

Disclosure decisions: Exploring the concealable stigmatized identities of science instructors

Sara Brownell

School of Life Sciences

Arizona State University

ASU Research for Inclusive
STEM Education Center
Arizona State University

Think back to your undergraduate science instructors...

What did you know about them personally?

What identities did they hold that you remember?

How did their identities make you feel, if anything?

Instructors with similar identities to students serve as powerful role models

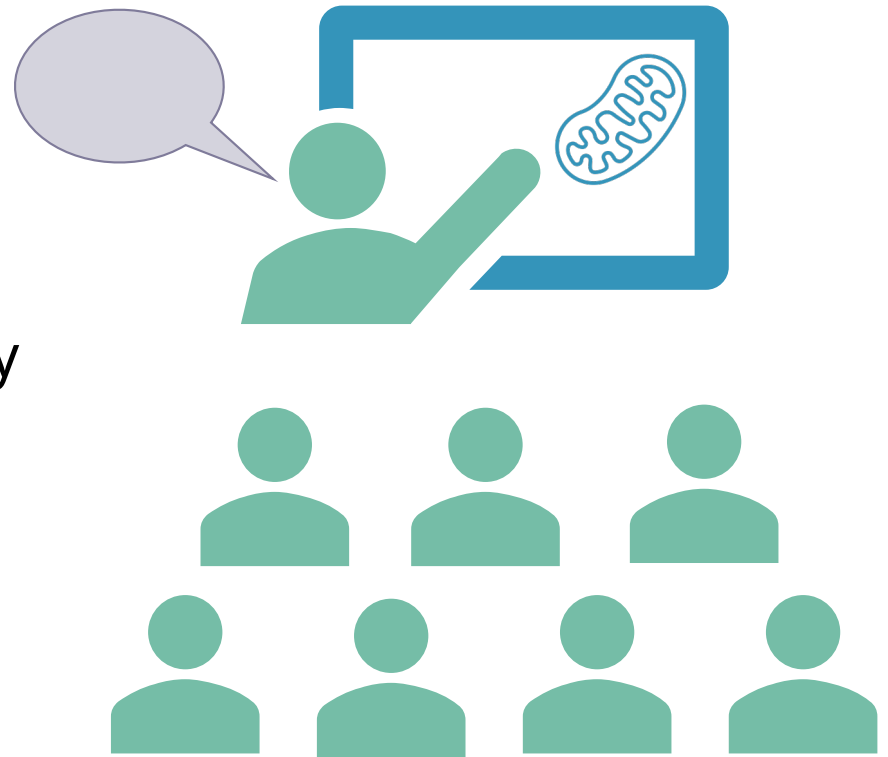
- Having a same-gender instructor improved women's levels of scientific confidence¹
- PEER² students with an instructor of the same race persisted in the major³
- Role models of the same race or gender improve self-efficacy^{1,4}



¹Cotner et al., 2011; ²Asai, 2020; ³Rask & Bailey, 2002; ⁴Shin et al., 2016

What do we know about instructor identities that we can't see?

- Instructors hold many identities that are invisible
- **Concealable stigmatized identities** (CSIs) are invisible or can be kept hidden and can carry negative stereotypes¹



¹Quinn & Earnshaw, 2013

Brainstorm as many potential CSIs as you can think of whose representation might impact science undergraduates.

Concealable stigmatized identities (CSIs) are invisible or can be kept hidden and can carry negative stereotypes.

Concealable stigmatized identities

LGBQ+

Community college
transfer student

Depression

Religious
affiliation

Low-income
background

Struggling academically

International student

Trans/non-binary

Anxiety

First-generation
status

Students report CSI role models would be beneficial

LGBQ+

Community college
transfer student

Depression

Low-income
background

Struggles

International student

Anxiety

First-generation
status

“Having somebody else [who is a scientist with depression] tell me, ‘Hey. I am successful, and I still suffer from depression,’ [would show me] that **you can succeed even with this extremely difficult thing weighing you down.**”

Students report CSI role models would be beneficial

“I think I **would feel more comfortable in a class** where an instructor identified as queer, because I can relate to them on a different level. I think that if I think a professor might be queer, then I can also [feel seen] as a queer person.”

Community college
transfer student

Religious
affiliation

Struggling academically

Trans/non-binary

Anxiety

First-generation
status

Students report CSI role models would be beneficial

LGBQ+

Community college

student

“One of my professors a couple of semesters ago was Jewish and she put (on the syllabus) that we’re not going to have class on certain days because she was observing religious holidays. And I **felt much more comfortable** telling her that I wouldn’t be in class one day because it was over Easter.”

**Religious
affiliation**

Low
back

emically

Intern

ns/non-binary

Anxiety

First-generation
status

Students report CSI role models would be beneficial

LGBQ+

Community college
transfer student

Religious
affiliation

Low-income
background

International

"I think I would feel **more comfortable in a class** if an instructor identified as asexual, because it would be nice to know that somebody feels the same way I do, which right now, would be very rare."

Anxiety

1st-generation
status

Overarching research questions

To what extent are role models with concealable stigmatized identities (CSIs) impactful for all students?

Concealable stigmatized identities

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Religious
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Struggling academically

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status

Lesbian
Gay
Bisexual
Trans*
Queer

LGBTQ+ undergraduates in STEM

- Academic STEM is unwelcoming and unfriendly in nature for LGBTQ+ individuals^{1,2}
- LGBTQ+ students report a lack of role models³
- LGBTQ+ instructors often conceal their identities because they worry about consequences and perceive few benefits⁴

Four-year STEM retention by LGBTQ+ and trans/gender non-conforming status

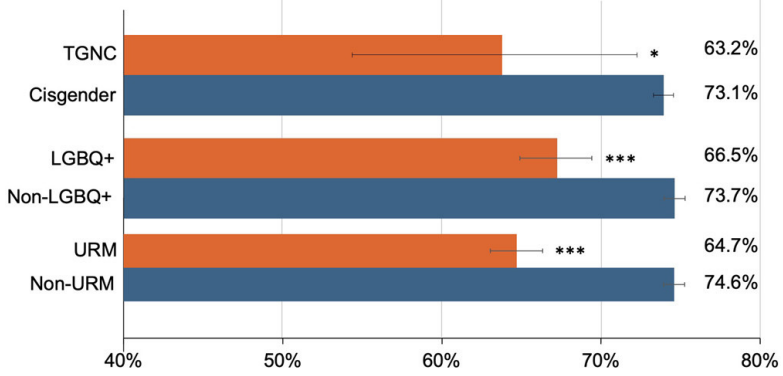


Figure from Maloy et al., 2022 CBE-LSE

¹Patridge et al., 2014; ²Cech & Waidzuna, 2011; ³Cooper & Brownell, 2016; ⁴Cooper et al., 2019

Study context

What is the impact on *all* students of an instructor revealing her LGBTQ+ identity and to what extent students think it is appropriate?

Do outcomes differ by student identity?

- An LGBTQ+ instructor agreed to reveal her identity at the beginning of the semester in her upper-level biology course
- Collected data over two terms
- Research-intensive institution in Arizona
 - Institution is not considered particularly LGBTQ-friendly or LGBTQ-unfriendly



Busch et al., 2022

Instructor reveals LGBTQ+ identity in less than 3 seconds



Never again mentioned LGBTQ+ identity in class



Hiking



Proud member of the LGBTQIA community



Instructor reveals LGBTQ+ identity in less than 3 seconds

Survey students who remember instructor coming out

Never again mentioned LGBTQ+ identity in class

8 weeks



Hiking



Proud member of the LGBTQIA community

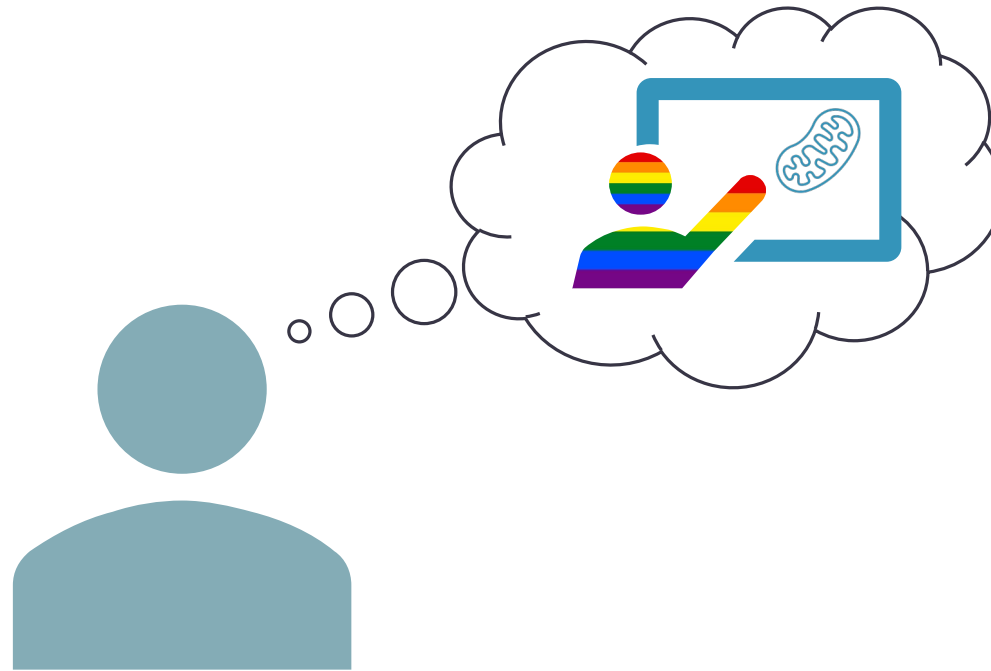


Do you remember your instructor revealing her LGBTQ+ identity?

