

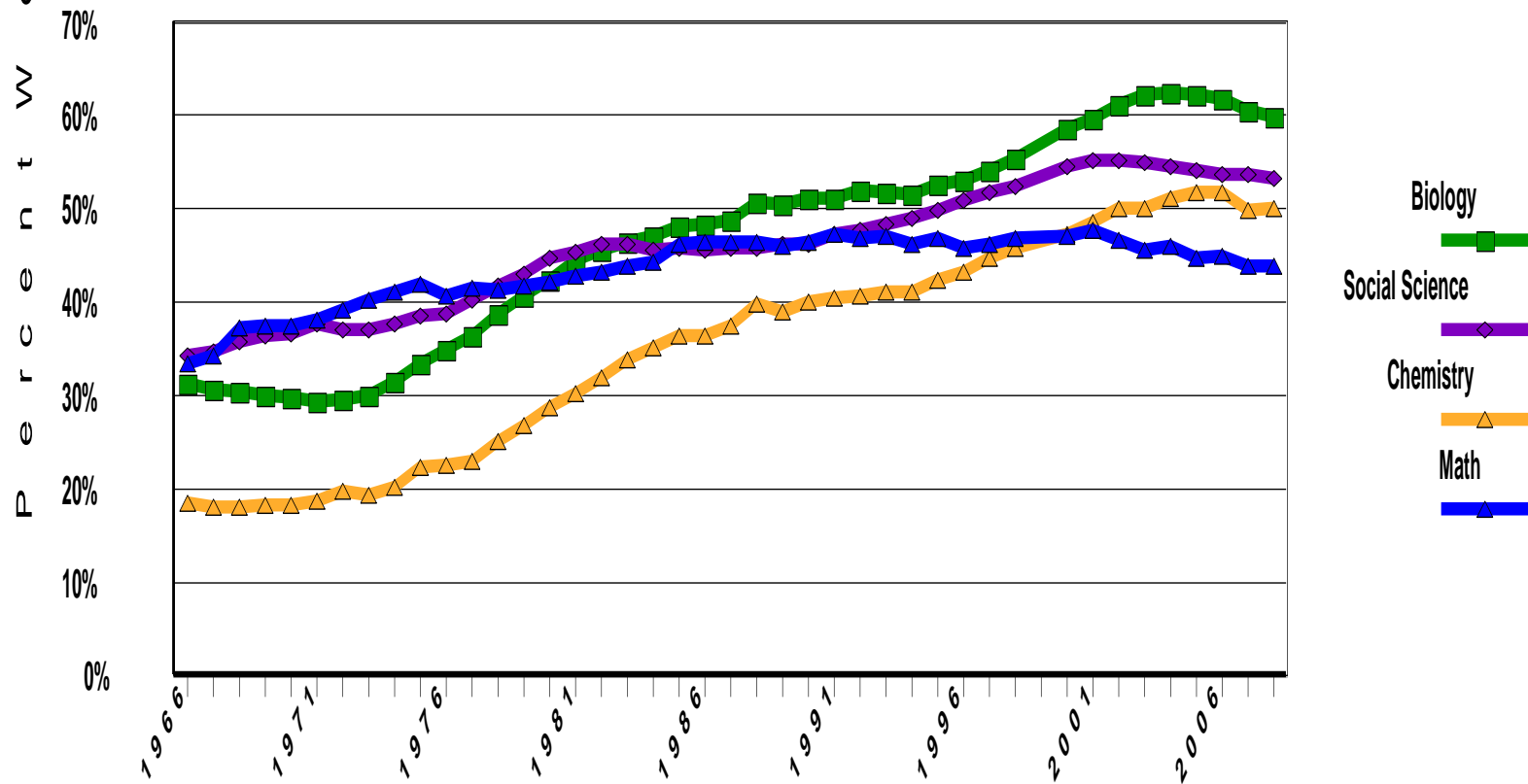
Fostering Opportunities in STEMM Occupations by Reducing Implicit Bias

Jennifer Sheridan, PhD

July 23, 2013

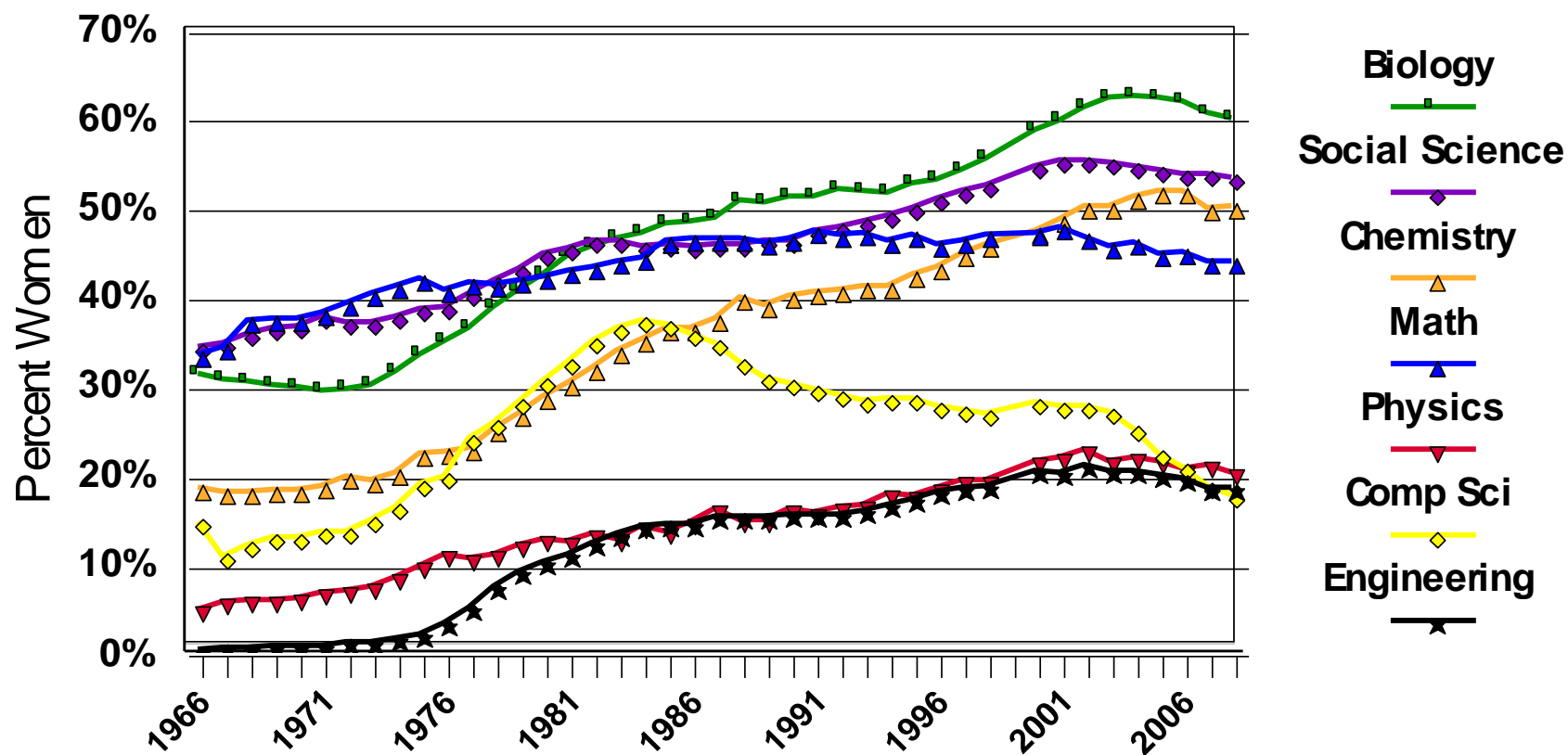
Percent Women Bachelor's Degrees, Selected Fields

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



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Outline

- Existence of unconscious/implicit bias
- Effects on evaluators
- Effects on those undergoing evaluation
- What to do?

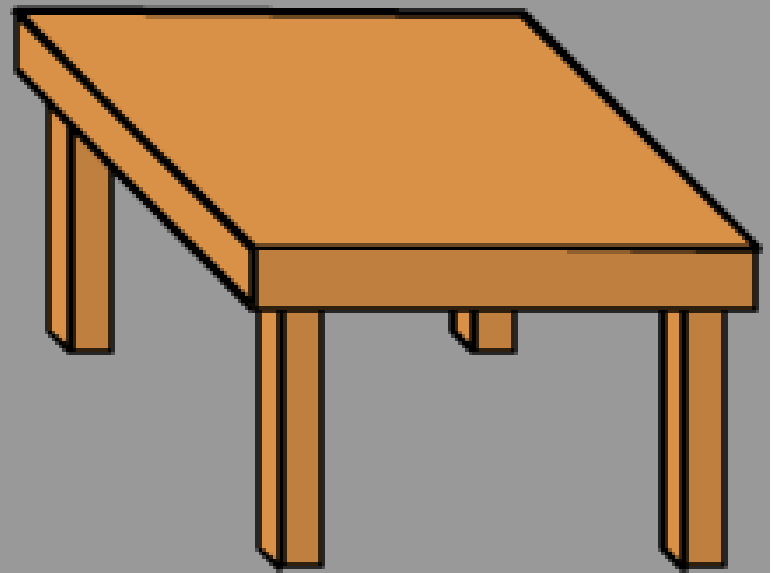
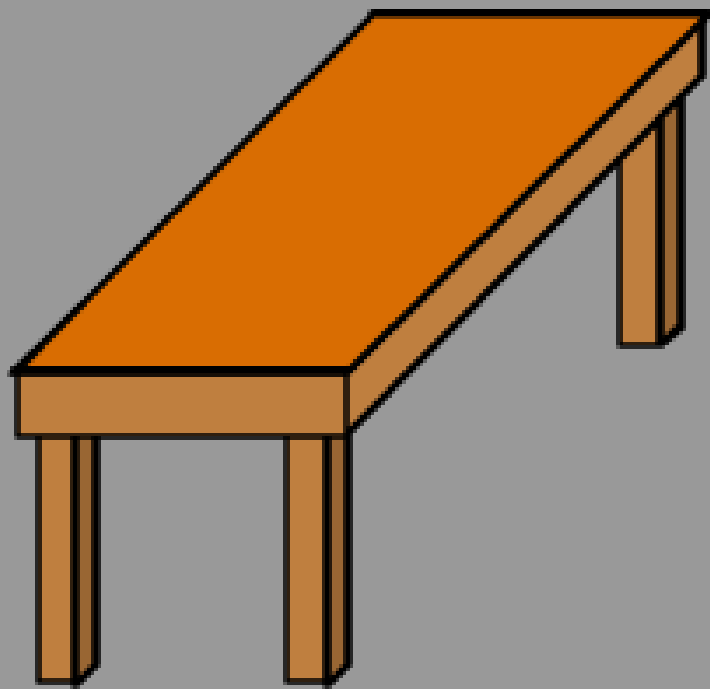
Existence of Unconscious/Implicit Bias

