

Systemic Disadvantages for LGBTQ Professionals in STEM



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** For thousands of years, the land on which the University of Michigan is based it has been the traditional land of the Chippewa, Ottawa, and the Potawatomi peoples. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.*

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Acknowledgements

“Collaborative Research: A Study of Interactional, Organizational and Professional Mechanisms of Disadvantage in the Underrepresented and Marginalized STEM Workforce.”

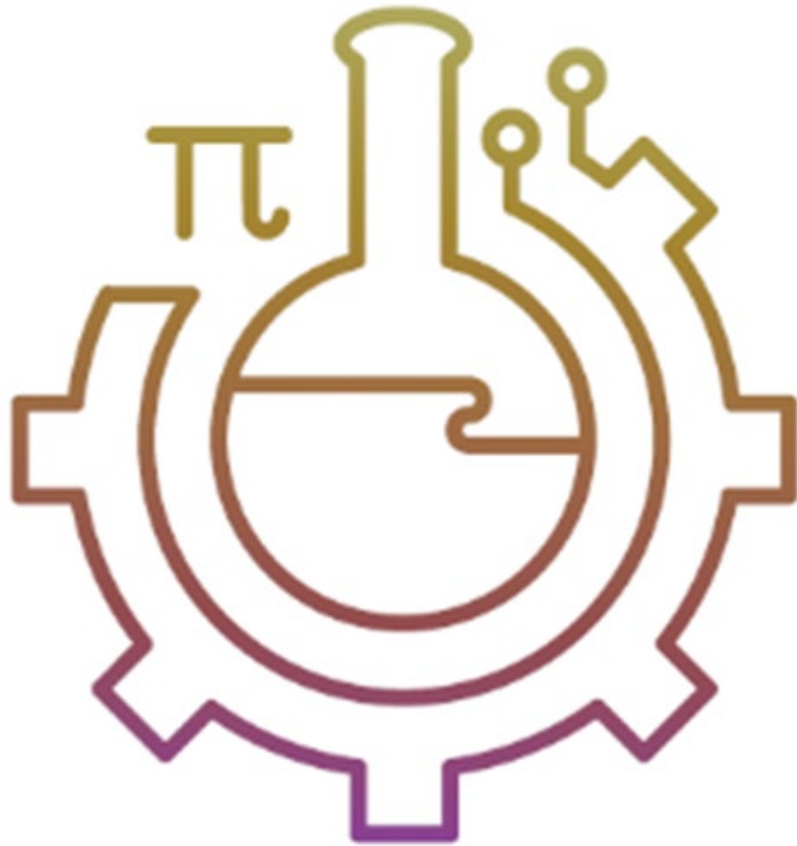
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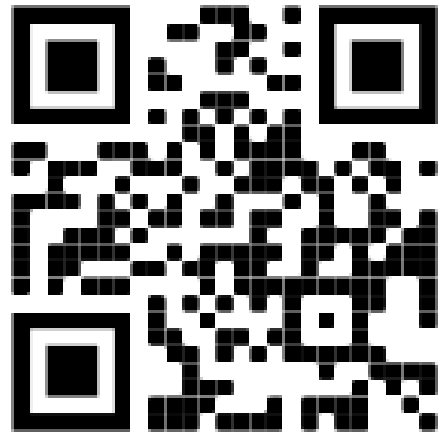
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Outline

- Introduction
- STEM Inclusion Study: Systemic Disadvantages for LGBTQ STEM Professionals
- What drives these patterns?
- Implications for workplaces and professional societies



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SCIENTIFIC COMMUNITY

Systemic inequalities for LGBTQ professionals in STEM

E. A. Cech^{1*} and T. J. Waldzunas²

Researchers have documented race and gender inequality in science, technology, engineering, and math (STEM) for decades. Do lesbian, gay, bisexual, transgender, and queer (LGBTQ) professionals face parallel experiences of disadvantage in STEM? Using representative survey data from 21 STEM professional societies ($N_{\text{sample}} = 25,324$; $N_{\text{LGBTQ}} = 1006$), this paper presents multidimensional and methodologically robust documentation of 5 dimensions of LGBTQ inequality in STEM. Controlling for variation by demographic, discipline, and job factors, LGBTQ STEM professionals were more likely to experience career limitations, harassment, and professional devaluation than their non-LGBTQ peers. They also reported more frequent health difficulties and were more likely to intend to leave STEM. These trends were similar across STEM disciplines and employment sectors. We found no differences by LGBTQ status in education level, work effort, or job commitment. These findings reveal LGBTQ status as a clear axis of inequality in STEM and motivate further research into the mechanisms producing such outcomes.

