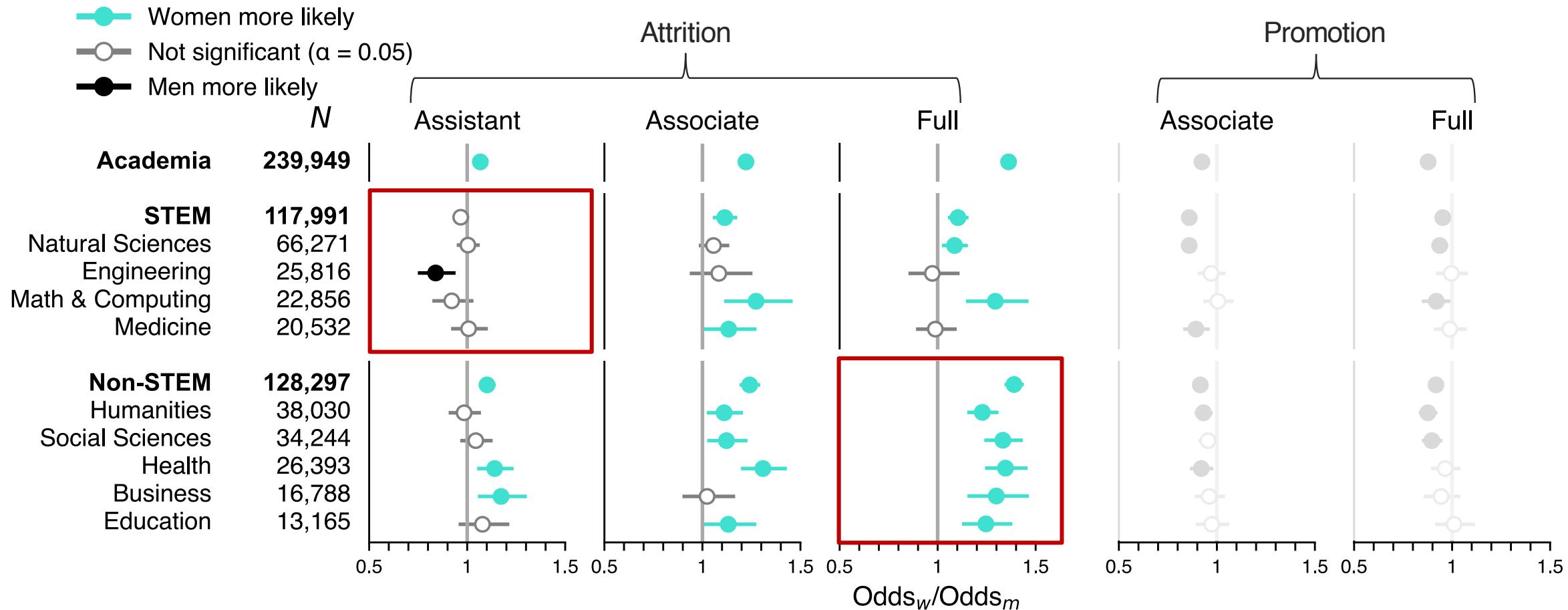
The gendered retention gaps are **larger in non-STEM domains** than in STEM domains

# Gendered odds vary across career stage, domain



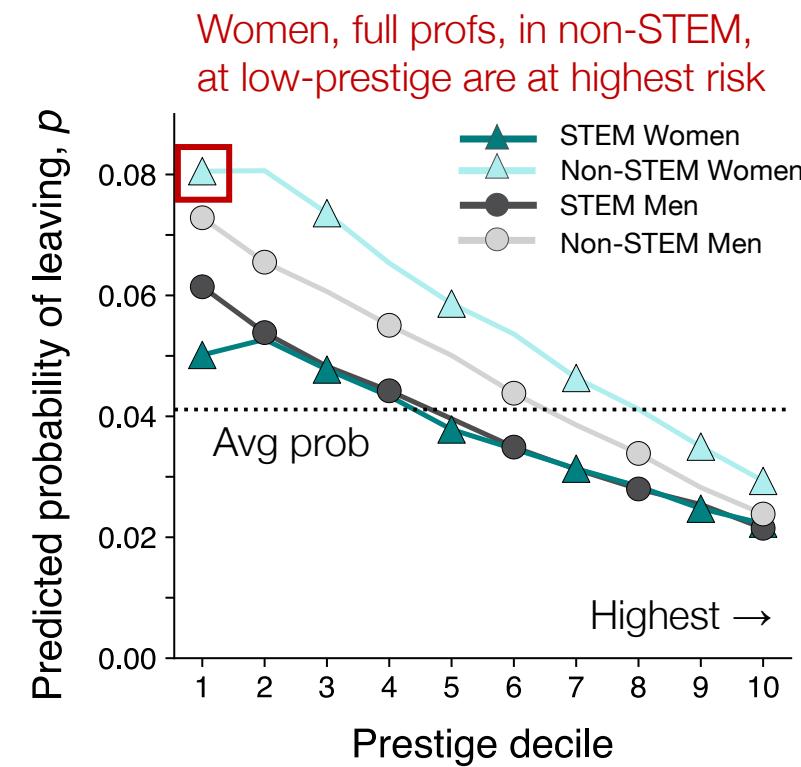
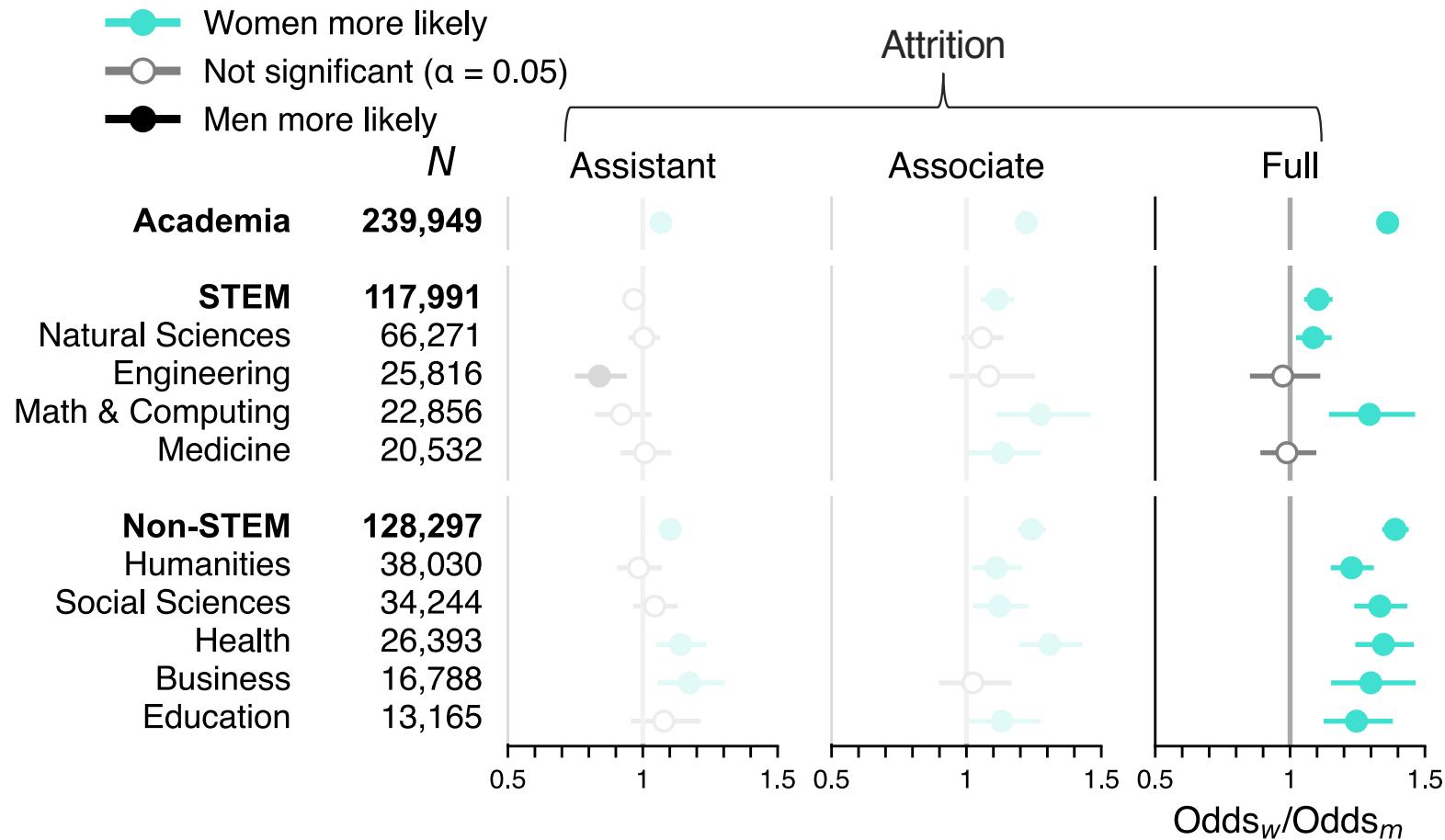
There are **no** STEM domains where women assistant profs are more likely to leave than men

