Creating a more inclusive environment for underrepresented groups through allyship
A Model of the Impact of Social Identity Threat

Cultural Stereotypes → Social Identity Threat

Social Identity Threat → Poor Performance
Social Identity Threat → Disidentification
Intervention Designed to Increase Male Engineers Respect for Their Female Peers

• Participants - 151 male first year engineering students at the University of Waterloo

• Four Conditions:
  • An intervention that includes self-affirmation and a persuasive appeal for latent ability, plus three sessions in the term that modelled respect toward female colleagues
  • A control condition that just had the persuasive appeal
  • A contact condition that enhanced belonging between men and women and that had three jigsaw exercises
### Time Line

<table>
<thead>
<tr>
<th>Session 1</th>
<th>Session 2</th>
<th>Session 3</th>
<th>Session 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Affirmation + Persuasion</strong>&lt;br&gt; Affirmation Persuasion&lt;br&gt;♀ &amp; ♂ TAs</td>
<td><strong>Build Bridge</strong>&lt;br&gt; Belonging Jigsaw Task&lt;br&gt;♀ &amp; ♂ TA&lt;br&gt;Model Respect</td>
<td><strong>Build Tower</strong>&lt;br&gt; Jigsaw Task&lt;br&gt;♀ &amp; ♂ TA&lt;br&gt;Model Respect</td>
<td>RAs collect DVs</td>
</tr>
<tr>
<td><strong>Persuasion Control</strong>&lt;br&gt; Persuasion Only&lt;br&gt;♂ TAs</td>
<td><strong>nothing</strong>&lt;br&gt;Belonging Control Task&lt;br&gt;♂ TAs</td>
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<td>RAs collect DVs</td>
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<tr>
<td><strong>Contact</strong>&lt;br&gt; Collect Background Info&lt;br&gt;♀ &amp; ♂ TA</td>
<td><strong>Belonging</strong>&lt;br&gt; Belonging Jigsaw Task&lt;br&gt;♀ &amp; ♂ TA&lt;br&gt;Model Respect</td>
<td><strong>Jigsaw Task</strong>&lt;br&gt; Belonging Control Task&lt;br&gt;♀ &amp; ♂ TA&lt;br&gt;Model Respect</td>
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<td><strong>Belonging</strong>&lt;br&gt; Belonging Control Task&lt;br&gt;♂ TAs</td>
<td><strong>Control Task</strong>&lt;br&gt; Control Task&lt;br&gt;♂ TAs</td>
<td>RAs collect DVs</td>
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</tbody>
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Results -

Men’s Respect for Women in Their Group

Ratings of Respect (1-9)

- Contact Control Condition
- Affirmation plus Persuasion
- Contact
Results

How Much Did Men Want Their TA to Supervise Capstone Project

<table>
<thead>
<tr>
<th></th>
<th>Persuasion Control Condition</th>
<th>Contact Control Condition</th>
<th>Affirmation plus Persuasion</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male TA</td>
<td>Red</td>
<td>Yellow</td>
<td>Green</td>
<td>Purple</td>
</tr>
<tr>
<td>Female TA</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Rating of TA (1-11)
Results

Female RA’s Report of How Much Men Treated Her with Respect

Rating of Respect (1-5)

- Persuasion Control Condition
- Contact Control Condition
- Affirmation plus Persuasion
- Contact
Initial research exploring ally interventions

- Ally interventions
- Who acts an ally?
- Why do we need ally interventions?
- Focused initially on Black women
  - Multiple stigmatized identities
Diversity Initiatives in STEM

- Often have the goals:
  - *Increase underrepresented minorities in STEM*  
  - *Increase women in STEM*  
  - *Increase men in STEM*  
  - *Increase white women in STEM*

- Examine the effectiveness of role model interventions for Black women
Role models

- Female scientist role models increase women’s identification with and sense belonging in STEM (Stout, Dasgupta, Hunsinger, & McManus, 2011)

- Women must feel similar to and relate to the role model (Asgari, Dasgupta, & Stout, 2014)

