

The Face of Science is Diverse

Jennifer Frederick
Yale University

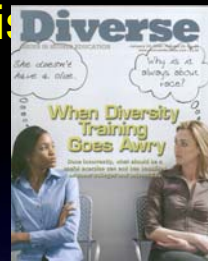
Standing on the shoulders of
Robert Lue

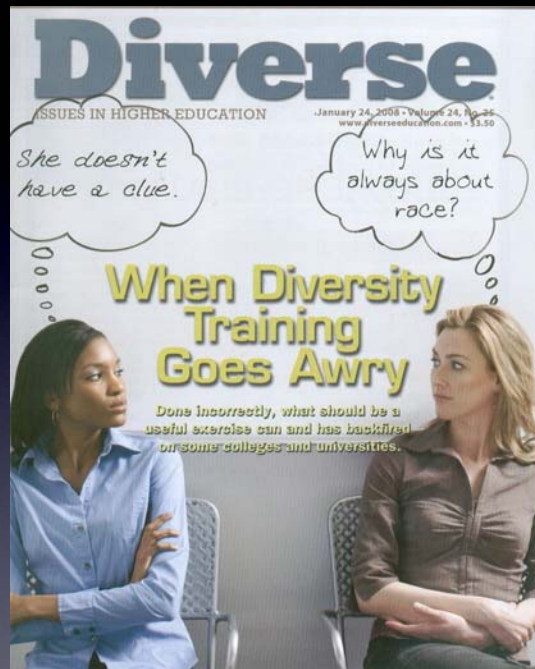
Harvard University

Christine Pfund
University of Wisconsin - Madison

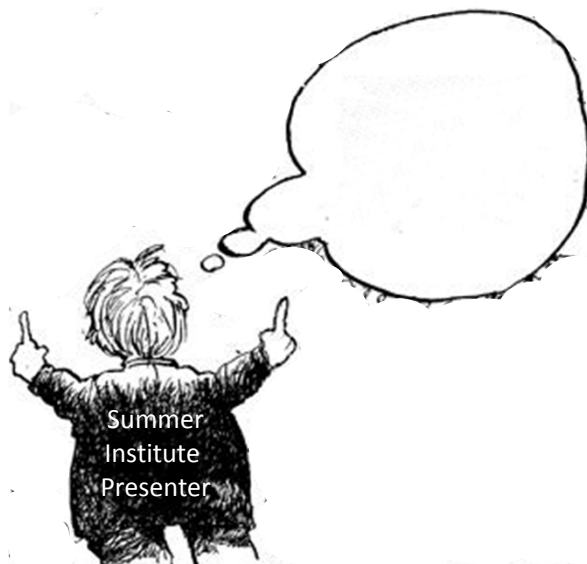
James Stith
American Institute of Physics

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What do you think of (and feel) when I say...



Summer
Institute
Presenter

Adapted from: <http://shnblog.com/wpcontent/uploads/2008/05/bramhall52008.jpg>

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Kim, Kalev, and Dobbin 2011, 2012, 2013.

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Summer Institute Goals

- To enhance the quality of science education
- To create a more diverse scientific community
- Initiate a national revolution in science education

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(New) Learning Objectives

Awareness - Participants will be able to:

- Explain the benefits and challenges of diversity in the classroom
- Use case studies to promote discussions about diversity
- Describe the research basis for unconscious bias and stereotype threat and articulate the implications of such studies on student learning
- Explain how you as the instructor contribute to the diversity in your classroom

Action – Participants will be able to:

- Identify student perspectives on exclusion in the classroom
- Develop strategies for inclusive teaching to address the challenges and benefits of diversity in the classroom

Opening Reflection Opening Reflection

What is the value of a diverse classroom environment?

I Know and Believe...

Those educated in diverse settings are:

- More likely to be intellectually nimble and creative
- More likely to make meaningful contributions
- More likely to be effective team players
- More likely to be successful leaders
- More likely to do the right thing



Why Use Case Studies?

- The human narrative is more engaging
- Allows discussion in a broader context
- Less threatening to the audience
- Emotional resonance produces greater “buy-in”

Issues to Consider when engaging a Case Study

- What are the relevant facts?
- What unconscious bias might have entered the discussion?
- What are the ethical issues?
- What are the possible alternatives?
- What are the ethics of the alternatives?
- What are the practical constraints?

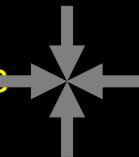
View the situation from the perspectives of the various players.