# Gendered odds vary across career stage, domain

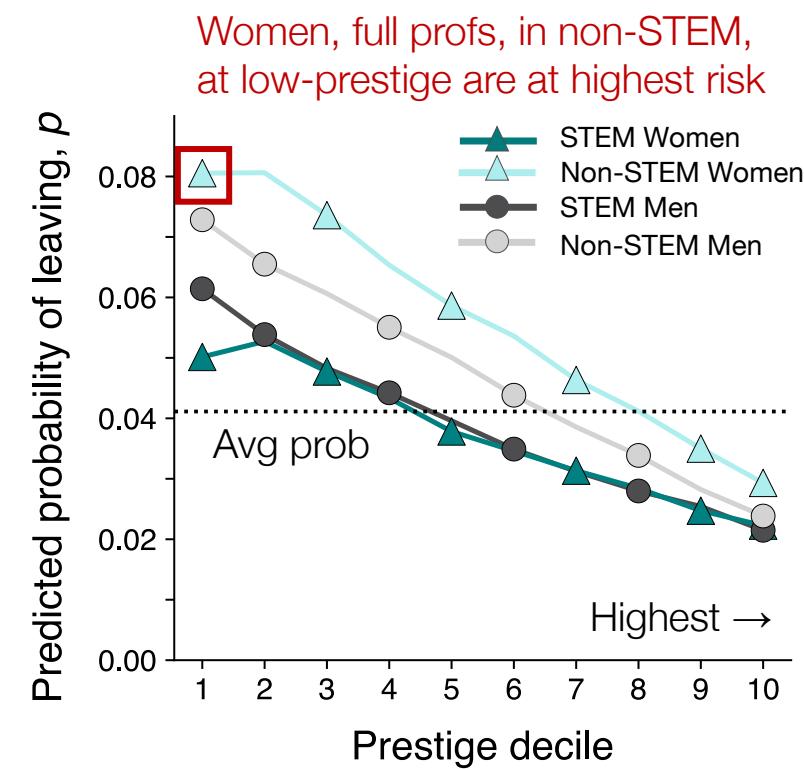
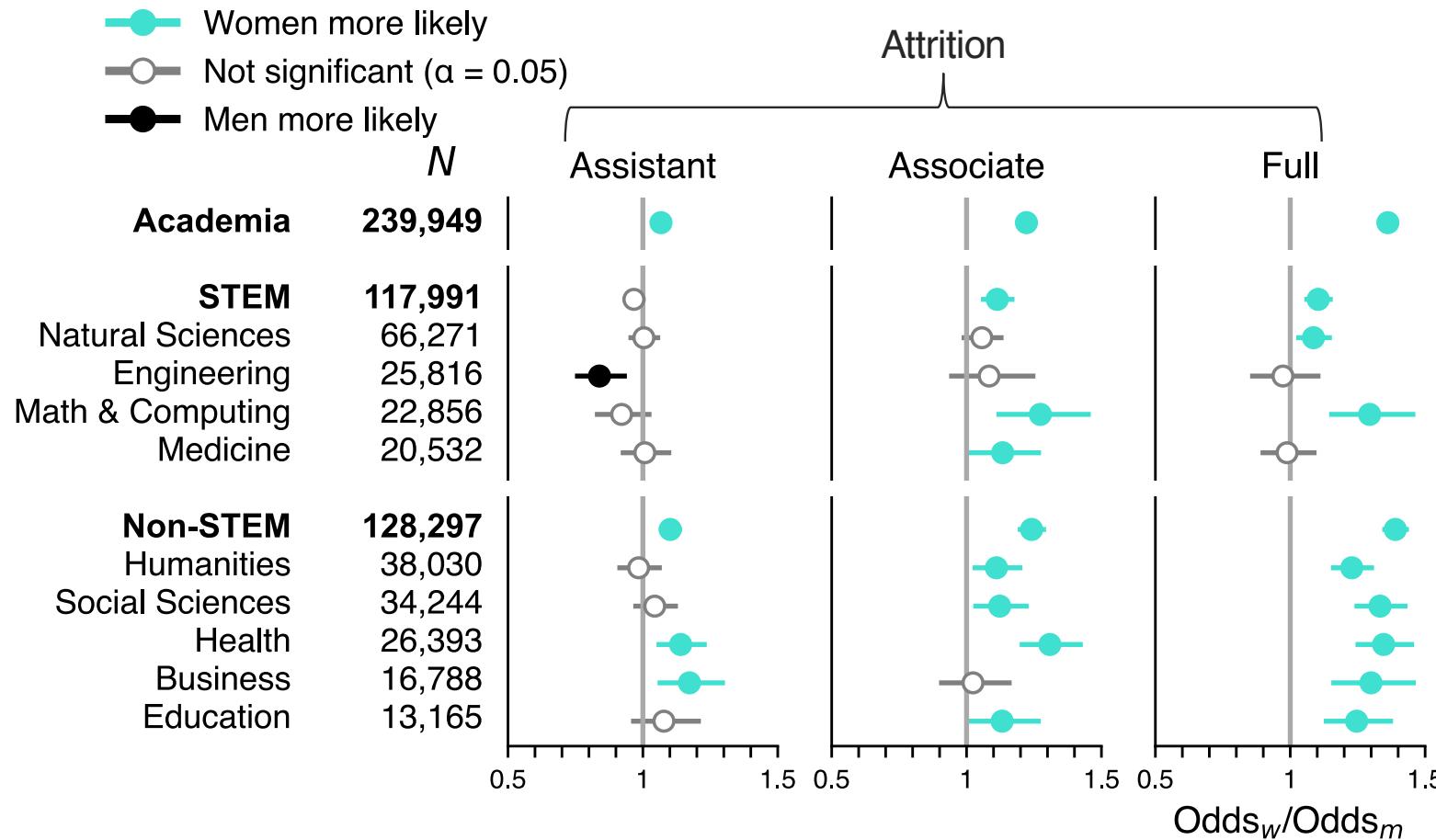


In contrast, women full profs in **every** non-STEM domain are more likely to leave than men

