

UNDERGRADUATE LATIN* QUEER STUDENTS' INTERSECTIONALITY OF MATHEMATICS EXPERIENCES: A BORDERLANDS PERSPECTIVE

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The cisheteropatriarchal climate of STEM education shapes oppressive experiences for queer and trans (QT) students majoring in the sciences. Intersectionality of STEM experiences for QT students of color is missing in the literature. Thus, it has been unexplored how undergraduate STEM as a racialized space shapes variation in experiences among QT students. Such intersectional analyses are especially necessary in mathematics -- a discipline socially constructed as 'neutral' despite being a gatekeeper to STEM degrees for historically marginalized groups. To address this area of needed research, this paper presents findings from an analysis of undergraduate Latin* QT students' intersectionality of mathematics experiences as STEM majors with a focus on peer relationships. I conclude with implications for research and practice to disrupt mathematics education as white, cisheteropatriarchal space.*

Keywords: gender, intersectionality, Latin*, sexuality

Introduction

Ximena (they/them), a Mexican agender¹ pansexual person in their senior year of college studying mechanical engineering, considered dropping the major due to invisibility of their identity that made them question their ability. They saw mathematics education as valuable for increasing historically marginalized populations' access to engineering and other STEM careers.

A lot of it [dropping engineering] had to do with imposter syndrome. And I think a big influence within that was lack of visibility. I really felt like I didn't fit in because everyone in my class is a male or white... When I was going to drop out, I was going to switch to math teaching... Even when I become an engineer, I want to help students understand math because I feel math can be a way to gatekeep these really good jobs... Math should be accessible, so that's why I was like, 'I'll just pursue that'... I want to inspire people of color and people in the Latinx community and queer folks to go into these STEM jobs... I want to stop it from being all just straight white men.

This perspective reflecting Ximena's use of their role as a mathematics educator to diversify scientific professions was shared during their individual interview as a participant in my research study about the experiences of queer and trans*² (QT) students of color in STEM majors. The narratives of undergraduate QT students of color in STEM like Ximena are central to the study's analysis to understand their experiences of intersectionality (Crenshaw, 1991), which refers to

¹ *Agender* is a gender identity of being genderless.

² *Queer* refers to all marginalized sexual and nonnormative gender identities. *Trans** describes individuals who depart from their assigned gender at birth and move across socially-constructed boundaries in normative views of gender, including those who do and do not pursue medical gender-affirming treatment as well as those who identify with binary and nonbinary genders (Nicolazzo, 2017). The term's asterisk, much like in computer searches, ensures broad inclusion of gender identities and expressions (e.g., transgender, transfeminine, trans man, transsexual). To avoid reinforcing trans* erasure, I use the phrase *queer and trans** and the corresponding acronym *QT*.

multiply-marginalized people's unique forms of oppression and agency at the juncture of racism and other overlapping systems of power. Ximena's quote conveys agency to use mathematics education in addressing the systemic issue of limited diversity in STEM, which transpired into a distinctly intersectional experience of invisibility as a Mexican queer engineering student.

Prior research has importantly shown how cisheteropatriarchy (i.e., a system of oppression that marginalizes QT people and cisgender women by reinforcing heterosexual and cisgender identities as normative and upholding misogyny) shapes undergraduate STEM as oppressive for QT students (Cech & Waidzunas, 2011; Miller et al., 2020). However, QT students of color were underrepresented in study samples, and the lack of intersectional analyses left implicit how racism figured into QT students' experiences of cisheteropatriarchy in STEM. The present analysis addresses these limitations in extant research by exploring variation in experiences of oppression and agency among undergraduate Latin*³ queer STEM majors like Ximena. This analysis comes from a larger study that exclusively sampled Black, Latin*, and Asian QT students in STEM to examine variation in intersectionality specific to race, gender, and sexuality.

My analysis pays particular attention to the influence of mathematical contexts on Latin* QT students' experiences while pursuing STEM majors. As raised in Ximena's opening quote, mathematics has played a long-standing role in higher education as a gatekeeper to STEM degrees and careers for historically marginalized groups. For example, research has shown that Latin* students' racialized experiences in undergraduate mathematics have a major influence on perceptions of their academic ability and decisions to continue coursework required for STEM majors (e.g., Leyva, 2016; Oppland-Cordell, 2014). Epistemologies of neutrality and objectivity in mathematics, which are rooted in ideologies of antiBlack racism (e.g., colorblindness) and cisheteropatriarchy (e.g., gender neutrality), insidiously reinforce the discipline's oppressive nature through educational opportunities that frame social identities and experiences as irrelevant (Gutiérrez, 2017; Leyva, McNeill & Duran, 2022; Martin, 2009). Constructions of mathematics as 'neutral,' therefore, also marginalize QT learners who may internalize that their queerness is distracting or unwelcome due to pervasive silence about their identities (Kersey & Voigt, 2020; Yeh & Rubel, 2020), which may negatively impact their STEM persistence (Leyva, McNeill, Balmer, et al., 2022). Mathematics education must be interrogated to inform instructional and support practices that affirm historically marginalized identities in STEM. An intersectional lens of analysis allows for complex insights that are essential to developing such practices, which are less readily attainable when attending to only a single axis of social oppression. The present study advances such inquiry in undergraduate mathematics research where QT students' racialized experiences went unaddressed (e.g., Voigt, 2022) and intersectionality among Latin* students specific to QT learners was an unexplored area of study (e.g., Oppland-Cordell, 2014).

The PME-NA 44 conference theme, "Critical Dissonance and Resonant Harmony," addresses how experiences of dissonance are "necessary for change and liberation" in struggles for justice across educational and societal contexts. Harmonious justice is characterized as resonance in multiple stakeholders amplifying each other's voices in disrupting oppressive forces tied to racism and overlapping systems of power. Applying the PME-NA 44 theme as a lens to interpret Ximena's opening quote, the invisibility of Latin* and queer students in engineering and STEM more broadly shaped dissonance between their intersectional identity and mathematical contexts

³ The asterisk in *Latin** considers fluidity in gender identities across the Latin American diaspora (Salinas, 2020). The term *Latin** responds to (mis)use of *Latinx*, a term reserved for gender nonconforming peoples of Latin American origin and descent (Salinas & Lozano, 2019). When describing student participants in the present analysis who did not identify as trans*, I use the phrase *Latin* queer*. Otherwise, I used the broader descriptor *Latin* QT*.

that produced feelings of imposter syndrome. Ximena's agency through their motivation to teach mathematics depicts an effort to seek justice by dismantling gatekeeping to STEM careers. Such effort fosters resonance for future generations of Latin* QT students between their identities and STEM pursuits. The following research questions for the present study are framed to examine dissonance and agency across Latin* QT students' intersectionality of mathematics experiences:

1. What oppressive contexts of mathematics education contribute to Latin* QT students' experiences of dissonance as STEM majors?
2. What agency do Latin* QT students exhibit to manage intersectional oppression from dissonant experiences in mathematics and protect their identities while pursuing STEM?

In what follows, I present the study's guiding theoretical perspective and methods to address the research questions. This paper presents findings specific to peer relationships in mathematics that shaped Latin* QT students' intersectionality of experiences. I conclude by discussing the study's scholarly significance and implications for educational research and practice.

