

# Increasing Women in Neuroscience (IWiN) Toolkit

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## Implicit Bias

Created by the Professional Development Committee  
of the Society for Neuroscience

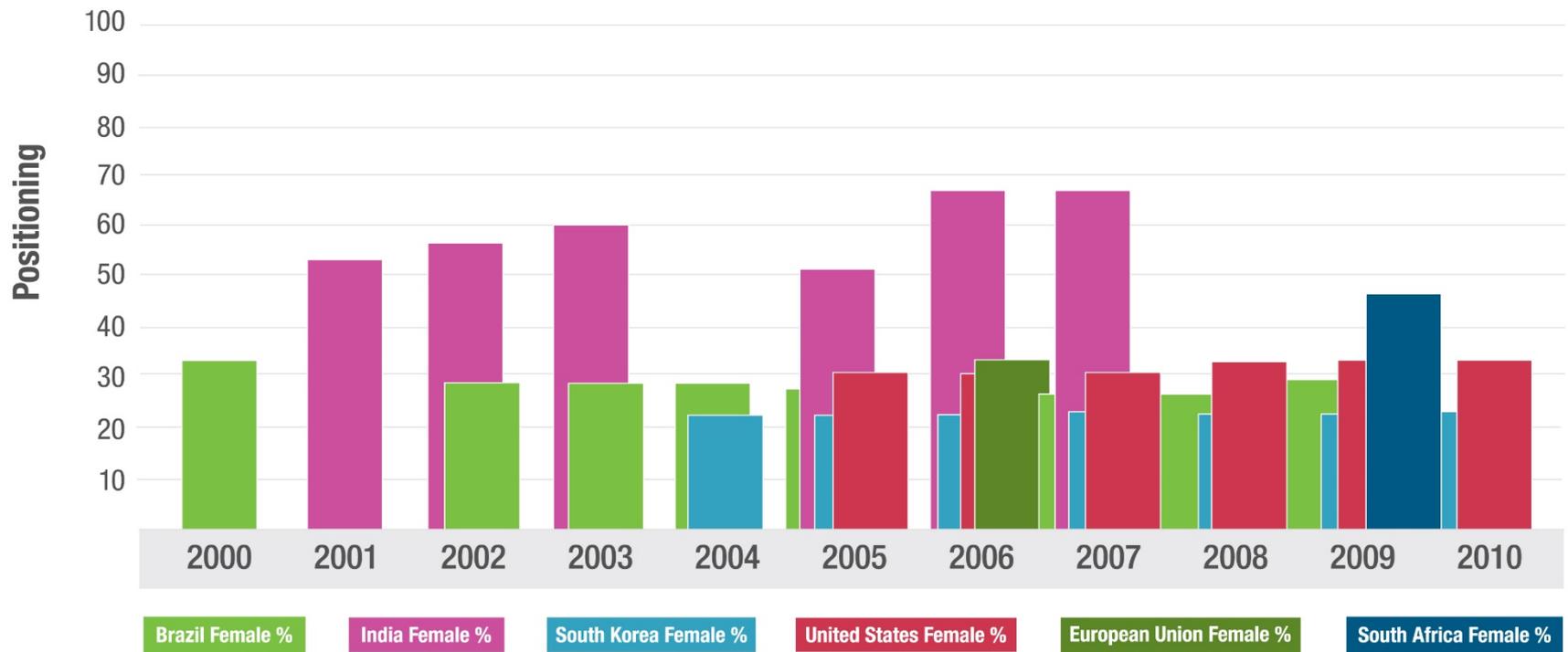
# Overview

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- Global Statistics on Faculty Salaries by Sex
- Diversity and Scientific Excellence
- Implicit Bias (Schemas): What Is It, How Is It Measured?
- Evidence that Implicit Bias Affects Evaluation
- Strategies for Breaking the Cycle

# Some Global Statistics on Women in SET

## SCIENCE, TECHNOLOGY AND INNOVATION PARTICIPATION: Tertiary science and engineering enrollment



# THE PERSISTENT GAP



\$82,530



\$110,883



\$85,807



\$104,006



\$60,269



\$73,622



\$39,880



\$40,196



\$42,299



\$49,984

# Full Time Faculty Member Salaries in the United States

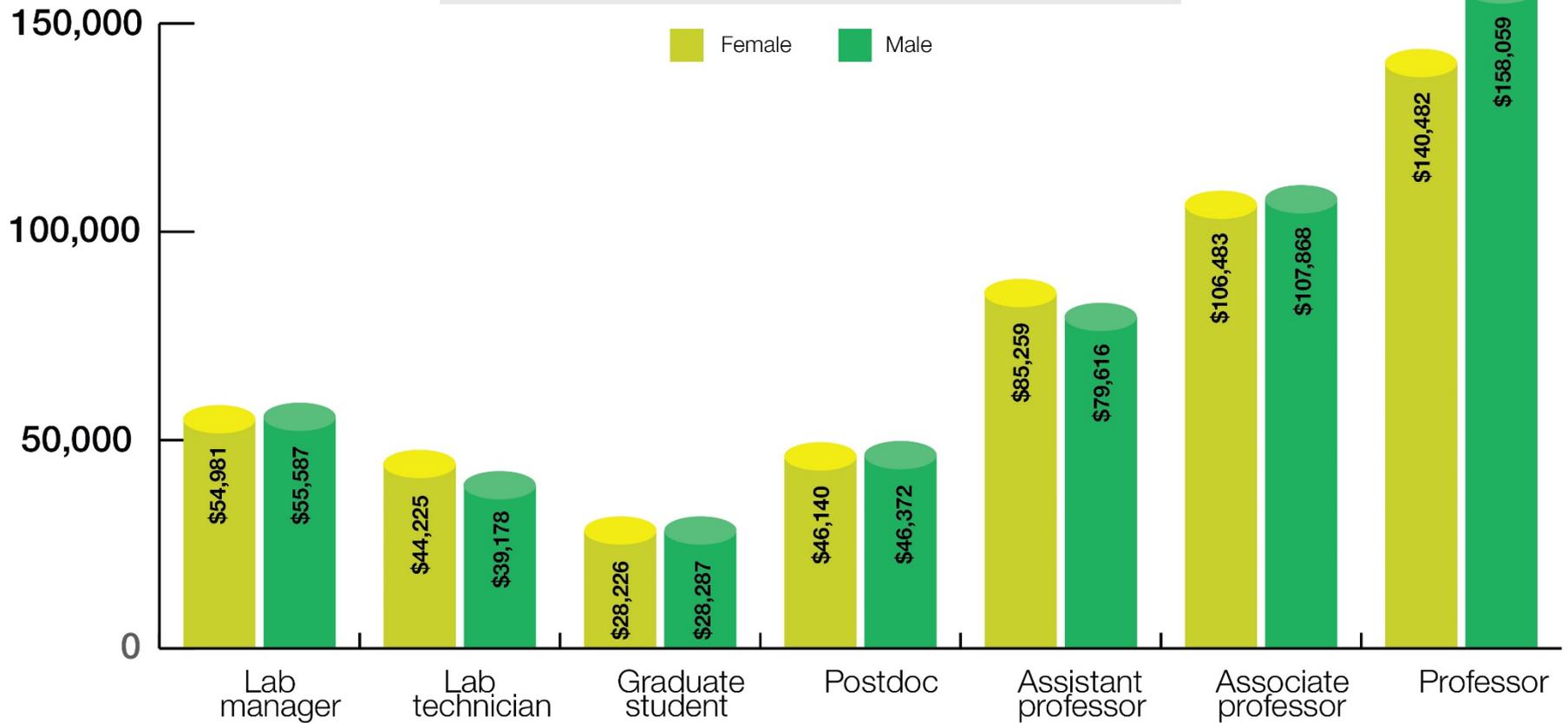
Average Salaries of Full-Time Faculty Members, 2012-13\*  
(All institutions)

	Salary (\$)	Men's Salary (\$)	Women's Salary (\$)	Women's Salary as a % of Men's
<b>Professor</b>	116,419	120,797	105,402	87.3
<b>Associate Professor</b>	80,116	82,628	76,797	92.9
<b>Assistant Professor</b>	68,025	70,781	65,321	92.5
<b>Instructor</b>	48,725	49,802	48,024	96.4
<b>Lecturer</b>	54,475	57,563	53,045	90.4
<b>No rank</b>	64,343	68,880	60,141	87.3
<b>All</b>	84,303	91,994	73,932	80.4

\* Source: AAUP Salary Survey 2013, as presented by Chronicle of Higher Education (April 12, 2013), Vol. 59, Issue 31.