# Gendered odds vary across career stage, domain and prestige

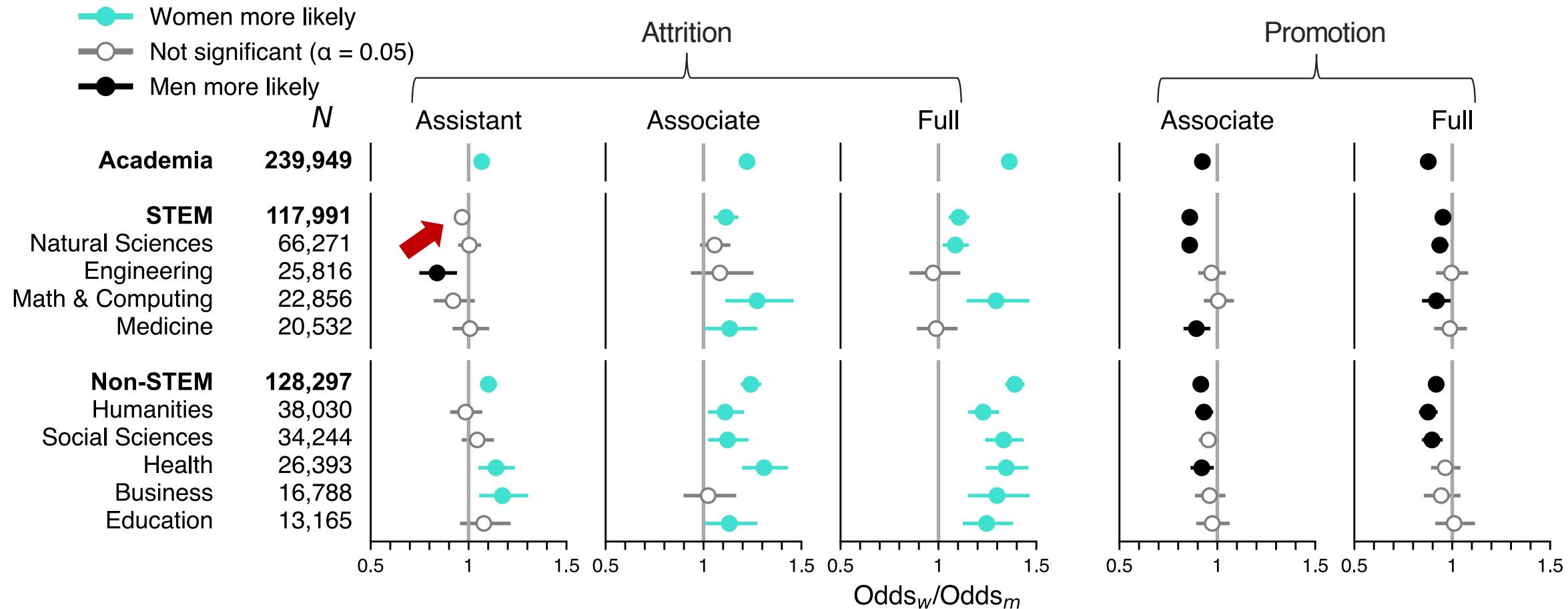


# Gendered odds vary across career stage, domain and prestige



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!**

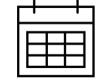
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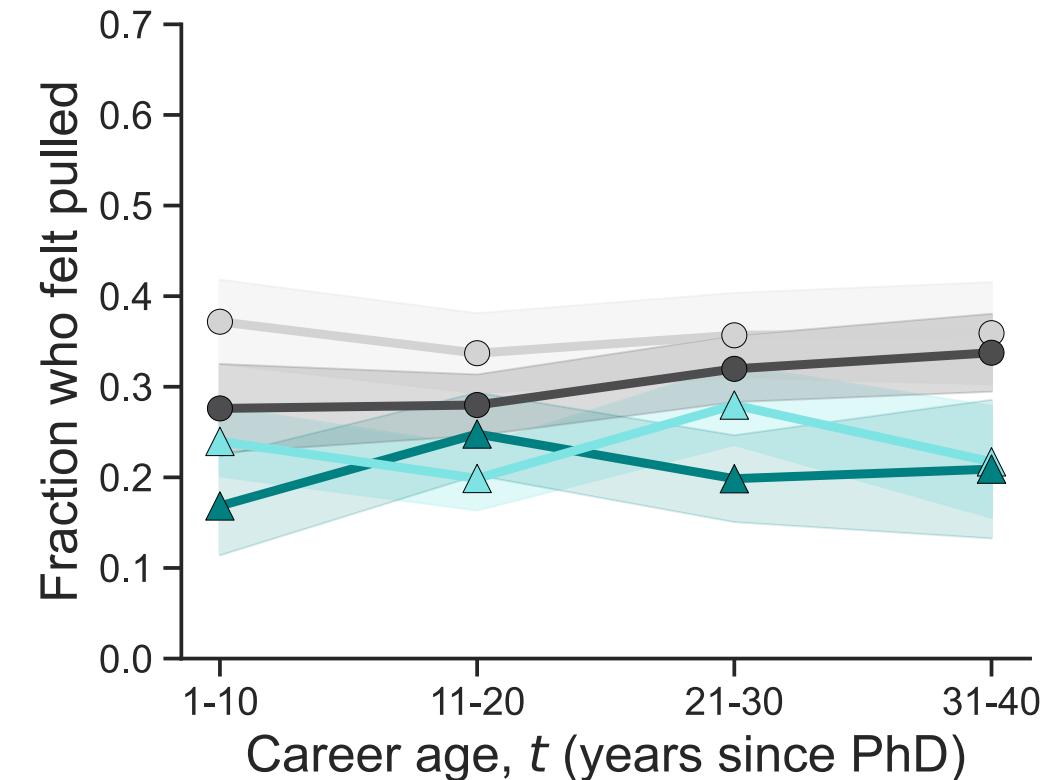
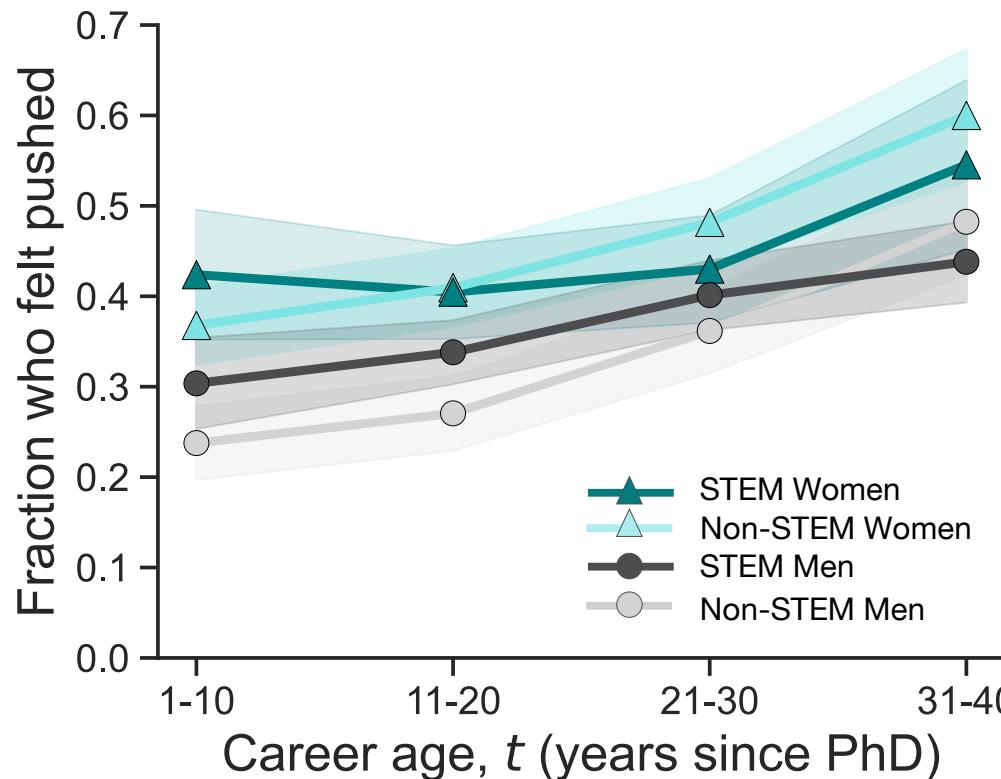
***Are the reasons faculty leave gendered?***

# 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

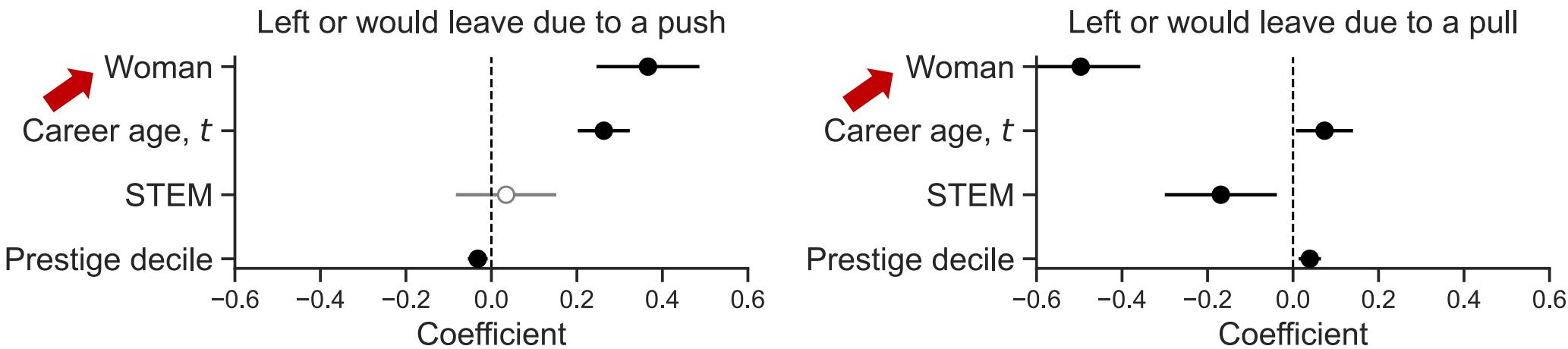
Which forces (push or pull) and what reasons, led or would lead faculty to leave their jobs?

# 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

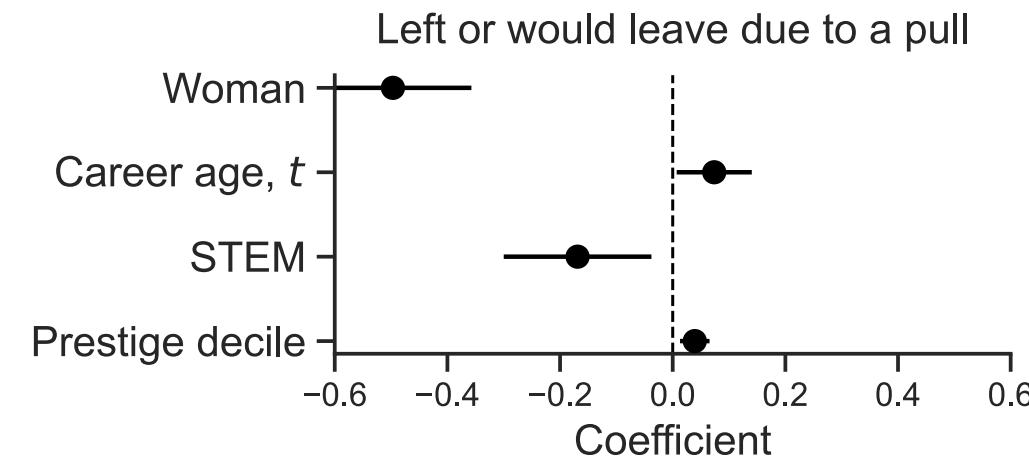
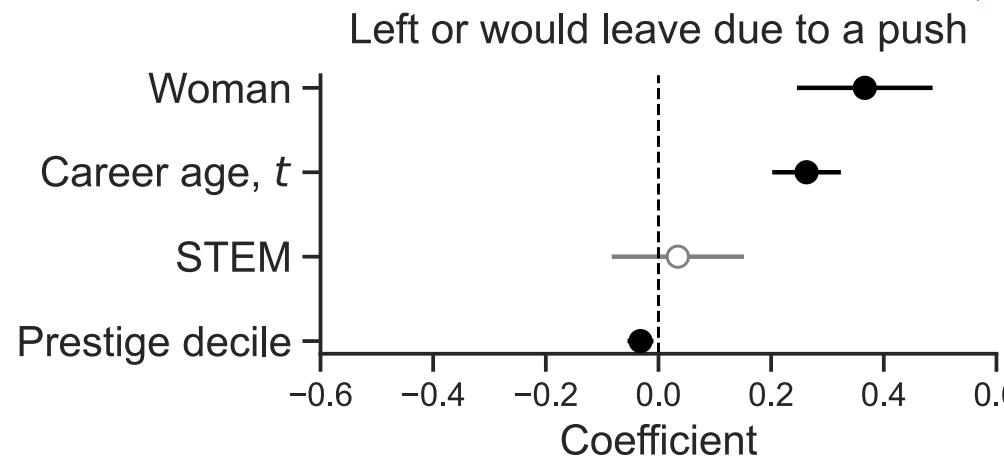


Gender was the **strongest predictor** of feeling pushed/pulled, out of gender, STEM & prestige, controlling for career age

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.