INTRODUCTION

The diversification of science, technology, engineering, and math (STEM) fields has lagged behind that of other previously white male-dominated professions in postindustrial societies like the United States (1, 2). The underrepresentation and mistreatment of historically marginalized and minoritized populations in STEM not only are problematic for basic equity concerns of access and opportunity (1–3) but also are harmful to STEM innovation: More diverse groups of problem solvers offer more creative, productive, and fact-based scientific and technical innovations than more homogeneous teams (4, 5).

While emerging workforce-wide research has demonstrated the existence of disadvantages for LGBTQ persons in the labor force generally, it cannot directly speak to whether and how LGBTQ inequality manifests within specific professional contexts. Professions, including STEM fields, have their own shared and semiautonomous cultural norms of interaction and ways of defining professional competence (27, 28). STEM fields are highly specialized professional arenas that demand lengthy training and work devotion (10). STEM fields strive for objective evaluation of merit and excellence, where a professional's credibility and contributions to scientific and technological advancement are presumed to be rooted in their STEM

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LGBTQ Equality has Advanced Unevenly

- Despite recent advancements in LGBTQ equality, still persistent formal and informal discrimination for LGBTQ employees

11% report being denied promotion

39% report LGBTQ-based harassment at work

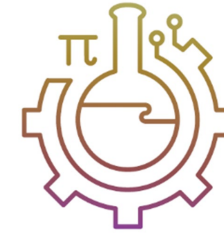
46% of transgender individuals report difficulty getting/keeping jobs



Research Questions

1. Are LGBTQ STEM professionals **equally qualified for and dedicated to** their STEM work, net of controls?
2. Do LGBTQ STEM professionals **fewer opportunities and resources** to do their work than non-LGBTQ professionals?
3. Are the professional contributions of LGBTQ STEM professionals more likely to be **discredited and devalued** in their workplaces?
4. Do LGBTQ STEM professionals have higher **turnover intentions** than their non-LGBTQ colleagues?
5. Do LGBTQ STEM professionals report more negative **health and wellness** measures than their non-LGBTQ peers?

STEM Inclusion Study Data



25,324 full-time STEM professionals (1,006 LGBTQ-identifying)