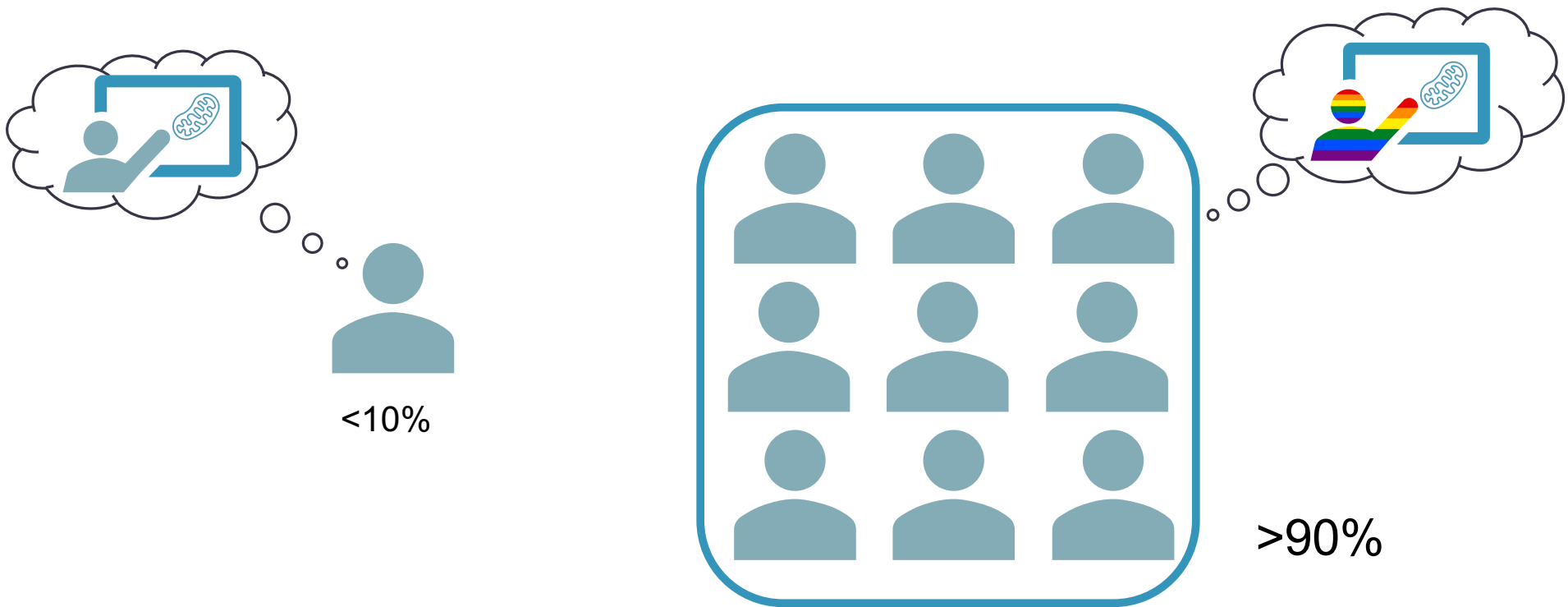
If yes

Survey assessing how instructor coming out affected students

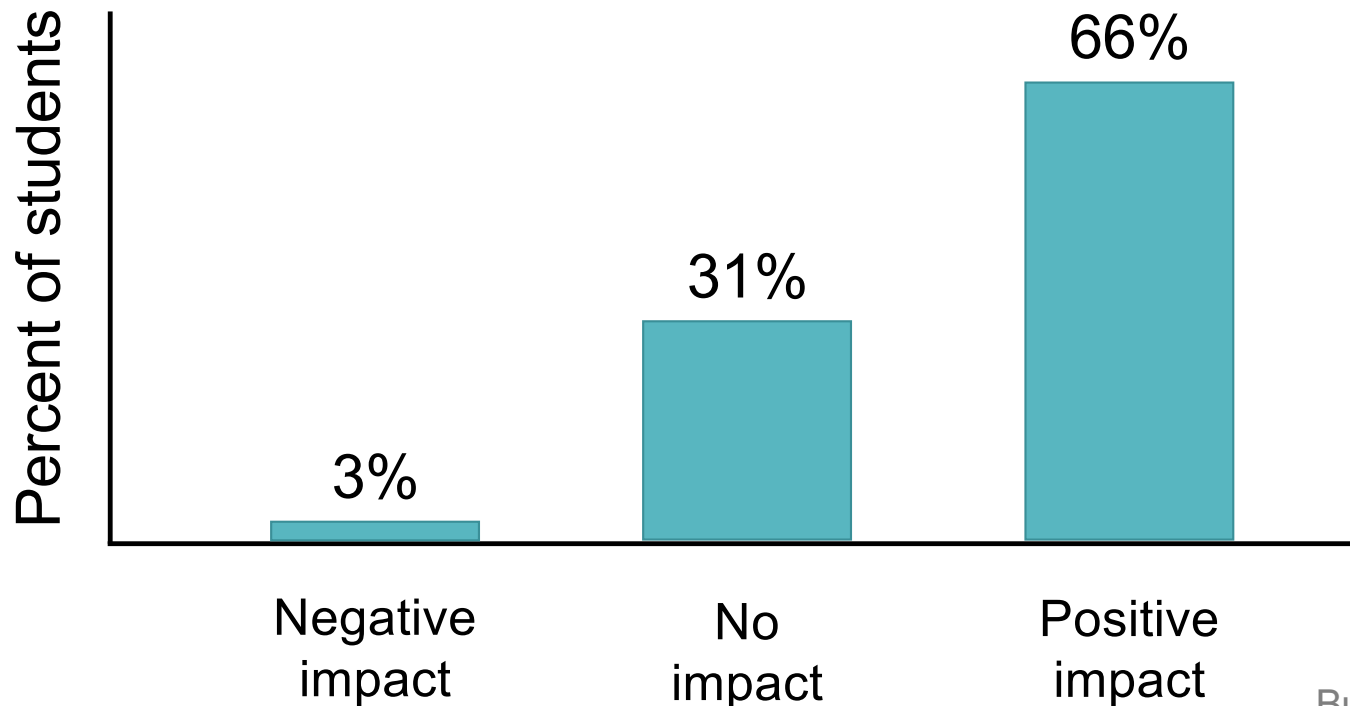
RQ1: To what extent do students remember an instructor revealing her LGBTQ+ identity?



Finding 1: 91% of students recalled their instructor revealing her LGBTQ+ identity



Finding 2: The instructor revealing her LGBTQ+ identity positively impacted students' course experiences



Busch et al., 2022

Share your ideas

What reasons do you think students said that the instructor coming out had a positive impact on their course experience?

Reasons the instructor revealing her LGBTQ+ identity had a **positive impact** on students' course experiences

It makes the instructor more “human” (46%)

Reasons the instructor revealing her LGBTQ+ identity had a **positive impact** on students' course experiences

It makes the instructor more “human” (46%)

It fosters an inclusive class environment (26%)

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It helps normalize LGBTQ+ identities (18%)

Reasons the instructor revealing her LGBTQ+ identity had a **positive impact** on students' course experiences

It makes the instructor more “human” (46%)

It fosters an inclusive class environment (26%)

It helps normalize LGBTQ+ identities (18%)

None of my instructors have come out in class before (13%)

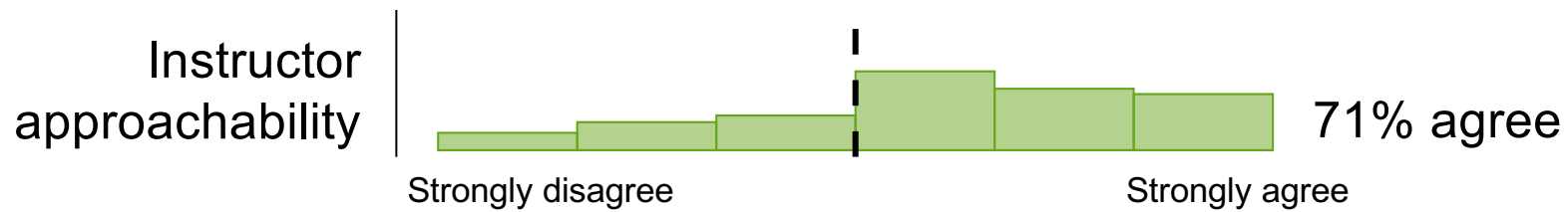
RQ3: To what extent did the instructor revealing her LGBTQ+ identity increase:

- Instructor approachability
- Instructor-student connectedness
- Student confidence
- Student class belonging
- Student science belonging

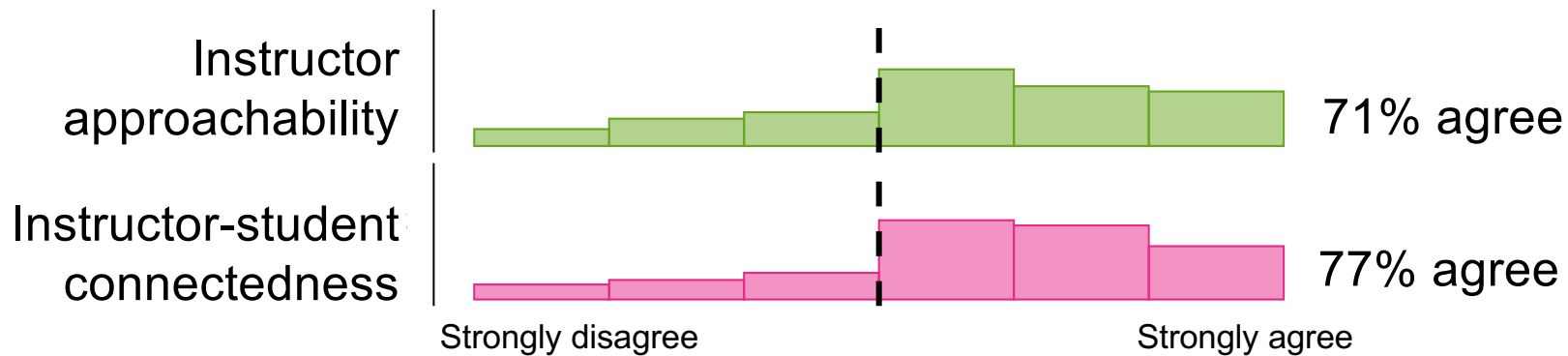
Student outcome ~ LGBTQ+ status + gender + religion + race/ethnicity + anxiety/depression + semester

Finding 3: Most students found specific benefits of their instructor coming out during the course

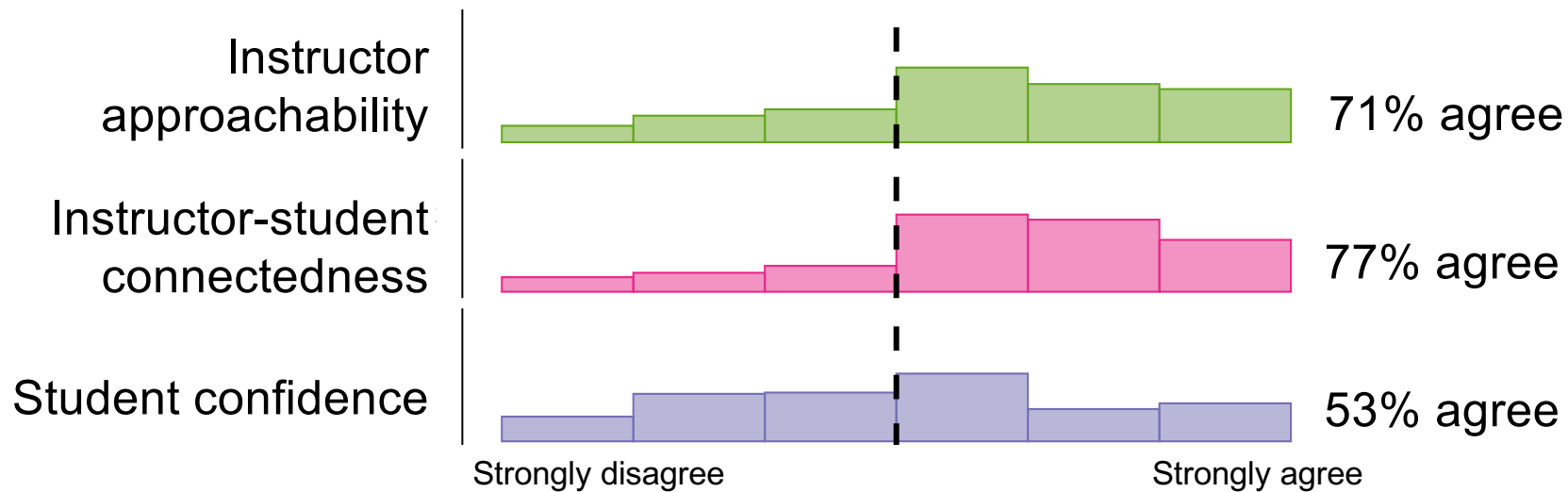
Finding 3: Most students found specific benefits of their instructor coming out during the course