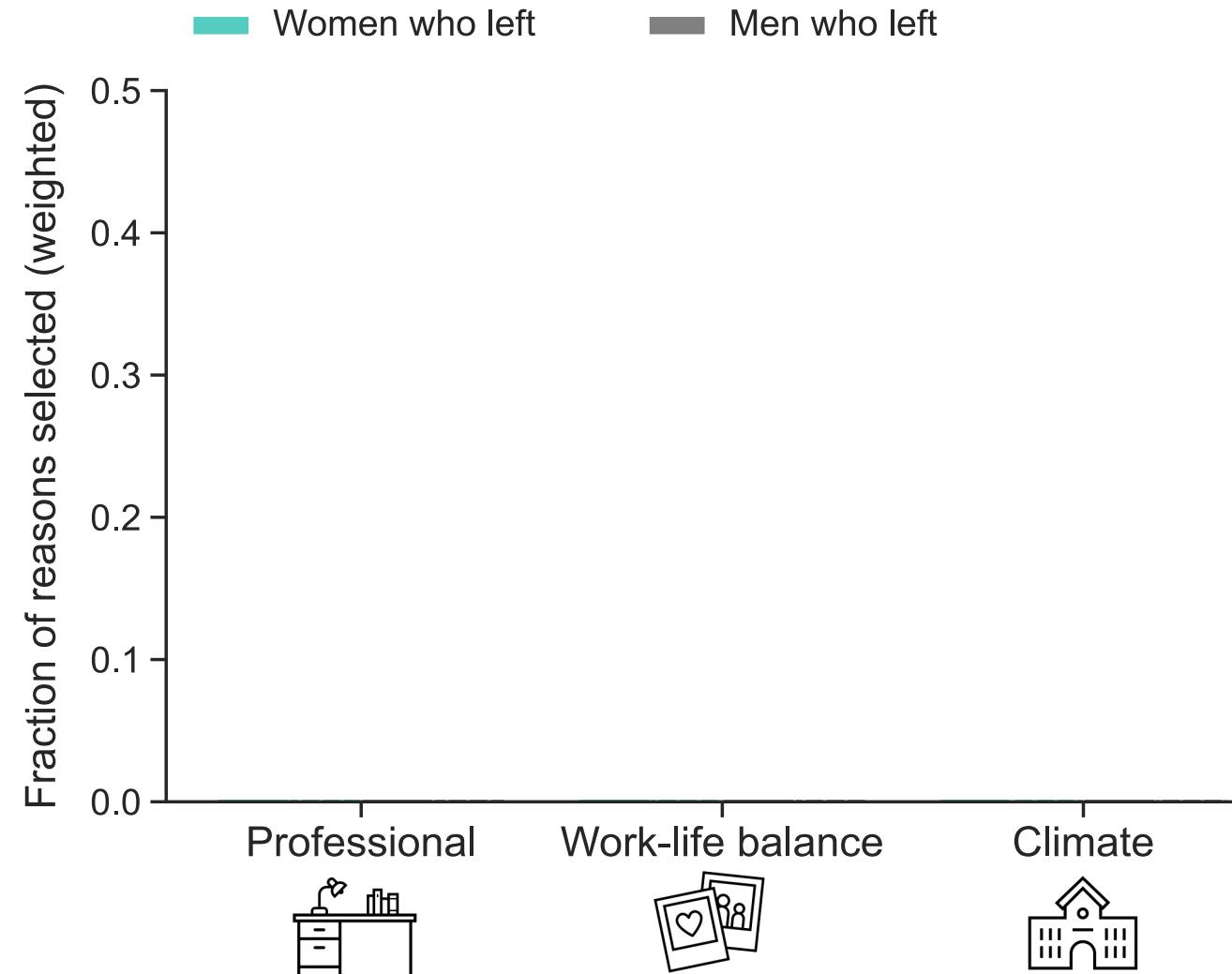
### Work-life balance

Kids, hours, etc.



### Workplace climate

Competition, not belonging,  
etc.



