Breaking the Bias Habit: A Cluster Randomized Controlled Study of an Educational Intervention in STEMMM Departments

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Premise:
1. The mere existence of cultural stereotypes leads to unintentional and unwitting bias in judgment and decision-making
2. These “implicit biases” occur as habits of mind even in those who personally disavow prejudice
3. If they are habits, they should be remediable
R01 GM088477
NIH RFA-GM-09-012:
Research on Causal Factors and Interventions that Promote and Support the Careers of Women in Biomedical and Behavioral Science and Engineering (R01)
Cultural stereotypes about men and women

- Men are *agentic*: Decisive, competitive, ambitious, independent, willing to take risks
- Women are *communal*: nurturing, gentle, supportive, sympathetic, dependent

*Works of multiple authors over 30 years: e.g. Eagly, Heilman, Bem, Broverman*
Supporting Evidence

• Funding discrepancies occur with type 2 (renewal) R01s (Ley & Hamilton. *Science* 2008; Pohlhaus et al., *Acad Med* 2011)

• “Goldberg” designs indicate that work performed by women is rated of lower quality than work performed by men regardless of the rater’s gender (Isaac et al. *Acad Med* 2009)

• Science faculty rated a male applicant as more competent, hireable, deserving of mentorship, and worth a higher salary than an identically credentialed female student whom they found more likeable. (*Moss-Racusin et al. PNAS* 2012)
Race Context

Implicit bias predicts behavior:

• Awkward body language in conversations between a White student and a Black student (Dovidio, et al., 2002) or Black experimenter (McConnell and Leibold, 2001)

• Interpretation of friendliness in facial expressions (Hugenbert & Bodenhausen, 2003)

• More negative evaluations of a Black vs. a White individual’s ambiguous actions (Devine, 1989; Rudman & Lee, 2002)

• Inadequate prescription of opioid analgesics in identical clinical vignettes of Black vs. White patients in pain (Sabin, 2012)

• Failure to follow treatment guidelines in prescribing thrombolytic therapy in identical vignettes of Black vs. White patient with acute myocardial infarction (Green et al., 2007)
Breaking a habit takes more than good intentions

- Awareness
- Motivation
- Self-efficacy
- Positive outcome expectations
- Deliberate practice

Breaking the Bias Habit in STEMM Faculty

• Cluster Randomized Controlled Study
• 92 departments – 46 pairs
  – Division, School/College, Size
  – Randomized to intervention or wait-list control
• Intervention = Bias Literacy Workshop
• Measures
  – Implicit Association Test (gender and leadership)
  – Motivation to engage in gender bias reduction
  – Gender equity self-efficacy
  – Gender equity outcome expectations
  – Self-reported gender equity action

• Study of Faculty Worklife Survey
Study Design

92 STEMM departments/divisions

Workshop introductory sessions completed at 91 departments (one refused; given handout)

92 STEMM departments matched by broad discipline, school/college, size,

Each department pair randomized

Intervention group (n=46)
Baseline survey and IAT
2.5-hour educational intervention
3-day survey and IAT
3-month survey and IAT

Wait list control group (n=46)
Baseline survey and IAT
3-day survey and IAT
3-month survey and IAT

Study of Faculty Worklife to UW-Madison faculty, Spring 2010
Study of Faculty Worklife to UW-Madison faculty, Spring 2012
Workshop Format

• Introduction – make the case with evidence, economic issue, paired activity
• Module 1 origins of implicit bias
• Module 2 bias literacy
• Module 3 bias-reducing strategies
• Summary – written commitment to action

Module 1 – Origins of Bias

• Demonstrate how habits of mind can be subject to error and fail our intentions

• Lead participants conceptually from object perception to social perception

• Discuss IAT as measure of strength of association between trait and social group
“Surely, you can see that the shades of gray in Squares A and B are identical.”
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“Surely, you can see that the shades of gray in Squares A and B are identical.”
Stroop Color Naming Task

Compatible Trials

RED
BLACK
BROWN
GREEN
YELLOW
BLUE

Incompatible (interference) Trials

RED
BLACK
BROWN
GREEN
YELLOW
BLUE
Discussion of the IAT
Logic of the IAT

• IAT measures strength of associations between categories such as “male and female” and attributes such as “leader and supporter” roles

• Strength of association reflected in the time it takes to respond to the stimuli while trying to respond rapidly

• Trial Types
Congruent Trials

Press “LEFT” key for:
- Leader
  - OR
  - Male name

Press “RIGHT” key for:
- Supporter
  - OR
  - Female name
Incongruent Trials

Press “LEFT” key for

Leader
OR
Female name

Press “RIGHT” key for

Supporter
OR
Male name
IAT Effect

The larger the difference, the greater the bias in associating men with leader roles and women with supporter roles.

