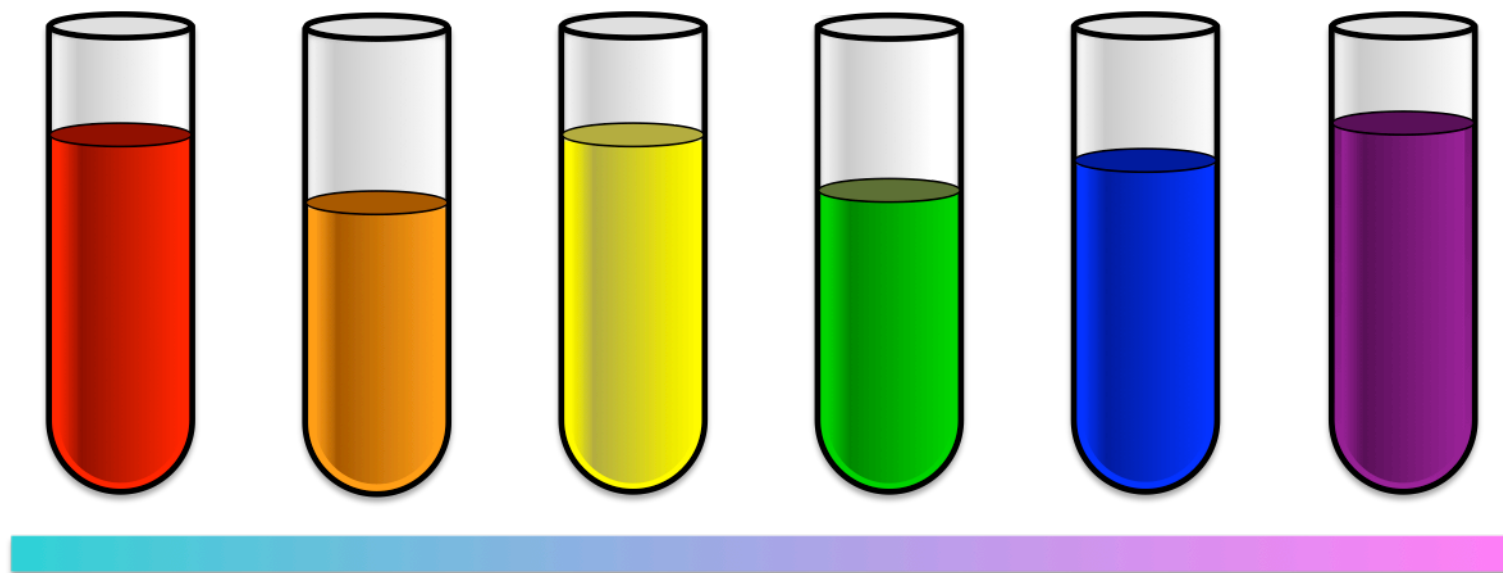


Effects of Gender and Sexual Orientation on Belonging Uncertainty in General Chemistry



Alec Kroll

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April 12, 2021

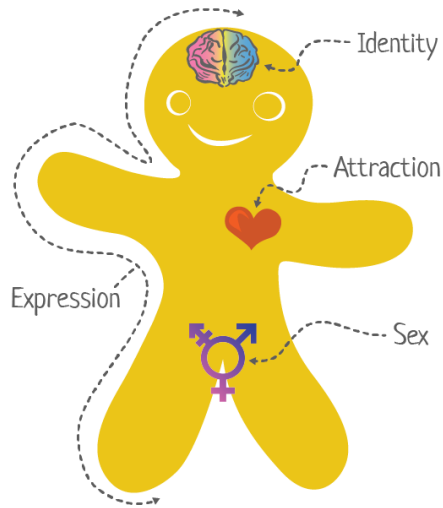


@AlecAstrochem

IRB protocols 16-0531 and 16-0380

Some Terms

The Genderbread Person v4 by its pronounced METROsexual.com



Anatomical Sex

Sex (sometimes called biological sex, anatomical sex, or physical sex) is comprised of things like genitals, chromosomes, hormones, body hair, and more. But one thing it's not: gender.

Gender Identity

Your psychological sense of self. Who you, in your head, know yourself to be, based on how much you align (or don't align) with what you understand to be the options for gender.

Gender Expression

The ways you present gender, through your actions, clothing, demeanor, and more. Your outward-facing self, and how that's interpreted by others based on gender norms.