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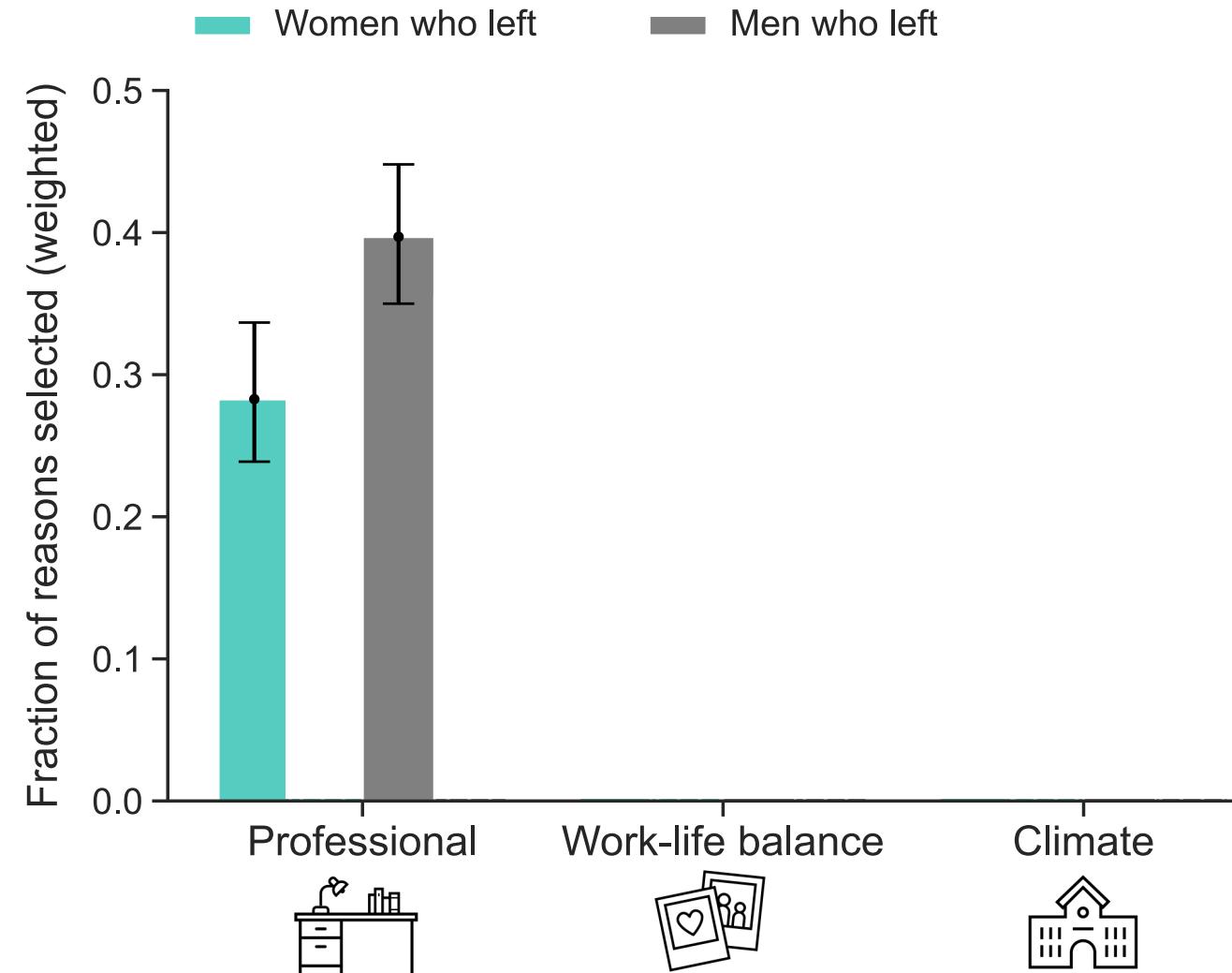
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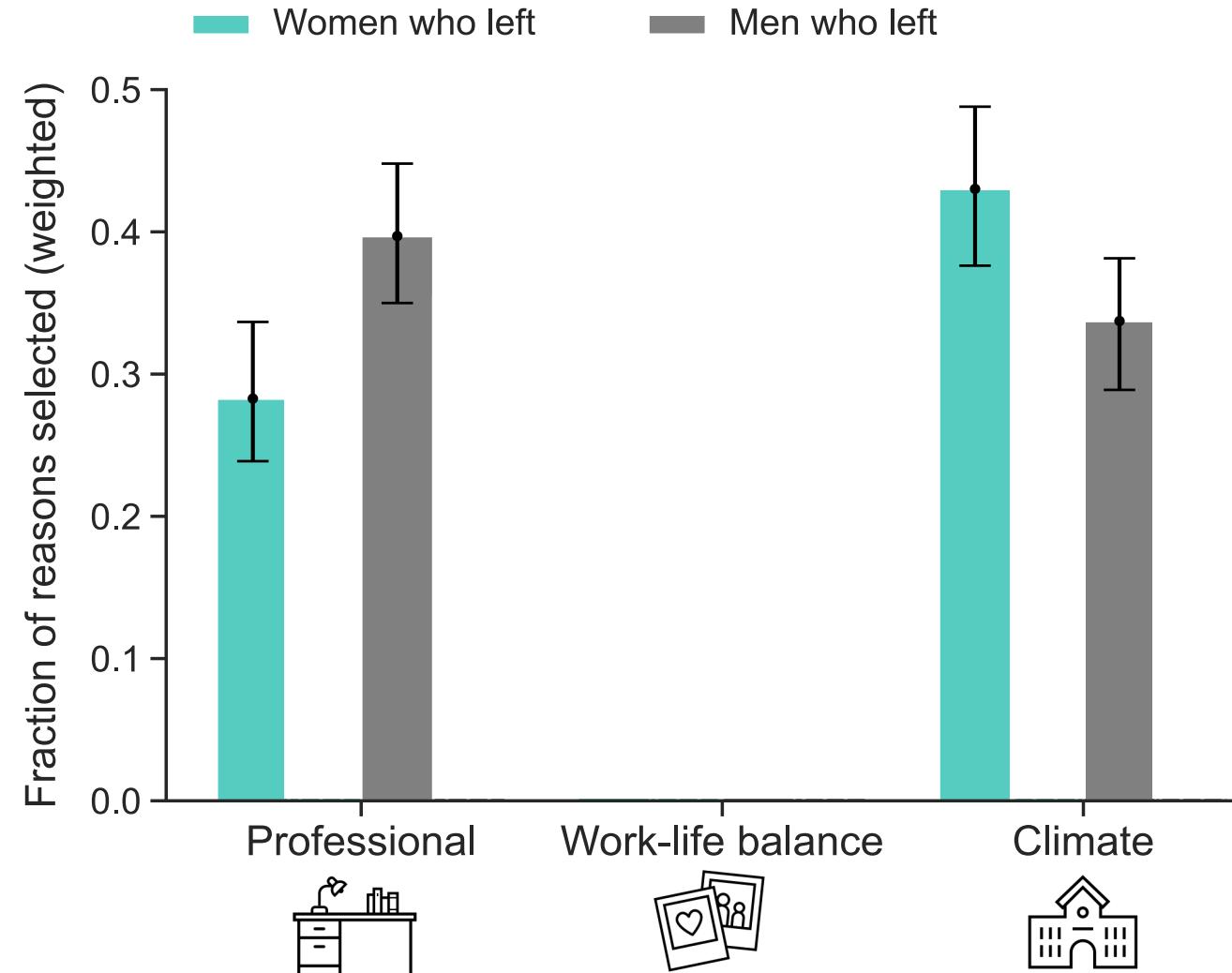
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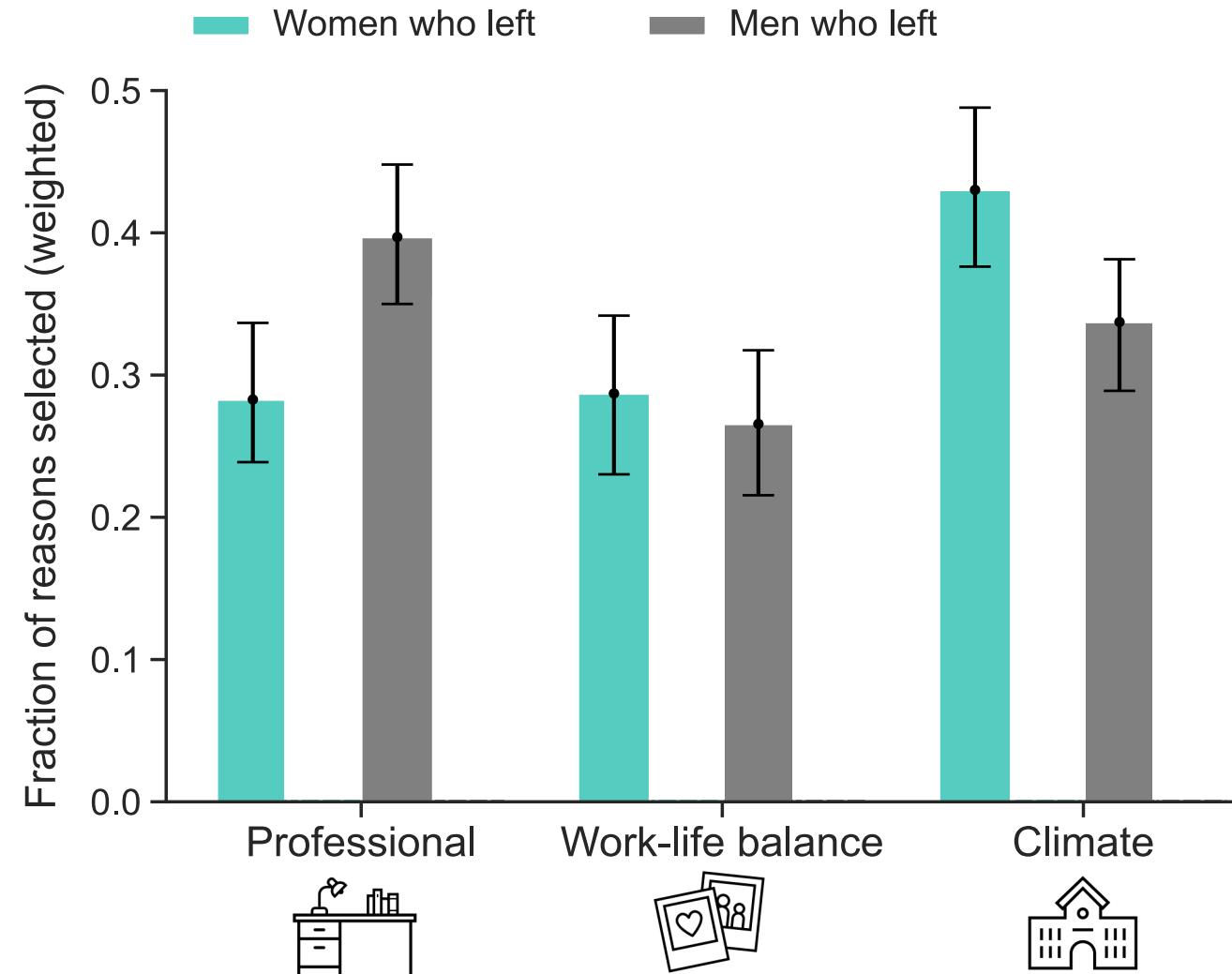
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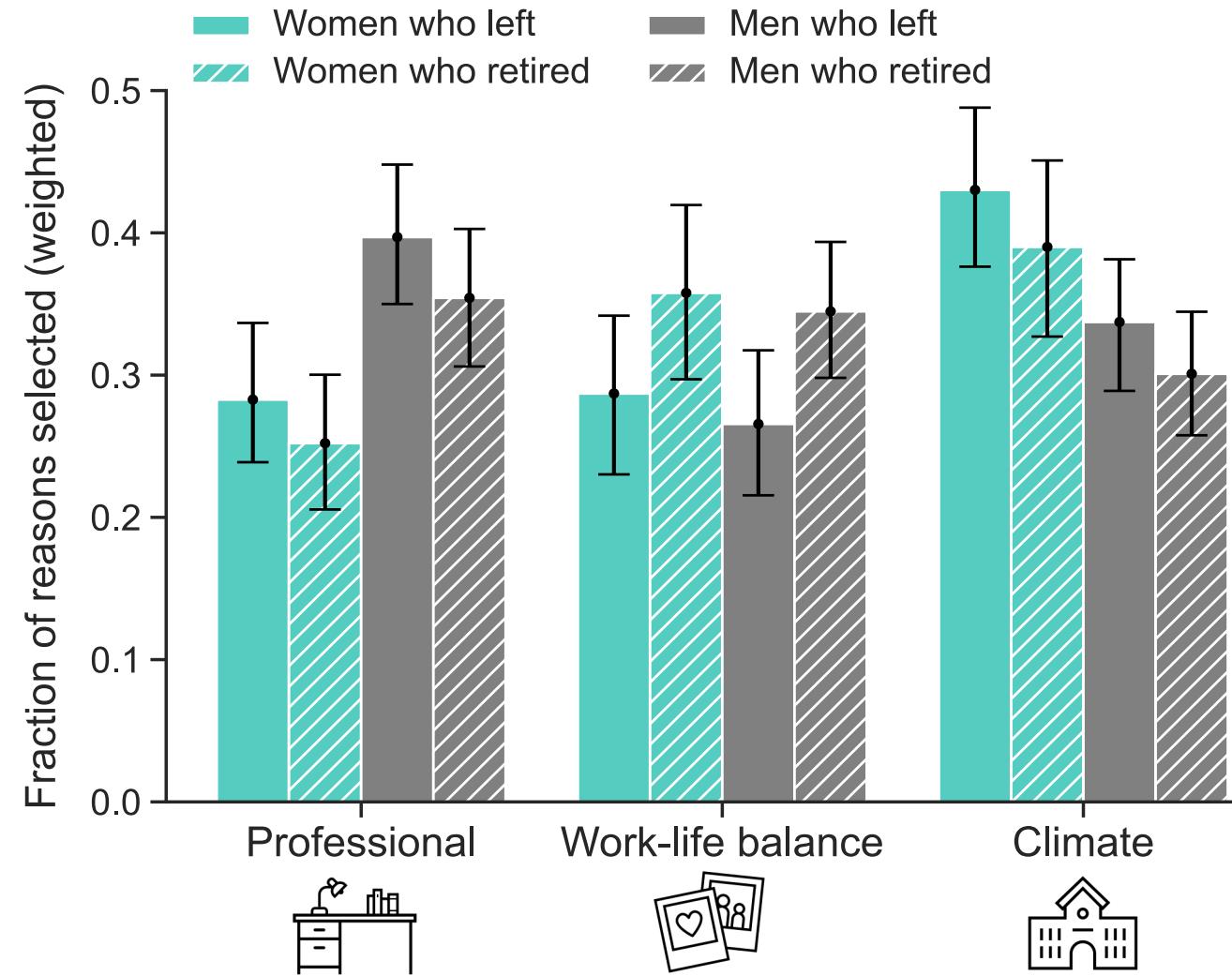
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### 3. Women and men consider leaving for different reasons



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Funding, admin. support, etc.