What might each be thinking and experiencing?

What suggestions for action do you have for each situation?

How might you avoid getting into the situation in the first

Case Study - Four Viewpoints

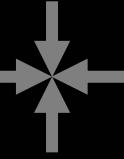


Professor

“I use active learning all the time in my class. Every minute or two, I ask questions. I think it makes me seem friendly and open to hearing students’ ideas. I try to call on students randomly to make sure everyone is engaged, but I often end up asking the best students so they can set the standard for the rest of the class.”

- Is there anything that might be problematic here?

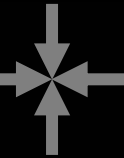
Case Study - Four Viewpoints



Student #1

“The professor is just so engaging in class. I feel like I have a connection with her, and I want to be prepared for every class so I can answer the questions she asks. Sometimes, she asks a question, and I answer it, and then we have a great dialogue in front of the whole class about something more advanced than what is in the syllabus or reading. I am learning so much!”

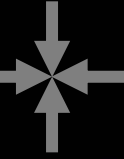
Case Study - Four Viewpoints



Student #2

“This class scares me to death! The professor constantly asks questions, and I am terrified that she will ask me something I don’t know the answer to. I don’t like to speak in public, and never had to in my homeland. I feel that I should sit at the front out of respect, but I aim for the far right to hopefully be out of her line of sight. I can’t wait for the semester to end so I can get rid of this stress.”

Case Study - Four Viewpoints



Student #3

"I have no clue what is going on in class. The prof asks lots of questions, but I usually have no idea what the answer is. I must be really stupid because the kids in the front row know it all already. The prof keeps on calling on them. It's like they are in the same club or something. Hell, they even look alike! Anyway, I hide in the back so she won't call on me or I just skip lecture. She should tell us what she wants."

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Data on Unconscious Bias and Stereotype Threat

In groups by number, discuss the following questions as they relate to the data provided to each group:

- What bias or stereotype threat does the result highlight?
- How can this bias affect the classroom learning environment?

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Study for Group 1

Blind, randomized trial: When asked to review lab manager applications, faculty rated 'John' more hireable than 'Jennifer,' were more likely to mentor John, and offered him a higher starting salary. The effect was the same for both male and female faculty.

(Moss-Racusin et al. 2012. Science faculty's subtle gender biases favor male students. PNAS 109, 16474-16479).

Data on Unconscious Bias and Stereotype Threat

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- How can this bias affect the classroom learning environment?

Study for Group 2

If African American or female students are asked to identify their race or gender, respectively, at the start of an exam, they will do statistically worse on that exam.

(Steele, Claude M. and Joshua Aronson. 1995. "Stereotype threat and the intellectual test performance of African Americans." Journal of personality and social psychology 69:797-811).

Data on Unconscious Bias and Stereotype Threat

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Study for Group 3

Blind, randomized trial: Evaluators rated the same job performance lower if told it was performed by a woman. This difference was substantially greater when evaluator was busy or distracted.

(Dovidio, J. F., & Gaertner, S. L. 2000. Aversive racism and selection decisions: 1989 and 1999. *Psychological Science*, 11, 319–323, and Martell, R. F. 1991. Sex bias at work: The effects of attentional and memory demands on performance ratings for men and women. *Journal of Applied Social Psychology*, 21, 1936-1960.)

Data on Unconscious Bias and Stereotype Threat

- What bias or stereotype threat does the result highlight?
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Study for Group 4

CVs of real women were assigned a male or female name, randomly, and sent to 238 academic psychologists to review either 1) at the time of job application or 2) at the time of review for an early tenure decision. Respondents were more likely to hire the applicant if a male name was found on the CV at the time of job application. Gender of applicant had no effect on respondents' likelihood of granting tenure when their CV was reviewed as part of an early tenure decision. However, there were four times more "cautionary comments" in the margins of the tenure packages with female names such as "We would have to see her job talk."

(Steinpreis, R. E., K. A. Anders, and D. Ritzke. 1999. The impact of gender on the review of the curricula vitae of job applicants and tenure candidates: A national empirical study. *Sex Roles* 41:509-527)

Data on Unconscious Bias and Stereotype Threat

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Study for Group 5

In a study on perceived teacher credibility and student learning, a male instructor lectured to undergraduate students enrolled in several separate introductory classes. In each class, the instructor kept his delivery and immediacy cues neutral and consistent. The instructor's sexual orientation, however, was revealed and systematically varied in different classes. In a validated series of follow-up surveys, students perceived a gay teacher as significantly less credible than a straight teacher. The students of a gay teacher also perceived that they learned considerably less than students of a straight teacher.

