

Addressing the Threat in the Air: Reducing Stereotype Threat in Science Environments

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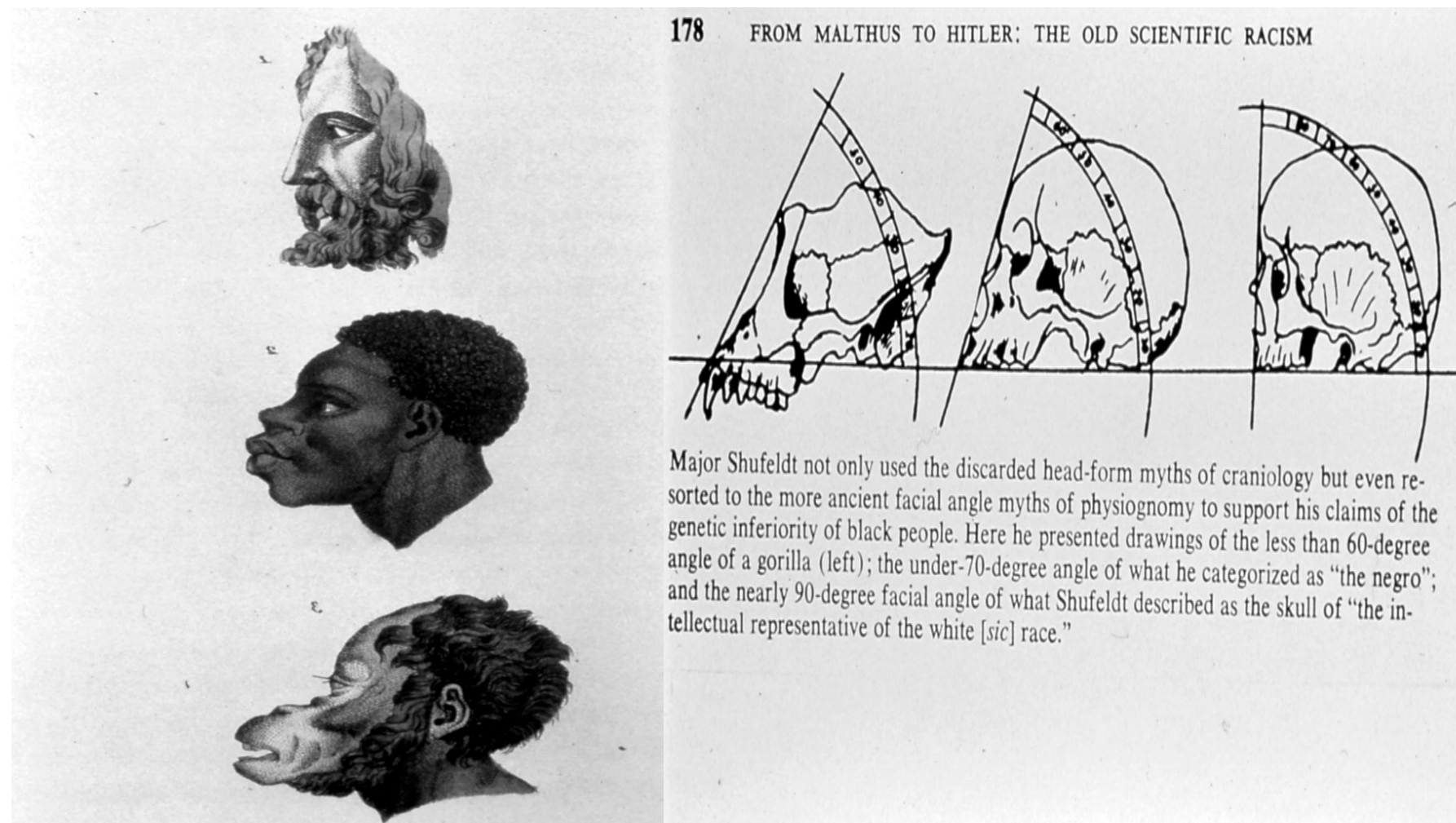
Abstract

Pseudoscience in the form of eugenics studies have led to the unfortunate stereotyping of people of color as less intelligent than their white counterparts. As a result, science environments often invalidate scientists of color and/or render them invisible, thereby triggering stereotype threat. This situational threat leads to the underperformance of trainees of color in science domains. To overcome this barrier to equity, diversity, and inclusion in science, leaders of the SF BUILD project at San Francisco State University (SF State) have developed a workshop for science faculty and research mentors. The workshop enables participants to recognize and reduce stereotype threat in their classrooms and research labs. It was developed by a transdisciplinary team of researchers that included cognitive and social psychologists, basic scientists, and science educators, and is based on nearly 50 scholarly articles. Since its development in 2016 the workshop has been delivered to hundreds of faculty and research mentors at SF State and at the University of California, San Francisco (UCSF). UCSF is the research partner for the SF BUILD project, and works with SF State, to “*Enable Full Representation in Science.*” Thus, the stereotype threat workshop can meet the needs of faculty and mentors at research-intensive universities (e.g., UCSF), as well at a comprehensive, minority-serving institution (e.g., SF State) who are committed to equity, diversity, and inclusion.

