



The Case for Diversity in STEM

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Attention to Diversity as a National Need

“If our 21st Century science and engineering workforce is not representative of our citizenry, we as a nation will miss the most promising opportunity for continued U.S. success. The loss will cut two ways- it will rob worthy individuals of the chance to enrich their lives and to contribute to the engine of our economy and culture, and it will undermine the ability of our nation to prosper within an increasingly competitive world.”

Joseph Bordogna, NSF (2003)

Agenda



- Building diversity literacy
- The case for diversity in STEM
- Challenges & Outcomes
- Opportunities and next steps

BUILDING DIVERSITY LITERACY



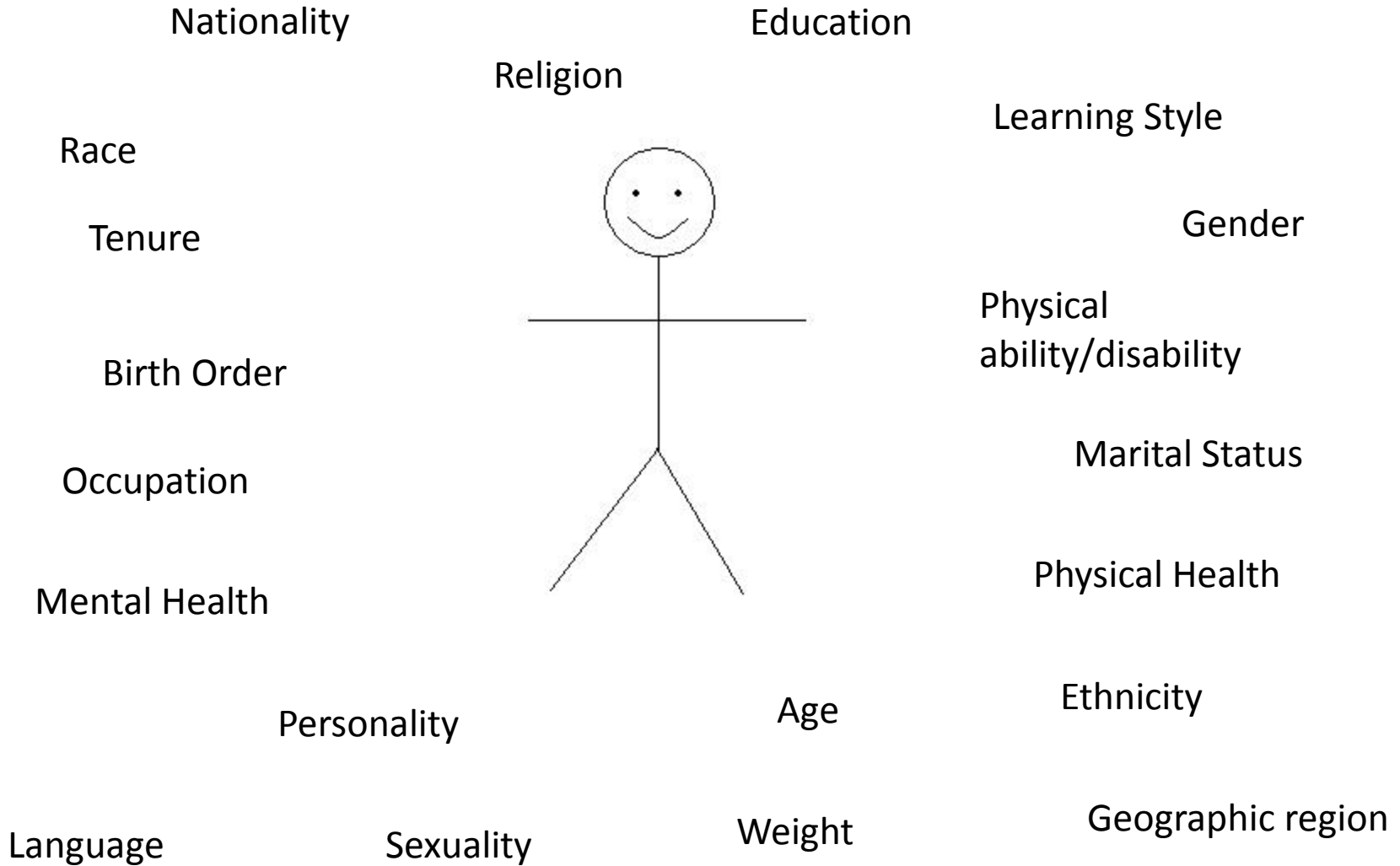
Diversity Literacy Preview

- Color-blindness
- Cultural competence
- Cultural default
- Demographic fault lines
- Diversity
- Diversity resistance
- Glass ceilings
- Glass escalators
- Identity
- Inclusion
- Privilege
- Multiculturalism
- Micro-inequities
- Sticky Floors





Social identities



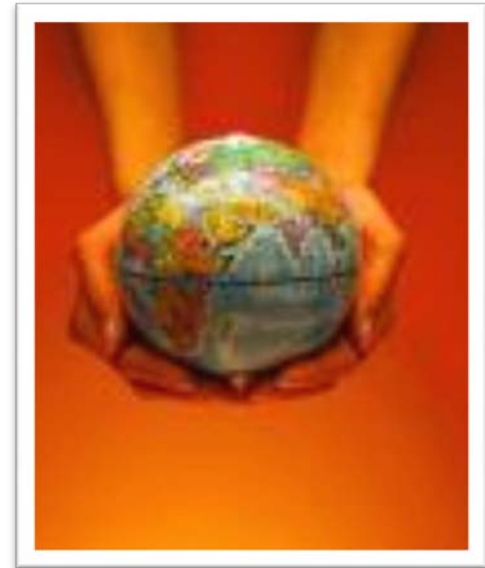
Definitions of diversity

- Everything that makes people different from each other
- Just race and gender (minority group status)
- Cultural variations within our institutions
- Those differences that carry social and historical significance in the modern world



Principles of Cultural Competence

- Working with others (e.g. clients, peers, suppliers) is ultimately a cross cultural experience
- Cultural competence reflects a process rather than an achievement
- In order to understand others we need to better understand the self
- Promote awareness rather than stereotypes
- Understanding the cultural default and meeting the needs of others outside that category



Diversity vs. inclusion

Diversity

- Quantity
- Demographics
- Observed worker characteristics
- Unobserved worker characteristics
- Fair treatment
- Representation across institution

Inclusion

- Quality
- Employee participation & involvement
- Enhanced communication
- Stronger community relations, internally & externally
- Voice
- Opportunity for influence



Some Characteristics of Inclusive Institutions

- Recognition
 - Individual
 - Group
- Participation
- Voice
- Equality & Fairness
 - Power
 - Influence
- Integration
 - Avoiding demographic fault lines

