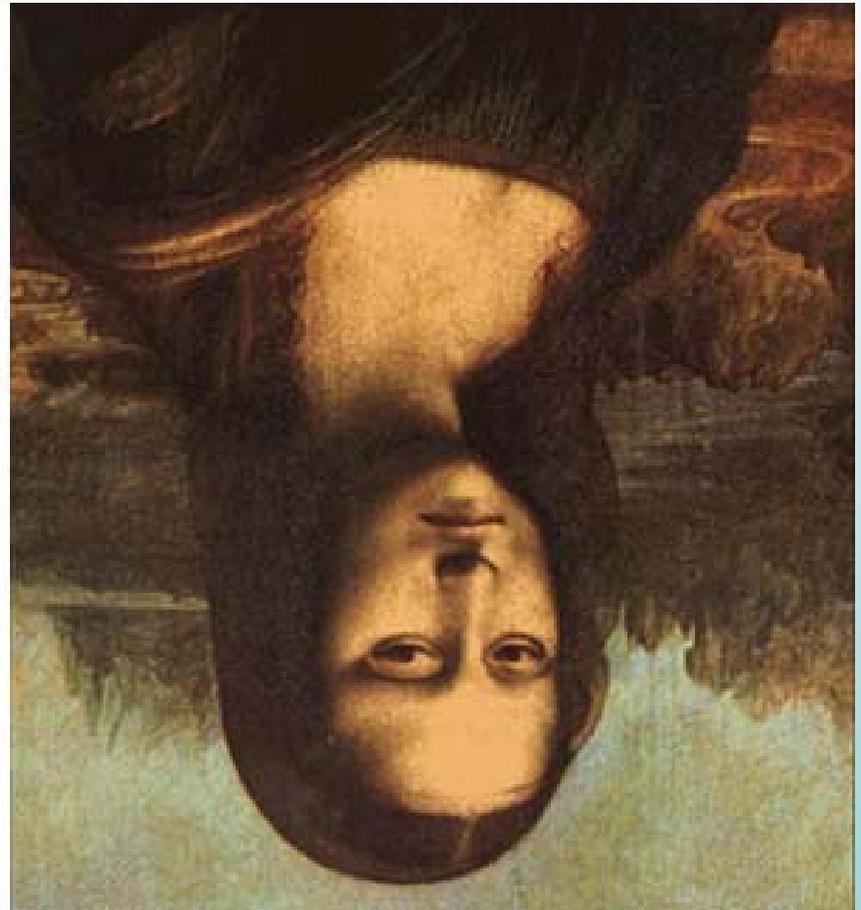


Mind bugs:

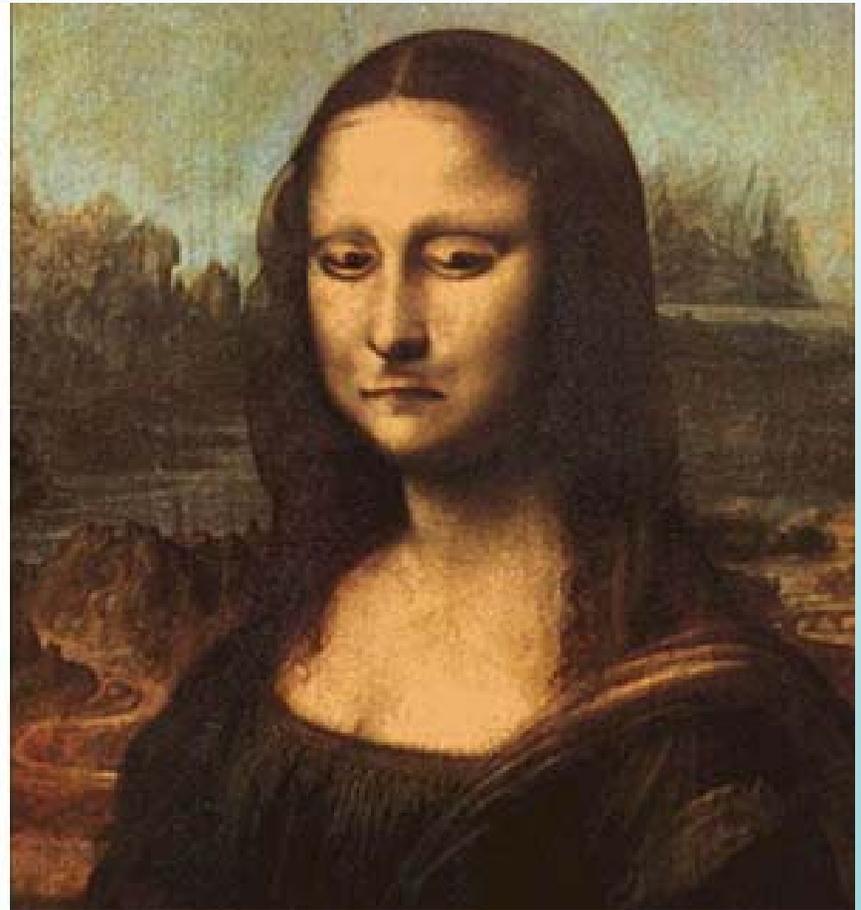
How implicit bias affects teaching and learning