Attraction

Who you fall in love with, are physically attracted to

⊖ means a lack of what's on the right side

Gender Identity

- Woman-ness
- Man-ness

Gender Expression

- Femininity
- Masculinity

Anatomical Sex

- Female-ness
- Male-ness

Identity ≠ Expression ≠ Sex
Gender ≠ Sexual Orientation

Sex Assigned At Birth
 Female Intersex Male

Sexually Attracted to...

and/or (a/o)

- Women a/o Feminine a/o Female People
- Men a/o Masculine a/o Male People

Romantically Attracted to...

- Women a/o Feminine a/o Female People
- Men a/o Masculine a/o Male People

Genderbread Person Version 4 created and uncopyrighted 2017 by Sam Killermann [For a bigger bite, read more at www.genderbread.org](http://www.genderbread.org)

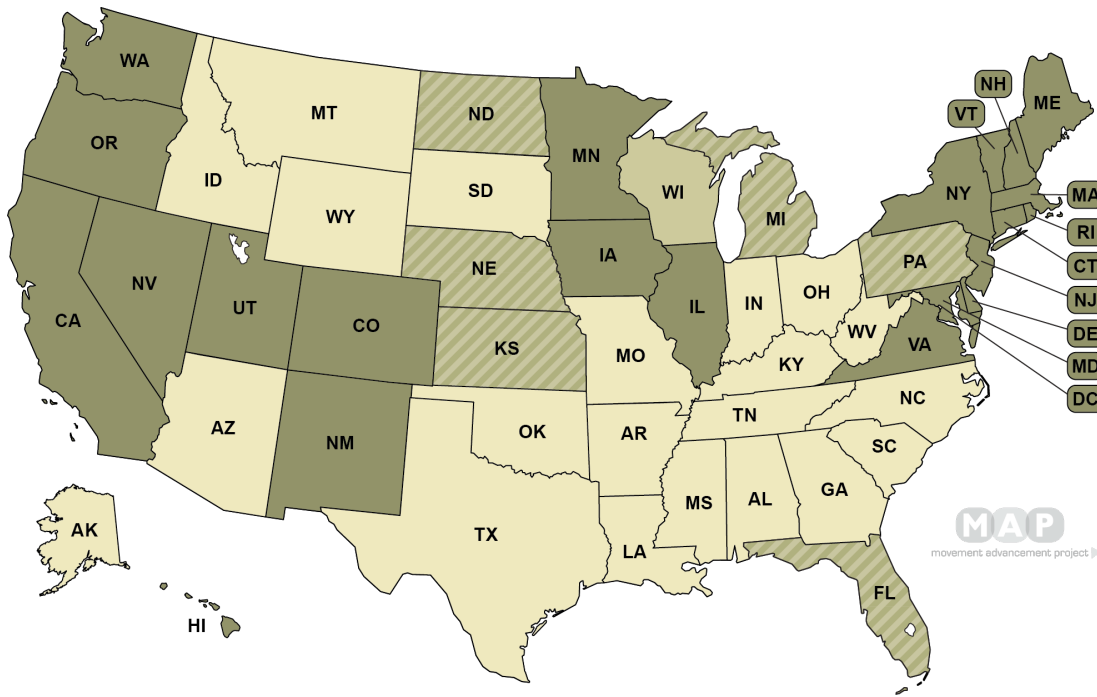
What inspired me?

- As an out gay man in science I've had a lot of amazing mentors.
- I have a ton of allies.
- I've only had one really negative experience with a peer in the lab as an undergrad.
- As a grad student I still felt very alone in STEM.

How many LGBTQ+ students do we even have?

How do we create spaces where students can learn and also feel like they belong in our classrooms and fields of study?

Housing Protection



- State law explicitly prohibits discrimination based on sexual orientation and gender identity (22 states, 0 territories + D.C.)
- State explicitly interprets existing prohibition on sex discrimination to include sexual orientation and/or gender identity (see note) (6 states, 0 territories)
- State law explicitly prohibits discrimination based on sexual orientation only (1 state, 0 territories)
- No explicit prohibitions for discrimination based on sexual orientation or gender identity in state law (21 states, 5 territories)

