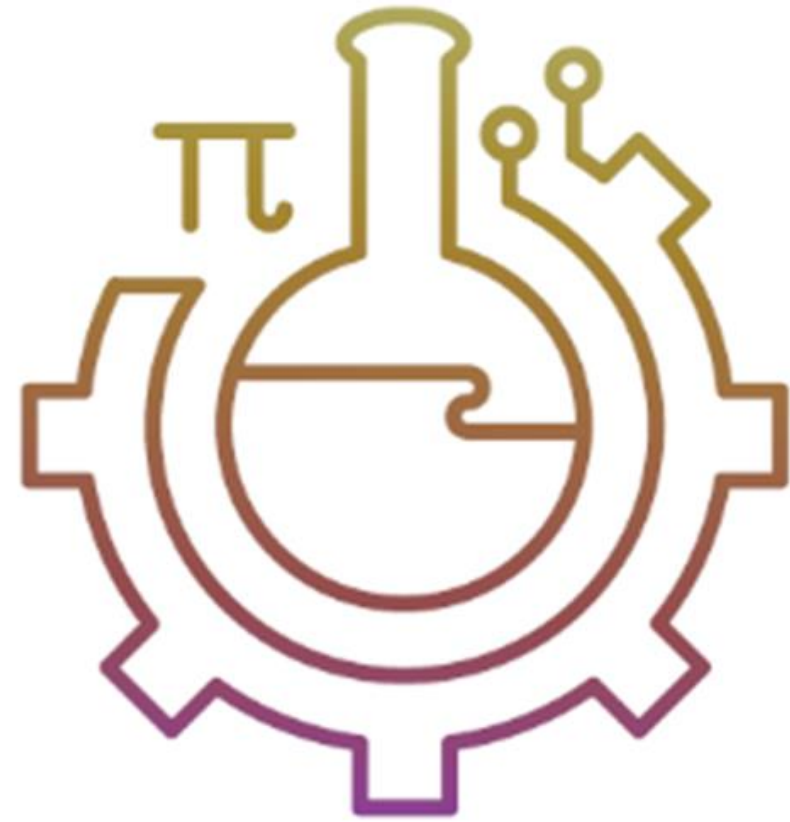# Professional Culture and Inequality in STEM

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STEM
Inclusion Study

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Acknowledgements

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.)
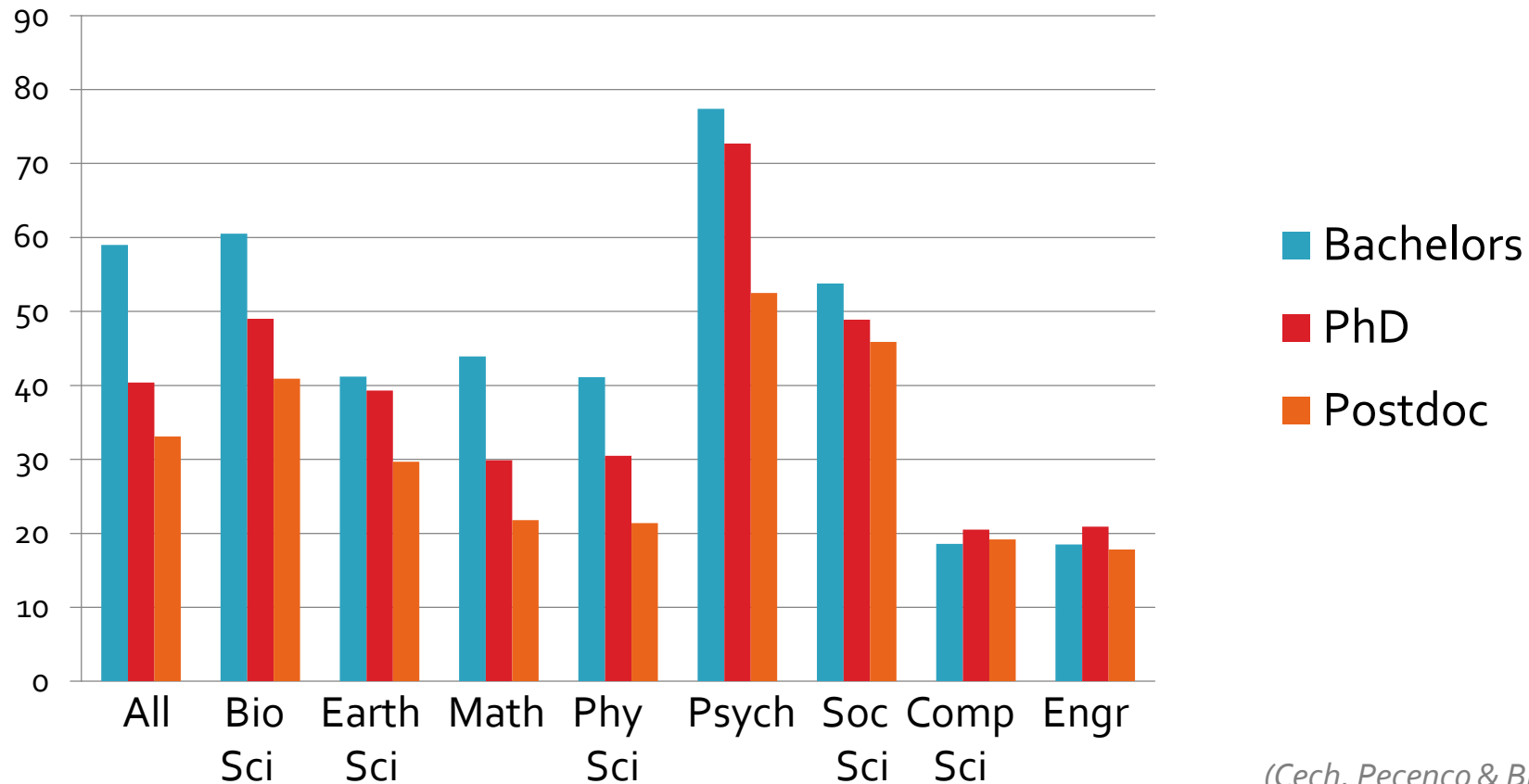
(Cech, Pecenco & Blair-Loy 2013)

