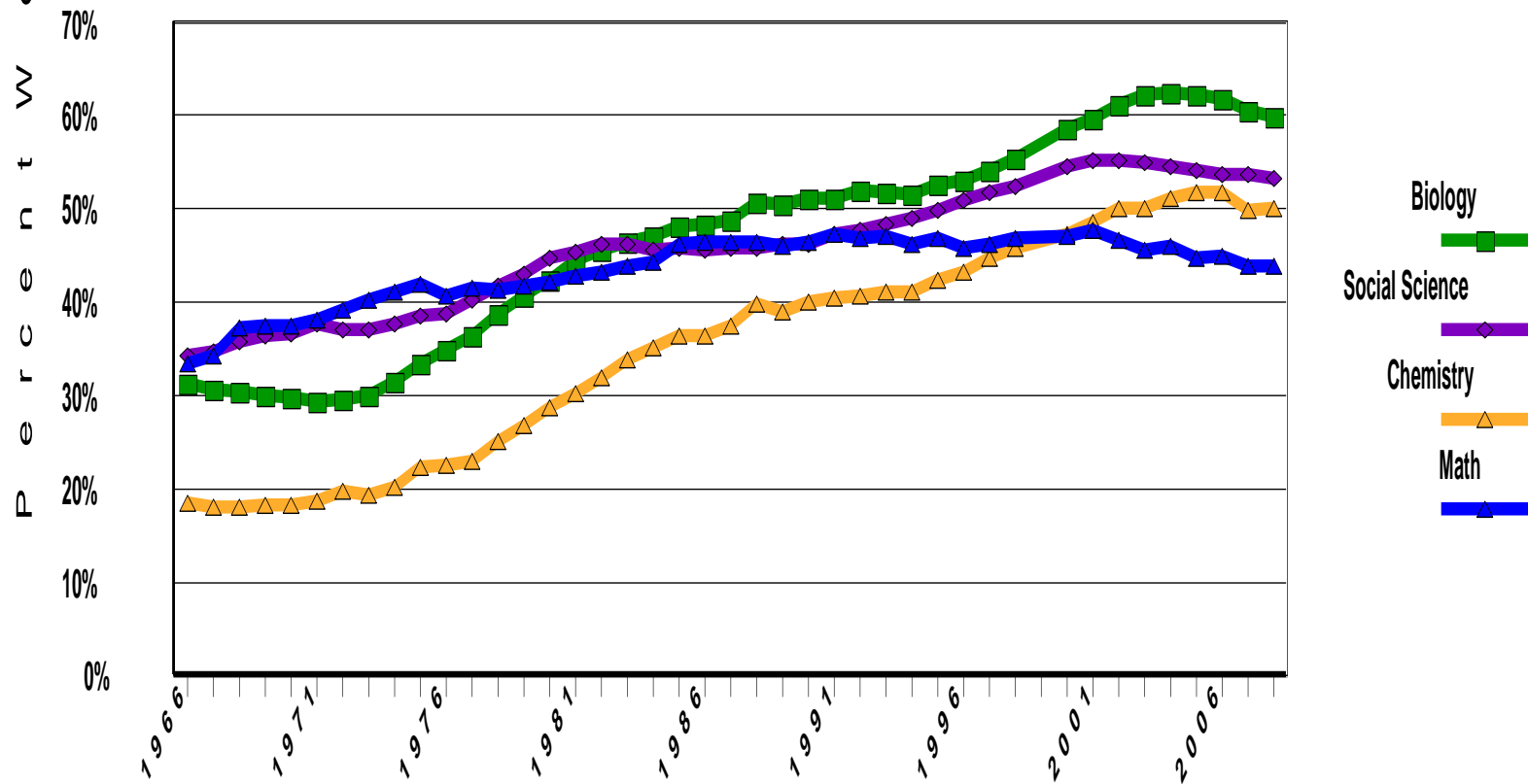


Breaking the Bias Habit:  
*Reducing the Impact of Implicit  
Assumptions on Student Outcomes*

Jennifer Sheridan, Ph.D.  
Executive & Research Director  
Women in Science & Engineering Leadership Institute

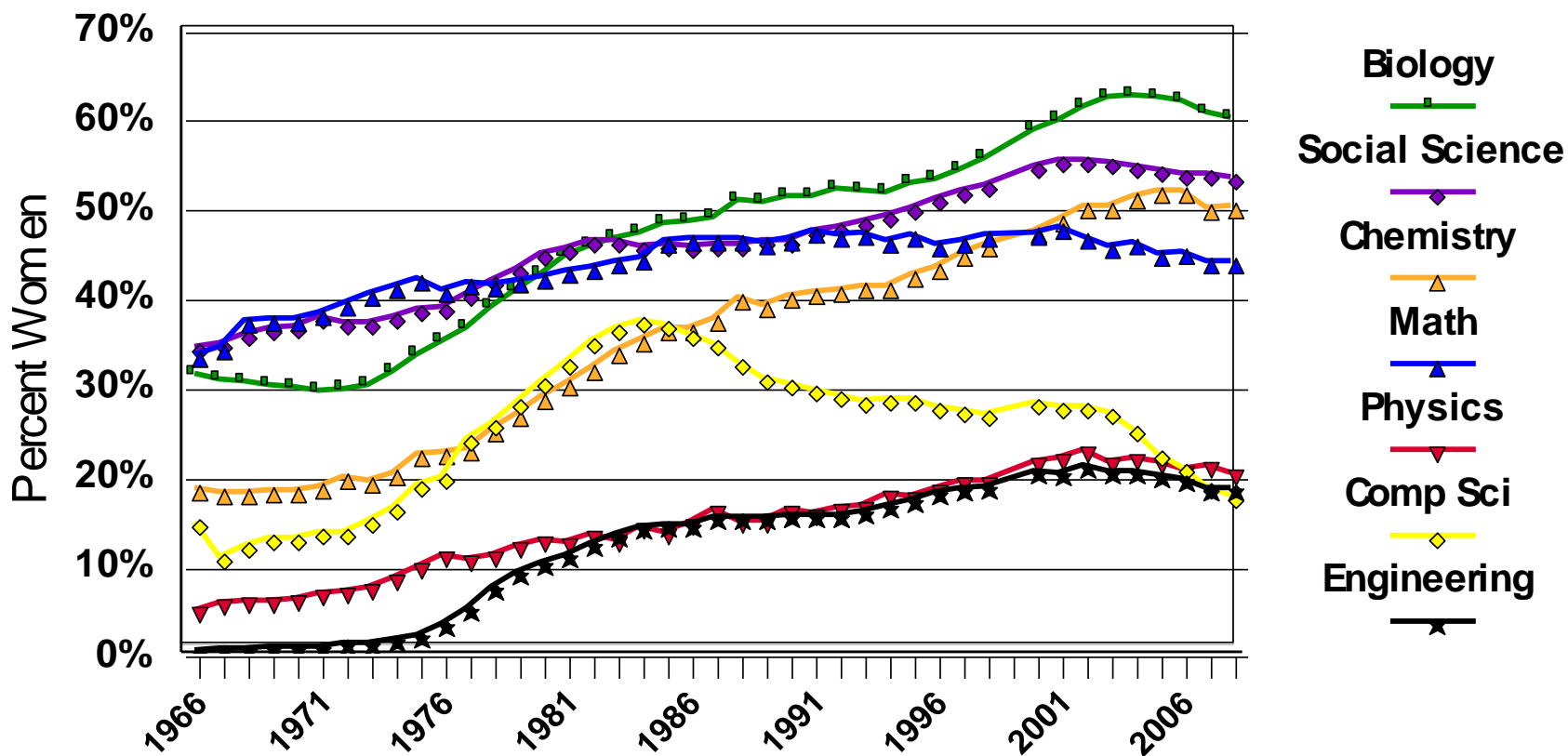
# Percent Women Bachelor's Degrees, Selected Fields

1966 - 2008



Source: National Science Foundation S&E Degrees

# Percent Women Bachelor's Degrees, Selected Field 1966 - 2008



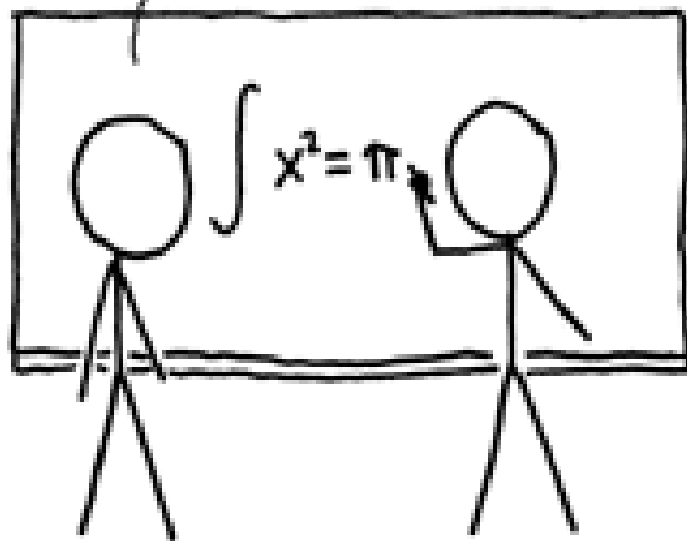
Source: National Science Foundation S&E Degrees