MAP
movement advancement project ▶

U.S. Territories

American Samoa

Commonwealth of the Northern Mariana Islands

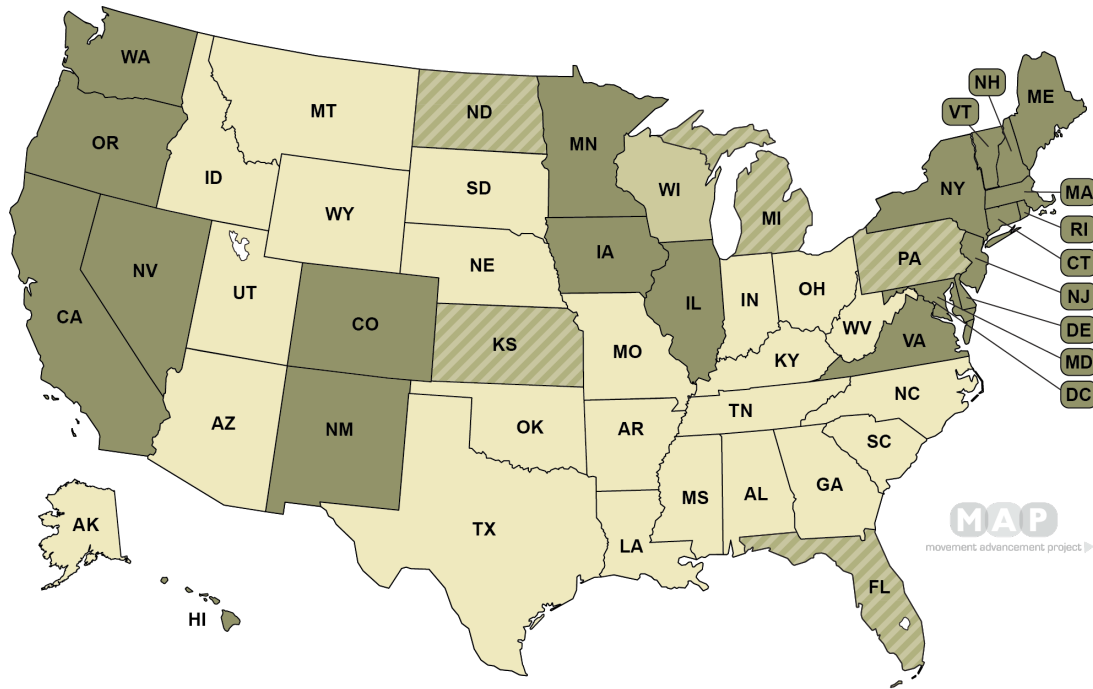
Guam





Puerto Rico

U.S. Virgin Islands



Public Accommodation Protections



-  State law explicitly prohibits discrimination based on sexual orientation and gender identity (21 states, 0 territories + D.C.)
-  State explicitly interprets existing prohibition on sex discrimination to include sexual orientation and/or gender identity (see note) (5 states, 0 territories)
-  State law explicitly prohibits discrimination based on sexual orientation only (1 state, 0 territories)
-  No explicit prohibitions for discrimination based on sexual orientation or gender identity in state law (23 states, 5 territories)

MAP
movement advancement project

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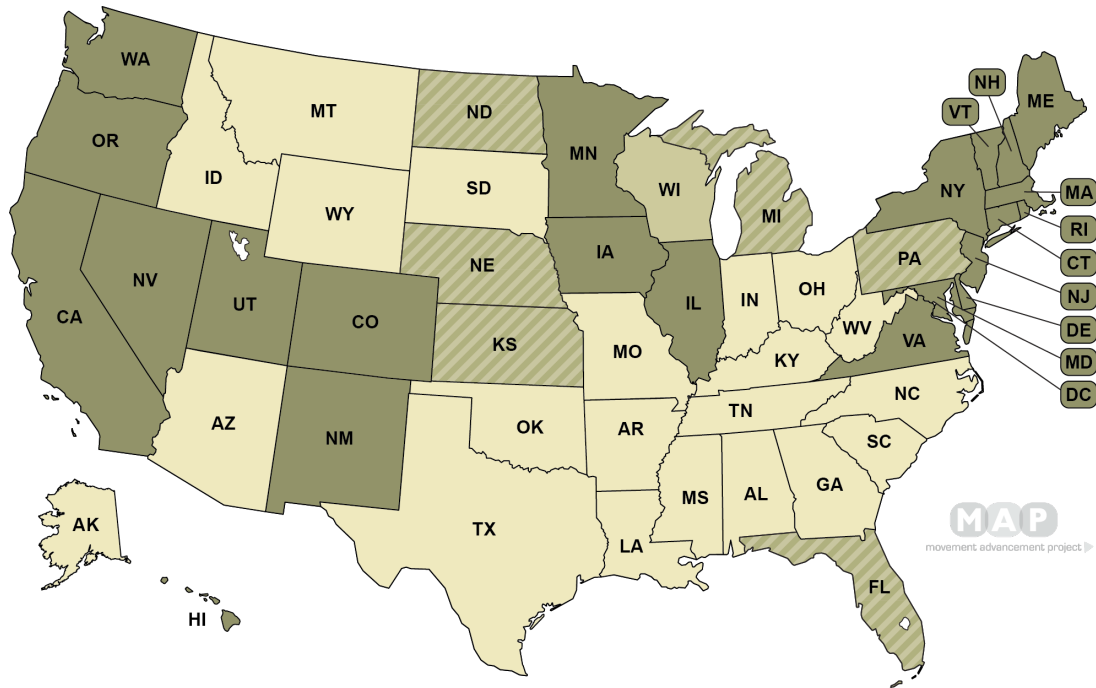
Guam





