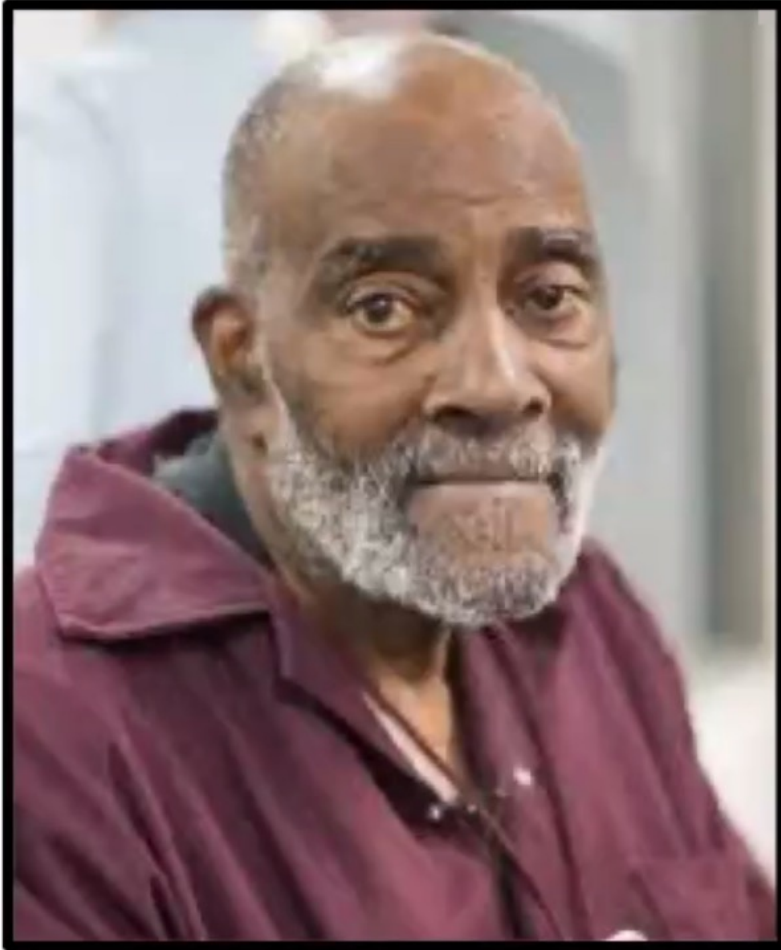


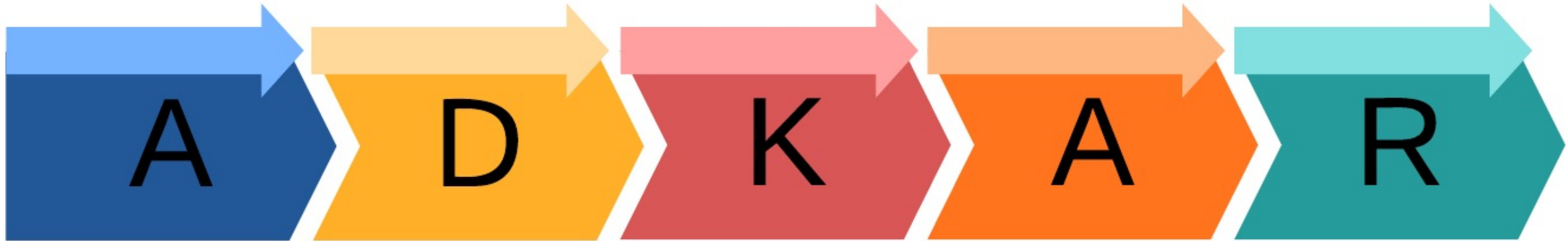
# HOW TO COUNTERACT UNCONSCIOUS BIAS IN ACADEMIA

Nina Gray  
May 21, 2021



*“The rear wheels of the train won’t catch the front wheels unless something dramatic happens”*

*-- Mel King, legislator, activist, MIT faculty member, co-founder of first fab lab*



Awareness

I recognize that there is a problem.

I know what the problem is.

Desire

I believe this is a problem I should address.

I want to engage in this work.

Knowledge

I know steps I can take to help address the problem.

I have skills needed to do the work.

Ability

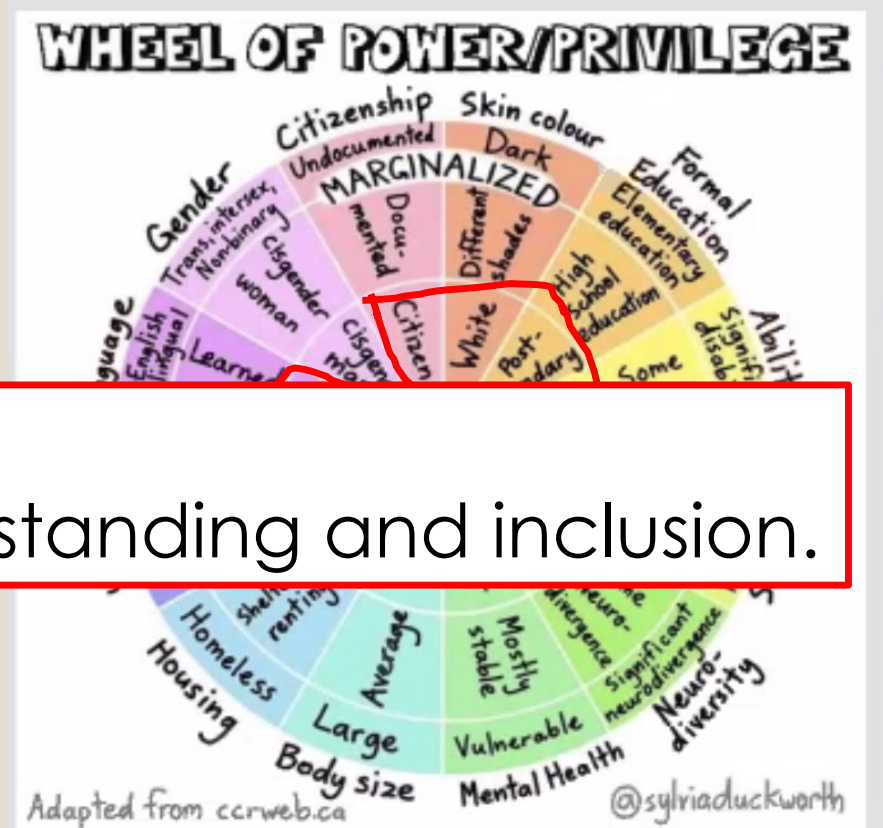
I have the time and resources needed to do the work.

Reinforcement

I am rewarded for this work, and it is having the desired outcomes.

# ELEPHANTS IN THE ROOM?

- I'm not an expert on unconscious bias, racism, sexism or discrimination, social justice, etc.
- I come from a place privilege.



## Lesson #1

Empathy is a pathway into understanding and inclusion.



# ELEPHANTS IN THE ROOM?

- Unconscious bias is one of many ways racism, sexism and discrimination manifest.
- There are many different types of diversity.

