FACULTY AND STUDENT PERCEPTIONS OF INSTRUCTIONAL SERVINGNESS IN GATEWAY MATHEMATICS COURSES AT A HISPANIC-SERVING INSTITUTION

Luis A. Leyva
Vanderbilt University
luis.a.leyva@vanderbilt.edu

Nicollette D. Mitchell
Vanderbilt University
nicollette.d.mitchell@vanderbilt.edu

R. Taylor McNeill
Vanderbilt University
reagin.t.mcneill@vanderbilt.edu

Martha H. Byrne
Sonoma State University
byrnema@sonoma.edu

Ben Ford
Sonoma State University
ben.ford@sonoma.edu

Lorely A. Chávez
Vanderbilt University
lorely.a.chavez@vanderbilt.edu

Enrique M. Abreu-Ramos
Vanderbilt University
enrique.m.abreu-ramos@Vanderbilt.Edu

Research exploring how Hispanic-Serving Institutions (HSIs) serve Latin STEM students has largely focused on features of organizational structures (e.g., support programs), but minimally examined instruction and classroom experiences. This is an important gap to fill, especially in gateway mathematics courses, where faculty relationships and quality of instruction impact Latin* students' persistence and identities in STEM. To advance such research, this report presents findings from an analysis of how perspectives from HSI mathematics faculty and students about instruction in introductory statistics converged and diverged in terms of serving Latin* populations. We present two illustrative cases of dissonant and resonant perspectives on serving Latin* students through instruction that frames mathematical ability expansively (e.g., not limited to being fast or correct). We conclude with research and practice implications.*

Keywords: Equity, Inclusion & Diversity; Undergraduate Education; Data Analysis & Statistics

Purpose of the Study

Institutions are designated as Hispanic-Serving Institutions (HSIs) if at least 25 percent of enrolled undergraduates are Latin*[1]. Despite receiving funding to increase Latin* postsecondary persistence, HSIs often lack visions of serving Latin* students and thus may not advance equitable outcomes or affirming support (Garcia, 2020). Thus, racialized and intersectional oppression among Latin* STEM students (Leyva, 2016; McGee, 2016; Rodriguez et al., 2017) are not necessarily disrupted in HSIs (Contreras Aguirre et al., 2020; Valenzuela, 2020).

Instructional quality in gateway courses, including calculus and statistics, is a major contributor to Black and Latin* attrition in STEM (Dadgar et al., 2021; Larsen et al., 2016). Although research that examines racially-equitable features of gateway mathematics instruction is emerging (Hagman, 2021; Leyva, McNeill, et al., 2021), an explicit focus on equity for Latin* students has not been adopted. Such inquiry can build a theory of racially- and culturally-affirming instruction in gateway courses to strengthen Latin* students' persistence and sense of belonging in STEM, along with enhancing HSIs' efforts to serve Latin* STEM students.

To fill this research gap, our report presents an analysis from a larger study of a HSI mathematics department's reform of instructional and organizational practices to better serve

[1] The asterisk in Latin* creates space for fluidity in gender identities among Latin American people. Latin* responds to (mis)use of Latinx, a term reserved for Latin American gender-nonconforming peoples (Salinas & Lozano, 2019).

Latin* students. We looked across faculty and student perceptions of instruction for fostering equitable opportunities of classroom participation among Latin* students in gateway courses. The following research question, aligned with the PME-NA 44 theme, is addressed: *What are forms of dissonance and resonance across faculty and student perceptions of serving Latin* students through instruction in gateway mathematics courses?* We raise implications for improving ways to serve Latin* students in mathematics departments based on our findings.