Nilanjana (Buju) Dasgupta
University of Massachusetts, Amherst

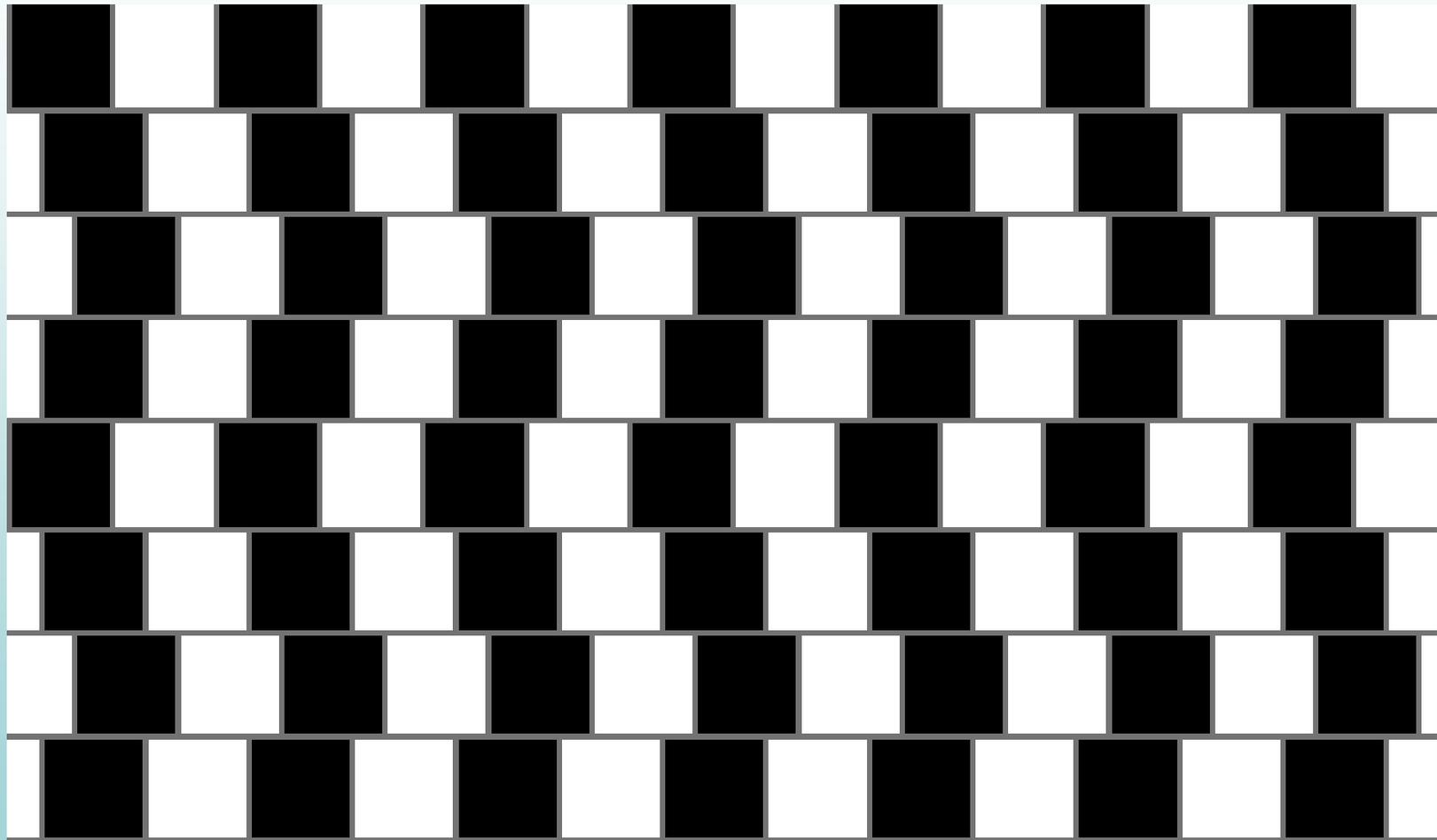
Same or different?



Mona Lisa right side up



Parallel or crooked?



Gregory & Heard, P. (1979, *Perception*).

Mind bugs are normal and ordinary

- The way we perceive, judge, and remember is often full of errors.
Feeling confident \neq being accurate
- What we already know affects what we see. Preconceived expectations influence current judgments
- Mind bugs are ordinary because they are by-products of normal mental processes (memory, perception, learned associations)
- Ordinary because *all* of us are prone to these errors
- Ordinary because errors are unintentional, occur without awareness or control

Learned associations can produce mind bugs

- Some concepts automatically go together in our mind because we've learned these associations simply by being immersed in society
- E.g., learned association between color concepts and specific words. It's fast, automatic, requires no conscious thought

Name the colors

SLB

CFLTK

CFLTK

SPRND

HLMG

CFLTK

SLB

SPRND

SLB

SPRND

HLMG

CFLTK

HLMG

SPRND

CFLTK

Name the colors

RED

GREEN

YELLOW

BLUE

GREEN

BROWN

RED

YELLOW

BLUE

BROWN

BROWN

BLUE

YELLOW

GREEN

RED

Learned associations between particular professions and types of people: Think *science and engineering* - who pops into mind?