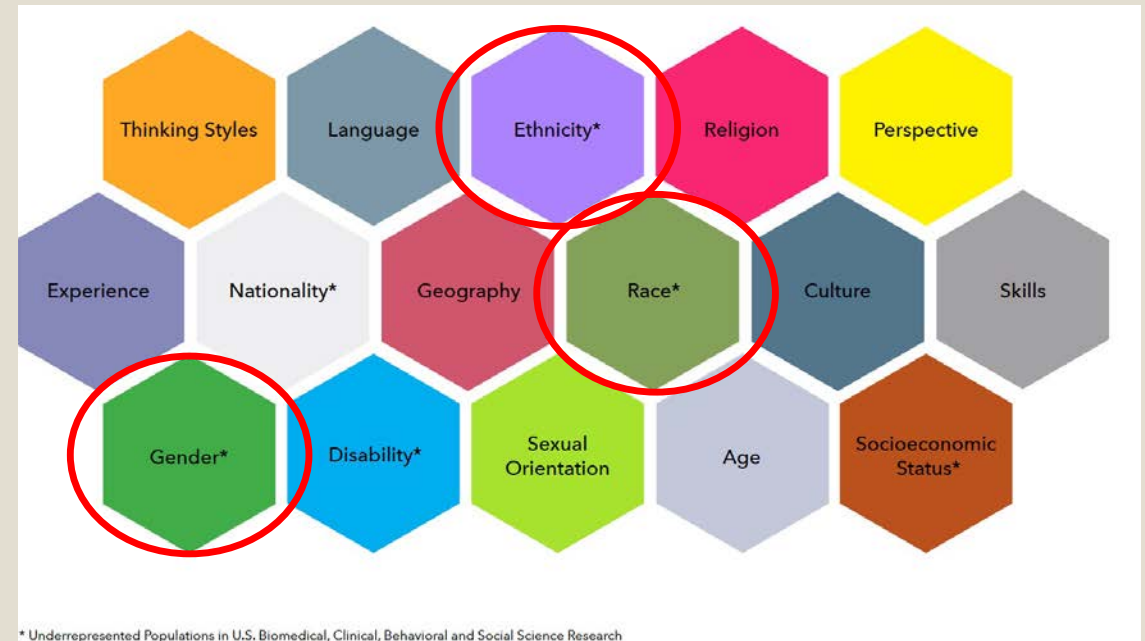
## 4 common ways in which racism can manifest in the life of a trainee

Bias

Privilege

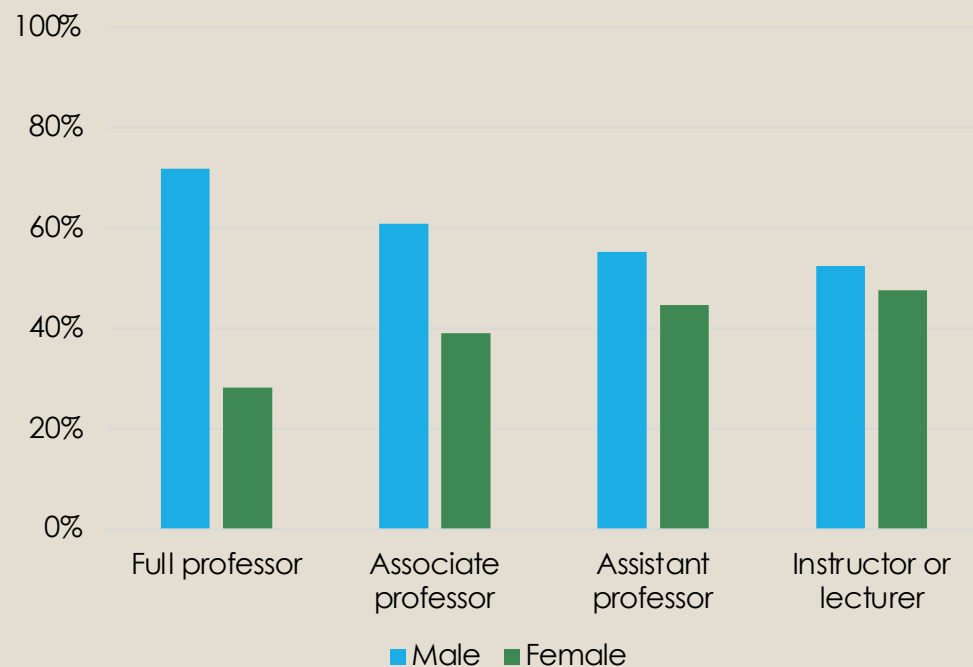
Racial Microaggressions

Stereotype Threat

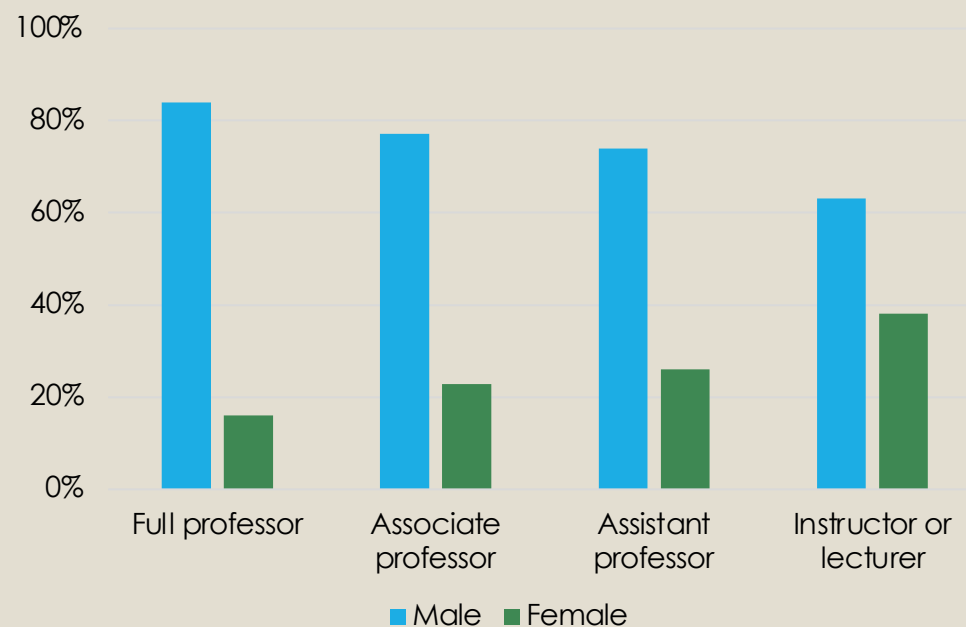


# Gender Representation, 2021 NSF Survey

U.S. residing employed doctoral scientists and engineers in 4-year educational institutions

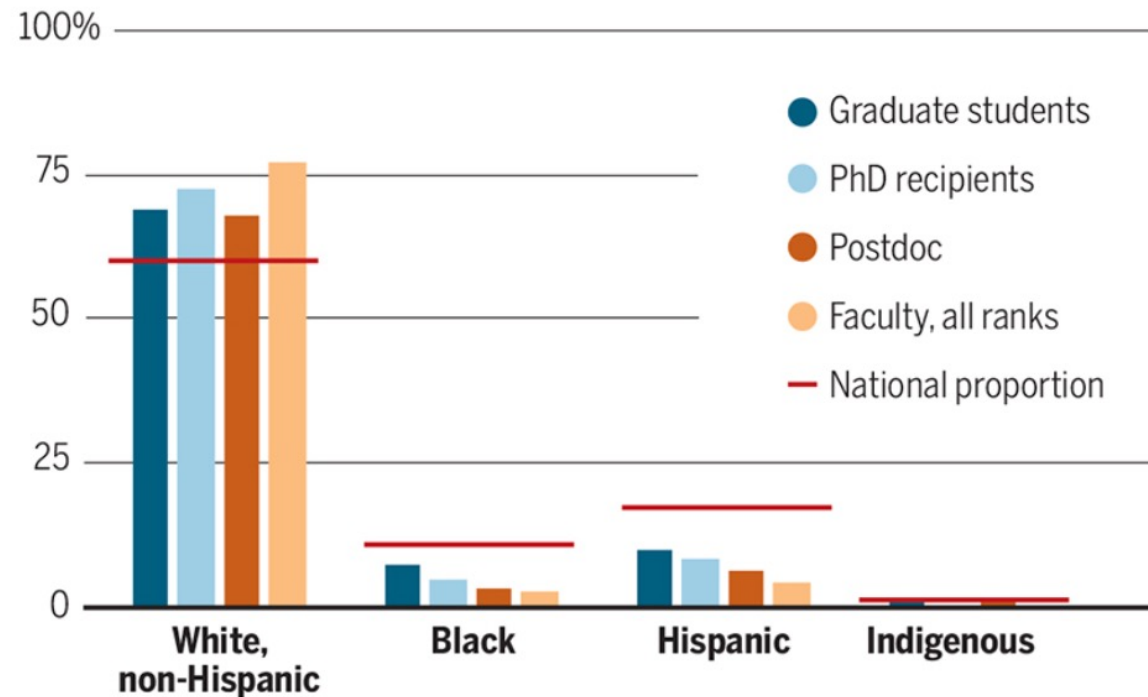


Computer Science; Math; Physical, Geo, Atmospheric, and Ocean sciences; and Engineering



