Using Persuasion to Promote a More Hospitable STEM Work Climate
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NSF ADVANCE LEADER Consortium (AFIT, CSU, UD, WSU) - Objectives:
Conduct a comparative analysis of the STEM climate
Conduct assessments of unconscious bias workshops
Conduct persuasion research to promote new norms of expectation

Abstract
The biobehavioral model of persuasion was used to investigate attitudes toward STEM women faculty. STEM undergraduates received a challenge, threat, or standard message. Messages interacted with recipient sex to influence attitudes. Behavior was encouraged in a practical way (although ns) by different messages. Different messages can help to warm the STEM workplace climate.

Introduction
Women are underrepresented in science, technology, engineering and mathematics (STEM). This is evidenced in academic training, hiring, advancement, and retention. This research investigated message effects on attitudes and behavior toward women STEM faculty.

The biobehavioral model of persuasion (Schneider et al., 2009) posits that challenging messages – those evoking some personal concern and high efficacy, will be more persuasive than threatening messages – those evoking greater personal concern and less efficacy. Challenging messages should evoke more message processing, physiological approach tendencies, favorable attitudes, and engage behaviors, relative to threatening or standard (NAS, 2007) messages.

Method
120 STEM undergraduates assigned randomly to one message (sample statements below):

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Threat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concern: Women make up only 1/5 of the nation’s scientific and technical workforce.</td>
<td>Concern: Women make up about 1/3 of the nation’s scientific workforce.</td>
</tr>
<tr>
<td>Efficacy: Academic leaders should confront biases and support local senior faculty, male and female, who advocate for fair treatment.</td>
<td>Efficacy: Academic leaders must confront faculty and others who are abrasive to students, staff, and faculty.</td>
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</tbody>
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Procedure
- Baseline measures, message exposure, manipulation checks, attitudes, behavior
- Design = 2 (Sex: f, m) x 3 (Message: Challenge, NAS, Threat)

Results
Experimenter effect – pts interacting with 1 RA had less interest in messages (n = 14), pts endorsing extreme discrimination risk (n = 5) were also excluded. N = 102, 57% women.

Baseline differences (covariates):
- Trait anxiety (women > men), state anxiety (NAS > challenge and threat), and risk of gender discrimination (women > men; challenge > NAS and threat; women given challenge > men given NAS)

Manipulation checks
Concern ~ 2-item agreement that message raised concern about STEM gender discrimination (r = .73).
- Sex x Message interaction - marginal, F(2,88) = 2.33, p = .10.

Post-attitudes exploratory simple effects: challenged men have stronger attitudes than women (baseline, ns), threatened women have stronger attitudes than men (baseline, ns), NAS, ns (baseline, men < women).

Discussion
Compared to women, men exposed to a challenge message thought gender discrimination in STEM is more serious, and were more persuaded that gender equality is critical for US success. Threat messages convinced women in this regard. Challenging messages appeared to be better at getting promises of time from students, but should be further examined. Notably, the NAS message did not stand out to change attitudes or facilitate behavior. Given limited resources, challenging messages appear the best for facilitating attitude change (particularly for men) and tempting behaviors.

Hypothesis testing
Post-message attitudes:
Seriousness of gender discrimination in STEM (5 items, α = .77).
- Sex x Message interaction, F(2,93) = 3.51, p < .05

Men given a challenge message thought the issue of gender discrimination in STEM was more serious than their female counterparts.

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<tr>
<th>Challenge</th>
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<th>Threat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women</td>
<td>3.66 (.74)</td>
<td>4.19 (.67)</td>
</tr>
<tr>
<td>Men</td>
<td>4.20 (.54)</td>
<td>3.80 (.69)</td>
</tr>
</tbody>
</table>

Behavior:
ns, practical significance - donating time appears highest in challenge (> 1 hr), less in NAS (< 1 hr), least in threat (< ½ hr).

References