**Learned association is that the successful person
in science and engineering is...**

Male

Mostly White

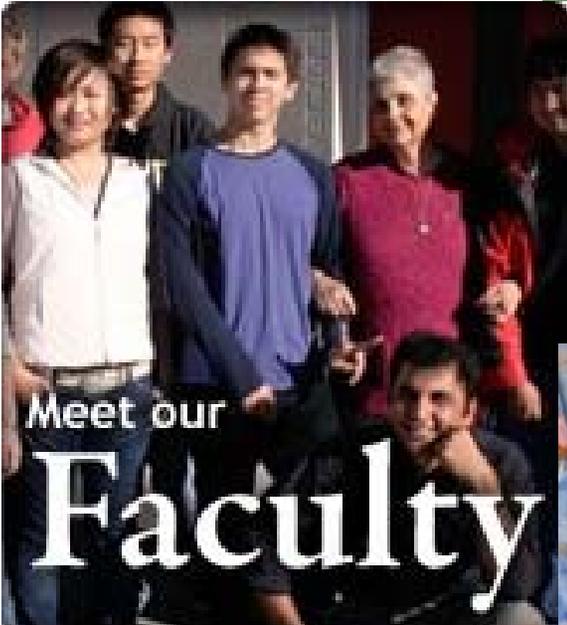
Sometimes Asian

Brainy

Nerdy

Geeky

Now think *humanities and arts* – who pops into mind?



**Learned association is that the successful person
in humanities & arts**

is...

Often female

White

Sometimes Black and Latino

Artistic

Creative

Intuitive

These learned associations about successful academics are mind bugs

- Why? because they go beyond the most important quality—*talent*—and assume that successful academics in any field fit a narrow demographic and narrow personality type
- Learned associations are *implicit stereotypes or implicit bias*
- Implicit stereotypes are *not* harmless or inconsequential
- They are unspoken expectations that have important effects on teaching and learning in the academy. Examples from 3 domains.
 1. Professors' evaluations of students
 2. Students' evaluations of professors
 3. Students' own academic and professional choices

Professors' evaluations of students

Implicit stereotypes influence professors' judgments about who is talented and likely to be successful

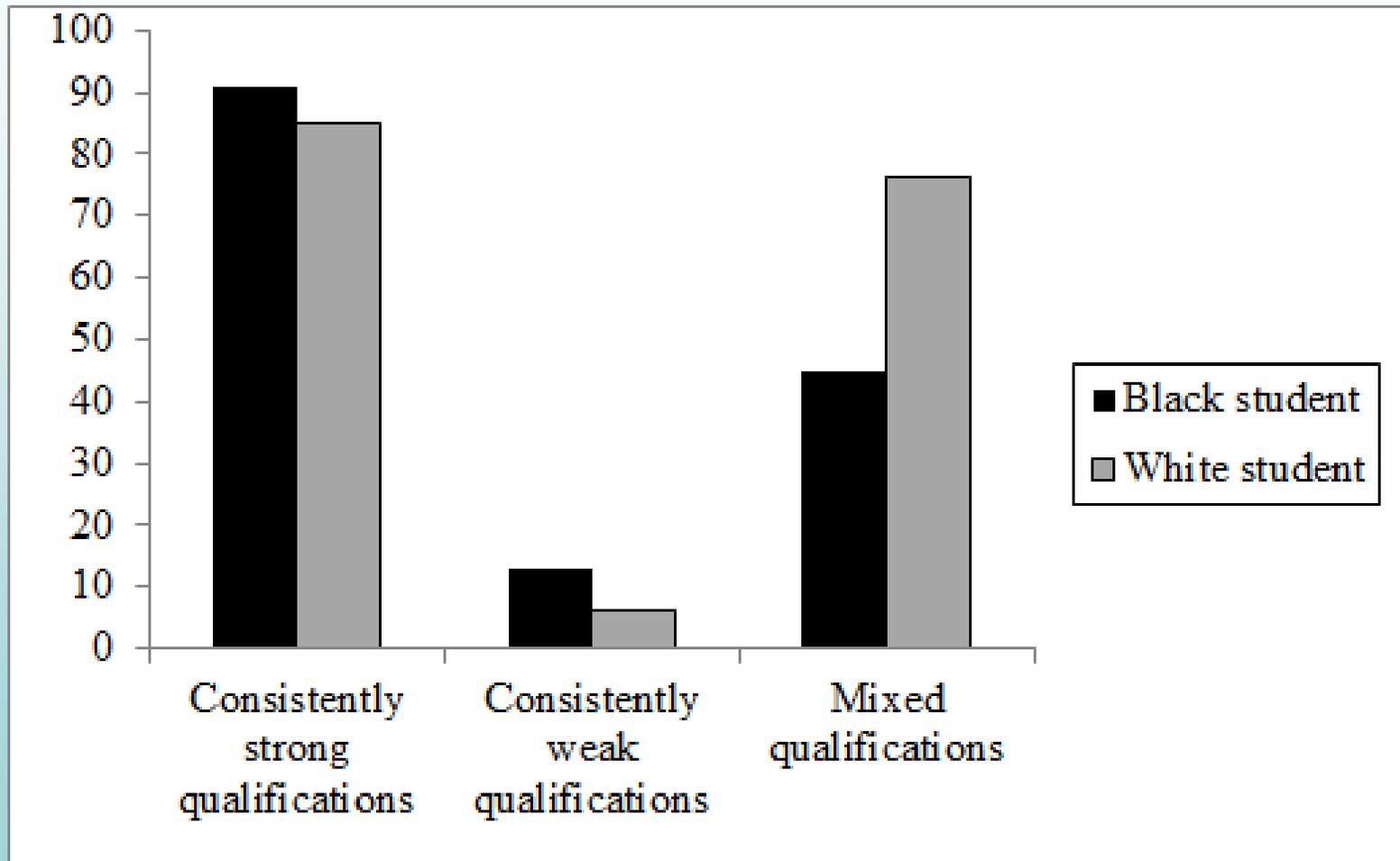
Implicit bias affects evaluations of students' academic ability