Theoretical Perspective

The theory of *borderlands* (Anzaldúa, 1987/2007) from Chicana feminist thought served as the guiding theoretical perspective for the study. As a theory of the flesh (Moraga & Anzaldúa, 1981/2021), Gloria Anzaldúa drew on her lived experience to develop borderlands as a lens for theorizing intersectional oppression and agency. Borderlands theory captures how an individual at the juncture of multiple, contradictory systems of power (e.g., racism, misogyny, homophobia) can experience an oppressive sense of liminality and ambivalence that can also be a site for transformative resistance. Anzaldúa, a sixth-generation Chicana lesbian born in Texas near the U.S.-Mexico border, described this push-pull dynamic between racialized constructions of nation-state and cisheteropatriarchy at the juncture of these two power systems:

As a mestiza, I have no country, my homeland cast me out; yet all countries are mine because I am every woman's sister or potential lover. (As a lesbian, I have no race, my own people disclaim me; but I am all races because there is the queer of me in all races). (p. 102)

This experience of liminality for Anzaldúa and other multiply-marginalized individuals is theorized to be existing at the borderlands, wherein *la frontera* (the border) is a "metaphor for all types of crossings – between geopolitical boundaries, sexual transgressions, and the crossings necessary to exist in multiple linguistic and cultural contexts" (Cantú & Hurtado, 2012, p. 6). Borderlands theory "seek[s] enlightenment of the ambiguity and contradiction of all social experience" (Cantú & Hurtado, 2012, p. 5) to generate complex insights into multiply-marginalized individuals' intersectionality of experiences.

There are three key constructs from borderlands theory that provided a foundation for the present study. First, *Nepantla* (liminality) refers to the space of being neither here nor there and the multiplicity of realities, as depicted in Anzaldúa's quote above, where new knowledge is produced. This space is characterized by *la mezcla* (the hybridity) at the borderlands of competing sources of power, which generates new understandings of the world that inform multiply-marginalized individuals' ability to engage in border-crossings. Second, *mestiza consciousness* refers to individuals' outsider-within knowledge at the borderlands. This critical awareness of not being fully accepted on either side of the border is an empowering source of knowledge for challenging oppressive dualities and coming into one's full, intersectional identity. Anzaldúa (1987/2007) argues that mestiza consciousness provides individuals with a

sense of *conocimiento* (familiarity with) that allows for an interconnected understanding of others' experiences at the borderlands. This knowledge production is a foundation for building coalitions and advancing collective action against intersectional injustices. Finally, *la facultad* (ability) refers to individual agency in leveraging knowledge produced through a sense of liminality at the borderlands to engage in border-crossings and resist oppressive systems.

Borderlands is a foundational theoretical perspective in scholarship advancing justice for QT people of color (Brockenbrough, 2015; Ferguson, 2004; Kumashiro, 2001), including work specific to Latin* QT communities (Aguilar-Hernández & Cruz, 2020; Hames-García & Martínez, 2011; Hernández et al., 2021; Rodríguez, 2003). To illustrate, the concept of *mestiza* consciousness provided an orientation for the development of gay Latino male studies from a space of solidarity with Chicana and Latina lesbian scholarship (Hames-García & Martínez, 2011). Latin* trans and nonbinary scholars have extended borderlands theory by disrupting its binary conceptualization of gender and sexual oppression to make visible the intersectional realities of border-crossing among Latin* gender nonconforming people (Cuevas, 2018; Hernández et al., 2021). Thus, borderlands theory offers a promising foundation for the present study of Latin* QT students' intersectionality of mathematics experiences as STEM majors.

Methods

The analysis presented in this paper comes from a larger study exploring intersectionality of experiences among undergraduate queer and trans* (QT) students of color pursuing STEM majors. A total of 39 students who identify as Black, Latin*, and Asian, including mixed-race, are included in the sample. The larger study examines students' narratives of oppression and agency to elucidate features of STEM classroom instruction and co-curricular support spaces experienced as affirming or marginalizing of their intersectional identities. For the present paper, I focus on an analysis specific to Latin* QT participants' mathematics experiences.

Study Context and Participants

Participants in the larger study were recruited across four U.S. universities in 2019-2021. The study began in 2019 at Lorde University— a large, research-intensive, elite, and private historically white institution (HWI; see Leyva, McNeill, Balmer, et al., 2022). The research team expanded the study in 2020 to include three large, research-intensive, and public HWI contexts – Ferguson University, Moraga University, and Rivera University. The three public HWIs were purposefully selected for their strong records of success with enrolling and granting bachelor's degrees to Black and Latin* students according to recent higher education policy reports (Excelencia in Education, 2018; Harper & Simmons, 2019). Rivera University received the federal designation as a Hispanic-Serving Institution (HSI). In addition, Moraga University and Rivera University were selected as institutions recognized for their efforts in promoting positive campus life experiences for QT students (Campus Pride, 2020). Ferguson University was also selected for its institutional legacy of preparing undergraduate students from racially minoritized backgrounds to pursue STEM graduate degrees and professional careers.

The purposeful selection of university sites made space for variation in how different institutional contexts and student support offerings shaped intersectionality of STEM experiences among QT students of color. For example, the multi-institutional study design allowed our team to look across student experiences in private and public HWIs across different U.S. regions. Inclusion of the three public universities with strong records of racial equity, including Moraga University as a HSI and Ferguson University with its history of addressing racial inequities for STEM access, served to explore the extent to which culturally-affirming institutional missions

and efforts provided intersectional support in STEM for queer of color identities. Our selection of Moraga University and Rivera University allowed us to consider how nationally-recognized support for minoritized gender and sexual identities impacted QT students of color in STEM.

For participant recruitment, the research team asked staff and student leaders for university offices and organizations to share information about the study with undergraduate networks. These offices and organizations had missions relevant to the scope of the study, including those of social affinity (e.g., queer student alliances), STEM (e.g., American Society of Civil Engineers chapters), and intersections of social affinity and STEM (e.g., Society for the Advancement of Chicanos/Hispanics and Native Americans chapters). See Leyva, McNeill, Balmer, et al. (2022) for details about recruitment across the four universities. The analytical sample for the present paper includes all 16 Latin* QT students from the study. This sample reflected variation in ethnoracial identity (e.g., Colombian, Mexican, Puerto Rican), queer sexual identity (e.g., bisexual, gay, pansexual) and STEM major (e.g., computer science, mathematics, mechanical engineering). Six Latin* participants held gender-expansive identities, such as agender, female/questioning, genderfluid, nonbinary, and transmasculine. Four students attended Lorde University, three attended Ferguson, four attended Moraga, and five attended Rivera.

Data Collection

The research team used five data sources for rich, multidimensional portraits of Latin* QT students' intersectionality of STEM experiences. First, participants completed a demographic survey to collect information about their identities (race, gender, and sexuality), year of study, STEM major, course enrollment, and campus involvement. For participants recruited in 2020-2021 during the COVID-19 pandemic and the transition to remote learning in higher education, the survey asked participants to indicate any preferred accommodations of the study design to ensure comfort with their participation (e.g., addressing privacy concerns about discussing their gender and sexuality via Zoom from home). Second, each participant submitted a STEM autobiography. The autobiographies were written reflections about being QT students of color in STEM, including responses to prompts about memorably positive and negative experiences, socially-affirming academic and co-curricular spaces, and influential people. One autobiography prompt asked participants to reflect on the role that mathematics played in their STEM trajectories as QT students of color and vivid memories from their experiences. The third data source was event journaling (Leyva, Quea, et al., 2021; Leyva, McNeill, Balmer, et al., 2022). Throughout the study, participants kept an ongoing record of events across STEM spaces (e.g., classrooms, study groups) experienced as supportive/encouraging or unsupportive/discouraging of their identities (see Leyva, McNeill, Balmer, et al., 2022 for more details about journaling).

The two final data sources were an individual interview (60-90 minutes) and group interview (90-120 minutes). Participants completed the survey and autobiography prior to the individual interview (Interview 1). Interviews with Lorde University participants were completed in person and before the start of the COVID-19 pandemic. Interviews with participants enrolled in other universities were scheduled after the start of the pandemic in 2021 and completed on Zoom. All interviews were semi-structured, audiotaped, and transcribed. Two research team members conducted each interview. To the extent possible, we matched participants and interviewers with similar racial, gender, and sexual identities. Such matching was an effort to increase comfort in discussions about racism, misogyny, cissexism, and heteronormativity in STEM.

