A Cultural Psychology Approach to Diversity in STEM Participation: Intersectional Forces of Gender and Race

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Cultural Psychology: What is it?

- NOT an exercise in documenting diversity or describing characteristic psychological tendencies in "other" settings

- Instead, a fundamental insight about the cultural and historical bases of mind …

- The structure of mind resides not only in brain architecture, but also is inscribed in the "stuff" of everyday worlds.
Diversity in STEM: A Cultural Psychology Approach

- Key to a CP approach: the dynamic, mutually constituting relationship between "mind in brain" and "mind in context".
- Rethinking psyche: Locating roots of mind in context.
- Rethinking worlds: Illuminating power, privilege.
Locating Mind in Context

Rather than defining individual traits, one can understand psychological tendencies as habitual orientations continuously tuned to structures of mind in context.

- **Implications for Conceptions of Action**
  Shifts focus of change from personal dispositions to the cultural ecologies that continually re-shape dispositions.

- **Implications for Identity-Based Exclusion**
  The consequences of power are not limited to differential treatment; instead, apparently neutral constructions of reality that re-present conditions of identity threat can be sufficient to cause harm, even in the absence of differential treatment.
Identity Threat in STEM Instruction
(Adams, Garcia, Purdie-Vaughns, & Steele, 2006)

Participants

- Study 1: 30 men and 29 women at Stanford University
- Study 2: 38 men, 39 women at the University of Kansas

Procedure

- Experimental Manipulation: Suggestion of Sexism
- Tutorial for GRE logic tests
- Situation Characterization: friendly, comfortable
- GRE-type logic test: 24 MC items in 25 minutes

Identity Threat in STEM Instruction: Conclusions

- **Social Identity Threat**
  
  The mere suggestion of sexism, even in the absence of differential treatment (i.e., direct discrimination) can be sufficient to undermine women’s experience in a STEM instruction situation.

- **Social Identity Privilege**
  
  The same cultural-ecological features that even in the absence of differential treatment (i.e., direct discrimination) can be sufficient to undermine women’s experience in a STEM instruction situation.

Cultural-Ecological Sources of Identity-Based Exclusion in STEM

Research Sites

- University of Kansas (PWI)
- Tulane University (PWI)
- California State University, San Bernardino (HSI)
- Xavier University of Louisiana (HBCU)
Identity-Based Exclusion in STEM:
Research suggests that many of the same constructions of STEM fields that harm women’s participation also harm participation of African Americans.

Additive Model of Identity-based Exclusion
Disadvantage (gender) + Disadvantage (race) = Double Disadvantage

Intersectional Analysis (e.g., Crenshaw, 1991; Mohanty, 1988)
- Implications of identity (and identity-based oppression) are not monolithic, but vary with position along other identity dimensions.
- Gendered dynamics of STEM participation are not natural or inevitable; instead, they vary as a function of cultural setting.
- Standard accounts gender exclusion from STEM may be particularly true of White American spaces and less true of Black American spaces.
Intersectional Analysis of Gender and STEM
(O’Brien, Blodorn, Adams, Garcia, & Hammer, 2013; Study 1)

Participants:

Cooperative Institute Research Program Freshman Survey (1990-1999)
(n = 1,456,215)
- 1,344,242 European American, 53% women
- 111,973 African American, 60% women

Measures
- College Major: STEM (e.g., Physics) or non-STEM (e.g., English)
- Intention to Change Major: ‘1’ (No Chance) to ‘4’ (Very Good Chance)

Intersectional Analysis of Gender and STEM

(O’Brien, Blodorn, Adams, Garcia, & Hammer, 2013; Study 1)

Intersections of Gender and Race in STEM

What can account for both …

(a) "Standard" pattern of gender exclusion in STEM observed in "mainstream" US settings

(b) Different dynamics of gender and STEM in African American communities

- Traits associated with *Feminine* (Goff, Thomas, & Jackson, 2008)
- *Romantic Ideology* (Holland & Eisenhart, 1990; Park, Young, Troisi, & Pinkus, 2011)
- Implicit associations of *Men* and *Science*
- Meritocracy Ideology
  - *(Essentialist) Attributions for gender differences in STEM*
  - *(Entity) Conceptions of Intelligence*
# Intersections of Gender and Nation