# Why?

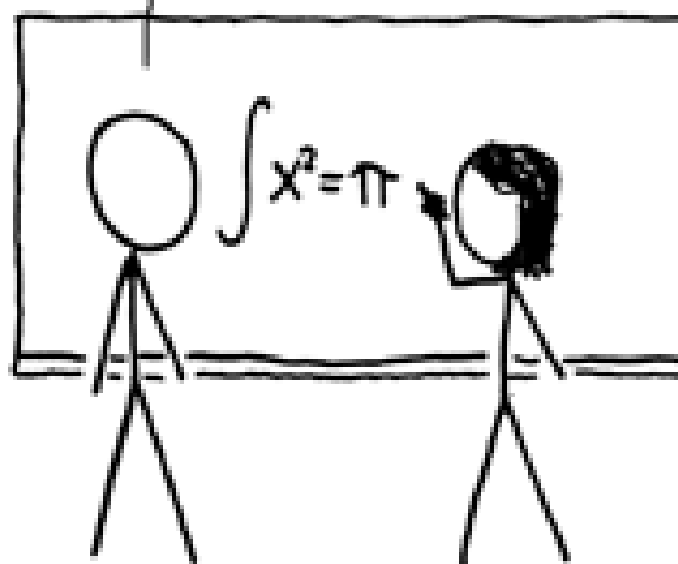
---

- Unconscious bias
- Tendency of our minds to evaluate individuals based on characteristics (real or imagined) of the group to which they belong
- Consequences for both the evaluator, and the person being evaluated

WOW, YOU  
SUCK AT MATH.



WOW, GIRLS  
SUCK AT MATH.





FOREVER 21



jcpenny

# Three Central Ideas

---

1. Our minds are more than the sum of the conscious parts
  - Implicit processes
2. Unintended thoughts can contradict beliefs
  - Prejudice as a habitual response
3. Acting consistently with beliefs can require more than good intentions
  - Breaking the prejudice habit

# Prejudice and Habits of Mind

---

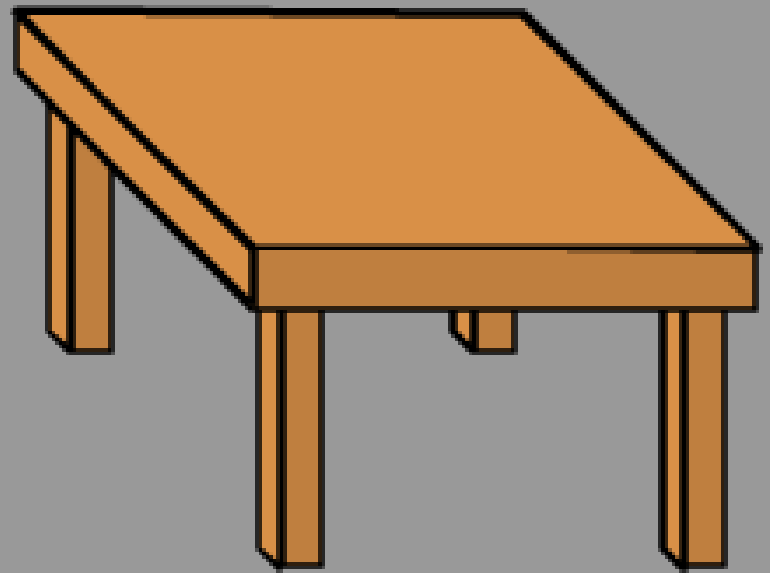
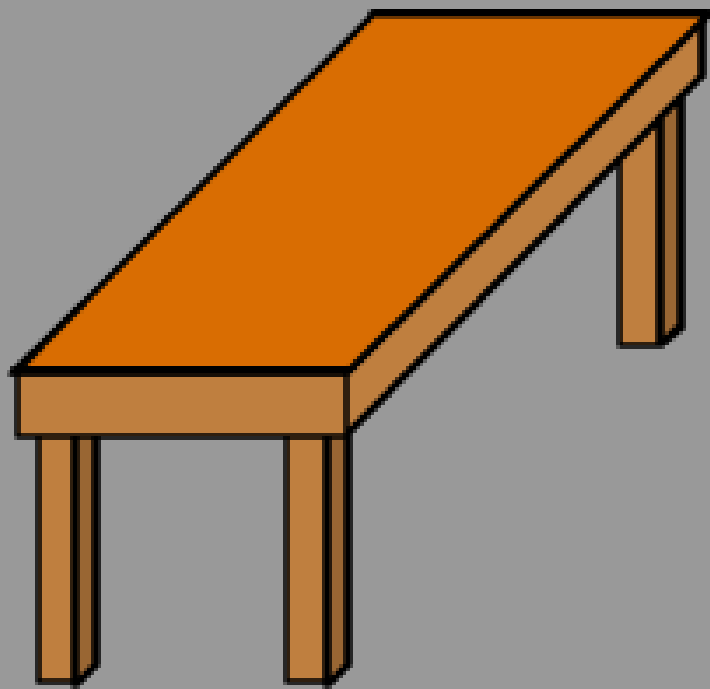
Ordinary mental operations that serve us quite well in most circumstances can fail our intentions

---

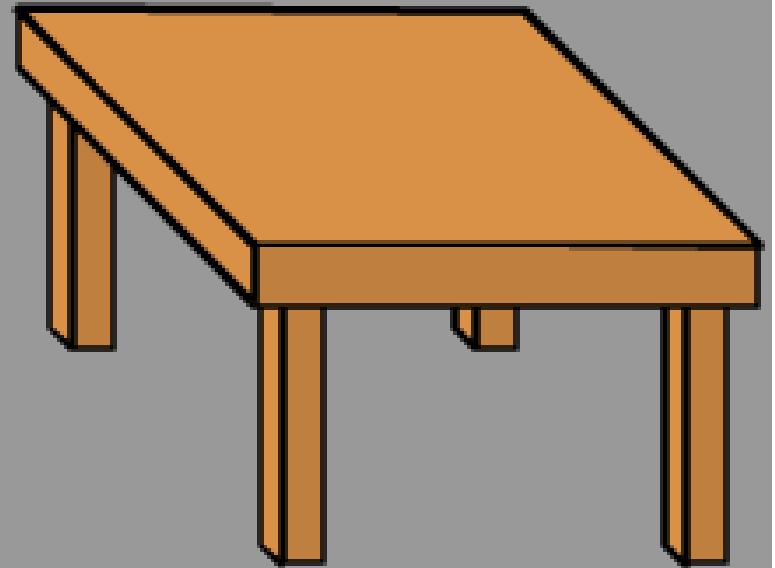
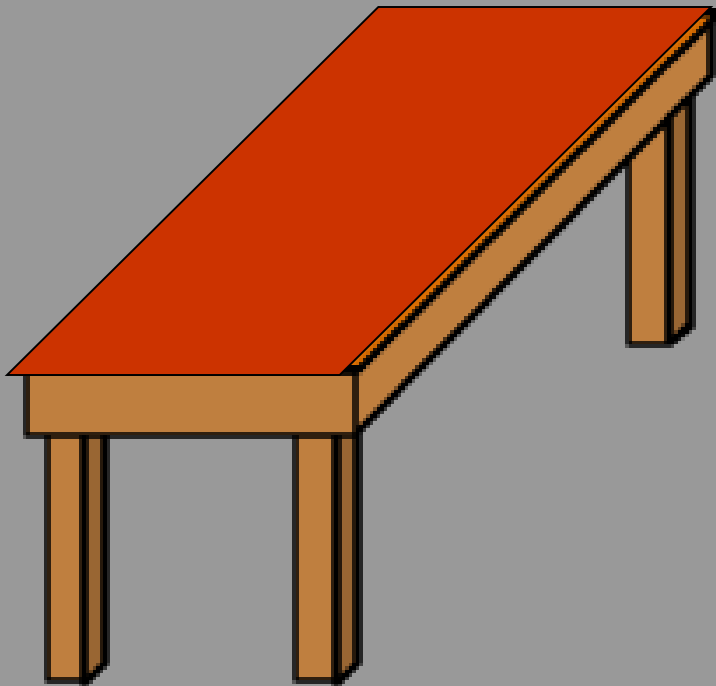
# Essential Process...