Interview 1 explored participants' perspectives on being QT students of color in and out of STEM, major influences on their STEM pursuits, coping strategies for STEM persistence, and recommendations for queer of color inclusion in STEM. The protocol revisited excerpts from

participants' STEM autobiographies and event journaling related to these themes. For participants interviewed during the pandemic, we also explored participants' views on the influence of COVID-19 on their STEM experiences. In particular, participants were asked about standout moments in online/hybrid classrooms that positively or negatively impacted their identities, nature of their campus involvement, and relationships with peers and family members.

After Interview 1, participants completed a group interview (Interview 2). I adopted my group interview methodology of presenting 3-4 prompts for stimulated-responses to explore variation in participants' intersectionality of STEM experiences (see Leyva, 2021 and Leyva, McNeill, Balmer, et al., 2022 for more details about the interview methodology). The prompts in Interview 2 featured excerpts from research about QT students' STEM experiences (e.g., Cech & Waidzunus, 2011; Kersey & Voigt, 2020) and intersectionality of campus experiences among QT students of color (e.g., Nicolazzo, 2016; Vega, 2016). The excerpts provided concrete starting points to stimulate group dialogue about emergent themes from preliminary data analysis, including cisheteronormativity in STEM instruction and perceptions of STEM ability linked to race and gender. To explore variation in opportunities for intersectional support across different universities in our study, one prompt included excerpts that featured reflections from QT students of color in prior research about their experiences of campus climate and identity-related support offerings at their institutions. We followed the presentation of these excerpts with statements about the advancement of diversity and equity at participants' home institutions. These statements were used to probe the extent to which participants perceived opportunities for identity support in their broader campus contexts influencing their STEM pursuits. After participants were presented with each interview prompt, we asked them about their general interpretations, degree of perceived relevance to their experiences, and recommendations for increasing queer of color inclusion in relevant practices of STEM education.

To the best of our ability, each participant who completed Interview 2 was paired with at least one other participant of a similar race-gender identity. Such identity-matching across the group interviews was an attempt to avoid participants feeling their perspectives were tokenized and create space for variation in responses to interview prompts among students with a similar intersectional identity. When we conducted Interview 2 via Zoom with participants after the onset of the COVID-19 pandemic, we also tried to have representation of participants enrolled in different universities for each interview to allow for discussion of similarities and differences in their STEM experiences across institutional contexts. We completed three group interviews with Latin* QT participants who attended different universities but shared a similar race-gender identity (namely, Latina cisgender women, mixed-race Hispanic and Latina cisgender women, and Latine gender-expansive people). For example, the group interview for mixed-race Hispanic and Latina participants included Erica (mixed, cisgender, bisexual Latina of Brazilian descent⁴ in Rivera University), Laura (Mexican and Chinese pansexual female at Ferguson University) and Tamara (mixed-race Hispanic, Peruvian/white masculine woman lesbian at Moraga University).

Data Analysis

The research team used the framework of *STEM Education as a White, Cisheteropatriarchal Space* (WCHPS, Figure 1; Leyva, 2021; Leyva, McNeill, Balmer, et al., 2022) to guide data analysis. The WCHPS framework provides a lens for examining how interplay between racism and cisheteropatriarchy in STEM educational contexts shapes intersectional experiences of oppression and agency for multiply-marginalized individuals, including QT students of color.

⁴ I use wording from participants in describing their identities.

Each framework dimension (ideological, institutional, and relational) attends to a level of influence in STEM education at which white cisheteropatriarchy (the juncture of white supremacy and cisheteropatriarchy) impacts multiply-marginalized individuals' experiences. The ideological dimension addresses beliefs, norms, and values that organize STEM educational practices. The institutional dimension explores structural inequities that constrain opportunities for achievement and participation in STEM, in addition to forms of individual agency in navigating such oppressive structures. The relational dimension addresses interactional forms of oppression and agency in STEM education. These dimensions are interconnected, thus allowing the WCHPS framework to examine how white cisheteropatriarchy shapes intersectionality of STEM experiences in complex ways. Elsewhere (Leyva, McNeill, Balmer, et al., 2022), I provide more details about developing the WCHPS framework.

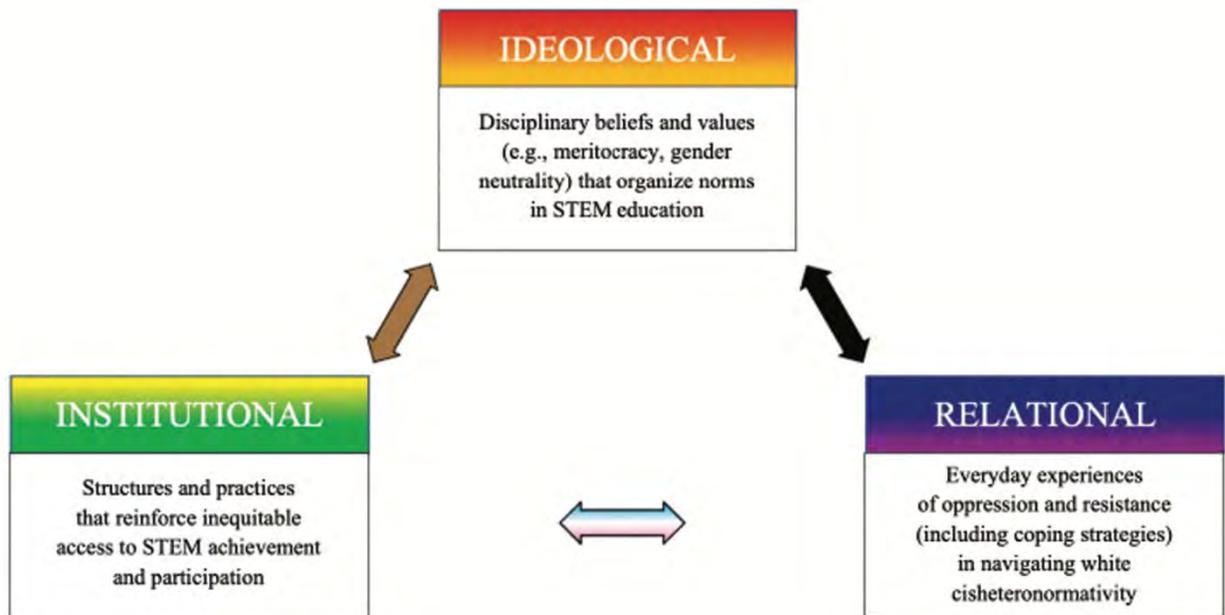


Figure 1: Framework of STEM Education as a White, Cisheteropatriarchal Space

Data analysis was completed in four stages. First, the research team inductively coded participants' data to flag aspects of their mathematics experiences corresponding to each WCHPS dimension. We coded for instances of oppression, supportive forms of structural disruption, and agency across ideological, institutional, and relational levels of Latin* QT students' experiences. (See Leyva, Balmer, et al., 2021 and Leyva, McNeill, Balmer, et al., 2022 for more details about coding.) The second stage of analysis was constructing an analytical narrative for each participant of navigating white cisheteropatriarchy in mathematical spaces as Latin* QT students majoring in STEM. These narratives were developed by following the critical race methodology of counter-storytelling (Solórzano & Yosso, 2022), which centers racially minoritized people's experiences of oppression for theorizing resistance to racism and other interlocking systems of power. Each participant's counter-story was structured around oppression, structural disruptions, and agency across WCHPS dimensions identified in coding.