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)
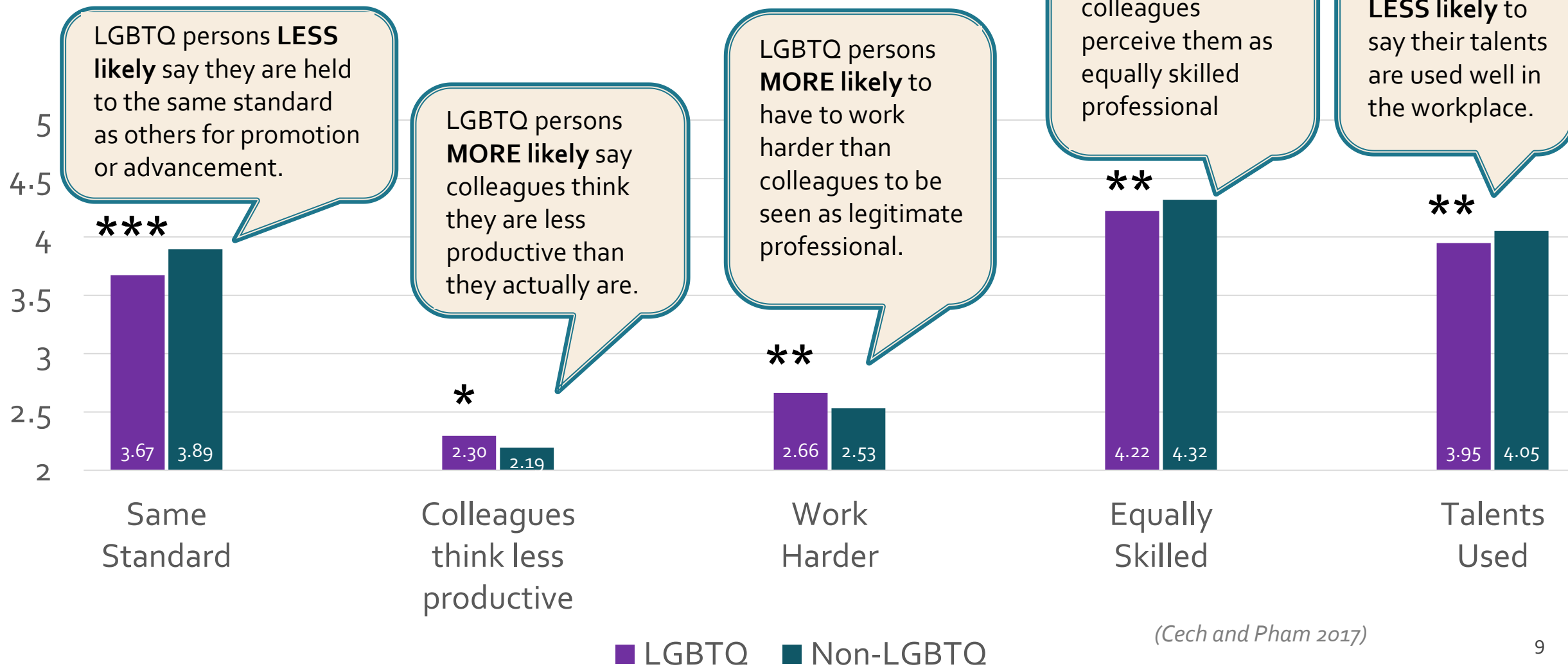