---

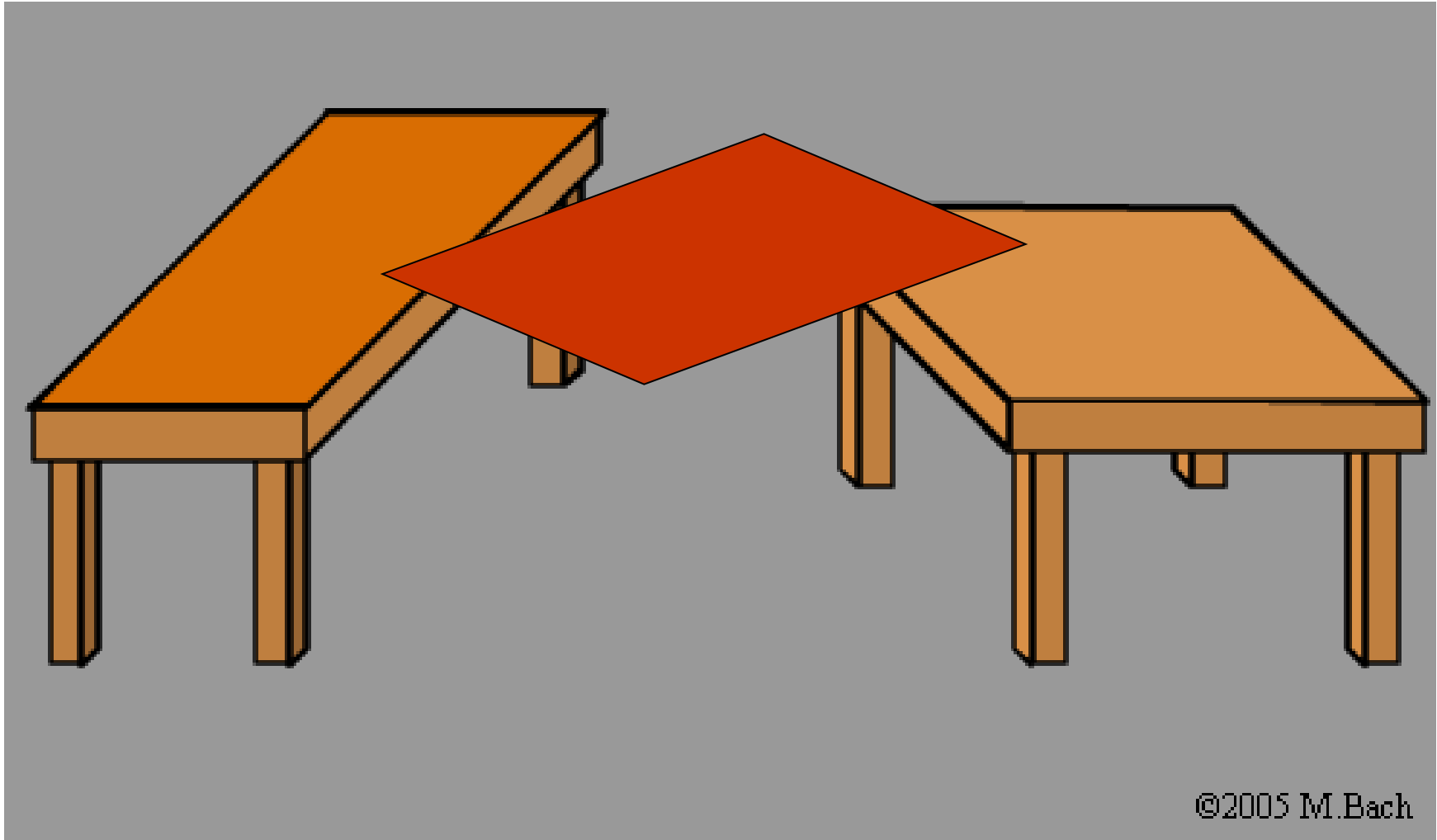
- Translation of the world outside to a mental experience inside
  - Guided by our experience and expectations
  - Affects our perceptions, judgments, and behavior
- This translation process is not infallible
  - A variety of *habits of mind*, born out of experience, can separate our experience from reality