- People asked to evaluate the quality of a student based on his writing sample. How intelligent, thoughtful, hardworking, etc? (Amodio & Devine, 2006)
- Essay was accompanied by student's demographic info (19-year-old African American sophomore from Milwaukee, WI).
- Measured evaluators' implicit stereotypes about race. How quickly do people associate Black vs. White Americans with *mental ability* vs. *physical ability*. Also measured explicit racial attitudes
- Results: On average, people implicitly associated African Americans with physical ability more than mental ability
- Those who had stronger implicit stereotypes evaluated the Black student less favorably after reading his essay
- Evaluators' explicit racial attitudes did not influence student evaluations.

Implicit bias affects which student gets the benefit of the doubt

- Common to see students with mixed qualifications (some strengths, some weaknesses).
- Does implicit bias play a role in how we evaluate students with mixed or ambiguous qualifications?
- Asked people to evaluate students for a peer counselor position. Some applicants were strong on all dimensions; others were weak on all dimensions; and yet others had mixed record (Dovidio & Gaertner, 2002).
- Evaluators saw resume of 1 applicant and read an excerpt of this applicant's job interview. Asked to judge: How qualified is this person? Would you recommend hiring?
- Systematically varied race of each 3 applicants (Black or White).

How often did evaluators recommend hiring each student applicant? Did applicant's race matter?



Dovidio & Gaertner (2002), *Psychological Science*

Implicit bias influences how recommendation letters are written by faculty for students

- Letters for students emphasize different qualities depending on the students' group membership and stereotype of their group. E.g., gender stereotypes
- Analyzed recommendation letters written by faculty for 600+ medical students applying for residency. Also accessed students' objective performance records (Axelson et al, 2010)
- 56% male medical students, 44% female medical students
- Four types of qualities mentioned in the letters:
 - (1) academic proficiency (e.g., quick-learner, self-directed)
 - (2) task-oriented (e.g., motivated, conscientious)
 - (3) patient-centered (e.g., sensitive, respectful)
 - (4) positive emotions/personality (e.g., compassionate, enthusiastic)

Recommendation letters (cont'd)