Background

Pseudoscience of Racism

- Historical “studies” create positive/negative stereotypes



- Negative stereotyping causes underperformance

Research Article
Latent Ability
Grades and Test Scores Systematically Underestimate the Intellectual Ability of Negatively Stereotyped Students
Gregory M. Walton¹ and Steven J. Spencer²
¹Stanford University and ²University of Waterloo

- Underperformance in stigmatized domains is not linked to success – *GRE is “ineffective predictive tool”*

RESEARCH ARTICLE
Predictors of Student Productivity in Biomedical Graduate School Applications
Joshua D. Hall, Anna B. O’Connell, Jeanette G. Cook
Published: January 11, 2017 • <https://doi.org/10.1371/journal.pone.0169121>

Recognizing Stereotype Threat

Workshop participants explore triggers of stereotype threat through primary literature and examples:

- Invalidating Surroundings:** Physical spaces that fail to signal diversity/belonging (Chervan, *et al.*, 2009)



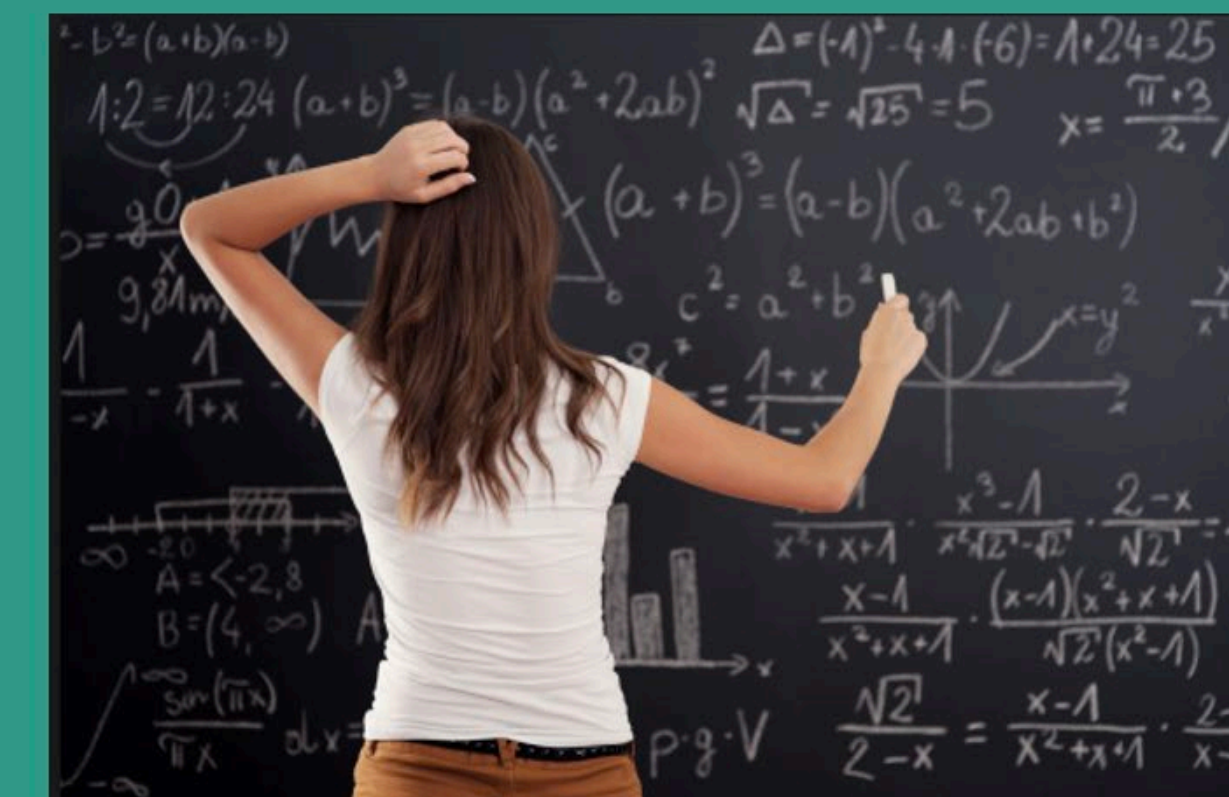
Example:
Grand photos at entry to new National Science Foundation (NSF) Building fails to include equitable representation.
Washington, DC 2018

