Professional Culture and Inequality in STEM
Acknowledgements

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Outline

- Statistics & starting assumptions
- What are professional cultures?
- 3 ideologies...
  - Schemas of scientific excellence
  - Depoliticization
  - Meritocratic ideology
- Where do we go from here?
Inequality in STEM?

- Women, racial/ethnic minorities, and LGBT individuals are under-represented in science and engineering-related fields.
Gender Diversity in STEM

Percent Women Among People with BS Degrees, PhDs and Postdocs in Science and Technology Fields (U.S.)

(Cech, Pecenco & Blair-Loy 2013)
Gender Diversity in STEM

**Industry:**
- Women are 21% of STEM industry professionals but 15% of STEM managers
- 6% of engineering managers

**Academia:**
- Women are 36% of adjuncts, 28% of tenure-track, 16% of full professors
- 9% of engineering faculty

*(Cech, Pecenco & Blair-Loy 2013)*
Racial/Ethnic Diversity in STEM

Percent Minority Groups among U.S. S&E Bachelor’s and PhD Earners in 2008, and those employed in S&E Jobs in 2006\(^1\) (Excluding SocSci and Psych)

<table>
<thead>
<tr>
<th></th>
<th>% white</th>
<th>% African-American</th>
<th>% Hispanic</th>
<th>% Asian</th>
<th>% Native American</th>
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<tbody>
<tr>
<td>BS</td>
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<td>PhD</td>
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<td>Employed</td>
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\(^1\)Cech, Pecenco & Blair-Loy 2013
### Inequality by LGBTQ Status

#### Nationally Representative Data of U.S. STEM Professionals

<table>
<thead>
<tr>
<th>Category</th>
<th>LGBTQ</th>
<th>Non-LGBTQ</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same Standard</td>
<td>3.67</td>
<td>3.89</td>
<td>***</td>
</tr>
<tr>
<td>Colleagues think less productive</td>
<td>2.30</td>
<td>2.19</td>
<td>*</td>
</tr>
<tr>
<td>Work Harder</td>
<td>2.66</td>
<td>2.53</td>
<td>**</td>
</tr>
<tr>
<td>Equally Skilled</td>
<td>4.22</td>
<td>4.32</td>
<td>**</td>
</tr>
<tr>
<td>Talents Used</td>
<td>3.95</td>
<td>4.05</td>
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**LGBTQ persons LESS likely** say they are held to the same standard as others for promotion or advancement.

**LGBTQ persons MORE likely** say colleagues think they are less productive than they actually are.

**LGBTQ persons MORE likely** to have to work harder than colleagues to be seen as legitimate professional.

**LGBTQ persons LESS likely** have colleagues perceive them as equally skilled professional.

**LGBTQ persons LESS likely** to say their talents are used well in the workplace.

*(Cech and Pham 2017)*
A Starting Place

- No longer primarily a “bad apples” problem
- Subtle beliefs and practices matter
- Won’t necessarily improve with time
- Small disadvantages accumulate over time
A Starting Place

No longer primarily a “bad apples” problem
Subtle beliefs and practices matter
Won’t necessarily improve with time
Small disadvantages accumulate over time
Professional cultures can help reproduce inequalities

3 specific cultural ideologies:
- Schemas of scientific excellence
- Depoliticization
- Meritocracy

How to undermine these ideologies
What are Professional Cultures?

- Professional cultures = rich and historically-rooted **meaning systems** built into and around professions’ tasks and knowledge.
  - Give professional work meaning
  - Unite profession members

- Biases can be built into these cultures.

Professional Cultures of STEM

Schemas of Scientific Excellence
Depoliticization
Meritocratic Ideology
Schemas of Scientific Excellence

- Characteristics & skills assumed to be markers of professional competence
  - Cultural yardsticks for measuring “excellence”
  - Influence hiring, promotion, and funding decisions
  - Not necessarily the characteristics actually required for success
  - Can be gendered, racialized, and heteronormative

Schemas of Scientific Excellence

- E.g., the *Technical/Social Dualism*
  - The ideological separation between “technically-focused” and “socially-focused” activities (Faulkner 2000)
  - “Technical” is more highly-valued than the “social”
Social stereotypes mapped on to this dualism:

- Women versus men

**Source: (Cech 2013, Social Forces)**
Also shape what research areas are considered most “prestigious” and “valuable:”

- I had a course that I hated because it was just so damn binary, it was all male/female...not about all the other genders... all the fish that have three or four gender mating systems. Nothing about same sex pairings; we’re so invisible that it hurts... [Bias] is not just about people making homophobic jokes in the classroom, but...how badly biased are [choices of research and teaching focus].
  
  (Cech & Waidzunas, ongoing research)
Reflection Question: How is excellence judged in your organization or workplace? How might social stereotypes get folded into these definitions of excellence?
Depoliticization

comic: http://xkcd.com/435/
Depoliticization: the belief that STEM is a “pure” space that *can* and *should* be stripped of political and cultural concerns.

- But what to **study**, how to **define problems**, what to **fund** are *cultural & political* decisions

-Cech 2013, 2013b; Cech & Sherick 2015; Knorr-Cetina 1999; Latour & Woolgar 1986
Depoliticization

- Depoliticization can *shut down* conversations about diversity and equality within STEM

- Affects Students:

(Cech 2014)
Depoliticization reinforces existing power structures within STEM:

In my department, [the issue of sexual identity] is sort of invisible. I think most of them are straight dudes who don’t really think about the existence of people who are not like them. I think they have so much privilege that they can’t understand what it’s like for people who don’t have that privilege.

(--taken from Cech and Waidzuans 2011, p. 11).
Reflection Question: How might depoliticization silence conversations about diversity and inequality in your organization or workplace?
The belief that success is the result of individual talent, training, and motivation

Frames inequalities in engineering as the fault of women and minorities, not the social system.
% of STEM Faculty who Report No Observed Instances of Discrimination in Last 3 years

STEM Faculty Reports of Chilly Departmental Climates

(Cech, Blair-Loy & Rogers 2018)
Reflection Question: Who in your organization or workplace still needs to be convinced that unequal processes actually exist in STEM?
These 3 ideologies are part of the professional cultures of STEM

- Difficult to see, hard to *change*

Professional cultures can reproduce inequalities within STEM

- Do we contribute to these cultural processes?
What can be done?

- Not about “fixing” women or minorities to be more like white men

- **Schemas of Scientific Excellence:** Be wary of discussions about “fit”

- **Depoliticization:** Legitimize topics of diversity and equality

- **Meritocratic Ideology:** First step—explain that there *is* a problem
Reflection Question: How is excellence judged in your organization or workplace? How might social stereotypes get folded into these definitions of excellence?

Reflection Question: How might depoliticization silence conversations about diversity and inequality in your organization or workplace?

Reflection Question: Who in your organization or workplace still needs to be convinced that unequal processes actually exist in STEM?