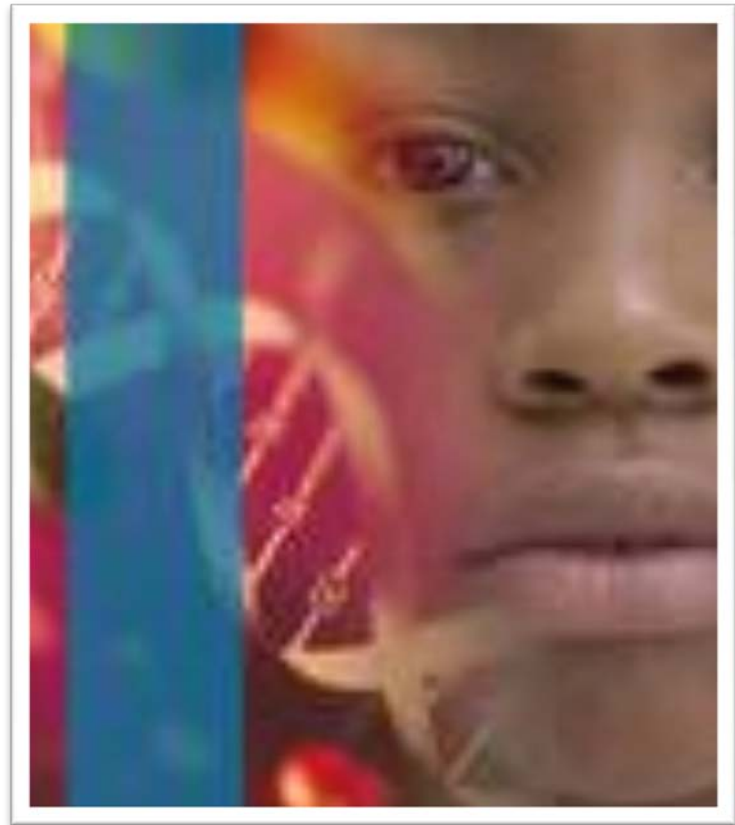


Institutional diversity paradigms: How does your institution do diversity?

- Discrimination & Fairness
 - Recruitment oriented
 - Little support or development
 - Revolving door
- Access & Legitimacy
 - “Special” positions or units
 - Feelings of exploitation
 - Lack of organizational learning
- Learning & Effectiveness
 - Diversity & inclusion as a key parts of strategy
 - Diversity adds value
 - Diversity as a tool for organizational learning and innovation
 - Accountability mechanisms



Cases for Diversity within STEM



The Cases for Diversity

- Democratic society
- Learning & innovation
- Business & the economy
- Higher education
- Institutional and individual costs of resistance



Making the Case for Diversity

- Democratic society
 - Fairness & justice
 - Access rather than treatment



Learning and Innovation

- Creativity and innovation
- Critical thinking
- Social and interpersonal development



Business/Economy case for diversity

- Tap hidden talent
- Enlarge worker skill sets
- Expand markets domestically and internationally
- Organizations that excel in regards to diversity excel in their financial performance
- Support national economy



“...if Hispanics and African Americans had the same education and commensurate earnings as Whites, there would be an upsurge in national wealth of \$113 billion annually for African Americans and \$118 billion for Hispanics.”

From the Educational Testing Service as cited in the Business Higher Education Forum, *Investing in People* (2002).

The Higher Ed Case

- Institutions of Higher Ed
 - Accomplish our mission
 - Competitiveness
 - National rankings
 - Size/quality of the student body
 - Productivity of our labs
 - Grant dollars
 - Recruitment efforts
- Individual faculty
 - Teach our classes
 - Conduct our research
 - Acquire funding
 - Extend our work



“...we are warned that our way of life is threatened because we are in danger of falling behind in science, technology, engineering, and math (STEM), the disciplines that have powered American prosperity for decades.”

National Academies (2007)

“The solution to America’s competitiveness problem is to activate the hidden workforce for young men and women who have traditionally been underrepresented in STEM careers—African Americans, American Indians, and Latinos.”

NACME (2008)

Challenges

- Implicit prejudice
- Privilege
- Colorblindness



Implicit Bias

- Modern forms of prejudice are rarely overt and hostile. Typically they are subtle, covert, and often not intentional.
- Many forms of modern prejudice and implicit bias are unintentional, automatic, and outside of our awareness.
- Frequently they are contrary to our espoused beliefs yet they infiltrate many judgments and decisions.