## Race and ethnicity in the biomedical research workforce

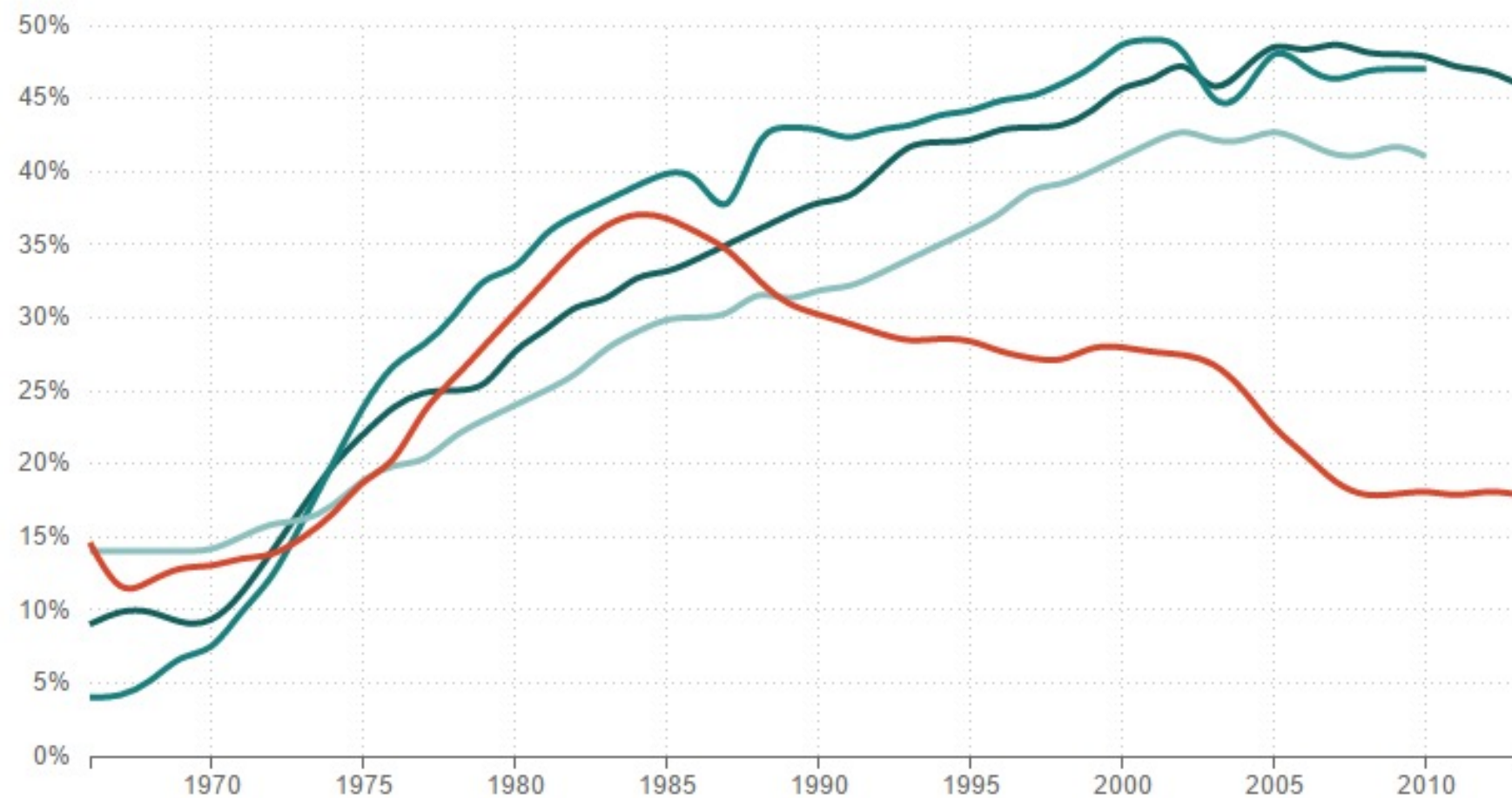
(Top) Demographics by career stage in 2016. The red line denotes the proportion of the specified race and ethnicity in the US population in 2016. (Bottom) Growth in Black and Hispanic PhD recipients over time. The dashed line indicates a linear best-fit trendline. Data are from (15).



## What Happened To Women In Computer Science?

% Of Women Majors, By Field

Medical School   Law School   Physical Sciences   Computer science



Source: National Science Foundation, American Bar Association, American Association of Medical Colleges