Prejudice and Habits of Mind

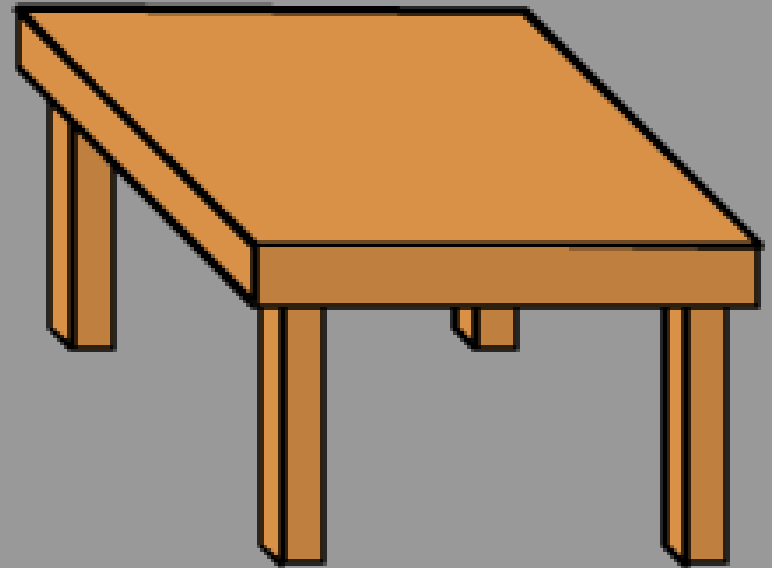
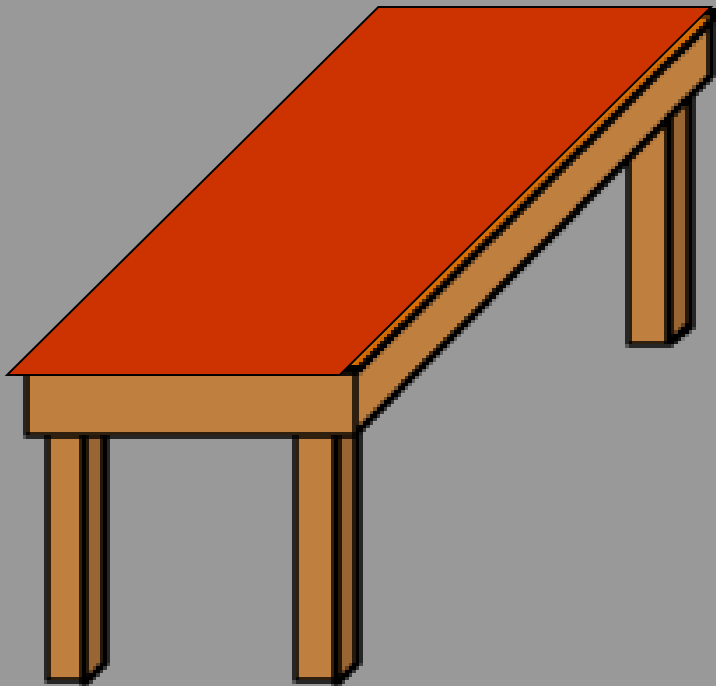
Ordinary mental operations that serve us quite well in most circumstances can fail our intentions

Essential Process...

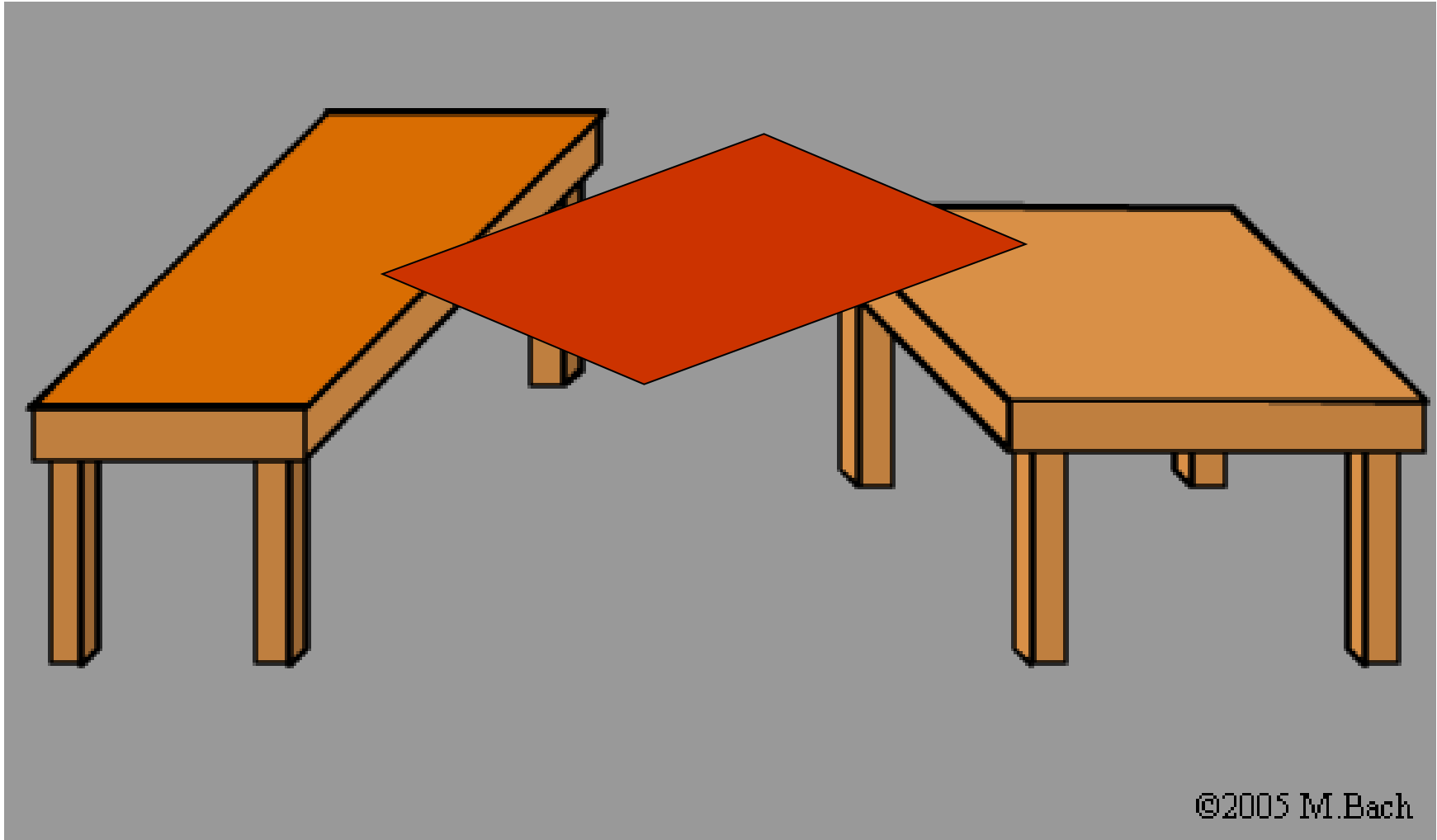
- Translation of the world outside to a mental experience inside
 - Guided by our experience and expectations
 - Affects our perceptions, judgments, and behavior
- This translation process is not infallible
 - A variety of *habits of mind*, born out of experience, can separate our experience from reality



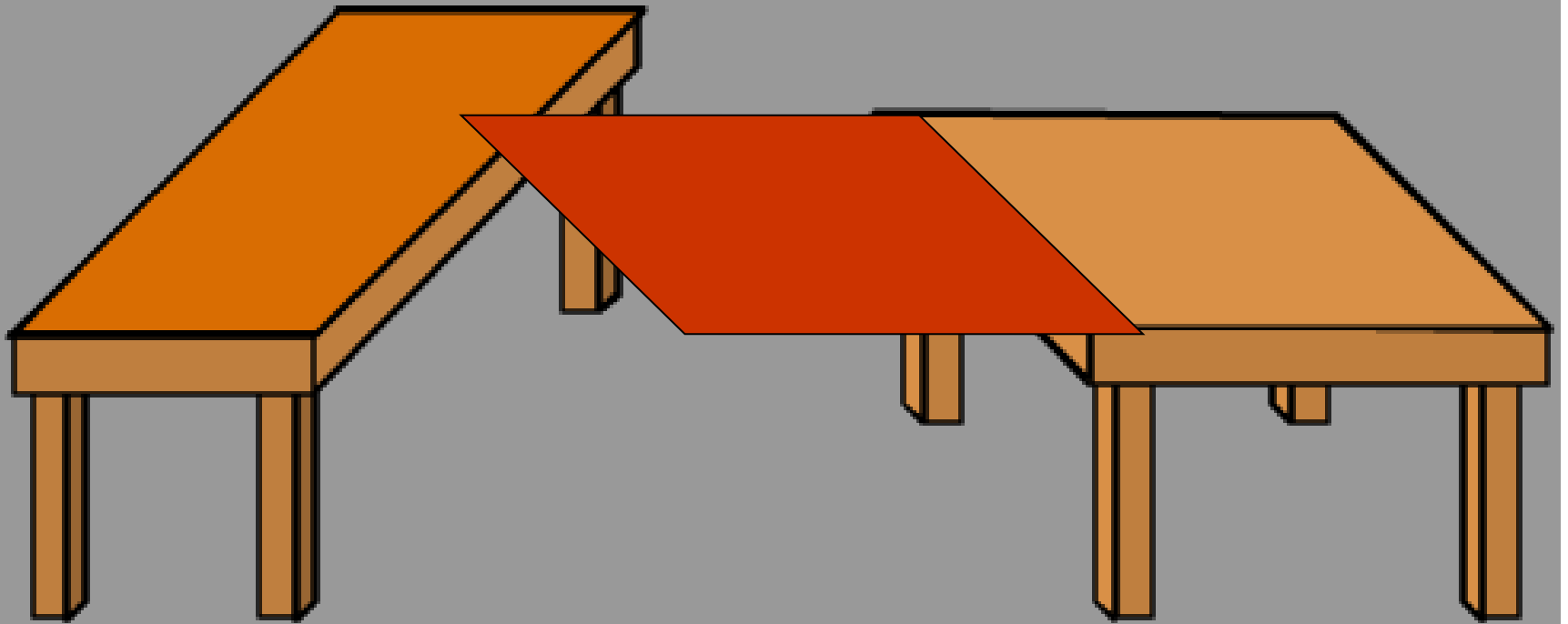
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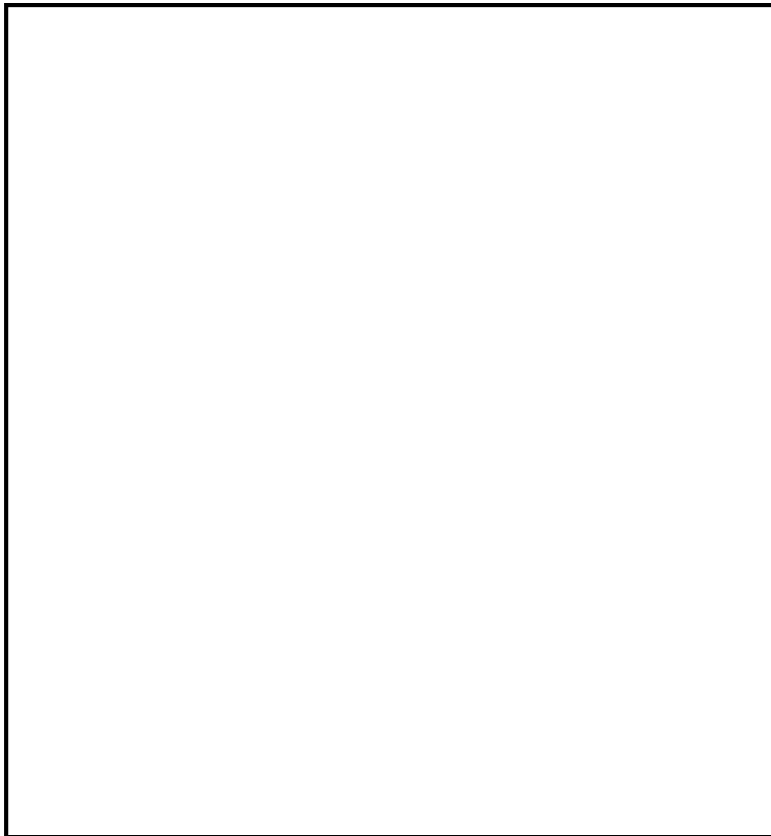