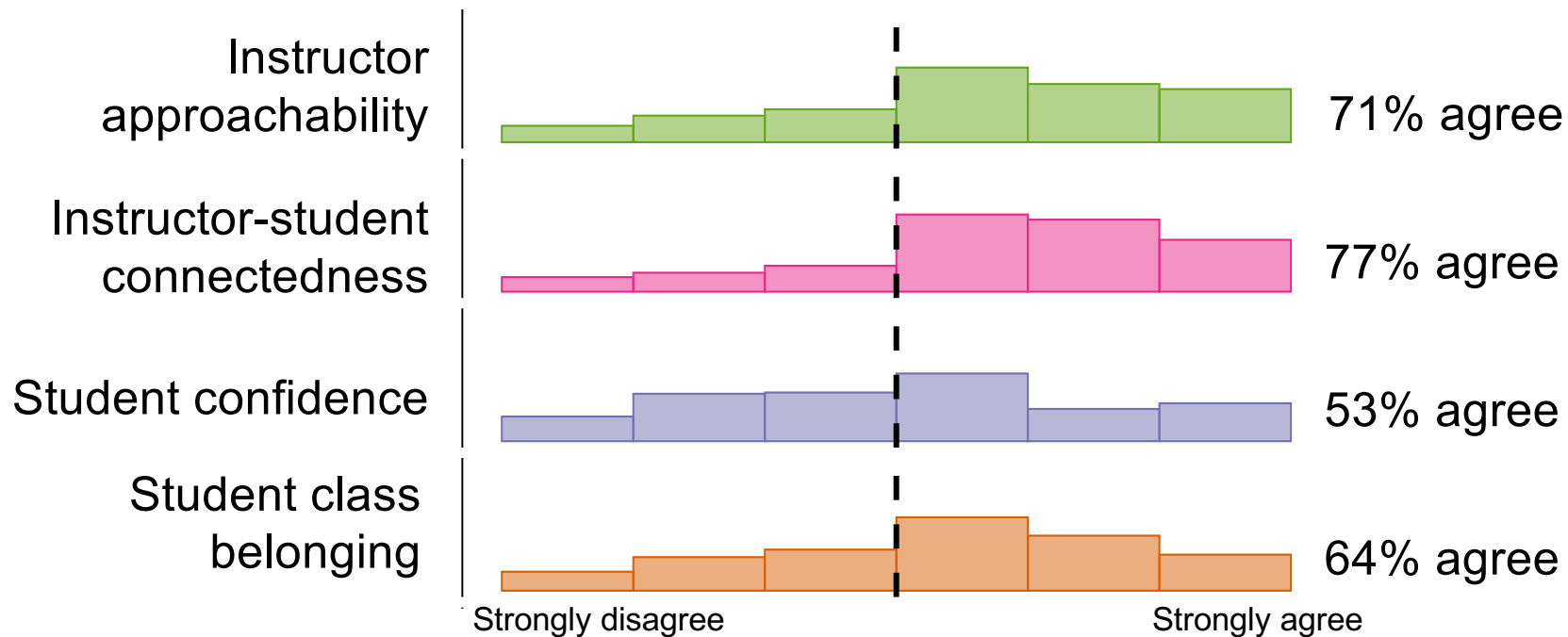
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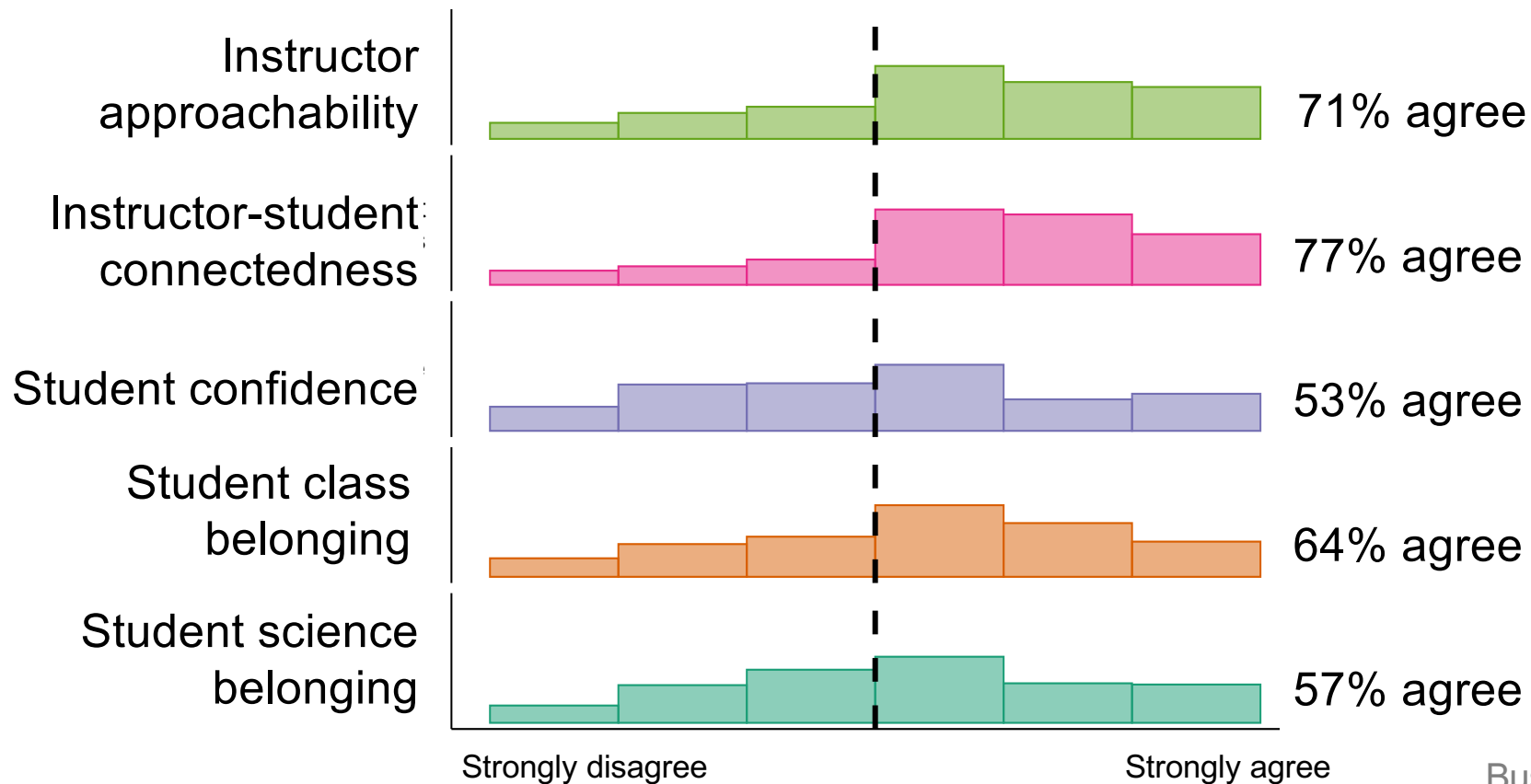
Finding 3: Most students found specific benefits of their instructor coming out during the course



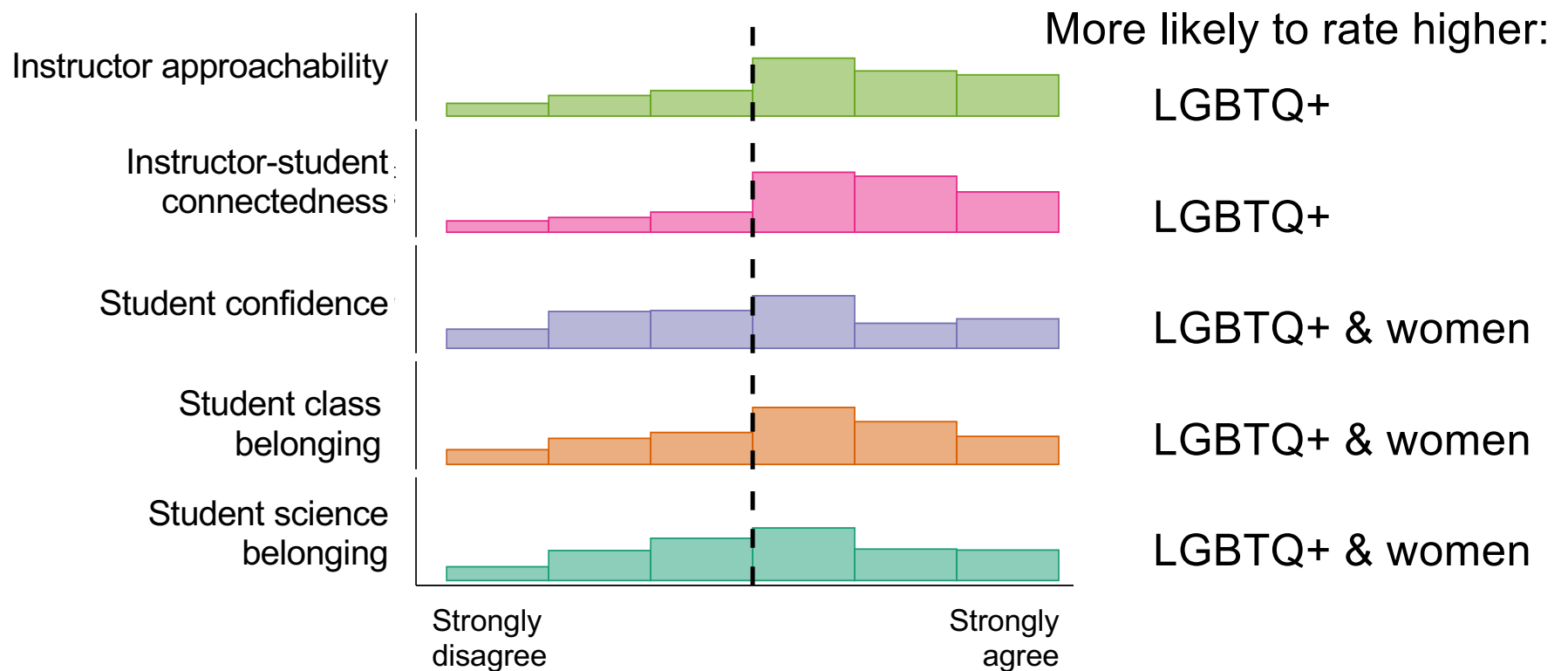
Finding 3: Most students found specific benefits of their instructor coming out during the course



Finding 3: Most students found specific benefits of their instructor coming out during the course



Finding 3: Most students found specific benefits of their instructor coming out during the course



Student outcome ~ LGBTQ+ status + gender + religion + race/ethnicity + anxiety/depression + semester

RQ4: To what extent do students agree with the statement:

I think it is completely appropriate for STEM instructors to reveal that they are a member of the LGBTQ+ community.

Why?

Share your ideas

What percent of students do you think thought it would be appropriate for a STEM instructor to come out during class?

Finding 4: Students think that it is appropriate for an instructor to reveal their LGBTQ+ identity

95% of ***all*** students agree that it would be appropriate for a STEM instructor to come out in class

Finding 4: Students think that it is appropriate for an instructor to reveal their LGBTQ+ identity

95% of **all** students agree that it would be appropriate for a STEM instructor to come out in class

It empowers the LGBTQ+
community
(29%)

Finding 4: Students think that it is appropriate for an instructor to reveal their LGBTQ+ identity

95% of **all** students agree that it would be appropriate for a STEM instructor to come out in class

It empowers the LGBTQ+ community
(29%)

It is a way to get to know the instructor
(28%)

Finding 4: Students think that it is appropriate for an instructor to reveal their LGBTQ+ identity

95% of **all** students agree that it would be appropriate for a STEM instructor to come out in class

It empowers the LGBTQ+ community
(29%)

It is a way to get to know the instructor
(28%)

It is an important part of the instructor's identity
(19%)

To what extent are role models with concealable stigmatized identities (CSIs) impactful for all students?

Even students who do not share the CSI can experience benefits from instructor disclosure.

Students with the identity benefit disproportionately.