Puerto Rico

U.S. Virgin Islands



Credit and Lending Protections



-  State law explicitly prohibits discrimination in credit based on sexual orientation and gender identity (15 states, 0 territories)
-  State explicitly interprets existing prohibition on sex discrimination to include sexual orientation and/or gender identity (see note) (1 state, 0 territories)
-  State law explicitly prohibits discrimination in credit based on sexual orientation only (0 states, 0 territories)
-  No explicit prohibitions for discrimination in credit based on sexual orientation or gender identity (35 states, 5 territories + D.C.)

MAP
movement advancement project

U.S. Territories

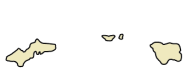
American Samoa

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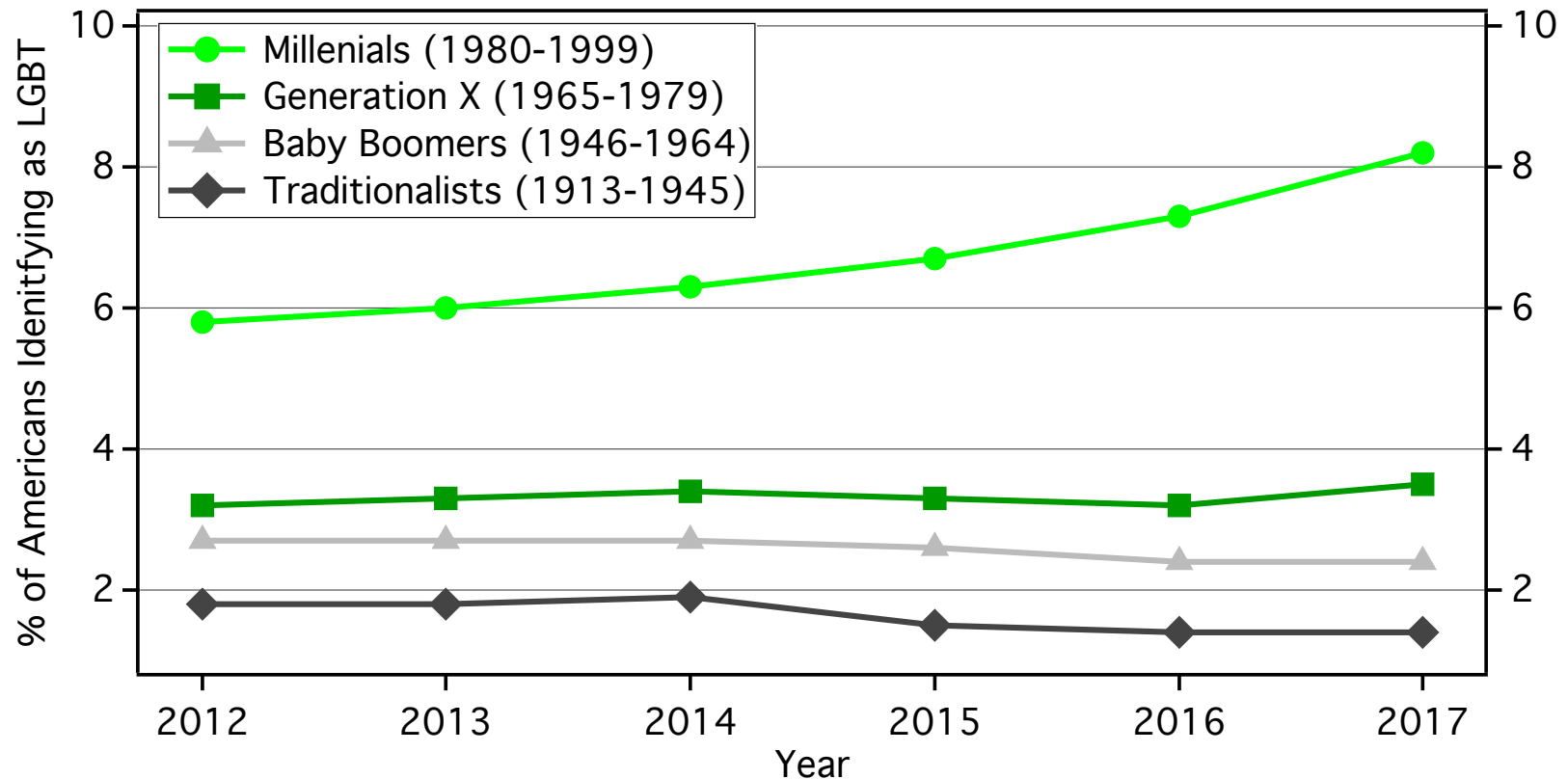
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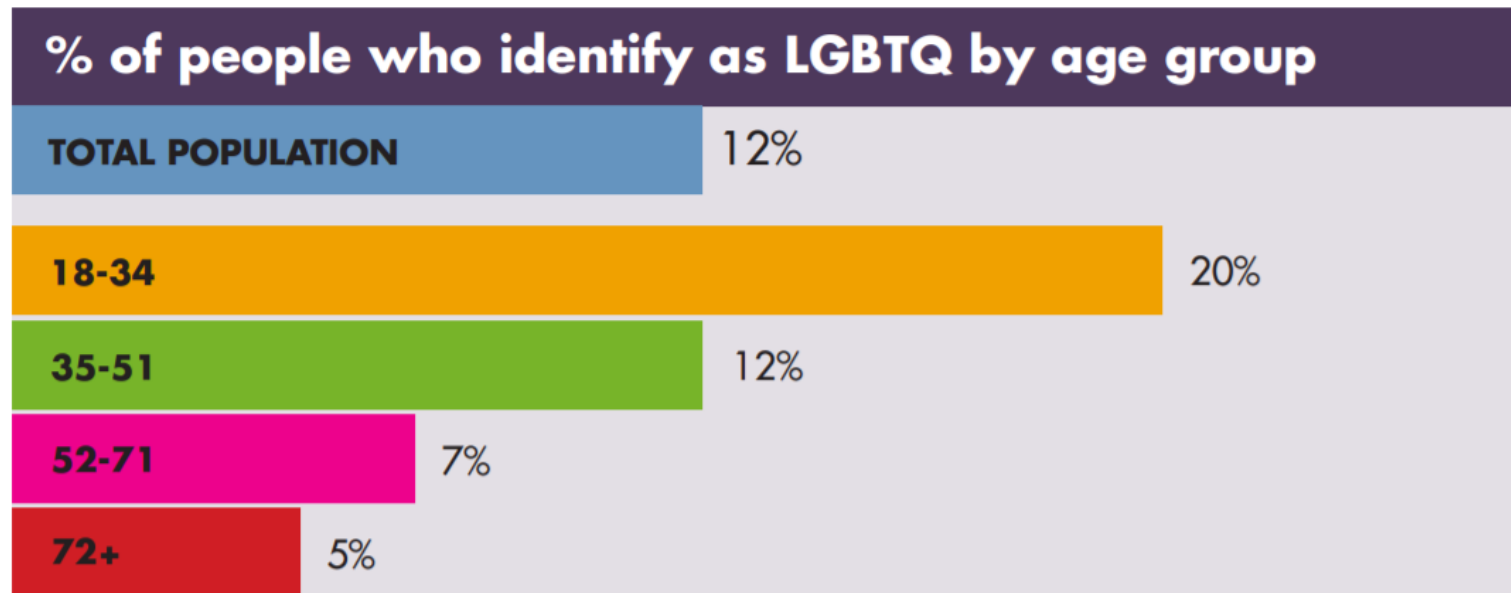