Areas where implicit bias undermines diversity in academe and STEM

By the perpetrators

- Lowered expectations (Bertand and Sendhill, 2004; Eagly and Karau, 2002)
- Uneven evaluations (Biernant & Manis, 1994)
- Limited and narrow views of excellence
- Exclusion

For the underrepresented targets

- Vigilant, suspicious
- Stereotype threat (Steele & Aronson, 1995)
- Lack of belonging (Cheryan et al., 2007)
- Taxes mental resources (Schmader & Johns, 2003)
- Health consequences (Clarke et al., 1999; Mendes et al., 2007)

Glass Ceilings, escalators, & sticky floors

- The Glass Ceiling
 - The invisible barrier that keeps women and minorities from ascending to positions of leadership and authority in their institutions despite their experiences and credentials.
- The Glass Escalator
 - The invisible that lifts, supports, and legitizes the continued development and promotion of the “cultural default.”
- Sticky Floors
 - The forces that limit the aspirations of women and minorities to climb their career ladders. “If I have it bad now, it will even be worse at a higher level. More work and even less support.”

Explanations for the glass ceiling

- What Leaders Say
 - Lack of a pipeline
 - Women not in the pipeline long enough
 - Lack of interest
 - Divided commitments
 - Women don't have the right kind of workplace experiences
- What Women Say
 - Male cultures
 - Poor climate for diversity & inclusion
 - Restrictive stereotypes
 - Lack of mentoring & access to networks
 - Limited access to the right kind of workplace experiences

Strategies for breaking the glass ceiling

- What leaders say...
 - Fill the pipeline
 - Develop committed women
 - Retain senior women to assist in the development of more junior women
- What executive women say...
 - Exceed all expectations
 - Adopt a style that puts men at ease

HANDEDNESS

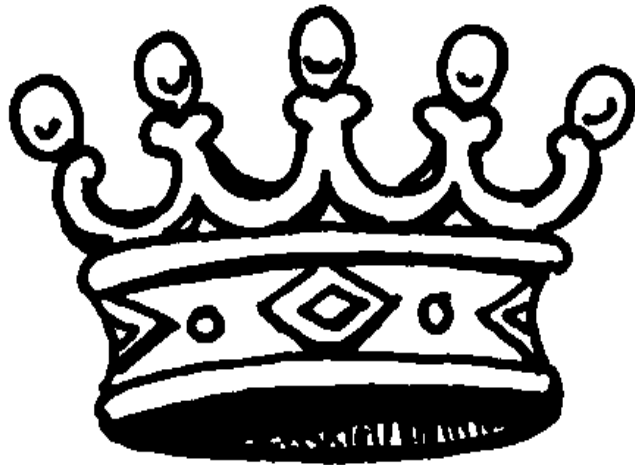


Definitions of and insights about privilege

- “...an invisible package of unearned assets that I can count on cashing in each day, but about which I was ‘meant’ to remain oblivious” (McIntosh, 1993, p.31)
- “...a ‘system’ normed on the experiences, values, and perceptions of one group.” (Maier, 1997, p. 29)
- “The invisibility of privilege strengthens the power it creates and maintains. The invisible cannot be combated, and as a result privilege is allowed to perpetuate, regenerate, and re-create itself. Privilege is systemic, not an occasional occurrence. Privilege is invisible only until looked for, but silence in the face of privilege sustains its invisibility...our way of life....simply the way things are...Others have a *lack*, an absence, a deficiency.” (Wildman & Davis, 1996, p. 8-17)