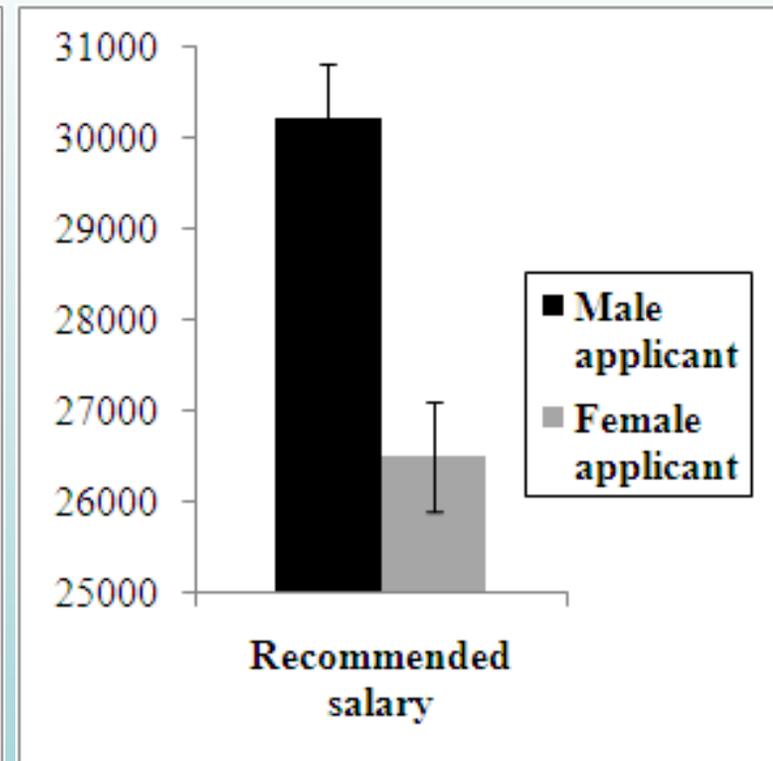
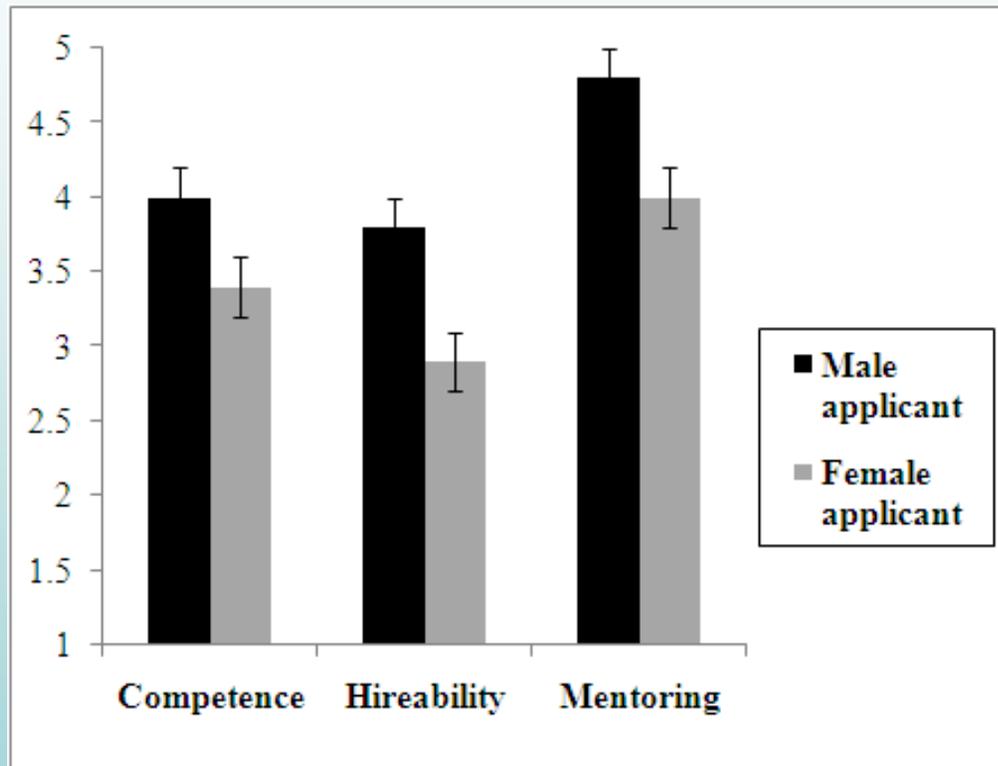
- Implicit gender bias appeared on 2 dimensions:
 - (1) Academic proficiency (competence): male students described as quick learners more often than female students. Gender bias was *bigger* for high performing male vs. female students.
 - (2) Positive emotions (warmth): female students were described more often in terms of positive emotions than male students.
- Because academic proficiency was most important quality when it came to securing a medical residency, these letters gave male students an advantage over female peers.

Implicit gender bias is more likely in academic disciplines with small % of women

- In academic fields where there are very few women (science, engineering), stereotype of success becomes very male-oriented. Successful scientists = male
- Individuals who don't fit the stereotypic profile have hard time getting experience to make them competitive for grad school or future positions.
- This hypothesis was tested in recent study: science faculty at research universities asked to evaluate a candidate applying to be a lab manager in their discipline (Moss-Racusin et al., 2012).
- Evaluated the candidate's competence, hireability, reported how much career mentoring they were willing to offer, and recommended a starting salary.
- Faculty received the same applicant CV with a male or female name.

STEM faculty members' evaluations of male vs. female job candidates for lab manager

Moss-Racusin et al. (2012); *Proceedings of the National Academy of Science*



12% salary gap favoring male applicant

These types of decisions restrict diversity in early stages of training and contribute to the underrepresentation of women at more advanced stages of the profession (“pipeline problem”)

Take home points (so far)

Implicit stereotypes about the “ideal” student act as an invisible lens that biases:

1. Evaluations of students’ work

- Evaluators who have strong implicit racial stereotypes judge Black students’ academic work less favorably than others who don’t have such stereotypes.
- Implicit bias also affects student evaluations by influencing who gets the benefit of the doubt when students have a mixed academic record

2. Faculty recommendation letters: Letters for men emphasize stereotypically masculine qualities (*competence*); letters for women emphasize stereotypically feminine qualities (*warmth*)

3. Hiring new graduates: “science = male” stereotype increases the chance that men will get hired and mentored more than women despite equal qualifications

Evaluators are unaware of bias. Bias occurs despite evaluator’s group membership.