#### Work-life balance

Kids, hours, etc.



#### Workplace climate

Competition, not belonging, etc.



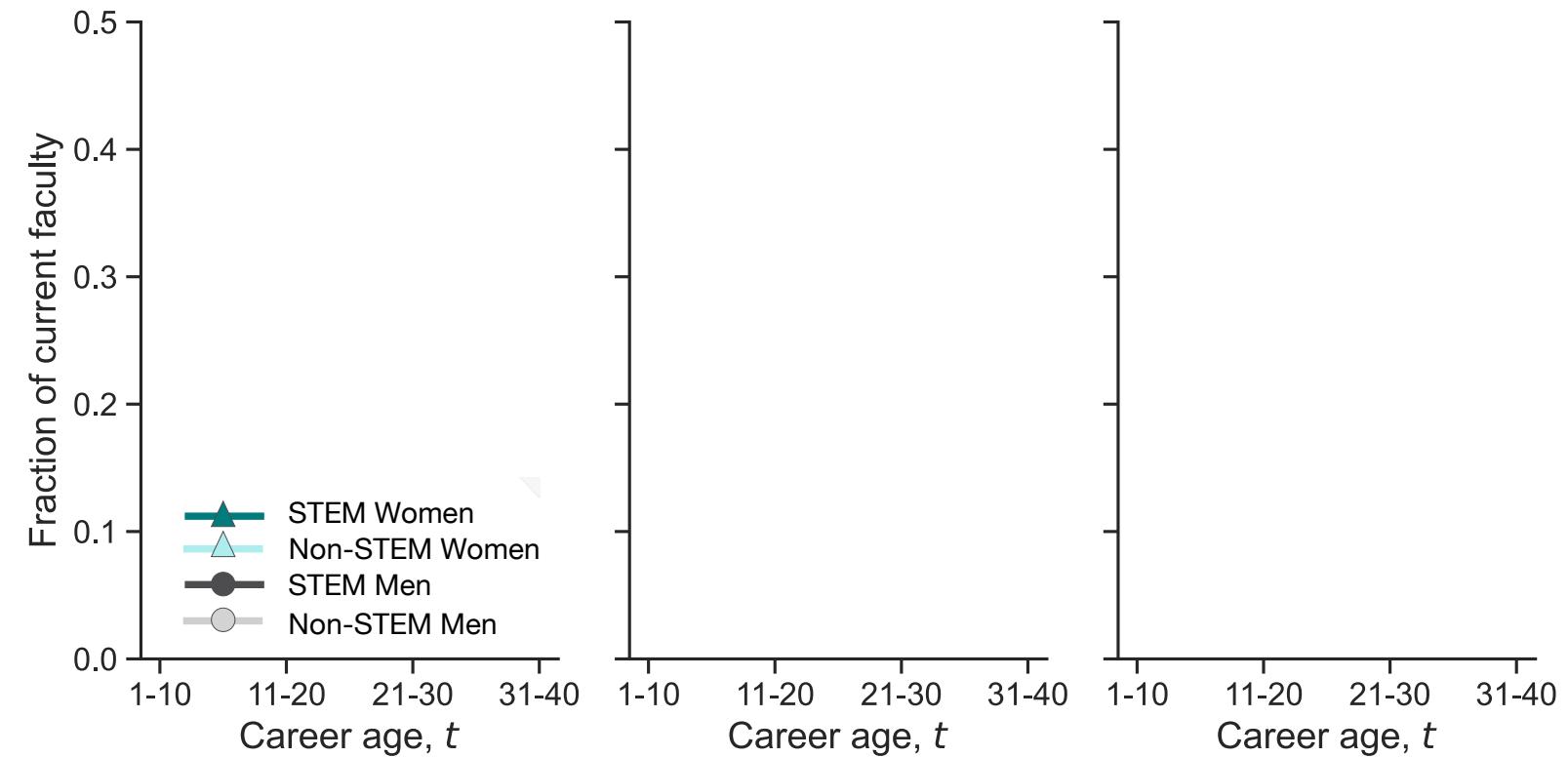
#### Professional



#### Work-life balance



#### Climate



### 3. Women and men consider leaving for different reasons



#### Professional

Funding, admin. support, etc.



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Competition, not belonging, etc.