Concealable stigmatized identities

LGBQ+

Community college
transfer student

Depression

Religious
affiliation

Low-income
background

Struggling academically

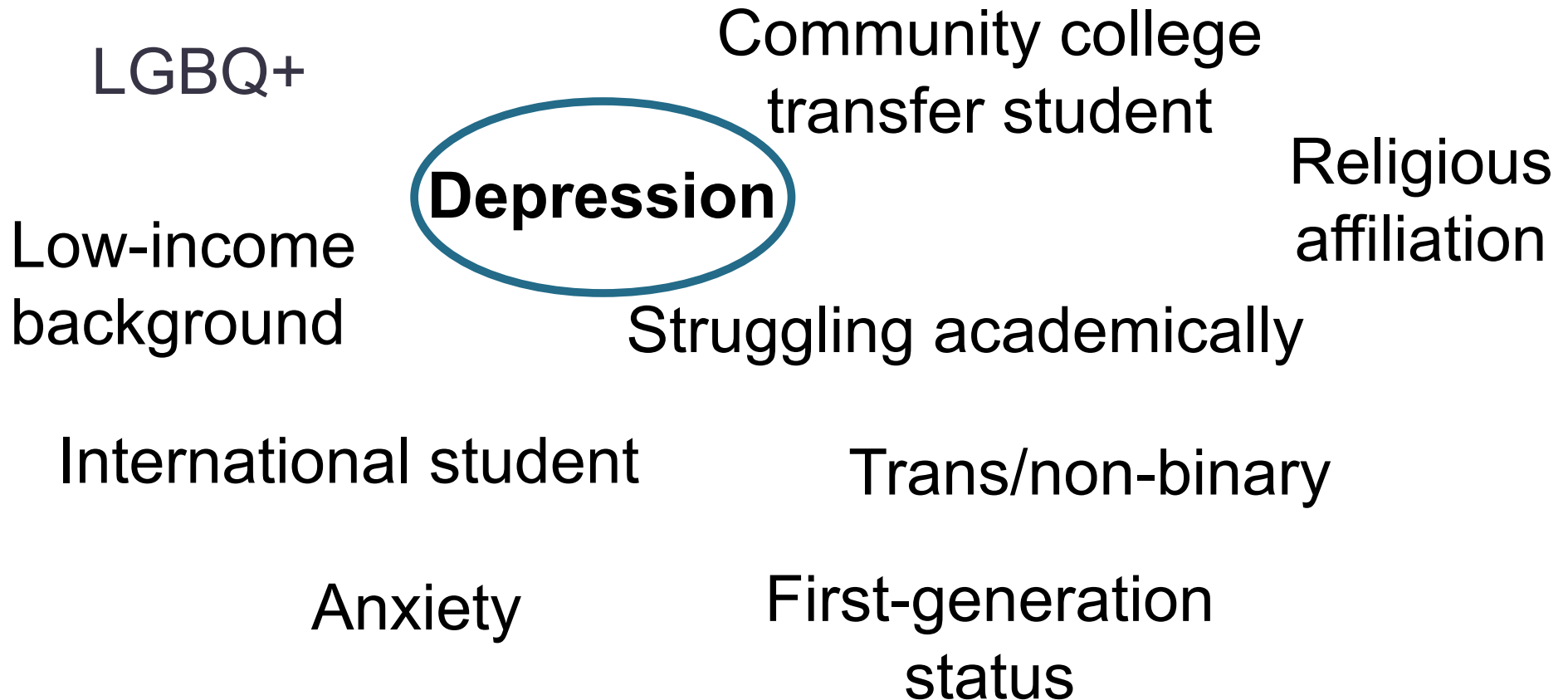
International student

Trans/non-binary

Anxiety

First-generation
status

Concealable stigmatized identities



Overarching research questions

To what extent are role models with concealable stigmatized identities (CSIs) impactful for all students?

To what extent do undergraduates have role models with CSIs?

Specific research questions

1. To what extent do science instructors have concealable stigmatized identities (CSIs)?
2. How does the prevalence of these CSIs among instructors compare to the prevalence among science undergraduates?



Methods

Survey structure

Suite of demographic questions

Reveal to undergraduates

Based on
identities



Methods

Survey distribution

- National survey (November 2021)
- Faculty and instructors in science and engineering at research-intensive institutions
 - Emailed all faculty and instructors listed on department webpages
 - 2,097 responses (of ~55,000 contacted)
- Focus on science instructors
 - Defined as: biology, physics, chemistry, geosciences



Identities of interest

- Evidence of stigma, bias, or being underserved in the U.S.
- Considered to be concealable by >70% of individuals with the identity

LGBQ+ identities: lesbian, gay, bisexual, queer, asexual

TGNC identities: trans, non-binary, genderqueer

Disability

Mental health: depression, anxiety

Undergraduate experience: CC transfer, first-generation college student, growing up in a low-income household, struggled academically

Addiction

Research questions

1. To what extent do science instructors have concealable stigmatized identities (CSIs)?
2. How does the prevalence of these CSIs among instructors compare to the prevalence among science undergraduates?



Share your ideas

Which identities do you think will be the most represented among instructors?

LGBQ+ identities: lesbian, gay, bisexual, queer, asexual

TGNC identities: trans, non-binary, genderqueer

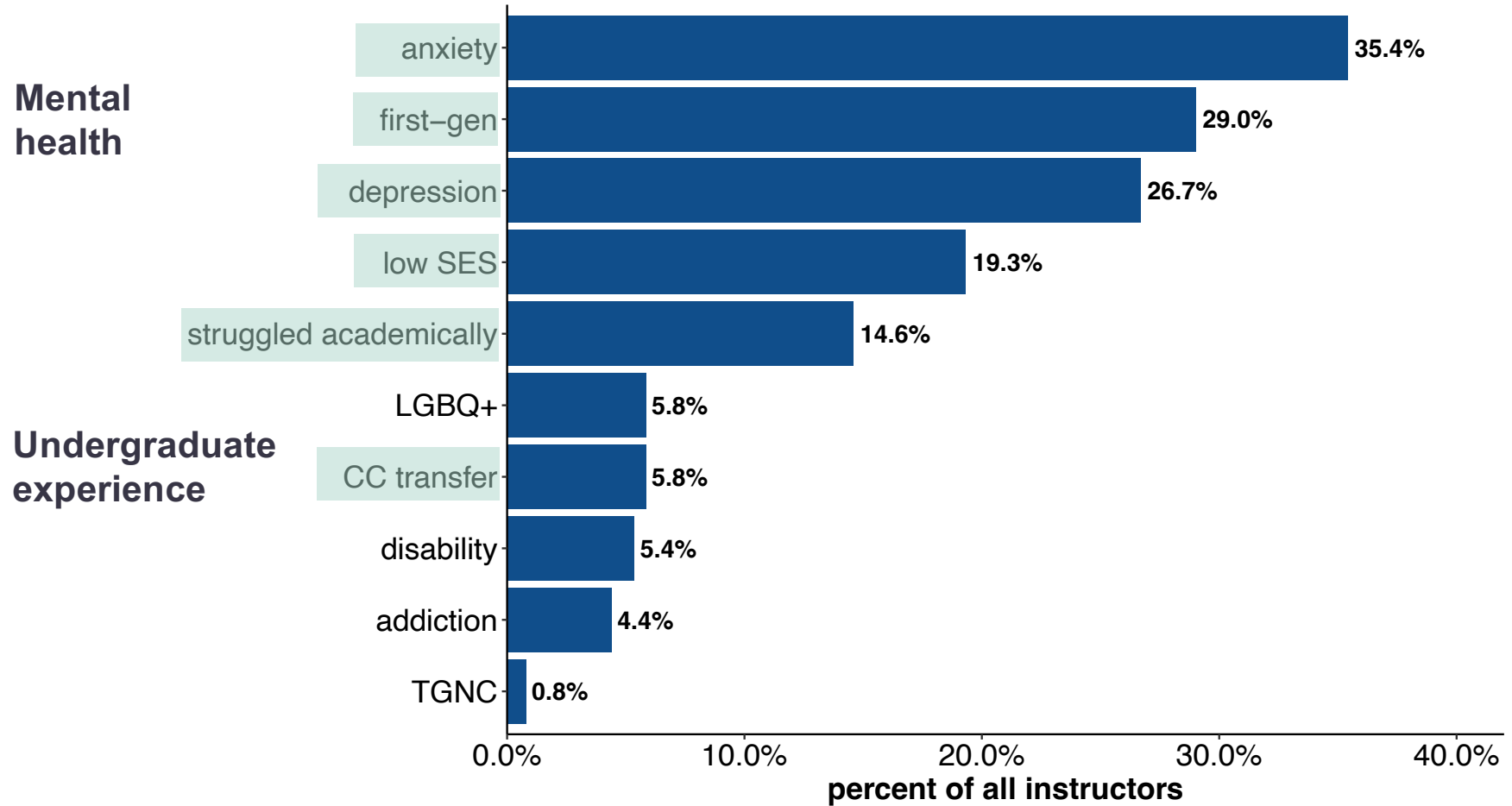
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Science instructors' CSIs



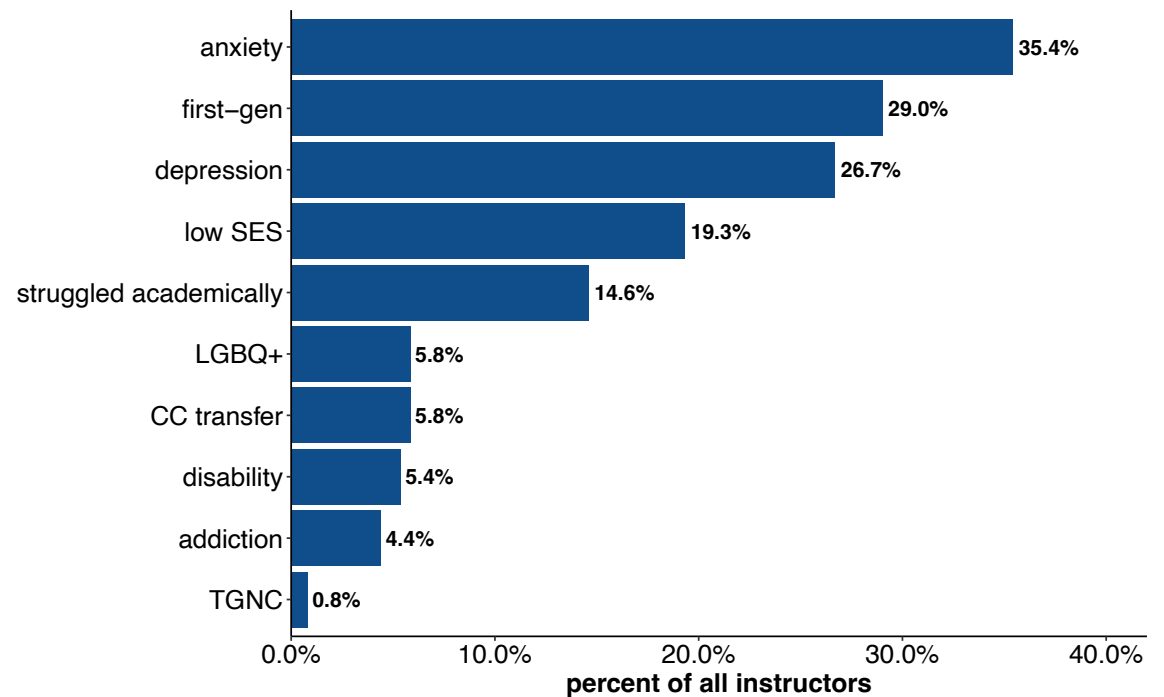
Research questions

1. To what extent do science instructors have concealable stigmatized identities (CSIs)?
2. **How does the prevalence of these CSIs among instructors compare to the prevalence among science undergraduates?**