# THE PERSISTENT GAP

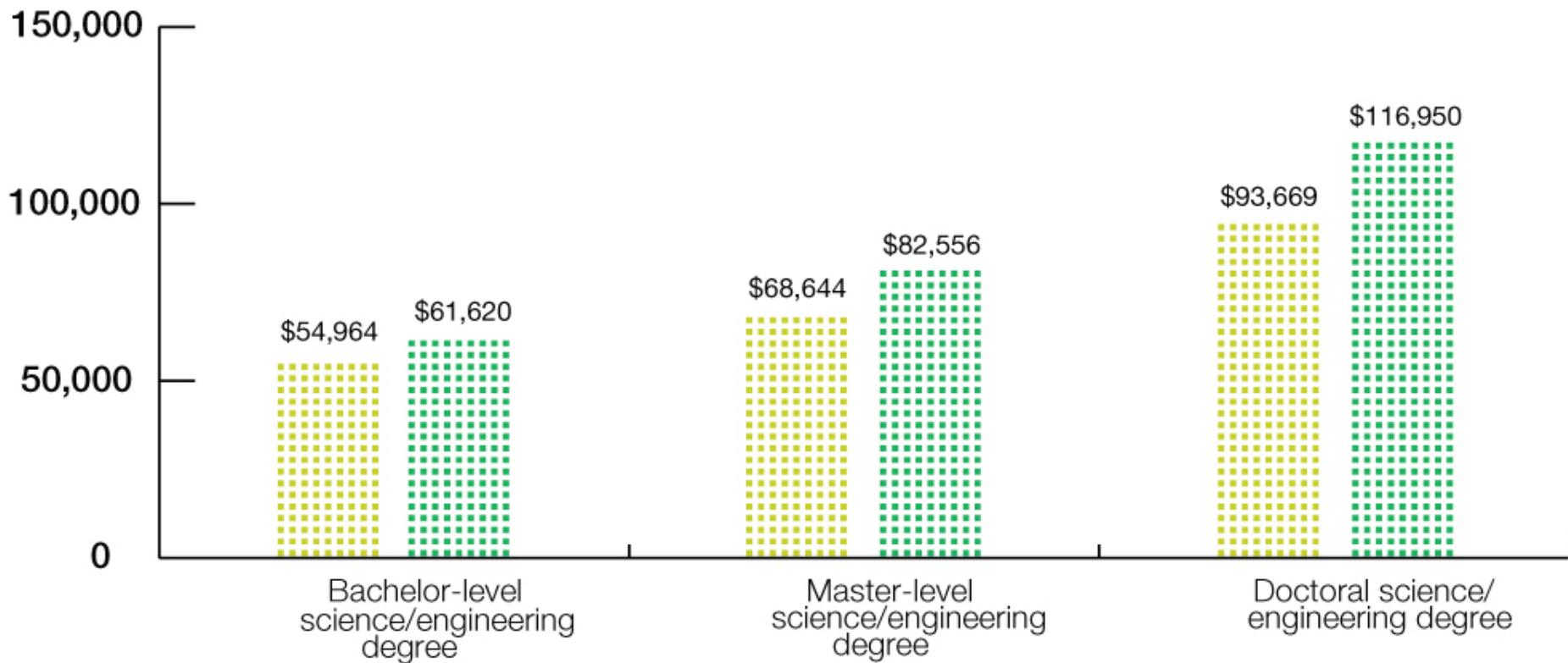
## Average Compensation in U.S.



# THE PERSISTENT GAP

## Average Compensation in U.S.

Female Male



# Why do we need to recruit a diverse faculty in order to attain excellence?

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- Gives us access to talent currently not represented.
- More perspectives are taken into account in devising solutions to problems.
- Heterogeneous groups are more effective in problem solving, demonstrate greater creativity, and improve the vigor of a scholarly community (see references).

## Why is it difficult to recruit for diversity and excellence?

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It is tempting to believe that discrimination against certain groups is a thing of the past, or is only practiced by a small set of uninformed people.

*Research shows that we all – regardless of the social groups we belong to – perceive and treat people differently based on their social groups (race/ethnicity, gender, sexual orientation, disability, etc.).*

## Schemas: Non-conscious Hypotheses

- Schemas (expectations or stereotypes) influence our judgments of others (regardless of our own group).
- All schemas influence group members' expectations about how they will be judged.



# Schemas are...

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## **Widely culturally shared**

- Both men and women hold them about gender.
- Both whites and people of color hold them about race/ethnicity.
- People are often not aware of them.

## **Applied more** under circumstances of:

- Ambiguity (including lack of information)
- Stress from competing tasks (e.g., job and family responsibilities)
- Time pressure
- Lack of critical mass (minority status)

# The Faces of Berkeley Engineering

Meet Tomorrow's Leaders and Today's Pioneers

## Students



Julia  
Cross

Studies  
the  
martial art  
Wu Shu



Kibibi  
Moseley

Table  
tennis  
champion



Anthony  
Levan-  
dowski

Lego robot  
creator

## Faculty



Werner  
Goldsmith

Wrote the  
book on  
Impact



Ali  
Niknejad

Circuit  
Maven



Jennifer  
Mankoff

Accomplished  
viola  
player

## Alumni



Oren  
Jacob

Pixar  
wizard



Julia  
Gee

Volunteer-  
aholic



Floyd  
Kvamme

Chip guru

**What is the effect on applicants -- aspiring students and potential faculty?**

**How is it that people committed to diversity made such a web page? It was clearly not done intentionally, meaning that there was an unconscious element.**

## Unconscious Bias: Even on Google

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“I was arguing with my girlfriend about women not inventing anything useful. In an attempt to prove me wrong, she Googled “She invented” only to have it ask, “Did you mean ‘He invented’?”” – submitted by Tom Boutcher to dig.com:  
May 6, 2007

Also works with “discovered,” “calculated,” “analyzed,” and even “led.” However, if you type in something like “she cried,” it does NOT ask if you meant “he cried.”