Common elements of privilege



Normalcy

Taken for granted

Invisible

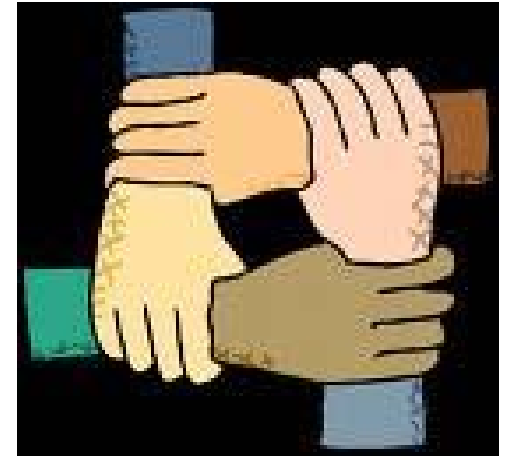
Status quo

Choice to confront



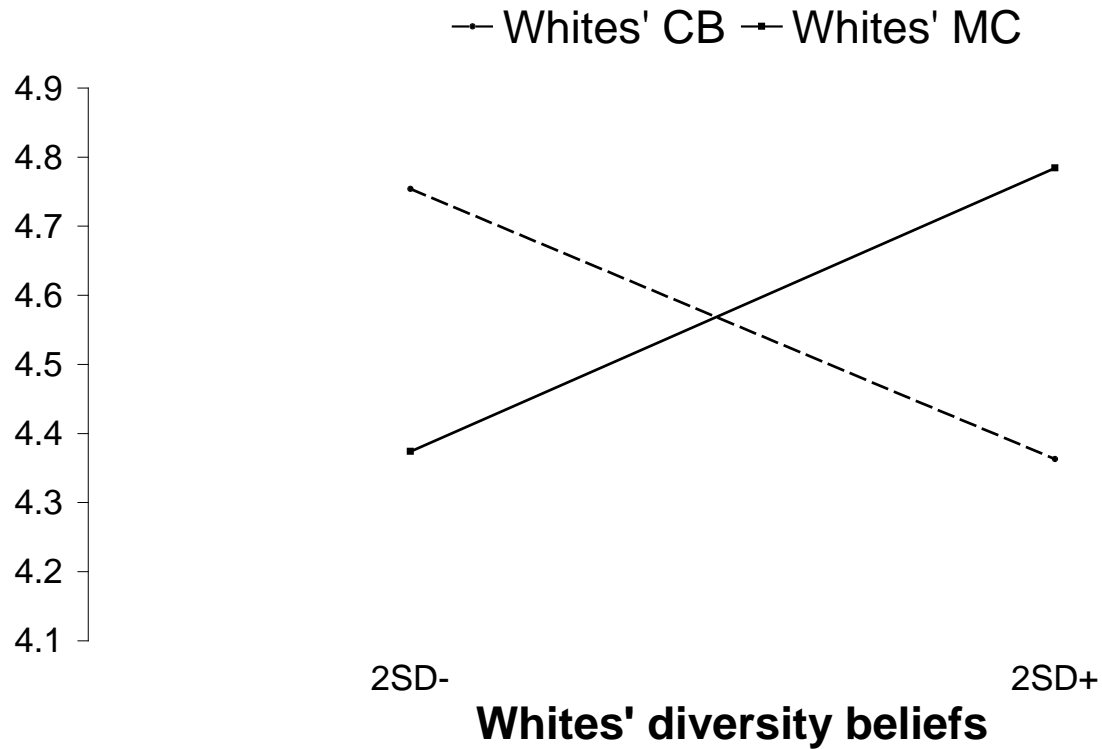
Examples of privilege

- ▶ I can look at the leadership in my institution and feel confident that I am represented.
- ▶ I can make a mistake and know that it will not impact the future of others like me in my institution
- ▶ I can seek information or feedback and not fear that I will be labeled as needy or incompetent.
- ▶ I can feel confident that my institution has the best interests of people like me in mind.
- ▶ I know that my culture and/or religion is respected.
- ▶ My language is respected in my institution.
- ▶ I am not viewed as a “credit to my group” when I am successful.
- ▶ There are high expectations of those who are of my group.
- ▶ I can ask to speak to the person in charge and feel confident that I will meet with a person of my group
- ▶ I can make a complaint or seek justice without having my group membership called into question
- ▶ I can be successful and not raise others' suspicions

