# Effective teaching in diverse classrooms

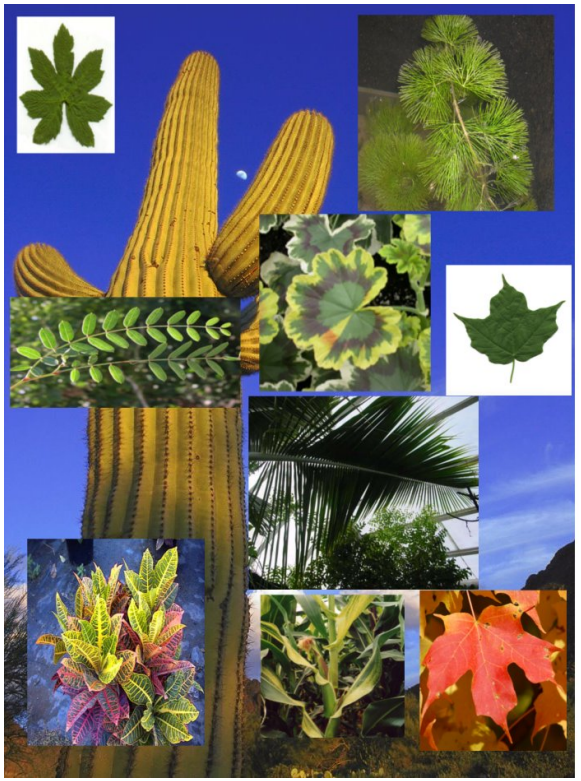
Agi Stachowiak

Instructor, 20.109

MIT ‘07 (PhD, DMSE), ‘01 (SB, ChE)

# Why think about diversity?

- Diverse experiences and values can promote team innovation… but also conflict
- You can increase creativity and collaboration in class as well as individual performance



Public domain image, Wikimedia Commons.

# Goals for today's session

- Increase awareness of obstacles to learning
  - in ourselves and in our students
  - that especially affect marginalized groups
- Discuss compensatory strategies
- This is a difficult topic! Ground rules:
  - Be honest but diplomatic
  - Avoid judging or accusing each other
  - Shared personal experiences stay in this room
  - In summary: both act in and assume good faith

***But I treat everyone the same way…***

Part 1… maybe you don't

Part 2… even if you do

# Part 1… maybe you don't (treat everyone the same)

# Understanding Unconscious Bias

# What is unconscious bias?

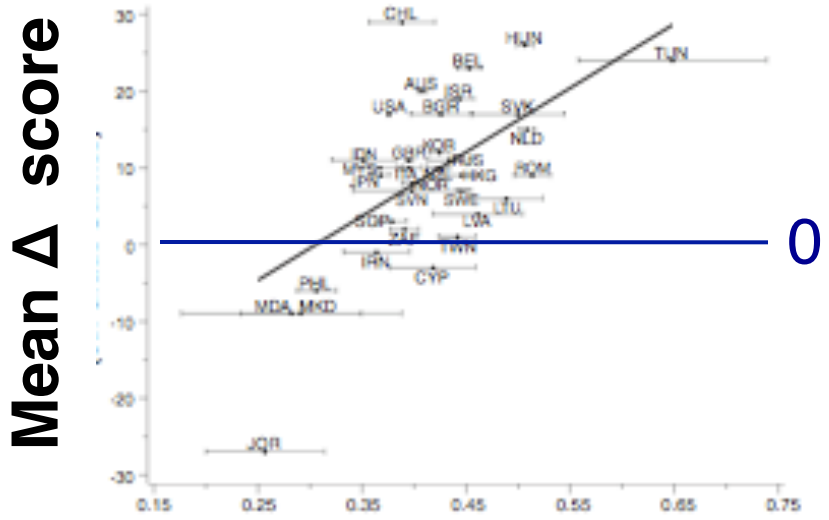
- Implicit association test
  - typing task to measure automatic associations
- Many people display implicit bias/stereotype
- Even members of the marginalized group may internalize self-bias