The third stage of analysis was identifying themes across the 16 Latin* QT participants' counter-stories that address our two research questions. To address the first research question, we identified themes about oppression through experiences of dissonance between participants'

identities and mathematical contexts. We addressed the second research question by identifying themes of agency specific to participants' behaviors and motivations for navigating dissonance to protect their Latin* QT identities and success as STEM majors. The fourth and final stage of data analysis was interpreting the themes through the lens of borderlands theory (Anzaldúa, 1987/2007) and its uptake in Latin* queer studies with an expansive theorizing of gender (e.g., Cuevas, 2018). In particular, the borderlands concept of *Nepantla* served to elucidate how dissonance in Latin* QT participants' mathematics experiences reflected liminality at the juncture of power systems that limited full affirmation of their intersectional identities. *Mestiza* consciousness supplied a lens to account for participants' critical awareness of how white cisheteropatriarchy operated in mathematical contexts, including how it was reinforced through dissonant educational practices. The construct of *la facultad* elucidated Latin* QT students' agency to manage dissonance in mathematics as a white, cisheteropatriarchal space. Overall, our analysis captured how white cisheteropatriarchy in STEM educational contexts shaped the borderlands of Latin* QT students' intersectionality of mathematics experiences.

To sharpen our data analysis, the research team conducted member-check interviews with available participants after data collection was complete. Eleven of the 16 Latin* QT students in the study sample completed a member check. We structured member-check interviews in three parts corresponding to each of the framework dimensions. During each interview part, the interviewers read a section from the participant's counter-story to convey our understanding of oppression, disruptions, and agency at each level of the WCHPS framework. Participants, who were positioned as experts of their lived experiences during the interviews, were prompted to suggest edits and add content to ensure an accurate analysis in their counter-stories. The interviewers also asked participants a series of questions to clarify and further elaborate on important ideas raised in each counter-story section read to them.

Positionality

Our research team (one faculty member, three doctoral students, eight master's students, and two undergraduate students) are members of the Power, Resistance and Identity in STEM Education (PRISM) Lab at Vanderbilt University. The team has robust social diversity across intersections of race (African American, Black, Latin*, biracial, white), gender (cisgender, nonbinary, transmasculine), and sexuality (demipansexual, gay, lesbian, pansexual, queer, heterosexual, unsure). Most of the team collected and analyzed data from Latin* QT participants. Milner's (2017) framework on positionality in educational research guided the team's self-reflections to avoid dangers of approaching our study without consciousness for the influence of our identities and experiences. These reflections avoided the seen danger of not interrogating our respective areas of privilege and oppression. The team adopted an asset-based research approach by making space for understanding Latin* QT participants' agency and resistance in mathematical contexts, thus avoiding the unforeseen danger of readers perceiving QT students of color as powerless victims of oppressive educational systems. To mitigate the unseen danger of misinterpreting participants' sensemaking about intersectionality of their experiences, we completed interviews and coding in pairs to have multiple researcher perspectives present in data collection and analysis procedures. We also completed member checks described earlier to strengthen the trustworthiness of our findings. Team members bracketed their lived experiences from those of participants to avoid the unseen danger of distorting participants' realities, all while remaining critical of oppressive STEM structures and systems through use of the counter-storytelling methodology. I avoided the unseen danger of flattening variation in oppression and agency that Latin* QT students experienced by infusing voices from multiple participants in the

findings, including a cross-case analysis of counter-stories for two participants with different ethn racial, gender, and sexual identities. Although this is a solo-authored piece, I solicited feedback from team members who analyzed Latin* QT participants' data to ensure the final draft of our analysis accurately reflects our collective work.

Findings

Themes across the 16 Latin* QT participants' counter-stories reflected how two mathematical contexts shaped experiences of dissonance and agency: (i) curricula and instruction and (ii) peer relationships. To respect space limitations, I present themes about peer relationships in this paper. I develop themes for curricula and instruction elsewhere (Leyva, 2022, 2023).

Half of the participants (Daniela, Erica, Koyotl, Laura, Ros, Steven, Teresa, Ximena) reflected on how peer relationships produced dissonance with their Latin QT identities across mathematical contexts. One theme was the lack of social diversity in STEM majors and mathematics classrooms, which brought forth feelings of isolation and imposter syndrome as well as struggles to build identity-affirming networks of support. Koyotl (he/him; Indigenous American, gay, transmasculine person of Mexican descent; third-year computer science major in Rivera University), for example, shared how the main impact of mathematics on his experience as a computer science major was making him feel "lonely as a LGBTQ+ student in STEM" (Autobiography). Being in mathematics classrooms, where he was the only queer student to his knowledge and often felt "alone in a room full of white students" (Autobiography), brought him to feel academically inferior to students from majority groups. Similarly, Erica (she/her; mixed, cisgender bisexual Latina of Brazilian descent; third-year computer science major in Rivera University) managed a sense of imposter syndrome due to a lack of peer diversity, which was not the case at the community college from where she transferred and "actively [saw] older students or more students of color" (Interview 1). She reflected on building a strong connection at the community college with an older student who identifies as a lesbian in her pre-calculus course, "We were able to connect over the fact that she was also around my age and came from an arts [background]... That was a really great way of [feeling like] 'Okay, well, clearly I'm not the only older student or I'm not the only queer one'" (Interview 1). Opportunities to build diverse networks of peer support in STEM were limited, which shaped dissonance in Erica's experience.

The second theme specific to peer relationships was marginalization through interactions during collaborations with peers in mathematical contexts, including microaggressions of ability as well as instances of cisgender women being fetishized or hypersexualized. To develop this theme, we look across counter-stories from two Latin* queer STEM participants (Ros and Daniela). The counter-stories are structured in three parts. I open each counter-story with a short biographical sketch of Ros and Daniela. To address the study's first research question about experiences of dissonance, the second part of each counter-story depicts peer relationships that limited affirmation and support for Latin* queer participants' identities as mathematics learners. The final part of each counter-story answers the second research question about agency. In this portion of the counter-stories, I account for participants' behaviors and motivations for managing and resisting dissonance through peer relationships to protect their identities and STEM success. I conclude the findings section by applying borderlands theory and the WCHPS framework in a cross-case analysis of Ros's and Daniela's counter-stories.

Ros's Counter-Story

Ros (they/she/he) is a Mexican, bisexual, and genderfluid person majoring in mechanical engineering as a senior in Rivera University. They saw themselves as being female-presenting and

recognized their privilege of passing as white. Family played a central role in Ros's motivation to succeed as a future engineer. They perceived their academic accomplishments as giving back to their parents for their sacrifices, including how their mother was unable to use her computer engineering degree from Mexico after immigrating to the U.S. Success in mathematics allowed Ros to serve as a role model for younger cousins aspiring to become engineers, "The only introduction my cousins and I had to it [calculus] was through media, and now it's nice to be one of the family members they can come to for help" (Autobiography). Ros felt a strong sense of acceptance as a queer person from his family, which he described as different from "traditional Latino ones" (Interview 1) where homophobia and transphobia rooted in religious beliefs resulted in some of her Latin* friends being disowned or having their queerness disregarded.

In addition to family, peer relationships that affirmed Ros's full identity as a Mexican queer engineering student were important for Ros's persistence in navigating the cisheteropatriarchal culture of STEM. His most positive STEM educational experience was having a peer network of support in high school engineering classes, which he described as "all Latinx and a few were LGBTQ+ as well so [he] always felt like [they] were all on the same plane" (Autobiography). Establishing such peer connections was more difficult as an engineering major with students largely coming from white, wealthy backgrounds and where the space felt "very cishet male-dominated... [and] very masculine" (Interview 1). As further developed in the remainder of Ros's counter-story, the exclusionary space of undergraduate STEM contributed to Ros's sense of vulnerability when meeting and working with unfamiliar peers in different contexts (e.g., study groups, engineering organization meetings). The constant threat of facing homophobic and transphobic microaggressions about their academic ability and queer identity in peer interactions shaped dissonance for Ros in mathematical spaces. To navigate such dissonance as a Latin* queer student, Ros carefully studied unfamiliar STEM peers' interactions to assess if they would be accepting of their queerness before sharing their pronouns and discussing their identities.

