

Effective teaching in diverse classrooms

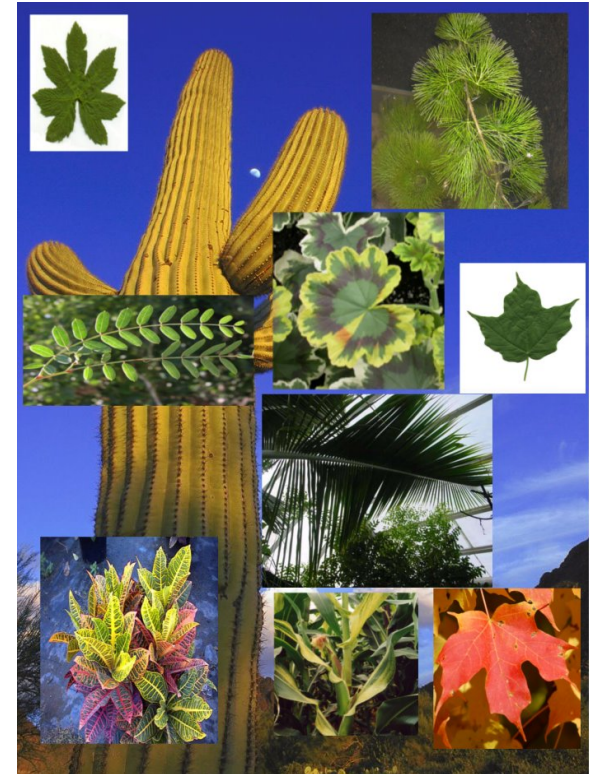
Agi Stachowiak

Instructor, 20.109

MIT '07 (PhD, DMSE), '01 (SB, ChE)

Why think about diversity?

- Diverse experiences, values, and learning styles mean that teaching is not one-size-fits-all
- Diversity can promote team innovation... but also conflict
- You can improve individual performance and create a collaborative environment



Public domain image,
Wikimedia Commons.

Goals for this session

- Increase awareness of obstacles to learning
 - in ourselves and in our students
 - that especially affect marginalized groups
- Discuss compensatory strategies
- Ground rules for discussion:
 - 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

What is a marginalized group?

- Not fully included in a mainstream environment (such as academia)
 - may feel unwelcome
 - may be unfamiliar with unspoken/implicit norms
- Often due to historical and/or current prejudice, ignorance, limited access
 - low income students $\leftrightarrow$ first generation students
 - minority populations (race, religion, nationality)
 - women in some disciplines
 - people with disabilities

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

Part 1... maybe you don't

Part 2... even if you do

Part 3... best practices

**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



Author: Project Implicit

Reuse: Free Art License.

<http://artlibre.org/licence/lal/en>

Bias linked with discrimination and performance gaps

- Female orchestra membership ↑ w/anonymity
- Job candidate bias
 - send *identical* resumes except name
 - male name called in more than female
 - stereotypically White name called more than Black
- Swedish research fellowship bias (1997)
 - women require 2.5x paper productivity to be judged equal to a man (accounting for journal tier)
- Internationally, implicit bias score correlated with stereotypical performance gaps

Roots of unintentional bias

- Nature *and* nurture – systemic
- Even babies favor those who resemble them
- Schemas (V. Valian)
 - expectations about an individual based on a group
 - can be very useful!
 - also can be very wrong!
 - individual male/female heights are misestimated in accordance w/*statistically* correct scheme
- Social/cultural contributions to schemas

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
 - criteria in advance
 - full attention to task
- Awareness is the first step to changing behavior and ultimately implicit attitudes