Legend:
- % white
- % African-American
- % Hispanic
- % Asian
- % Native American
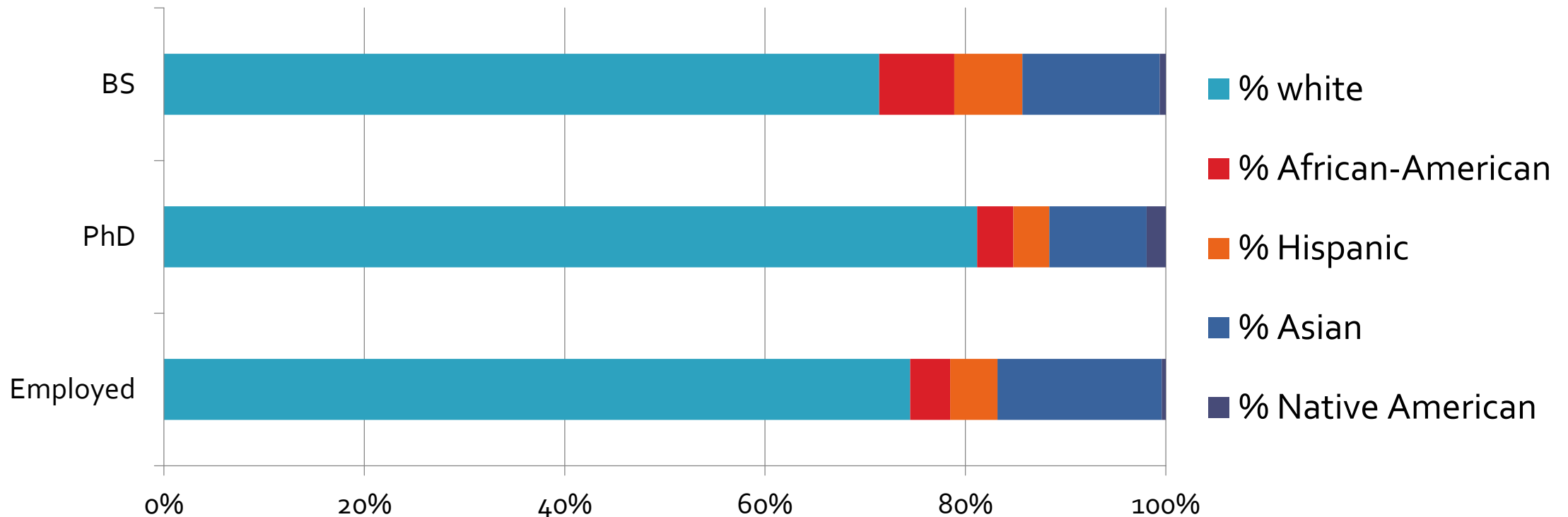
(Cech, Pecenco & Blair-Loy 2013)

Inequality by LGBTQ Status

Nationally Representative Data of U.S. STEM Professionals

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.