National Demographics



National Demographics

2017 GLAAD Accelerating Acceptance Survey



https://www.glaad.org/files/aa/2017_GLAAD_Accelerating_Acceptance.pdf

National Demographics

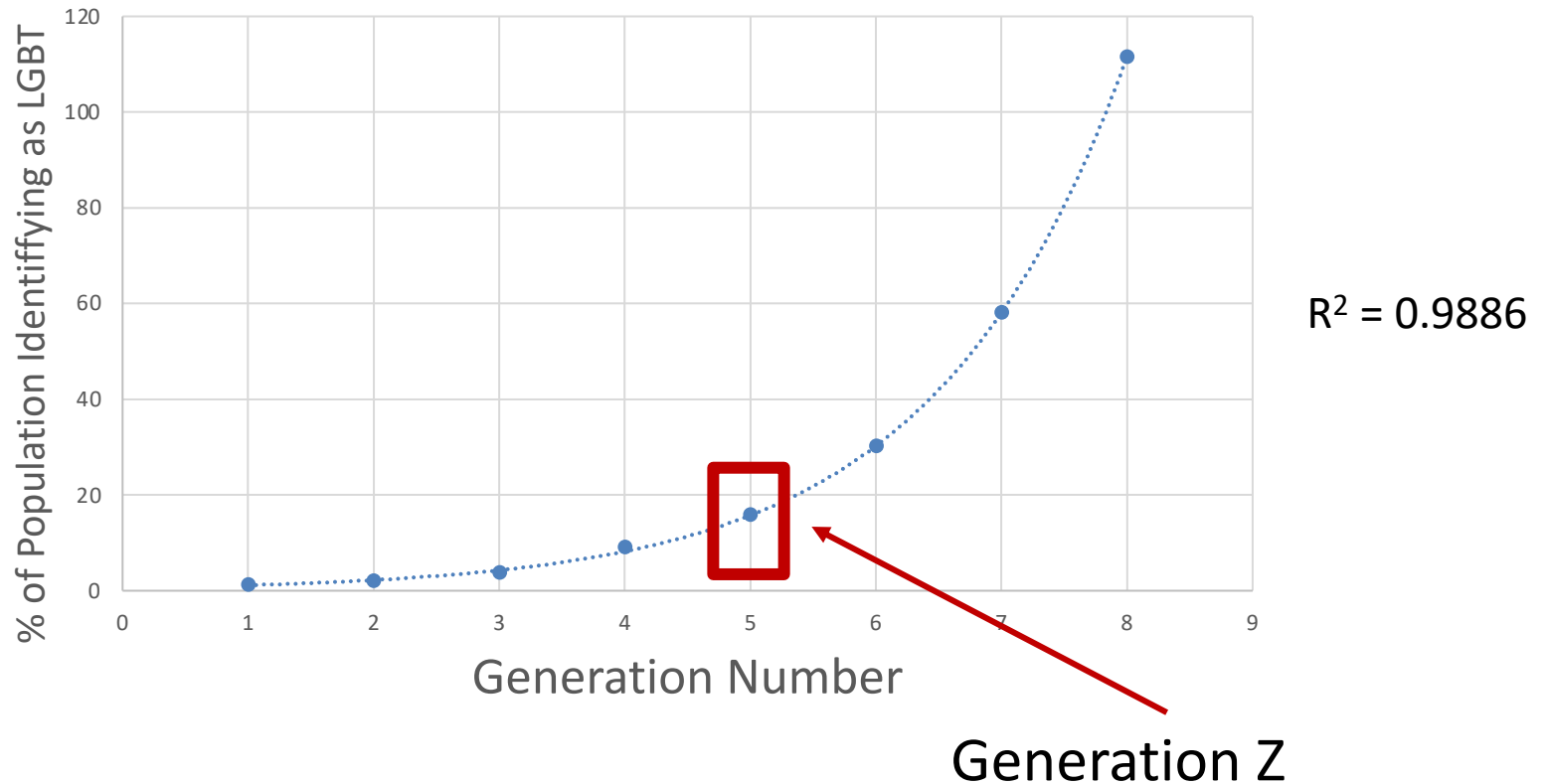
Gallup Poll – February 2021

Americans' Self-Identification as LGBT, by Generation

	LGBT	Straight/Heterosexual	No opinion
	%	%	%
Generation Z (born 1997-2002)	15.9	78.9	5.2
Millennials (born 1981-1996)	9.1	82.7	8.1
Generation X (born 1965-1980)	3.8	88.6	7.6
Baby boomers (born 1946-1964)	2.0	91.1	6.9
Traditionalists (born before 1946)	1.3	89.9	8.9

GALLUP, 2020

Inappropriate Extrapolation Using an Exponential Function



Within 3 generations 111% of the population will identify as LGBT!

National Demographics

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GALLUP, 2020

If LGBTQ+ Students don't feel like they belong in our classrooms we're in big trouble.