- Role model in STEM research has often focused on women generally (Stout et al., 2011; Asgari et al., 2014)

- Black women may not easily relate to or identify with a White woman role model
Intersectional identities

- Ethnic-prominence perspective

- Black women are more likely to anticipate and attribute experiences of discrimination to their ethnic group than their gender (Levin, Sinclair, Veniegas & Taylor, 2002)

- Black female and Black male scientists > White female scientist
Intersectional identities

- Double Jeopardy perspective
- Women of color face compounding challenges as a result of their dual stigmatized identities (Beale, 1970; King, 1975; Klonoff, Landrine, & Scott, 1995)

- Black female scientist > Black male and White female scientist
Study 1

- 393 Black women from the general population using Amazon’s Mechanical Turk Website

*Imagine how you would feel working at this company*
Study 1

- 4 conditions
  - No profile
  - Black woman profile
  - Black man profile
  - White woman profile

- Profiles were identical

- Only things that differed:
  - The name - Melissa or Mark Evans
  - The picture
Study 1: Measures

- Perceived similarity to scientist
  - E.g., “This person is similar to me” (1-strong disagree to 5-strongly agree)
  - 4 items, α=.87

- Predicted Trust and Comfort (Purdie-Vaughn et al., 2008)
  - E.g., “I think would be treated fairly by colleagues” (1-strong disagree to 5-strongly agree)
  - 4 items, α=.86
Study 1: Measures

- Stigma Consciousness (Pinel, 1999)
  - E.g., “When interacting with people, I feel like they interpret all of my behaviors in terms of my race and gender” (1-Strong disagree to 5-Strongly agree)
  - 5 items, $\alpha=.78$
Study 1 Results: Perceived similarity

- **Black Woman Scientist** vs. **White Woman Scientist**: $d = .32, p < .001$
- **Black Man Scientist** vs. **White Woman Scientist**: $d = .31, p = .063$

$F(2, 288) = 9.61, p < .001, \eta_p^2 = .063$
Study 1 Results: Trust and comfort

- Black women vs. no profile: $d=0.41$, $p=0.014$
- Black man vs. no profile: $d=0.39$, $p=0.045$
- White women vs. no profile: $d=0.05$, $p=0.985$

$F(2, 389)=4.75$, $p=0.003$, $\eta^2_p=0.035$
Study 1 Results: Moderation by stigma consciousness

- Trust and Comfort
- 1 SD below Gender Race Stigma Consciousness
- 1 SD above Gender Race Stigma Consciousness

- No profile
- Black woman
- Black man
- White woman

$p<.001$
Study 2

- Replication of Study 1 with 362 Black female students

Imagine how you would feel at this school
Study 2

- 4 conditions
  - White man profile
  - Black woman profile
  - Black man profile
  - White woman profile

- Profiles were identical
Study 2: Measures

- Perceived similarity to scientist
- Predicted Trust and Comfort
- Gender-Race Stigma Consciousness
Study 2 Results: Perceived Similarity

\[ F(3,359)=12.02, \ p<.001, \ \eta^2_p=.091 \]

Black woman vs. White man: \( d=0.70, \ p<.001 \)

Black man vs. White man: \( d=0.73, \ p<.001 \)

White woman vs. White man: \( d=0.12, \ p=0.846 \)
Study 2 Results: Trust and comfort

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Effect Size</th>
<th>p-value</th>
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</thead>
<tbody>
<tr>
<td>Black woman vs. White man</td>
<td>d = 0.42</td>
<td>p = 0.038</td>
</tr>
<tr>
<td>Black man vs. White man</td>
<td>d = 0.37</td>
<td>p = 0.083</td>
</tr>
<tr>
<td>White woman vs. White man</td>
<td>d = 0.02</td>
<td>p = 0.999</td>
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</tbody>
</table>

$$F(2, 389) = 4.05, \ p = 0.008, \ \eta_p^2 = 0.033$$
Study 2 Results: Moderation by stigma consciousness