Same Standard: *** — LGBTQ 3.67, Non-LGBTQ 3.89
Colleagues think less productive: * — LGBTQ 2.30, Non-LGBTQ 2.19
Work Harder: ** — LGBTQ 2.66, Non-LGBTQ 2.53
Equally Skilled: ** — LGBTQ 4.22, Non-LGBTQ 4.32
Talents Used: ** — LGBTQ 3.95, Non-LGBTQ 4.05

■ LGBTQ ■ Non-LGBTQ
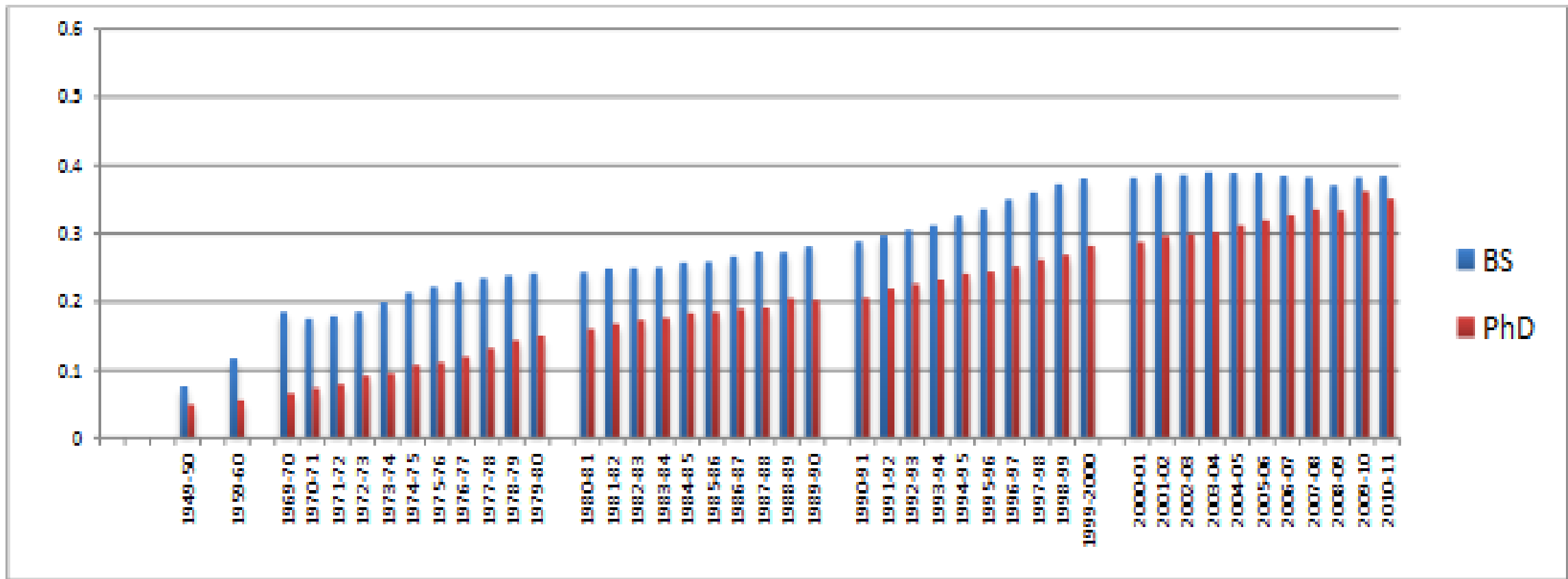
(Cech and Pham 2017)

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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

Figure 3: Representation of Women among S&E Bachelor's and PhD Earners, 1949-2011 (Excluding SocSci and Psych)

- Source: Erin Cech , Laura Pecenco, and Mary Blair - Loy. 2013 . " Science and Technology Professions : The Status of Women and Men ." Center for Research on Gender in the Professions, UC San Diego . http://crgp.ucsd.edu .

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

Culture Matters

- 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.