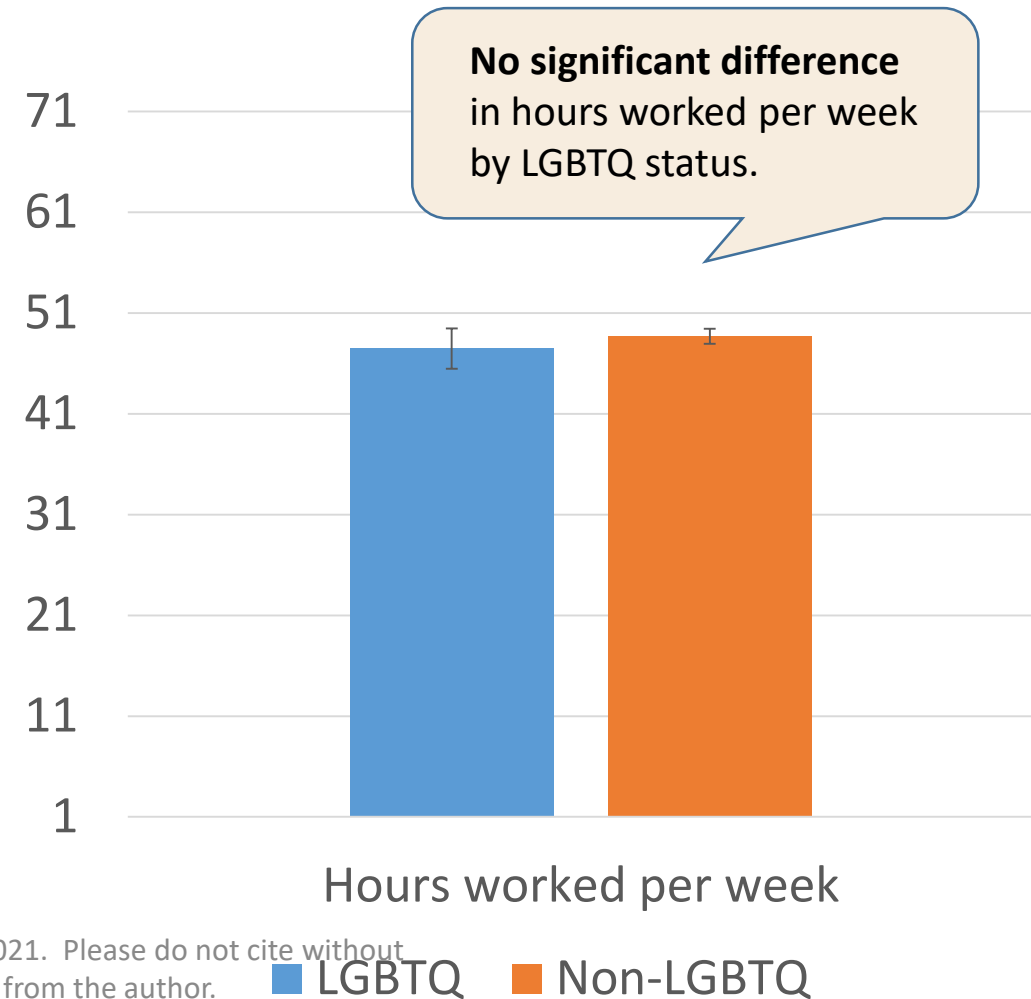
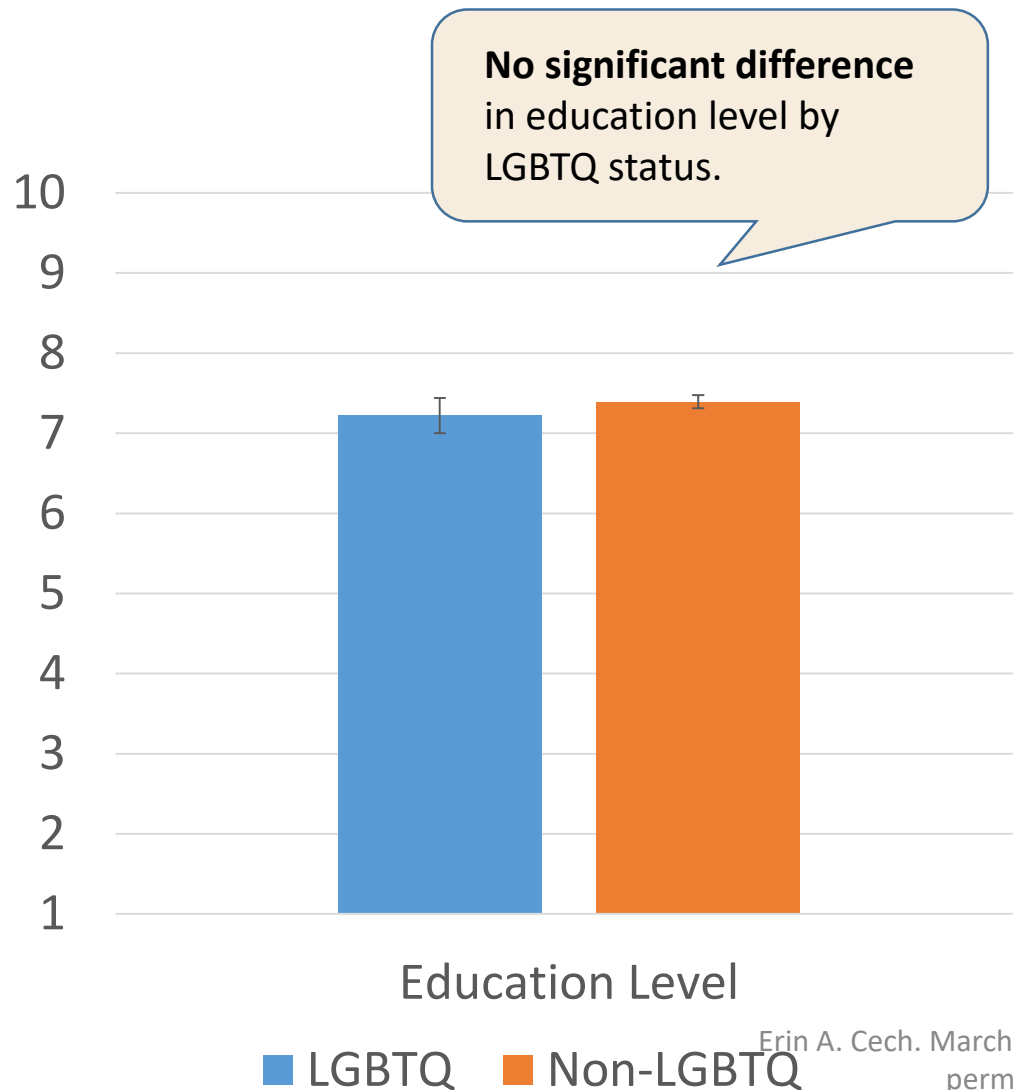
- Confidential, representative surveys of 21 STEM professional societies and organizations
 - 8 US national flagship societies in natural and physical sciences and math
 - 5 US national flagship societies in engineering
 - 2 teaching-focused societies in STEM
 - 4 interdisciplinary STEM societies
 - 2 demographic-focused societies
- Procedure
 - Survey link distributed via email to **full** or **random sample** of organization members
 - Endorsed by organization leadership