# Discriminatory outcomes suggest implicit (or explicit) bias

- For female musicians in orchestras
  - female membership ↑ with veiled auditions
- For hypothetical job candidates
  - send *identical* resumes except name
  - male name called in more than female
  - typically White name called more than Black
- For Swedish fellowship applicants
  - women require 2.5x paper productivity to be judged equal to a man (accounting for journal tier)

# Implicit bias correlates with stereotypical performance gaps

- All 8th-graders given same science exam
- 1 SD bias score ~ 0.7 SD exam score




Δ = boy - girl

34 countries

B. Nosek et al. *P Natl Acad Sci USA* **106:**10593 (2006).

# Combating unconscious bias

- Bias test: not an accusation or an inevitability
- Changing implicit associations takes time…
  - a product of culture and personal experience
- … but changing actions is “easy”
  - cultivate experiences counter to your bias
  - consciously compensate for the bias
- Awareness is the first step to changing behavior and ultimately implicit attitudes

# Unconscious bias in the classroom: example

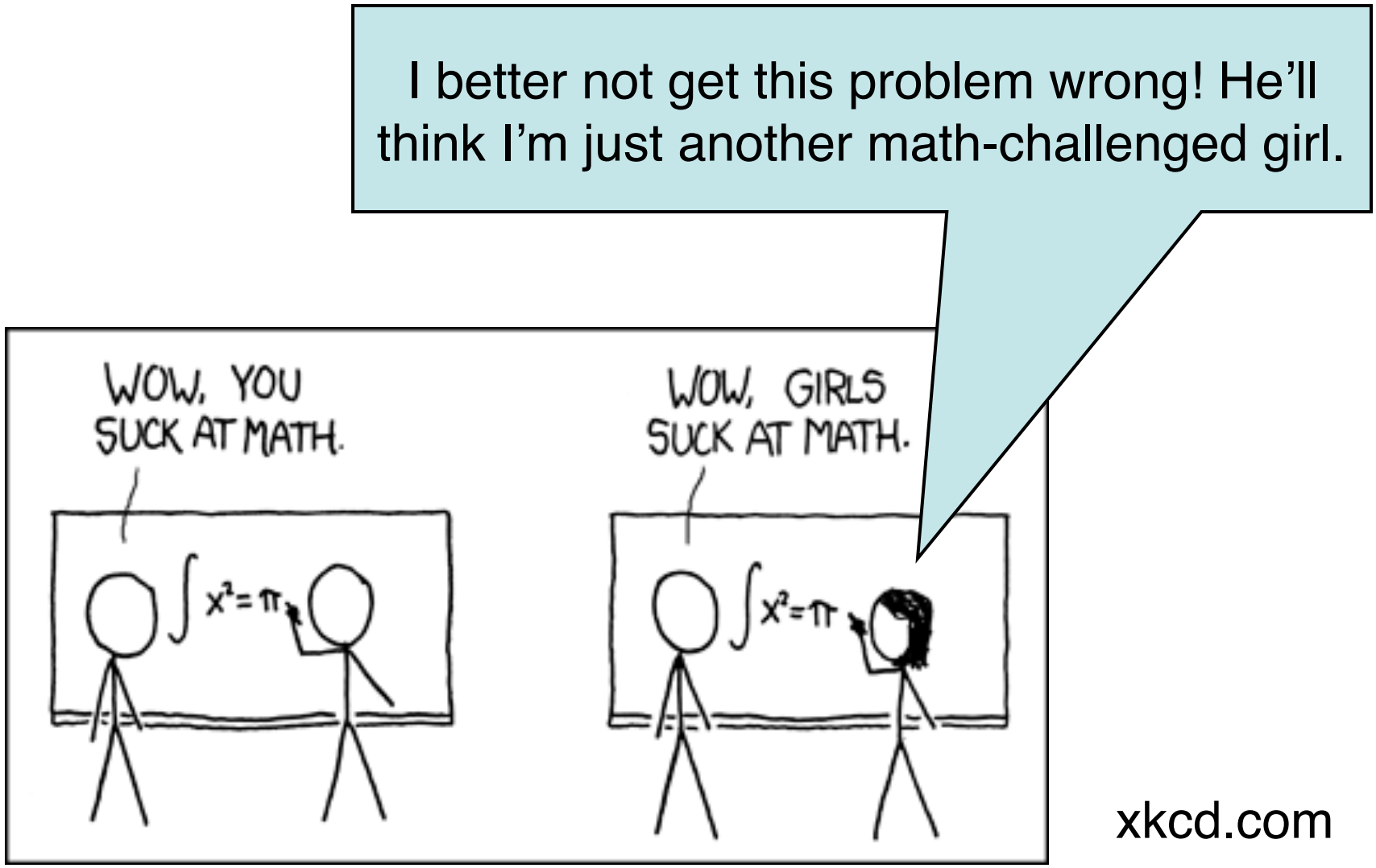
- Asian students treated as “model minority”
- Impact on struggling student of Asian descent
  - low homework scores ignored
  - greeted by surprise if s/he comes for help
  - furthers cycle of feeling marginalized
- Solution: self-check your assumptions