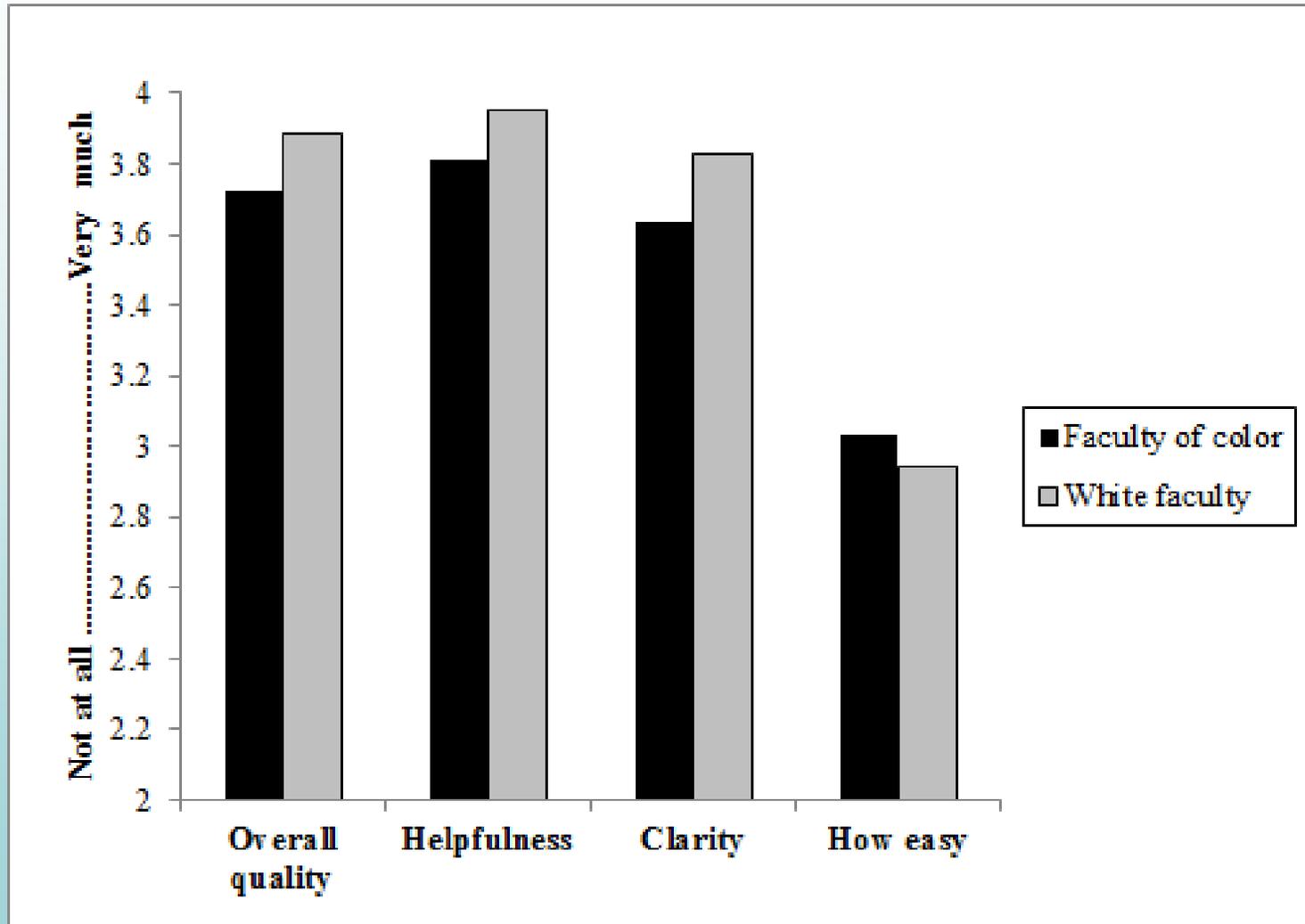
Implicit bias is a two-way street:

**Students' evaluations of
professors**

Students' evaluations of their professors

- Just as professors' evaluations of students are affected by implicit stereotypes, so too students' evaluations of professors are affected by implicit stereotypes about who is likely to be a good teacher
- Even though the academy is slowly diversifying, the dominant image of a professor remains a person who is White, male, and middle-aged or older.
- What happens when students come into a class and meet their professor who doesn't fit these demographics?
- Are students' evaluations of their professors influenced by the gender or race of these professors especially when they don't fit the prototype?
- One study accessed student ratings of 5000+ professors at top 25 liberal arts colleges across the US through RateMyProfessors.com (Reid, 2010)
- Students rated: (1) quality of class, (2) helpfulness, (3) clarity, (4) how easy?

Students' evaluations of their professors



Reid (2010). *Journal of Diversity in Higher Education*

**Implicit stereotypes affect students'
own academic and professional
choices**

Implicit stereotypes shape students' choices about what academic path to pursue (or avoid)

