Increasing Women in Neuroscience (IWiN) Toolkit

Implicit Bias

Created by the Professional Development Committee of the Society for Neuroscience
Overview

- 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

U.S. & CANADA
- Women: $60,269
- Men: $73,622
- Overall: $68,361

OCEANIA
- Women: $39,880
- Men: $40,196
- Overall: $39,654

EUROPE
- Women: $42,299
- Men: $49,984
- Overall: $48,689

LATIN AMERICA
- Women: $85,807
- Men: $104,006
- Overall: $95,026
## Full Time Faculty Member Salaries in the United States

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

THE PERSISTENT GAP

Average Compensation in U.S.

- Female
- Male

<table>
<thead>
<tr>
<th>Position</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab manager</td>
<td>$54,981</td>
<td>$55,587</td>
</tr>
<tr>
<td>Lab technician</td>
<td>$44,225</td>
<td>$63,588</td>
</tr>
<tr>
<td>Graduate student</td>
<td>$28,226</td>
<td>$28,287</td>
</tr>
<tr>
<td>Postdoc</td>
<td>$46,140</td>
<td>$46,372</td>
</tr>
<tr>
<td>Assistant professor</td>
<td>$85,259</td>
<td>$79,616</td>
</tr>
<tr>
<td>Associate professor</td>
<td>$106,483</td>
<td>$107,868</td>
</tr>
<tr>
<td>Professor</td>
<td>$140,482</td>
<td>$158,059</td>
</tr>
</tbody>
</table>
THE PERSISTENT GAP

Average Compensation in U.S.

Female  Male

Bachelor-level science/engineering degree: $54,964  $61,620
Master-level science/engineering degree: $68,644  $82,556
Doctoral science/engineering degree: $93,669  $116,950
Why do we need to recruit a diverse faculty in order to attain excellence?

- 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?

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...

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)
### 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

“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

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

![Bar chart showing the distribution of participants in the Science gender stereotype study. The chart indicates that 70% of participants believe that males are better at science, while 10% believe that females are better.](image-url)
Same for Men and Women (unless…)

Male Respondents

Female Respondents

11% 70% 71%

10%
Academic Identity Matters

Women ($N=124,479$)

Men ($N=52,456$)

Major Field
Greater 8th-grade Boys’ Advantage correlated with greater country-level implicit bias, $r = .60$
Implicit Bias Can Affect Evaluation

- 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

- **Business (62%)**: 25%**
- **Education (65%)**: 21%***
- **Human services (71%)**: 18%**
- **Health sciences (57%)**: 14%
- **Engineering and computer sciences (59%)**: 13%***
- **Life sciences (61%)**: 11%*
- **Natural, physical sciences and math (64%)**: 9%**
- **Social sciences (68%)**: 7%`
- **Humanities (75%)**: 5%
- **Fine arts (73%)**: 11%* (Reverse Discrimination)

*In the life sciences, 61% of emails from women/minorities receive a response, while 72% of emails from white males receive a response (72%=61%+11%)*
Unconscious Implicit Bias: Hiring and Promotion

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

Moss-Racusin et al., *PNAS*, “Science faculty’s subtle gender bias favors male students”, 2012 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.

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

- Competence: Male (4.2) vs. Female (3.0)
- Hireability: Male (3.8) vs. Female (3.0)
- Mentoring: Male (4.5) vs. Female (3.5)

Moss-Racusin et al., 2012
Salary Offered

But women more “likeable”!

Moss-Racusin et al., 2012
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 postdoctoral 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)

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

• 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.

A

Male Faculty

<table>
<thead>
<tr>
<th></th>
<th>% female postdocs</th>
<th>% female grad students</th>
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<tbody>
<tr>
<td>All male PIs</td>
<td></td>
<td></td>
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<tr>
<td>non-HHMI investigators</td>
<td></td>
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Female Faculty

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Sheltzer J M, and Smith J C PNAS 2014;111:10107-10112
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

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

Schemas do...

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

Strategies for Breaking the Cycle

• Increase conscious awareness of bias and how bias leads to overlooking talent
  • Implicit Association Test: [https://implicit.harvard.edu/implicit/](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

![Graph showing the effect of exposure to female professors on implicit attitudes towards leadership gender]

- **Female Students**
  - Coed college: IAT effect = 74 ms
  - Women’s college: IAT effect = 31 ms
  - IAT effect = -5 ms

**Year in College**
- 1st Year
- 2nd Year

**IAT effect**
- 128 ms

**Sources**
- Courtesy: Frederick L. Smyth, UVA, 2013
- Dasgupta & Asgari, 2004
Take Homes

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

• NSF ADVANCE PROGRAM
• Pamela Raymond, ADVANCE Program at the University of Michigan, Strategies and Tactics for Recruiting to Improve Diversity and Excellence (STRIDE)
• Society for Neuroscience
• Fred Smyth, University of Virginia