Theoretical Perspective & Relevant Literature

A guiding perspective for our analysis is *servingness*, a framework for developing culturally-enhancing experiences at HSIs for Latin* students across various dimensions, including outcomes, experiences, organizational structures, and external forces (Garcia et al., 2019). Prior research on serving Latin* STEM students in HSIs has focused on organizational features that promote academic persistence, such as course design (Chang & Chen, 2020; Meling et al., 2020), departmental policies (e.g., course placements; Burn et al., 2019), and support programs (Cruz et al., 2019). This work has importantly depicted structural interventions' advancement of equitable outcomes for course success and STEM persistence. However, these outcome-focused analyses left implicit how organizational features impacted Latin* students' racialized experiences specifically in STEM. Instruction in STEM courses was also not central in analyses. Extending this work, the present analysis uses servingness as a lens to examine HSI faculty members' and students' perceptions of instruction in gateway courses as reinforcing or disrupting racialized outcomes (e.g., grades) and experiences (e.g., cultural validation). Our analysis also considered how departmental structures (e.g., professional development) for fostering culturally-responsive learning and resisting forces of white supremacy shaped servingness in mathematics instruction.

Faculty advance servingness at HSIs through instruction and student support that disrupt racialized oppression to promote Latin* students' positive identity development and sense of belonging (Ching, 2019). However, it remains unclear the extent to which STEM faculty at HSIs leverage awareness of Latin* students' cultural backgrounds and racialized experiences to inform pedagogy. For example, in a study of HSI faculty's racial attitudes, Garcia and colleagues (2020) found that faculty held low levels of colorblind attitudes, indicating racial consciousness. However, findings also showed that STEM faculty demonstrated more colorblind attitudes than faculty in other disciplines, even when controlling for differing racial and gender demographics. Colorblind faculty attitudes in mathematics and STEM more broadly leave stereotypes of ability, inequities of access, and other racialized forces unchallenged (Bensimon et al., 2019; McCoy et al., 2015; McNeill et al., 2022), which can reinforce deficit views and thus limit instructional servingness (Chase et al., 2013; Ching, 2019). The impacts of faculty racial attitudes, including orientations to servingness through STEM instruction in HSIs as well as Latin* students' classroom experiences, have been underexplored. Our study fills this gap by triangulating faculty and student perspectives to explore the efficacy of gateway course instruction in servingness.

Methods

Study Context and Participants

Our present analysis comes from a larger study exploring the effectiveness of an ongoing, equity-oriented professional development (PD) in the mathematics department at Sonoma State University (SSU). SSU is a medium-sized, public university in California that recently received the HSI designation. In 2021, enrolled undergraduate students at SSU were approximately 45% white, 35% Latin*, 7% two or more races, 5% Asian, 2% Black or African American, and 6% some other race. Faculty PD began in summer 2021, and data collection started in fall 2021. The

two-year faculty PD aims to develop culturally-responsive institutional practices, including classroom instruction and student support, to better serve Latin* students.

The research team (a collaboration between two faculty involved in the PD and educational researchers at Vanderbilt University) designed a study to look across instructors' and Latin* students' perspectives on instructional servingness in gateway courses. Twelve mathematics faculty PD participants agreed to participate in the study. Over half of faculty participants served as gateway course instructors. Latin* student participants were recruited from gateway courses by sending an e-mail message to all enrolled students with a flyer containing a URL to express interest and completing classroom visits (in-person and virtual) to provide a study overview. Instructors were not informed if any of their students served as study participants and vice versa. To the extent possible, we purposefully sampled from students who expressed interest to have multiple voices from each course section as well as to ensure variation in race-gender identities.

Data Collection

Researchers at Vanderbilt (1 faculty, 2 Ph.D. students, 1 graduate student, and 1 undergraduate student) led data collection. SSU team members also served as study participants and did not assume data collection responsibilities. Using event journaling methodology (Leyva, Quea, et al., 2021), one data source was student and faculty participants' journaling of events from instruction in gateway courses perceived as marginalizing or supportive for Latin* students. Journal entries were submitted using an online form that prompted participants for a description of events and reflection on why events were perceived in these ways. Students journaled about their course experiences as learners, and faculty journaled about their practices as instructors. Journaling was ongoing throughout the fall semester without any required number of entries.