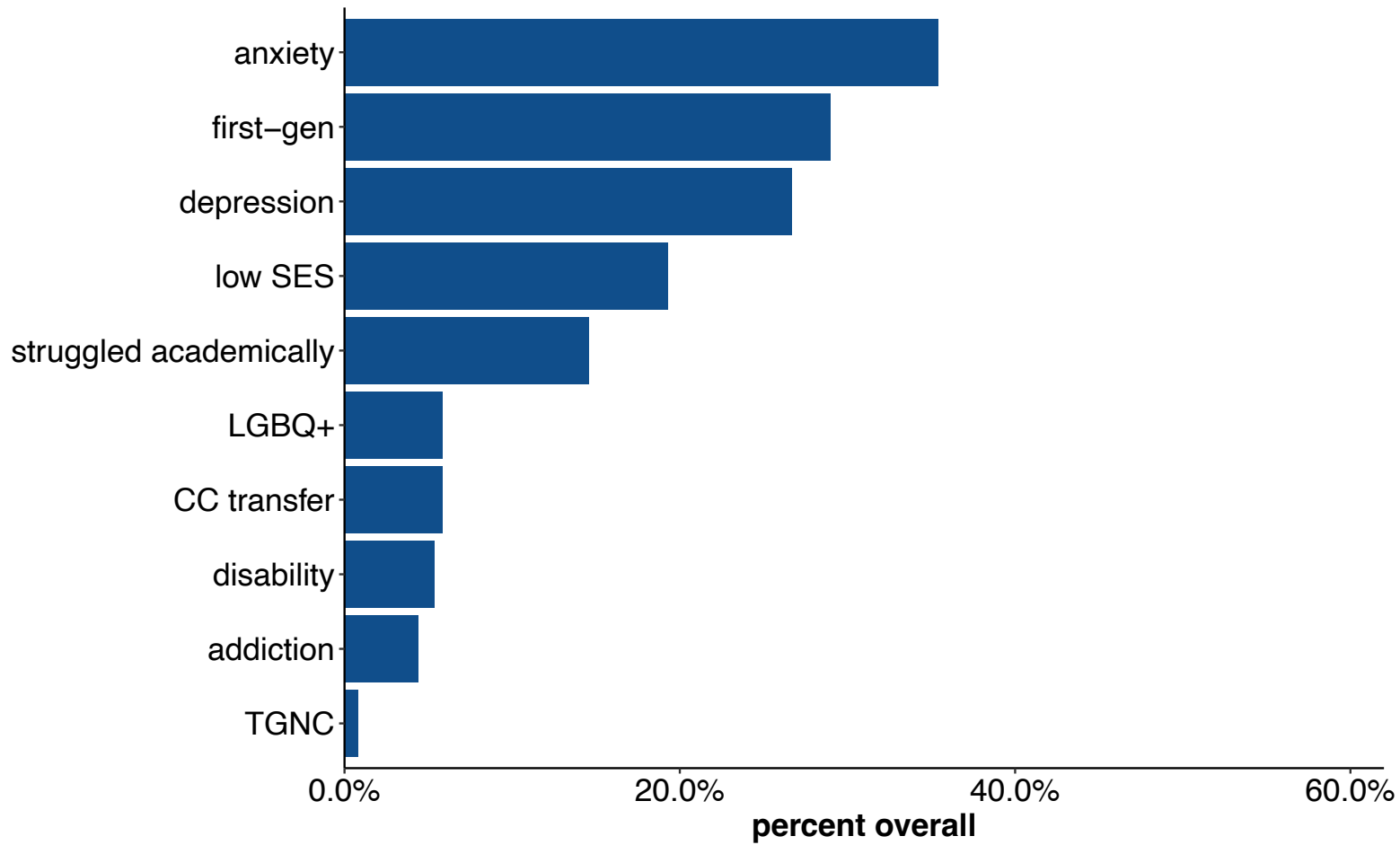


Share your ideas

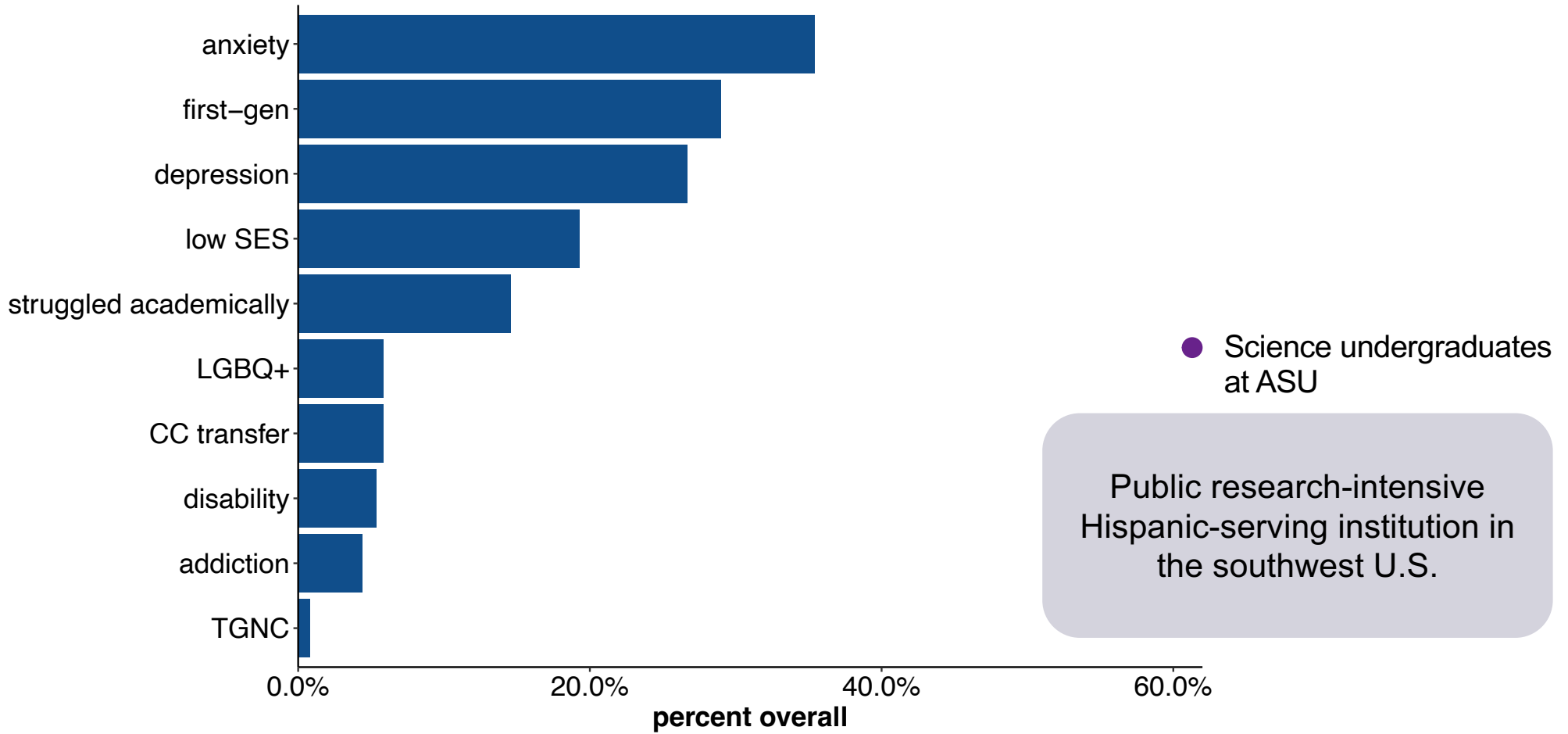
For which two identities do you predict there will be the biggest difference between instructors and undergraduates?