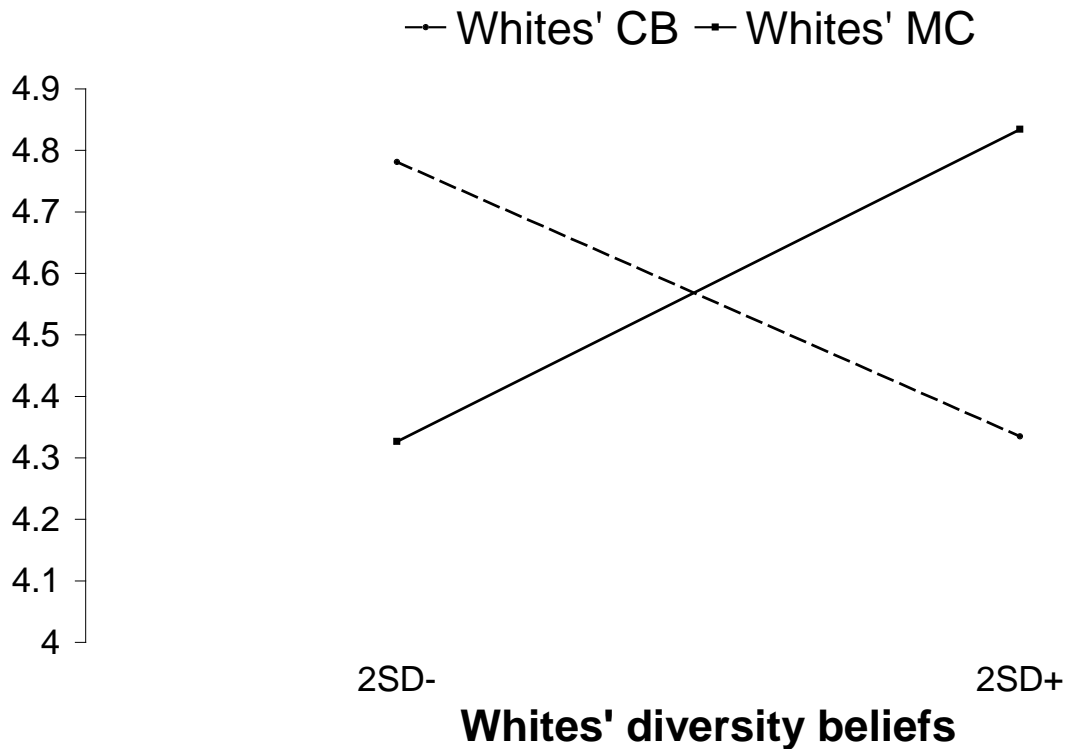


Plaut, V.C., Thomas, K.M., & Goren, M.J. (2009). Is multiculturalism or colorblindness better for minorities? *Psychological Science*, 20(4), 444-446