- Abbott 1988, Bourdieu 1984, Cech 2013, Grusky 2005, Weeden & Grusky 2005

Three Specific Ideologies

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*

-Cech & Blair-Loy in progress, Cech 2013, Cech & Waidzunas 2011

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

Predicted Wages of U.S. Engineers
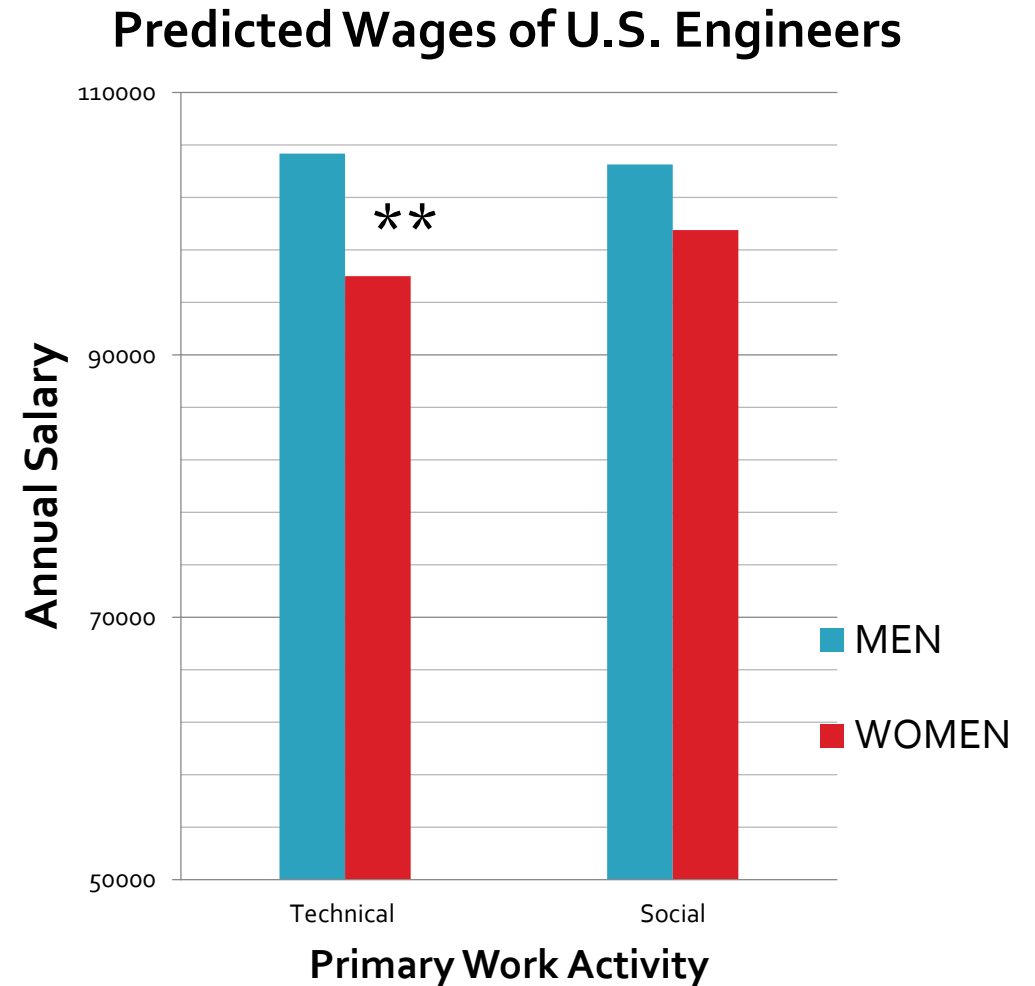
Source: (Cech 2013, *Social Forces*)

Schemas of Scientific Excellence

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)