<table>
<thead>
<tr>
<th>Race</th>
<th>Gender</th>
<th>Stigma Consciousness</th>
<th>Trust and Comfort</th>
</tr>
</thead>
<tbody>
<tr>
<td>White man</td>
<td></td>
<td>1 SD below</td>
<td>3.7</td>
</tr>
<tr>
<td>Black woman</td>
<td></td>
<td>1 SD above</td>
<td>3.1</td>
</tr>
<tr>
<td>Black man</td>
<td></td>
<td>1 SD below</td>
<td>3.5</td>
</tr>
<tr>
<td>White woman</td>
<td></td>
<td>1 SD above</td>
<td>3.3</td>
</tr>
</tbody>
</table>

$p < .001$
Study 1 and 2: Summary

- Website featuring a Black female scientist or a Black male scientist
  - ↑ trust and comfort in the STEM environment
  - In line with the ethnic prominence perspective

- High stigma consciousness:
  - ↓ trust and comfort unless the website featured a Black woman role model
  - In line with double jeopardy perspective

- **Problem**: The White female scientist was never effective
Study 3

- How do role models influence Black female STEM majors experiences in an institution?

- Recruited Black female STEM majors from:
  - Predominately White University (PWI) (89)
  - Historically Black female college (HBCU) (116)
  - 54 full-time faculty in STEM- 18 Black women (33%)
Study 3: Measures

- Role models at institution
  - Indicated the race and gender of the role model
  - Perceived allyship of the role model
    - “How much do you think this role model cares about helping Black women?” (1- does not care at all to 7- cares very much)

- Belonging at their institution

- Belonging in STEM
  - “I belong in the sciences” (1-strong disagree to 5-strongly agree)
    - 8 items, α=.85
Study 3: Results

- Significantly more Black female role models at HBCU (~2-3) than PWI (~0-1), $t(203)=8.53$, $p<.001$, $d=1.12$

![Graph of Allyship Non-Black Female Role Models](image1)

$t(73)=4.70$, $p<.001$, $d=1.10$

![Graph of Allyship Male Role Models](image2)

$t(82)=4.17$, $p<.001$, $d=.92$
Study 3: Results

Belonging at University

$t(203)=2.64, p=.009, d=.37$

Belonging in STEM

$t(203)=3.50, p=.001, d=.49$
## Study 3: Results

<table>
<thead>
<tr>
<th></th>
<th>Belonging university</th>
<th>Belonging STEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black female role models</td>
<td>$r(203) = .31$, $p &lt; .001$</td>
<td>$r(203) = .14$, $p = .046$</td>
</tr>
<tr>
<td>Allyship non-Black female role models</td>
<td>$r(72) = .21$, $p = .080$</td>
<td>$r(72) = .42$, $p &lt; .001$</td>
</tr>
<tr>
<td>Allyship male role models</td>
<td>$r(81) = .14$, $p = .134$</td>
<td>$r(81) = .20$, $p = .068$</td>
</tr>
</tbody>
</table>
Study 3: Summary

- Compared to PWI, Black female STEM majors at HBCU
  - ↑ Black female role models
  - ↑ belonging at their institution and in STEM
  - ↑ Perceived allyship from role models with different gender and racial identities
Study 3: Summary

- Believing their non-Black female role models were allies
  - ↑ belonging at their institution and in STEM

- How do we make White women more effective role models?
  - Have them signal allyship
Study 4

- Ethnic minorities feel more welcomed in companies that acknowledge the value of diverse perspectives (e.g. a multicultural ideology) (Plaut, Thomas, & Goren, 2009; Stevens, Plaut, & Sanchez-Burks, 2008)

- A White woman who endorses multiculturalism
Study 4

- Black women have more positive experiences when they perceive more allyship from their White counterparts (Dominigue, 2015)

- White women can demonstrate allyship acknowledging and combating prejudice (Brown & Ostrove, 2013; Droogendyk et al., 2016)

- A White woman ally who acknowledges the unique experiences of Black women
Study 4

- 426 Black women from the general population using Amazon’s Mechanical Turk Website

