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BOOK REVIEW

Latinos/as' Mathematical Experiences: A Review of *Latinos/as and Mathematics Education*[1]

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As a Latina mathematics educator, I was eager to read *Latinos/as and Mathematics Education: Research on Learning and Teaching in Classrooms and Communities*. During my undergraduate training in mathematics, I developed a deep interest in sharing my passion for mathematics with children from non-dominant communities, especially Latino/a children. As one of three Latinas in a group of nearly 300 mathematicians at the Massachusetts Institute of Technology (MIT), this commitment to my community was strengthened when I noticed how underrepresented Latinos/as were within my chosen career path and the struggles we shared. My own difficulty in being successful at my undergraduate institution, coupled with the observation that many of my Latino/a friends struggled to finish their careers in science, technology, engineering, and mathematics (STEM) made me realize that something needed to be done to ensure future generations of underrepresented students continue to enter STEM fields, and that the spaces in which non-dominant students learn mathematics needed to be attuned to meeting the needs of diverse groups of student learners.

I became involved in mathematics education when, as an undergraduate student, I founded an outreach program for local middle school children who were from traditionally marginalized groups. This program exposed children from the local urban community to STEM disciplines and matched them with undergraduate mentors that held similar backgrounds and interests. The program also held workshops for the parents of the participants that informed them of local resources and addressed concerns parents had about their children's education. Additionally, as an undergraduate, I went through a newly established teacher educa-

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tion program and decided to follow a non-traditional path for a student at MIT: a public school teacher.

Upon graduation, I headed back to my hometown to become a high school mathematics teacher. My experiences as a teacher led me to understand the necessity for better teacher education programs, the lack of resources for teachers (especially first year teachers) in urban communities, and the struggles some Latino/a children face in their mathematical educational experiences. Although I came from the same community as my students and grew up in a bilingual home, I had a different classroom mathematical experience because my mother was a mathematics teacher. I did not always experience the same struggles in school mathematics that my students did. Hence, as a teacher, I often felt that I was not well prepared to deal with the challenges my students encountered in learning mathematics. I felt it necessary to return to graduate school to better prepare myself as an educator.

As a graduate student, I have learned a lot from my mentors and from education research about learning and teaching. I have also discovered that we have so much more to understand about the school and everyday practices that inform the teaching and learning of mathematics. Given the diversity that exists in our classrooms, we need to understand how teachers' historical, social, and cultural experiences influence how they engage in the practice of teaching. Likewise, we need to understand how students' historical, social, and cultural experiences influence how they participate in the mathematics classroom. As such, I have continued my path as an educator in research that looks at the learning and teaching of mathematics. More specifically, I am interested in looking at home and community practices of mathematics students and thinking about how we can include these practices in classroom teaching. Thus, I too adopt sociocultural theories of learning in my own research in order to make mathematics education accessible to students of diverse backgrounds.

I have included this mini-autobiography to give you a sense of the multiple identities that shape my perspective. On one hand, I am a trained mathematician, on the other, a K–12 educator, and yet, on a third, if you will, a first generation Mexican-American woman with a deep commitment to sharing her passion for mathematics. I exist as multiple identities at once. Therefore, I read *Latinos/as and Mathematics Education* and present my review with these different perspectives influencing my interpretation.

What Is This Book About?

Latinos/as and Mathematics Education documents diverse mathematical experiences that **some** Latino/a students have in and out of classroom settings. It is interesting to note that the diverse representation of mathematical experiences

within *Latinos/as and Mathematics Education* is analogous to the definition of what it means to be Latino/a within the United States that the editors present in the first chapter. As what it means to be Latino/a in the United States varies in multiple contexts, likewise, the contributing authors present multiple ways in which Latino/a children experience mathematics within their Latino/a and non-Latino/a communities. With this in mind, the use of a sociocultural perspective throughout the multiple analyses found in the volume is appropriate because it refuses the notion of painting all Latino/a students in one brushstroke. It allows the authors to examine how the students' unique home, school, local and non-local political communities influence their mathematics education. In the following sections, I give a brief summary of the three major themes that I see develop throughout the book: community experiences, classroom experiences, and the role of assessments.

Community Experiences

One of the important factors that *Latinos/as and Mathematics Education* addresses is that Latino/a children's mathematical education is not limited to what they do in the mathematics classroom. The editors, Téllez, Moschkovich, and Civil (2011), identify home and community mathematical practices and experiences that in various ways influence or can influence children's classroom experiences. For example, Domínguez (2011) illustrates how mothers with little or no prior schooling experience are able to identify mathematical practices in their everyday activity, and help their children make sense of classroom mathematics by situating school mathematics problems in contexts familiar to their children. Previous research has shown that bridging home and community practices with classroom mathematics experiences helps students develop interest and motivation in engaging with a subject because it makes the subject matter culturally and socially relevant (Lipka et al., 2005; Nasir, Hand, & Taylor, 2008). Additionally, drawing upon students' community experiences helps researchers to continue to move away from culturally deficit views of students' home experiences (Gutierrez & Rogoff, 2003). Thus, identifying community mathematical practices is useful knowledge because it brings to light collaborative opportunities for schools and local communities to participate together in the students' mathematical experiences (Rogoff, 1994).