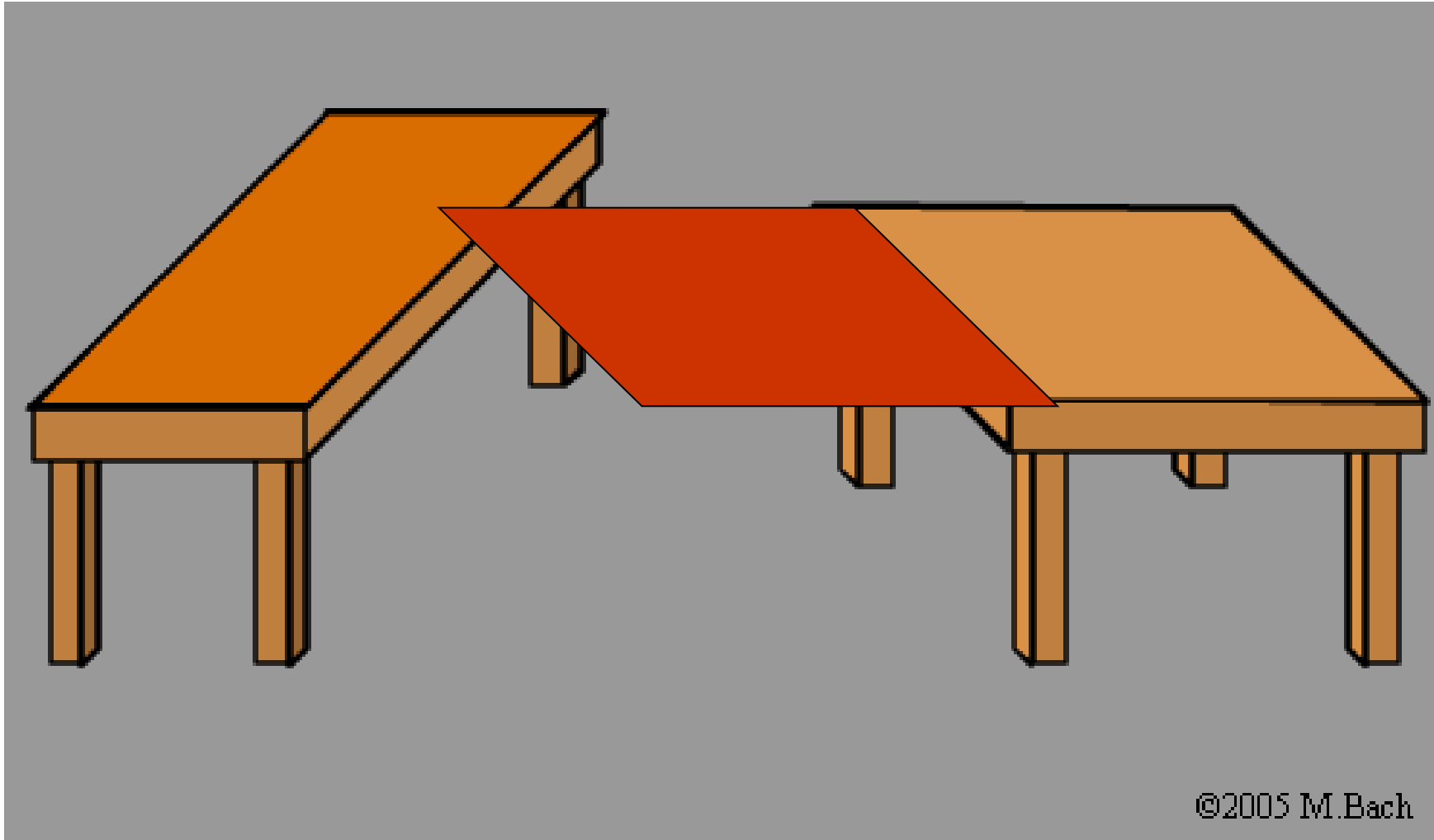
©2005 M.Bach



©2005 M. Bach



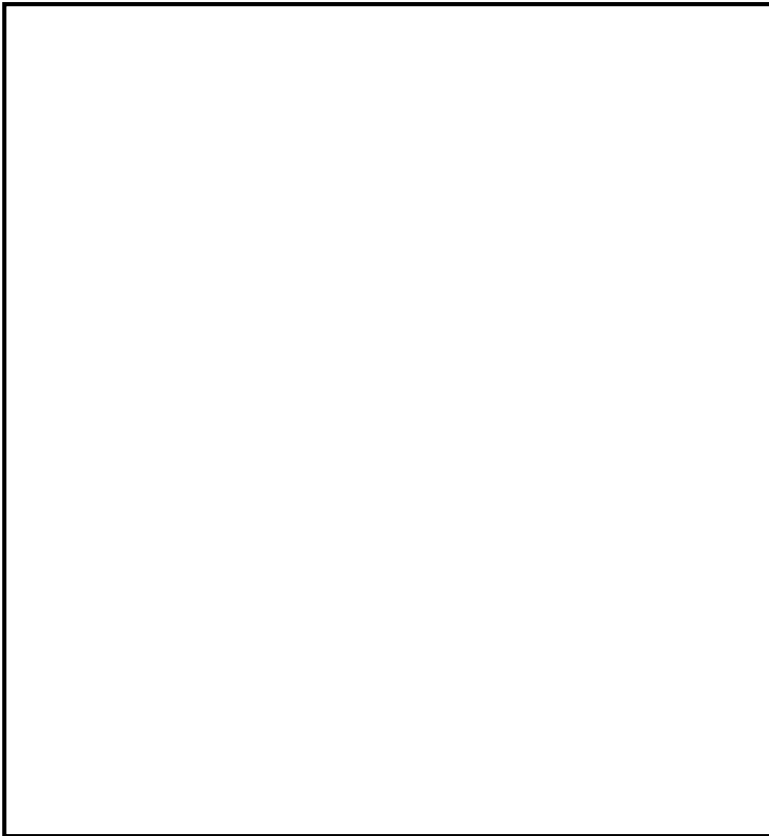
©2005 M. Bach



# Stroop Color Naming Task

---

Compatible Trials



# Stroop Color Naming Task

---

Compatible Trials



RED

# Stroop Color Naming Task

---

Compatible Trials

RED

BLACK

# Stroop Color Naming Task

---

## Compatible Trials

RED

BLACK

BROWN

# Stroop Color Naming Task

---

## Compatible Trials

RED

BLACK

BROWN

GREEN

# Stroop Color Naming Task

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## Compatible Trials

RED

BLACK

BROWN

GREEN

YELLOW

# Stroop Color Naming Task

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## Compatible Trials

RED

BLACK

BROWN

GREEN

YELLOW

BLUE

# Stroop Color Naming Task

---

Compatible Trials

RED

BLACK

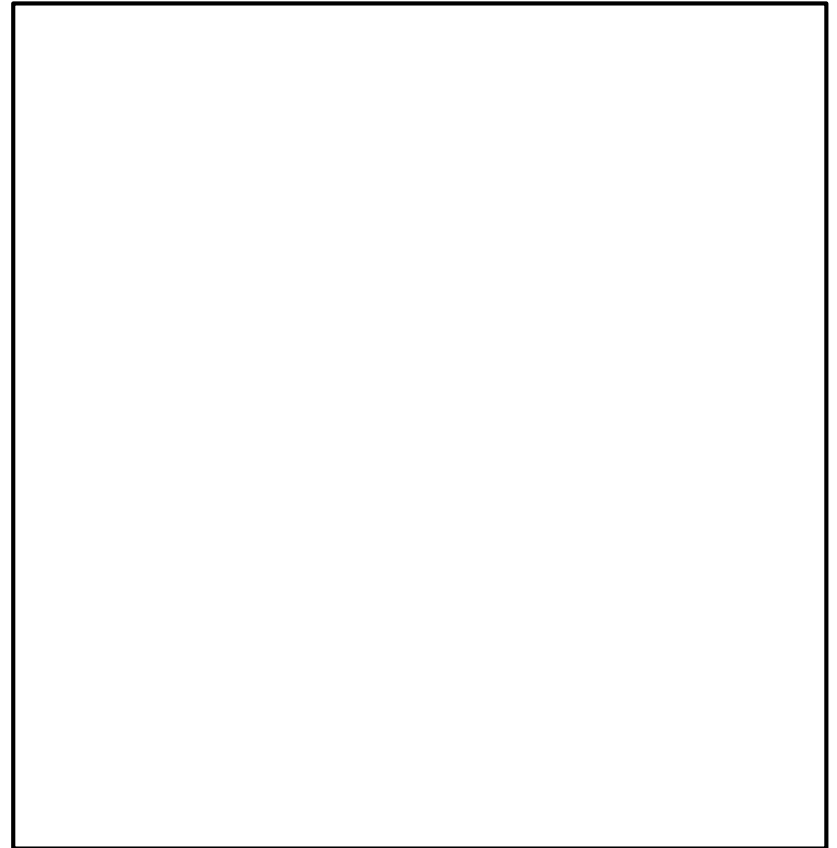
BROWN

GREEN

YELLOW

BLUE

Incompatible  
(interference) Trials



# Stroop Color Naming Task

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# Construction Worker Experiment

# Measuring Unconscious Bias: Gender-and-Science IAT

# Logic of the IAT

---

- IAT provides a measure of the strength of associations between mental categories such as “male and female” and attributes such as “science and humanities” disciplines
- Strength of association between each category and attribute is reflected in the time it takes to respond to the stimuli while trying to respond rapidly
- Trial Types

# Congruent Trials

Say “LEFT” for

**Science**

**OR**

**Men**

Say “RIGHT” for

**Humanities**

**OR**

**Women**

# Incongruent Trials

**Say “LEFT” for**

**Science**

**OR**

**Women**

**Say “RIGHT” for**

**Humanities**

**OR**

**Men**

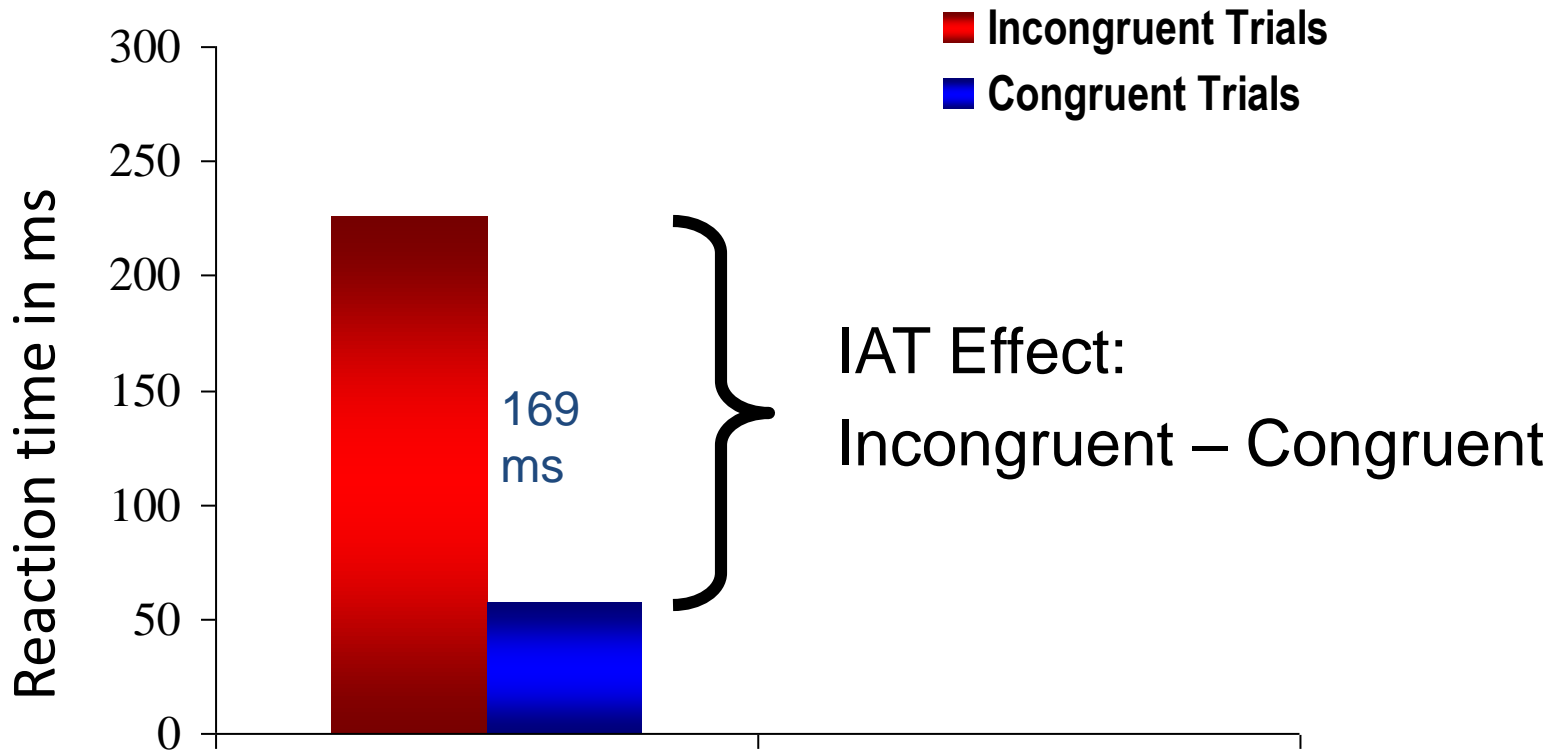
# Implicit Association Test

---

Demonstration

# IAT Effect

---

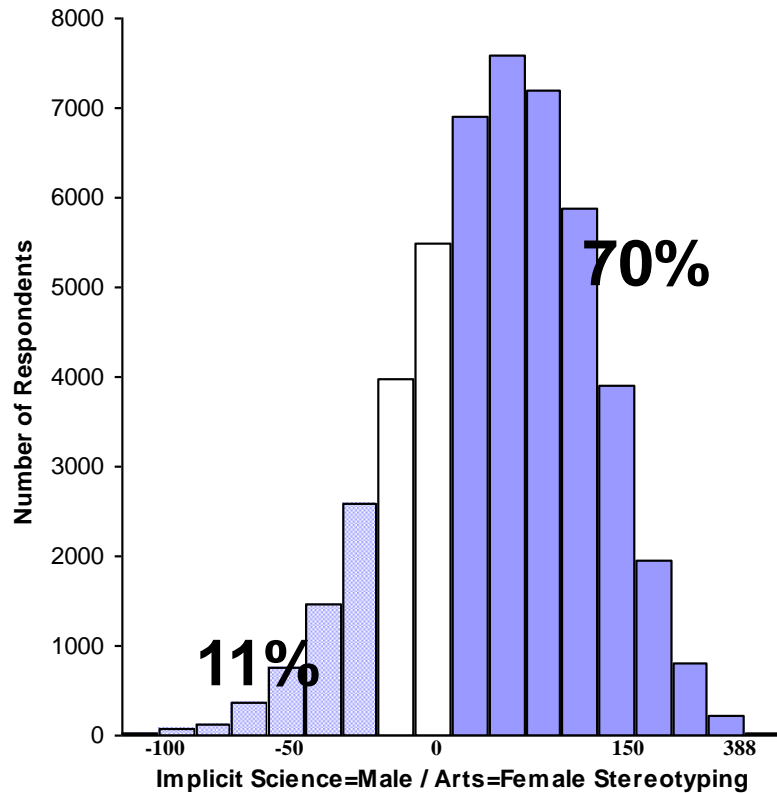


The larger the difference, the greater the bias in associating men with science and women with humanities