## Gender-Science on Project Implicit

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Easier for 10%

**Male**

**Liberal Arts**

**Female**

**Science**

No Difference for 20%

**PERCEPTIONS MATTER!**

Easier for 70%

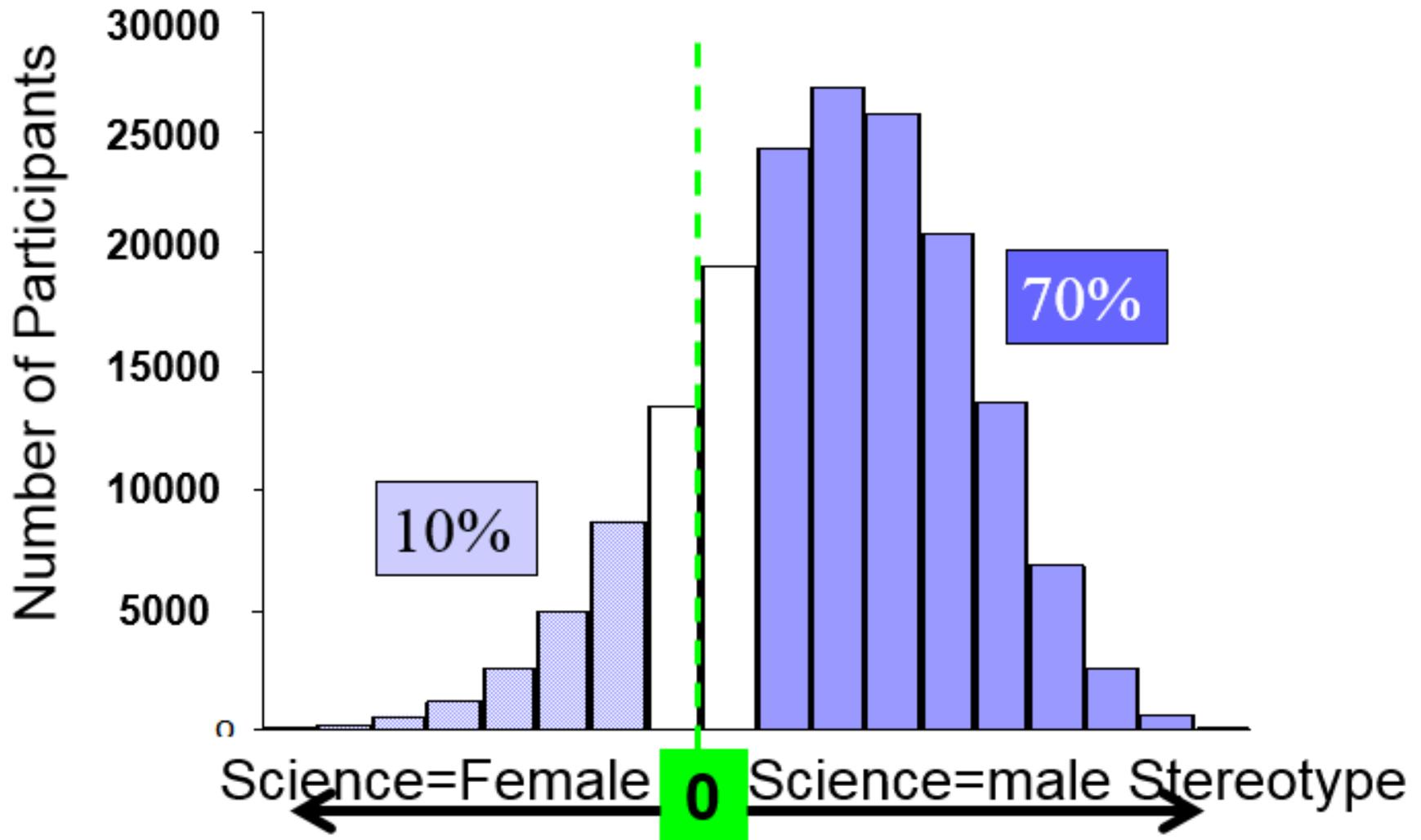
**Female**

**Liberal Arts**

**Male**

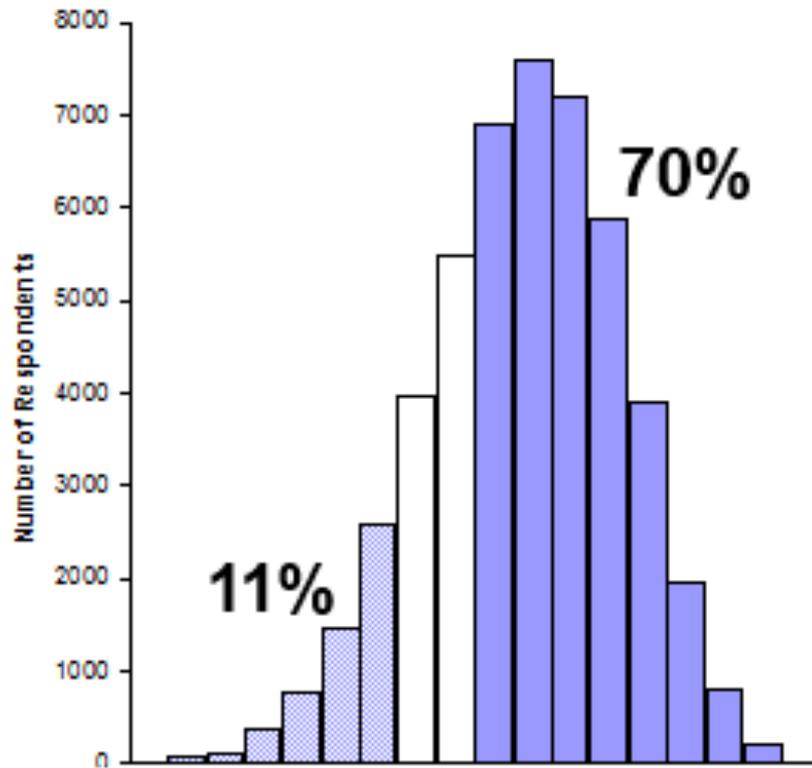
**Science**

# Gender-Science on Project Implicit

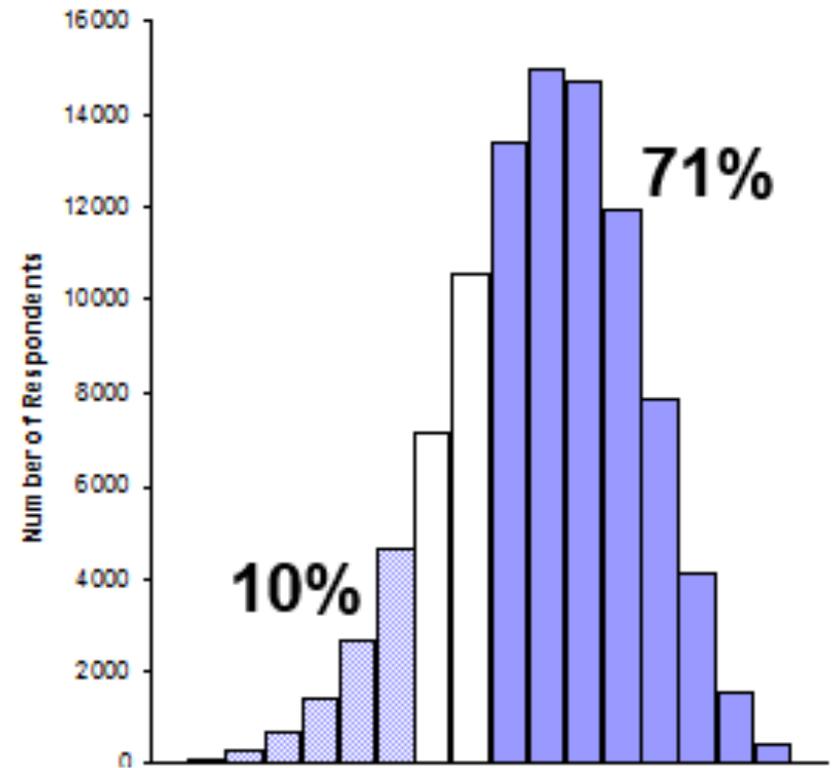


# Same for Men and Women (unless...)

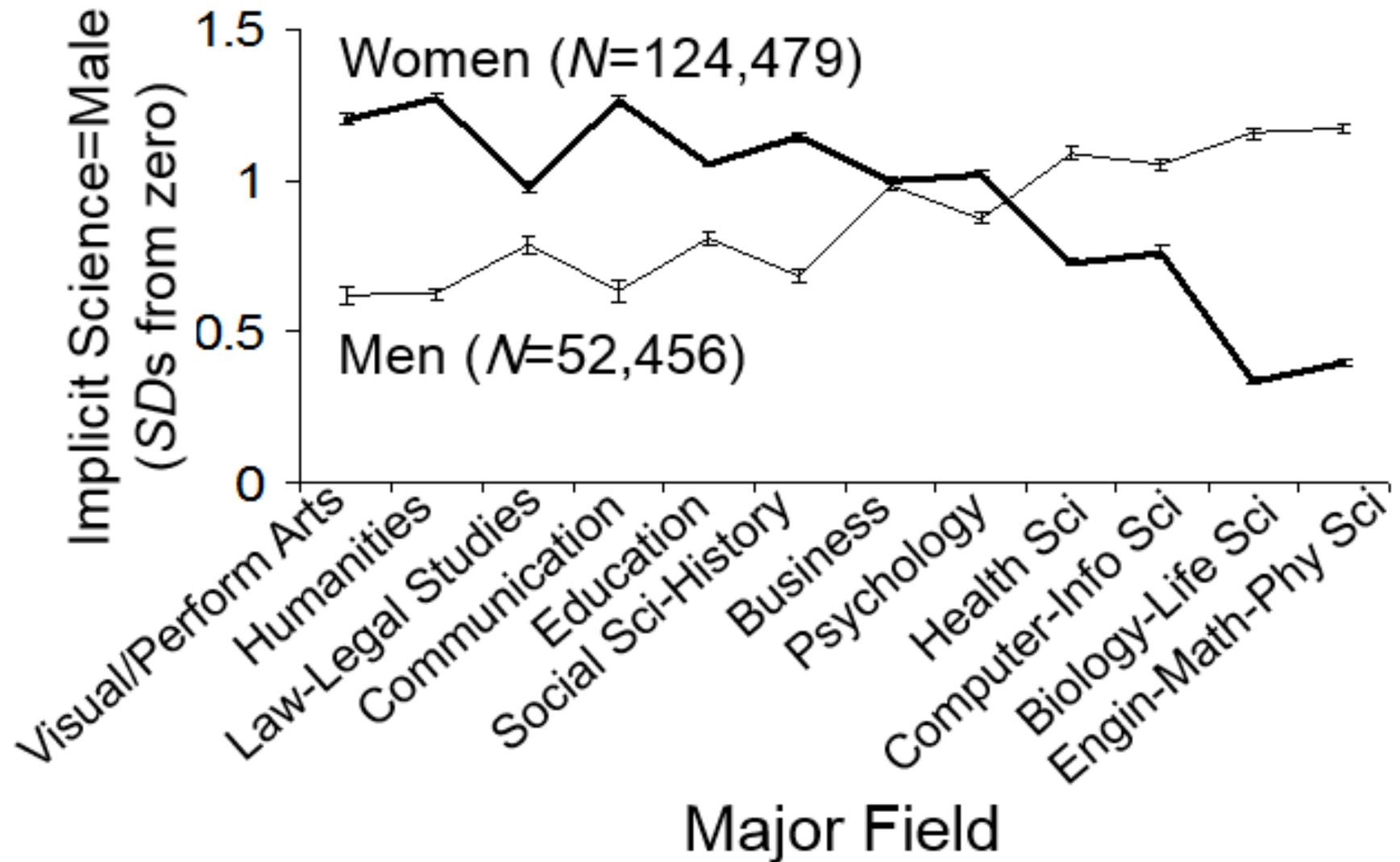
## Male Respondents



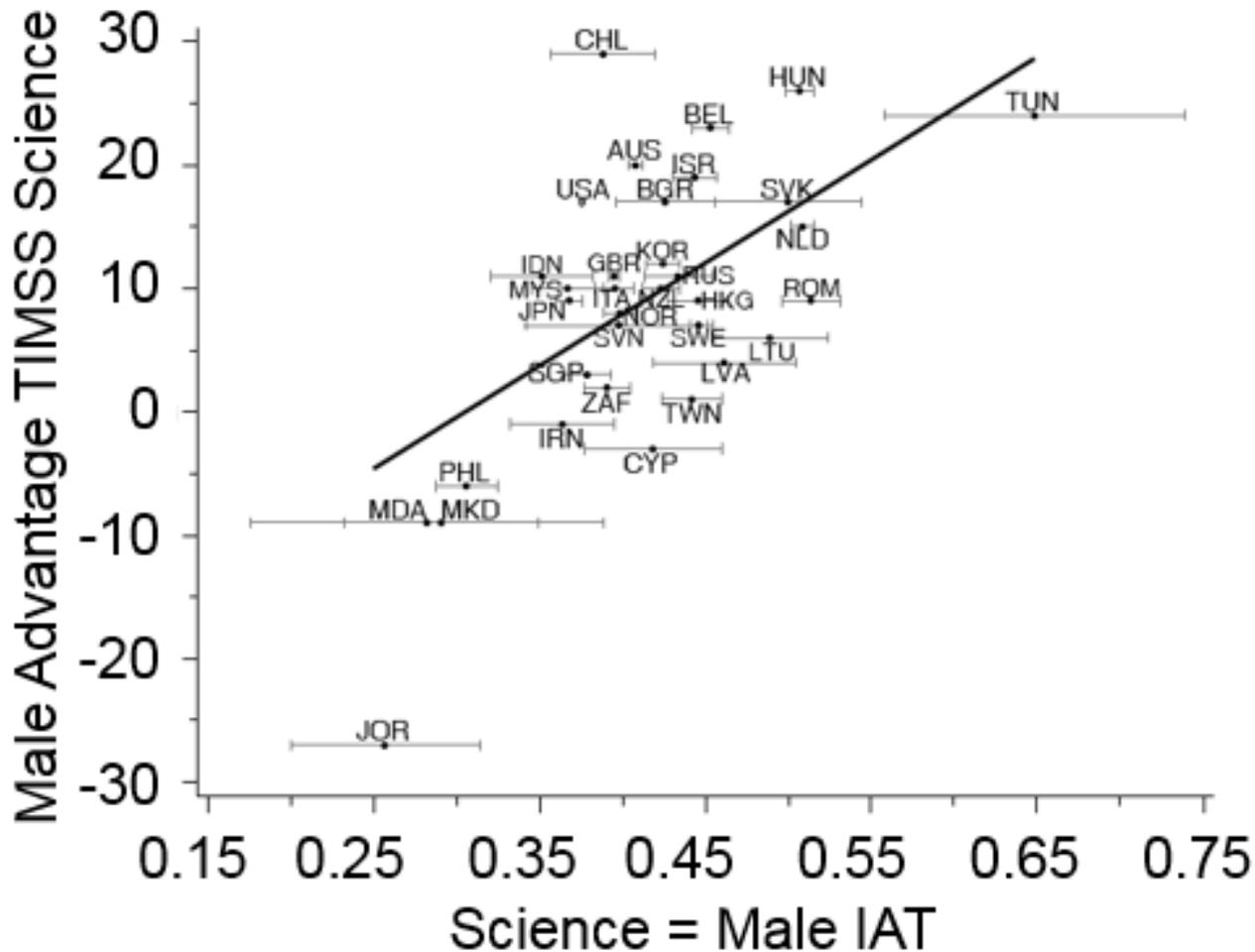
## Female Respondents



# Academic Identity Matters



# Greater 8th-grade Boys' Advantage correlated with greater country-level implicit bias, $r = .60$



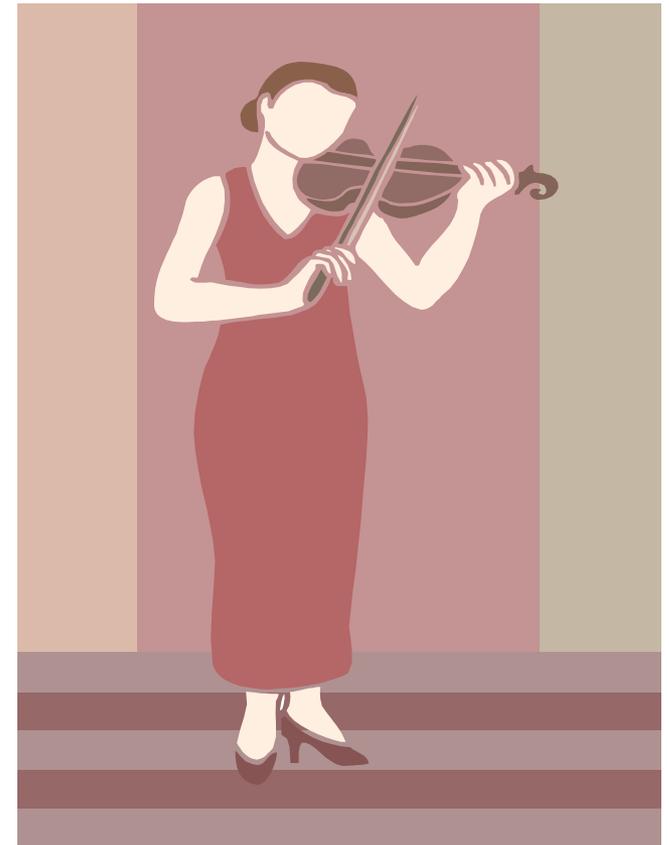