Classroom Experiences

Latino/a children's mathematical experiences differ from classroom to classroom, and the authors highlight the range of these experiences. In particular, the authors note the range of resources that students encounter in their daily classroom life. We see the importance of Latino/a children's native language in solv-

ing mathematical problems, the importance of creating social spaces where different kinds of mathematical problem solving can occur, the importance of tying subject-matter content to community agency, the importance of teacher preparation, and much more. For example, Zahner and Moschkovich (2011) attempt to understand the relationship between bilingualism and mathematical reasoning through analysis of the role of code-switching on social interaction during mathematical problem solving in a sixth-grade mathematics classroom in a dual-immersion program. Thus, different cultural issues that concern not only Latino/a students but also students from other non-dominant communities are presented to further document the diverse cultures that exist within mathematics classrooms.

Assessments and English Language Learners

Although mathematics assessments only account for a small portion of the book, the experiences that Latino/a students have with mathematical assessments is an important theme. Given the current climate of using testing for accountability, it is important to understand how assessments are written with bias against particular groups of students. Solano-Flores' (2011) analysis of English Language Learner's (ELL) underperformance on standardized assessments in addition to his discussion on the development of standardized assessments causes the reader to question the purpose of creating assessments that are constructed to ignore ELL's linguistic needs and therefore do not accurately evaluate ELL's knowledge of mathematical concepts. In addition, Mosqueda (2011) shows that exposure to rigorous mathematics courses mediates Latino/a performance on assessments. However, he notes that perceived English proficiency can (does) limit Latino/a students' access to rigorous mathematics classes. Thus, both of these authors illustrate that we have much to do in improving the functions of student assessments as well as in improving how well assessments capture student mathematical knowledge.

Why This Book Is Important and What Is Missing?

Latinos/as and Mathematics Education gives us a glimpse of Latino/a children's experiences in their mathematical classrooms and draws attention to critical issues around mathematics learning that continue to impact Latino/a students. For example, English as a second language continues to be an important issue for some children in mathematics classrooms. Policies that enforce teachers to ignore linguistic and sociocultural capital have been linked to the continued underperformance of Latino/a children on statewide assessments (Gandara, Hopkins, & Martinez, 2011). In addition, Latino/a children continue to struggle learning mathematical concepts in de-contextualized classrooms. Throughout the volume,

authors draw from mathematics education literature and Latino/a education scholarship in a way that helps us further investigate the issues that Latino/a students face contextualized within students' mathematical experiences. The volume also demonstrates that educational researchers need to continue studying these issues as we think about how to make mathematics education in schools more accessible to Latino/a children.

Latinos/as and Mathematics Education is important because it extends the discussions around Latino/a community mathematical practices that empower Latinos/as and mathematics educators to think critically about the communities in which they teach. It helps Latinos/as and non-Latinos/as to value the different mathematical knowledge that Latino/a community members are constantly engaging. Acknowledgement of our home mathematical experiences also empowers Latinos/as because it gives agency to our children, as we consider the different but powerful knowledge that our children bring to their classrooms. This conversation is particularly important now, given the current anti-Latino/a and anti-immigrant dialogue that is taking place nationwide which actively pushes Latino/a students out of schools (Robertson, 2011) and denies them of their basic human right to an education.

An important discussion that could have been more explicit in *Latinos/as and Mathematics Education* is what "mathematics education" means to the authors. Perhaps this discussion was omitted given that mathematics education has many representations to different people; however, it would have been helpful if in each of the chapters, the authors clearly stated their own mathematical education values and beliefs. For example, Quintos, Civil, and Torres (2011) are explicit that they view mathematics education as the teaching of mathematical practices that encourages students to be agents of change. This explicitly stated view allows us, as readers, to understand how and why Quintos and colleagues choose the evidence that supports the arguments they make. Clearly, articulating the researcher's position in relation to mathematics education would help the reader understand why the researcher decided to conduct the study in a particular way.

Additionally, *Latinos/as and Mathematics Education* covers a wide variety of topics within an equally wide variety of Latino/a communities, and brings the reader to the realization that, when it comes to thinking about how Latinos/as experience mathematics education, the social contexts of each educational setting need to be considered. Given the centrality of social context within the volume, and within my own work, I think it is important to note that readers should not be alarmed if they feel that there is a lack of generality within *Latinos/as and Mathematics Education*. The study of mathematics education is complex in itself, and there are a number of ways to examine many of the issues of mathematics education (such as content, problem types, classroom practices, classroom structures, language, classroom culture, etc.), which are always situated within a particular

context. While it is important to gain a deep understanding of particular issues in mathematics education, it is equally important to first survey the landscape of such issues. Through this survey, we see the need to continue research of mathematics education in context, so that we can get closer to an understanding of how we can work with teachers in creating mathematics classrooms that make mathematics accessible to all of its students. Thus, *Latinos/as and Mathematics Education* invites us to think about these mathematics education issues within context(s), particularly in the context of Latinos/as mathematical learners.