Analytic Approach

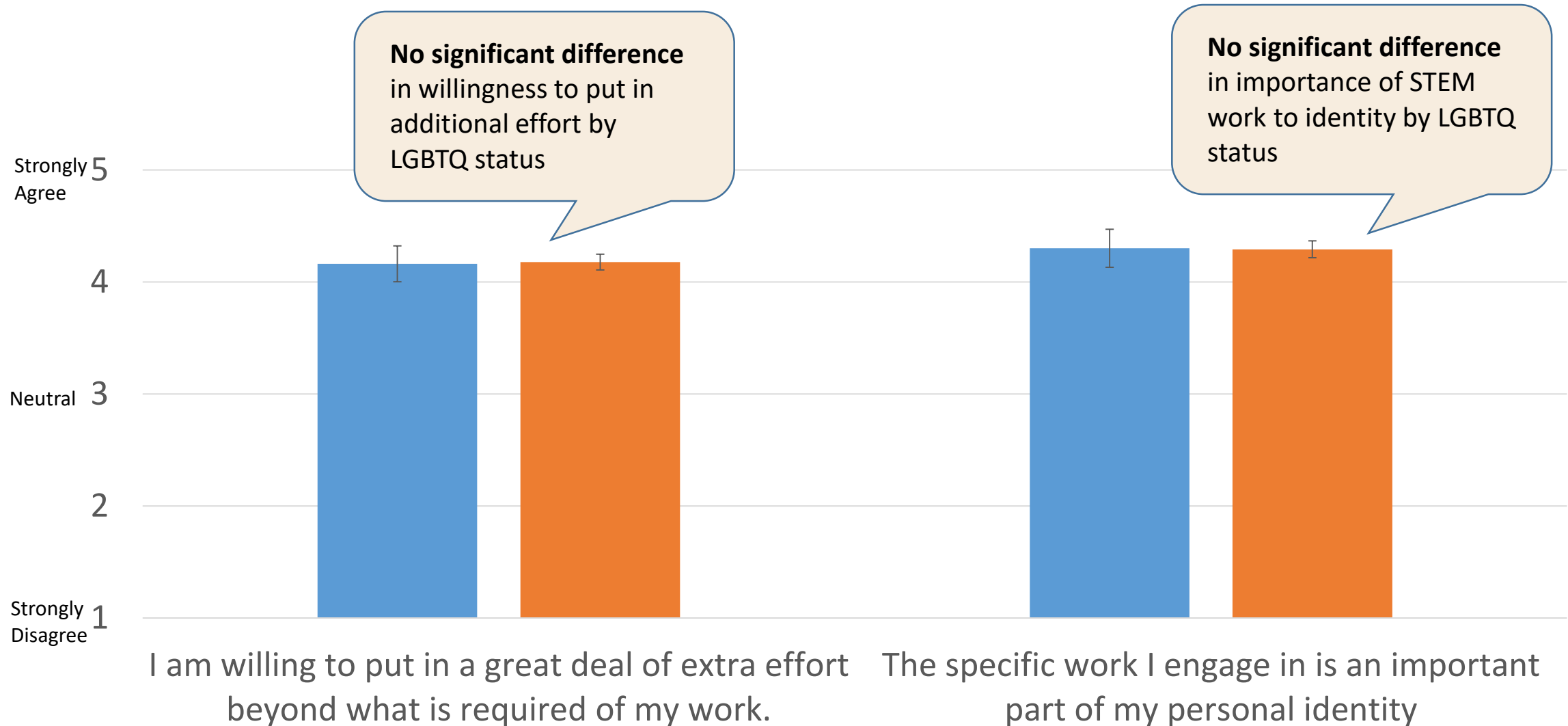
- Graphs present *predicted values* = means for each group controlling for variation by:
 - Gender
 - Race/ethnicity
 - Age
 - Education level
 - Employment sector
 - STEM professional society
- *Significance levels* produced by OLS regression models
 - Two-tailed test: *** $p < .001$; ** $p < .01$; * $p < .05$; + $p < .10$
 - Indicate *significant difference* between LGBTQ and non-LGBTQ respondents, net of controls

Results

Q1: Are LGBTQ STEM professionals as **qualified** and **dedicated** as non-LGBTQ professionals?