Credit: Quoc Trung Bui/NPR



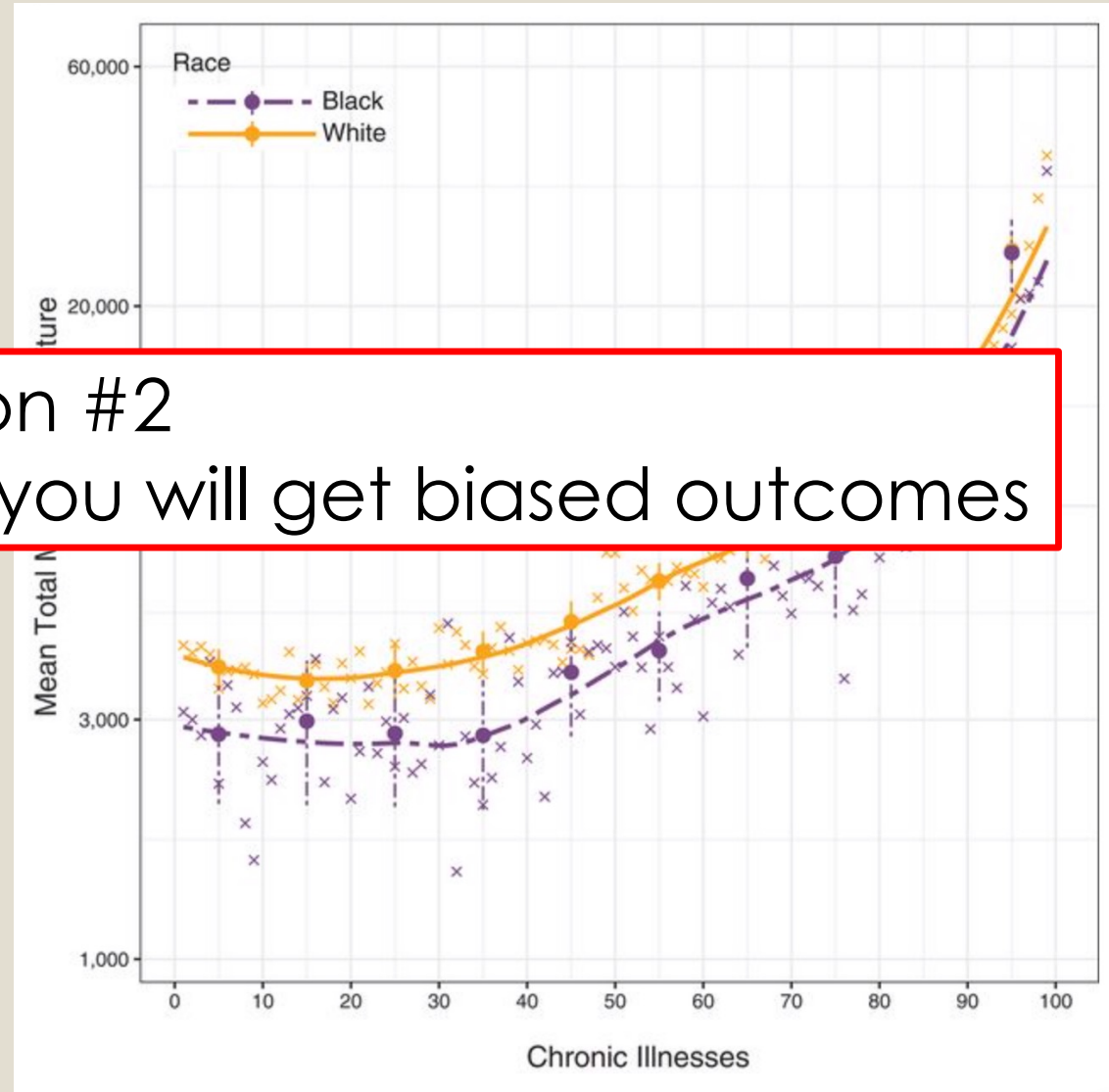
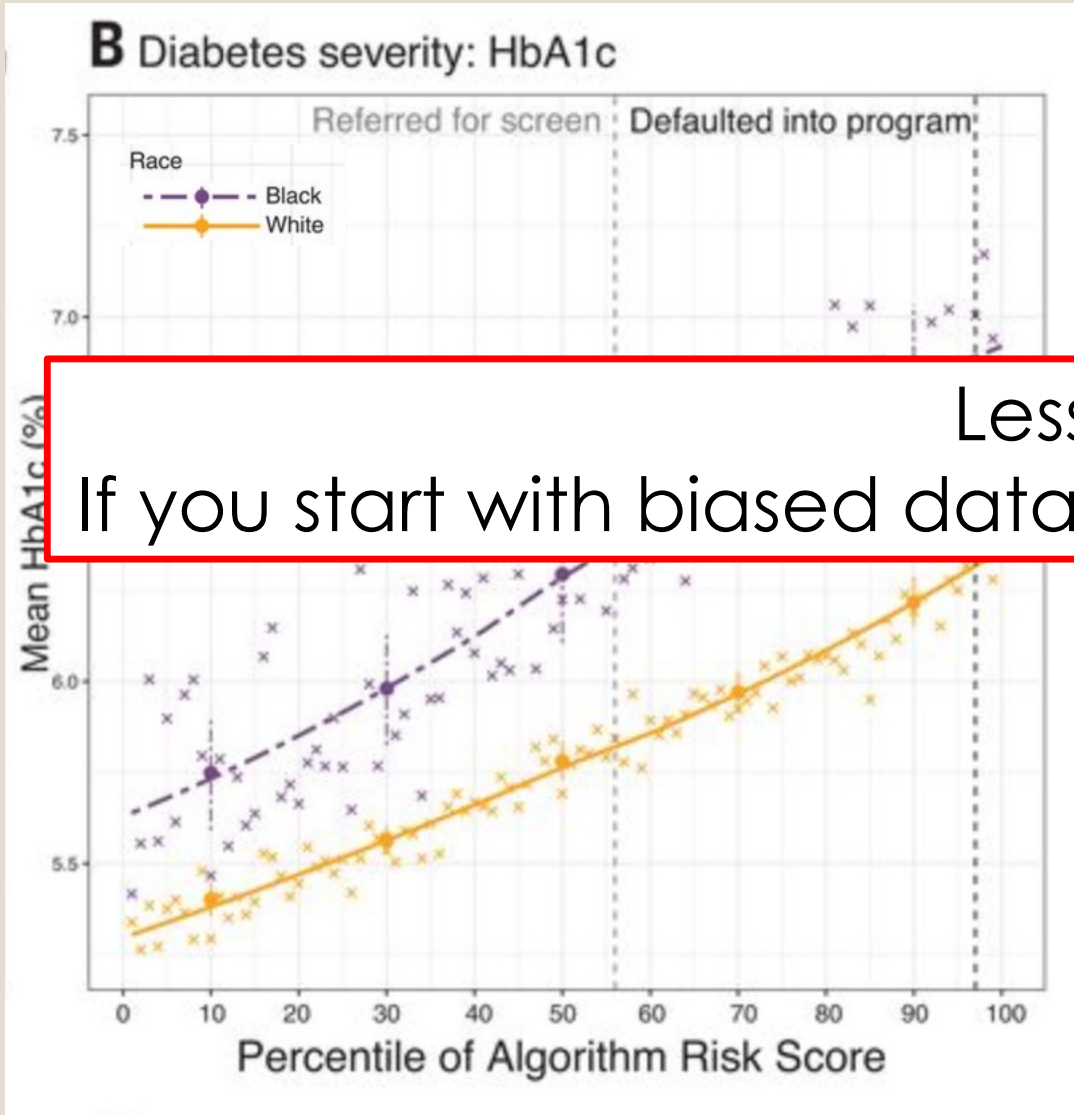
# So, we have a diversity problem.

- Why should we fix it? Why should we care?
- Does it actually have anything to do with unconscious bias?

# Why should we fix it?

## Why should we care?

- We have an obligation to provide equal access to everyone.
- We should not limit the resources and talents available to find solutions to the most pressing problems facing our world and society.
- More diverse teams generate better, more innovative outcomes because they are informed by a broader range of lived experiences and knowledge.
- STEM outcomes impact our daily lives, from the healthcare we receive to the technologies we use. Innovations in these areas only address the diversity of needs in our communities if the teams creating them reflect the world's diversity.



## Lesson #2

If you start with biased data, you will get biased outcomes

# So, we have a diversity problem.

Yes, we should care, and we should fix it.

Does it actually have anything to do with unconscious bias?

I contend yes, and that we:

- Fail to properly evaluate candidates, students, and colleagues from non-majority backgrounds and who are women, in part because of unconscious bias.
  - And that this contributes to creating an unattractive, unsustainable environment for them to thrive and persist.

# Who is the better athlete?

- Athlete A finished a 5K in 25 minutes ← Scholarship and a supply of new running shoes
- Athlete B finished a 5K in 50 minutes

Athlete A's path



Athlete B's path



## Lesson #3

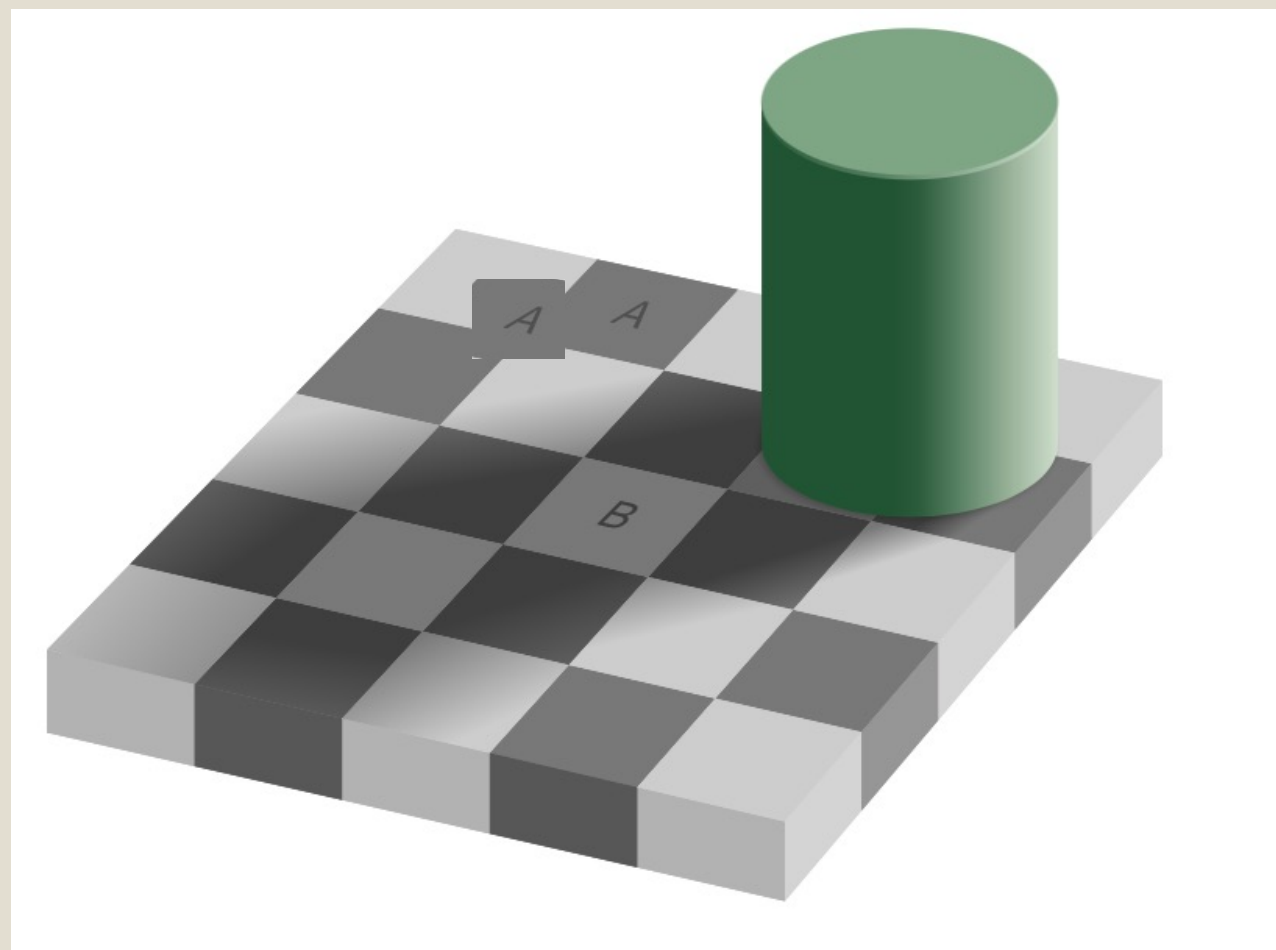
Learning about someone's path tells you about their strengths