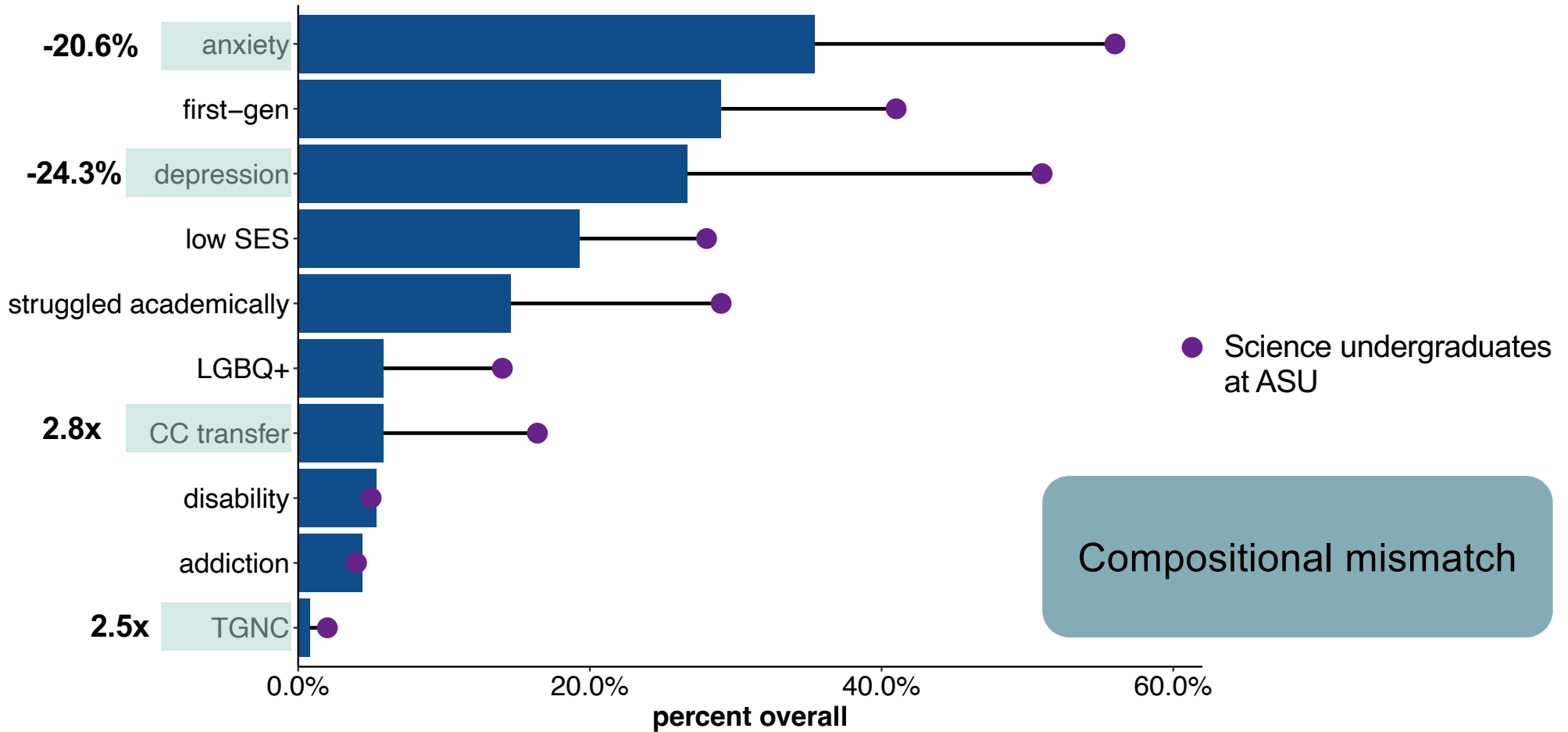
Science instructors' CSIs



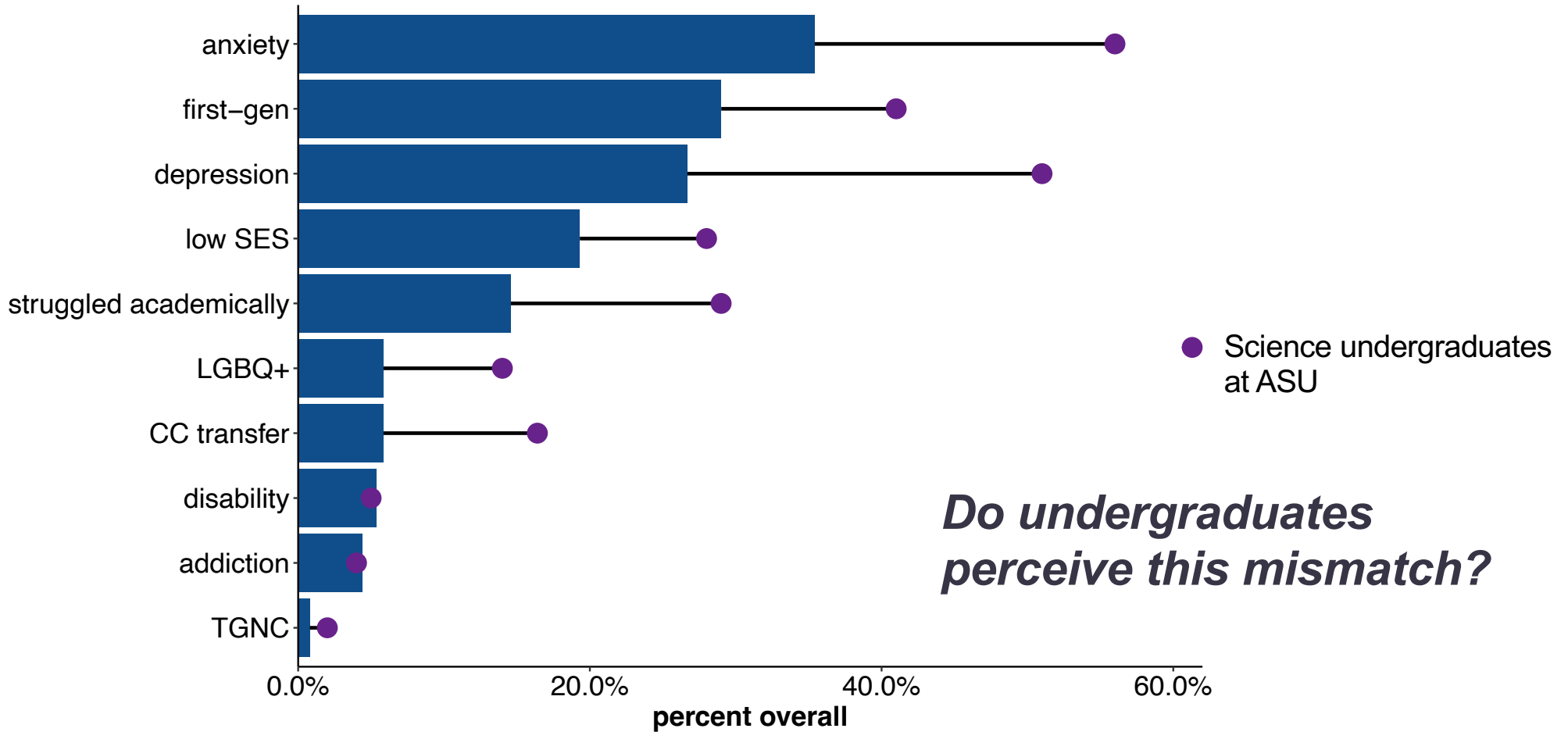
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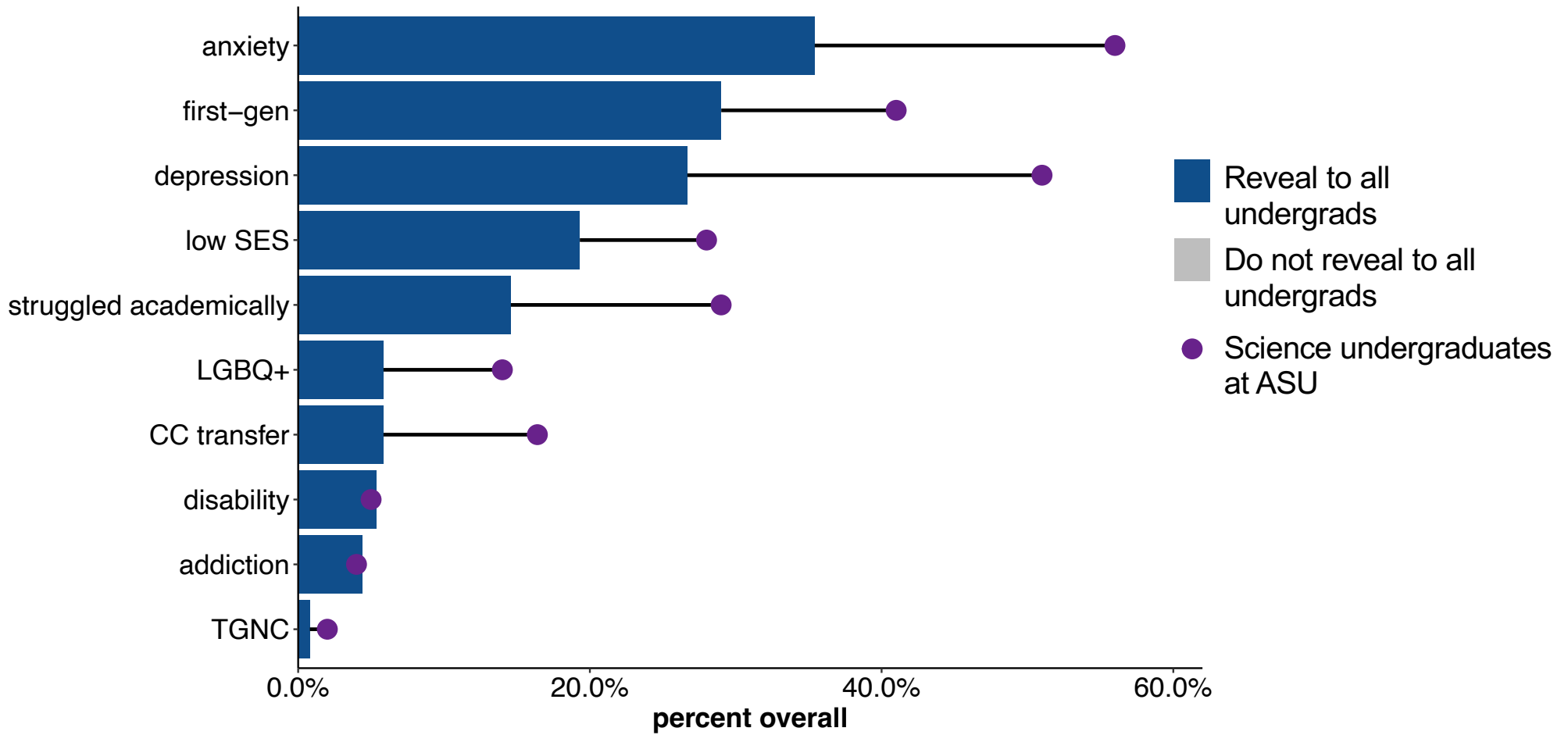
Science instructors' CSIs