Schemas of Scientific Excellence

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/
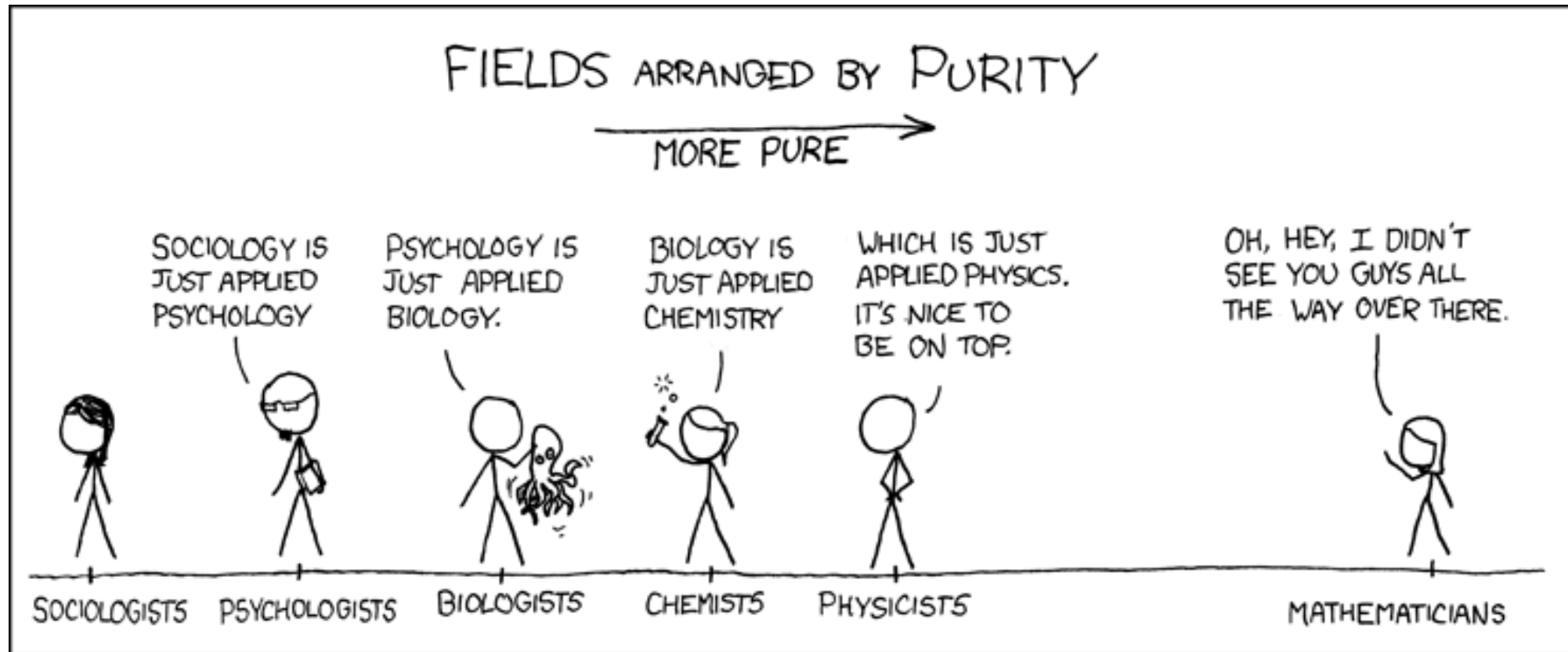
Depoliticization

- 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)