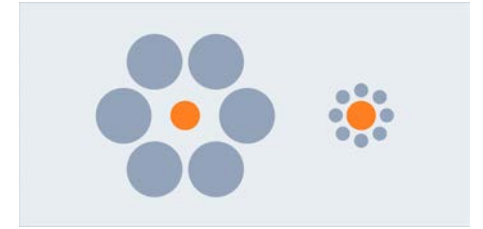
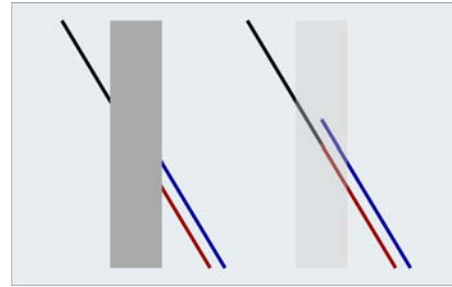
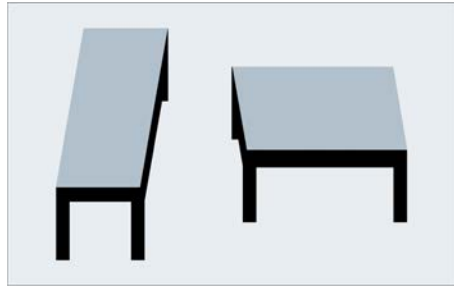
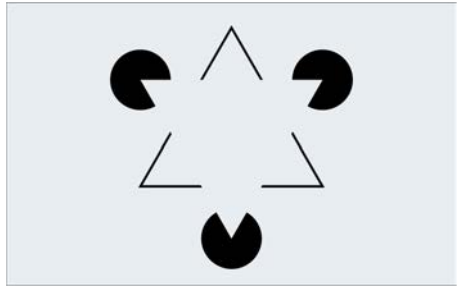


# What is unconscious bias?

**Definition:** Unconscious bias refers to a bias that we are unaware of and/or which may be outside of our control. These biases emerge because our brain, in an effort to filter and pre-process information before it reaches conscious awareness, makes assumptions and categorizes information based on prior experiences and learned expectations.

- The brain receives an estimated 11 million bits of information per second, but our “conscious mind” can only process about 2-60 bits per second, depending on the task.

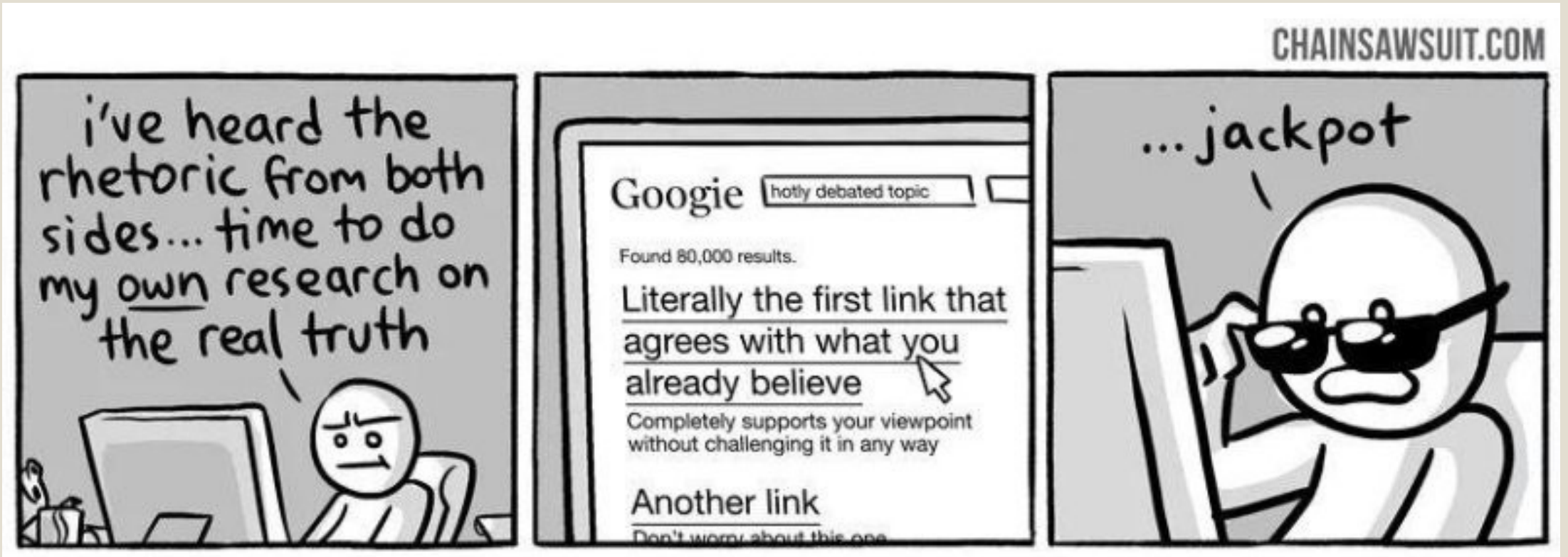




## Lesson #4

Don't rely on automatic, gut reactions. Slow down decision making.