Near the end of the semester, each participant completed a 90-minute, semi-structured individual interview on Zoom. Interviews were audiotaped and transcribed. To the extent possible, we matched interviewers and participants by race and gender as an attempt to build comfort with discussing issues of structural oppression. The first half of the interview explored what serving Latin* students meant to participants in gateway mathematics courses and in general. The second half of the interview centered around two prompts of instructional events that reflected emergent themes of servingness from journaling. Each prompt was written as a composite of journaled events. One prompt was written from a faculty perspective and addressed issues of student support. The second prompt, which is central to the analysis presented in this research report, was written from a student perspective and focused on classroom participation:

> I was asked to share my solution for a homework problem during class. I was unsure if I solved the problem correctly. I was worried about presenting an incorrect solution in front of the instructor and the rest of the class. My instructor acknowledged that my final answer was incorrect and guided me through steps for solving the problem. The instructor also mentioned that perfection was not the expectation for success and how students can learn from errors. This interaction made me feel less pressure about having to always be correct and encouraged me to more readily share my thinking during class.

For each prompt, participants were asked about the instructional event's frequency of occurrence and potential for serving Latin* students as well as recommended changes in gateway courses for more racially-equitable participation or support. All participants were prompted for specific examples from their gateway courses to support their reasoning about servingness.

Data Analysis and Positionality

Vanderbilt research team members de-identified data prior to sharing with SSU research team members for analysis. Information that explicitly or implicitly revealed participants'

identities (e.g., names, students' backgrounds, faculty's professional histories) was redacted. For the present research report, we completed an analysis of data specific to participants involved in courses that contained both faculty and student participants. Our analysis looked across data for 4 faculty participants and 6 Latin* first-year student participants associated with calculus and statistics courses. In addition to journaling, we analyzed interview responses to questions about the meaning of serving Latin* students in and beyond gateway mathematics instruction, along with responses to the prompt about classroom participation presented above.

A research team member from each university coded each faculty participant's data. Two Vanderbilt team members coded each student participant's data since de-identification was still in progress. To the extent possible, at least one coder for student data identified as Latin* to have an insider perspective for data analysis. Team members independently and inductively coded data to flag instances when participants raised instructional features and departmental structures perceived as advancing or limiting servingness in gateway courses, including attention to Latin* students' social identities and cultural backgrounds. When individual coding was complete, one coder from each pair synthesized the two sets of codes for each participant's data into themes on instructional servingness. Themes were exchanged and discussed during weekly team meetings. To address our research question about dissonance and resonance across HSI faculty and student perspectives on servingness, the research team identified points of convergence and divergence in how faculty members and students in the same class perceived servingness in instruction.

Our research team approached the present analysis with critical reflexivity. The team consists of two Latino cisgender men, a Latina cisgender woman, a Black cisgender woman, a white transmasculine person, a white cisgender woman, and a white cisgender man. We brought awareness of how our varying forms of privilege and oppression influence our inquiry on instructional servingness in mathematics at HSIs. The team resisted deficit engagement with participants' reflections as mathematics learners or educators and constantly recognized how gateway mathematics instruction is situated in broader systems of social power. Interviewers and coders bracketed their lived experiences in engaging with participants' reflections to avoid analytically distorting their perspectives, all while approaching the study with a lens of criticality to interrogate structures that limit servingness in STEM contexts across HSIs. Our infusion of multiple faculty members' and Latin* students' voices in the findings captures complexities of instructional servingness in gateway mathematics and avoids portraying it in essentializing ways.

Findings

We present findings centered on an emergent theme of instructional servingness – namely, expansive framing of mathematical ability to increase Latin* students' classroom participation. This framing resists dominant views of correctness and speed as indicating innateness of ability, which do not account for educational inequalities that limit Latin* students' opportunities to develop such skills. Two cases of coupling HSI faculty and student perspectives were most illustrative of this theme. One coupling includes faculty member Dina (white woman[2]) and her students, Rosalinda (Mexican female) and Christian (Mexican male). The second pairing includes faculty member Michael (white male) and his students, Lisandra (Chicana female) and Nereyda (Salvadoran female). These couplings were specific to introductory statistics courses that enrolled exclusively first-year students and predominantly Latin* students. We organize our findings in two sections that each presents a coupling of faculty-student perspectives to highlight dissonance and resonance in reflections on instructional servingness through framing ability.

[2] Participants' identities are reported as they were self-described during interviews.

"My Teacher Likes to Tell Us That It's Okay to Ask for Help and If We Get Something Wrong, It's Not the End of the World. It Just Means That We're Actually Learning."