# Implicit Bias Can Affect Evaluation

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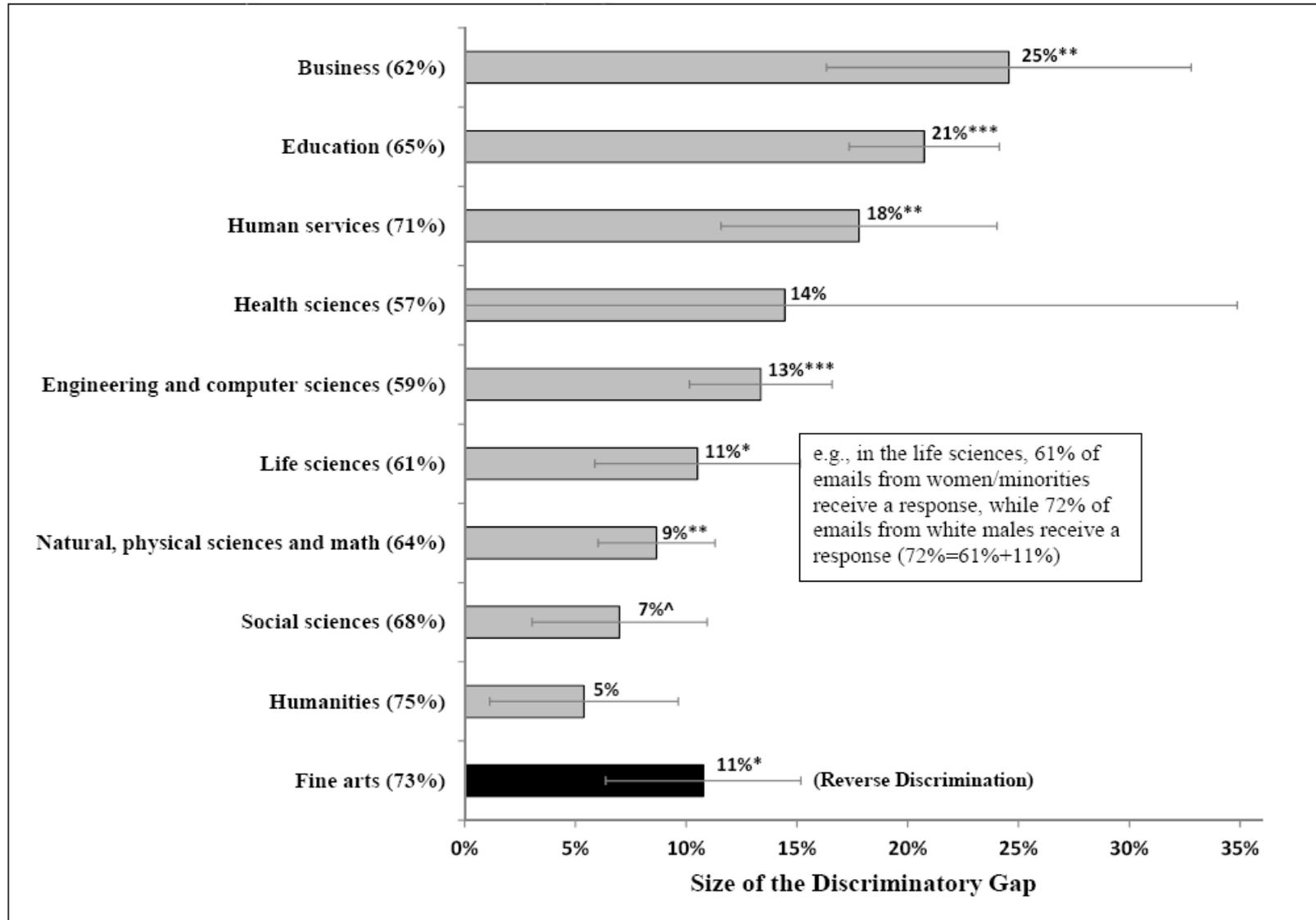
- Blind auditions
- Evaluation of student inquiries
- Evaluation of resumes
- Evaluation of CVs
- Evaluation of fellowship applications
- Letters of recommendation

## Blind Auditions: Gender

Records from major US symphony orchestras from 1970-1996: Audition data from 14,000 individuals show the use of a screen increases the probability that a woman will advance from preliminary rounds by 50%. Roster data from 11 major orchestras show the switch to blind auditions accounts for 30% of the increase in the proportion of women among new hires.



