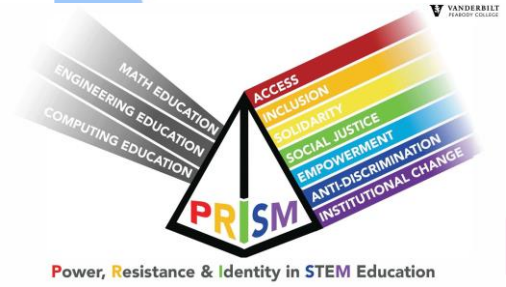
: LuisLeyvaEdu

Inclusive curricular opportunities for undergraduate Black STEM students across intersections of race, gender, and sexual identities



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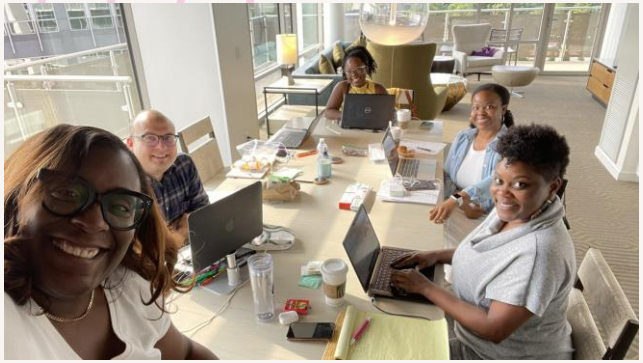
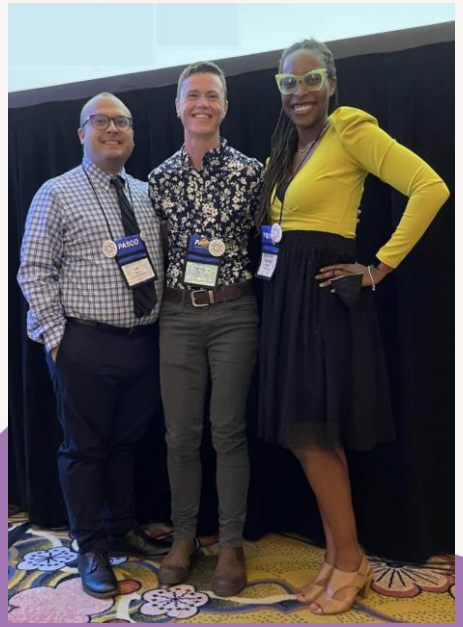
NASEM Roundtable on Black Men & Black Women in Science, Engineering & Medicine





Researcher Positionality

Cuban-American, queer cisgender man raised by immigrant parents

Undergraduate mathematics major and certified P-12 teacher in New Jersey

Professional experience in STEM support initiatives for underrepresented students

Writing in solidarity and community is a core value as a activist-oriented educational researcher

Intersectionality of Educational Experiences among Black and Latin* STEM Majors

Leyva, L. A., McNeill, R. T., Balmer, B R., Marshall, B. L., King, V. E., & Alley, Z. D. (2022). Black queer students' counter-stories of invisibility in undergraduate STEM as a white, cisheteropatriarchal space. *American Educational Research Journal*, *59*(5), 863-904.

Leyva, L. A. (2021). Black women's counter-stories of resilience and within-group tensions in the white, patriarchal space of mathematics education. *Journal for Research in Mathematics Education, 52*(2), 117-151.

Leyva, L. A. (2018). The counter-storytelling of Latinx men's co-constructions of masculinities and undergraduate mathematical success. In A. Weinberg, C. Rasmussen, J. Rabin, M. Wawro, & S. Brown (Eds.), *Proceedings of the 20th Annual Conference on Research in Undergraduate Mathematics Education* (pp. 1031-1040). San Diego, CA.

Leyva, L. A. (2018). Braids, glasses, and (Black guy) nerdiness: An intersectional counter-storytelling of Black college men's stereotype management in mathematics. Paper presented at the American Educational Research Association Annual Meeting. New York, NY.

Leyva, L. A. (2016). An intersectional analysis of Latin@ college women's counter-stories in mathematics. *Journal of Urban Mathematics Education, 9*(2), 81-121.

Funding Sources:

NATIONAL ACADEMY of EDUCATION

spencer

VANDERBILT PEABODY COLLEGE

Study Design

EVENT JOURNALING: Ongoing report of positive and negative events from everyday experiences as Black students across STEM contexts

STEM AUTOBIOGRAPHY: Written reflection about most memorably positive and negative STEM experiences, socially affirming spaces, and influential people

INDIVIDUAL INTERVIEWS: Semi-structured, 60-90 minute dialogue about:

- being Black in STEM;
- influences on academic pursuits;
- coping strategies for persistence in STEM majors; and
- recommendations to promote inclusion in STEM

Member checking

GROUP INTERVIEWS: Semi-structured, 90-120 minute dialogue about themes from published research on marginalized identities in STEM. Some examples of themes:

- teacher-student interactions in the classroom;
- stereotypes of mathematical ability in peer relationships; and
- cisheteronormativity in STEM teaching.