*Imagine how you would feel working at this company*
Study 4

- 5 conditions
  - No profile
  - Black woman profile
  - White woman profile
  - White woman endorsing multiculturalism
    - Having diverse research teams has been key in the success of this research. Diverse groups really do bring more creative and innovative ideas for new experiments and avenues to take this research.
  - White woman ally
    - The reality is, right now there are just not as many women as men in science and the group that is really missing is women of color. Even though I’m a woman, I recognize my experience as a White women is different than that of a Black or Latina woman. I really value their unique perspective and work to actively recruit them as research assistants and research scientists for my group.
Study 4: Measures

- Perceived similarity to scientist
- Perceived allyship of the scientist
  - “Most likely this person wants to help Black women succeed in the sciences” (1-strong disagree to 5-strongly agree)
    - 2 items, α=.85
- Predicted Trust and Comfort
- Gender-Race Stigma Consciousness
Study 4 Results: Perceived similarity

![Bar chart showing perceived similarity between different groups.](chart)

- **Black woman vs. White woman**: $d=0.44, p=0.021$
- **White woman ally vs. White woman**: $d=0.26, p=0.321$
- **White woman ally vs. White woman**: $d=0.04, p=0.994$

$$F(3,339)=3.70, \ p=0.012, \ \eta_p^2=0.032$$
Study 4 Result: Perceived allyship

\[ F(3,339) = 17.29, \ p < .001, \ \eta^2 = .133 \]

- Black woman vs. White woman: \( d = .97, \ p < .001 \)
- White woman ally vs. White woman: \( d = .98, \ p < .001 \)
- White woman multicultural vs. White woman: \( d = .34, \ p = .207 \)
Study 4 Results: Trust and comfort

Black woman vs. no profile: $d = 0.42, p = 0.071$
White woman ally vs. no profile: $d = 0.50, p = 0.006$
White woman multiculturalism vs. no profile: $d = 0.31, p = 0.287$
White woman vs. no profile: $d = 0.01, p = 0.999$

$F(4,421) = 4.71, p = 0.01, \eta_p^2 = 0.043$
Study 4 results: Moderation by stigma consciousness

Trust and Comfort

p=.001

1 SD below Gender Race Stigma Consciousness

1 SD above Gender Race Stigma Consciousness

No profile
Black woman
White woman ally
White woman Multicultural
White woman
Study 4: Summary

- Website featuring a Black woman or White woman ally
  - $\uparrow$ trust and comfort at a company

- High stigma consciousness:
  - $\downarrow$ trust and comfort unless the website featured a Black woman role model

- Low stigma consciousness:
  - The White woman ally resulted in higher trust and comfort
Study 5

- How can we make the White female scientist more effective for Black woman with high stigma consciousness?

- Extended Contact Theory
  - Knowledge that ingroup members have positive contact experiences with an outgroup → reductions in prejudice towards outgroup members (Turner, Hewstone, Voci, Paolini, & Christ, 2007)

- Black woman endorsing a White woman scientist as an ally
Study 5

- 315 Black women from the general population using Amazon’s Mechanical Turk Website

Imagine how you would feel working at this company
Study 5

- **3 conditions**
  - Black woman profile
  - White woman profile
  - White woman ally + Endorsement

Although she is a woman, Dr. Evans acknowledges that the experiences of Black woman in the sciences are unique and does what she can to support my needs; she is truly an ally and an advocate for challenges Black women in the sciences face. She recognizes that Black women are underrepresented in the sciences, and actively works to support and recruit women of color (like me!) so we too can contribute to the sciences!
Study 5 Results: Perceived similarity

Black woman vs. white woman: $d=0.48$, $p=0.001$

White woman ally + Endorsement vs. white woman: $d=0.39$, $p=0.016$

$F(2,306)=8.59$, $p<0.001$, $\eta_p^2=0.053$
Study 5 Results: Perceived Allyship

Black woman vs. white woman: $d=0.87$, $p<.001$
White woman ally + Endorsement vs. white woman: $d=1.04$, $p<.001$