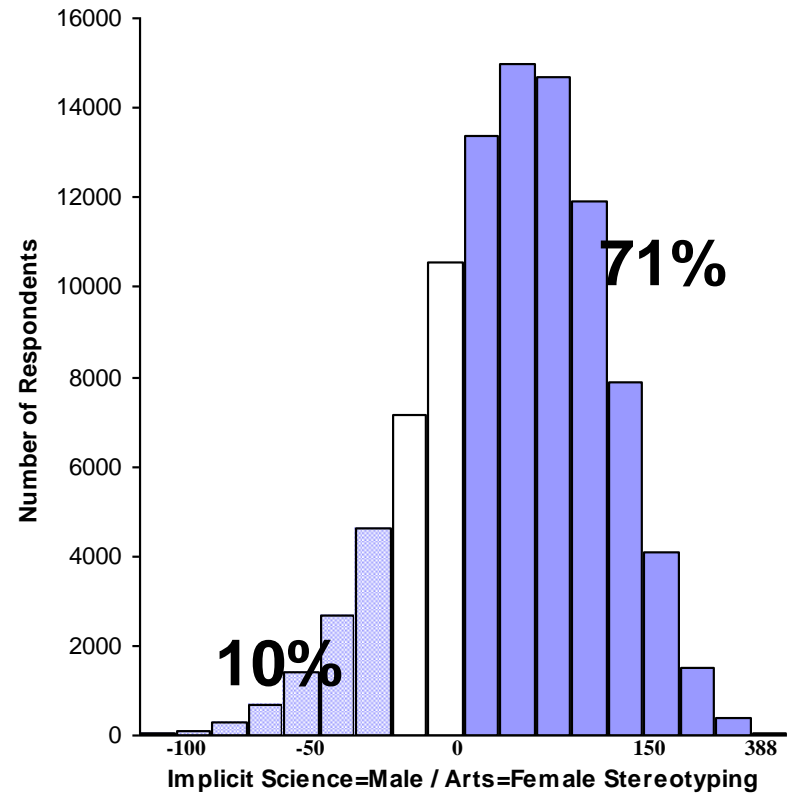
# Implicit Gender-Science Stereotypes

---

## Male Respondents



## Female Respondents



# Shift in Conceptualization of Prejudice

---

Old Framework = Prejudice is bad so if I think or act with bias, I am a bad person

New Framework = Prejudiced thoughts and actions are habits that we all have and breaking these habits requires more than good intentions

---

# How does this affect students?

---

- Parents/teachers/counselors steer women away from “male” jobs
  - Students “choose” jobs that conform to their gender stereotypes
  - Evaluators view credentials in ways that conform to gender expectations
-

# Expectancy Bias

Expecting certain behaviors or characteristics in individuals based on stereotypes about the social category to which they belong

Stereotypes about men?

Stereotypes about women?

# Role Congruity/Incongruity

The fit (or lack of fit) between gender norms and workplace roles

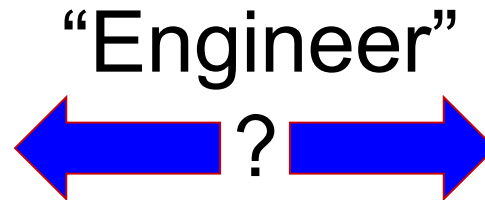
Stereotypes about engineers?

# Occupational Role Congruity for men

---

## Men

- Strong
- Decisive
- Independent
- Don't ask for directions
  - Logical
- Lack emotions
- Love sports
- Good at math



## Women

- Nurturing
  - Nice
- Supportive
  - Helpful
- Sympathetic
  - Verbal
  - Social
  - Creative



# Social Penalties for Violating Gender Norms

---

## Women

- Strong
- Decisive
- Independent
- Don't ask for directions
  - Logical
- Lack emotions
- Love sports
- Good at math

## Social Penalties

## Men

- Nurturing
  - Nice
- Supportive
  - Helpful
- Sympathetic
  - Verbal
  - Social
  - Creative

# Stereotype Threat

Members of negatively stereotyped groups may underperform when reminded of their group membership

# Classroom Environments

Stereotypical room

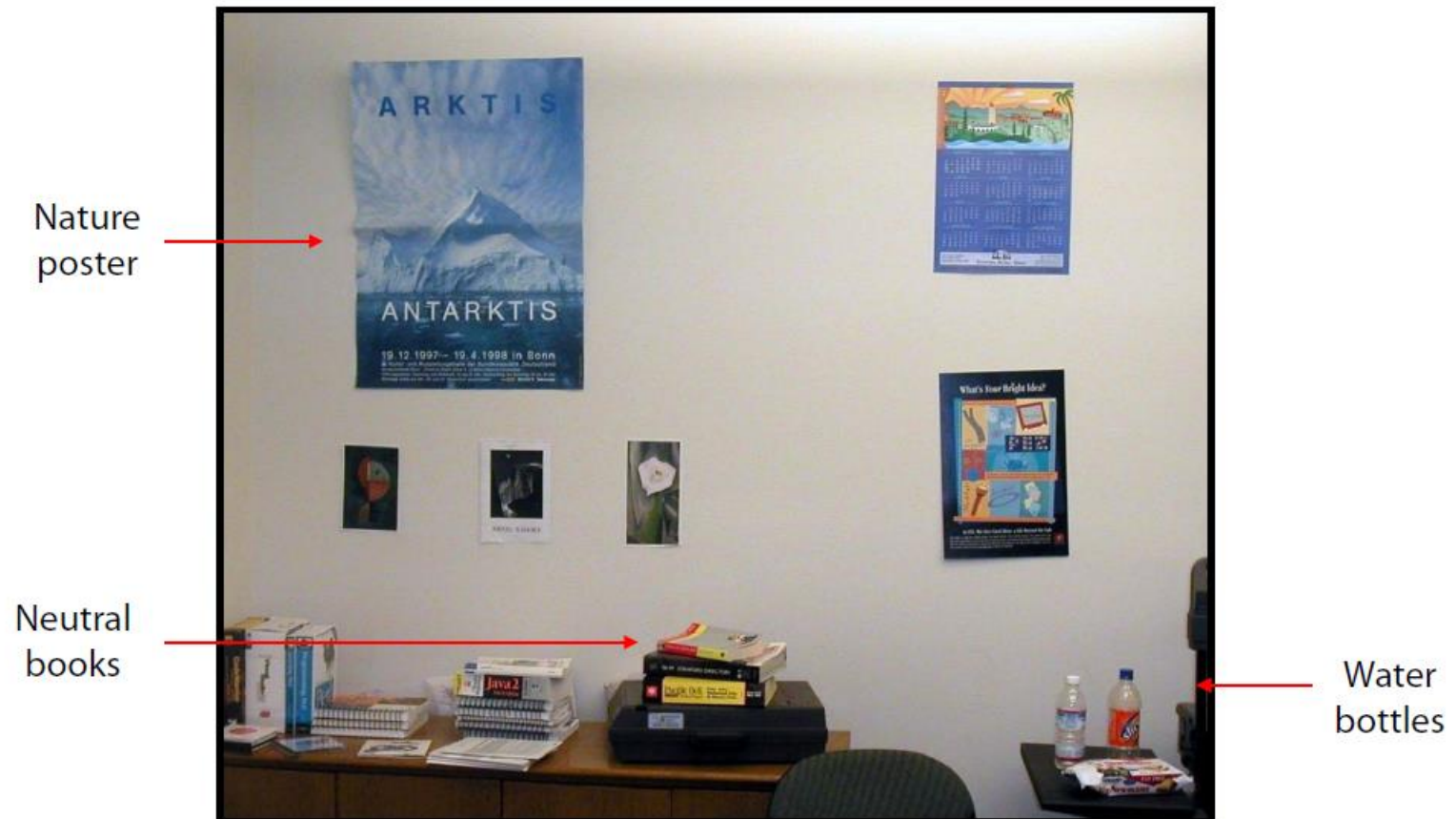


Cheryan, Plaut, Davies & Steele, *Journal of Personality & Social Psychology*, 2009