Key Findings

THEME 1: Disrupting Erasure of Black Experiences in STEM Curricula

We have a **very broken healthcare system, and just working to fix that from the inside is very important to me**. . . . A lot of my things [medical career motivations] were about race. It was about race, and poverty, and single-class families [sic]. And those aspects of my identity [are] really strongly tied into it, because there's **a disproportionate amount of Black people that these circumstances [conditions of substandard healthcare] are happening to**. . . . When you tie in the sexuality piece though, oh Lord. . . . It is ridiculous. **When you look at how trans people of color are treated in healthcare, it is atrocious** . . . potentially criminal. . . . When I learn about these things, there's a rage that's definitely there, but . . . **I try to convert that into a positive energy to power my career aspirations.** (Marcus, Individual Interview 1)

Leyva, L. A., McNeill, R. T., Balmer, B R., Marshall, B. L., King, V. E., & Alley, Z. D. (2022). Black queer students' counter-stories of invisibility in undergraduate STEM as a white, cisheteropatriarchal space. *American Educational Research Journal*, *59*(5), 863-904.

Key Findings

THEME 1: Disrupting Erasure of Black Experiences in STEM Curricula

It's coming from sociology classes, anthropology classes, history classes. . . . **I learned the fact that interventionist medicine exists [there] . . . community medicine, social medicine, all those.** I started looking into them. I'm like, ''What kind of doctor do I want to actually be?'' And I've pretty much decided. . . . I don't want to work in a hospital. I want to work at a clinic, maybe, and then do primary care, looking at families and people and maybe even an LGBTQI health center. . . . **It wasn't necessarily my STEM classes—more so the humanities classes that opened my mind to the broader world.** (Marcus, Individual Interview 1)

Leyva, L. A., McNeill, R. T., Balmer, B R., Marshall, B. L., King, V. E., & Alley, Z. D. (2022). Black queer students' counter-stories of invisibility in undergraduate STEM as a white, cisheteropatriarchal space. *American Educational Research Journal*, *59*(5), 863-904.

Key Findings

THEME 2: Fostering Within-Group Support through Peer Collaborations

I also think that **sometimes diversity, sometimes people look at it negatively. . . . It pits people against each other, like too competitive.** This is kind of the opposite: I feel sometimes I see someone like me succeeding, and I'm like, "OK, I'm motivated now to keep going." . . . **I was brought up where I was the only Black person in the class, and then you see another one, and you feel, "Well, there's only supposed to be one."** (Sierra, Group Interview)

Leyva, L. A. (2021). Black women's counter-stories of resilience and within-group tensions in the white, patriarchal space of mathematics education. *Journal for Research in Mathematics Education, 52*(2), 117-151.

Key Findings

THEME 2: Fostering Within-Group Support through Peer Collaborations

In chemistry class, there is me and two other African American girls. . . . **I don't know why they just didn't talk to me and I didn't talk to them.** I never had anything against them, but **they just helped themselves, helped each other pass the class and I'd have to help myself** and study hard on my own. I know they did well because they bragged about how well they did, but then **I felt I needed to do better than them because I just have to.** (Bia, Individual Interview)

Leyva, L. A. (2021). Black women's counter-stories of resilience and within-group tensions in the white, patriarchal space of mathematics education. *Journal for Research in Mathematics Education, 52*(2), 117-151.

Key Findings

THEME 2: Fostering Within-Group Support through Peer Collaborations

It's different when you see someone else [like you], and you're like, **"Do I need to work as hard as I was working before to prove myself?"** or "Can I just be myself and take the math class without having to like feel I have to do well because somebody's watching me?" or **"Should I because I have to prove that it's not just her who can do well, it's everybody?" I have to prove that more than one minority can make it. It's not a special case.** (Sierra, Group Interview)

Leyva, L. A. (2021). Black women's counter-stories of resilience and within-group tensions in the white, patriarchal space of mathematics education. *Journal for Research in Mathematics Education, 52*(2), 117-151.

Implications for Undergraduate STEM Curricular Design

- Partnerships between STEM and social science departments for developing curricular opportunities that nurture Black students' justice-oriented pursuits of STEM majors

- Peer collaboration in classrooms disrupts dominant views of doing mathematics as a solitary endeavor and expands opportunities for building Black peer networks of support

- Co-constructing norms of participation in STEM classrooms mitigates the influence of stereotyping in peer collaborations and creates space for Black learners' contributions

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Thanks!

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