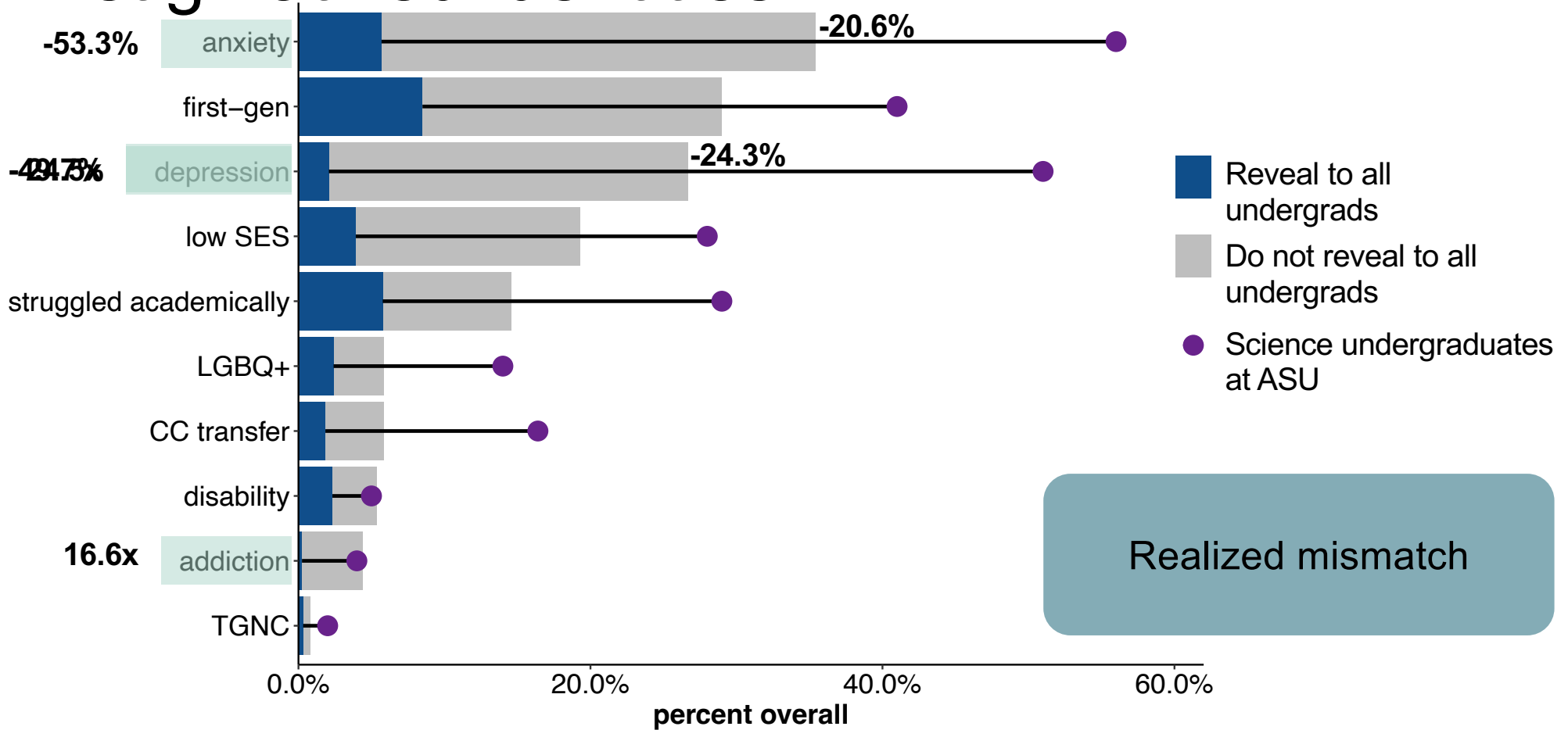
Science instructors' CSIs



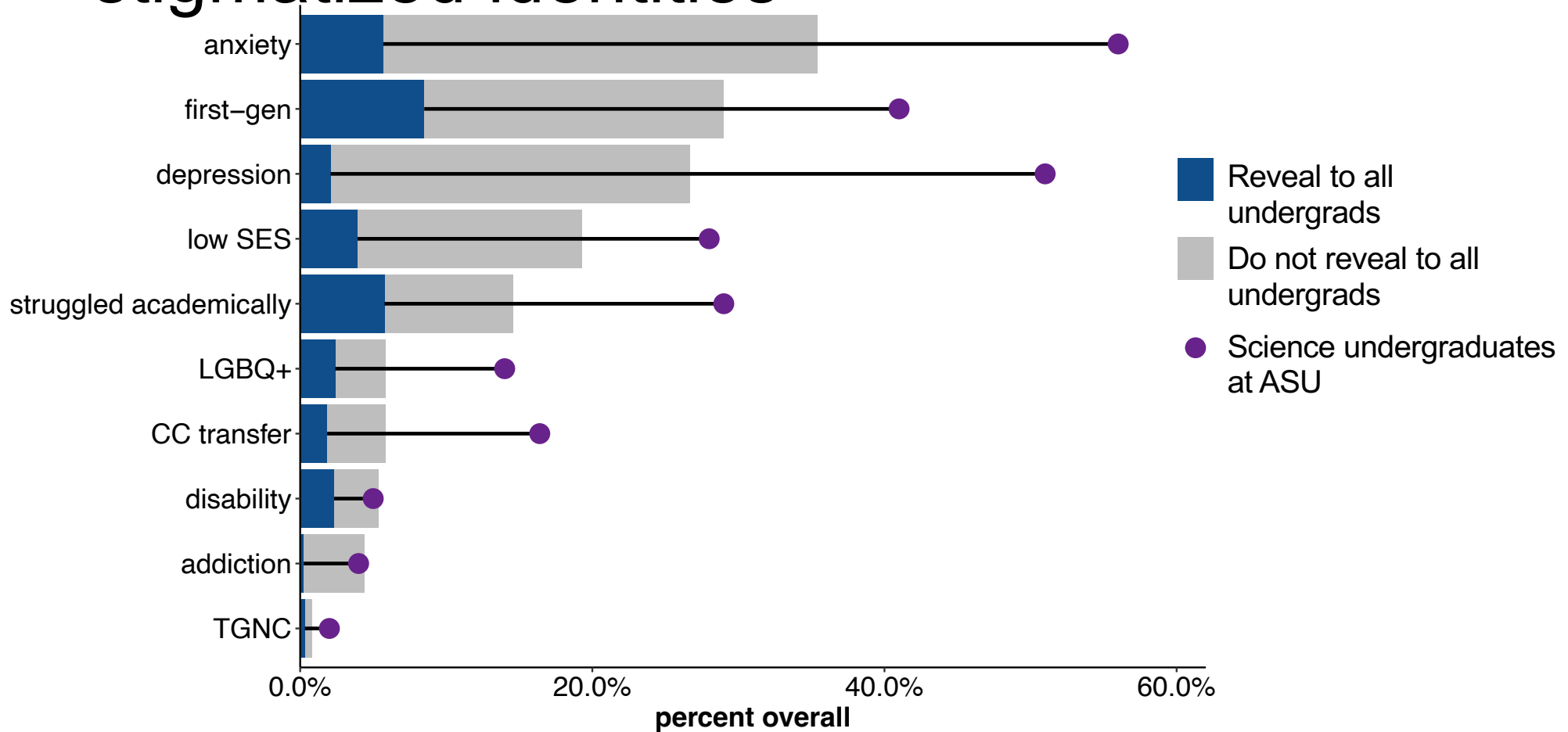
Science instructors' CSIs



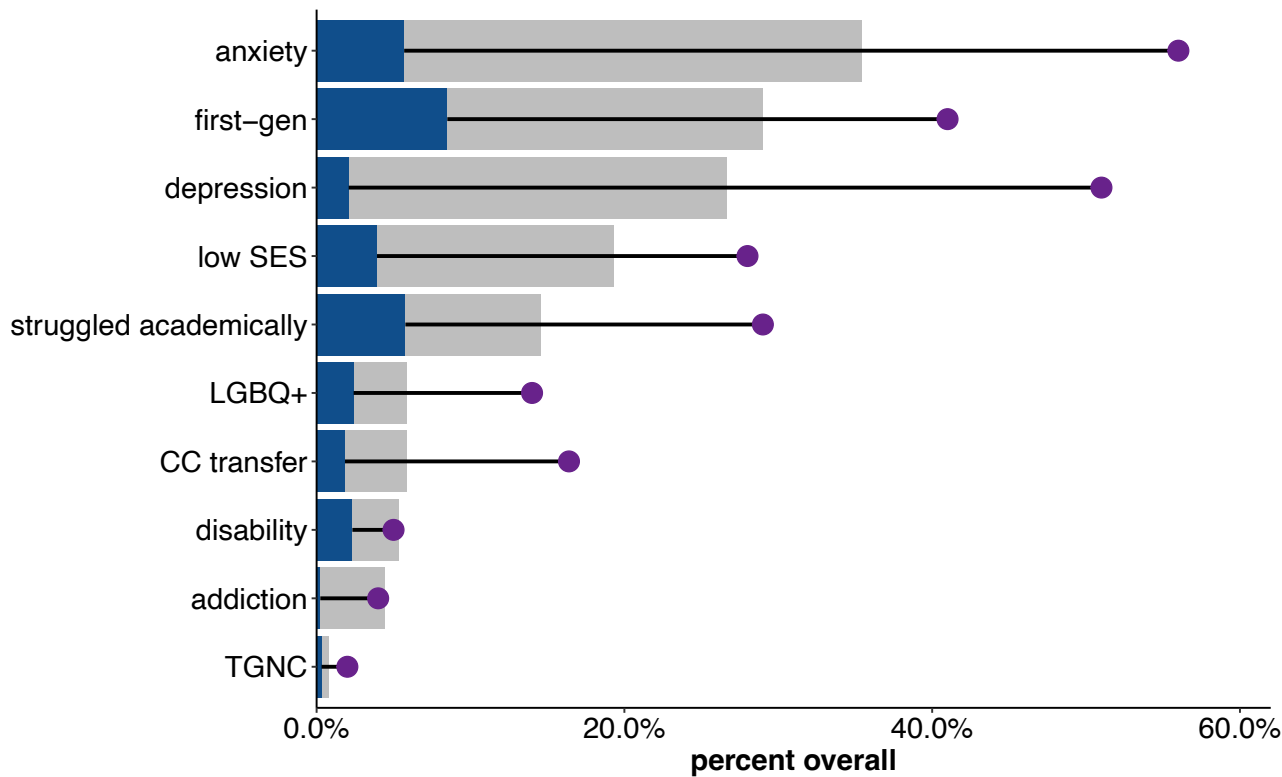
Few instructors reveal concealable stigmatized identities



Few instructors reveal concealable stigmatized identities



To what extent do students have role models with CSIs?



**Untapped potential for
instructors to become
role models**

Overarching research questions

To what extent are role models with concealable stigmatized identities (CSIs) impactful for all students?

To what extent do undergraduates have role models with CSIs?

What influences an individual to reveal or conceal a CSI?

Why might instructors keep CSIs concealed?

- STEM is said to have a chilly climate¹
- Depoliticization, the removal of social and political issues from day-to-day STEM work, aims to perpetuate the idea of objectivity²
- Perceived stigma may play a role



¹Seymour & Hunter, 2019;

²Cech, 2013

Methods

Survey structure

Suite of demographic questions

Reveal to undergraduates

Based on identities

Stigma ratings



Methods: stigma ratings

To be **stigmatized** means to be culturally devalued, prejudiced, or negatively stereotyped due to a particular identity and is influenced by the culture of a particular context.

To what extent do you perceive that identifying as **[identity]** is stigmatized in the context of academic science and engineering?

- Extremely stigmatized
- Somewhat stigmatized
- A little stigmatized
- Not stigmatized
- I do not know what this identity is

Which instructors perceive greater stigma associated with CSIs?

Ordinal regression

Stigma rating (extremely/somewhat/a little/not) ~ gender + race/ethnicity + age + appointment + (1 | individual)

Gender: man, woman

Race/ethnicity: white, Black, Asian, Latin*

Age: 23- 37, 38-49, 50-59, 60+

Appointment: tenured, tenure-track, lecturer

Share your ideas

Which demographic groups do you expect will perceive greater stigma?

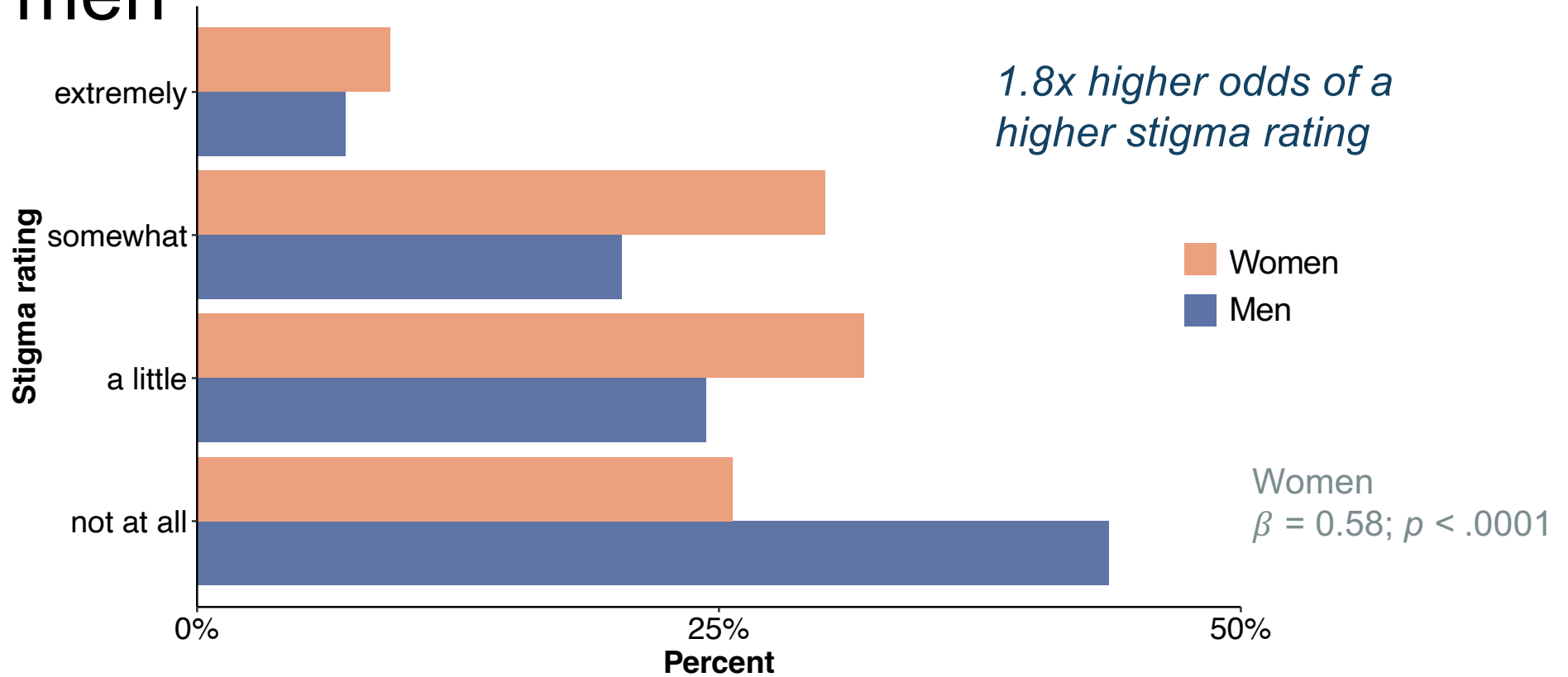
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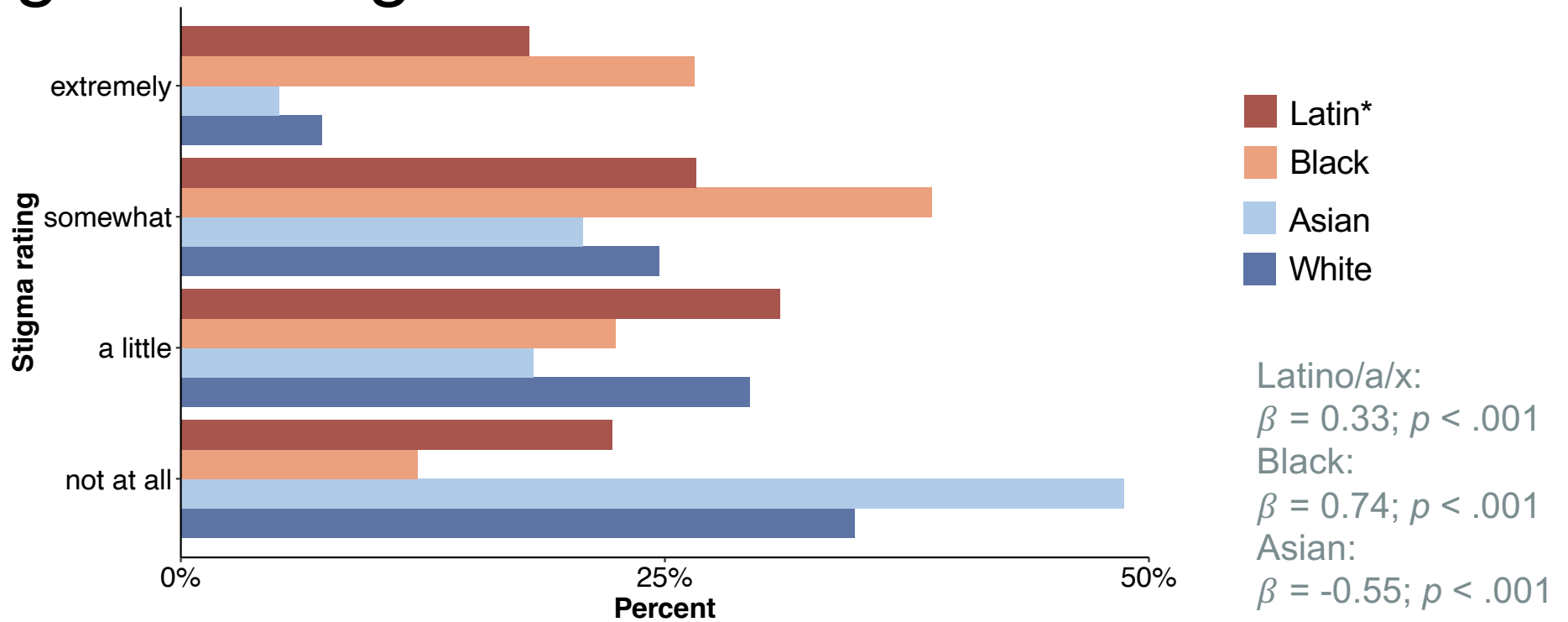
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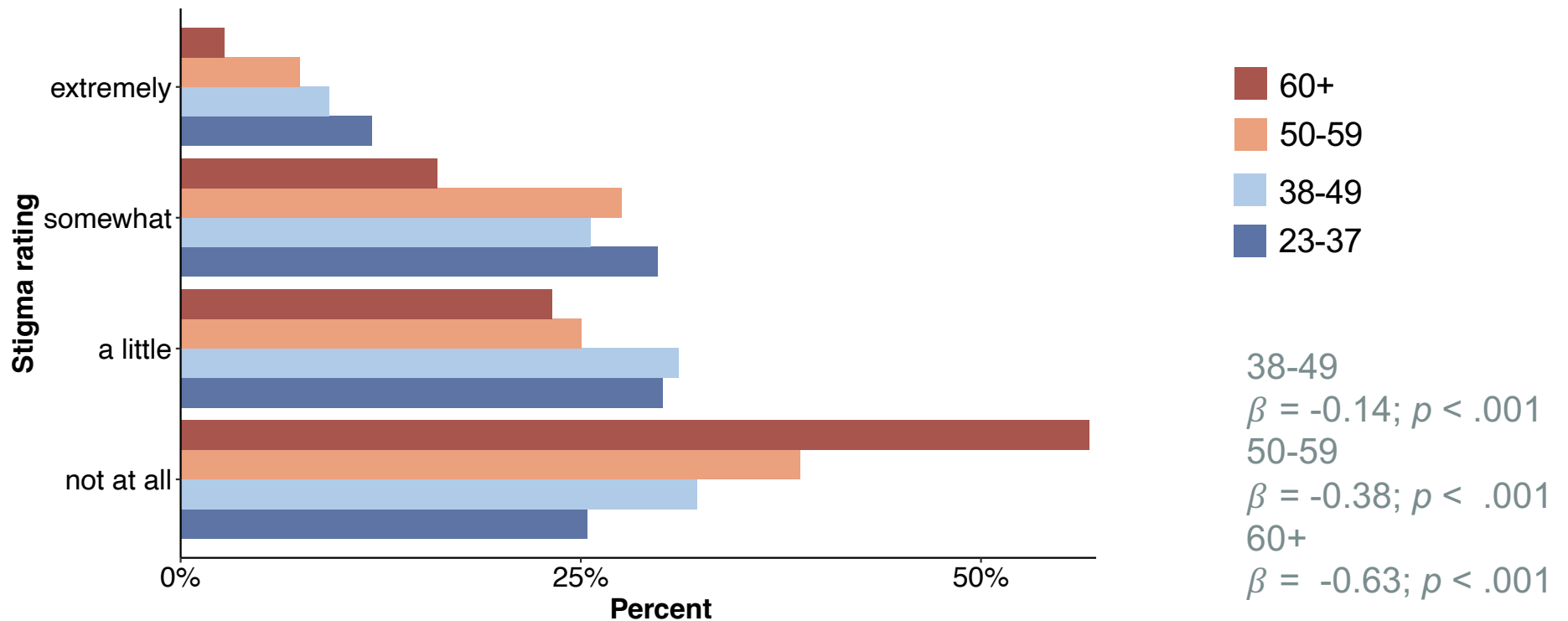
Women perceive greater stigma than men



