Supporting multiple identities in informal spaces: Examining design choice

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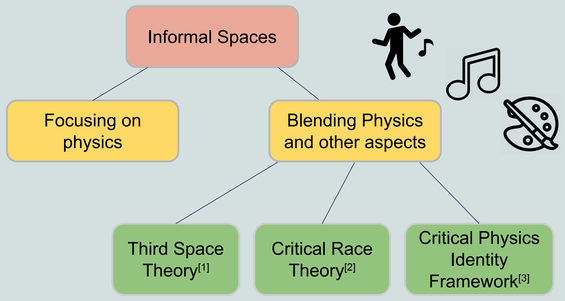
Understanding Equity Within Informal Spaces

- Aiming to critically look at informal physics spaces through Critical Race Theory (CRT) and Critical Physics Identity (CPI)
- Specifically focusing on informal physics programs that intentionally blend physics with other interests
  - This blend creates a third space between the first space of home life/hobbies and the second space of school sciences
- Preliminary research focuses on one interview the a program coordinator for "Artistic Physics"



Interview with Informal Physics Program Coordinator

Taylor

- Taylor is white, English speaking Outreach coordinator at a predominately white midwestern institution for physics research
- Taylor identifies with a marginalized population
- Taylor is the program coordinator for Artistic Physics
  - a week long summer camp with 300 student participants
- Taylor was virtually interviewed by two white, female researchers
- Interview transcript was analyzed using CRT and CPI by myself

Please see QR code for complete reference list, draft of PERC paper, and copy of this/related posters

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Partial reference list:
[1] Moje, E. et. al. "Working toward third space in content area literacy: An examination of everyday funds of knowledge and Discourse." *Reading Research Quarterly*. Vol. 39, No. 1. 2004.
[2] Delgado, R., Stefancic, J. *Critical race theory: An introduction*. New York, NY: NYU Press. 2012.
[3] Hayter-Adams, S., et. al. "Critical look at physics identity: An operationalized framework for examining race and physics identity." *Physical Review Physics Education Research*. Vol 14. 2018.

Analysis Steps:

1. Use Critical Race Theory (CRT) to code the interview

1. Racism is ordinary and endemic
2. Interest convergence
3. Race is a social construct
4. Counter storytelling
5. Anti-essentialism and intersectionality

2. Use Critical Physics Identity (CPI) to code the interview

1. Recognition
2. Competence/performance
3. Interest
4. Material Resource
5. Relational Resource
6. Ideational Resource

3. Identify overlap between CRT and CPI within interview

CRT and CPI Frameworks Illuminate Important Design Choices

Intersectionality
Offering reduced or free camp tuition; advertisement for the camp through diverse languages

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Material Resource
Low cost or free tuition; teachers are paid to create lesson plans; free transportation for campers; advertisement in many languages; volunteers who are physicists, engineers, and artists

*"And so the first year, [...] **if you knew about the camp, you got in**, and if you didn't, you didn't. [Then] **I started sending in flyers to targeted schools**, I've made **flyers in different languages** to send to different community centers. I realized that with our lower income areas, even though they can go to camp for free [...] **they still were having travel issues**. So getting to campus at 9:00 AM, being picked up at 5:00 PM was an issue. So [...] I actually sent an undergrad in a car to go pick the kids up to bring them to camp for the week. **[W]e tried to make it representative of [the local area]**."*

Racism is Ordinary
Discipline issues that arose because of the diversity of campers and counselors

Counter Storytelling
Hands-on activities; activities that include storytelling and different cultural elements; volunteer physicists with wide range of identities

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Recognition
Providing positive science experiences; teen counselor program for previous campers; activities grounded in a diversity of cultures

Relational Resources
University volunteers, local teachers, and teen counselors; small groups of campers; differing ages of campers interacting with the same activities; counselors with experience with autism spectrum

*"I always try to have a **Black man as a counselor to be a role model for the younger kids**. I try to have **at least a couple of Latino people as role models** for the kids. [...] In terms of the volunteers, I get the students that I get and **physics is not diverse, so most of my volunteers are not going to be diverse.** But of course, that said, in physics women and minorities are more likely to volunteer for things. So you get an unrepresentative group of your students volunteering."*

Counter Storytelling
Hands-on activities; activities that include storytelling and different cultural elements; volunteer physicists with wide range of identities

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Recognition
Providing positive science experiences; teen counselor program for previous campers; activities grounded in a diversity of cultures

Interest
Connecting physics with other interests such as art; content relating science to participants' lives; creative and hands-on activities; enthusiastic facilitators

*"One other thing is when I'm building the activities, **I look at different sites to try to make sure that they're inclusive.** So there's this whole series put out by people in Washington on inclusive STEM. [...] They talk a lot about how **storytelling can bring in non-Western cultures in different ways and make the activity more persona**l to them if you ask the kids first what they know about it through storytelling. [...] And so **I do bring in different cultural activities, Celtic knots, different African math games.** So I do make an effort in the activities to **bring activities from different cultures, but also input inclusive ideas in there.**"*

Future work:

Code 3 more interviews that have been collected with program facilitators → **Analyze coded interviews and revise data collection methods (ie new protocol)** → **More interviews & more analysis** → **Create list of best practices for considering equity within informal physics spaces** → **Create informal physics space that can support the development of multiple identities**