Serving Latin* students for faculty participant, Dina (white female), meant "need[ing] to do what it takes for all [her] students to succeed" regardless of race and other social differences, which included expanding opportunities for classroom participation. Dina perceived Latin* students' participation as often inhibited by narrow constructions of mathematical ability in K-12 education that frame being correct and quick as essential to being successful.

Interviewer:	How common do you think it is for Hispanic and Latinx students to be concerned about being incorrect or being unwilling or unable to share?
Dina:	It's very common… I would say, 'I'm afraid I have the wrong answer' is very common.... The way they're [Latin* students] prepared in math makes them feel stupid… We've been taught that math is fast.

To disrupt limited views of mathematical ability and broaden space for Latin* students' participation, Dina asks students to share prior experiences with mathematics and emphasizes that "math is really hard" to reassure them that struggle does not reflect inability. She interpreted her practice, along with the faculty behavior featured in the interview prompt, as bringing relief to Latin* students about being negatively judged when sharing their thinking. Dina approached instruction with awareness of potential linguistic barriers to classroom participation among Latin* students, especially in statistics where terms (e.g., bias) have specific meanings that differ from everyday use, "If English is not your first language, that's already a huge piece of baggage… You are at risk of having a language gap… I need to pay a lot of attention to… [students] being able to use and understand and pronounce." Dina's perspectives convey awareness of how narrow ideas of mathematical ability collide with Latin* students' experiences of educational inequities. Her awareness led to instruction that framed ability expansively and practices that clarified mathematical concepts in order to increase Latin* student participation.

Dina's view of serving Latin* students through instruction resonates with Rosalinda's reflection on her experience as a Mexican female in her class. In a journal entry, Rosalinda wrote that Dina's instruction made her "more confident in math… [and] capable in math" after having several high school mathematics teachers who undermined Latin* students' ability and dismissed her contributions. She experienced Dina's practice of framing errors as entry points for learning as reducing her fears about being wrong and encouraging her to readily participate.

Rosalinda:	Math isn't my strongest subject and… I have failed a few classes because my teachers didn't know how to serve me or other students like me. And so I like my class [with Dina]… My teacher likes to tell us that it's okay to ask for help and if we get something wrong, it's not the end of the world… It just means that we're actually learning rather than feeling bad. Because in the past, when I would get something wrong, it felt the worst.
[…]	
Interviewer:	How comfortable do you feel as a Latina student to participate?
Rosalinda:	I'm slowly getting more comfortable when it comes to going up to the board… Every time my professor, before we present, she'll be like, 'If you have any questions, even if it's a small question, feel free to ask. If we don't ask, she'll be like, 'It's okay if you get it wrong, I'll help guide you.'

Dina's instruction served to increase Rosalinda's access to classroom participation as a Mexican female with a history of racial oppression in K-12 mathematics, which captures resonance in faculty and student views on servingness through an expansive framing of ability.

Christian's reflection on his classroom experience as a Mexican male student largely resonated with Dina's view on serving Latin* students and aligns with Rosalinda's experiences in the classroom. He likened the faculty behavior in the interview prompt to Dina's comments during instruction for encouraging participation, "This sounds very much like my professor who has [said] things [like] 'Mathematicians don't always do the problems right away. They take their time'… It definitely encouraged me to not rush and take my time in math." Christian perceived Dina's instruction removing pressures of solving problems quickly to demonstrate his mathematical ability, which he commonly experienced prior to college. Such classroom practices brought Christian to feel like Dina "made [him] like math… [and] feel involved all the time."

However, Christian also noted limitations on his access to participation despite Dina's expansive framing of mathematical ability. He sometimes felt his participation was constrained by his command of the English language. Christian described "get[ting] a bit anxious sometimes for presenting [his] math solutions" out of concerns about any embarrassingly incorrect phrasing or pronunciation, "Some words, I can't pronounce them correctly, so I struggle a bit getting my phrasing out there." Although Christian journaled about how Dina strengthened his mathematical understanding through explanations of vocabulary, classroom participation remained less accessible to him due to risks of classmates' negative judgment about how he communicates his ideas as an emergent bilingual. Dissonance between Dina's and Christian's perspectives convey how servingness through instruction that resists narrow views of mathematical ability must account for varying levels of comfort with verbal communication, especially among Latin* students developing command of the English language on top of mathematical terminology.