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Stroop Color Naming Task

Compatible Trials



Stroop Color Naming Task

Compatible Trials

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Stroop Color Naming Task

Compatible Trials

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Stroop Color Naming Task

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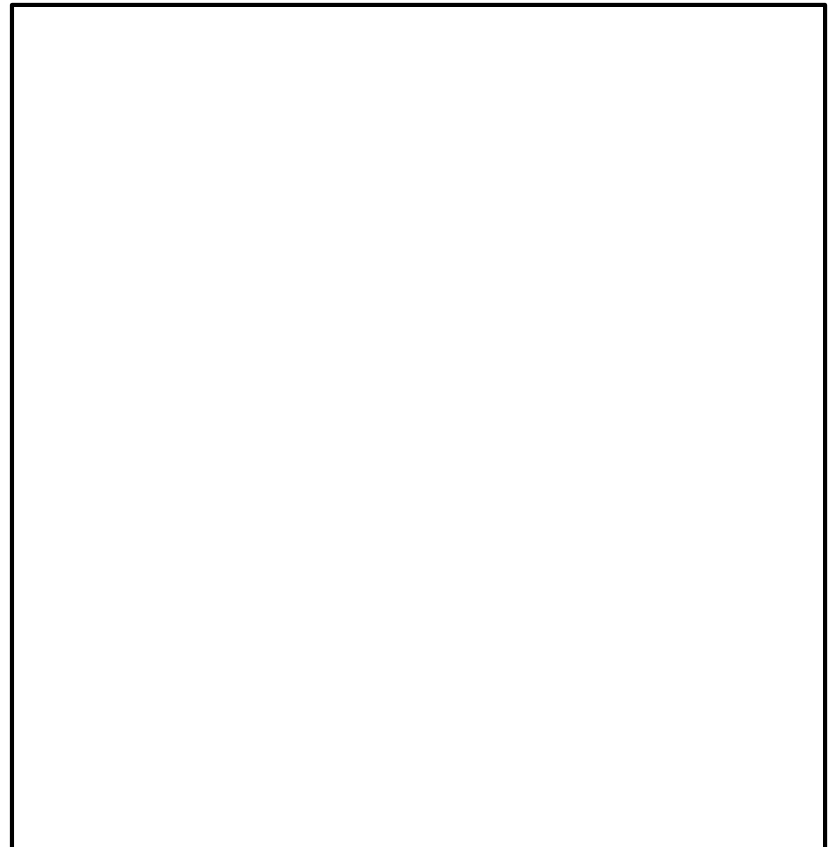
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Incompatible
(interference) Trials



Stroop Color Naming Task

Compatible Trials

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Incompatible (interference) Trials

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Construction Worker Experiment

Measuring Unconscious Bias: Implicit Association Tests (IAT)

Implicit Association Test

Demonstration

Congruent Trials

Say “LEFT” for

Science

OR

Men

Say “RIGHT” for

Humanities

OR

Women

Incongruent Trials

Say “LEFT” for

Science

OR

Women

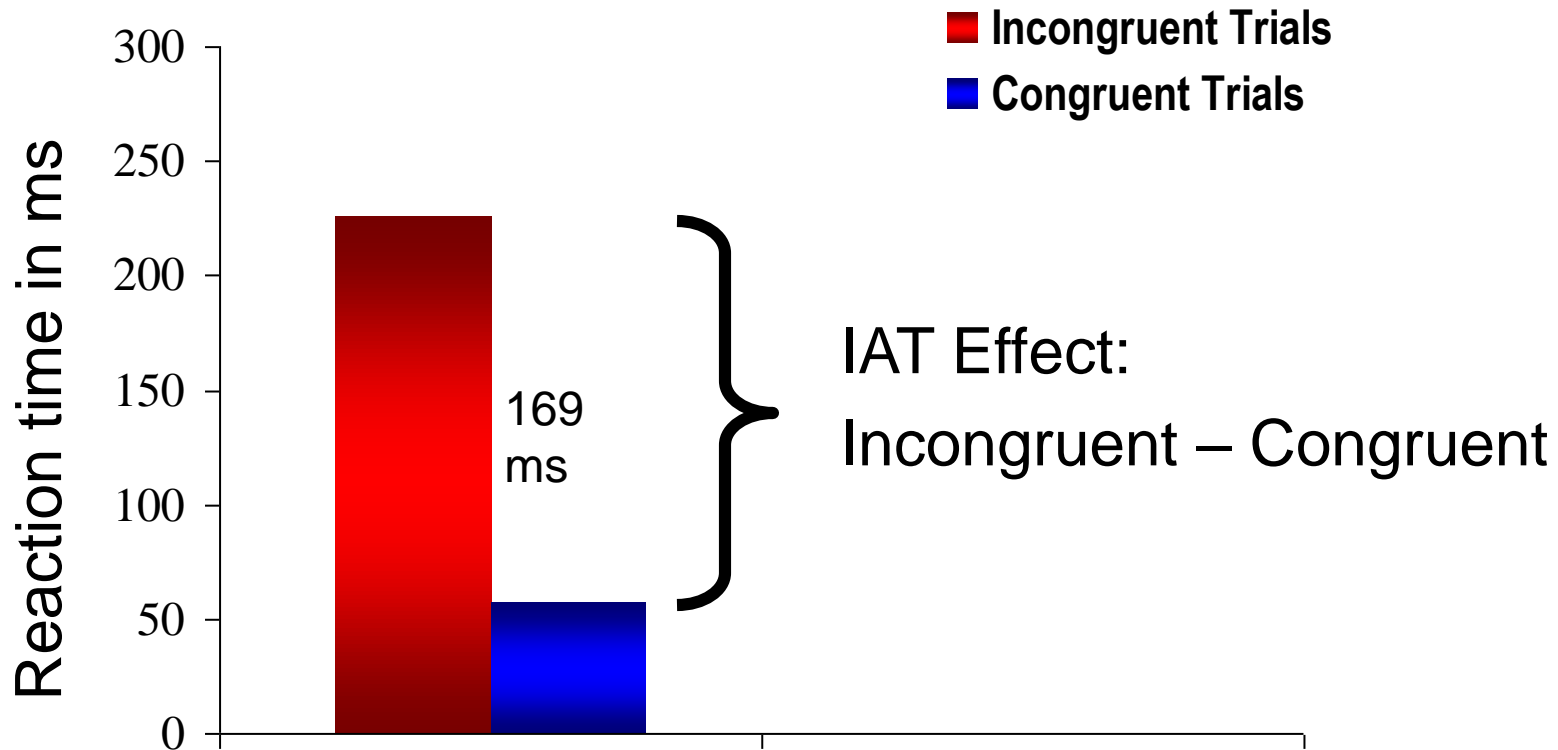
Say “RIGHT” for

Humanities

OR

Men

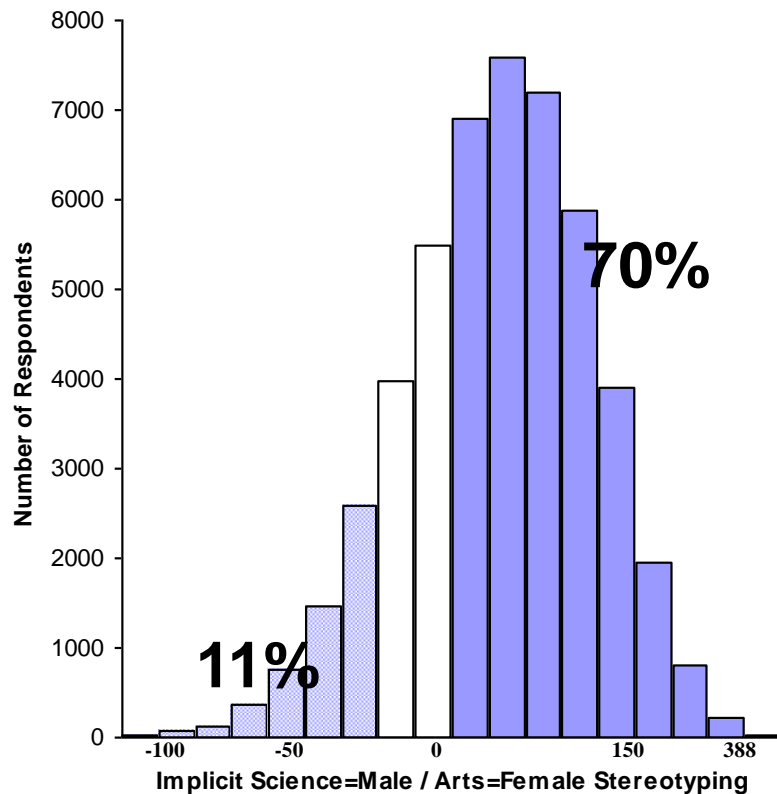
IAT Effect



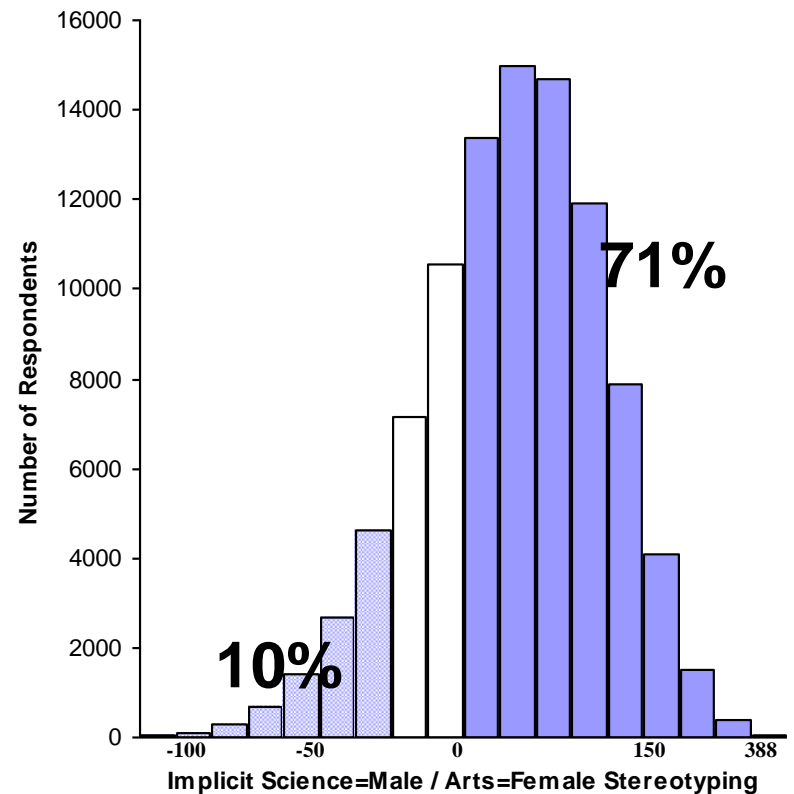
The larger the difference, the greater the bias in associating African Americans with “Bad” and European Americans with “Good”

Implicit Gender-Science Stereotypes

Male Respondents



Female Respondents



Source: Project Implicit

Characteristics of Implicit Biases

1. Ordinary

- Stem from our natural tendency to form associations to help organize our social worlds

2. Learned from culture

- Reflect the “thumbprint of culture” on our minds

3. Pervasive

- Prevalent among men and women, blacks and whites, young and old, etc.