CU Boulder Statistics

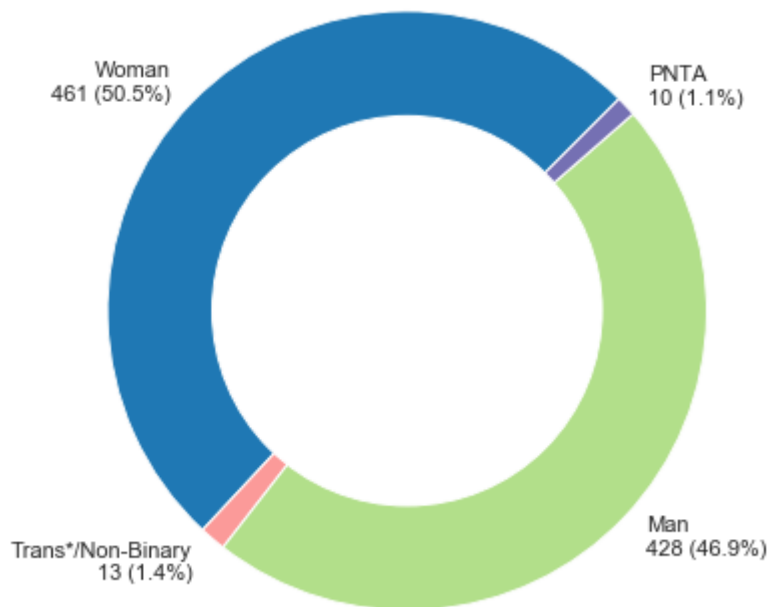


11% of students on campus identify as LGBTQ+

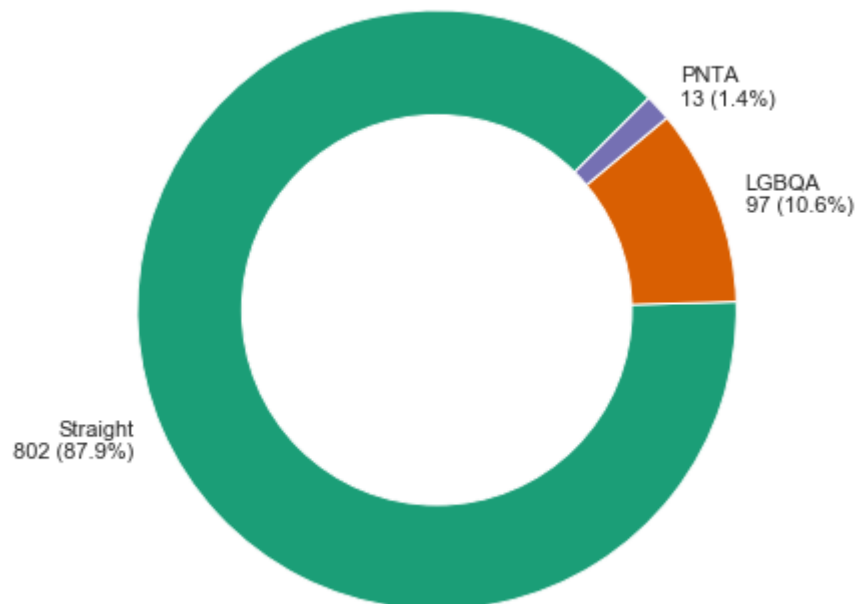
~1% of students on campus identify as trans* or non-binary

Data from the 2015 Sexual Misconduct Survey

Our General Chemistry Students?




Gender



Sexual Orientation

Official statistics for the class only report male/female.
Historical data for this course shows the class consistently has a ratio of
~55% male, 45% female.

Some Open-Ended Responses from Students

- “Make office hours less intimidating.”
 - “Introduce yourself with pronouns (like some other departments /communities do) and don’t assume pronouns.”
 - “Show that there are people like me in chemistry.”
 - “I think they should use more gender neutral language as a precaution (ex. You all versus you guys).”
- 

Some Open-Ended Responses From Students

“As a female, having female instructors/professors is encouraging, and makes me feel as though I can in fact succeed as a woman in a STEM field.”

“I don't feel that my sexuality excludes me from the scientific community or makes it so I can't succeed. If anything it might be more about gender and people assuming that women can't succeed in Chemistry, but I don't really feel that in my class.”

“Thanks for including asexual in the questionnaire, I felt represented.”

“Overall, STEM classes tend to single out and make students that identify as female or are of an ethnic minority uncomfortable because of the lack of representation. Students are often asked to speak on the behalf of everyone who identifies as such group and or targeted because of their "new" perspectives.”

“I've heard there is a sort of community for LGBT Engineering students, so it might be a nice/cool idea to set up a similar thing with LGBT chemistry students.”




Some Open-Ended Responses From Students

“Frankly, my classes are ruined by overconfident white males, who value their own voices over the voices of others.”

–White Bisexual Man in a STEM Major.

“A lot of students are trying to attend Graduate school after their Undergrad and many students feel that the professors are not on our sides. Fairness in exams and assignments should be catered to the students in order to help us achieve our goals, not keep us from them.”

What is one thing the chemistry department could do to help you feel that you belong in the chemistry community?