IAT Effect: Incongruent – Congruent

169 ms
Implicit Gender-Science Stereotypes

Male Respondents

Female Respondents

Nosek BA, Banaji MR & Greenwald AG, 2006

http://implicit.harvard.edu/
Module 2 – Bias literacy

• 6 bias constructs:
  – Expectancy bias
  – Prescriptive gender norms
  – Occupational role congruity
  – Reconstructing credentials
  – Stereotype priming
  – Stereotype threat

• Illustrate with experimental studies or real world examples

• Apply to cases as readers’ theater
Module 3 –
Personal Bias Reduction Strategies

• Stereotype Replacement
• Counter-Stereotypic Imaging
• Individuating
• Perspective-Taking
• Increase Opportunities for Contact


• Plus 2 that DON’T work:
  – Stereotype Suppression
  – Too Strong a Belief in One’s Personal Objectivity

## Study Departments – 2290 faculty

<table>
<thead>
<tr>
<th></th>
<th>46 Intervention N=1137</th>
<th>46 Control N=1153</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>5-107 (mean 31)</td>
<td>6-129 (mean 26)</td>
<td>NS</td>
</tr>
<tr>
<td>% attending workshop</td>
<td>31%</td>
<td>NA</td>
<td>NS</td>
</tr>
<tr>
<td>Dept chair attended</td>
<td>72%</td>
<td>NA</td>
<td>NS</td>
</tr>
<tr>
<td>% answered at least one time point</td>
<td>52%</td>
<td>49%</td>
<td>NS</td>
</tr>
<tr>
<td>% answered all three time points</td>
<td>15%</td>
<td>16%</td>
<td>NS</td>
</tr>
<tr>
<td>% tenure track</td>
<td>71%</td>
<td>72%</td>
<td>NS</td>
</tr>
<tr>
<td>% women</td>
<td>34%</td>
<td>31%</td>
<td>NS</td>
</tr>
</tbody>
</table>
Gender and Leadership IAT Scores

Male Respondents (n=359)

- IAT Score --> Male/Leader Stereotyping
- 72%
- 8%

Female Respondents (n=315)

- IAT Score --> Male/Leader Stereotyping
- 71%
- 8%
Notes:
N = 92 departments; 1154 faculty (50.4% response rate)
* Statistically significant difference of $p<0.05$ between experimental and control departments compared with differences at baseline
** Significant only for departments in which ≥25% of faculty attended the intervention workshop, $p<0.05$
Does changing behavior of faculty change academic culture?

Study of Faculty Worklife:

• Faculty (all tracks) in 92 depts. surveyed baseline and after completion of interventions; 671 responded both years (296 experimental, 375 control)

• Intervention vs. control improvements in:
  • Research valued
  • “Fit” in department
  • Comfort raising personal and family issues
Conclusion

- Gender bias responds to interventions shown effective in breaking other behavioral habits
- When STEMM faculty break the bias habit, it appears to improve department climate for all faculty
- No reason to believe that similar approaches would not work in the context of race or disability
Questions?
## UW-Climate Survey 2010-2012

<table>
<thead>
<tr>
<th>Experimental Assignment</th>
<th>Control Departments (N=46 Depts.)</th>
<th>Intervention Departments (N=46 Depts.)</th>
<th>Total (N=92 Depts.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Faculty</td>
<td>822</td>
<td>708</td>
<td>1530</td>
</tr>
<tr>
<td>Resp 2010 only</td>
<td>254</td>
<td>243</td>
<td>497</td>
</tr>
<tr>
<td>Resp 2012 only</td>
<td>193</td>
<td>169</td>
<td>362</td>
</tr>
<tr>
<td>Resp 2010 &amp; 2012</td>
<td>375</td>
<td>296</td>
<td>671</td>
</tr>
<tr>
<td>Chair Att. Intvn.</td>
<td>-</td>
<td>N=33 Depts</td>
<td></td>
</tr>
<tr>
<td>Total M vs. F</td>
<td>M=525, F=297</td>
<td>M=474, F=234</td>
<td>1530</td>
</tr>
<tr>
<td>Full Prof</td>
<td>339</td>
<td>321</td>
<td>660</td>
</tr>
<tr>
<td>Assoc. Prof</td>
<td>200</td>
<td>179</td>
<td>379</td>
</tr>
<tr>
<td>Asst. Prof</td>
<td>283</td>
<td>208</td>
<td>491</td>
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</tbody>
</table>
Baseline IAT Scores for Faculty in Experimental & Control Departments

- Number of Respondents
- Baseline IAT Scores
- 12% Slight
- 67% Moderate
- 12% Strong

Baseline IAT Scores range from -0.85 to 1.55.