The overall pattern



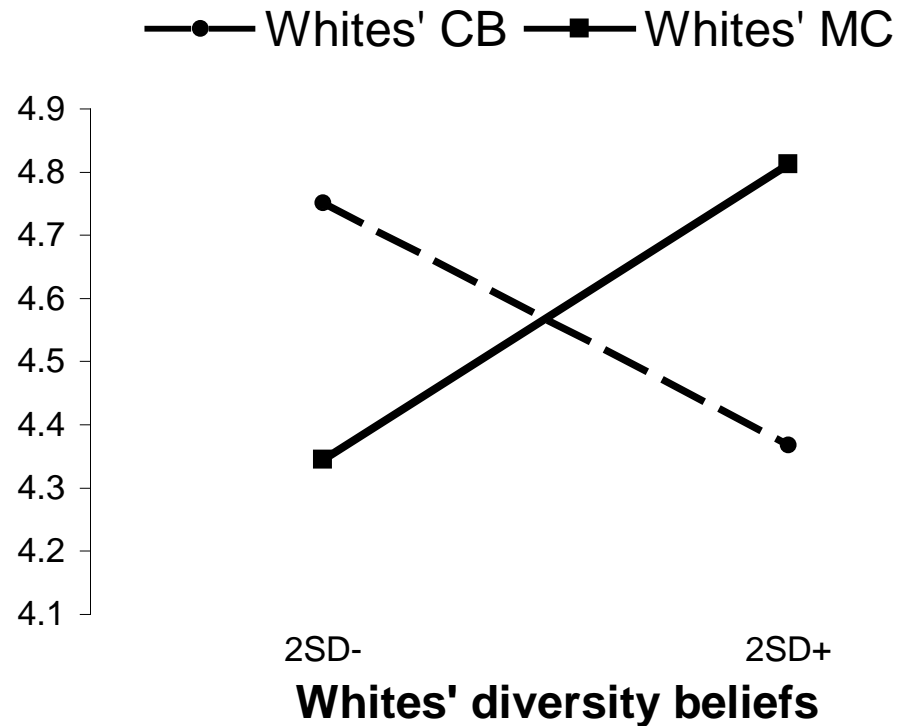
Controlling for department demographics



multiculturalism: $R^2 = .36$, $\beta = .71$, $t(14) = 3.24$, $p = .006$

colorblindness: $R^2 = .43$, $\beta = -.62$, $t(14) = -2.77$, $p = .015$

Controlling for belief dispersion



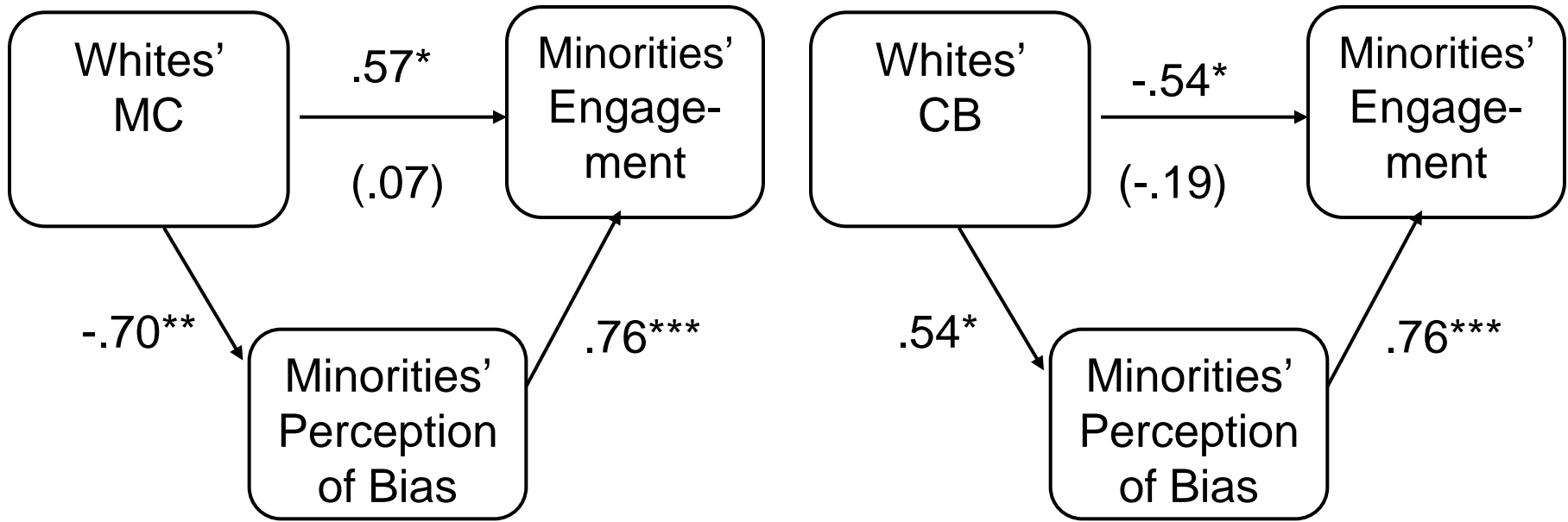
Colorblindness: $R^2 = .30$, $\beta = -.53$, $t(14) = -2.25$, $p = .049$

Multiculturalism: $R^2 = .33$, $\beta = .65$, $t(14) = 1.88$, $p = .081$



The mediating role of perceived bias

“There is zero tolerance for any form of harassment at [the organization]” (reverse-scored).