- Microaggressions:** Brief and commonplace daily verbal, behavioral, or environmental indignities, whether intentional or unintentional, that communicate hostile, derogatory, or negative racial slights and insults (Sue *et al.*, 2007)



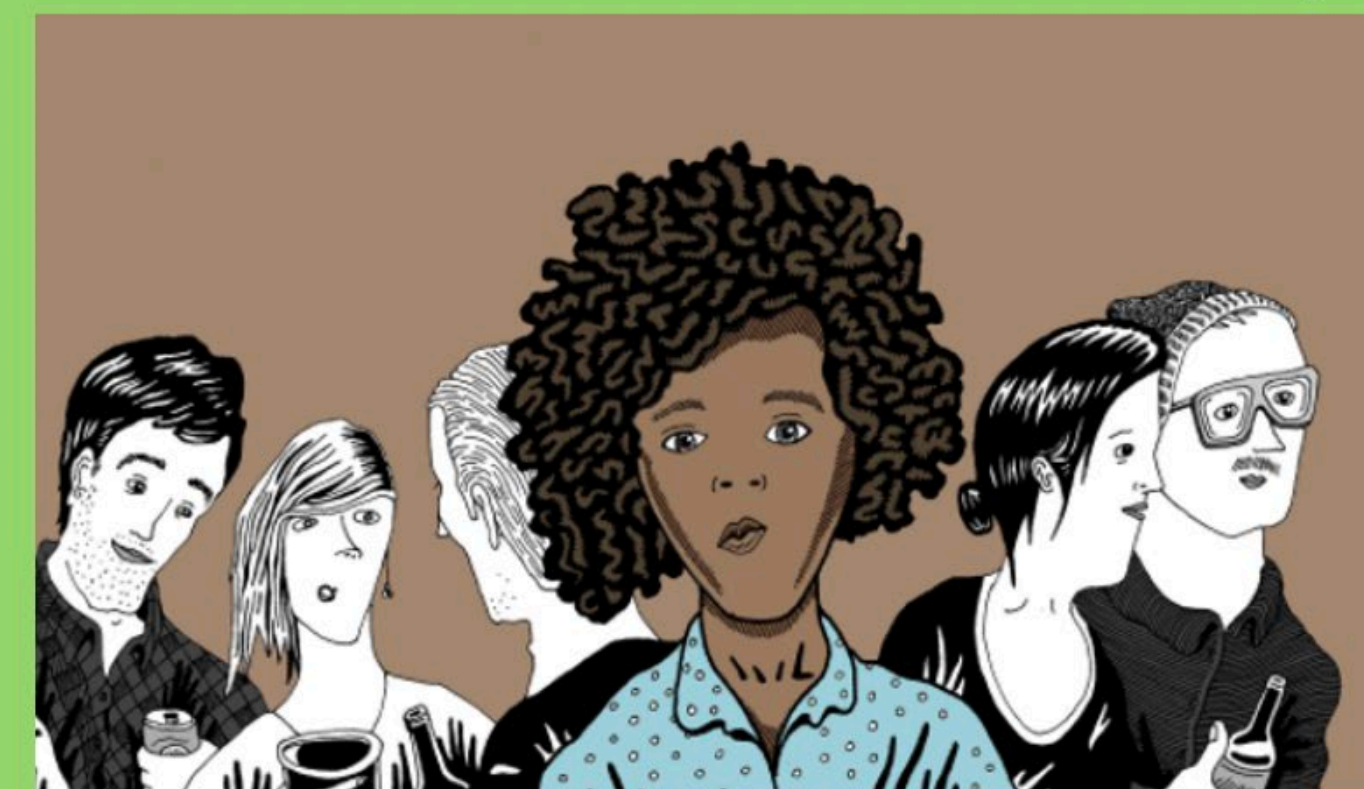
Example:
An instructor says “*When I see students, I don’t see color.*” (i.e., their racial experiences are not valid – the students are rendered invisible)
Subtle, verbal and non-verbal assaults that render folks invalid or invisible.

- Stigmatized Subject Matter:** Identities that are stereotyped to have lower performance or not suited in certain academic areas (Steele, 1997)



Examples:
Blacks/Latinos/Women are not good at math or science
Men are not supposed to major in Women’s studies or Nursing
Whites are not able to have conversations about diversity

- Numerical Underrepresentation:** Groups that are homogenous or composed of mostly similar demographics (Ben-Zeev, *et al.*, 2005)



Example:
There was only 1/500 Black male graduates in Biology at UCLA in 2018

Reducing Stereotype Threat

Workshop participants elaborate strategies for reducing stereotype threat based on examples, microaffirmations, and use of anti-deficit, asset-based discourse.