Unconscious bias in the classroom: example

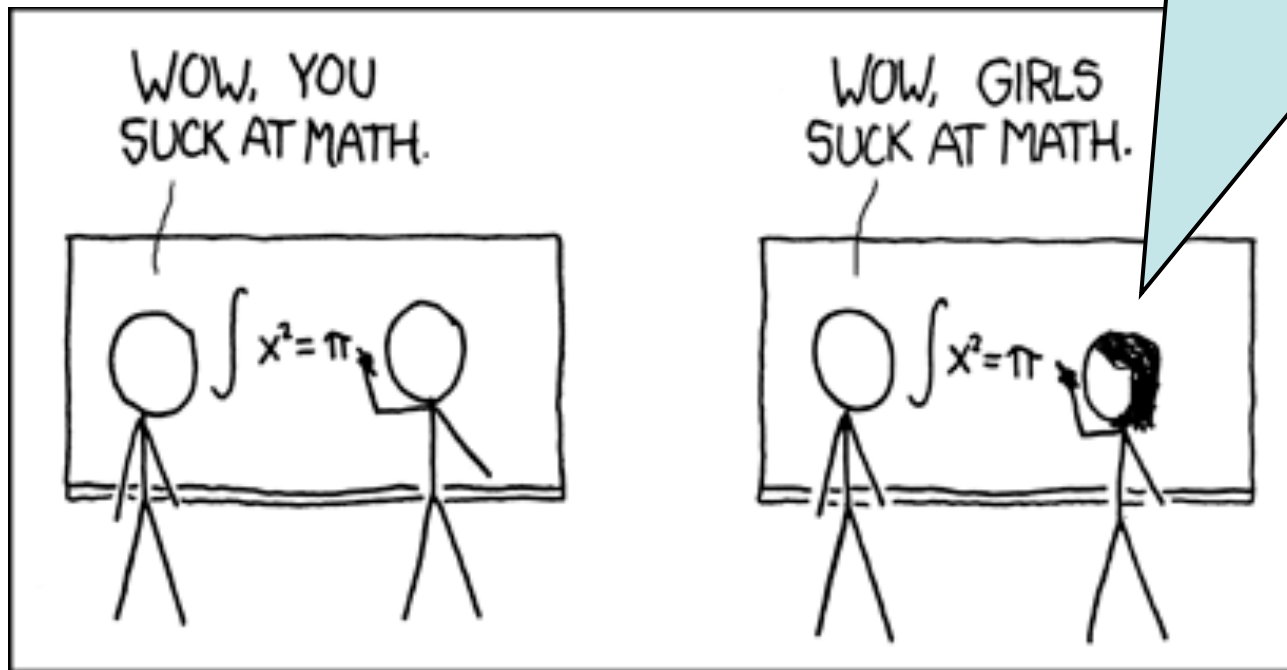
- Asian students treated as “model minority”
 - aggregate success despite discrimination
 - ignores history/context, creates division
 - skewed expectations of individuals
- Impact on struggling student of Asian heritage
 - low homework scores ignored
 - greeted by surprise if s/he comes for help
 - furthers cycle of feeling marginalized
 - overall: given less opportunity/support to improve
- Solution: check your assumptions

**Part 2... even if you do
(treat everyone the same)**

**Understanding
Stereotype Threat**

Stereotype threat in short

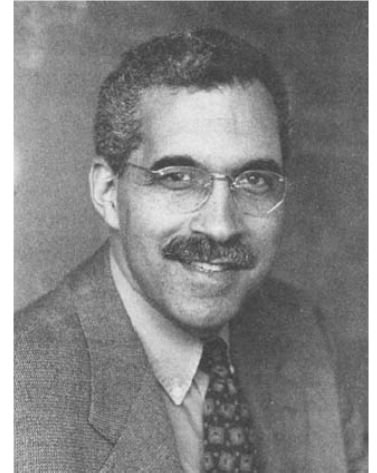
I better not get this problem wrong! He'll think I'm just another math-challenged girl.



xkcd.com

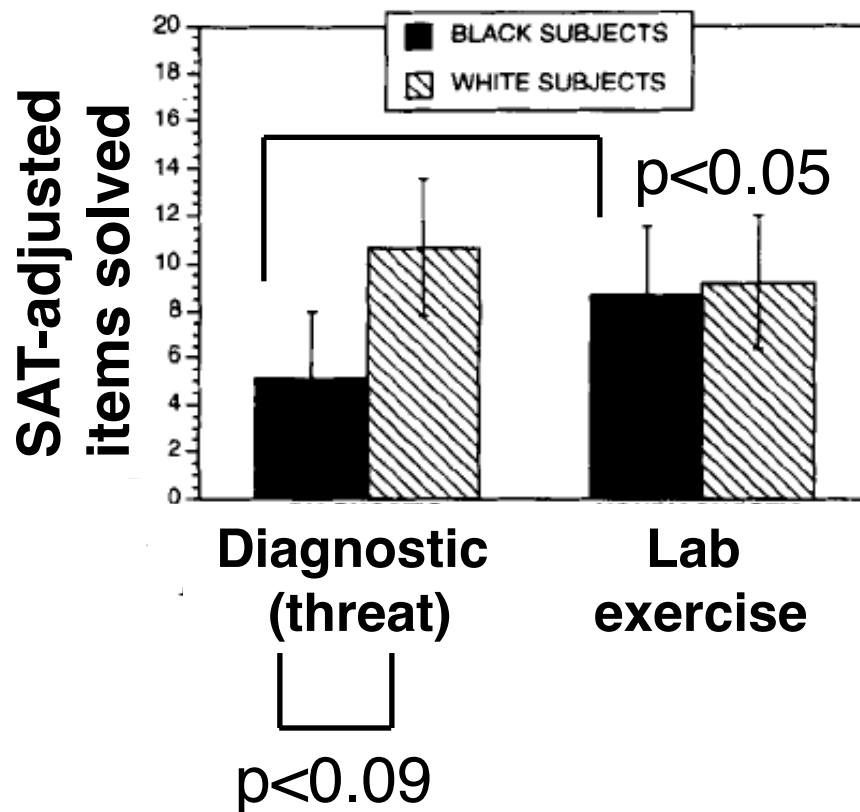
What is stereotype threat (ST)?