As editors, Téllez, Moschkovich, and Civil (2011), provide the reader with a collection of powerful work that highlights the potential for classroom agency within the Latino/a community. Unfortunately, however, not all authors included in the volume discuss the issue of student mathematical agency, particularly within the sections that do not explore the intersection of classroom and community experiences. The chapters that document community experiences clearly articulate sources of student and family agency, even when students and families do not always realize the power of their personal knowledge and experiences. Agency is noted in the sections on classroom experience and assessment; however, the connection between student agency in the classroom and mathematics learning is not always readily apparent. Student agency within the classroom is an important topic that is related to teacher development and assessment. These sections would have been more powerful if the authors had made the discussion of agency a primary theme rather than a secondary theme.

Finally, *Latinos/as and Mathematics Education* illuminates places where additional research is needed, and illustrates in what areas we need to create change so that Latino/a students can have mathematical experiences that value the mathematical knowledge they bring to class. Overall, this volume creates opportunities for educators and researchers to think about (different) ways in which we can continue to make mathematics education accessible to Latinos/as in the United States and beyond.

Who Should Read This Book?

Latinos/as and Mathematics Education is a great read for anyone who works with, is a part of, or just wants to learn about the Latino/a community. More specifically, anyone in educational settings such as teachers and school administrators can read this book to see the kinds of opportunities that exist in relating mathematical learning to local community practices. I would hope that this book would encourage educators to reach out to their local community (especially parents) and to begin to dialogue about ways in which they might work together to help students make connections between what they learn in the classroom and what they do at home. Educators can also find this book useful in terms of think-

ing about other social issues included in its pages, such as language and the organization of social participation structures within the schools and classrooms. Further, educators can and should take into consideration their own professional development and think about assessments in relation to their students' mathematical experiences and its direct impact on students' mathematical social identities.

Additionally, I think this volume can be an excellent resource for Latino/a parents. Although most of *Latinos/as and Mathematics Education* is written in academic language, the chapters that deal with the community and home experiences of Latino/a students use language that is accessible to the general public. In doing so, Téllez and colleagues (2011) give parents agency in many ways. First, *Latinos/as and Mathematics Education* gives Latino/a parents a voice by sharing their experiences and knowledge. Second, the findings by Domínguez (2011) recognize that regardless of the number of years that parents may have spent in school (or their success in school mathematics), parents are constantly engaged in complex mathematical activity in their everyday lives. Third, Acosta-Iriqui, Civil, Díez, Palomar, Marshall, and Quintos-Alonso (2011) recognize Latino/a parents' ability to recognize gaps in their children's education, and their concern for their children's success. Thus, Téllez and colleagues not only give voice to Latino/a parents, but they also recognize Latino/a parents' voices as legitimate, and in this way give Latino/a parents agency in their children's education.

Latinos/as and Mathematics Education is accessible by most readers; however, the intended audience is most likely educational researchers. This intent is evident through the use of academic language and the academic writing style by most of the authors. Moreover, the authors present important issues on the mathematical experiences Latinos/as have in their everyday lives in relation to research done on mathematics education. As a result, *Latinos/as and Mathematics Education* brings together research on mathematics education and research on Latinos/as educational experiences in an important way that not only informs the existing literature in mathematics and Latino/a education but also allows the educational community to think about these issues in a practical way.

Final Comments

Latinos/as and Mathematics Education is a riveting and foundational book that brings together the work on the Latino/a educational experience with the work on mathematics education in a cohesive and unprecedented way. Between Domínguez's (2011) work on Mexican mothers' desire and ability to help their children be successful in their mathematics classrooms, to Morales, Vomvoridi-Ivanovic, and Khisty's (2011) study of parental participation in mathematical activities in informal settings, to Solano-Flores' (2011) historical analysis of the assessment development process, Téllez, Moschkovich, and Civil (2011) have skill-

fully created an opportunity for dialogue between the educational and local Latino/a communities that will hopefully give agency to Latinos/as in their own education. *Latinos/as and Mathematics Education* brings to light issues that continue to be critical for mathematics education, and guides the reader to think about the work that we need to continue doing to improve the educational experiences of Latino/a children.

Through this edited volume, Téllez, Moschkovich, and Civil (2011) significantly contribute to both the work on mathematics education and Latino/a education by bringing together a critical mass of researchers and scholars who force us to think differently about the ways that Latino/a children experience mathematics education and how these experiences can shape what mathematical identities they take both in the classroom and in their social communities. Given the current projections by the U.S. 2010 census on the growth of the Latino/a population in the United States (U.S. Census Bureau, 2010), I would encourage you to read *Latinos/as and Mathematics Education* to become more knowledgeable concerning meeting the needs of Latino/a mathematics learners. The Latino/a population is the fastest growing population in the United States, and we as a community need to be prepared to meet Latino/a students' needs in and out of mathematics classrooms.

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