*(Nosek et al., 2009)*

## Male Advantage in TIMMS Performance

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## Implicit Association of STEM with male

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Intersectional Analysis of Gender and STEM

(O’Brien, Blodorn, Adams, Garcia, & Hammer, 2013; Study 2)

Participants: 152 women from Tulane and Xavier (43 Afr Am, 109 Eur Am)

Procedure

■ Implicit gender-STEM stereotypes (Nosek et al., 2009)
  ■ LA: Art, English, History, Humanities, Literature, Music, Philosophy
  ■ STEM: Astronomy, Biology, Chemistry, Engineering, Geology, Math, Physics
  ■ Female: Aunt, Daughter, Female, Girl, Grandma, Mother, Wife, Woman
  ■ Male: Uncle, Son, Male, Boy, Grandpa, Father, Husband, Man

■ STEM outcomes:
  ■ Enjoyment of STEM courses (7-point scale: 1 = not at all; 7 = very much)
  ■ STEM major

Intersectional Analysis of Gender and STEM
(O’Brien, Blodorn, Adams, Garcia, & Hammer, 2013; Study 2)

Implicit Association

STEM Enjoyment

Intersections of Gender and Race

Implicit STEM Stereotypes

Ethnicity
$(0 = \text{Afr}, 1 = \text{Eur})$

STEM Major

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Intersectional Analysis of Gender and STEM
(O’Brien, Blodorn, Adams, Garcia, & Hammer, 2013; Study 3)

Participants: 761 undergraduates from 4 universities in the USA
- 192 African American (80% women)
- 569 European American (69% women)

Procedure
- Implicit gender-STEM stereotypes (Nosek et al., 2009)
- STEM Major

Intersectional Analysis of Gender and STEM
(O’Brien, Blodorn, Adams, Garcia, & Hammer, 2013; Study 3)

Intersectional Analysis of Gender and STEM

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Intersectional Analysis of Gender and STEM
(O’Brien, Blodorn, Adams, Garcia, & Hammer, 2013; Study 4)

Participants: 162 women from 3 universities in the USA
- 72 African American
- 90 European American

Procedure
- Attributions for Gender Differences in STEM
  - "Gender differences between men and women are due to negative stereotypes."
Intersectional Analysis of Gender and STEM
(O’Brien, Blodorn, Adams, Garcia, & Hammer, 2013; Study 4)

Intersectional Analysis of Gender and STEM

(O’Brien, Blodorn, Adams, Garcia, & Hammer, 2013; Study 4)

Participants: 162 women from 3 universities in the USA

- 72 African American
- 90 European American

Procedure

- Attributions for Gender Differences in STEM
  - "Gender differences between men and women are due to negative stereotypes."

- Beliefs about Intelligence
  - "You have a certain amount of intelligence and you can’t do much to change it."
  - "You can learn new things, but you can’t really change your basic intelligence."

Intersectional Analysis of Gender and STEM

(O’Brien, Blodorn, Adams, Garcia, & Hammer, 2013; Study 4)

Refinements

- Not *race*, but (particular) cultural settings:
  - African American communities? HBCUs? Xavier?

- Beyond the Black/White binary
  - Dynamics of racial identity will vary across communities

- Greater proportions of STEM majors among African American women does not signal advantage.
  - Reflects broad exclusion from all academic fields, not just STEM.

- Lower rate of STEM participation among European American women does not necessarily signal disadvantage.
  - *To some extent*, may reflect privilege to choose something other than STEM.
Intersectional Conclusions

Normalizing the Marginalized

- Rather than seeing marginalized communities as sites for outside intervention, we should appreciate them as source of critical consciousness and strategies for broad human liberation.

De-Naturalizing the (White American) "Standard"

- Intersectionality approaches help illuminate how people can adopt ideas (e.g., meritocracy) in the service of dominant identity positions (e.g., race) that lead to subordination or oppression along other identity positions (e.g., gender).
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