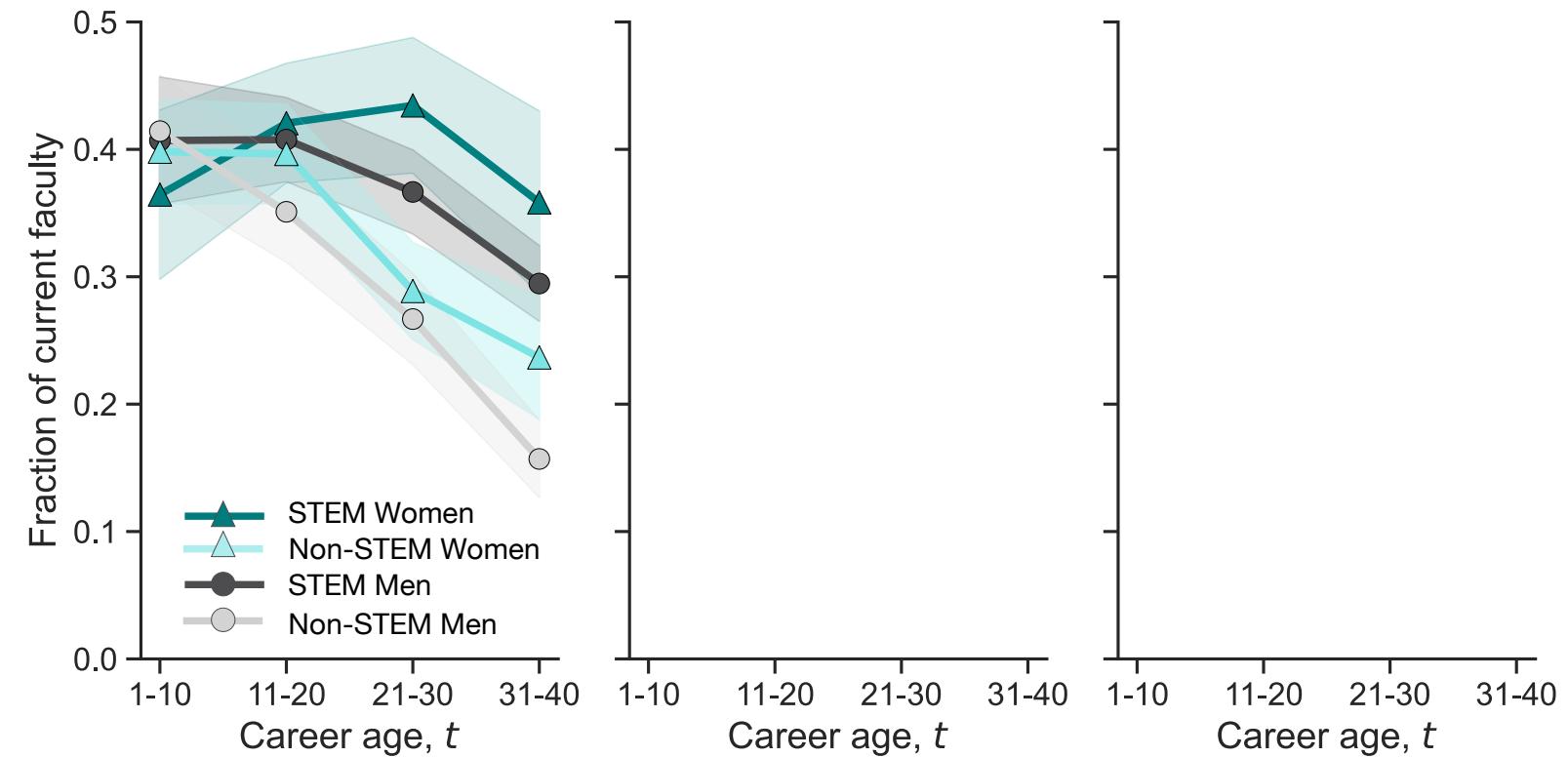
#### Professional



#### 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.



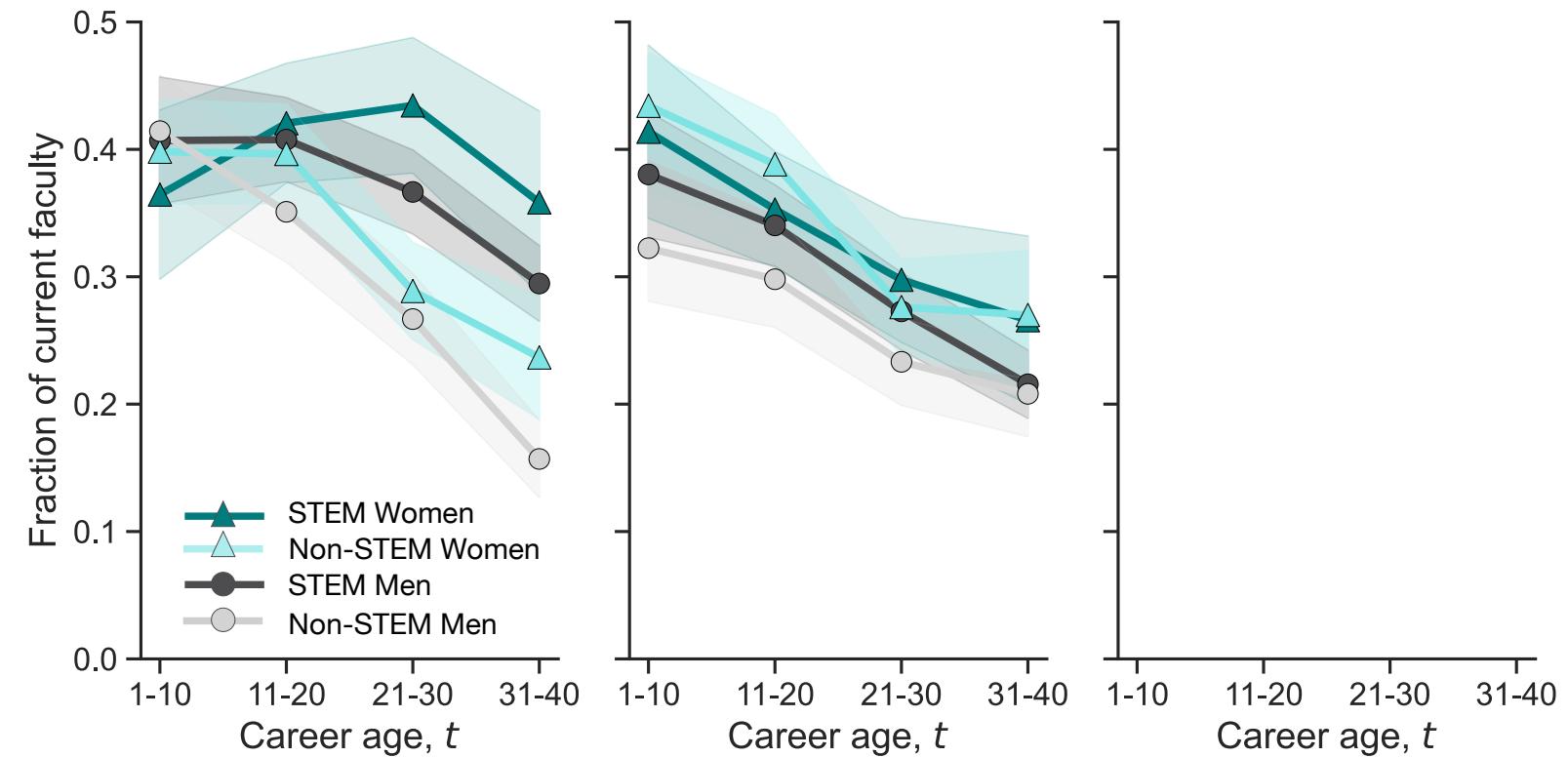
#### Professional



#### 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.



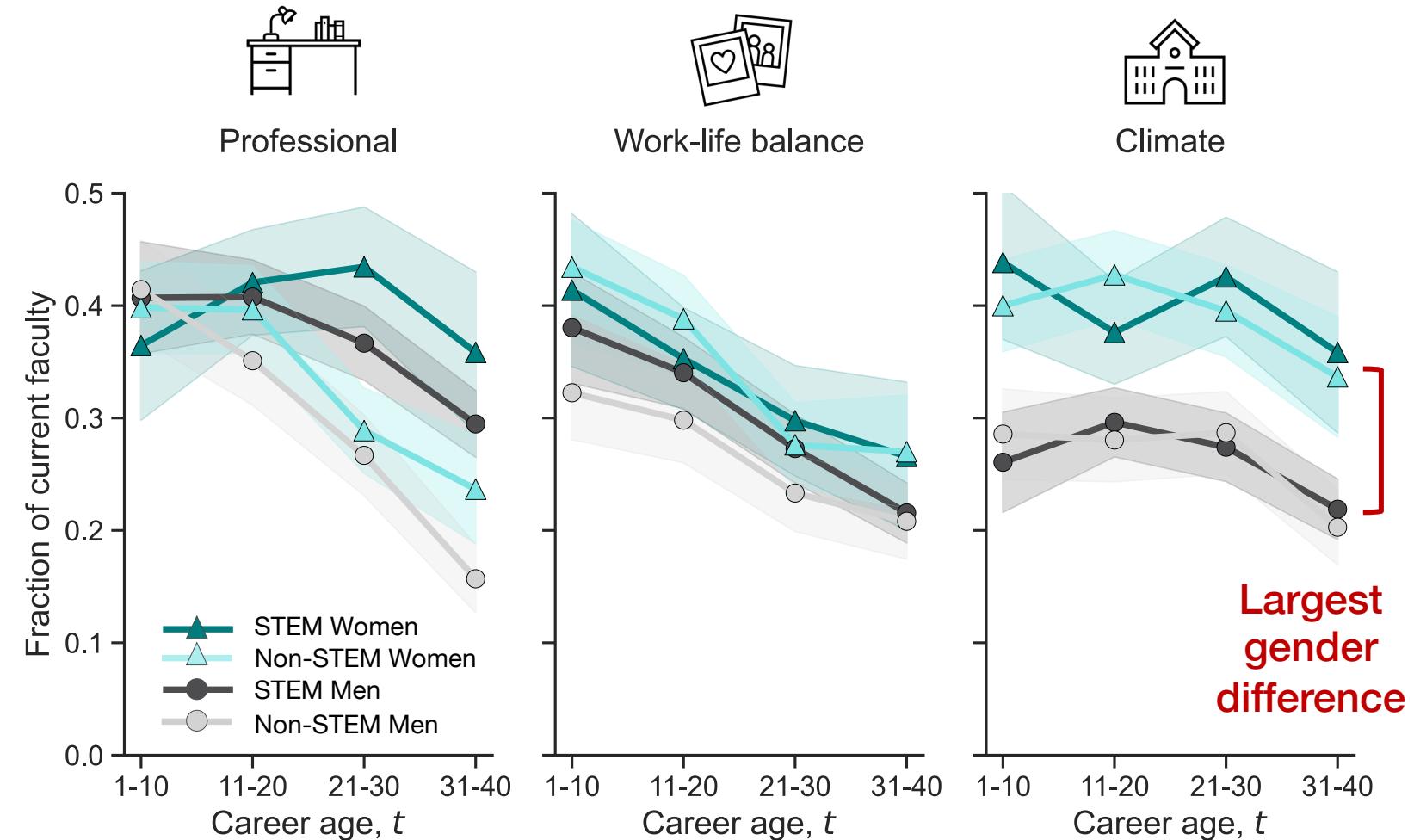
#### Work-life balance

Kids, hours, etc.



#### Workplace climate

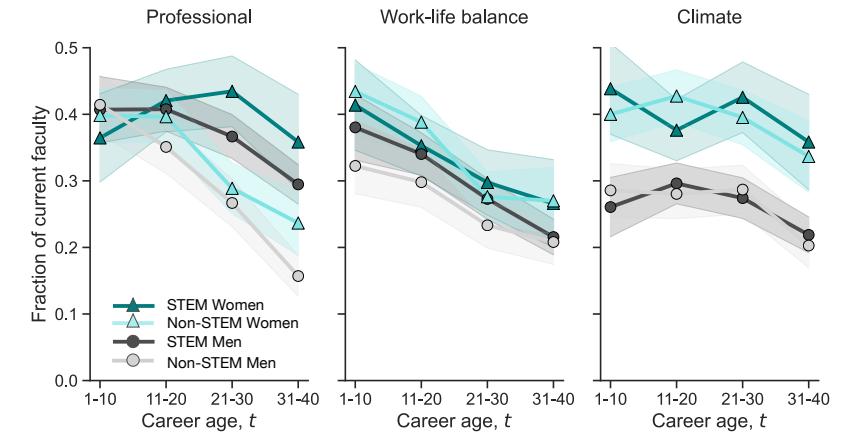
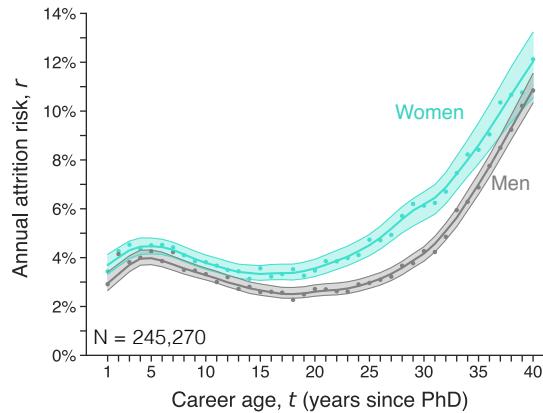
Competition, not belonging, etc.