Images used with permission of Dr. Sapna Cheryan

# Classroom Environments

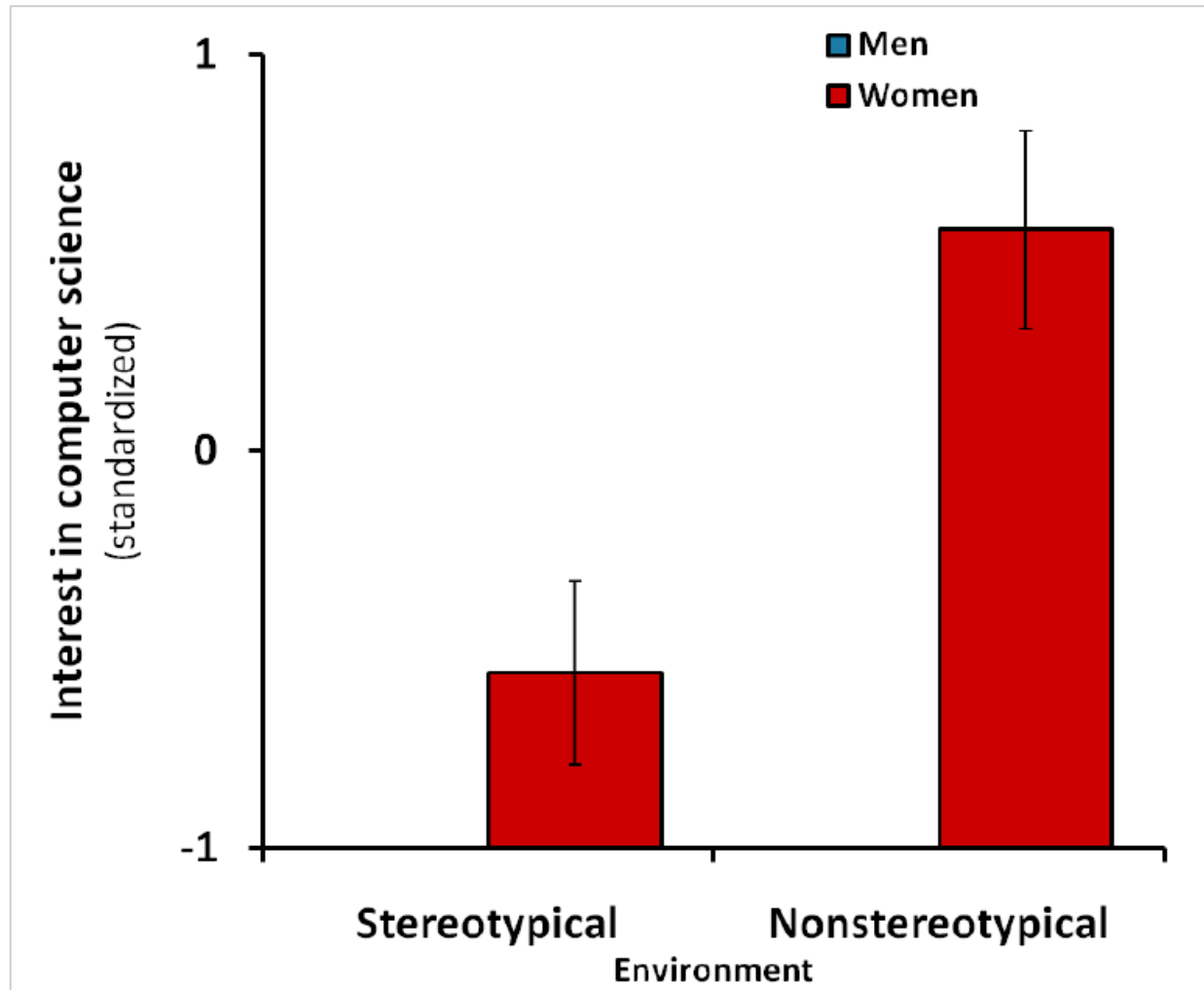
Non-stereotypical room



Cheryan, Plaut, Davies & Steele, *Journal of Personality & Social Psychology*, 2009

Images used with permission of Dr. Sapna Cheryan

# Environment influences women's interest in CS



Cheryan, Plaut, Davies & Steele, *Journal of Personality & Social Psychology*, 2009

Images used with permission of Dr. Sapna Cheryan

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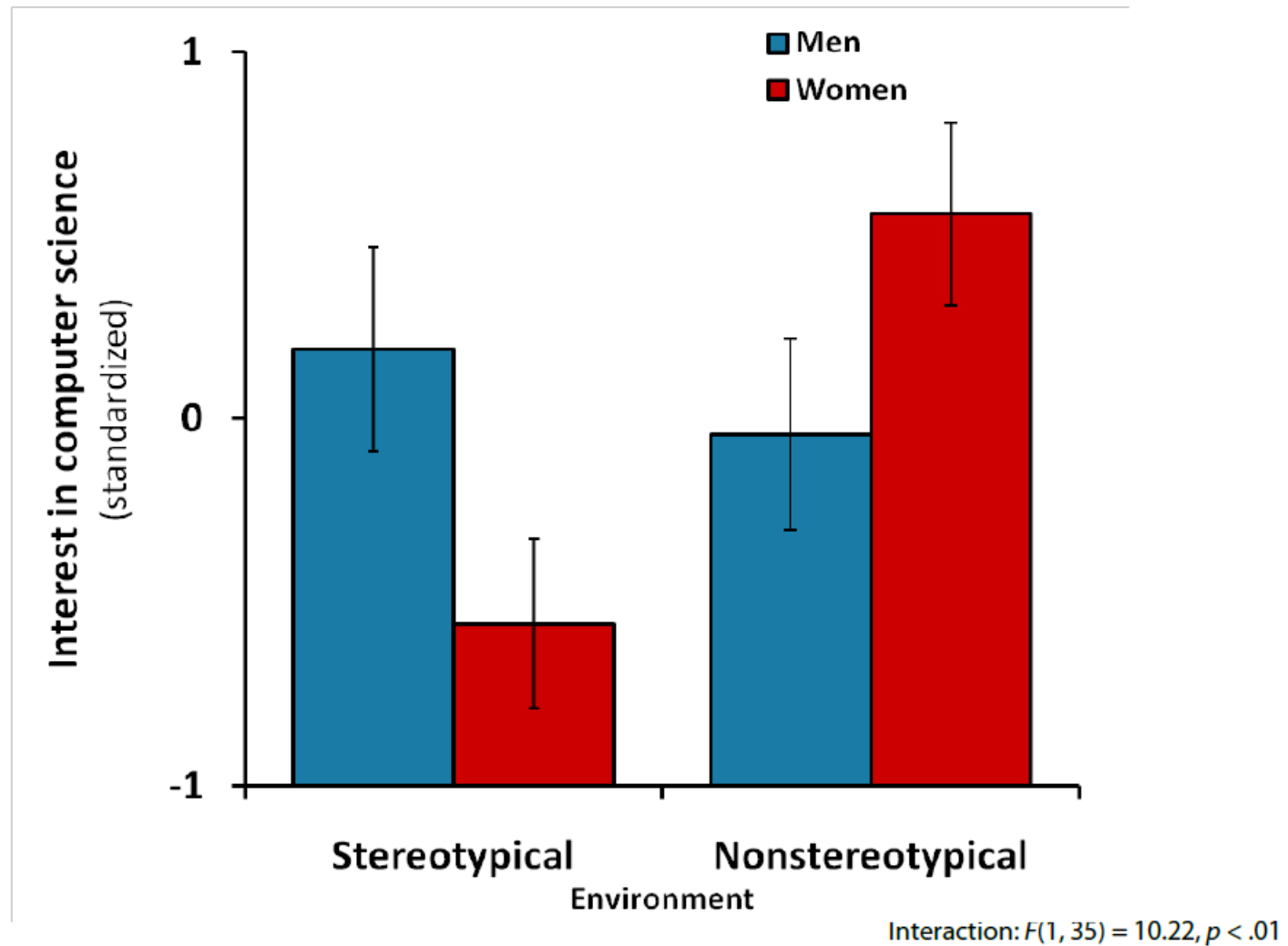


TABLE 1. Mean Comprehension Scores According to Sex and Image Condition

Image Condition	Sex		Total
	Female	Male	
Stereotypic	7.42 (SD = 3.35) n = 18	9.00 (SD = 2.18) n = 7	7.86 (SD = 3.11) n = 25
Counter-Stereotypic	9.38 (SD = 1.88) n = 16	7.70 (SD = 1.72) n = 10	8.73 (SD = 1.97) n = 26
Mixed Gender	8.37 (SD = 3.30) n = 15	8.25 (SD = 3.20) n = 12	8.31 (SD = 3.19) n = 27
Total	8.35 (SD = 2.99) n = 49	8.24 (SD = 2.50) n = 29	8.31 (SD = 2.80) n = 78

Note. Comprehension scores are out of a possible high score of 12.