Dissonant influences. Dissonance in Ros's mathematics experience as a mechanical engineering major arose from navigating cisheteronormativity in peer interactions. Ros described how their queerness was often overlooked or stigmatized and how they felt underestimated in terms of their academic ability. Ros described facing peers' microaggressions about her mathematical ability couched in humor, "I have heard some jokes along the lines of people finding it interesting that I am skilled in math when 'Queer people are bad at math' is apparently a stereotype" (Autobiography). He expressed uncertainty if such peer humor was coming from a space of homophobia and transphobia or whether it served as a coping mechanism for fellow queer students in STEM, "If you're saying that weird gay joke, does that mean that you're going to be against my identity? Or is it one of those things where... you're also queer and you're just joking about it to cope?" (Interview 1). The ambiguity of humor that invoked microaggressions of mathematical ability produced dissonance in Ros's experience as a queer engineer.

Queer oppression in peer humor was one aspect of a broader culture of cisheteronormativity that Ros experienced in mathematical and scientific spaces. This oppressive culture made Ros feel vulnerable to facing homophobia and transphobia when joining new STEM study groups with unfamiliar peers. To illustrate, Ros recounted their most negative experience as a Latin* queer student in STEM as being when they were misgendered and assumed to be straight during a small study group session for an introductory calculus or physics course.

I went out of my comfort zone to sit at a group with people I didn't know... all of which seemed like cis men minus one woman. As we were getting along, the woman turned to me and said something along the lines of 'It's nice to see another regular girl at these things, it's

always all guys or the girls who come are lesbians.’ It was really jarring to me because I neither identify as a woman nor am I straight so as she said this to me I had to sit with the knowledge that my identity was something she was bothered by. And because I wasn’t familiar with this group, I just chuckled awkwardly and switched the topic. (Autobiography)

The groupmate’s assumption that Ros was a cisgender, heterosexual woman suggests a feeling of relief from patriarchal, male-dominated STEM spaces. At the same time, this assumption points to the cisheteronormative culture of STEM that erases queer people as well as produces undue labor for queer students like Ros about disclosing or concealing their gender and sexuality. Building peer networks in STEM was a taxing endeavor for Ros in terms of constantly preparing themselves for students “making assumptions based on what you look like... [and] mak[ing] comments that are probably going to be hurtful and homophobic and transphobic” (Interview 1).

The dissonance that Ros experienced as a queer person navigating cisheteronormativity in STEM peer relationships also took form in campus meetings for identity-based engineering organizations and programs. Although Ros felt a reprieve from the hypermasculinity of their major in events for women in engineering, the focus on cisgender women produced tensions about sharing their genderfluid identity and made them feel like an imposter, “When I do go to events that are specifically for women, I’m kind of like, ‘Do I say that I don’t identify as a woman? Does that make me not belong in this space even though I appear female?’” (Interview 1). Ros also felt conflict with her queer identity in the university’s chapter for the Society of Hispanic Professional Engineers (SHPE). He described how SHPE’s strong focus on racial affinity, in addition to traditional, culturally-mediated views on gender and sexuality among student members, made expression of his queer identity inaccessible in this Latin* affinity space.

With SHPE, I didn’t so much expand on my gender and sexual identity because... everybody in those spaces bonds over the fact that they identify as Hispanic or Latino, so it’s not as prioritized. They are a little bit better about having pronouns available and all of that at some of their meetings, but most of them, it’s just traditional. And there’s also this stigma... with people who are more traditionally Hispanic... especially first-generation immigrants aren’t always onboard and as progressive when it comes to gender and sexuality. (Interview 1)

SHPE, as a single-identity affinity space that left cisheteronormative beliefs of gender and sexuality in Latin* culture uninterrogated, limited opportunities for Ros to find community with Latin* peers that embraced her full identity. With Ros having received the “biggest backlash... from people with Latino backgrounds against [his] sexuality” (Interview 1), including family members in Mexico, he chose not to engage his queerness with SHPE peers. Dissonance between Ros’s Latin* queer identity and STEM peer groups, including study groups and spaces for identity affinity in engineering, limited peer support that affirmed their intersectional identity.

Agency. One strategy that Ros adopted to navigate cisheteronormativity in peer relationships when working in study groups was not disclosing their queerness right away to protect themselves from homophobia and transphobia, “If I do go into these spaces, I’m not really like, ‘Hey, these are my pronouns. Please respect them. Please respect me.’ I’ll let you assume whatever you want to assume” (Interview 1). Ros described entering new spaces of STEM peer collaboration as “learning how to read the room and learning... what’s going to be acceptable and what’s not going to be acceptable” (Interview 1) in terms of identity expression. Although Ros also experienced transphobia during groupwork in high school, the presence of Latin* QT peers in her engineering classes who “reaffirmed what [she] was feeling and helped [her] work through that whole gender identity thing” (Interview 1) mitigated oppression in collaborations. With the

challenge of building diverse networks of peers who would provide similar forms of support in the engineering major, Ros readily concealed his queerness, much like he did when misgendered in the study group, to cope with the dissonance experienced in STEM peer relationships.

Another behavioral strategy that reflected Ros's agency in managing dissonance as a Latin* queer engineering student was entering new spaces with unfamiliar individuals alongside peers with whom they feel comfort and trust. Ros reflected on the significance of such peer connections as a STEM major, "Making connections has been the biggest thing in finding support with people that you feel comfortable with. It is one of the most essential things I've found to try to get through college with my identities" (Interview 1). To illustrate, Ros developed a close relationship with a queer classmate and SHPE leader whose openness about her identity increased her comfort with attending SHPE meetings. This strategy of "mak[ing] a connection first with the person before going into a space" (Interview 1) depicts Ros's agency in protecting himself from cisheteronormativity at intersections of STEM and Latin* cultures to overcome dissonance that limited access to peer support networks across mathematical spaces.

Daniela's Counter-Story

Daniela (she/her) is a bisexual, mixed-race Latina (Colombian/Cuban and white) in her third-year as a computer science major at Lorde University. Being a mixed-race queer woman meant that "the thing that impacts a lot of [her] experiences is a lack of identity" (Interview 1), especially as someone who sees herself as "be[ing] a part of two cultures and then a part of neither culture at the same time" (Interview 1). This sense of liminality in Daniela's experience made it initially difficult for her to find community on campus as a STEM student. At the same time, Daniela faced peers' racialized and gendered assumptions that her accomplishments were not based on merit but rather affirmative action. This "recipe for imposter syndrome" (Journal) as a mixed-race Latina in STEM made her feel constantly devalued and defeated.

In managing identity-specific challenges and academic struggle in computer science as a difficult major, Daniela built a supportive community of diverse, like-minded peers in and beyond the engineering school. She reflected on how such community supported her STEM persistence as a mixed-race queer Latina, "If there are people that are like you, you can ask them for help and form a community... If I didn't have an engineering community, I don't know what I would do. I'd probably fail" (Interview 1). She identified three sources of peer community: (i) the university's SHPE chapter; (ii) a professional engineering fraternity; and (iii) a group of women of color who met at a conference for gender equity in technology. Representation of queer people and opportunities to exchange stories of identity-based struggles created space for Daniela to comfortably engage her bisexuality in these STEM collectives, which contrasted her STEM classroom experiences where "you leave yourself at the door" (Interview 1). SHPE was also a space where she could be open about the "feeling of not fully being able to own up to [being] Latinx" (Interview 1) and could learn more about Latin* culture, which she felt was taken from her as a child raised to believe that being white was more socially acceptable. The collective of women of color in technology fields, which included another queer student, was a space for openly sharing and processing personal histories of misogyny in STEM. Daniela described how this community of healing and empowerment in STEM conveyed how "from the struggle you can form really good bonds with people" (Interview 1), which they sustained through regular check-ins and sharing professional development resources.