*Can your group think of another example?*

# Part 2… even if you do (treat everyone the same)

# Understanding Stereotype Threat

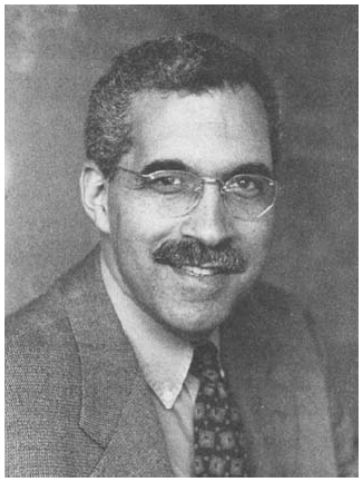
# Stereotype threat in short




xkcd.com

# What is stereotype threat (ST)?

- Under-performance in anticipation of being judged according to a negative stereotype
  - anxiety diverts cognitive resources
- Activated by circumstance
  - context in which stereotype may apply
  - working at edge of one's knowledge/skills
- Academically *strongest* students most affected
  - who identify with the domain (e.g., science)
  - who are generally confident about their abilities
  - who care about not "confirming" stereotypes

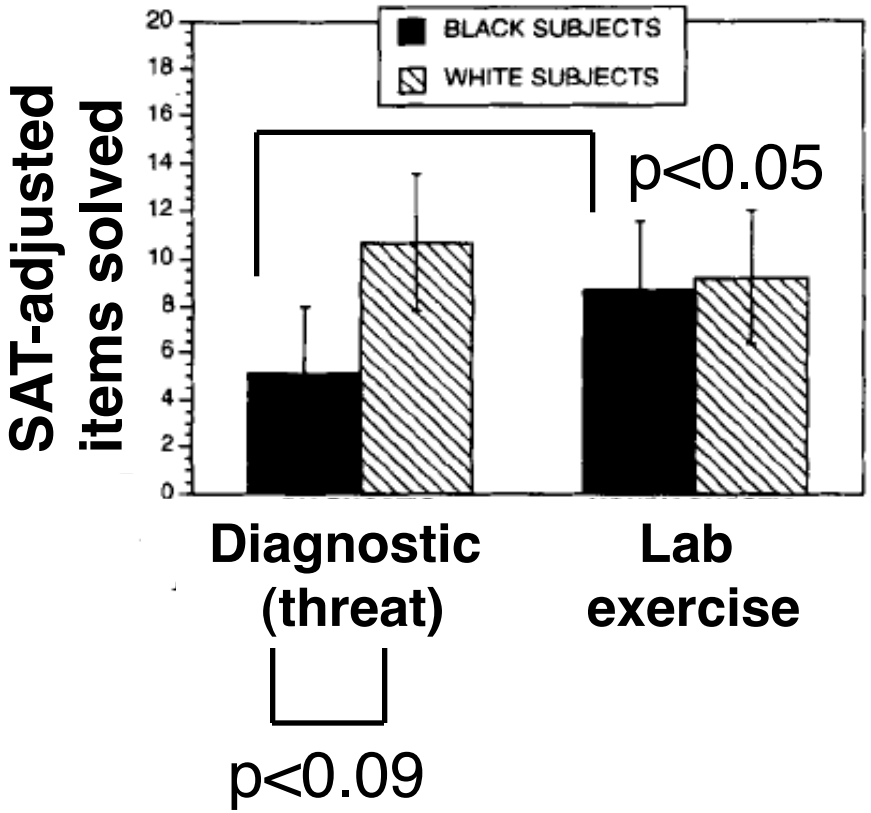


Claude M. Steel
*L.A. Cicerco, Stanford News Service ©*

- Work of Claude M. Steele, others (>100 studies*)