4. Often conflict with consciously endorsed beliefs

- Dissociation between implicit and explicit responses

Characteristics of Implicit Biases

5. Consequential

- Predict behavior better than (and often at odds with) explicit measures
- Constrain the opportunities of targets of implicit bias

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

Effects on Evaluators

Applications of Unconscious Bias

- Applications/CVs/Résumés
- Reference Letters

Résumés/Gender Context

- 127 Biology, Chemistry, and Physics faculty review application materials for position of “lab manager”
 - Recent BS degree with stated intention of applicant to go on to graduate school
 - High but slightly ambiguous competence
 - Applications randomly assigned name “John” or “Jennifer”
 - Rated on competence, hireability, mentoring, and starting salary

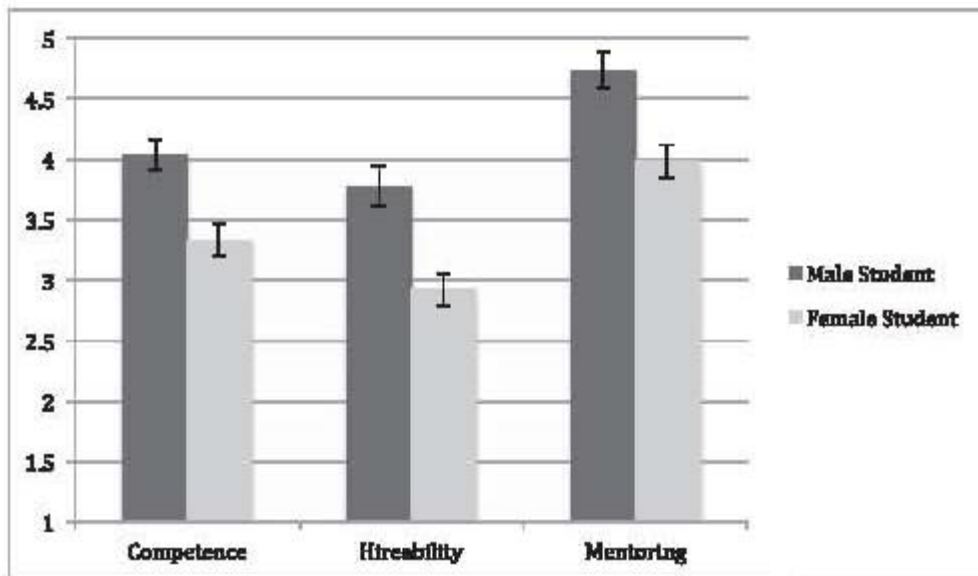


Fig. 1. Competence, hireability, and mentoring by student (collapsed across faculty gender). All student gender differences ($P < 0.001$). Scales range from 1 to 7, with higher numbers representing extent of each variable. Error bars represent SEs. $n_{\text{male student condition}} = 64$, $n_{\text{female student condition}} = 64$.

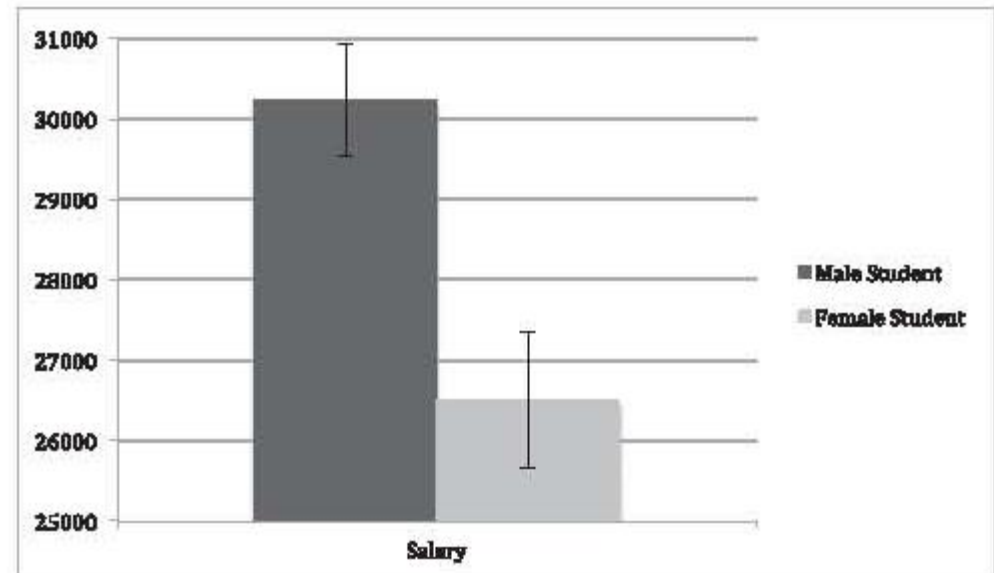


Fig. 2. Salary conferral by student gender condition (collapsed across faculty gender). The student gender difference is significant ($P < 0.01$). The scale ranges from \$15,000 to \$50,000. Error bars represent SEs. $n_{\text{male student condition}} = 63$, $n_{\text{female student condition}} = 64$.

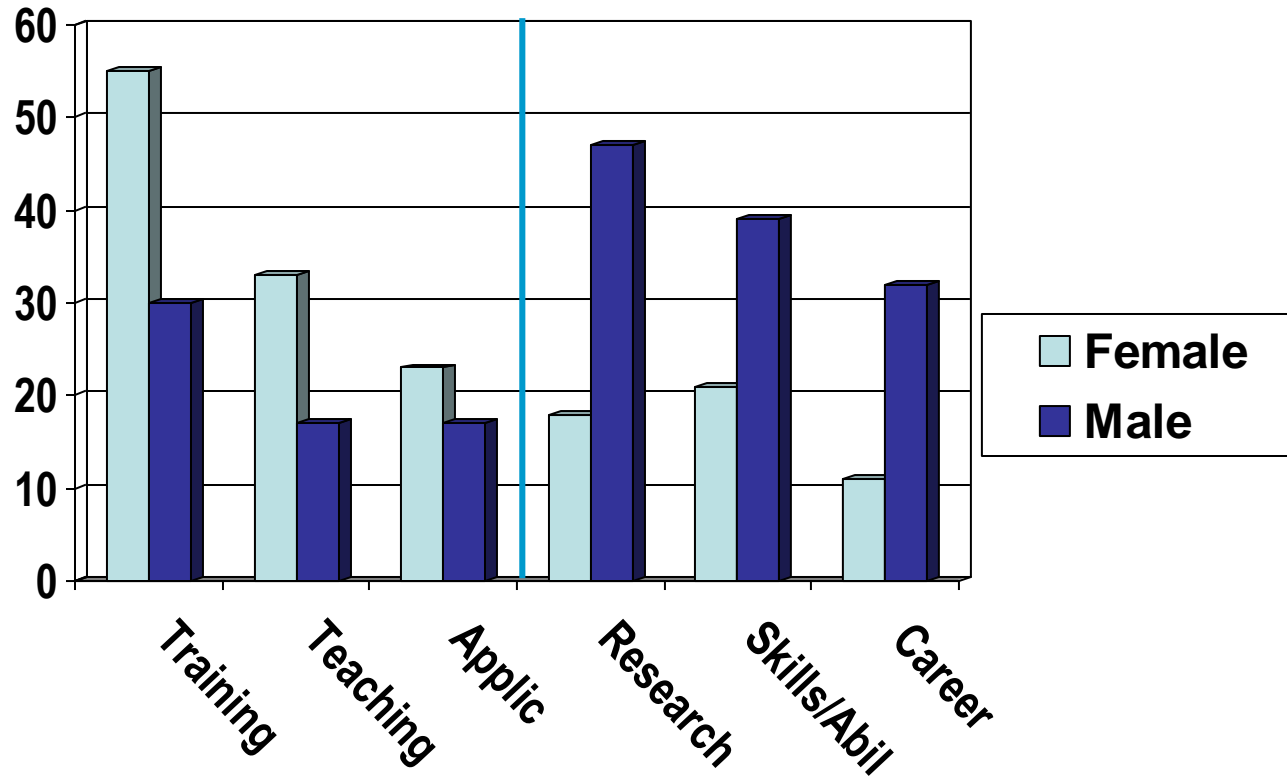
Résumés/Race Context

- Résumés of differing quality are randomly assigned white-sounding or African American-sounding names
 - Mailed in response to actual job ads in Chicago, Boston. Callbacks are measured.
 - White names are 50% more likely to be called back.
 - White names with high quality resume are 27% more likely to be called back (compared to whites with low quality), but Black names with high quality resume are only 8% more likely to be called back. (Less return to labor market experience for blacks.)
 - Neighborhood, job/employer characteristics not significant

Reference Letters/Gender Context

- 312 letters of recommendation for medical faculty hired at a large U.S. medical school
- Women's letters compared to men's more often:
 - Were *shorter*
 - Offered *minimal assurance*
 - Used *gender terms*
 - Contained *doubt raisers*
 - Used *stereotypic adjectives*
 - Used *grindstone adjectives*
 - Used fewer *standout adjectives*
 - Contained less *scientific terminology*