# Cognitive biases



# Describe these people



Ted Bundy  
Serial Killer



John Fetterman  
34th Lt. Governor, PA

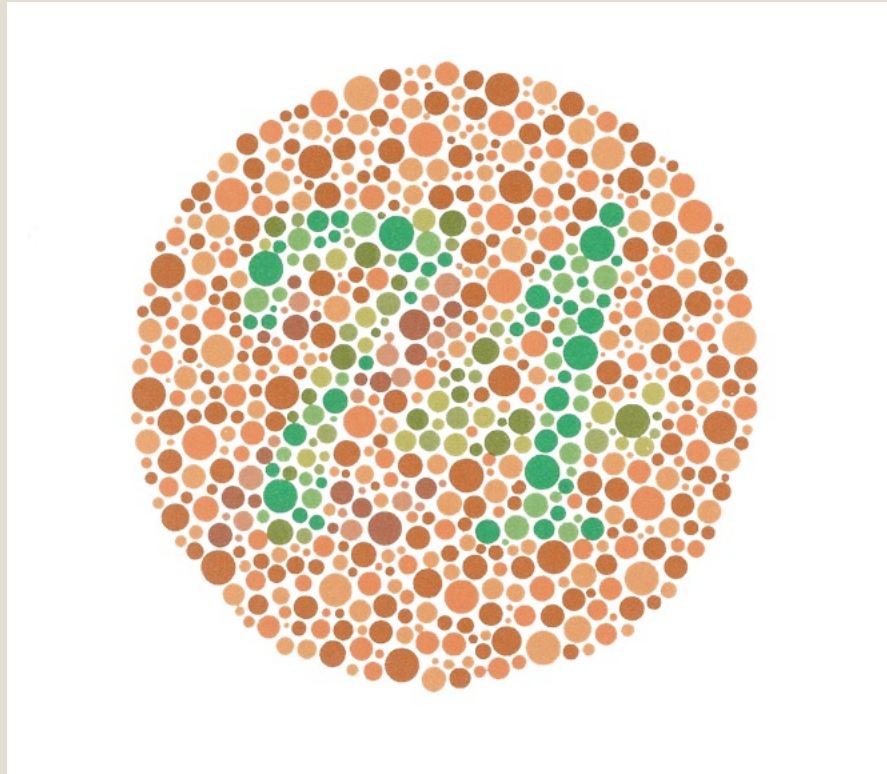


Pratibha Patil  
12th President of India



Mae Jemison  
Astronaut, Physician





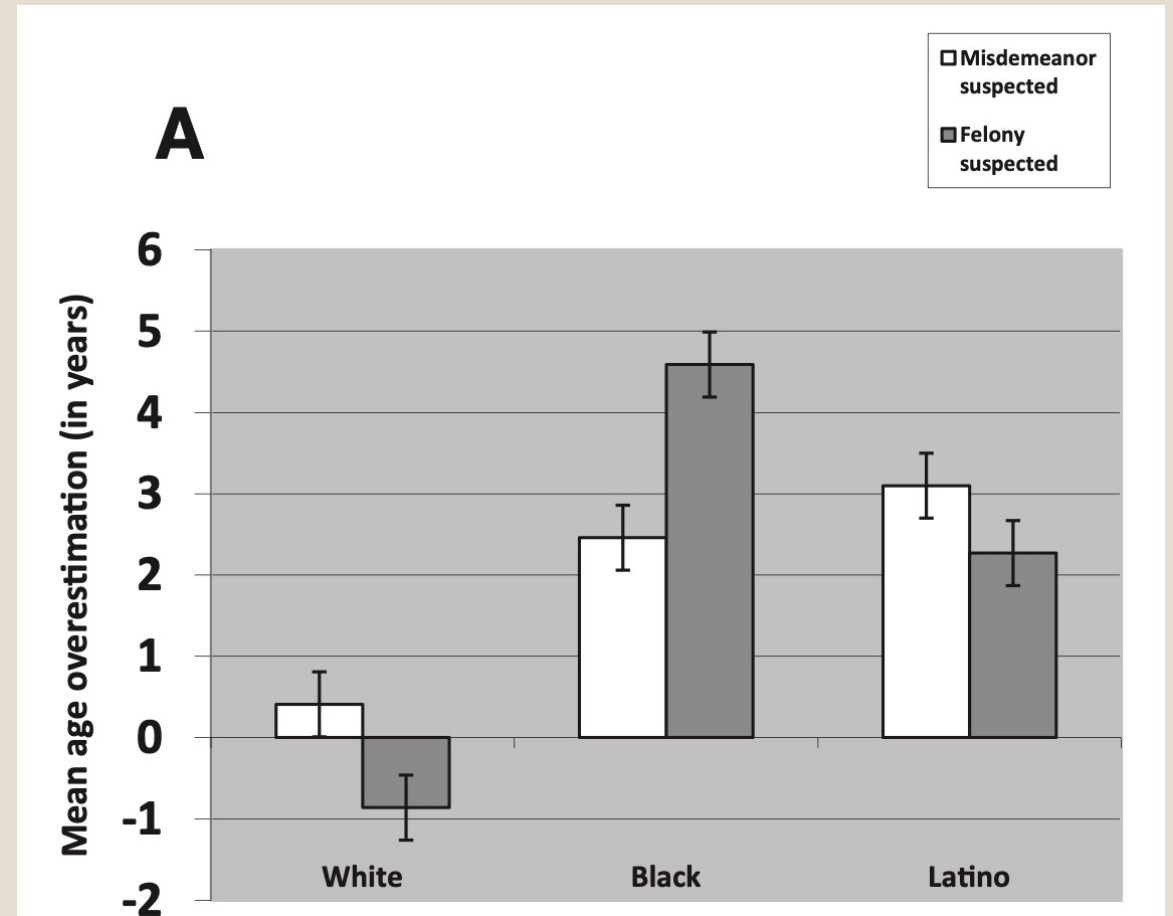
You don't know if you're color blind until you are evaluated for it.

# What is unconscious bias?

**Definition:** Unconscious bias occurs when an individual's subconscious prejudicial beliefs or unrecognized stereotypes about individual attributes, such as ethnicity, gender, socioeconomic status, age, and sexual orientation (or even height, dress, and hairstyle), result in an automatic and unconscious reaction and/or behavior.

# How do we know unconscious bias plays a roll?

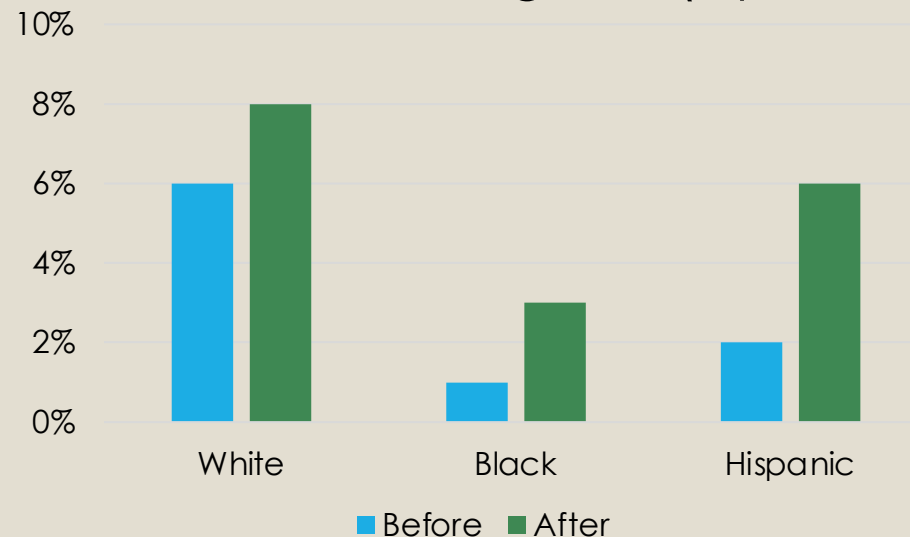
- Black children represent 18% of **preschool** enrollment, but make up 48% of preschool children receiving more than one out-of-school suspension (Education Department's Office for Civil Rights).
- Adults tend to view black children as being older than they are.



(Goff et al, 2014)

# Adults underestimate children's abilities

- Broward County gifted program changed their process for screening 2<sup>nd</sup> graders
  - Before, parents and teachers recommend students.
  - After, all students participate in universal screening
  - Result: percent of students identified as gifted (by an IQ test) increased