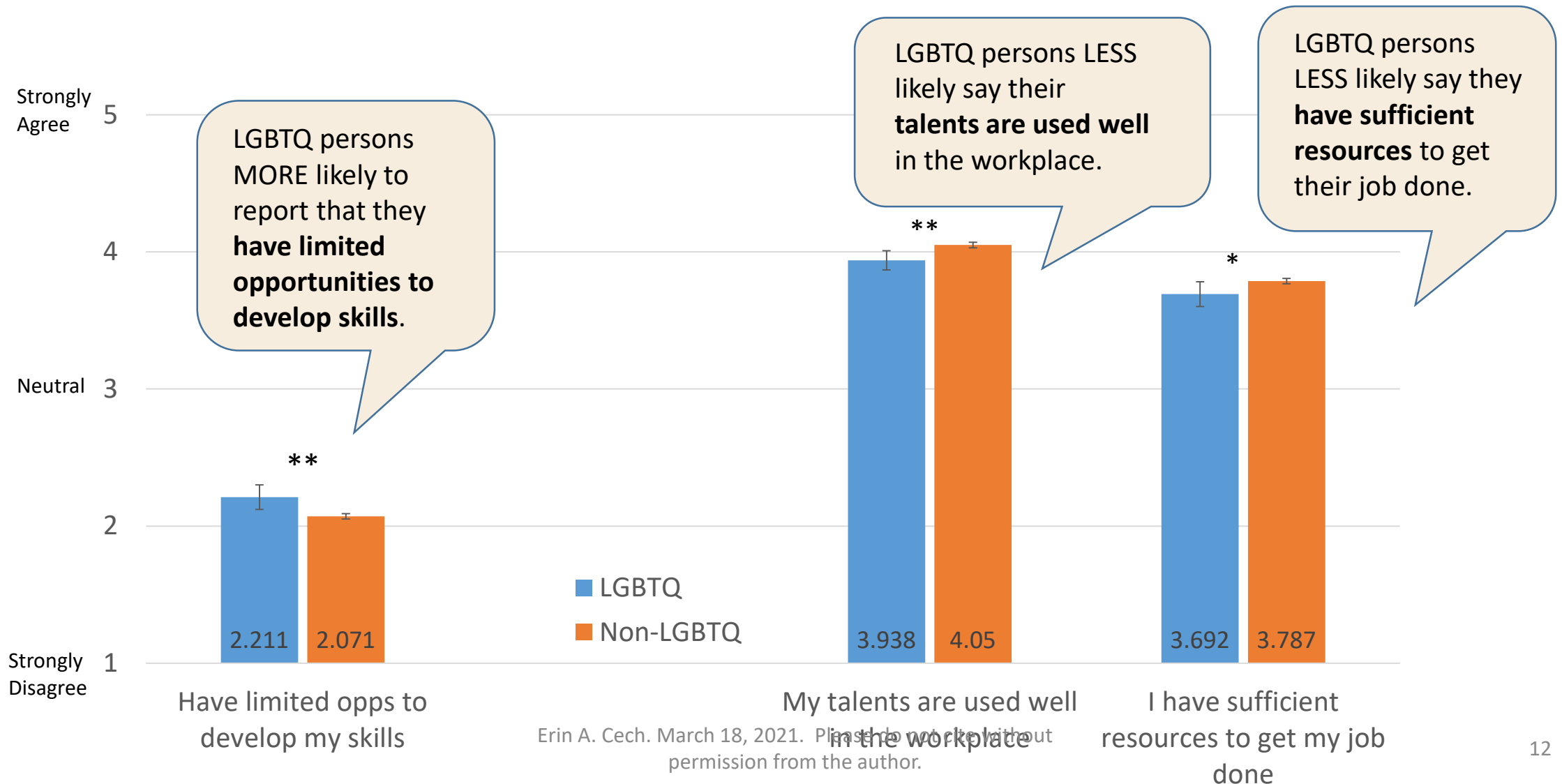
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