I now highlight how peer relationships in mathematical contexts (namely, fetishizing and sexualizing behaviors from male peers) contributed to Daniela's experiences of dissonance as a

mixed-race bisexual Latina in STEM, which exemplifies the gendered struggles she processed in the women of color collective. Next, I address Daniela's agency in coping with such dissonance.

Dissonant influences. Daniela reflected on how the overrepresentation of white male students in her mathematics classes made her hyperconscious of being fetishized and hypersexualized when interacting with them. Such hypersexualization felt racialized to Daniela as a mixed-race Latina, "In terms of my sexuality... I've had to be very conscious of people fetishizing. So, it's very common for guys to be, 'Oh, I think Latinas are really hot, and I want their mom to make me tacos,' which I find super offensive and creepy" (Interview 1). Daniela described the risk of being hypersexualized when seeking male peers' support with mathematics, "I typically have to [ask] a man, who always makes a sexual advance on me... These advances make it really hard to focus and feel comfortable in math classes. This is especially annoying because math classes are incredibly difficult" (Autobiography). The discomfort Daniela felt from being hypersexualized added to the challenge of understanding content in mathematics courses.

As a computer science major, Daniela was often one of the only women in collaborative groups, which made her feel vulnerable to being hypersexualized, "If I'm working on an assignment with a group of people, that group of people is going to be predominantly male, and they're all going to be making advances, typically. And that's something that's pretty obnoxious" (Interview 1). To depict how "mathematics has always been an awkward experience" (Autobiography) navigating male peers' fetishization and hypersexualization, she recalled being the only woman in a study group where one male placed his foot on hers to keep her from moving away, another invited her to study in his room, and another asked for her phone number. Male peers' behaviors capture how Daniela was perceived as a sexual object before she was seen as a mathematics classmate. Despite this discomfort, she reflected on the "pressure to not turn guys down" (Interview 1) in her study groups and classes because rejecting their sexual advances jeopardized access to peer support in mathematics. In the following section addressing Daniela's agency, I highlight how she strategically used her bisexuality to keep male peers interested in helping her with mathematics despite their oppressive advances. The white, heterosexual male gaze in mathematics, thus, shaped Daniela's experience of dissonance as a bisexual Latina navigating racialized fetishization and hypersexualization in peer relationships.

Agency. Agency in Daniela's experience to protect her academic success in the masculinized spaces of mathematics courses is reflected in strategic expressions of her sexual identity. She shared how although claiming to be a lesbian could stop male peers from hypersexualizing her, presenting as bisexual ensured that they would remain interested in her and continue to help her.

Maybe it would be easier if I just told them that I was a hundred percent lesbian, not interested in them, and they wouldn't make advances at all. But then I also consider, maybe then they wouldn't help me study, you know? And then they wouldn't be interested in assisting me anymore, or interacting with me anymore. (Interview 1)

Daniela used her bisexuality strategically by playing into male classmates' fetishization and hypersexualization as a way of maintaining access to peer support in mathematics. Such agency, while protective of Daniela's academic success, reinforced dissonance in her STEM experience.

Another way that Daniela exhibited agency in managing unwanted sexual attention was toning down feminine self-expression through dress, particularly in STEM classrooms where she was underrepresented as a femme Latina. Daniela described preferring to wear crop tops and artsy, quirky clothing that departed from what she described as the "engineering uniform" (Interview 1), a hoodie and T-shirt. However, she worried that her preferred dress would make her hypersexualized and subjected to negative judgment from STEM peers and faculty as "some

dumb girl that is dressed inappropriately for class” (Interview 1) who put more attention into her appearance than academics. As a result, Daniela saw sacrificing her femininity through dress as protecting her not only from being hypersexualized, but also having her intellect undermined.

One thing I leave of myself behind is... I don't wear the clothes I wanted to wear to school a lot because... I don't want other students to think I look dumb... If you look like you took care of yourself [as an engineering student], people say you're not smart... I also don't want to be wearing anything that could possibly be sexualized by people. (Interview 1)

Making intentional choices of dress was a strategy that Daniela adopted to protect herself from the dissonance between her intersectional identity and masculinized environments of STEM classrooms. By “going for as asexual as possible in classes” (Interview 1), Daniela's dress captured a self-preserving form of agency in response to how femininity was disassociated from STEM ability as well as male peers' racialized hypersexualization in mathematical contexts. Although Daniela's selectivity in dress alleviated dissonance rooted in the white, heterosexual male gaze in classrooms, she had to sacrifice aspects of her identity for such self-preservation.

Cross-Case Analysis

Looking across Ros's and Daniela's counter-stories through the lens of borderlands, their experiences of dissonance in peer relationships demonstrate Nepantla through a sense of liminality about bringing their full Latin* queer identities into mathematical contexts, especially collaborative settings like study groups. Ros's and Daniela's experiences at the juncture of racism and cisheteropatriarchy (e.g., navigating culturally-mediated tensions of disclosing queerness in SHPE, managing racialized fetishization from male peers) made them feel a sense of being “neither here nor there.” The counter-stories also depict mestiza consciousness through critical awareness of the white, cisheteropatriarchal gaze in peer interactions that shaped dissonance across the intersectionality of their experiences. This awareness also informed agency or *la facultad* in using their motivations and strategic forms of self-expression to protect their Latin* queer identities and ensure academic success. In what follows, I develop two conclusions from a cross-case analysis of Ros's and Daniela's counter-stories through the lens of borderlands and the WCHPS framework. These conclusions address how Latin* queer students' experiences of dissonance and agency exemplify navigating the borderlands of mathematics education as a white, cisheteropatriarchal space across ideological, institutional, and relational levels.

First, the counter-stories show how dominant constructions of mathematics and STEM as neutral can leave racialized, cisheteropatriarchal climates of educational contexts unchallenged. Daniela's perception of STEM classrooms as disconnected from identities and social experiences, for instance, left her grappling with the liminality of being a mixed-race queer Latina struggling to find socially-affirming community as a computer science major. She ultimately found relational support in STEM co-curricular contexts, including SHPE and a conference for gender equity in technology fields, that made space to process her experiences of Nepantla and coming into her intersectional identity. These spaces, thus, disrupted ideological notions of STEM as neutral to offer Daniela opportunities to heal from the dissonance of being a mixed-race queer Latina in computer science. Unfortunately, such ideological disruptions were absent in formal institutional contexts, including peer collaboration in mathematics courses, that subjected Daniela to being fetishized and hypersexualized as a queer woman of color working with predominantly white, heterosexual male peers. Daniela's awareness of the white, cisheteropatriarchal gaze across classrooms and groupwork in mathematics illustrates mestiza consciousness that guided her agency (*la facultad*) through strategic self-expression in dress and disclosure of her queer sexuality. Ros's counter-story similarly depicts such awareness of facing

intersectional marginalization as a Mexican genderfluid, bisexual person in STEM peer interactions where homophobic and transphobic perspectives went unchecked (e.g., jokes about queer people lacking mathematics ability, having their queer identity overlooked in SHPE meetings). Both counter-stories capture how ideological assumptions of neutrality in mathematical spaces can perpetuate Latin* queer oppression in exclusionary climates of peer relationships linked to a lack of social diversity (institutional influence) and toxic interactions involving microaggressions of ability and sexual harassment (relational influences). Therefore, being at the borderlands for Daniela and Ros as Latin* queer STEM majors meant managing oppressive peer relationships reinforced through assumptions of mathematics as a neutral space.