*Strategies to Reduce the Influence of  
Implicit Bias*

# Bias within these constructs is malleable...

---

Construct	Intervention	Example of study
↓ <b>Expectancy bias and promote <u>role congruity</u></b>	Be specific about what a job or task requires, rather than use generalizations or make assumptions	Heilman ME. <i>Organ Behav Hum Perf.</i> 33(2):174-86, 1984.
↓ <b>Effect of <u>stereotype priming</u></b>	Stating that “there is no gender difference in ability to perform this task” eliminated impact of priming	Davies, Spencer & Steele. <i>J Pers Soc Psych.</i> 88:276-287, 2005.
↓ <b>Impact of <u>stereotype threat</u></b>	Minimizing stereotype threat by removing gender stereotype priming (e.g. pictures of men and women doing science)	Good et al. <i>J Soc Psychol.</i> 150:132-47, 2010.

# Strategies That DO NOT Work

---

- **Stereotype Suppression**

(e.g., Galinsky & Moskowitz. *J Pers Soc Psychol* 2000;  
Monteith et al. *Pers Soc Psychol Rev*1998)

- Banish stereotypes from one's mind  
(i.e., gender or race “blind”)

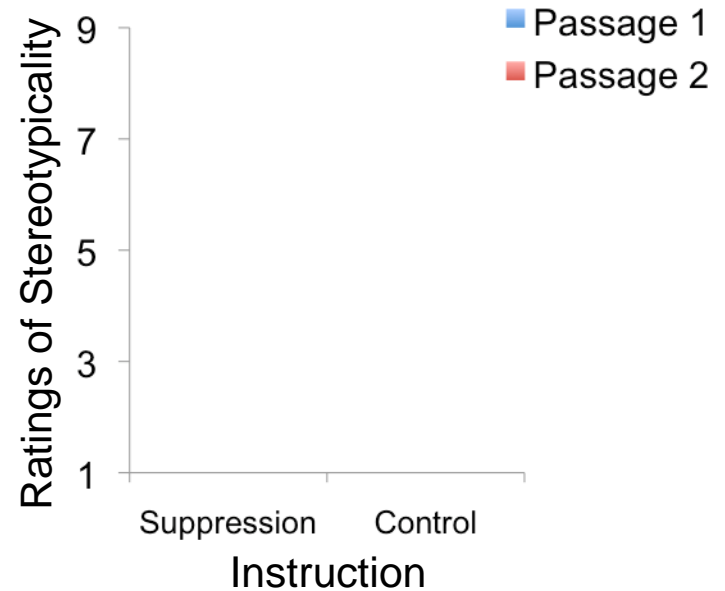
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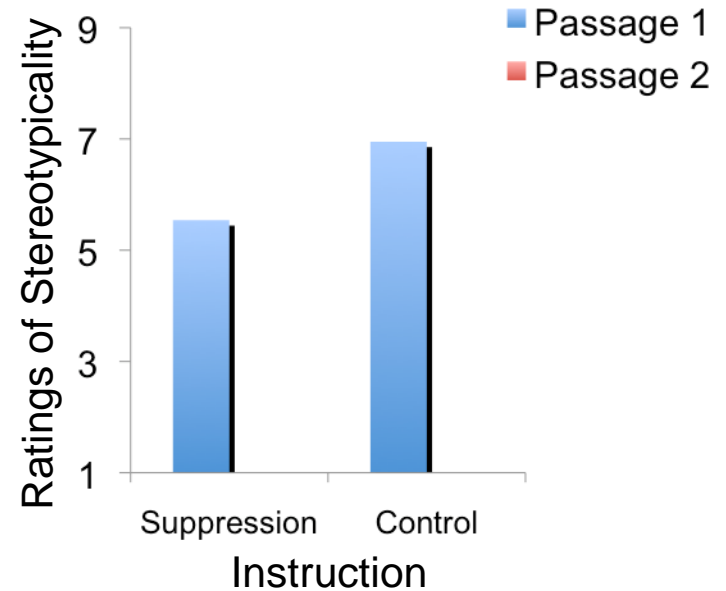


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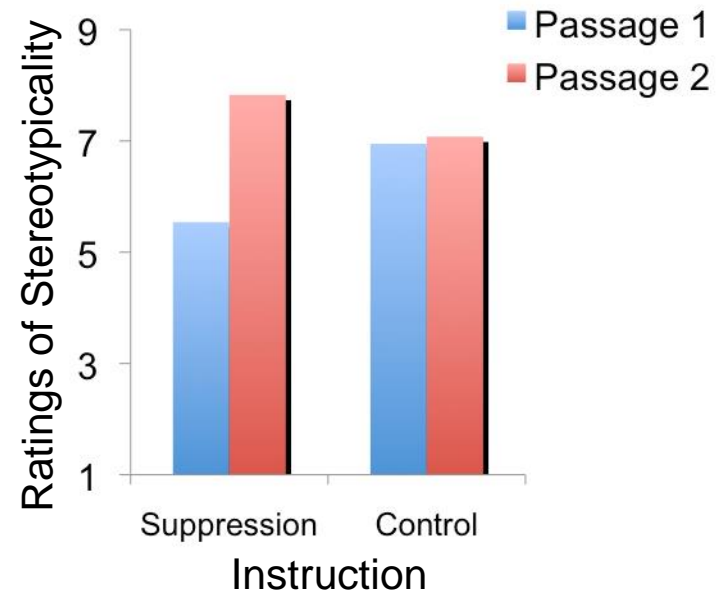


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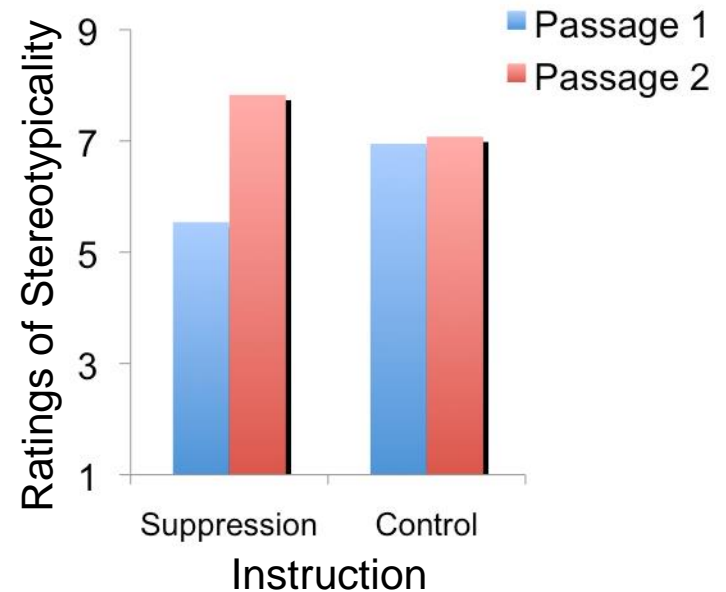


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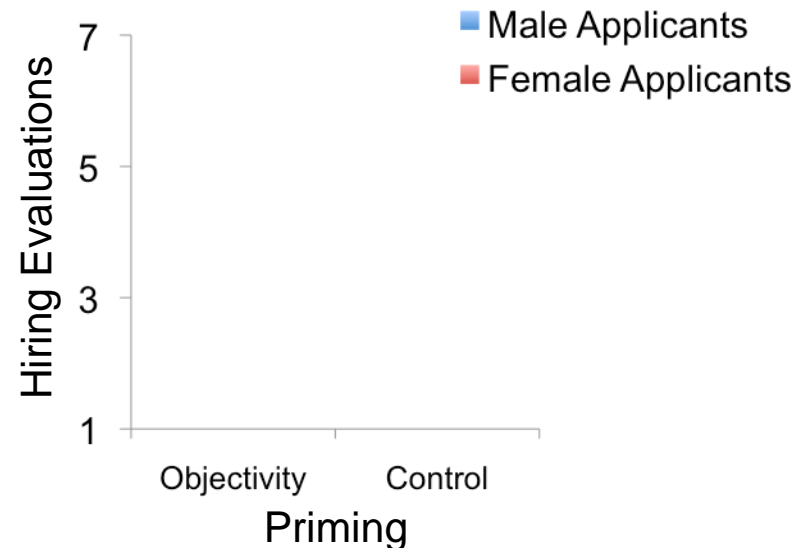
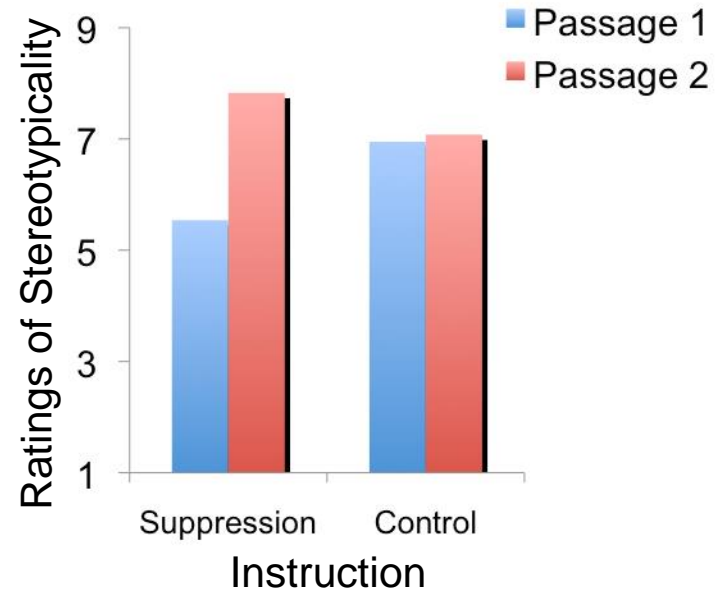
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- **Belief in personal objectivity**