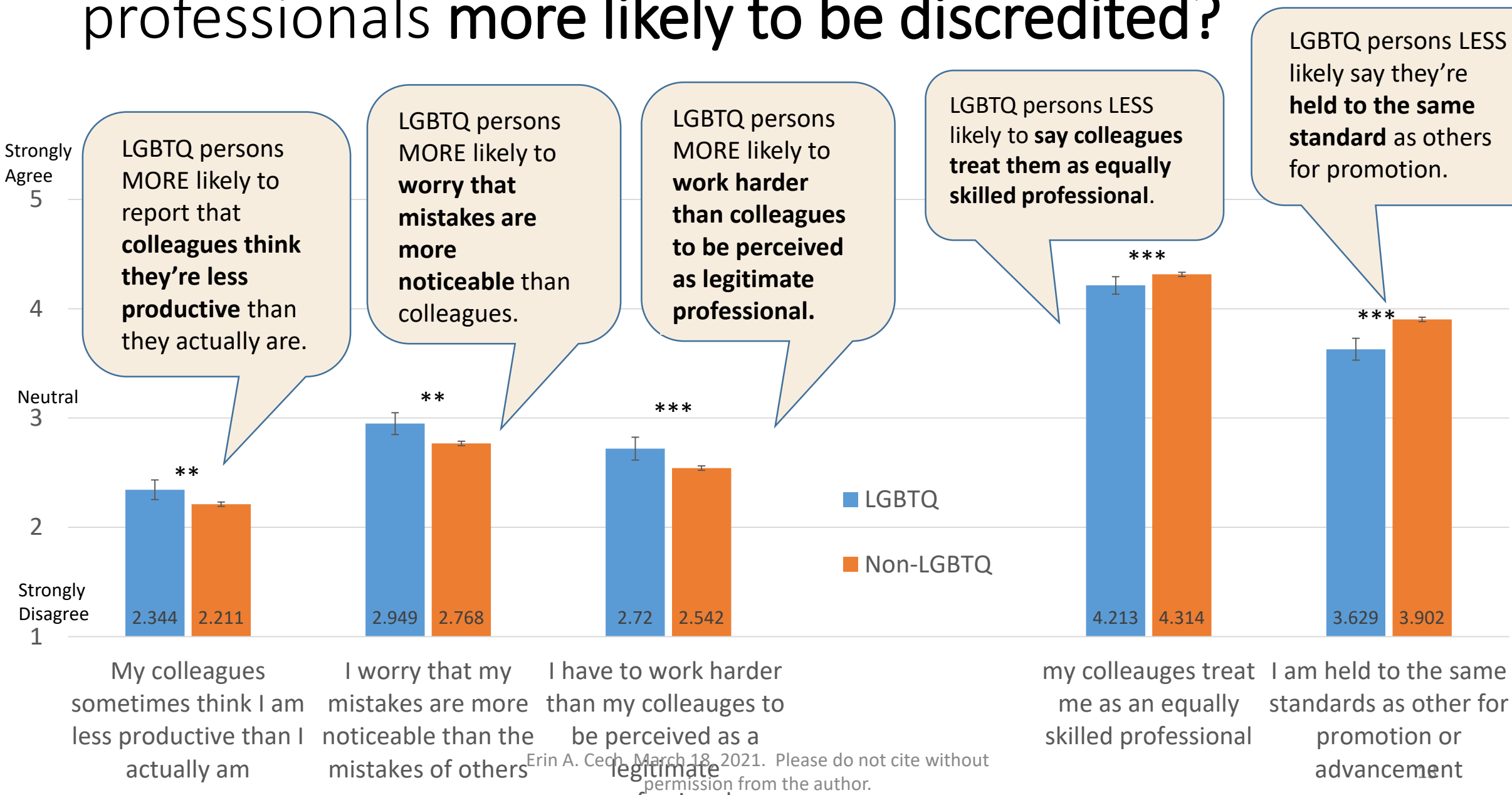
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■ LGBTQ ■ Non-LGBTQ