- Inclusive Surroundings:** Physical spaces that signal diversity/belonging (non-verbal microaffirmation)



Example:
Grand photos at entry to new National Science Foundation (NSF) Building include pictures of current and former NSF Directors for more inclusive (and accurate) representation.

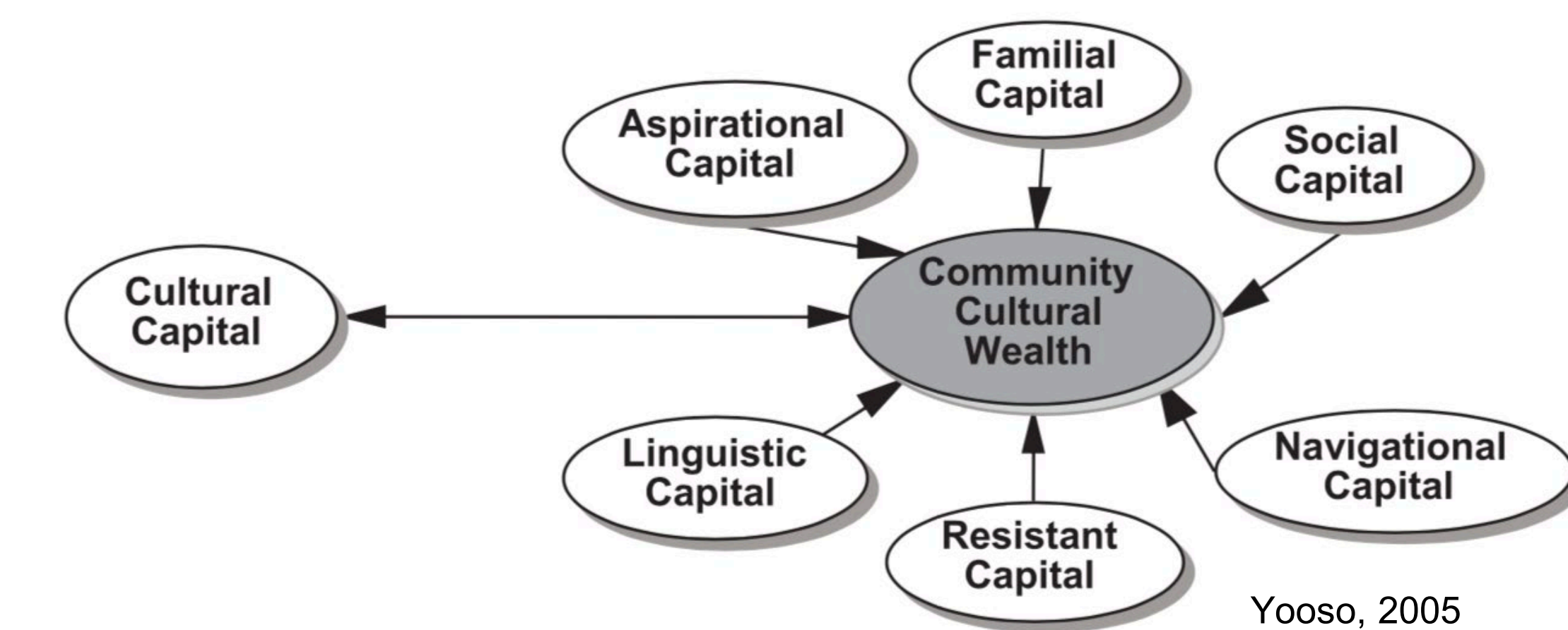
- Microaffirmations:** Brief and commonplace daily verbal, behavioral, or nonverbal acts, which occur wherever people wish others to succeed. (Estrada *et al.*, 2019)



Example:
An instructor says “*When I see students, I am very interested to learn about their racial/ethnic backgrounds, and about the assets they bring to the classroom.*”

Anti-deficit discourse replaces comments like, “*students of color are not, do not have, or just need to...*” with “*institutions are not, do not have, or just need to...*” to achieve student success.

Asset-based pedagogy takes into account the lived experiences of students and trainees that increase their community cultural wealth (e.g., linguistic capital attained through communication in more than one language that improves intellectual and social skills).



Summary

- Biased scientific studies and/or data analyses has contributed to the unfortunate stereotyping of people of color in intellectual domains.
- Stereotype threat causes underperformance, and is triggered by factors that can be changed by faculty & research mentors.
- A workshop that increases understanding of stereotype threat, and provides tools for combating its effects can enhance diversity of the scientific workforce.

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