(Russ, TL, Simonds, CJ, and Hunt, SK, 2002. Coming Out in the Classroom...An Occupational Hazard? The Influence of Sexual Orientation on Teacher Credibility and Perceived Student Learning. *Communication Education*, Vol. 51, No. 3, pp. 311–324).

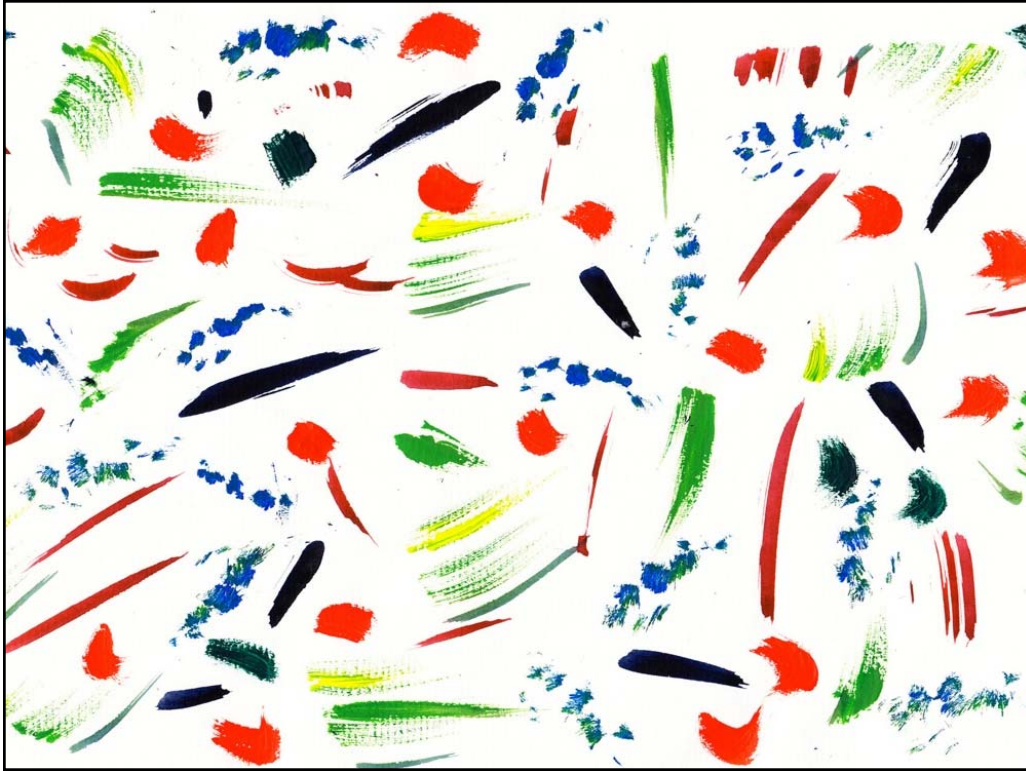
Data on Unconscious Bias and Stereotype Threat

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- How can this bias affect the classroom learning environment?

Study for Group 6

Subjects were told to select one of two rooms in which to watch a movie. In each situation there is a handicapped person sitting in one of the rooms. If both rooms are showing the same movie, the subjects were more likely to choose the room where the handicapped person is sitting. If the rooms are showing different movies, the subjects are more likely to choose the room where the handicapped person is not sitting. The result is the same independent of which movie is showing in the room with the handicapped person.

(Snyder, M. L. 1979. Avoidance of the handicapped – attributional ambiguity analysis. *Journal of Personality and Social Psychology* 37(12): 2297-2306).



Group Brainstorm

What are some examples of types of diversity?



- Take 3 minutes
- Brainstorm 2 ideas in answer to this question:
- What sort of modifications would you make to the materials and/or structure of a class you currently teach to accommodate your group's assigned type of diversity?
- Write these ideas down and be prepared to share with the whole group.



Closing Reflection Closing Reflection

What are 1 or 2 elements of your conception of diversity that you had not considered before this session?