# Implicit Bias: Responses to White Males vs. Other Students



## Unconscious Implicit Bias: Hiring and Promotion

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- Both men and women are significantly more likely to rank a perceived man higher than a perceived woman, using identical resumes.

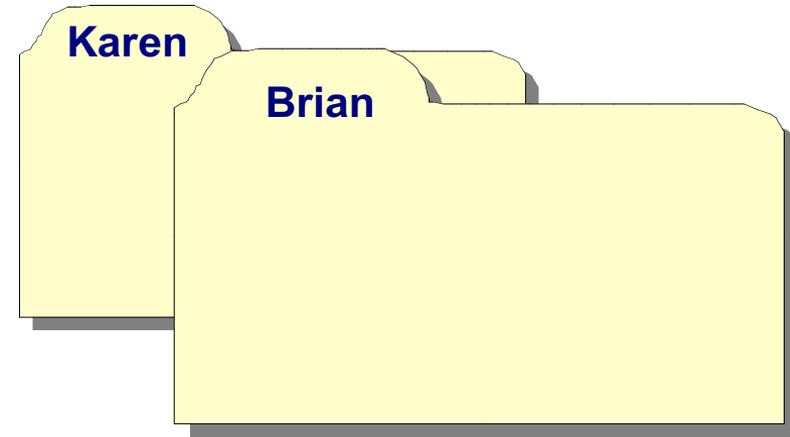
Fidell, L. S. (1970). *Amer. Psych.* 25, 1094-1098.

Steinpreis, R.E., Ritzke, D., and Anders, K.A. (1999). *Sex Roles*, 41, 509-528.

Moss-Racusin et al., *PNAS*, "Science faculty's subtle gender bias favors male students", 2012 [www.pnas.org/cgi/doi/10.1073/pnas.1211286109](http://www.pnas.org/cgi/doi/10.1073/pnas.1211286109)

# Evaluation of Identical CVs: Gender

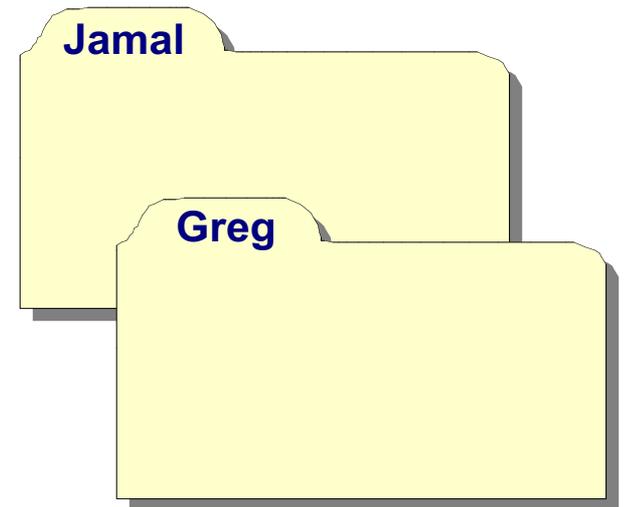
- When evaluating identical application packages, both male and female University psychology professors preferred 2:1 to hire “Brian” over “Karen” as an assistant professor.
- When evaluating a more experienced record (at the point of promotion to tenure), reservations were expressed four times more often when the name was female.



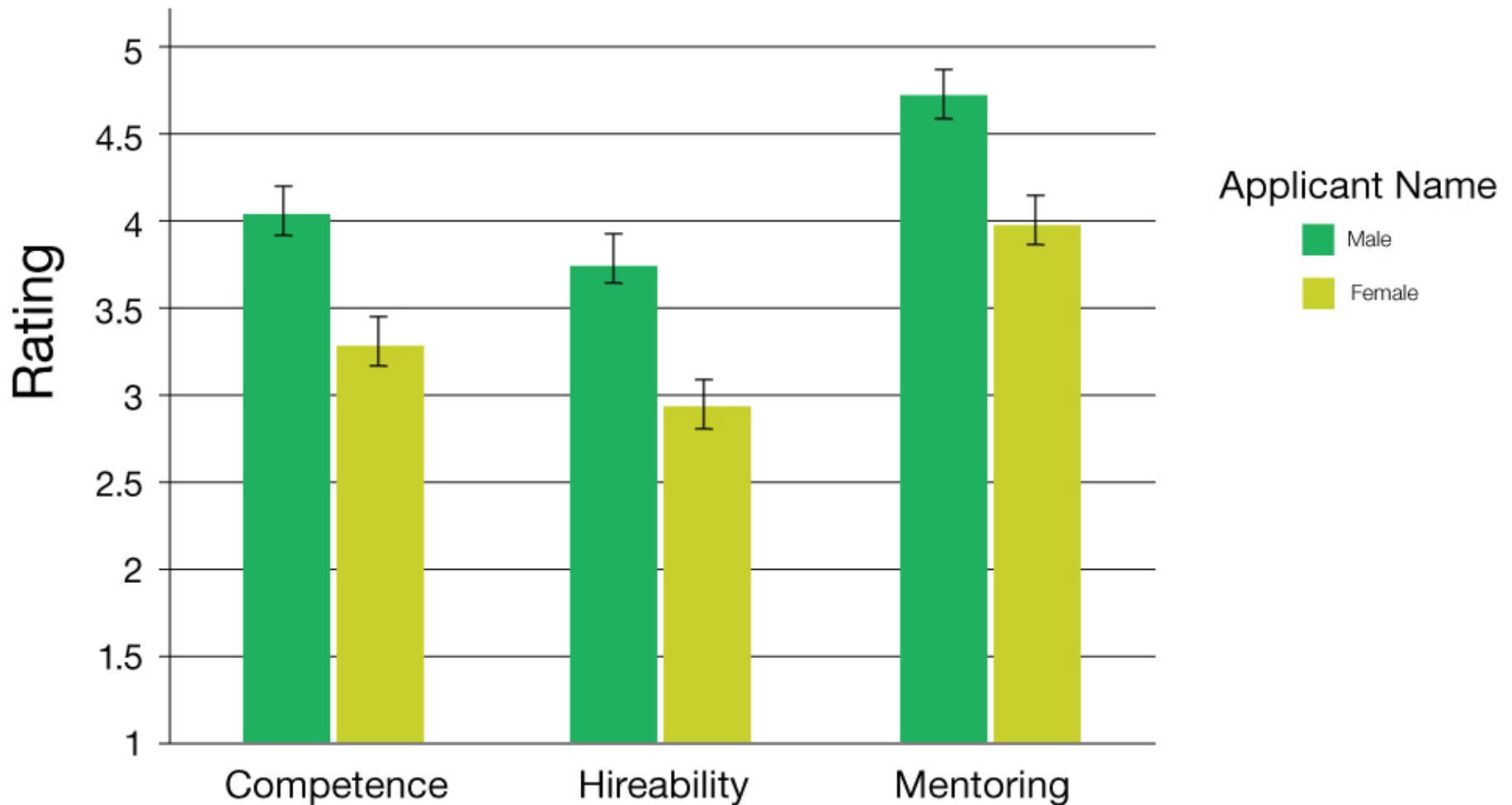
Science faculty's subtle gender biases favor male students  
Corinne A. Moss-Racusina,<sup>b</sup> John F. Dovidio,<sup>b</sup> Victoria L. Brescoll,<sup>c</sup> Mark J. Graham,<sup>d</sup> and Jo Handelsman,  
PNAS (2012)