**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

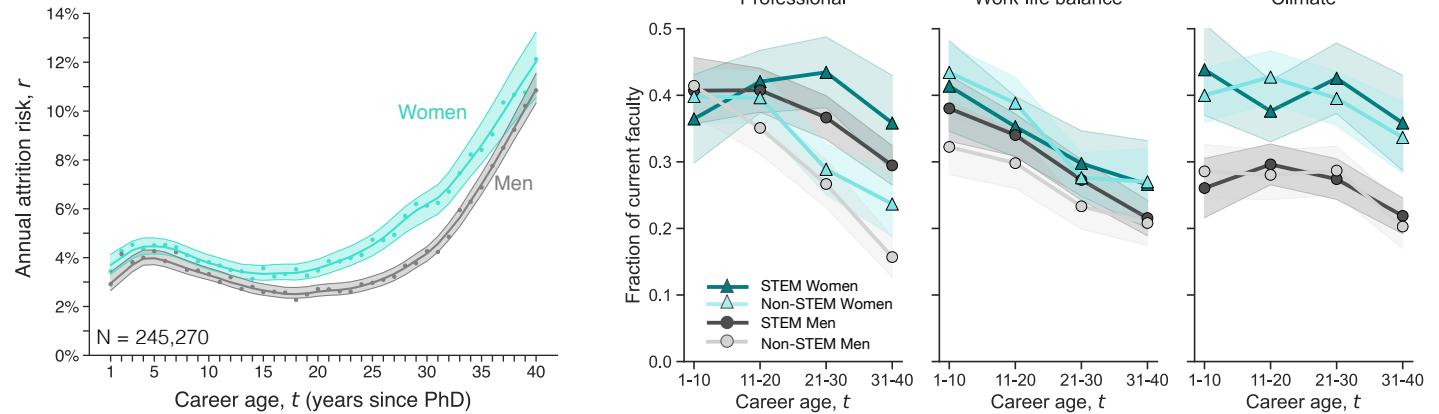
Part 1: Administrative analysis

*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**

Part 2: Survey analysis

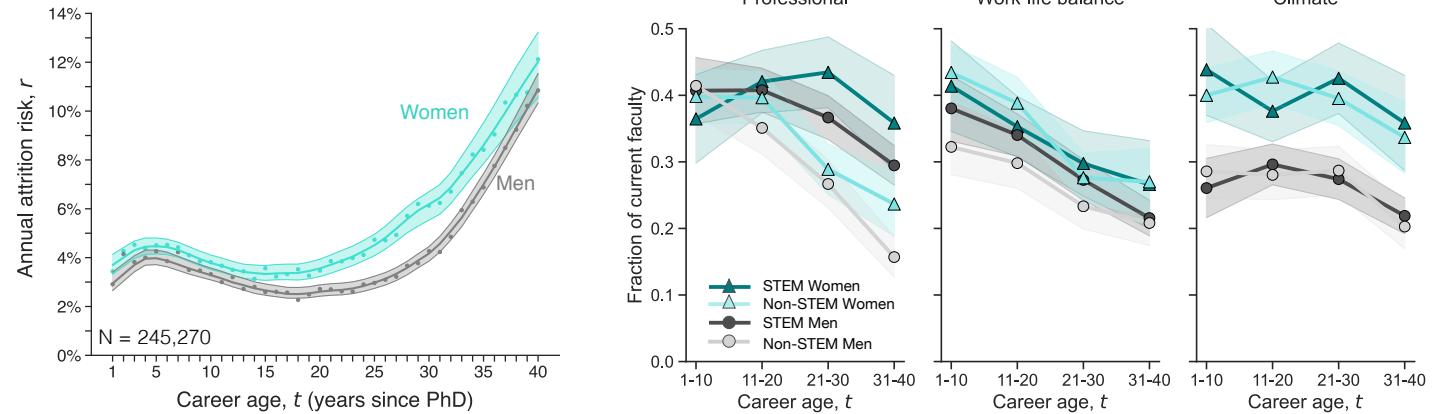
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# Implications

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

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

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

# Implications

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Are *retention rates* gendered?

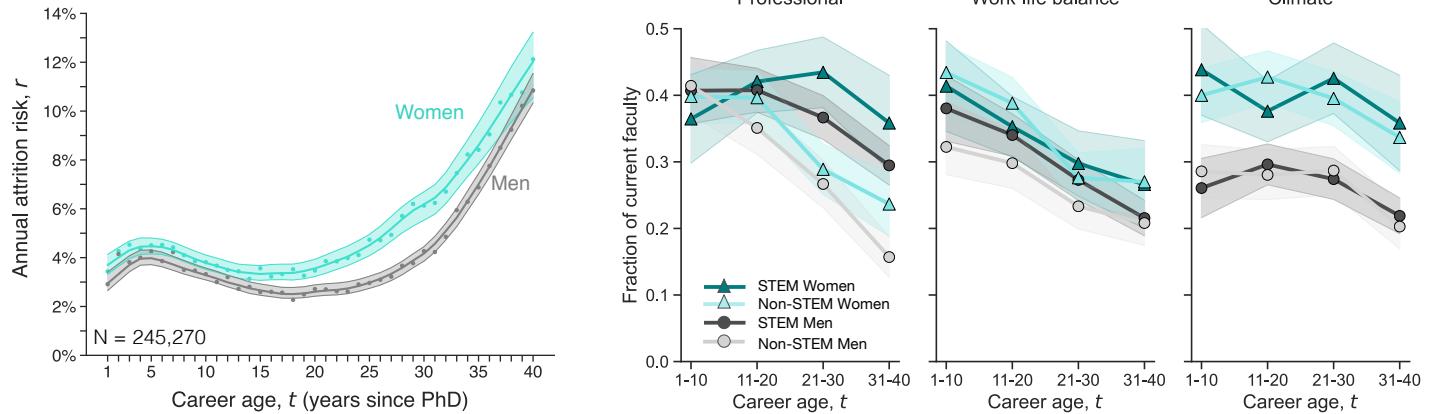
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- **Women are more likely to feel pushed & less likely to feel pulled**
- **Women are more likely to leave & consider leaving due to workplace climate**
- **BUT this doesn't mean we should ignore work-life balance**

**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



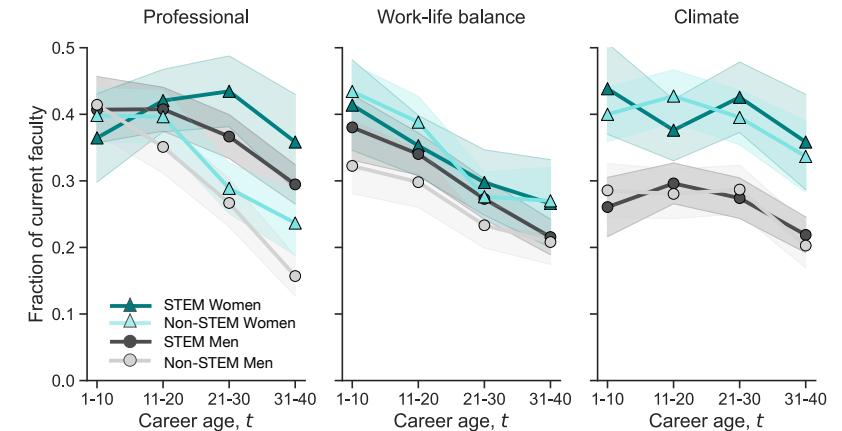
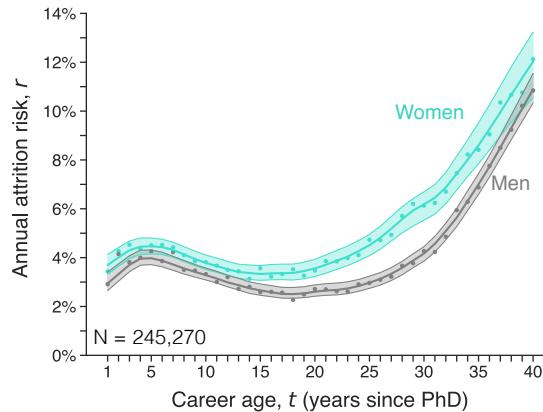
# A final note on the value of people's stories

- **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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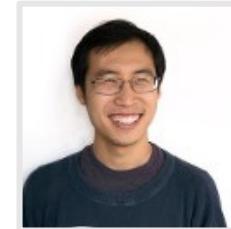
 @thekatiespoon



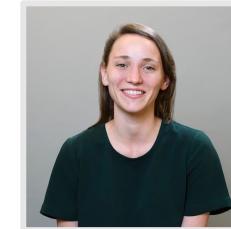
Nick LaBerge



Hunter Wapman



Sam Zhang



Allie Morgan



Joanna Mendi



Maria Martinez



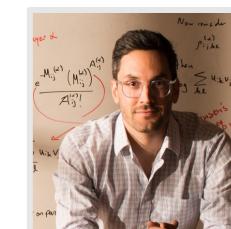
Mirta Galesic



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!