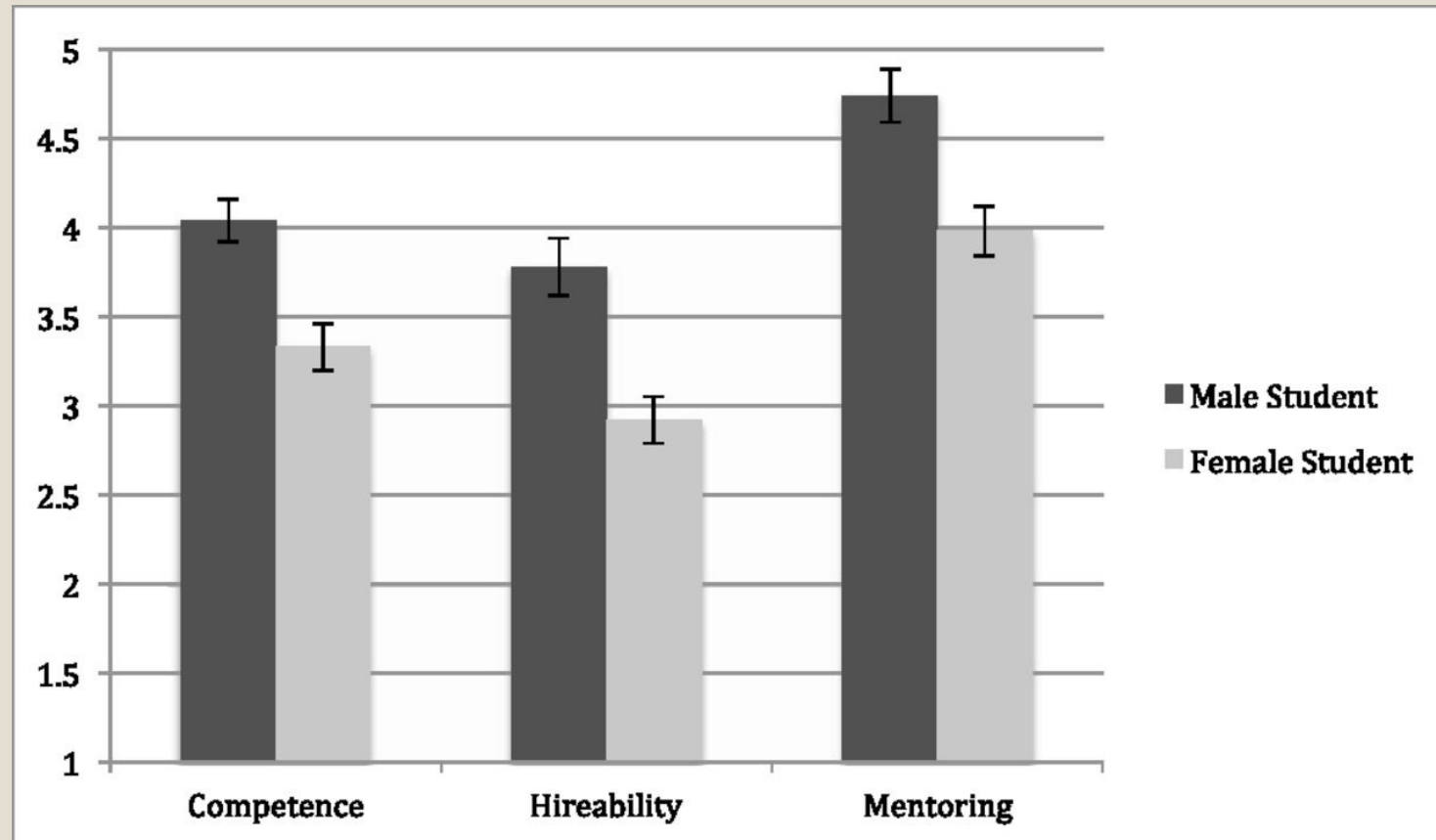
# Students underestimate female classmates' academic achievement



- Female students needed to exceed male GPAs by 0.75 to be perceived as equally competent with the class material



# Faculty rate undergraduate male applicants as better



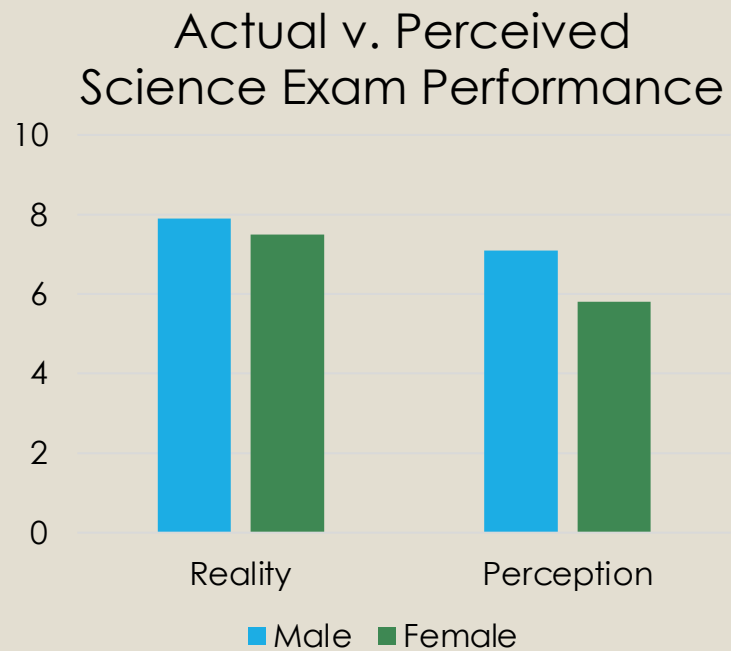
(Moss-Racusin et al, 2012)

# By the end of college

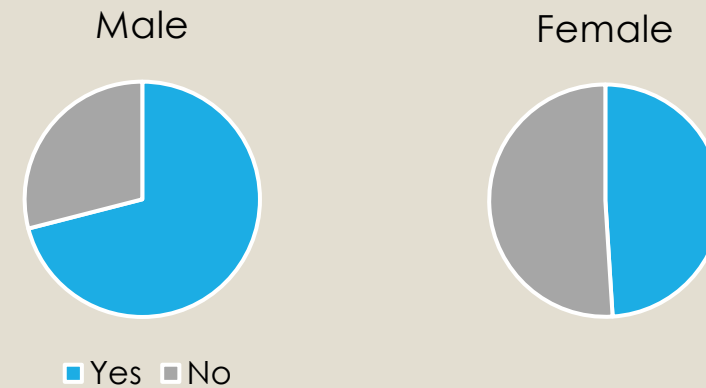
- Women and BIPOC have withstood years of being underestimated in their academic abilities compared to their white male peers – by parents, teachers, peers, and ultimately by potential employers and mentors.



# The Confidence Gap



Who Participated in Science Competition



(Ehrlinger and Dunning, 2003)

# What about at the faculty level?

- Letters of Recommendation
- High profile publications
- Number of Citations
- Quality of seminar presentation

# Letters of recommendation

- Letters for women are shorter
- Letters for women include more “doubt raisers” (Madera et al, 2018)
  - Hedges: “she might be a good leader in the future”
  - Faint praise: “An independent worker, she requires only a minimum of supervision.”
  - Negativity: “the candidate has a somewhat challenging personality”
  - Irrelevant information: “she bakes cookies for the lab” or “she’s a wonderful mother”
- And stereotypical descriptions
  - Portraying women as educators; organized; compassionate; collaborative; hard-working
  - Compared to researchers; innovative; successful; independent; accomplished
  - The female traits are perceived negatively on the academic job market