# Evaluation of Identical Resumes: Race

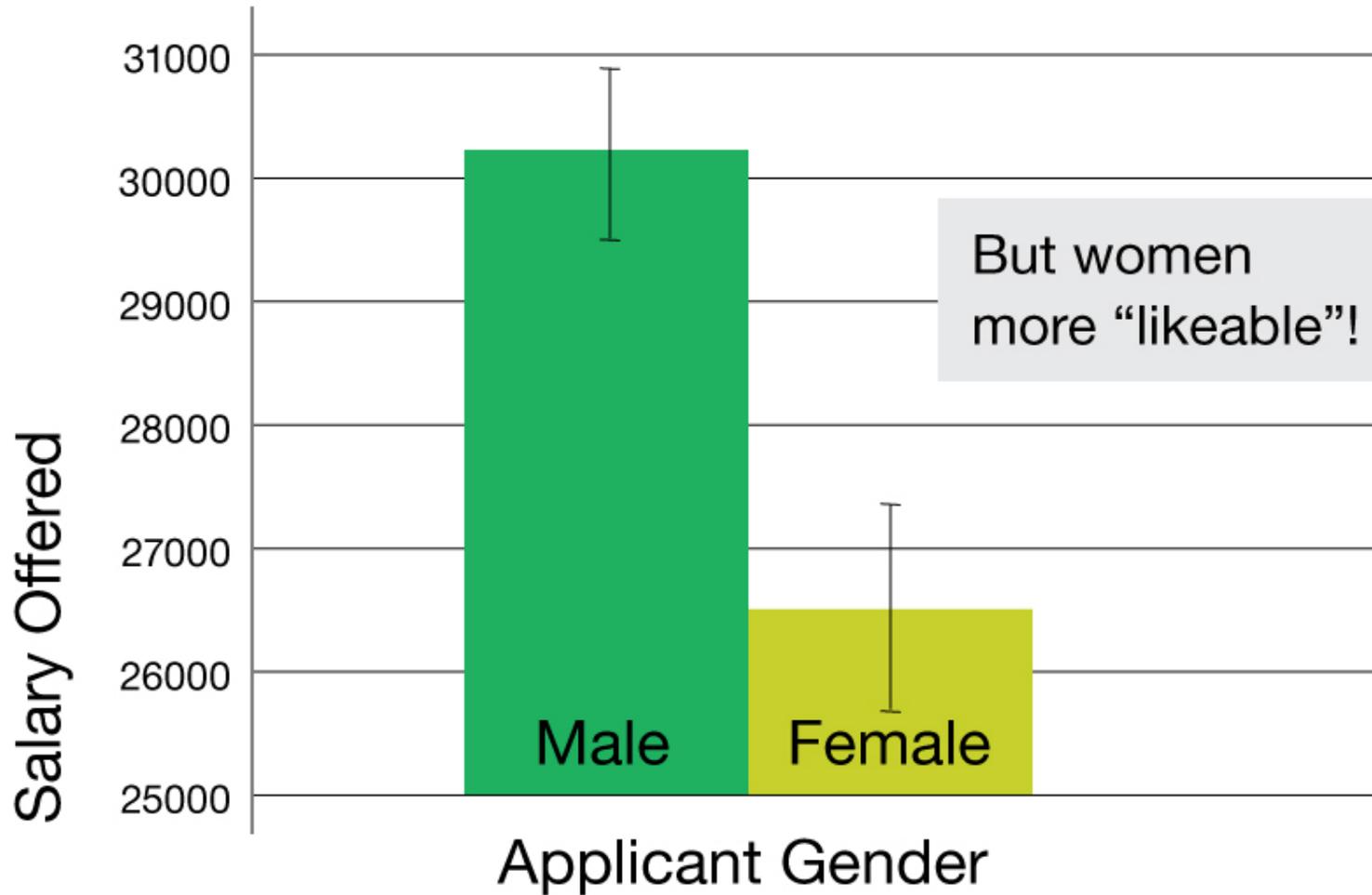
- Applicants with African American-sounding names had to send 15 resumes to get a callback, compared to 10 needed by applicants with white-sounding names.
- White names yielded as many more callbacks as an additional eight years of experience.



# STEM Faculty's judgments of lab manager applicant



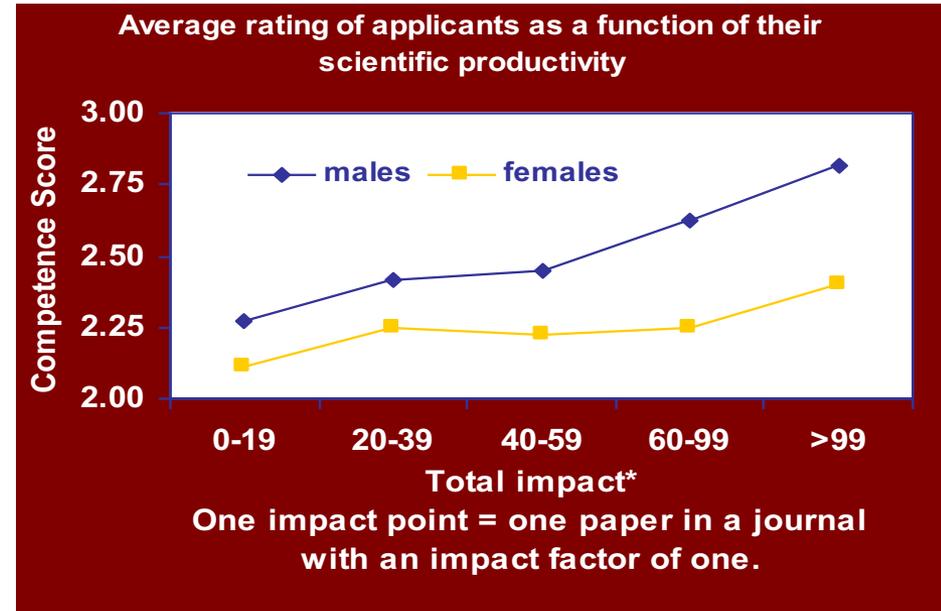
# Salary Offered



# Evaluation of Fellowship Applications: Gender

“...the success rate of female scientists applying for postdoctoral fellowships at the [Swedish Medical Research Council] during the 1990s has been less than half that of male applicants.”

Women applying for a post- doctoral fellowship had to be 2.5 times more productive to receive the same reviewer rating as the average male applicant.



## Similar findings:

- USA/GAO report on Peer Review in Federal Agency Grant Selection (1994)
- European Molecular Biology Organization Reports (2001)
- NIH Pioneer Awards: Journal of Women's Health (2005) & Nature (August 2006)

# Differences in Letters of Recommendation for Successful Medical School Faculty Applications

## Letters for men:

- Longer
- More references to:
  - CV
  - Publications
  - Patients
  - Colleagues



## Letters for women :

- Shorter
- More references to personal life
- More “doubt raisers” (hedges, faint praise, and irrelevancies)