"When I Asked My Teacher for Help After Class and He Stayed Until I Understood the Problem, It Was A Little Bit of a Shocker For Me! I Thought I Would Be Perceived as the Stereotype That Hispanic Students are Lazy… [and] They Don't Understand Anything."

Faculty participant, Michael (white male), reflected on growth in his development of instructional practices that foster servingness, "It's a huge part of my job right now, going through that change that's happening at our school [becoming an HSI]... Redefining my job around my students... I'm just like in preschool with the whole thing." Michael positioned himself as constantly trying to learn more about Latin* students' backgrounds and needs, "The way I'm trying to do it is just trying to collect more, and more, and more information, and think about how we can serve based on the information." While Michael recognized the value of understanding Latin* students as a group, he also felt tensions about how such knowledge may shape assumptions and activate stereotypes when interacting with students, "I want to get my head around that, but I don't want to look at a student and think I know what's going on."

Like Dina, Michael noted fear of being wrong as a barrier to Latin* student participation due to the equating of ability with correctness and speed in K-12 mathematics. He shared instructional comments about leveraging wrong answers as learning opportunities to allay such fears and frame ability expansively, "If it's [a student's answer] wrong, I'm going to actually be happier… You're not the only person making a mistake, first of all, and then it's going to give us a discussion to have.'" At the same time, Michael grappled with concerns about how his social distance from Latin* students as a white male, on top of students' histories as K-12 mathematics learners, shaped skepticism toward his instructional messages, "They've [Latin* students] had dozens of teachers… And I'm just one guy they don't know, who doesn't look like them… So

it's hard for me to make provocative statements like this about how to approach this [mathematics learning] differently." He reflected on the promise of connecting his students in statistics classes with former Latin* students who can "bridg[e] that culture, and race, and age gap" and disrupt current students' distrust about his expansive views of mathematical ability.

Lisandra's (Chicana female) reflection on her classroom experience largely exhibited dissonance and also somewhat resonated with Michael's conceptions of servingness. Although Lisandra observed instructional practices with an expansive view of mathematical ability (e.g., attending to student struggles), she did not feel comfortable sharing incorrect thinking or exhibiting struggle with content in the statistics classroom, "It doesn't feel like, 'Oh, we can be wrong because it's alright; we're learning.' It doesn't feel like that. It feels like, 'Oh, you have to be right." Reflecting on how Latin* students are commonly worried about being wrong, she shared, "It's been one of the many reasons why I haven't spoken up in any class, because I'm not sure and I don't want to embarrass myself... So I just keep to myself… I don't want to sound dumb." Lisandra's concerns about being negatively judged for her intellect as a Latina student prompted her to hold back on participating in her statistics class, which resonated with Michael's concerns about Latin* students' skepticism toward his framing of mathematical ability.

Lisandra also described how her inhibited participation, despite Michael's encouraging instructional behaviors, stemmed from a lack of community in the classroom. Servingness, for Lisandra, was forming part of a community that understood her as a first-generation Chicana female where she can "fully feel comfortable and safe to reach out" when needing support. The lack of community in her statistics classroom made her feel isolated and that her needs were not recognized, "I feel on my own… The teacher goes around and everything… but I feel like in the classroom, it doesn't feel so much as a community… I don't feel represented." Lisandra, as a result, was often "not feeling safe in the environment enough to speak" in terms of sharing ideas and seeking help. Dissonance between Michael's and Lisandra's perspectives convey how servingness through instruction with an expansive framing of mathematical ability can fall short in increasing Latin* students' access to participation. Lisandra was missing a foundation of safety and community to feel comfortable taking risks in her participation as a Chicana female.