Second, both Latin* queer students' counter-stories portray the undue cognitive labor placed upon them to adopt strategies for protecting their identities and success across oppressive contexts of peer relationships in mathematics. To illustrate, Ros's keen awareness of how homophobic and transphobic ideologies influenced peer interactions, such as their most negative STEM experience of being misgendered and assumed to be straight in a study group, taxed them with the burden of concealing their queerness until peers said or did something that signaled being accepting of their genderfluid and bisexual identities. Ros exhibited similar awareness of the cisheteropatriarchal culture in the SHPE organization that informed her decision to attend meetings when accompanied by a peer with whom she can confide her queer identity. Critical awareness of study groups and SHPE meetings as potentially oppressive spaces depicts Ros's mestiza consciousness that led to investing cognitive energy in determining how to present himself with unfamiliar peers and ensuring the presence of queer-affirming peers for his safety. While these behavioral strategies depict agency or *la facultad* from Ros in managing queer marginalization through peer relationships, such self-protection came at a cost with Ros only being able to embrace certain aspects of their identity as a Latin* queer student in STEM. Daniela faced a similar reality in terms of sacrificing her gender expression through feminine dress to protect herself from hypersexualization in mathematics classrooms. Furthermore, Ros's counter-story conveys how institutional spaces of identity support for STEM majors often failed to account for experiences of queerness and intersectionality. The cisnormative framing of gender support in programs for women in engineering left Ros with a sense of liminality as a genderfluid person who presents as female and the labor of concealing their queerness to avoid being deemed as not belonging. She described how tensions of being a queer SHPE participant were due to traditional views of gender and sexuality in Latin* culture that also shaped dismissal of her sexuality from family, specifically cousins living in Mexico who were also sources of motivation for excelling in mathematics. Ros's liminality in SHPE and programs for women engineers captures his experiences of *Nepantla* in terms of being "neither here nor there" as a beneficiary of institutional support. The affirmation that Ros felt for their full identity from immediate family and in high school engineering with Latin* queer peers was missing. Ros, thus, was taxed with the same cognitive labor of protecting their queerness in peer collaborations for mathematics coursework even in institutional spaces like SHPE designed to resist oppression in formal STEM contexts. The labor imposed on Ros and Daniela to cope with intersectional oppression across peer relationships in groupwork and co-curricular programs reflects realities at the borderlands with needed disruptions of white cisheteropatriarchy in mathematical contexts.

Discussion

The present study's scholarly significance is twofold. First, the focus on Latin* queer students contributes insights about intersectionality that went unexamined in research about Latin* students and QT students in undergraduate STEM (e.g., Convertino et al., 2022; Hughes,

2017 McGee, 2016). Findings uncovered intersectional forms of dissonance that Ros and Daniela managed between their Latin* queer identities and peer relationships in mathematical spaces. For example, Daniela's counter-story depicts her strategic ways of sharing her queer sexuality and expressing her gender through dress to navigate the white, cisheteropatriarchal gaze in mathematics courses, which subjected her to unwanted sexual attention from male peers who were also sources of academic support. Second, representation of Latin* gender nonconforming students in the study extends understandings of gender equity in mathematics education. Over the years, equity-oriented research in mathematics education has framed gender as a binary and disconnected from other dimensions of social experience, including race and sexuality (Leyva, 2017; Leyva & Mahtab, in press). By centering intersectionality of mathematics experiences for Latin* students with queer gender identities, this study disrupts the long-standing erasure of trans* and nonbinary students of color in mathematics education for more complex insights on how racialized forms of trans* oppression impact gender equity. To illustrate, Ros's counter-story conveys struggle in finding peer support across study groups and pre-professional engineering societies that affirmed their genderfluid identity. Along with feeling like an imposter in programs for women in engineering that mainly catered to cisgender women, Ros felt tensions about participating in SHPE where cisheteronormative ideologies of gender and sexuality in Latin* culture influenced their perceptions of peers' acceptance of their queer identity.

Findings from the present study raise implications for research to generate more nuanced insights into Latin* QT students' intersectionality of mathematics experiences. One implication is exploring how differences in ethnoracial backgrounds, immigration history, and ability to pass as white, cisgender, and/or heterosexual shape variation in intersectional oppression and agency. Although Ros and Daniela both identified as members of the Latin* community, their racialized experiences differed. Social norms of gender and sexuality in Mexico shaped Ros's concerns about facing homophobia and transphobia from cousins living there, which can be likened to the vulnerability he felt about engaging his queerness with Latin* engineering peers. Daniela's upbringing in a mixed-race household with Colombian-Cuban and white parents, who she felt distanced her from Latin* culture, produced conflict in identifying as Latina. Peer relationships in SHPE helped her come into her intersectional identity and overcome struggles in finding community as a mixed-race, queer woman in STEM. Future research that continues unpacking within-group differences in participants' racial backgrounds, including mixed-race experiences, disrupts monolithic representations of Latin* QT students in mathematics and contributes robust understandings of intersectionality for this population. A second implication for research is further exploring variation in Latin* QT students' intersectionality of mathematics and STEM experiences across different types of higher education institutions, including HSIs. Although Ros attended a HSI with a mission for providing culturally-affirming opportunities to Latin* students, the cisheteropatriarchal culture of STEM environments, even in spaces of racial affinity like SHPE, limited their access to networks of peer support like they had in high school engineering. This finding illustrates the importance of future research that continues to explore how structures and practices at HSIs and other institutions with missions for serving minoritized populations (e.g., women's colleges) disrupt intersectional marginalization in mathematics classrooms and other STEM contexts for Latin* QT students. Such research in HSIs responds to calls for insights about queer-affirming institutional support that serve Latin* QT students (Vega et al., 2022).

The study's findings also raise implications for educational practice. Both counter-stories addressed peer collaboration for mathematics coursework as a context where participants experienced dissonance with their Latin* queer identities. This finding points to the importance

of instructors co-constructing norms of collaboration with their class that resist influences of white cisheteropatriarchy and expand Latin* QT students' comfort with groupwork. Examples of norms include students reflecting on how much space they have occupied, checking in on students who have not shared ideas, using peers' chosen names and pronouns, and avoiding assumptions of peers' gender, sexual, and other identities. These norms foster accountability to ensure that group members, including Latin* QT students, feel safe and comfortable to participate. This accountability alleviates the vulnerability that Ros and Daniela reported about navigating racialized-gendered judgments of ability, possibilities of being hypersexualized, and uncertainties of homophobia and transphobia that negatively impacted their experiences in peer collaboration. Instructors can ensure students engage in alignment with co-constructed norms by re-visiting them as a class when they observe groups departing from them, modeling norms through behavior and discourse during instruction, and encouraging adoption of these norms to structure collaboration in peer study groups and other contexts outside of the classroom.

Another practice implication is adopting an expansive approach to identity-based support in affinity spaces for STEM majors from historically marginalized groups. Findings captured limitations to peer support that participants experienced in spaces like SHPE and programs for women in engineering, where they were unable to bring their full intersectional identities as Latin* queer individuals. Leaders for STEM affinity spaces must interrogate how they frame gender inclusion to avoid reinforcing cisnormative exclusion like Ros had experienced. In addition, the design of STEM affinity spaces for Latin* students (e.g., SHPE) and QT students (e.g., Out in STEM) must give explicit attention to experiences of intersectionality to ensure a robust sense of inclusion and support for Latin* QT students. Daniela's ability to process complexities of being a mixed-race queer Latina in SHPE exemplifies how such intersectional support was available to her in a space for racial affinity.

Conclusion

This study portrays undergraduate Latin* QT students' experiences at the borderlands as aspiring STEM majors navigating white cisheteropatriarchy in mathematical contexts. Ros's and Daniela's counter-stories shed light on dissonance between their intersectional identities and exclusionary peer relationships, in addition to their individual agency for coping with such dissonance to protect their identities and success in STEM. With participants' accounts of agency involving the sacrifice of their queer identities, disruptions of mathematics education as a white, cisheteropatriarchal space are needed to advance intersectional justice for Latin* QT students.