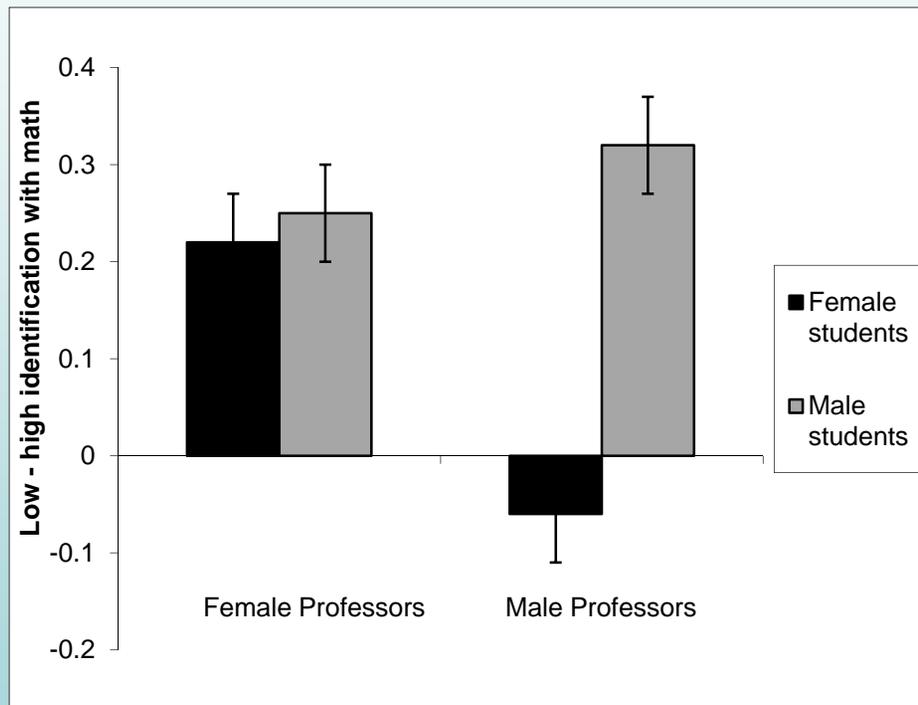
- We assume academic and professional decisions are *free choices* driven purely by talent and ability; unconstrained by societal forces
- Lots research shows these choices are not free. Heavily constrained by feelings of belonging or fitting in (Dasgupta, 2011; Stout, Dasgupta et al., 2011)
- Humans beings are social animals. Students' choice to pursue a given academic path = Ability + belonging.
- Feelings of belonging in an academic world increases when students see people like themselves in a given setting.

How implicit stereotypes affect women's feelings of belonging in STEM and pursuit of STEM majors

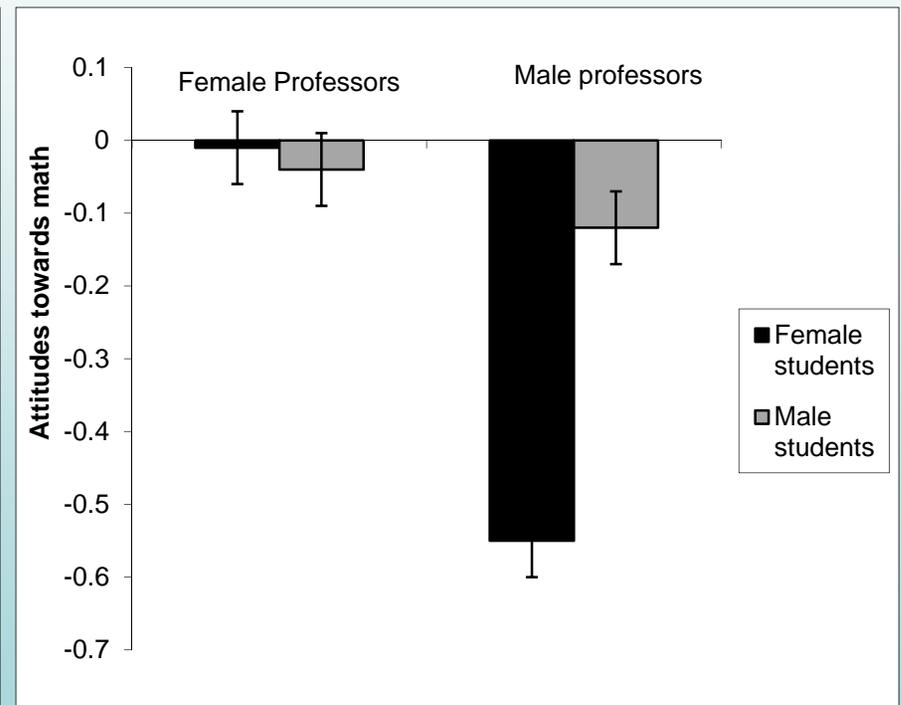
- Recruited students from calculus class. Required for all STEM majors. Followed them through semester.
- Multiple sections taught by different professors (male or female). Students pre-registered for a section without knowing who their professor would be.
- Tested whether the gender of the calculus professor would affect students' academic engagement.
- All sections had same syllabus and same exams.
- Measured students: (1) attitudes toward math, (2) identification with math, (3) expected performance (confidence), (4) actual course grade (ability)