Top 3 semantic realms following the possessive for men and for women



Effects on Those Undergoing Evaluation

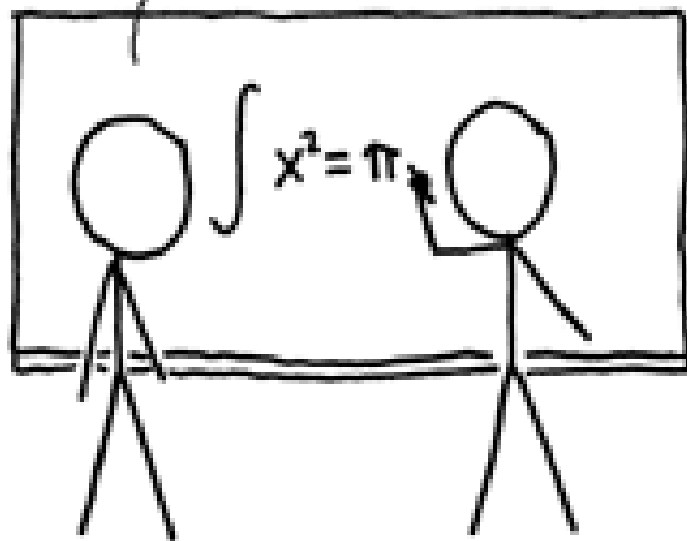
Stereotype Threat

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

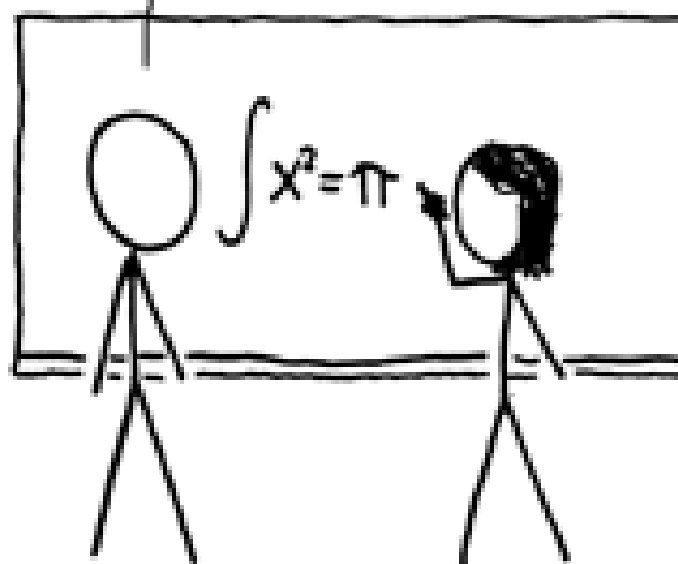
Multiple Examples of Stereotype Threat

Females vs. males in math	e.g., Spencer et al. <i>J Exp Soc Psychol</i> , 1999
White men vs. Asian men in math	e.g., Aronson & Lustina. <i>J Exp Soc Psychol</i> , 1999
White men vs. African American men in sports	e.g., Stone J. <i>Pers Soc Psychol Bull</i> , 2002
Women and leadership	e.g., Davies et al. <i>J Pers Soc Psychol</i> , 2005
Women and science	Good et al. <i>J Soc Psychol</i> , 2010

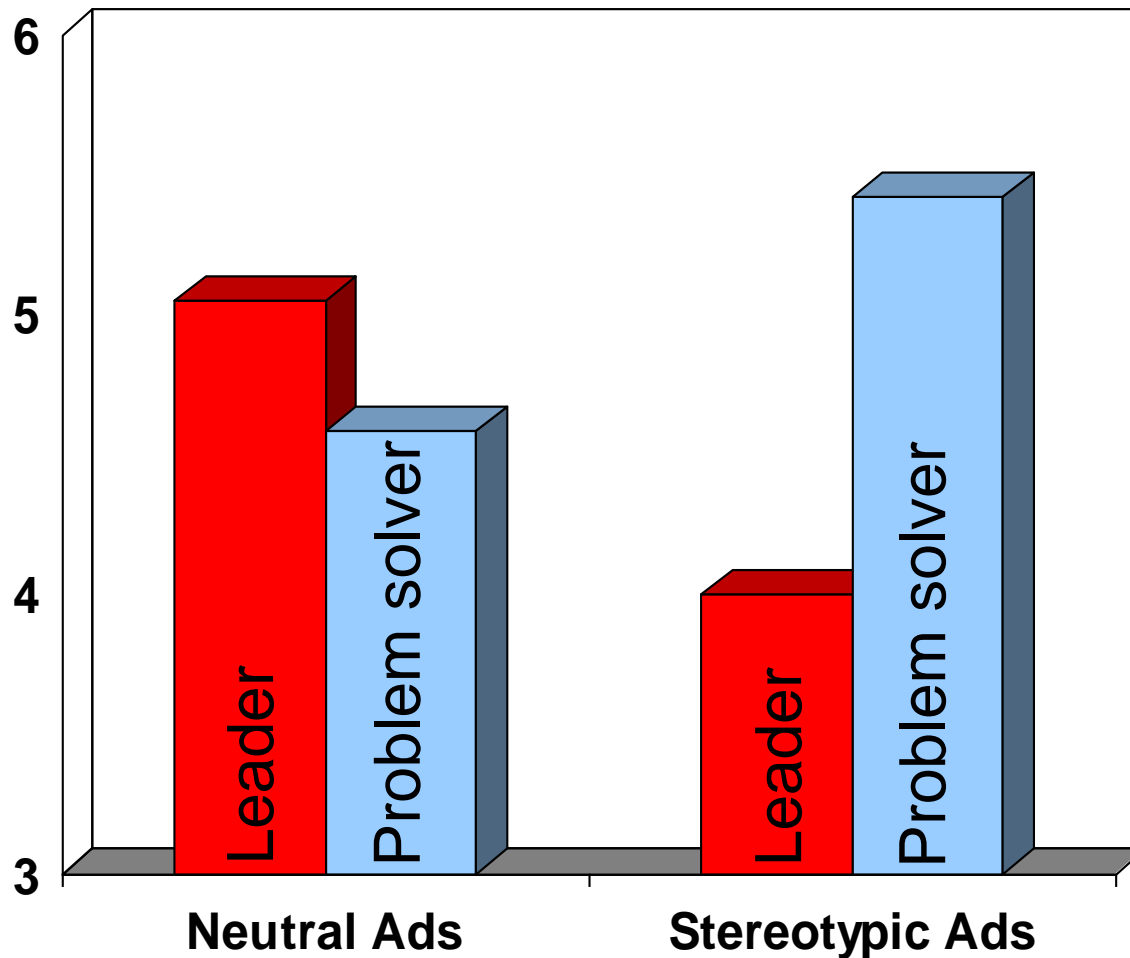
WOW, YOU
SUCK AT MATH.



WOW, GIRLS
SUCK AT MATH.



Women are less likely to select a leadership role when gender stereotype is primed



Neutral ad: NS

Stereotypic ad: $p < .01$

Neutral vs. stereotypic ad:

- Leader $p < .05$
- Problem solver $p < .05$

Classroom Environments

Stereotypical room



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

Images used with permission of Dr. Sapna Cheryan

Classroom Environments

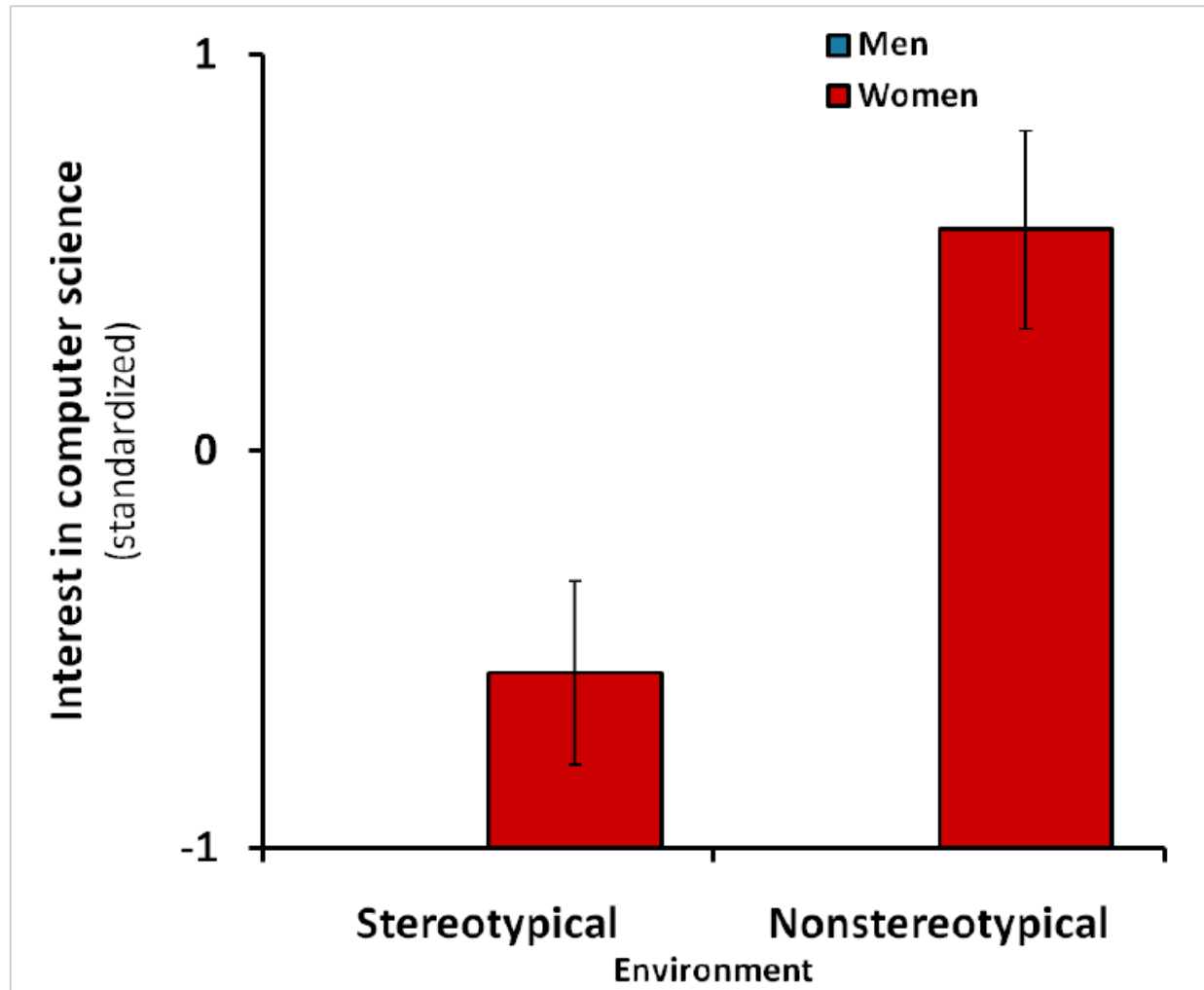
Non-stereotypical room



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

Images used with permission of Dr. Sapna Cheryan

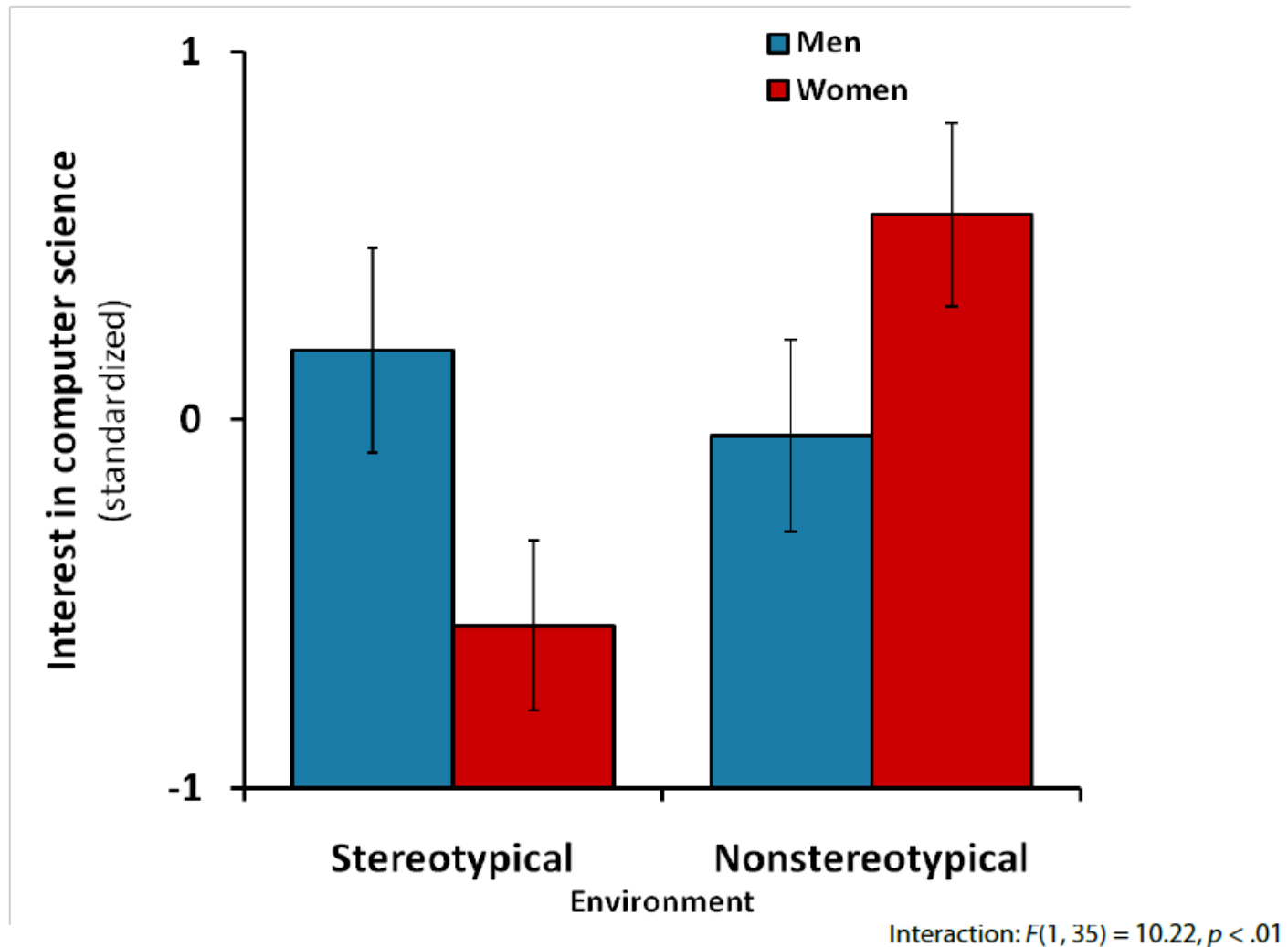
Environment influences women's interest in CS



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

Images used with permission of Dr. Sapna Cheryan

Environment influences women's interest in CS



What to Do?
Breaking the Bias Habit

Reducing Bias in Evaluations: Individual Behaviors

Know what factors increase vulnerability to unconscious bias

- Believing oneself to be objective and unbiased
- Believing oneself to be colorblind or gender blind
- Having insufficient or ambiguous information
- Being busy and under time pressure
- Multi-tasking
- Being stressed, tired, and/or hungry

Reducing Bias in Evaluations

What Not to Do:

- Suppress bias and assumptions from one's mind (or try to)
- Rely solely on a presumably “objective” ranking or rating system to reduce bias

[Wennarås & Wold. Nepotism and Sexism in Peer Review. *Nature* 1997.](#)

Strategies That DO NOT Work

- **Stereotype Suppression**

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

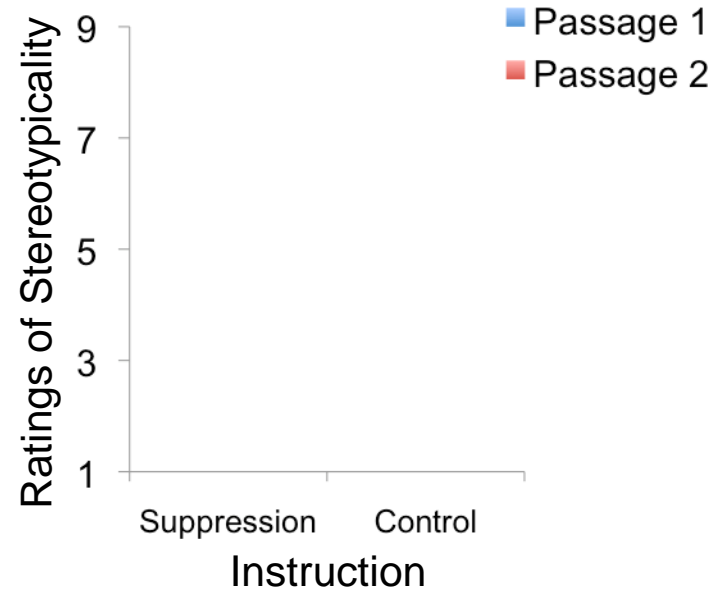
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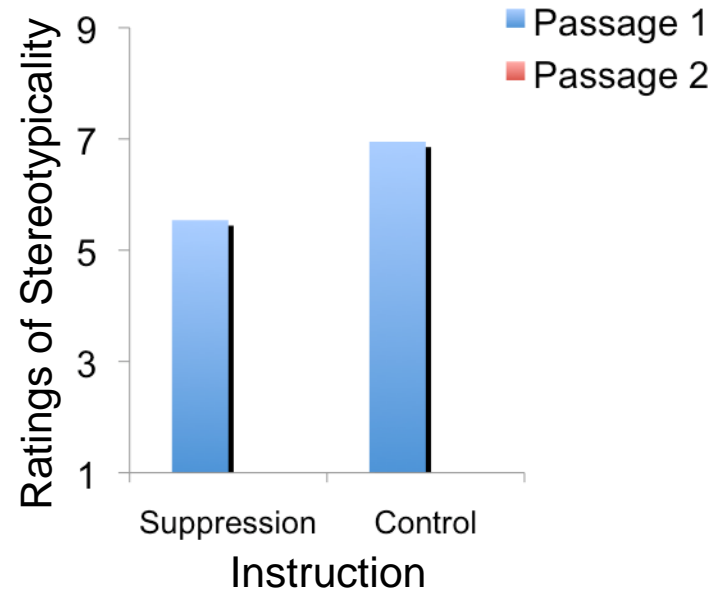


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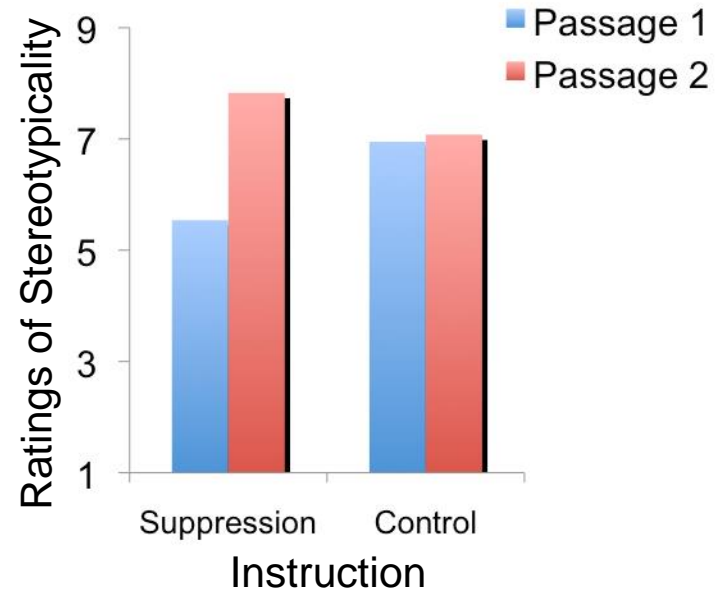


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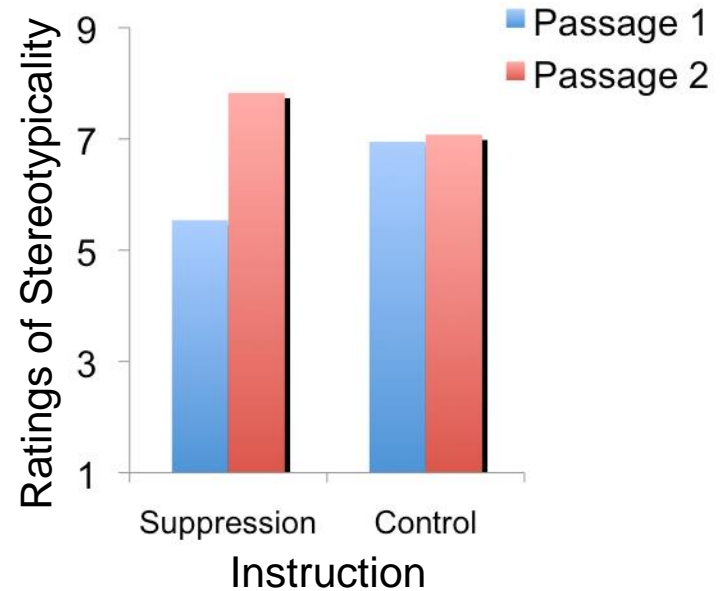