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References

- Aguilar-Hernández, J. M., & Cruz, C. (2020). Grounding emerging scholarship on queer/trans* Chicana/o/x and Latina/o/x pedagogies. *Association of Mexican American Educators Journal*, 14(2), 5-22.
- Anzaldúa, G. (1987/2007). *Borderlands/La frontera: The new mestiza*. Aunt Lute Books.
- Brockenbrough, E. (2015). Queer of color agency in educational contexts: Analytic frameworks from a queer of color critique. *Educational Studies*, 51(1), 28-44.
- Campus Pride (2020). *Campus Pride's 2020 Best of the Best LGBTQ-friendly colleges & universities*. <https://www.campuspride.org/2020BESTOFTHEBEST/>.
- Cantú, N., & Hurtado, A. (2012). Introduction to the fourth edition. In *Borderlands/La frontera: The new mestiza*. Aunt Lute Books.
- Cech, E. A., & Waidzunus, T. J. (2011). Navigating the heteronormativity of engineering: The experiences of lesbian, gay, and bisexual students. *Engineering Studies*, 3(1), 1-24.
- Convertino, C., Alvidrez, M., Pickett, J., & Camberos, D. (2022). Exploring worksheets and attendance-taking as gatekeeping features in a gateway course for Latinx STEM majors. *Journal of Latinos and Education*, 1-17.
- Crenshaw, K. (1991). Mapping the margins: Identity politics, intersectionality, and violence against women. *Stanford Law Review*, 43(6), 1241-1299.
- Cuevas, T. J. (2018). *Post-Borderlandia: Chicana literature and gender variant critique*. Rutgers University Press.
- Excelencia in Education (2018). *Latino college completion: United States*. *Excelencia in Education*. Retrieved from <https://www.edexcelencia.org/research/latino-college-completion>.
- Ferguson, R. A. (2004). *Aberrations in Black: Toward a queer of color critique*. University of Minnesota Press.
- Gutiérrez, R. (2017). Why mathematics (education) was late to the backlash party: The need for a revolution. *Journal of Urban Mathematics Education*, 10(2), 8-24.
- Hames-García, M., & Martínez, E. J. (2011). *Gay Latino studies: A critical reader*. Duke University Press.
- Harper, S. R., & Simmons, I. (2019). *Black students at public colleges and universities: A 50-state report card*. Los Angeles: University of Southern California, Race and Equity Center.
- Hernández, E. D., Alvarez, E. F., & García, M. (2021). *Transmovimientos: Latinx queer migrations, bodies, and spaces*. University of Nebraska Press.
- Hughes, B. E. (2017). "Managing by not managing": How gay engineering students manage sexual orientation identity. *Journal of College Student Development*, 58(3), 385-401.
- Kersey, E., & Voigt, M. (2020). Finding community and overcoming barriers: Experiences of queer and transgender postsecondary students in mathematics and other STEM fields. *Mathematics Education Research Journal*.
- Kumashiro, K. K. (2001). *Troubling intersections of race and sexuality: Queer students of color and anti-oppressive education*. Rowman & Littlefield.
- 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.
- Leyva, L. A. (2017). Unpacking the male superiority myth and masculinization of mathematics at the intersections: A review of research on gender in mathematics education. *Journal for Research in Mathematics Education*, 48(4), 397-433.
- 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. (2022). "We can't just turn that off and then do some physics": A counter-storytelling analysis of introductory physics as a white, cisheteropatriarchal space in undergraduate STEM education. In B. W. Frank, D. Jones & Q. Ryan (Eds.), *2022 Physics Education Research Conference (PERC) Proceedings*. American Association of Physics Teachers. Grand Rapids, MI. <https://doi.org/10.1119/perc.2022.plenary.pr.Leyva>.
- Leyva, L. A. (2023). *Undergraduate mathematics education as a white, cisheteropatriarchal space and opportunities for structural disruption to advance queer of color justice*. Invited presentation delivered as the Spectra Lavender Lecture for the 2023 Joint Mathematics Meetings. Boston, MA.
- Leyva, L. A., Balmer, B. R., Marshall, B. L., McNeill, R. T., Jefferson, A., & Roditti, N. (2022). Characterizing agency among gender-expansive Black and Latin* students with queer sexual identities in undergraduate STEM. Paper presented annual meeting of the American Educational Research Association. San Diego, CA.
- 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., McNeill, R. T., & Duran, A. (2022). A queer of color challenge to neutrality in undergraduate STEM pedagogy as a White, cisheteropatriarchal space. *Journal of Women and Minorities in Science and Engineering*, 28(2), 79-94.

- Leyva, L. A., & Nazemi, M. (in press). Toward intersectional understandings of gender in mathematics education. In M. A. Clements, B. Kaur, T. Lowrie, V. Mesa, & J. Prytz (Eds.), *Fourth international handbook of mathematics education*. Springer.
- Leyva, L. A., Quea, R., Weber, K., Battey, D., & López, D. (2021). Detailing racialized and gendered mechanisms of undergraduate precalculus and calculus classroom instruction. *Cognition & Instruction*, 39(1), 1-34.
- Martin, D. B. (2009). Researching race in mathematics education. *Teachers College Record*, 111(2), 295-338.
- McGee, E. O. (2016). Devalued Black and Latino racial identities: A by-product of STEM college culture?. *American Educational Research Journal*, 53(6), 1626-1662.
- Miller, R. A., Vaccaro, A., Kimball, E. W., & Forester, R. (2020). “It’s dude culture”: Students with minoritized identities of sexuality and/or gender navigating STEM majors. *Journal of Diversity in Higher Education*, 14(3), 340.
- Milner, R. H. (2007). Race, culture, and researcher positionality: Working through dangers seen, unseen, and unforeseen. *Educational Researcher*, 36(7), 388–400.
- Moraga, C., & Anzaldúa, G. (1981/2021). *This bridge called my back: Writings by radical women of color*. SUNY Press.
- Nicolazzo, Z. (2016). ‘It’s a hard line to walk’: Black non-binary trans* collegians’ perspectives on passing, realness, and trans*-normativity. *International Journal of Qualitative Studies in Education*, 29(9), 1173-1188.
- Nicolazzo, Z. (2017). *Trans* in college: Transgender students’ strategies for navigating campus life and the institutional politics of inclusion*. Stylus.
- Oppland-Cordell, S. (2014). Urban Latina/o undergraduate students' negotiations of identities and participation in an Emerging Scholars Calculus I workshop. *Journal of Urban Mathematics Education*, 7(1), 19-54.
- Rodríguez, J. M. (2003). *Queer Latinidad: Identity practices, discursive spaces*. NYU Press.
- Salinas, C. Jr. (2020). The complexity of the “x” in Latinx: How Latinx/a/o students relate to, identify with, and understand the term Latinx. *Journal of Hispanic Higher Education*, 19(2), 149–168.
- Salinas, C., Jr., & Lozano, A. (2019). Mapping and recontextualizing the evolution of the term Latinx: An environmental scanning in higher education. *Journal of Latinos and Education*, 18(4), 302–315.
- Solórzano, D., & Yosso, T. (2002). Critical race methodology: Counter-storytelling as an analytical framework for education research. *Qualitative Inquiry*, 8(1), 23–44.
- Vega, G. P. (2016). *Latina lesbian students: Understanding their experiences and perceived sexual identity development at a Hispanic-serving institution*. Unpublished doctoral dissertation.
- Vega, G. P., Duran, A., McGill, C. M., & Rocco, T. S. (2022). Attending to sexuality in servingness: A phenomenological exploration of the experiences of Latina lesbians at a Hispanic-serving institution. *Journal of Diversity in Higher Education*.
- Voigt, M. (2022). A quantitative exploration of Queer-spectrum students’ experiences in introductory undergraduate mathematics courses. *PLoS ONE*, 17(10), e0275325.
- Yeh, C., & Rubel, L. (2020). Queering mathematics: Disrupting binary oppositions in mathematics pre-service teacher education. In N. Radakovic & L. Jao (Eds.), *Borders in mathematics pre-service teacher education* (p. 227-243). Springer.