*“It’s amazing how much she’s accomplished.”*

*“It appears her health is stable.”*

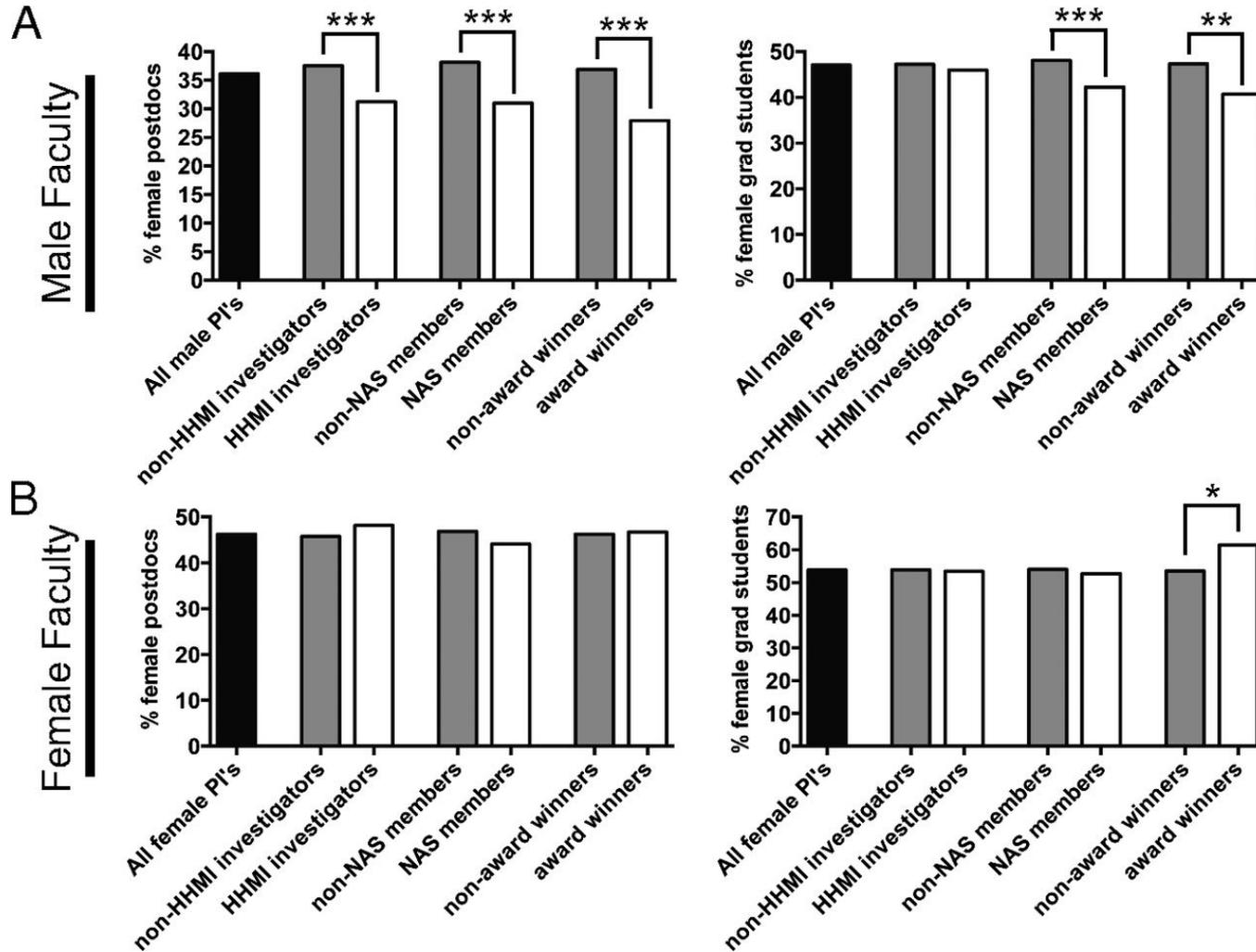
*“She is close to my wife.”*

# Critical Mass Affects the Use of Schemas

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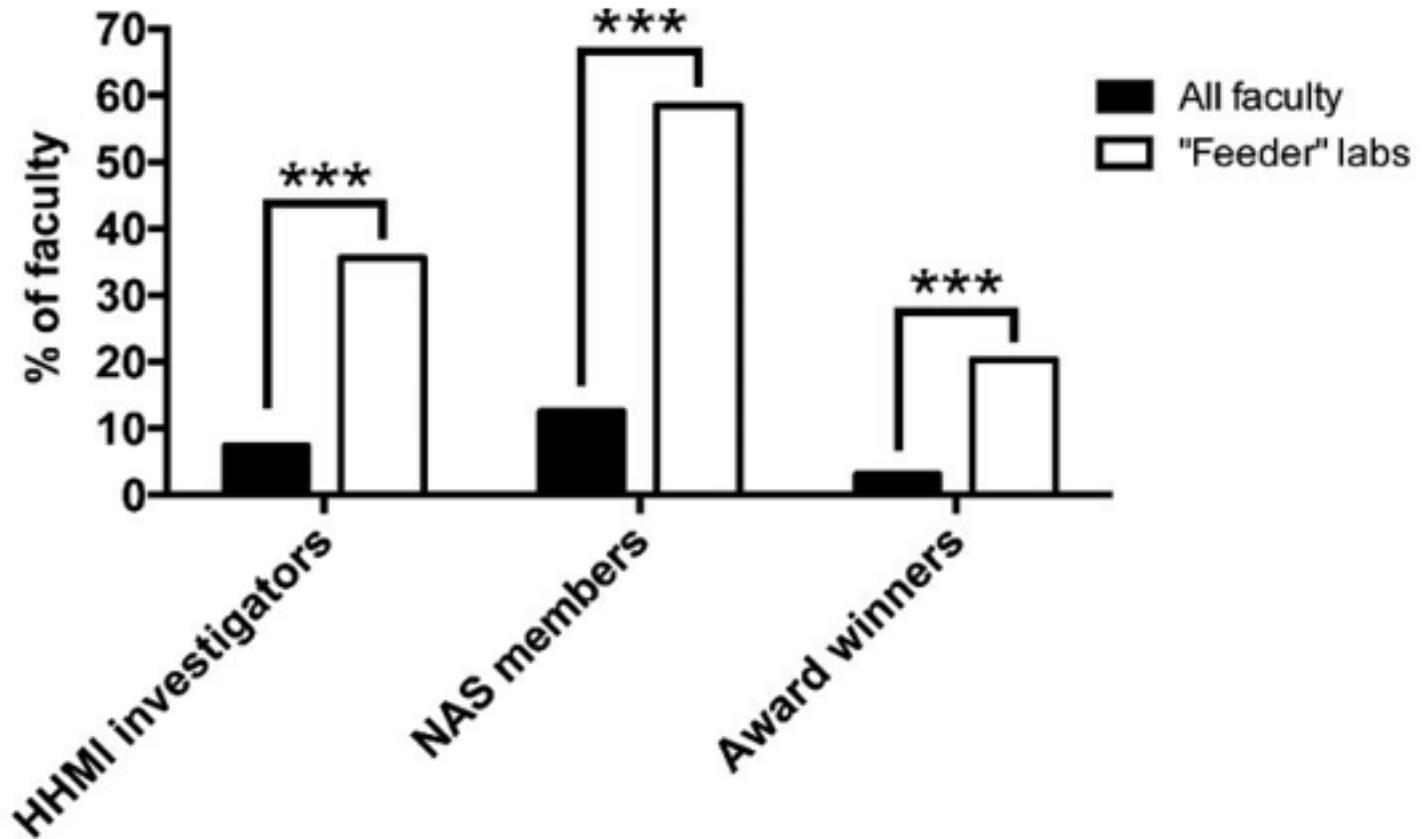
- When there are many individuals, we differentiate among them and cannot rely on group-based schemas.
- In both experimental and field settings, increasing the female share of those being rated increased ratings of female applicants and employees.

# The Gender Composition of Elite Biological Laboratories in the U.S.

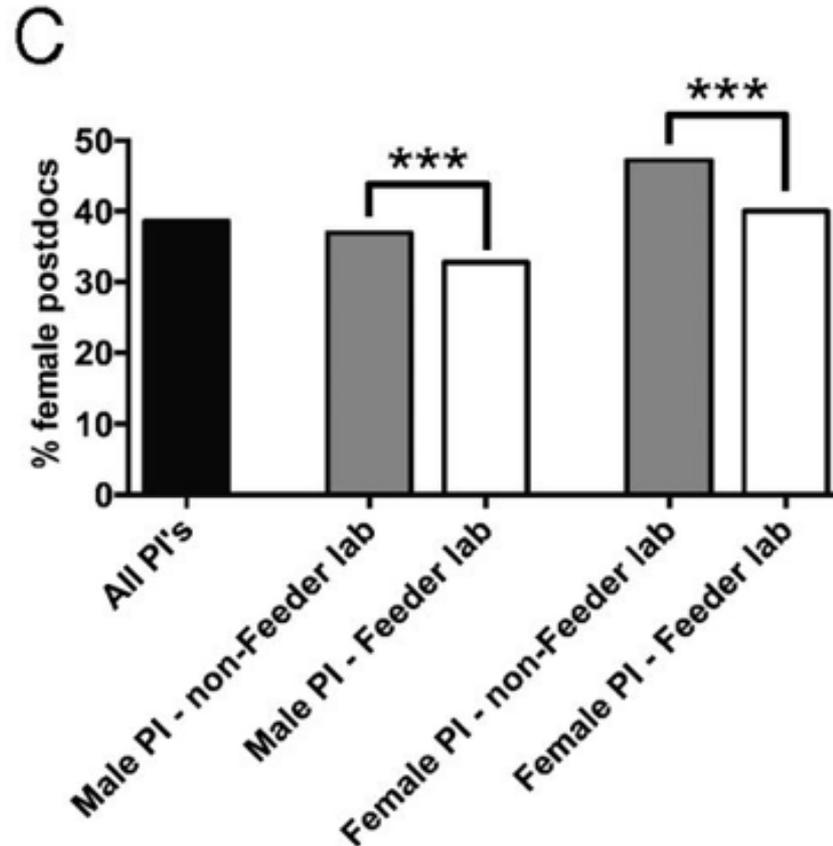
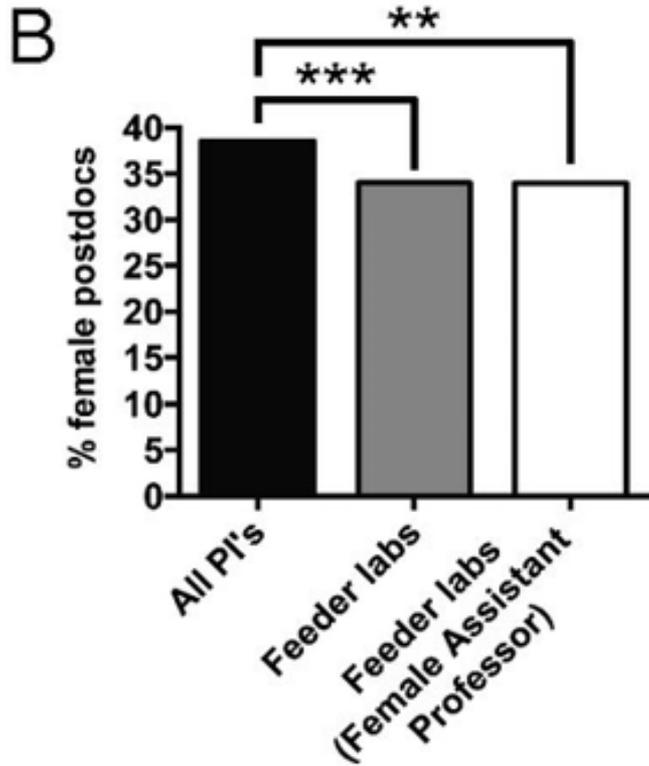