Figure 3: Public Welfare Measures in Time 1, Time 2, and Post-Graduation Work (Time 3), among Engineering Students who Enter Engineering Jobs
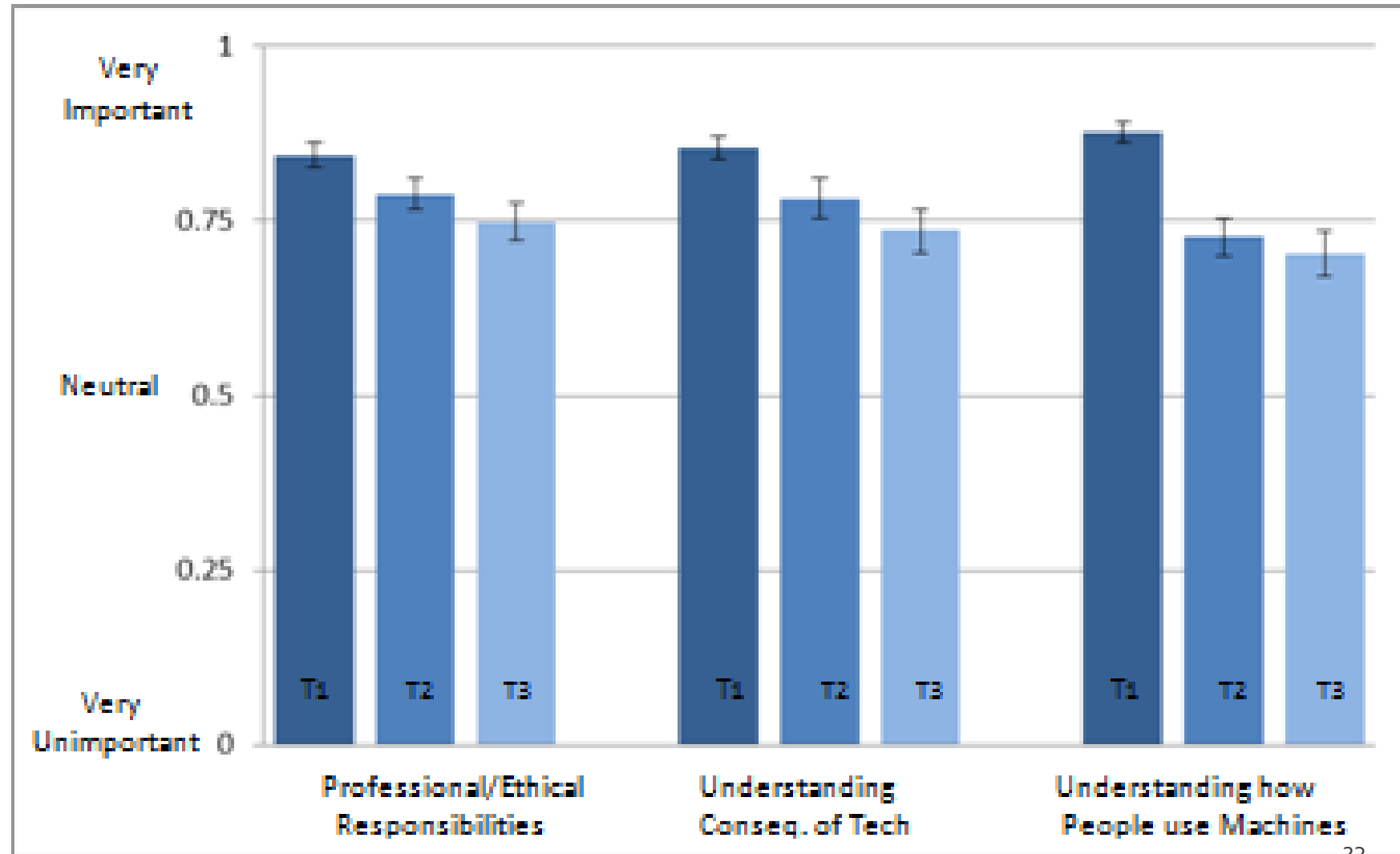
Depoliticization