*Paul Sackett and others are skeptical of 'real-world' relevance

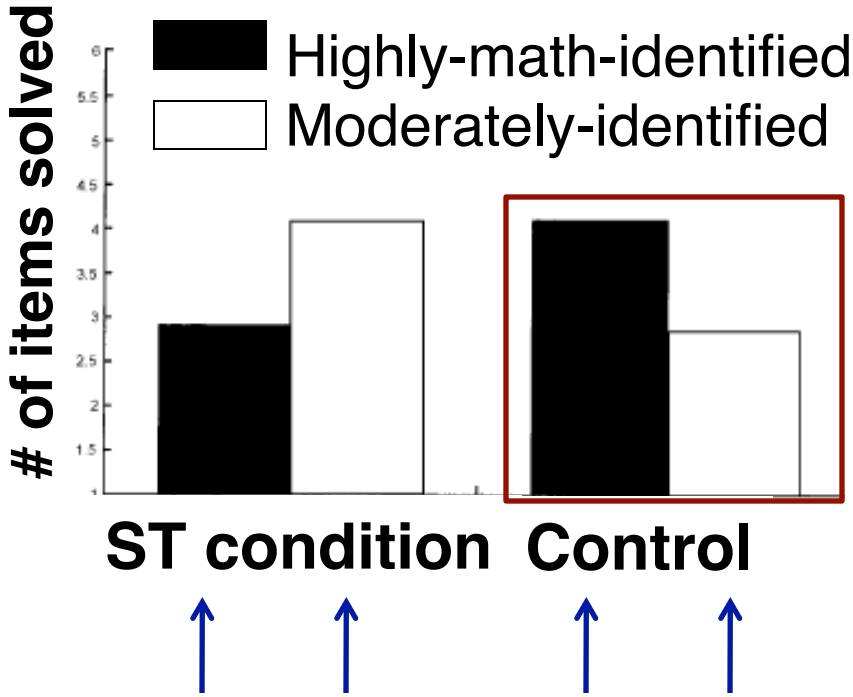
# Reducing stereotype threat (ST) improves student performance




- GRE verbal exam
- High-achieving cohort
- Black student scores significantly increased to equal White student scores when threat gone

C. Steele & J. Aronson *J Pers Soc Psy* **69**:797-811 (1995).

# Increasing ST affects the most motivated students




- Difficult math exam
- White male students
- Threat condition: primed stereotype that Asians are best at math

J. Aronson et al. *Exp Soc Psy* **35**: 29-46 (1998).

# Long-term consequence of ST

- Short-term: under-performance
- Long-term: stop trying
  - have to prove oneself at each new level
  - may avoid risking failure and judgment
  - thus avoid learning!
  - “disidentify” from domain as source of identity and self-esteem