- “Is there even much of a community? I just go to my lectures but I would never use the word ‘community.’”
 - “Is there really a chemistry community?”
 - “There is no chemistry community and life is an illusion. Seriously IDK if being part of any sorta chem community would really help me like it’s such a big class. There is no community in that. So smaller classes... preferably ones that aren’t 90% male.”
 - “Allow people to meet others and bring others together. Make it not feel like a "dog eats dog" world. It's only gen chem 1.”
- 

What is one thing the chemistry department could do to help you feel that you belong in the chemistry community?

- “I already feel the chemistry department has plenty of people “like me” that I encounter in my day to day (my professor is an Indian woman, one of my recitation TAs is a woman, and my lab TA is a woman). I feel very well represented...”
- “Encourage the creation of study groups and provide means to create those.”
- “Hold open houses to meet professors and researchers.”
- “Hire more women of color.”

Some Conclusions

- LGBTQ students have a lot of the same concerns as a lot of the other students in our classrooms
 - They want a space to learn.
 - They want more resources to help them practice and succeed
 - They want to be seen/heard.
- Very few of our students feel like there is a community in chemistry.
- We need to be thinking about how we build community in large classroom spaces.
- Diversity in the instructors for chemistry is something we have working in our favor right now.
- **Making our classrooms more welcoming for LGBTQ+ students can make our classrooms better for everyone!**

What can we do?

- Sometimes smaller class sizes aren't an option.
- I have a “name card” survey in all my classes
 - I've moved it digital!
 - Ungraded survey that students can fill out with their preferred name, pronouns, and favorite song
 - It's quick and easy for me to search when I'm answering emails.
 - For my smaller classes I make a study playlist of everyone's favorite songs on spotify.
- Pronouns in your email signature
- Scientists you might not know slides
- Safe Zone Training

Acknowledgements

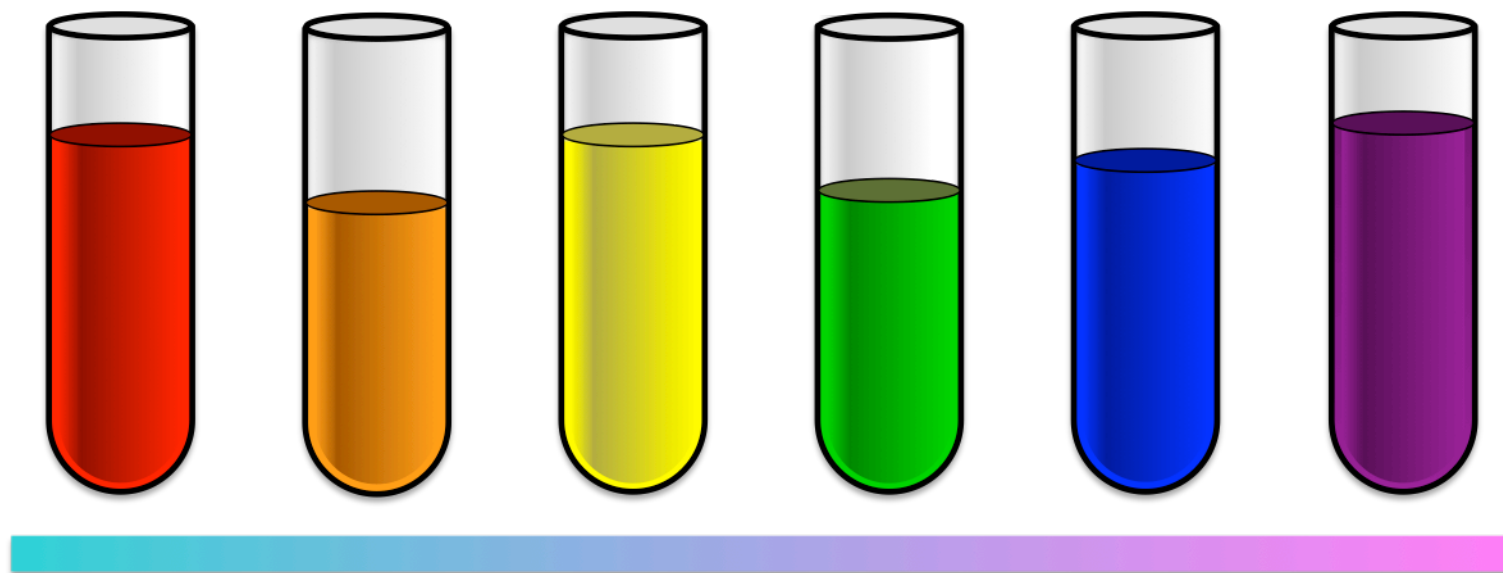
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 - Dr. Parson
 - Dr. Palmer
- Center for the Study of Origins – University of Colorado



Center for the Study of Origins



Thank You!



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