Nereyda's reflections as a Salvadoran female were both resonant and dissonant with her instructor Michael's perspectives on servingness anchored in an expansive view of mathematical ability. Unlike Lisandra, Nereyda perceived her classroom experience, including Michael's openness to student struggle and creation of a non-judgmental learning environment, as aligned with her views of servingness in mathematics. She related the faculty behavior in the interview prompt to Michael's instruction, "He's constantly telling us that there's no need for perfection. 'Do not worry about getting the right answer. It's just the process of learning and showing me what you have learned.'" She shared instances of seeking and receiving Michael's support, which she perceived as especially impactful for Latin* students who often "don't speak up because they don't think they're going to get the help they need" due to stereotypes of being dumb or lazy. Nereyda journaled about such support from Michael after class that disrupted stereotyping influences, which often limit Latin* students' access to classroom participation.

> When I asked my teacher for help after class and he stayed until I understood the problem, it was a little bit of a shocker for me! I thought I would be perceived as the stereotype that Hispanic students are lazy in their study [sic] and they don't understand anything, but it made me feel heard and seen [and] that it's okay to not get things from the get-go. I now don't want to hide out.. I'm eager to go to class and keep making mistakes so I can continue getting help from my professor.

Nereyda's reflections of relief from pressures of sharing correct mathematical thinking and concealing academic struggles, thus, capture resonance with Michael's perspectives of serving Latin* students through instruction that challenges narrow constructions of ability.

Despite perceiving an overall sense of servingness through Michael's instructional practices of welcoming students' contributions and questions, Nereyda still experienced moments of discomfort with participation as a Salvadoran female due to stereotypes of ability.

> There's that stereotype that women aren't really good at math and they just don't understand. I feel like that impacts me in the classroom sometimes. I just get kind of intimidated… As well as with race, I feel like they [faculty] think that Hispanic students… need a little bit more attention… [and] can't capture the full event [referring to instruction] and it's not really like that. I journaled about it. It's the stereotype.

Nereyda particularly felt intimidated during groupwork to seek support and share her ideas. She observed a racialized pattern in self-sorted groups with "white students working together and… Latinx students just sitting out on those sidelines." When working with female and Latin* peers, either the group or Nereyda herself suppressed asking Michael for help, "In that space, I feel a little iffy or uncomfortable… He [Michael] goes around and helps people, but I feel like sometimes, some days, I can't speak up." Nereyda felt that further opening the statistics classroom space where "you share your identity with the class and when your classmates share their identity with you…creates a safe place of trust" that could alleviate racialized-gendered tensions with classroom participation. Therefore, dissonance is also evident across Michael's and Nereyda's perspectives on servingness. Michael approached instruction with commitment to resist stereotypes about Latin* students and increase participation through an expansive framing of mathematical ability. While Nereyda valued the reduced risks of seeking help and sharing her thinking, the unchallenged stereotypes of ability in her class often left participation inaccessible.

Discussion and Implications

Our findings reveal complexities of instructional servingness in gateway mathematics courses. Resonance in HSI faculty and student perspectives captured how instruction with an expansive framing of mathematical ability alleviated pressures of being quick and correct, which increased opportunities of classroom participation and support. At the same time, dissonance across faculty and student perspectives conveyed how these instructional practices were not always responsive to Latin* students' social positions (e.g., emergent bilinguals' language-based support needs, navigating racial and gender stereotypes of ability). Extending research on racial attitudes among HSI faculty (e.g., Garcia et al., 2020), our study shows how faculty consciousness of Latin* students' racialized experiences in mathematics that informed expansive framing of ability did not necessarily translate to experiences of servingness. Latin* students' perspectives suggest how instructional servingness that ensures equitable classroom participation requires explicitly confronting stereotypes of ability and building identity-affirming community.

Future work can extend our analysis by further unpacking Latin* identities to explore how within-group differences (e.g., nationality, gender and sexuality) can further inform servingness in HSI mathematics classrooms. We also call for research that explores how features of instructional servingness shift in upper-level mathematics and across other HSI contexts. In terms of practice, we call for HSI mathematics faculty to use instructional feedback from students to explore dissonance and resonance between classroom practices and Latin* students' needs. Mathematics faculty can also engage in observations of instruction with departmental colleagues and educational researchers to dissect practices that advance or constrain servingness.

References

Bensimon, E., Dowd, A., Stanton-Salazar, R., & Dávila, B. (2019). The role of institutional agents in providing institutional support to Latinx students in STEM. Review of Higher Education, 42(4), 1689–1721.