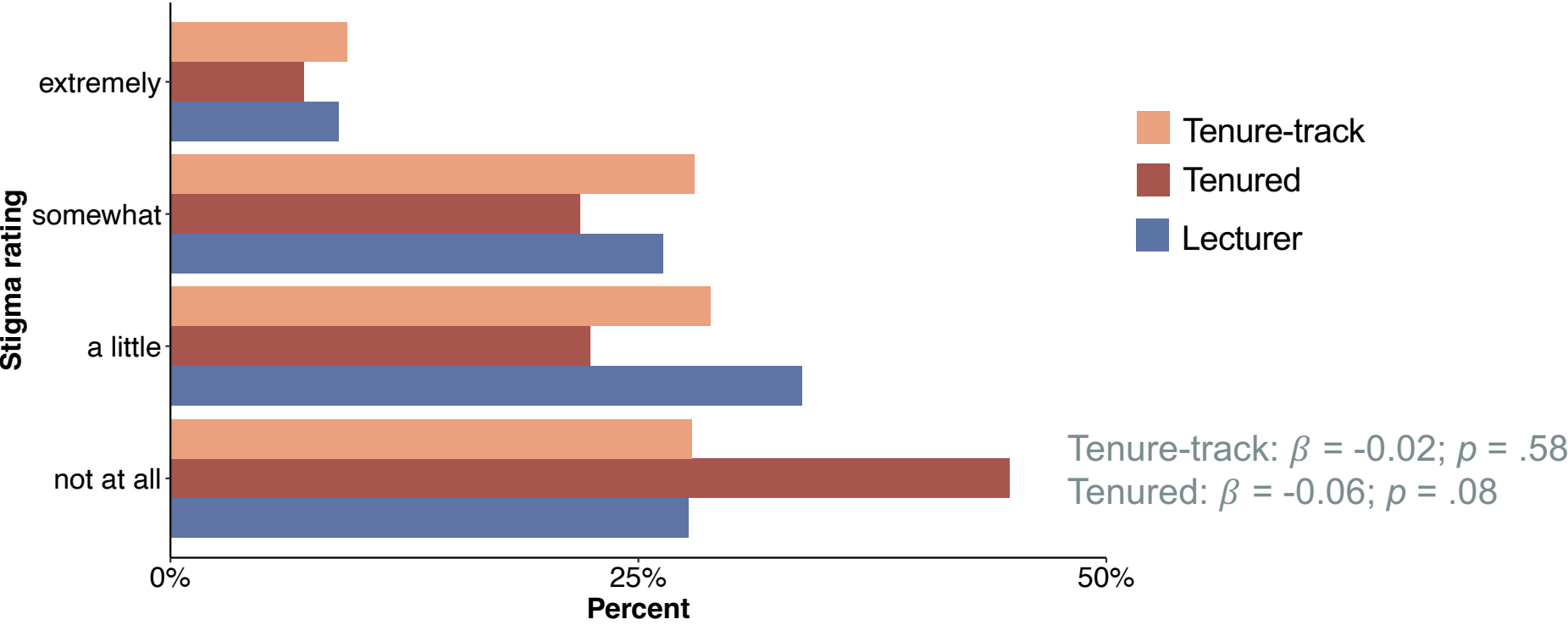
Black and Latin* instructors perceive greater stigma than white instructors



Instructors younger than 37 perceive greater stigma than all other age groups



Appointment type does not affect perceived stigma



Gender, race, and age affect perceived stigma

- Groups that are underrepresented and marginalized in the sciences generally perceive greater stigma (i.e., women, Black, Latin*)
- Stigmatized individuals may be more perceptive of when others are experiencing discrimination¹
- Younger instructors may be more aware of stigma associated with concealable stigmatized identities in the context of science and engineering
- Diversity statements are increasingly a part of lecturer/faculty applications, where applicants describe their diversity, equity, and inclusion contributions and experiences² which may predispose these faculty members to be cognizant of stigma in the sciences
- Older individuals tend to adopt color-blind racial attitudes³ potentially making them less likely to perceive or acknowledge systems of oppression

¹Craig & Richeson, 2016; ²Sylvester et al., 2019; ³Becker et al., 2021

Methods

Survey structure

Suite of demographic questions

Reveal to undergraduates

Based on identities

Stigma ratings

Reasons to reveal or conceal CSIs

Based on identities



Share your ideas

Why do you think instructors are concealing their identities in class?

Why conceal CSIs?



1. I typically do not share this identity **56%**
2. I did not think this identity was relevant to the course content **54%**
3. I had never thought about telling students about this identity **46%**
4. I did not think this identity was relevant to the students in this course **42%**
5. I did not feel like I had a personal enough relationship with the students in this course **38%**
6. I thought revealing this identity to all undergraduates in this course was inappropriate **28%**
7. I was concerned students would have a negative opinion of this identity **21%**
8. I did not know others in the department, such as other faculty or instructors, who had revealed a similar identity **20%**
9. I was concerned it would waste class time **14%**
10. I was concerned it would result in poor course evaluations **14%**
11. I was concerned that I would be subjected to departmental disciplinary action **6%**
12. I was concerned I could be fired **4%**

Why conceal CSIs?

Concern about consequences

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Why conceal CSIs?

Culture of academia

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Why conceal CSIs?

Do not recognize benefits

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Why conceal concealable stigmatized identities?

Do not recognize benefits

Culture of academia

Concern about consequences

Why reveal CSIs?

1. I wanted to **be an example** to my students as someone with the identity **79%**
2. I wanted to be known as a **supporter** of individuals with the identity **69%**
3. I thought revealing my identity to students in this course was **appropriate 66%**
4. I thought revealing my identity would be **relevant to the students** in this course **58%**
5. I wanted to **serve as a mentor** to students with the identity **56%**

Takeaways

- Revealing CSIs to students may make the instructor more personable and approachable for **all** students and disproportionately so for students with the specific identity.¹
- Instructors are somewhat representative of the student body but revealing CSIs could increase representation.
- Instructors often reveal CSIs to provide students with a mentor or example of a scientist with the identity.

¹Busch et al., 2022

Implications for instructors

- We can highlight the student-oriented benefits of revealing CSIs in class, such as increasing students' sense of belonging, feeling more connected to the instructor, and having a science role model.
- Disclosing any information, and especially a concealable stigmatized identity, is a personal decision and not everyone is able to reveal a CSI to their students.
- Instructors can use Scientist Spotlight to highlight scientists with CSIs (<https://scientistspotlights.org>)¹

¹Schinske et al., 2016

Thank you to

Dr. Katelyn Cooper



Carly Busch



Dr. K. Supriya



Tala Araghi



Jingyi He



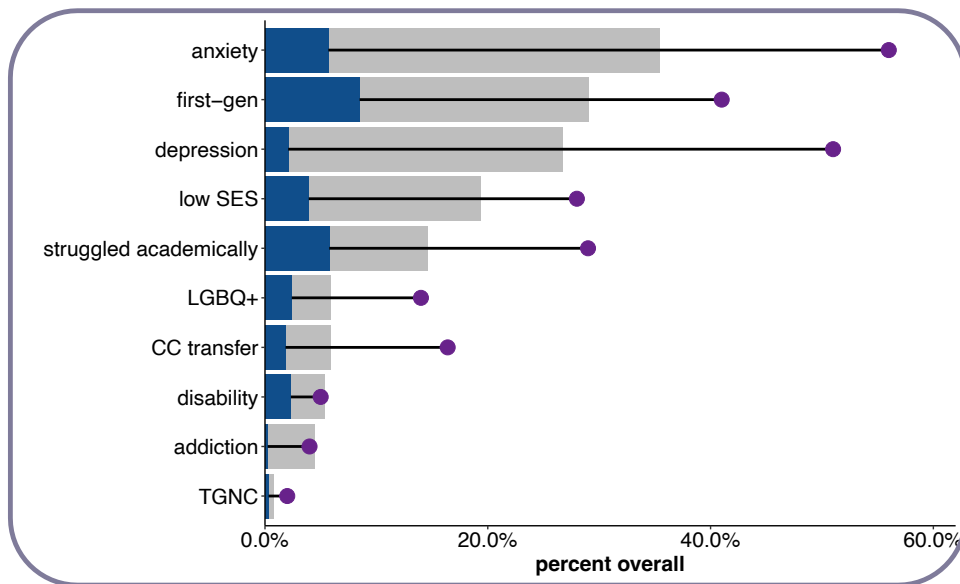
**Research for
Inclusive STEM
Education Center**

**Arizona State
University**



Questions?

✉ Sara.brownell@asu.edu



- Instructors often do not reveal CSIs to undergraduates because they do not perceive a benefit or do not know others who have.
- Increasing representation of scientists with CSIs can foster a more welcoming environment.

Resources



Scientist
Spotlights
website



Busch et al., 2022: Positive
impact of revealing a CSI to
students