- 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
 - Work of Claude M. Steele, others (>100 studies*)
- *Paul Sackett and others are skeptical of ‘real-world’ relevance



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

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).

ST can affect *anyone*

- Most obviously (and disproportionately) affects historically marginalized groups
- But context matters
- Any difference from the “in-group”
 - older person playing a memory game
 - women playing sports
 - White college-aged males primed to think about success of their Asian-/American peers in math
 - engineer in a Harvard humanities class...
hypothetically, of course!

Consequences 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 self-esteem

Developing a personal understanding of ST

Within your group, discuss a time that you made a conscious effort to avoid “confirming” a negative stereotype.

Did anything trigger your feeling of threat – e.g., someone making a comment – or was it an automatic response?

Part 3... best practices

**Breaking Down Barriers
to Learning**

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 ignoring... need I say more?
- Perils of criticism with no context
 - student mistrust → disengagement from the task
 - misplaced efforts → miss forest for trees
- Perils of over-praising or under-challenging
 - again mistrust, disengagement
 - underachievement → discourages future effort

Wise criticism example

Student gave a scripted oral presentation followed by a thoughtful Q&A, and overall lacked confidence.

You did such a great job [in Q&A]. I was surprised by how good and natural an extemporaneous speaker you are, because you spent the entire talk reading from your slides and notes! This approach was really a loss and misuse of your talents, and I hope next time you will trust yourself to speak “off script” more. I appreciate also your honesty about which parts of the paper you didn’t understand, or thought you didn’t – in fact, you did a great job explaining [them].

Not-so wise versions

- *Great Q&A, but please improve talk next time*
 - vague
- *You'll have to stop sounding so uncertain if you want to be taken seriously*
 - cold/demotivating
- *This was way better than I expected going in. Keep up the good work!*
 - damning with faint praise, under-challenging

Wise criticism exercise 1

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?

Wise criticism exercise 2

*How about a student who has been consistently struggling with the work?
How might you approach him or her when you're not sure s/he is prepared to meet the highest standards?*

Wise criticism exercise 3

A student in your recitation has failed the first two exams, and hasn't even bothered to come pick them up. Why might she be behaving this way? How might you respond?

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
 - emphasize professional development, not grades
 - draw out excitement, not anxiety
- 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)
 - contextualize analogies and references to pop culture

On teaching non-native speakers

- Keep your examples broad and accessible
- Engage explicitly
 - do you think this a language or a technical issue?
 - becomes a problem you are solving *together*
 - shows confidence in student' s perceptions
- Seek outside expertise
 - <http://web.mit.edu/fll/www/languages/ELS.shtml>

On *being* a non-native speaker

- Choose your best media
 - okay to ask for written questions from students!
 - images are universal: use lots
- Actively acknowledge and bridge the gap
 - first day getting-to-know you exercise
 - before/after recitation chats
 - seek student and peer allies for honest feedback
- NB: “muddy cards” are a best practice for *all*
 - written student comments re: “muddiest” part of day
 - thoughtful written responses to common questions
- Your thoughts here

On differences in learning styles

- Perceptual styles/needs:
 - whole versus parts (big picture/details)
 - abstract vs. tangible (theory/experiment)
- Conceptual styles:
 - synthetic vs. divergent
 - reflective vs. active processing (e.g., comfort with thinking out loud – hi, extroverts!)
- Emotional styles: response to criticism
- Relevance of cultural and language background
 - e.g., oral vs. written vs. pictorial processing

Accommodating different learners

- No *one* best way to teach or learn!
- To reach diverse learners, vary your approach
 - visual support benefits almost *everyone*
 - ditto for hands-on and real-life examples
 - interaction w/you (Socratic)
 - collaboration w/peers (discuss w/partners → class)
 - time to think (try problem alone → whole class)
- If something isn't working, don't just repeat it
 - have more than one way to explain something...
 - ... getting back to the student later is okay
 - ask questions to identify key conceptual hang-up

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 an early draft of this talk.

Resources (see also slide notes)

- 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. Weneras and A. Wold, *Nature* **387**:341-343 (1997).
 - Stereotype: B. Nosek et al. *P Natl Acad Sci USA* **106**:10593 (2006).
- Gender schema tutorials: <http://www.hunter.cuny.edu/gendertutorial/>
- Stereotype threat overviews
 - Popular press summary: <http://www.theatlantic.com/magazine/archive/1999/08/thin-ice-stereotype-threat-and-black-college-students/4663/>
 - New one-stop site: <http://www.reducingstereotypethreat.org>
- Wise schooling
 - Overview: C.M. Steele, *Am Psychol* **52**:613-629 (1997).
 - Mentoring : G.L. Cohen et al., *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).
- Learning styles
<http://education.jhu.edu/PD/newhorizons/strategies/topics/Learning%20Styles/diversity.html> (not peer-reviewed but includes some refs)