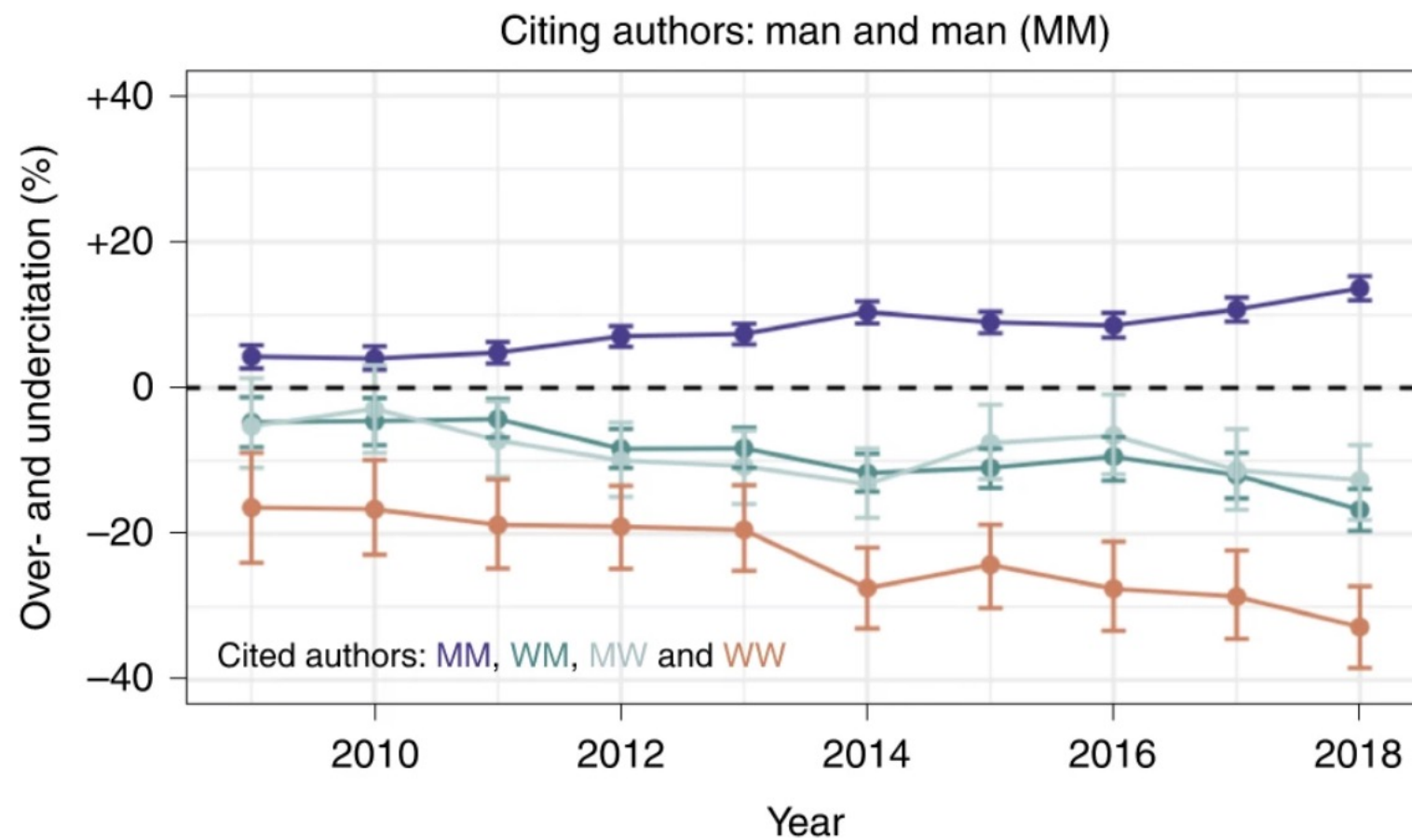
# High profile publications

- There is a gender gap in science publishing: globally, women account for 30% of authors (Larivière et al., 2013). Why?
  - Apart from the confidence gap...
  - Male senior authors are less likely to publish with women than female senior authors (20% versus 60% in one study, Salerno et al. 2019).
  - Women are asked to do more (and do more) student advising, teaching, and professional service (Guarino and Broden, 2017; O'Meara et al. 2017).
  - Gender-neutral parental leave and tenure pause policies favor men: Men at universities with gender-neutral policies are more likely to publish in top tier journals than their male counterparts elsewhere and than their female counterparts in similar universities (Antecol et al. 2018).

# Citations

- Articles with women as senior authors receive fewer citations than those with male senior authors (e.g., Larivière et al., 2013).
  - Articles with male first AND last authors are cited >10% more than would be expected proportionally. Articles with female first AND last authors are cited 30% less than would be expected (Dworkin et al. 2020).
- This is driven by the behavior of authorship teams with male first AND last authors.

**a**



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  - This is driven by the behavior of authorship teams with male first AND last authors.
- Men cite their own research papers at a higher rate than women do (e.g., King et al. 2015).
  - This only partially accounts for the overall gender gap in citation rates.

# Quality of seminars – what happens when women speak?

- Managers give male employees better performance evaluations than female employees who speak up with equally good ideas (assessed by performance metrics).
- Women entrepreneurs are less likely to receive funding – even in a controlled experiment where women and men give the same exact pitch.
- Male executives who speak more than their peers receive 10% higher competency ratings. When female executives speak more than their peers, their competency ratings go down by 14%.
- In fact, female CEOs are viewed as less competent and less suited to leadership if they speak the same amount as their male peers.

# The upshot – faculty recruitment

Published high profile papers as a first author



But papers are cited less than a male colleague's papers



Received fewer invitations to speak at conferences about the work because (a) a woman and (b) papers are less highly cited



Mentor provided a shorter, less enthusiastic letter of recommendation because (a) a woman, (b) papers are less highly cited, and (c) didn't give as many invited talks at conferences.



SUBMITS APPLICATION FOR A FACULTY POSITION  
**WHAT HAPPENS?**

# What Not to Do

- Accept that everyone has bias?
  - Increased stereotyping (Duguid & Thomas-Hunt, *J Appl Psychol* 2015)
- Believe you are objective, nonracist, nonsexist?
  - Showed greatest bias (Uhlmann & Cohen, *Organ Beh Hum Decis Proc* 2007; Monin & Miller, *J Pers Soc Psychol* 2001)
- Suppress stereotypes (colorblind, genderblind)?
  - Greater interpersonal distance (Macrae et al., *J Pers Soc Psychol* 1994)



# What You Can Do – As a Teacher

## Make the content reflect diversity to promote inclusion

- Normalize the participation of women and BIPOC in STEM
  - Include their work in classes you teach – and show their pictures when you talk about them – talk about their path in STEM
  - Examine the history of the research team as you may discover that women and people of color were involved but unacknowledged
- Make your examples reflect diversity
  - Not just Billy, but also Feng, José, Juanita, Kalyani, Lina, Ravi, Yan, Shaquita, LaShawn, etc.
- And the real world – use examples that resonate with students

# What You Can Do – As a Teacher

## Build confidence alongside competence (no weed out classes)

- Add some low-stakes assignments before the high-stakes assignment
- Provide prescriptive, informational feedback: focus on strategies, effort, and the process of learning – not just criticism
  - This enhances students' beliefs about their abilities, typically improves persistence, and improves performance.
- Rethink how you use and encourage class participation
  - If unconstrained, it is subject to your unconscious bias.
  - It also favors the most confident and extroverted, leaving behind others.
- Accept that your job is to attempt to reach all students and take the time to learn new teaching methods

# What You Can Do – As a Mentor

- Do self-work to become more culturally aware
  - Consider what institutional or environmental factors may create/have created barriers at an individual level
- Go out and get training in inclusive mentorship
- Ensure equal access to yourself and your time for all mentees
- Allow mentees space to express how they think their gender, race/ethnicity, etc. influences their academic or career progress
- Give them the “invisible knapsack”
  - Don't assume they know the secrets of academic culture

# What You Can Do – In the Lab

- Make expectations clear upfront
  - Code of Conduct
  - Mutual Compact
- Address sexism and racism in Lab and Field Safety Guides
- Build and protect trust with other team members
- Collaborate with women and BIPOC and publish and cite them
  - You don't need to keep citing the same old articles as everyone else

# What You Can Do – As a Letter Writer

- Write a check list of the pertinent information you need to cover in each letter of recommendation you write, and make sure you cover all items for each person
  - If it's not on the list, but it's in the letter – ask yourself why.
- Do not talk about someone's personal life – keep it focused on professional details
- Evaluate your letters for women and BIPOC for “doubt raisers” and stereotypical descriptions – rewrite as needed
- Emphasize and describe accomplishments, not effort
- Use formal titles for both men and women (or neither)

# What You Can Do – As an Evaluator

- Recognize that those in privileged positions likely have been coached on how to prepare their application
- Establish hiring criteria before reviewing applications – and stick to them
- Ask about their challenges – what mountains have they had to climb?
- Have recommenders fill out an evaluation form rather than write a letter
- Pay attention to how you and others interpret contribution on multi-author papers
- Acknowledge that better access to opportunities does not make someone better, and lack of access doesn't make someone else worse
- Recognize that diversity-related experiences and institutional barriers influence a person's apparent career trajectory
- Accept that traditional measures of accomplishments may not be enough to tell you who is best for the job

# What You Can Do – As a Leader

- Assess the culture and climate for inclusivity and share the results
- Hire, support, and retain people of color at all levels without tokenizing them
- Be proactive about giving raises and promotions, not just to those who ask for them
- Evaluate workloads and resource distribution for equity and fairness
- Reward and recognize those who participate in K-12 STEM outreach and diversity, equity and inclusion activities
- Invest in programs that support K-12 education in communities that are historically disadvantaged, and build accessible pathways to enter your institution
- Provide and require training



# What You Can Do – As a Person

- Find connections and common ground
- Value and celebrate unique contributions and perspectives
- Remember a time when you were “the only ... in the room” or you felt marginalized and how that felt, and use that to build empathy
- Avoid homophily – even though it takes more effort to listen to and work with someone who talks and thinks differently than you
- Learn about historical racist symbols, expressions, and acts; ignorance is not an excuse
- Consider how you are privileged
  - I can go into a music shop and count on finding the music of my race represented, into a supermarket and find the staple foods that fit with my cultural traditions, into a hairdresser’s shop and find someone who can cut my hair.
  - I can do well in a challenging situation without being called a credit to my race.
- And if you are privileged, don’t expect to be congratulated for DEI work – just do it.



**THE MAN WHO MOVES  
A MOUNTAIN BEGINS BY  
CARRYING AWAY SMALL STONES**