# Feeder Laboratories Train Fewer Female Postdocs

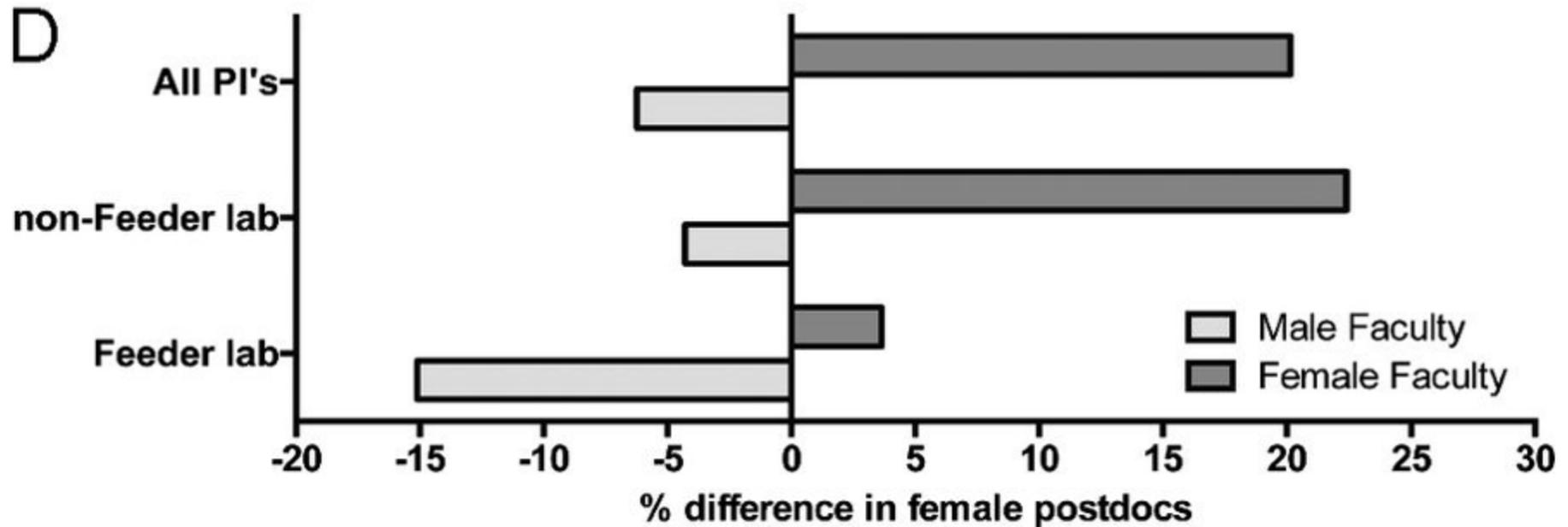
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# Feeder Laboratories Train Fewer Female Postdocs



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# Impact of Schemas on Leadership

- With single sex groups, observers identify the person at the head of the table as the leader.
- With mixed sex groups
  - a male seated at the head of the table is identified as the leader.
  - a female seated at the head of the table is identified as the leader only half the time (and a male seated somewhere else is identified the other half).



# Impact of Schemas about Parenthood

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Assumptions about the implications of motherhood for women's career commitment have consequences, despite recent data showing that:

- Women academics who marry and have families publish as many articles per year as single women.
- "...net sex differences in productivity are small to nil once other personal characteristics, structural settings, and facilitating resources are taken into account." – Xie and Shauman

Yu Xie and Shauman (2003) *Women in science: Career processes and outcomes*.

Cole and Zuckerman (1987) *Scientific American* 256 (2), 119-125.

Boushey (2005) Center Economic Policy & Research

# Schemas do...

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- Allow efficient, if sometimes inaccurate, processing of information.
- Often conflict with consciously held or “explicit” attitudes.
- Change based on experience/exposure.

**Nosek, Banaji, & Greenwald (2002). Group Dynamics: Theory, Research and Practice, 6, 101-115.**

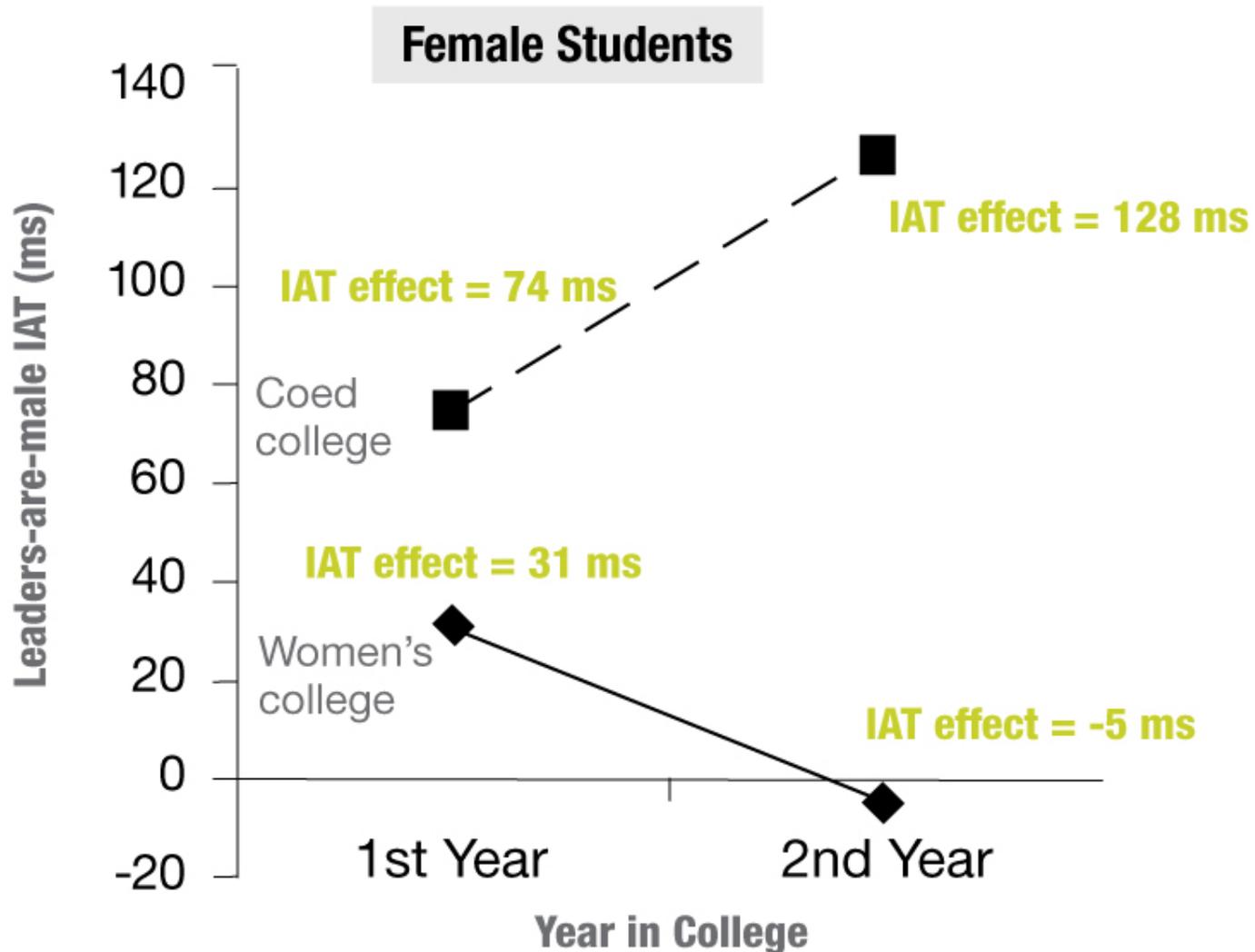
**Fiske, Cuddy, Glick, & Xu (2002). Journal of Personality and Social Psychology, 82(6), 878-902.**

## Strategies for Breaking the Cycle

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- Increase conscious awareness of bias and how bias leads to overlooking talent
  - Implicit Association Test:  
<https://implicit.harvard.edu/implicit/> Greenwald, McGhee & Schwarz, 1998
- Develop more explicit criteria (less ambiguity)
- Alter departmental policies and practices

# Exposure to Female Professors Undoes Implicit Bias



# Take Homes

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1. Diversity fosters excellence
2. Implicit bias affects evaluation
3. Implicit biases can change
4. Self-concepts and environments matter

# Acknowledgements

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- Society for Neuroscience
- Fred Smyth, University of Virginia