Diversity Session Recap

Awareness – we have:

- Reflected on the benefits and challenges of diversity
- Used case studies to promote discussions about diversity
- Examined the research basis for unconscious bias and stereotype threat and the implications of such studies on student learning
- Considered how instructors contribute to classroom diversity

Action – we have:

- Considered student perspectives on exclusion in the classroom
- Begin to develop strategies for inclusive teaching to address the challenges and benefits of diversity in the classroom

Resources



CIRTL Network COMMITTED TO ADVANCING THE TEACHING
OF STEM DISCIPLINES IN HIGHER EDUCATION

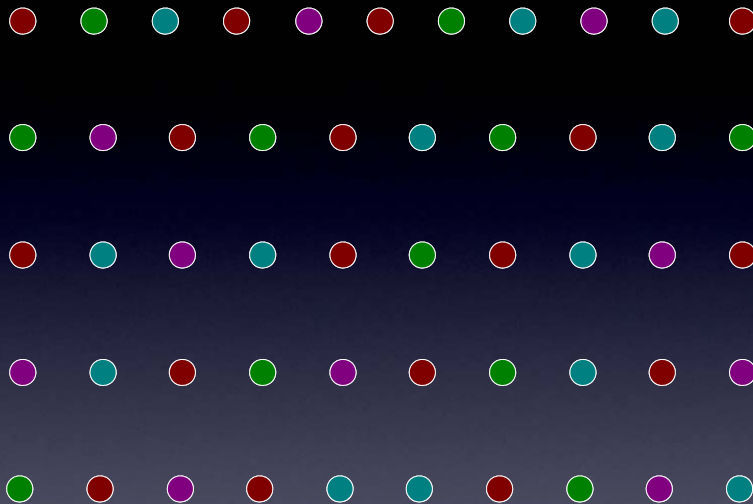
Diversity Institute of the
Center for the Integration of Research, Teaching, and Learning
www.cirtl.net

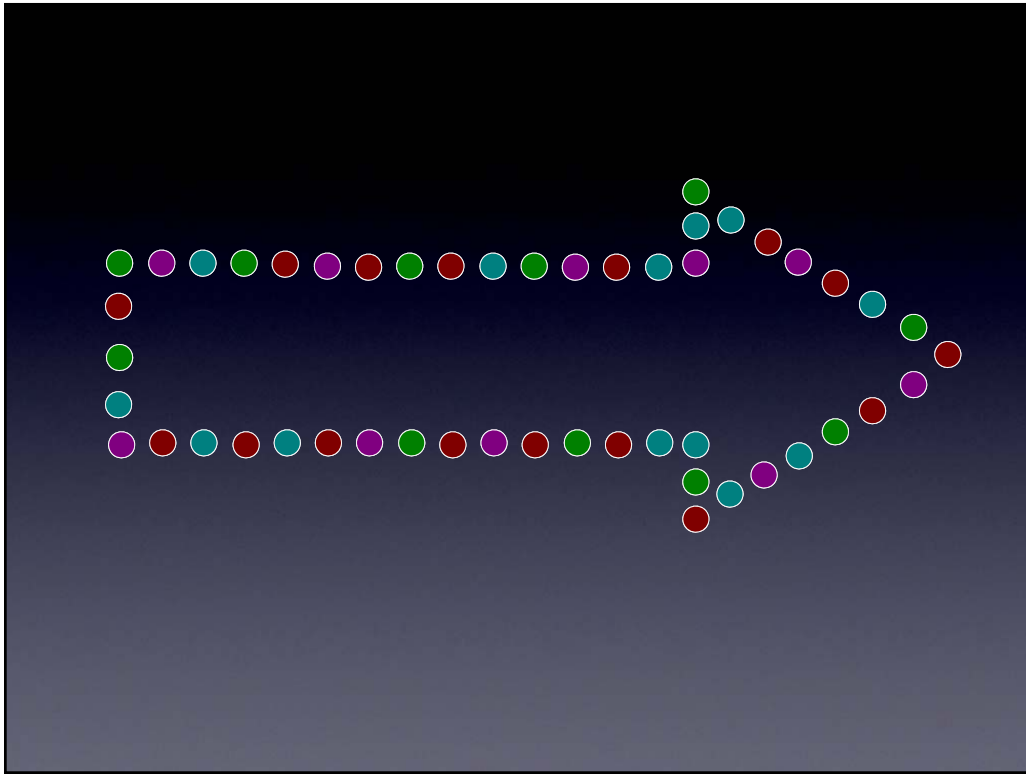
case studies, bibliographies, instructional resources, etc.

<https://implicit.harvard.edu/implicit/demo/>

Examine your unconscious biases; Harvard's research-based *Project Implicit*

Handout on *Inclusive Teaching* (compiled in 2013)





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