(Uhlmann & Cohen. *Organ Behav Hum Decis Process* 2007)

- Leads to biased evaluations of women



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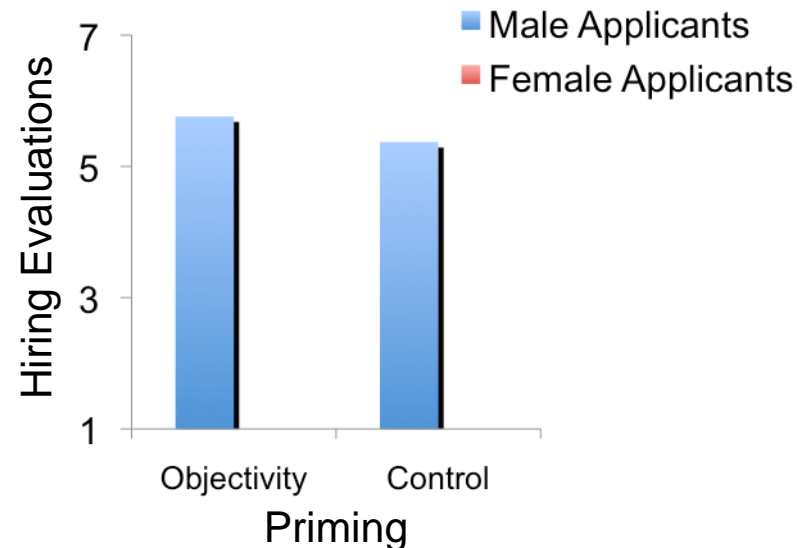
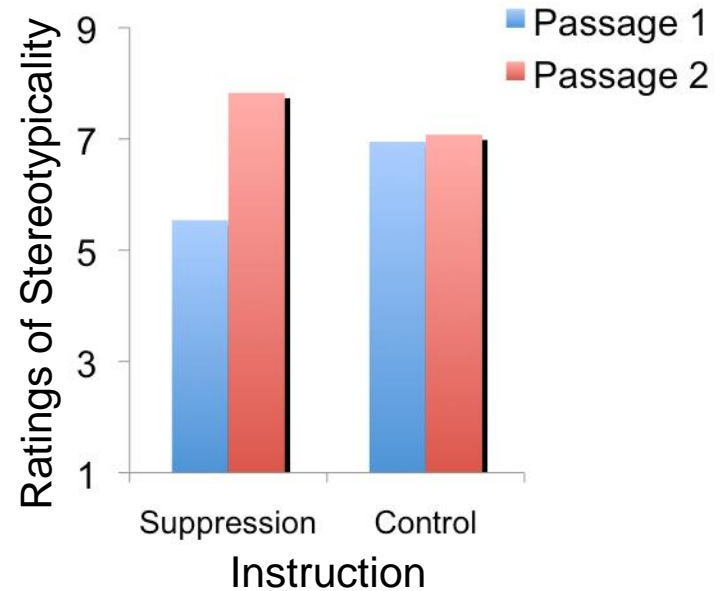
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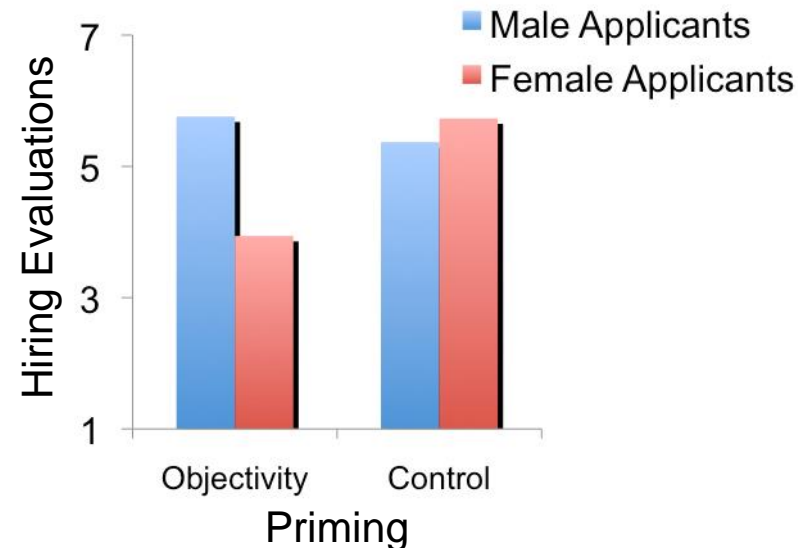
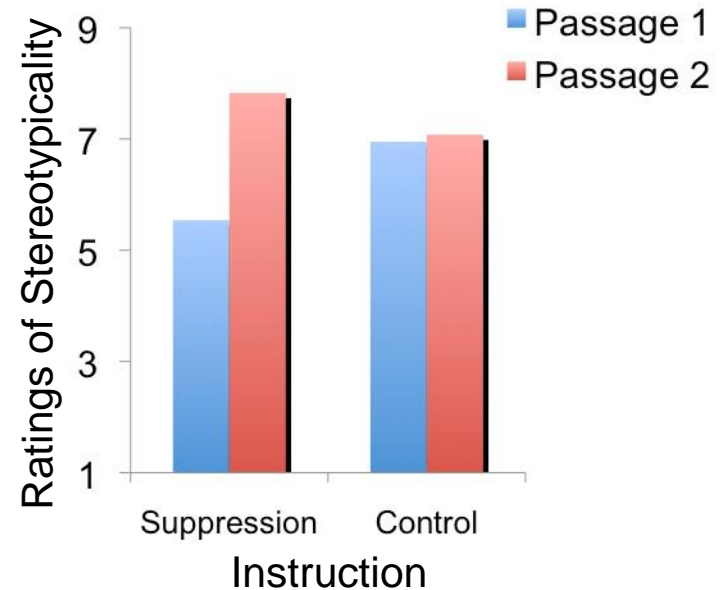
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- Leads to biased evaluations of women



# 1. Stereotype Replacement

---

- ✓ Recognize when you have stereotypic thoughts, and recognize stereotypic portrayals in society. For example,
  - *Women students are less interested in engineering than in social studies*
  - *Portrayal of females as poor at math or males as unable to do housework*
- ✓ Challenge the fairness of the portrayal and replace it with a non-stereotypic response. For example,
  - *I know many successful women engineers*
  - *Research does not support a gender difference in math performance once we control for the number of math courses taken*

## 2. Counter-Stereotype Imaging

---

- ✓ Help regulate your response by imagining a counter-stereotype woman in detail
  - *e.g., Imagine an astronaut, engineer, CEO who is also a woman OR specific positive counter-stereotypical individuals you know*



*I Set the Curve*

“Science is the New **Pink**”



*Be My Lab Partner*

“**Sassy Scientist**”

“**Real Women are Real Smart**”

# 3. Individuating (instead of generalizing)

---

- ✓ Avoid making a snap decision based on a stereotype
  - *e.g., Make gender less salient than being a scientist, physician, or engineer*
- ✓ Obtain more information on specific qualifications, past experiences, etc. before making a decision
- ✓ *Practice making situational attributions rather than dispositional attributions*
  - *e.g., If a woman does poorly on an exam, consider a situational explanation (maybe she didn't get enough sleep) rather than a dispositional explanation (e.g., she's terrible at math)*

# 4. Perspective-Taking

---

- ✓ Adopt the perspective (in the first person) of a member of the stigmatized group
  - *For example, imagine what it would be like to...*
    - *Have your abilities called into question*
    - *Not be offered opportunities because of assumptions about what fields you will like*

# 5. Increasing Opportunities for Contact

---

- ✓ Seek out opportunities for greater interaction with counter-stereotypic women
  - *e.g., Ensure guest teachers or speakers brought into the department are diverse*

# Breaking the Prejudice Habit

---

- Not necessarily easy
- With effort (awareness, motivation, and a sustained commitment), prejudice is a habit that can be broken
  - Can expect that you may slip up
  - Stay committed
- Strategies we provided are powerful tools to combat implicit biases
  - Implicit responses can be brought into line with explicit beliefs