Q2: Do LGBTQ STEM workers report **fewer** professional opportunities & resources?



Q3: Are the professional contributions of LGBTQ professionals more likely to be discredited?



LGBTQ persons LESS likely say they're **held to the same standard** as others for promotion.

LGBTQ persons LESS likely to **say colleagues treat them as equally skilled professional.**

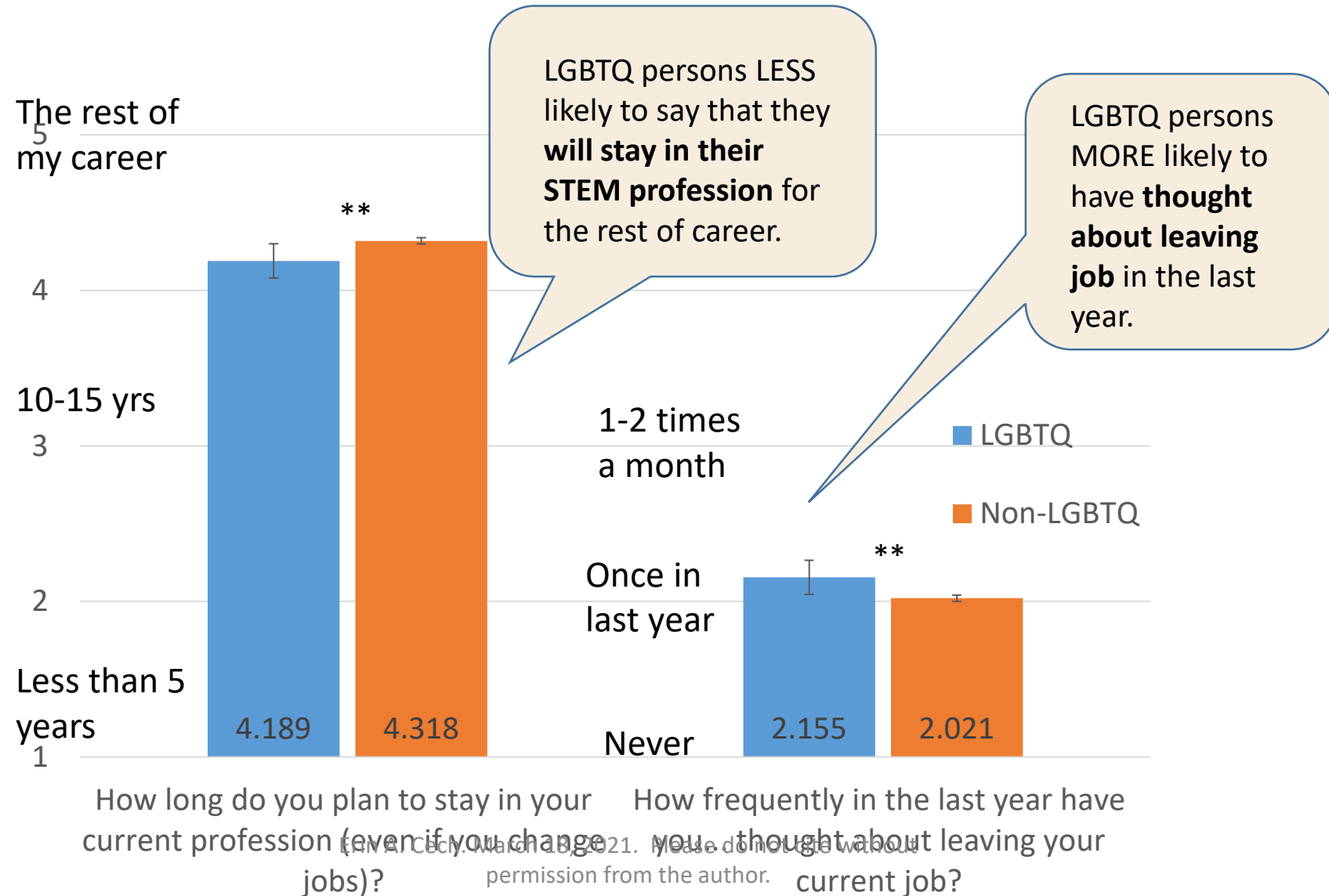
LGBTQ persons MORE likely to **work harder than colleagues to be perceived as legitimate professional.**

LGBTQ persons MORE likely to **worry that mistakes are more noticeable** than colleagues.