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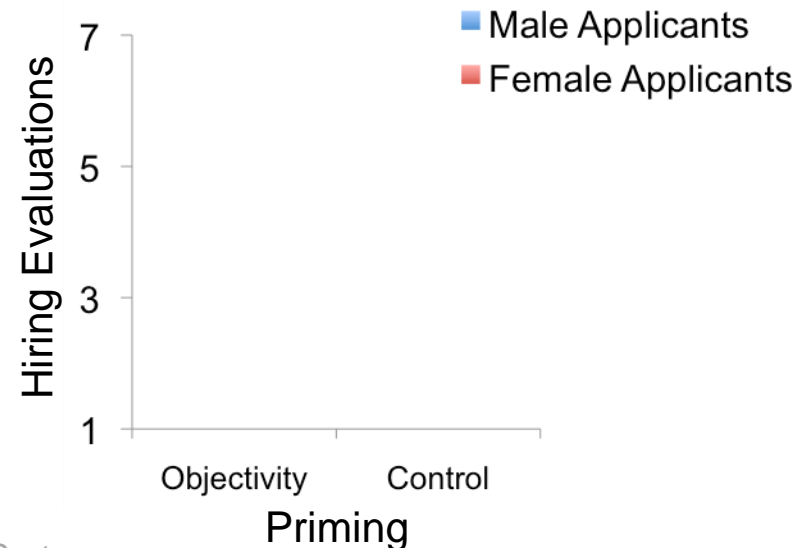
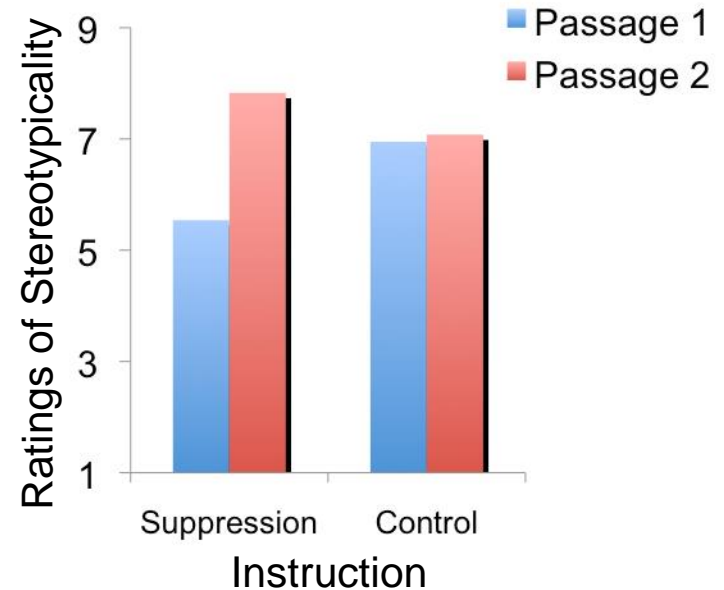
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- **Belief in personal objectivity**

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

- Leads to biased evaluations of women



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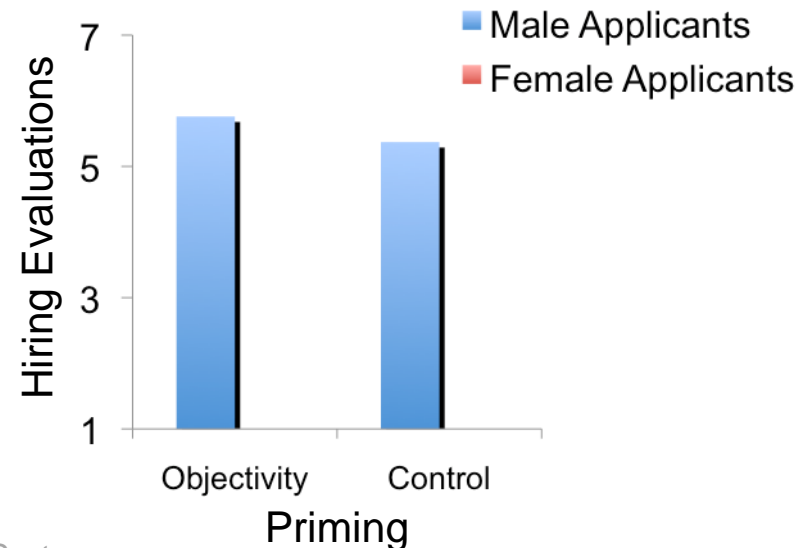
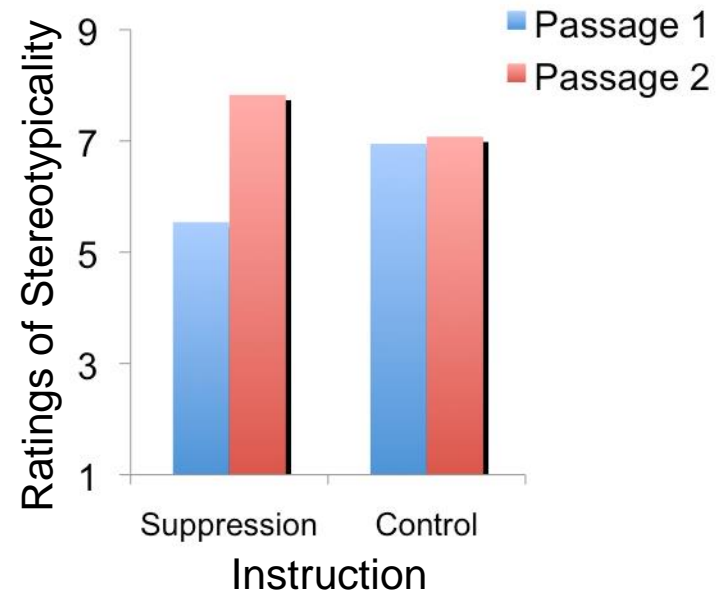
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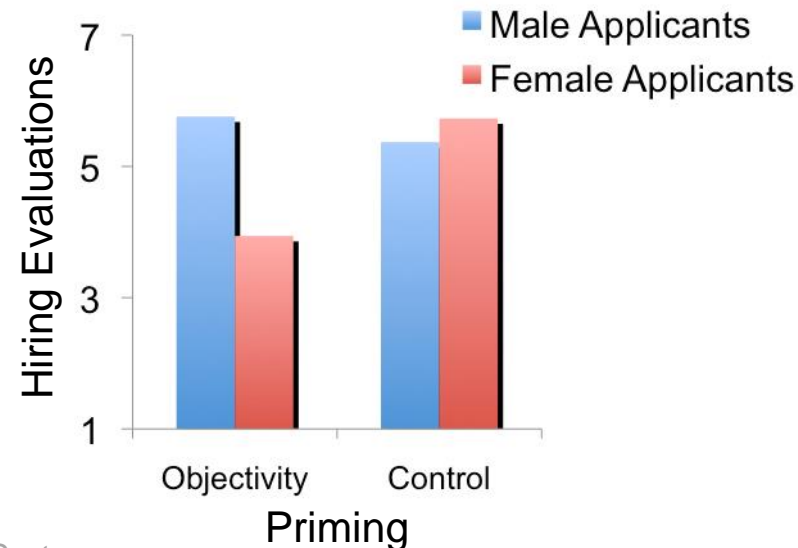
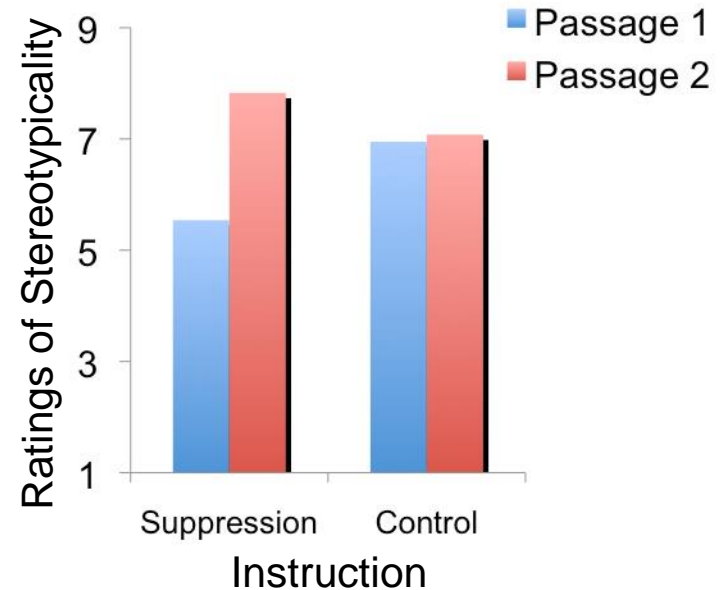
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1. Stereotype Replacement

- ✓ Recognize when you have stereotypic thoughts, and recognize stereotypic portrayals in society. For example,
 - *Women faculty are less interested in leadership opportunities*
 - *Portrayal of females as poor at math or males as unable to do housework*
- ✓ Label the characterization as stereotypical
 - *e.g., Role incongruity, Prescriptive gender norms*
- ✓ Identify precipitating factors
 - *e.g., Priming with gender-congruent information*
- ✓ Challenge the fairness of the portrayal and replace it with a non-stereotypic response. For example,
 - *I know many successful women leaders*
 - *I know that training and experience rather than gender are the main determinants of leader competence*
 - *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*

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 program developer*
- ✓ Obtain more information on specific qualifications, past experiences, etc. before making a decision
 - *e.g., Heilman study reviewed in Module 2.*
- ✓ *Practice making situational attributions rather than dispositional attributions*
 - *e.g., If a woman cries, consider a situational explanation (maybe a loved one died) rather than a dispositional explanation (e.g., she's emotional)*

