BATTLING THE BIAS

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NASA Hi-C rocket launch at White Sands on July 11, 2012
Few million degrees

Few thousand degrees
American Astronomical Society Committee on the Status of Women in Astronomy

Mission: Help create a climate of equal opportunity in all aspects of astronomy including hiring, promotion, salary, and access to research opportunities.

Website: http://www.aas.org/cswa/
CSWA

- Weekly eNewsletter: AASWOMEN
- WomenInAstronomy Blogspot
- Facebook
- Twitter: follow "AAS CSWA" or @AAS_Women
CSWA Topics:

- Unconscious Bias
- Stereotype Threat
- Impostor Syndrome
- Family Leave Policies
- Childcare for Graduate Students and Postdocs
- Workplace Bullying in Astronomy
- Increasing Diversity in Your Department
- Mentoring/Networking Groups
- What Can Men Do to Help Women Succeed in Astronomy?
- Strategies for Addressing Harassment and Prejudice
- Longitudinal Study of Astronomy Grad Students
- Two-Body Problem
Unconscious Bias

- Expectations or stereotypes influence our judgments of others (regardless of our own group).
- Gender:
  - Men judging women; women judging women
  - Men and women BOTH downplay the contributions of women
- Race/ethnicity
  - Whites judging minorities; minorities judging minorities
  - Whites and minorities BOTH downplay the contributions of minorities
- Unconscious bias is NOT discrimination
Schema

- A well-dressed businessman draws a knife on a vagrant.

- The onlookers may (and often do) "remember" the vagrant pulling the knife.

- Results of these studies are starting to question the reliability of eye witnesses.

From Wikipedia, the free encyclopedia
Schemas ...

- Influence group members’ expectations about how they will be judged.
- Allow efficient, if sometimes inaccurate, processing of information.
- Often conflict with consciously held or “explicit” attitudes.
- Change based on experience/exposure.

Schemas are applied more often under circumstances of:

- Lack of critical mass
- Time pressure
- Stress from competing tasks
- Ambiguity (including lack of information)

When Do Schemas Affect Evaluation Outcomes?

- Resumes
- Job credentials
- Fellowships
- Hiring
- Awards
- Promotion
- Proposal Reviews
Example: America’s Symphony Orchestras

- **1970s:** women were rare in the upper echelons of the classical music profession
- **1980:** premiere orchestras – Boston, Cleveland, NY, Chicago & Philadelphia – only 10% women
- Despite a pool of well-qualified graduates from places like Juilliard – ~45% women.
Schema: Virtuoso = Male

- “The more women, the poorer the sound.”
- “Women have smaller techniques than men.”
- “Women are more temperamental than men and more likely to demand special attention.”
- “I just don’t think women should be in an orchestra.” — Zubin Mehta
Blind Audition

- During auditions: screen inserted between musician and judge
- Results: % women in America’s major symphony orchestras increases to >40%!

Virtuoso = Male

What is the science equivalent of the blind audition?
Unconscious Bias: Gender

- Teams of male and female university psych profs (search committees)
- Evaluate candidates for an open position (assist prof of psych)
- Application packages for Karen and Brian are identical except for name
- Search committees preferred 2:1 to hire Brian over Karen
- When evaluating a more experienced record (tenure), reservations expressed 4 times more often when the name was female.

Unconscious Bias: Science

- Evaluate candidates for a lab manager position (competent, not stellar).
- On a scale of 1 to 7 (7 highest) professors gave John a score of 4.0 for competence and Jennifer 3.3.
- John was viewed more favorably as someone they would hire or mentor.
- Average starting salary: Jennifer $26,508; John $30,328.
- The bias had no relation to the professors’ age, sex, teaching field, or tenure status.

Implicit Association Test

- Think unconscious bias = conscious prejudice?
- Think you don’t have unconscious biases?
- Try taking the Harvard Implicit Association Test: https://implicit.harvard.edu/implicit/
- And be prepared to think again!
Critical Mass Affects 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.

Why So Few? presents evidence that social and environmental factors contribute to the underrepresentation of women and girls in STEM.

Eight research findings in three areas:

- How social and environmental factors shape girls’ achievements and interests in math and science
- The climate of college and university science and engineering departments
- Continuing influence of bias

To download the report: www.aauw.org
Other Hidden Obstacles

- **Stereotype threat**: the anxiety women face in a situation where they have the potential to confirm a negative stereotype about women as a group.
  - This anxiety alone can result in documented cases of lower scores on standardized math tests.

- Highly competent women may also face *impostor syndrome* where they find it impossible to believe in their own competence.
  - They live with a fear of being discovered.
Students are selected based on their excellent math SAT scores and divided randomly into two groups.

Both groups are given a math test of GRE level problems:

- Group 1: test given under normal "GRE-type" conditions
- Group 2: told specifically that this test was designed to be gender neutral
Stereotype Threat: Results

- Results for Group 1: men and women got the same average score
- Results for Group 2: women did significantly better than men. Why?
  - On the SAT test, they got scores equal to the men, but with stereotype threat
  - On the GRE test, there was no stereotype threat, so they performed at their “real” level
Impostor Syndrome: the Article

Status Magazine (Jan ’11)
By Rachel Ivie and Arnell Ephraim (AIP)
Women and the Impostor Syndrome in Astronomy

http://www.aas.org/cswa/status/STATUS_jan11_FINAL_s.pdf
Impostor Syndrome: the Post

Women in Astronomy Blogspot

John Johnson

I remember waking up in a cold sweat one night in early 2010, about six months after I joined the faculty at Caltech.

Gender differences in self-assessment

Does this rectangle have more black or more white?

Fictitious measure of “contrast-sensitivity ability”
Self-Assessment of Ability, by Gender

- Women: 55.3%
- Men: 47.1%

When Subjects Are Told...

How high would you have to score to be convinced that you have high ability in this task?

When Subjects Are Told …

Self-Assessment of Ability, by Gender

<table>
<thead>
<tr>
<th>Women</th>
<th>Men</th>
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<tbody>
<tr>
<td>55.3%</td>
<td>41.1%</td>
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“When Men are better at this task”

<table>
<thead>
<tr>
<th>Women</th>
<th>Men</th>
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<tbody>
<tr>
<td>47.1%</td>
<td>47.2%</td>
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</table>

“When There is no gender difference in performing this task”

Students’ Standards for Their Own Performance, by Gender

<table>
<thead>
<tr>
<th>Women</th>
<th>Men</th>
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<tbody>
<tr>
<td>88.9%</td>
<td>82.4%</td>
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“When Men are better at this task”

<table>
<thead>
<tr>
<th>Women</th>
<th>Men</th>
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<tbody>
<tr>
<td>79.3%</td>
<td>83.1%</td>
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“When There is no gender difference in performing this task”

When Subjects Are Told …

Findings

- Girls are “harder on themselves” when assessing their abilities in “male” fields like science and math

Remedy:
- Set clear performance standards
- Help women recognize their career-relevant skills
What Can We Do about Unconscious Bias?

- Awareness
- Policies
- Practices
- Accountability
The Physics Workforce of the Future

Excellence has no gender or race or sexual orientation