Burn, H., Zamani-Gallaher, E., Mesa, V., & Wood, J. L. (2019). Transitioning STEM learners to calculus: Findings from a national survey of mathematics chairs in two-year colleges by Hispanic-Serving institutional designation, MathAMATYC Educator, 10(2), 5-13.

Chang, C., & Chen, Z. (2020). Math course redesign in a private four-year Hispanic-Serving institute to address diverse equitable and inclusive issues. arXiv preprint arXiv:2006.14792.

Chase, M. M., Bensimon, E. M., Shieh, L. T., Jones, T., & Dowd, A. C. (2013). Constraints and opportunities for practitioner agency in STEM programs in Hispanic serving community colleges. In R. T. Palmer & J. L. Wood (Eds.), Community colleges and STEM (pp. 192-212). Routledge.

Ching, C. D. (2019). Supporting Latinx students in Hispanic-Serving Institutions: An exploration of faculty perceptions and actions. Journal of Latinos and Education, 21(1), 39-58.

Contreras Aguirre, H. C., Gonzalez, E., & Banda, R. M. (2020). Latina college students' experiences in STEM at Hispanic-serving institutions: Framed within Latino critical race theory. International Journal of Qualitative Studies in Education, 33(8), 810-823.

Cruz, C., Rajpal, G., Lecocke, M., Martines, I., & Lurie, A. (2021). Peer coaching program development: A framework of first-year Latina/o student persistence pursuing STEM pathways at a Hispanic Serving Institution. Journal of Hispanic Higher Education, 20(4), 365-384.

Dadgar, M., Buck, D., & Burdman, P. (2021). Solving for equity: Design and implementation of new postsecondary math pathways. Just Equations.

García, G. A. (2020). Hispanic Serving Institutions (HSIs) in practice: Defining" servingness" at HSIs. Information Age Publishing.

García, G. A., Koren, E. R., & Cuellar, M. G. (2020). Assessing color-neutral racial attitudes of faculty at Hispanic-Serving Institutions. AERA Open, 6(3).

García, G. A., Núñez, A. M., & Sansone, V. A. (2019). Toward a multidimensional conceptual framework for understanding "servingness" in Hispanic-serving institutions: A synthesis of the research. Review of Educational Research, 89(5), 745-784.

Hagman, J. E. (2021). The eighth characteristic for successful calculus programs: Diversity, equity, & inclusion practices. PRIMUS: Problems Resources, and Issues in Mathematics Undergraduate Studies, 31(1), 70-90.

Larsen, S., Marrongelle, K., Bressoud, D., & Graham, K. (2016). Understanding the concepts of calculus: Frameworks and roadmaps emerging from educational research. In J. Cai (Ed.), Compendium for research in mathematics education (pp. 526-550). NCTM.

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., McNeill, R. T., Marshall, B. L., & Guzmán, O. A. (2021). "It seems like they purposefully try to make as many kids drop": An analysis of logics and mechanisms of racial-gendered inequality in introductory mathematics instruction. The Journal of Higher Education, 92(5), 784-814.

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.

McCoy, D., Winkle-Wagner, R., & Luedke, C. (2015). Colorblind mentoring? Exploring white faculty mentoring of students of color. Journal of Diversity in Higher Education, 8(4), 225.

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.

McNeill, R. T., Leyva, L. A., & Marshall, B. L. (2022). "They're just students. There's no clear distinction": An analysis of colorblind, gender-neutral faculty discourses on undergraduate calculus instruction. The Journal of Learning Sciences.

Meling, V. B., Kupczynski, L., Mundy, M. A., & Green, M. E. (2012). The role of supplemental instruction in success and retention in math courses at a Hispanic-Serving Institution. Business Education Innovation Journal, 4(2), 20-31.

Rodriguez, S., Cunningham, K., & Jordan, A. (2019). STEM identity development for Latinas: The role of self-and outside recognition. Journal of Hispanic Higher Education, 18(3), 254-272.

Salinas, C., & 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.

Valenzuela, A. (2020). STEM diversity and student Latina/o resilience: A reflection. International Journal of Qualitative Studies in Education, 33(8), 898-904.