- ## 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).

Depoliticization

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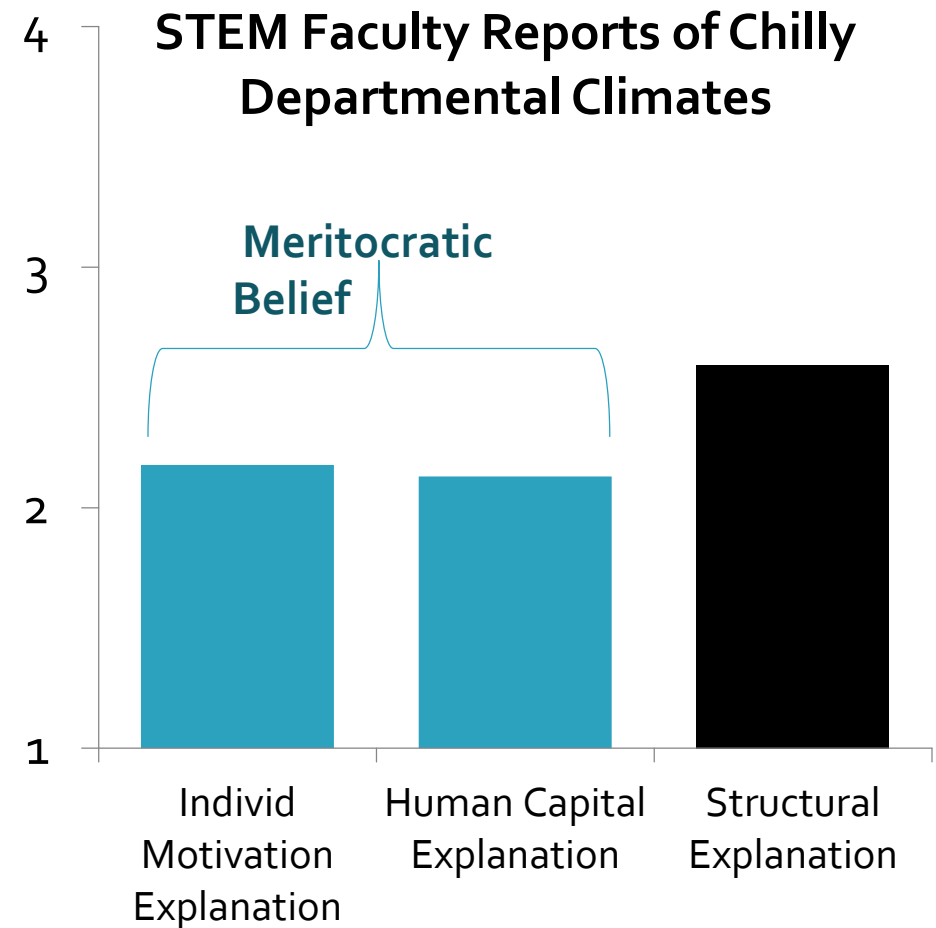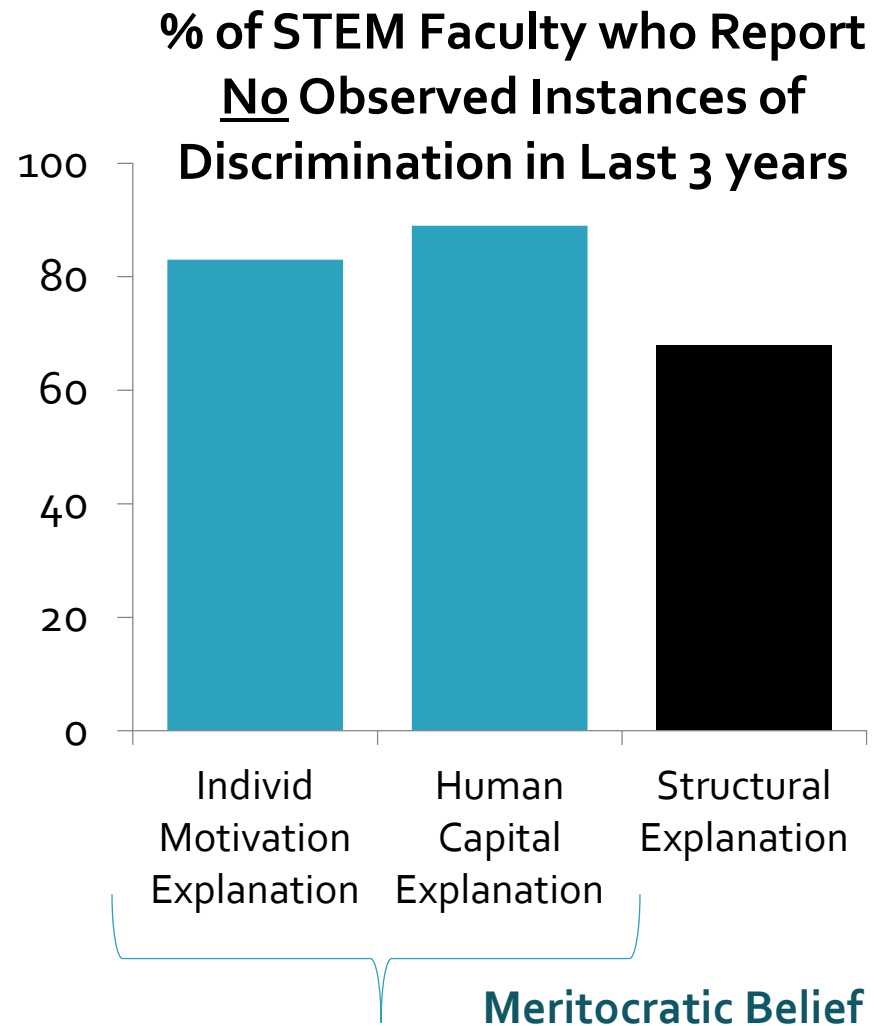
Meritocratic Ideology

- 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.

Cech & Blair-Loy 2010, Cech, Blair-Loy and Rogers in progress, Klugel and Smith 1989, McCall 2012

Meritocratic Ideology

% of STEM Faculty who Report <u>No</u> Observed Instances of Discrimination in Last 3 years

Individ Motivation Explanation | Human Capital Explanation | Structural Explanation

Meritocratic Belief

STEM Faculty Reports of Chilly Departmental Climates

Meritocratic Belief

Individ Motivation Explanation | Human Capital Explanation | Structural Explanation

(Cech, Blair-Loy & Rogers 2018)

Meritocratic Ideology

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?