Sobel's $Z = -2.34, p = .019$

Sobel's $Z = 1.99, p = .047$



Potential mechanisms

- Whites' diversity-resistant beliefs (e.g., less MC/more CB) may lead to
 - Organizational policies unsupportive of diversity
 - Hostile interpersonal environment
 - Social distancing
 - Interpersonal discrimination
 - Lack of access to quality mentoring
 - Exclusion from informal networks
 - Additional hurdles, sticky floors, and glass ceilings



Micro-inequities: Bias in action

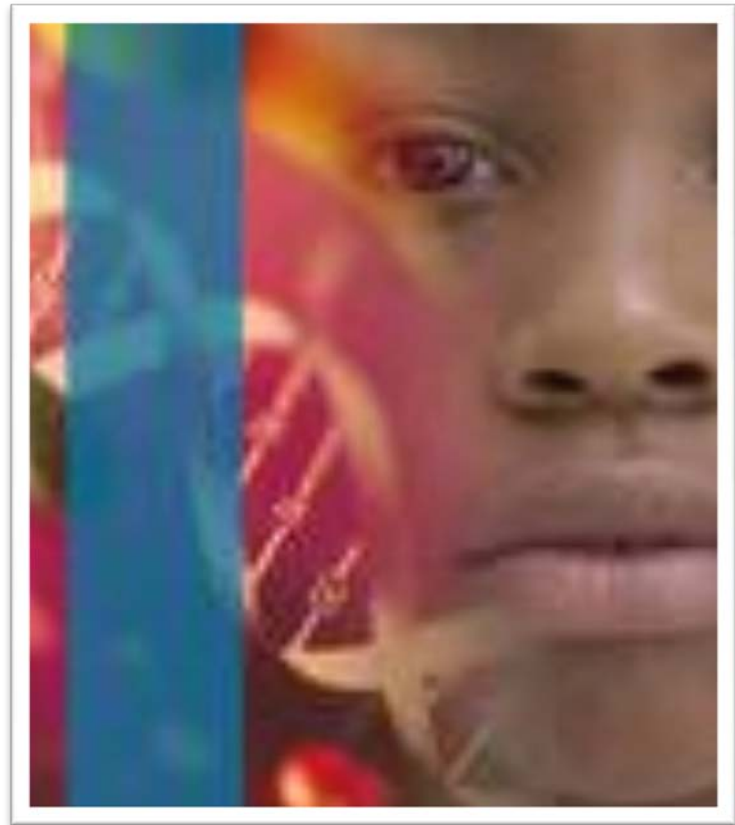
- **Micro-aggressions**

- Interruptions
- Talked over
- Translations
- Called the wrong name or have your name repeatedly mispronounced
- Excluded by others
- Ideas discounted

- ▶ **Micro-support**

- ▶ Provide our full attention
- ▶ Acknowledge each other's contributions
- ▶ Recognize strengths
- ▶ Respectfully ask questions for clarification
- ▶ Hold each other accountable when we see micro-aggressions taking place
- ▶ Break the silence

Strategies



What's next?

- Make diversity an espoused and practiced goal
- Set transparent and inclusive criteria and processes for hiring, promotion, salary, resources
- Assessment, assessment, assessment....
- Pay attention to the practices of search committees-build accountability

More strategies

- Break cultural norms that silence conversations around diversity
- Developmental assignments
- Monitor graduate students' experiences and career goals
- Legitimize conversations around diversity

THANK YOU!

- Questions, comments?