# ST can affect ***anyone***

- Most obviously (and disproportionately) affects historically marginalized groups
- But context - here academia - matters
- Any difference from the “in-group”
  - older person playing a memory game
  - smallest kid in a sport
  - engineer in a humanities class
  - student not familiar with U.S. pop culture

# Personal experiences with ST

*Can you think of a time you felt concerned that you might be unfairly judged and/or were eager to disprove a stereotype?*

# Reducing ST: wise criticism

- Telling students that you are using high standards AND that you believe they can meet those standards is *highly* motivating
- Perils of criticism with no context
  - student mistrust
  - disengagement from the task
  - misplaced efforts
- Perils of over-praising or under-challenging
  - same as above but in slightly different form
  - student underachievement, discouraging future effort

# Wise criticism exercise

*Imagine that you have a student who did well on homework assignments and answered questions in recitation but bombed the first exam. What might wise and not-so-wise criticism sound like?*

# Reducing ST: model resilience

- Be candid about your own past struggles as part of a learning process
- Explore, don't downplay recitation errors: "let's talk about why this mistake is easy to make…"
- Normalize asking for help
  - casually mention "several people asked about this in OH" to decrease anxiety/stigma about attending
  - make problem-solving process and assumptions explicit, build in space for questions by default
- Intra- and cross-group sharing both important

# Reducing ST: promote sense of community and belonging

- Reinforce student identities as (apprentice) biological engineers
  - encourage autonomy and creativity, not grade-seeking
  - focus on our similarities – passion for BE!
- Find opportunities for collaboration
  - work in small groups *before* class-wide discussion
- Use inclusive language
  - avoid always saying “he” as the default human
  - diversify examples of scientists when possible
  - diversify conceptual analogies (e.g. not always sports)

# Parting thoughts about diversity

**"Students who believe in the immutability of intelligence focus on 'performance goals'; they seek to demonstrate rather than enhance their competence and are apt to withdraw from tasks where they risk failure.** -from G.L. Cohen, C.M Steele, L.D. Ross, *Pers Soc Psychol Bull* **25**:1302 (1999).

NOT a zero sum game. Many strategies we discussed here improve *everyone's* learning.

# Acknowledgements


- Thanks to Instructor Beth Taylor and Professor Cathy Drennan in the Chemistry Department for helpful discussions and references.
- Thanks to Forest White and the 2008 BE Retreat Committee for giving me a chance to give a very (!) early draft of Part 2 of this talk.
- Thanks to all of my colleagues and students, from whom I have learned – and continue to learn – so much.
- Thanks to my husband and a fine educator in his own right, Wally Holland, for comments on a draft of this talk.

# References


- See also papers cited directly on slides that show data.
- Implicit bias overview: https://implicit.harvard.edu/implicit/
- Implicit bias examples
  - Orchestras: C. Goldin and C. Rouse, *Am Econ Rev* **90**:715-741 (2000).
  - Resumes: M. Bertrand and S. Mullainathan, *Am Econ Rev* , **94**:991-1013 (2004).
  - Swedish fellowships: C. Wenneras and A. Wold, *Nature* **387**:341-343 (1997).
- Stereotype threat overviews
  - Popular press summary: *http://www.theatlantic.com/magazine/archive/1999/08/thin-ice-stereotype-threat-and-black-college-students/4663/*
  - Book-length summary: C.M. Steele, *Whistling Vivaldi and Other Clues to How Stereotypes Affect Us.* (New York: W.W. Norton and Company, 2010).
- Wise schooling
  - Overview: C.M. Steele, *Am Psychol* **52**:613-629 (1997).
  - Wise criticism and mentoring: G.L. Cohen, C.M Steele, L.D. Ross, *Pers Soc Psychol Bull* **25**:1302 (1999).
  - Calculus seminar approach (independent of Steele's work and quite relevant): U. Treisman *Coll Math J* **23**:362 (1992).