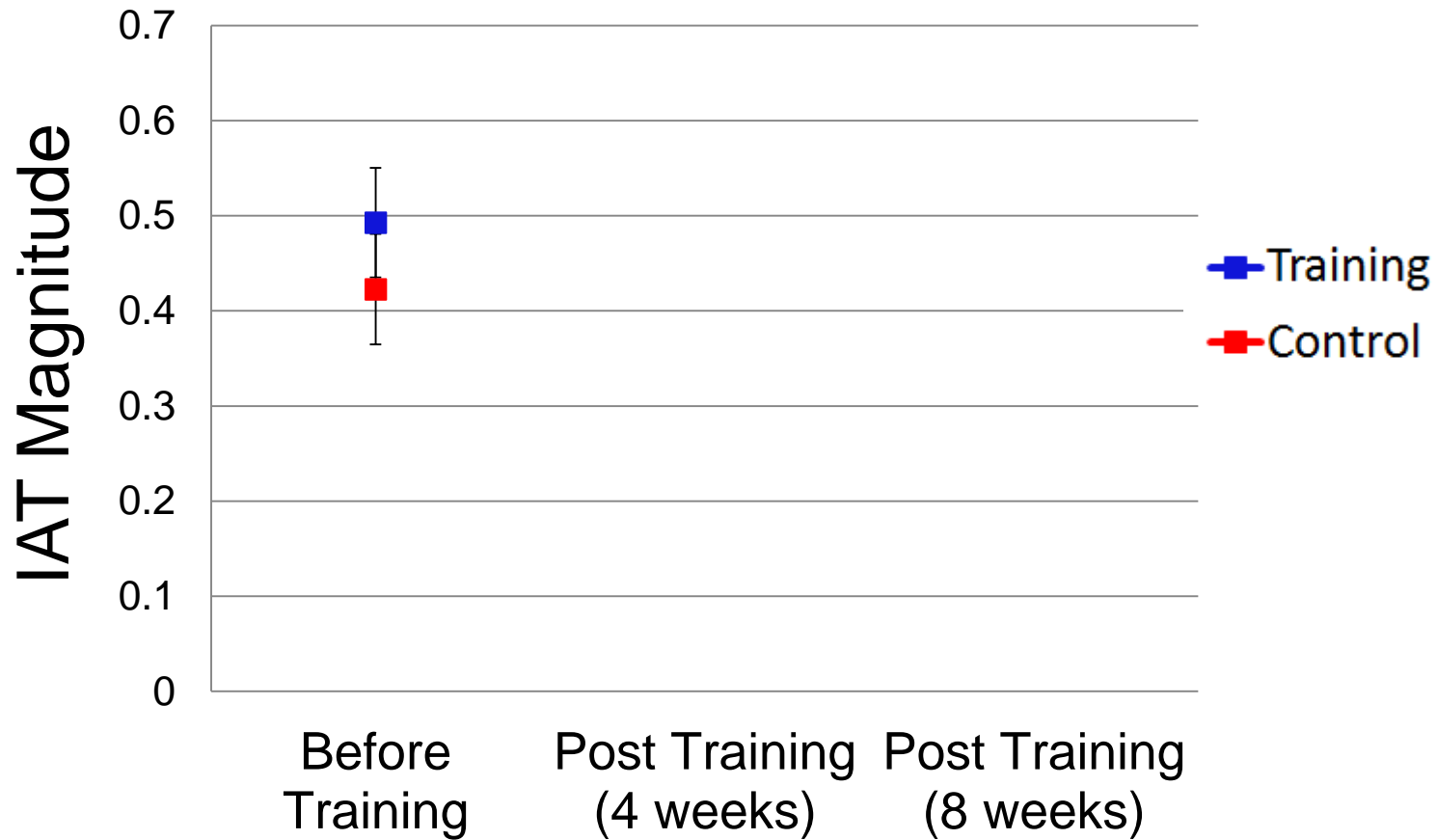
4. Perspective-Taking

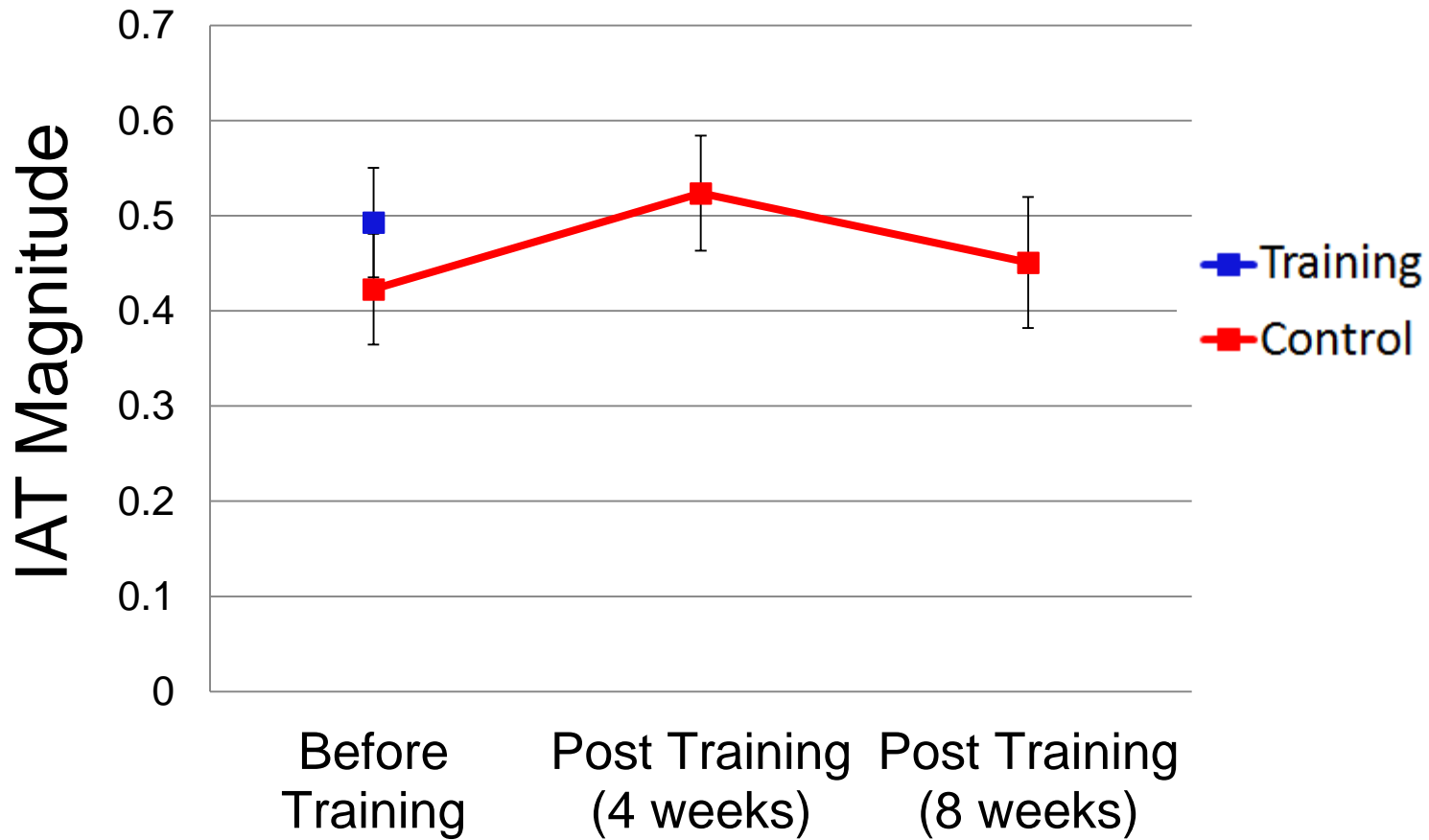
- ✓ Adopt the perspective (in the first person) of a member of the stigmatized group
 - *For example, imagine what it would be like to...*
 - *Have your abilities called into question*
 - *Be viewed as less committed to your career than colleagues with similar training and effort*
 - *Not be offered opportunities because of assumptions about family responsibilities*

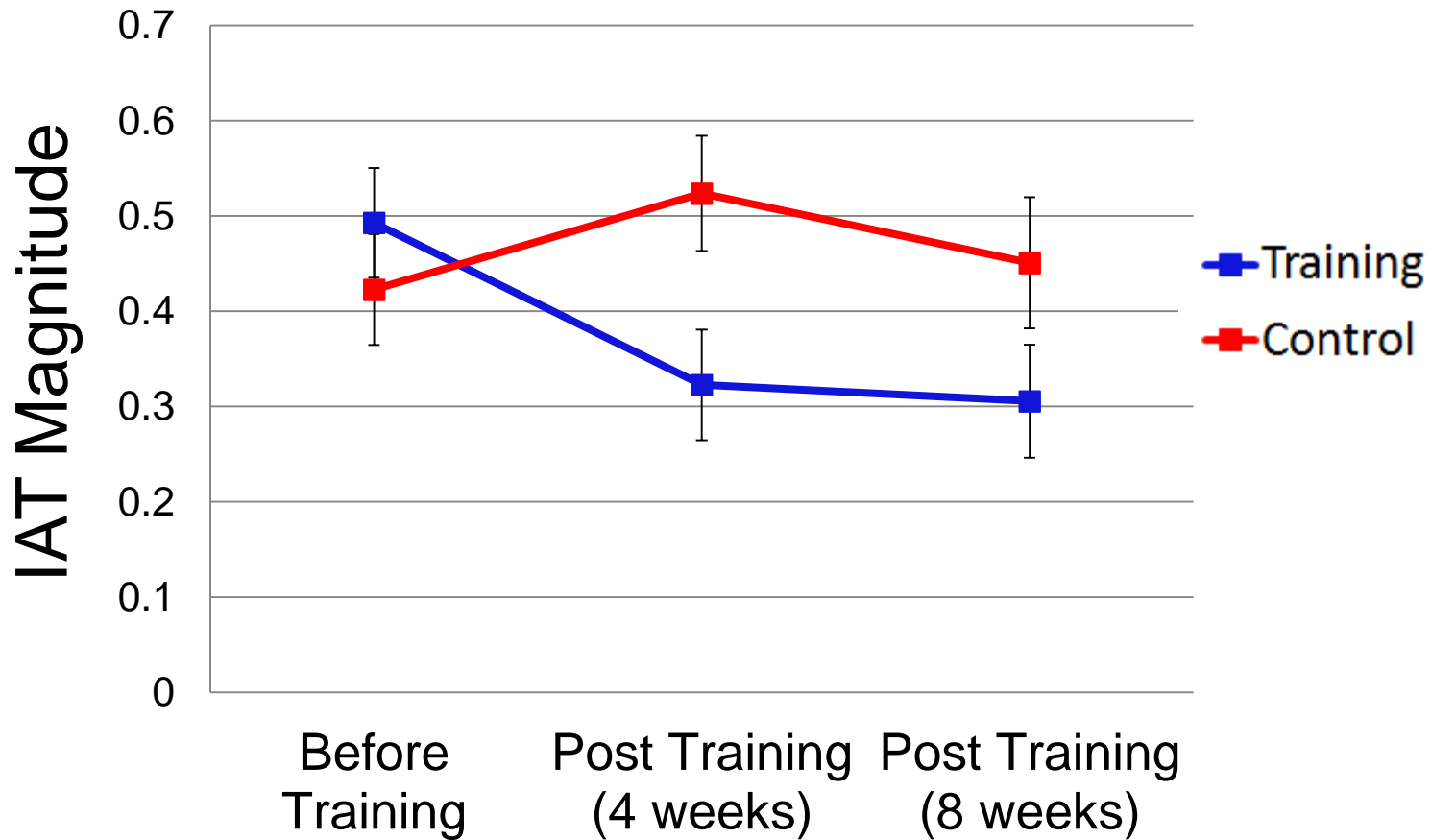
5. Increasing Opportunities for Contact

- ✓ Seek out opportunities for greater interaction with counter-stereotypic women
 - *e.g., Meet with women in high authority positions to discuss research endeavors, ideas, and visions*
 - *e.g., When compiling membership for key committees or speaker lists, ensure that women (from diverse groups) are represented*









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

Reducing Bias in Evaluations: Organizational Behaviors

What to do:

- Diversify the evaluation committee
 - Social tuning/increased motivation to respond w/o bias
Lowery, Hardin, and Sinclair. J. Personality and Social Psychology 2001.
 - Counterstereotype imaging
Blair, Ma, and Lenton. J. Personality and Social Psychology 2001.
Dasgupta and Greenwald. Journal of Personality and Social Psychology 2001.
- Hold each member of the evaluation committee responsible for conducting equitable evaluations
Dobbs and Crano. Social Psychology Quarterly 2001.
Foschi. Social Psychology Quarterly 1996.
- Critical Mass – increase proportion of women and minorities in the pool
Heilman, Organizational Behavior and Human Performance 1980.
van Ommeren et al. Psychological Reports 2005.
- Develop and prioritize criteria prior to evaluating applicants
Uhlmann and Cohen. Psychological Science 2005.

Reducing Bias in Evaluations

What to do (cont.):

- Spend sufficient time and attention on evaluating each application
Martell. Applied Social Psychology 1991.
- Focus on each applicant as an individual and evaluate their entire application package – information minimizes bias
Heilman. Organizational Behavior & Human Performance 1984.
Tosi and Einbender. Academy of Management Journal 1985.
Brauer and Er-rafiy. Journal of Experimental Social Psychology 2013.
- Use inclusion rather than exclusion decision-making processes
Hugenberg et al. J. Personality and Social Psychology 2006.
- Stop periodically to evaluate your criteria and their application
- Accountability - Be able to defend every decision
 - **Competence:** *Biernat and Fuegen,, Journal of Social Issues, 2001*
 - **Equity:** *Dobbs and Crano, Personality and Social Psychology Bulletin, 2001*
Foschi, Social Psychology Quarterly, 1996