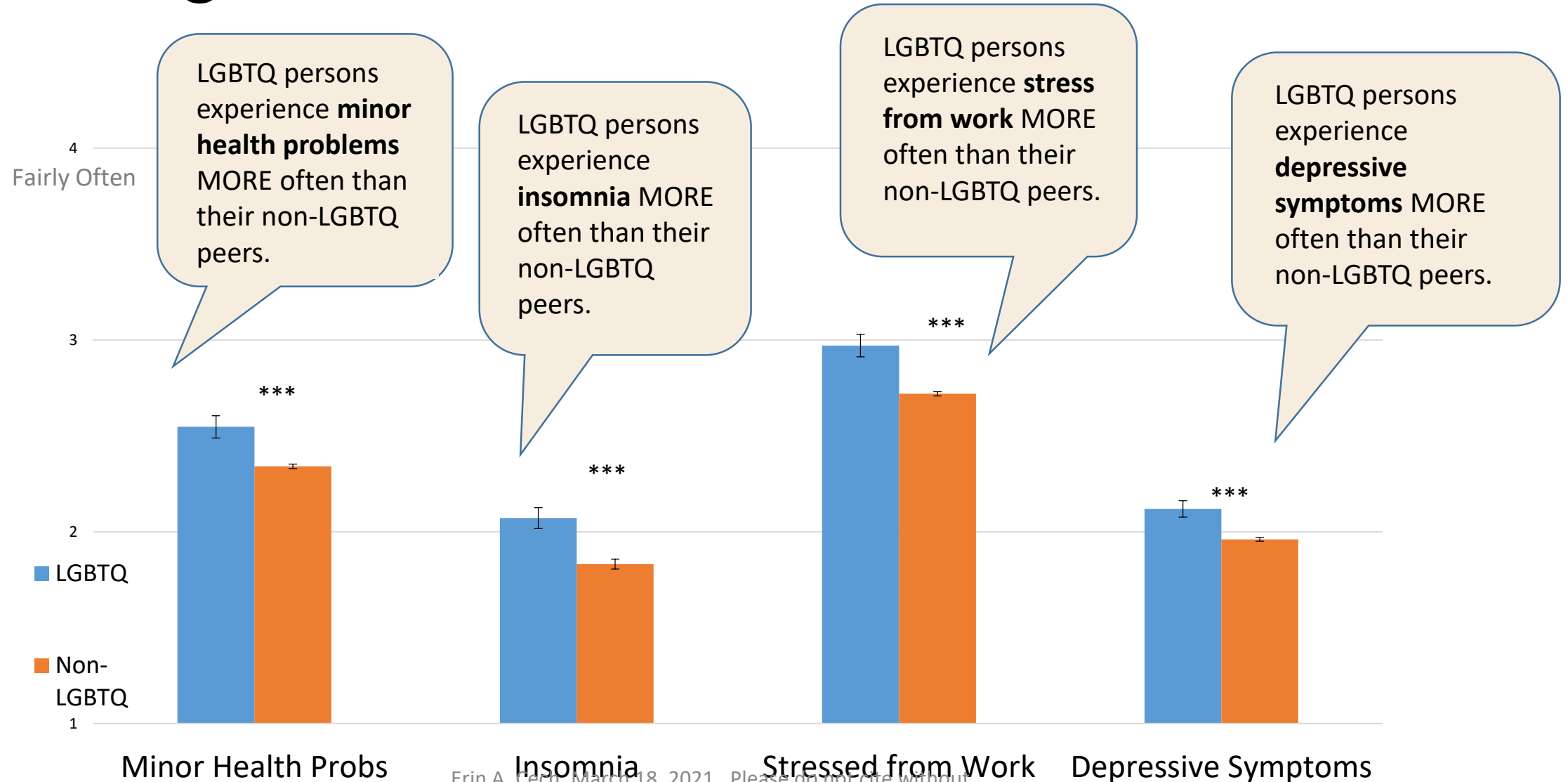
LGBTQ persons MORE likely to report that **colleagues think they're less productive** than they actually are.

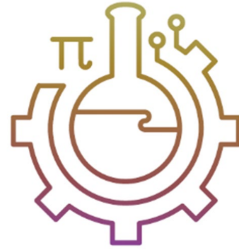
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Q4: Are LGBTQ STEM Professionals more likely to intend to leave STEM?



Q5: Are LGBTQ STEM Professionals more likely to have negative health and wellness outcomes?





LGBTQ STEM Professionals experience professional devaluation, more marginalization, fewer professional opportunities, and have higher turnover intentions than similar non-LGBTQ professionals, even though they are equally qualified and dedicated to their STEM work.

Implications for...

INDIVIDUAL LGBTQ STEM PROFESSIONALS:

- Devaluation of professional skills and abilities (not just a *social* disadvantage)
- Obstacles to professional advancement
- Gets “under the skin” to negatively affect health & wellness

STEM BROADLY:

- Undervaluation and under-recognition of contributions to STEM
- Undercutting diversification that helps advance innovation
- Possible loss of talented and dedicated STEM professionals

How do we support LGBTQ STEM Professionals?

- LGBTQ-inclusive anti-discrimination policies in organizations
- Employee Resource Groups in workplaces
- LGBTQ affiliate groups in professional societies
- More research on mechanisms & best practices...

STEM

Inclusion Study



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