Implicit identification with math & implicit attitudes toward math

Implicit identification with math

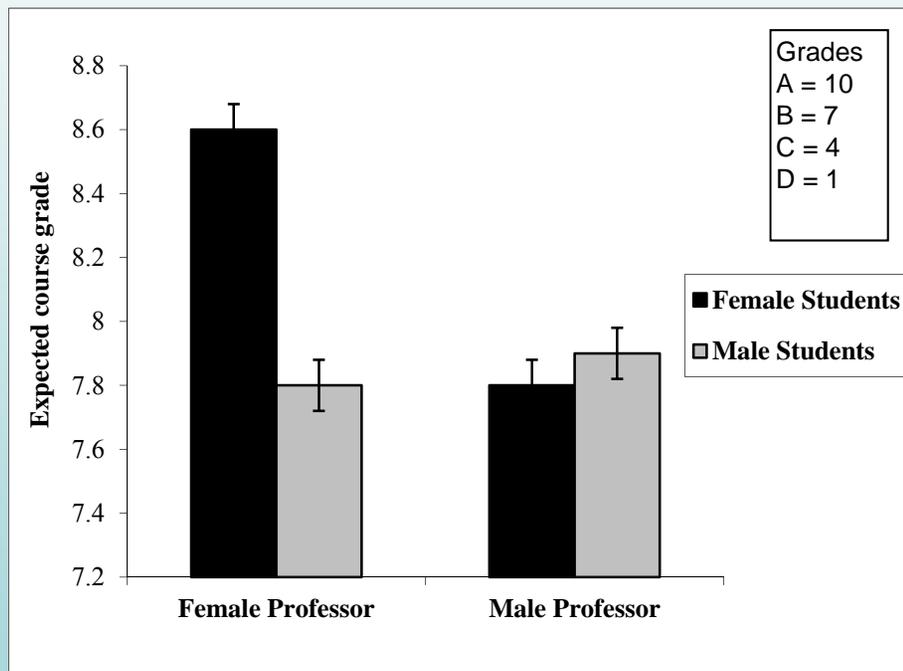


Implicit attitudes toward math

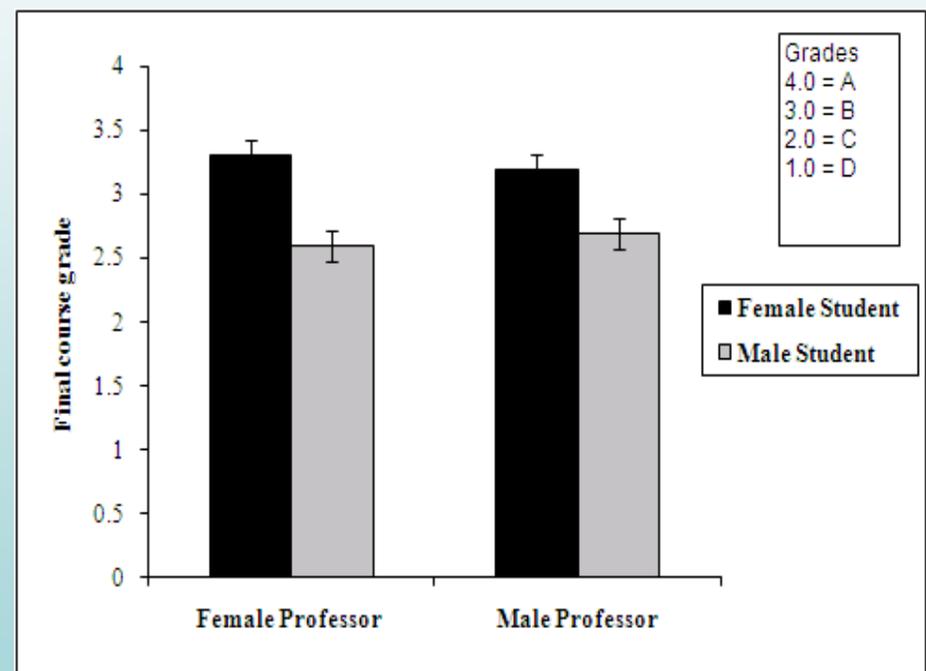


Expected final grade and actual final grade

Expected grade (confidence)



Actual math grade (performance)



Stout, Dasgupta, Hunsinger, & McManus (2011), *Journal of Personality and Social Psychology*

Take home

- For students who are a small numeric minority in an academic field, the absence of role models from their ingroup decreases confidence, interest in the field and, in the long run, increases attrition.
- This happens to students regardless of their objective ability
- Awareness of negative stereotypes about one's group can act as a distraction during a difficult test and undermine students' performance on that test – *stereotype threat* (Steele & Aronson, 1995; Steele et al., 2002)

**We've spent a lot of time identifying
problems associated with implicit
bias**

What are some solutions?

How to prevent implicit bias from affecting *women and minorities' choice of majors and careers*

1. For students who are numeric minorities in a major, increase their exposure to successful experts in the field who are members of their group.
2. Personalize these experts so that students can identify with them. Don't portray them as "superstars" whose success is unattainable.
3. Peer mentoring: Encourage mentoring relationships between new students and advanced peers in the same field from their ingroup.
4. Consider the timing of interventions: Most important in early years of training

In sum, increasing visibility of ingroup role models and peers strengthens women and minorities' sense of belonging in the field. Makes own success seem more attainable

Finally, five ways to prevent implicit bias from affecting *student evaluations*

1. Whenever possible evaluate students after masking their race, gender, or other group membership (Goldin & Rouse, 2000)
2. Ask evaluators to commit to specific merit criteria and rank order their importance before reviewing student applications (Uhlmann & Cohen, 2005).
3. Reduce time pressure and distraction while making evaluative decisions (Bertrand et al., 2005; Martell, 1991; Sczesny & Kuhnen, 2004).
4. For student hiring where interviews are involved, use structured interviews with standardized questions instead of unstructured conversations (Bragger et al., 2002)
5. Finally, use same criteria in all recommendation letters. Emphasize students' *competence* more than other qualities. Compare letters for male vs. female students, White vs. minority students to catch unintentional bias

Thanks!

For research see:

<http://people.umass.edu/nd/index.html>

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