$F(2,306)=38.14$, $p<.001$, $\eta_p^2=.20$
Study 5 Results: Trust and comfort

Black woman vs. white woman: $d=.08, p=.816$

White woman ally + Endorsement vs. white woman: $d=.40, p=.015$

$F(2,302)=4.46, p=.012, \eta_p^2=.029$
Study 5 Results: Moderation by stigma consciousness

Trust and Comfort

1 SD below Gender Race Stigma Consciousness 1 SD above Gender Race Stigma Consciousness

White woman
Black woman
White woman endorsed ally

p < .001
p = .017
Study 5: Summary

- Website featuring a White woman ally endorsed by a Black woman
  - ↑ trust and comfort at a company
  - Even for participants *high in stigma consciousness*

- Do these effects generalize to other underrepresented identities?
Study 6

- 335 White women from the general population using Amazon’s Mechanical Turk Website

Imagine how you would feel working at this company
Study 6

- 4 conditions
- White man profile
- White woman profile
- White man ally + Black female Endorsement profile
- White man ally + White female Endorsement profile
Study 6 Results: Perceived similarity

<table>
<thead>
<tr>
<th>Similarity</th>
<th>White man</th>
<th>White woman</th>
<th>White man ally + WW Endorse</th>
<th>White man ally + BW Endorse</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.5</td>
<td>2.7</td>
<td>2.9</td>
<td>3.1</td>
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<td></td>
<td>3.3</td>
<td>3.5</td>
<td>3.7</td>
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<td></td>
<td>3.7</td>
<td>3.9</td>
<td>4.1</td>
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</table>

White woman vs. White man: $d=.28$, $p=.33$

White man ally + WW Endorsement vs. White man: $d=.51$, $p=.007$

White man ally + BW Endorsement vs. White man: $d=.52$, $p=.006$

$F(3,331)=5.24$, $p=.002$, $\eta_p^2=.045$
Study 6 Results: Perceived allyship

F(3,331) = 29.56, p < .001, $\eta_p^2 = .211$

White man vs. White man: $d = .69$, $p < .001$

White man ally + WW Endorsement vs. White man: $d = 1.21$, $p < .001$

White man ally + BW Endorsement vs. White man: $d = 1.23$, $p < .001$
Study 6 Results: Trust and Comfort

![Bar chart showing trust and comfort scores for different groups.]

- **White woman vs. White man:** $d = 0.39$, $p = 0.093$
- **White man ally + WW Endorsement vs. White man:** $d = 0.49$, $p = 0.013$
- **White man ally + BW Endorsement vs. White man:** $d = 0.66$, $p < 0.001$

$F(3, 331) = 6.83$, $p < 0.001$, $\eta^2_p = 0.059$
Study 6 Results: Moderation by stigma consciousness

Trust and Comfort

1 SD below Gender Stigma Consciousness  | 1 SD above Gender Stigma Consciousness

White man

White woman

White man ally + WW Endorsed

White man ally + BW Endorsed

p<.001
Study 6: Summary

- Website featuring a White male ally endorsed by a Black or White woman
  - ↑ trust and comfort at a company
  - Even for participants high in stigma consciousness
Taken together

- An ally who explicitly expressed allyship
  - Helpful for women with low or average levels of stigma consciousness

- Ally who expresses allyship and was endorsed by a woman (i.e., a member of the stigmatized group)
  - Helpful for all women regardless of stigma consciousness level
Next Steps

- Allyship Training Intervention
- Study 1
  - Mixed-methods approach to identify how students of underrepresented groups perceive individuals belonging to majority groups can best support and serve as effective allies
- Study 2
  - Experimentally manipulate allyship → Belonging, perceived allyship, & interest in future interactions
Next Steps: Allyship Training Intervention

- Study 3
  - Allyship Training Intervention
  - Anti-Bias Training
  - Waitlist Control
    - Faculty \(\rightarrow\) Attitudes towards underrepresented students, behavioral intentions & self-efficacy
    - Underrepresented Groups \(\rightarrow\) Belonging
Thanks!

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