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Towards a Critical-Mathematical Consciousness: Understanding the Construction of a Counterspace for Prospective Maestras Mexicanas

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Publication Date
2022

Peer reviewed|Thesis/dissertation

Towards a Critical-Mathematical Consciousness: Understanding the Construction of a Counterspace for Prospective Maestras Mexicanas

By

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A dissertation submitted in partial satisfaction of the

requirements for the degree of

Doctor of Philosophy

in

Education

in the

Graduate Division

of the

University of California, Berkeley

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Summer 2022

Abstract

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By

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Doctor of Philosophy in Education

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This dissertation was motivated by a commitment to building more just mathematical learning opportunities for children grounded in care and dignity. Creating those opportunities for children begins by cultivating those kinds of opportunities for teachers, specifically marginalized educators. This study seeks to understand what it means to co-construct an identity-centered learning space for prospective teachers of color who seek to develop more just understandings of mathematics. This commitment also stems from an understanding in the need to create spaces of affirmation and support that leverages people's everyday experiences and repertoires of practice. In teacher education, these spaces of affirmation can be a disruption of the constant marginalization and push out of teachers of color.

For this study, four prospective teachers of color, self-identified Mexicanas and I met over a period of six months and engaged in critical conversations, pláticas. Through pláticas (deep meaningful and personal conversations), the women had opportunities to engage in issues related to mathematics, identity, culture, and justice. Drawing from the methodology of social design-based experiments, we co-designed pláticas with new tools, artifacts, discursive practices, and norms to support learning opportunities towards our commitment to educational justice. The design included our pláticas, interviews, and reflection prompts. Analyses examined the learning environment and its development, the shifts in critical-racial-mathematical literacies and the challenges that arose for the women as they embraced becoming social justice educators.

Findings indicate that throughout the study there was an emerging focus on "practice" as the pláticas progressed and there was an organic emergence of focusing on two classrooms to create change. I conceptualized the co-design process as an iterative, collaborative and in-the moment process that cultivated opportunities for co-constructing new meanings with mathematics and justice. There was also a conceptualization of pláticas as a multidimensional practice. As I sought to understand the shifts in critical, racial and math literacy, analyses revealed that master narratives about mathematics education were invoked, often contradicting, and coming into tension with one another. In fact, they operated as a system, which is complex and not straightforward. As the vignettes allude to, engaging with one master narrative based on a lived

experience may potentially reinforce another master narrative. Findings related to the challenges that the women named during pláticas revealed that the women primarily held on to three specific social justice ideals: social justice work is action-driven work, social work engages with political issues, and social justice work transforms lives. Yet, these ideals were often embraced or challenged by the women based on their own experiences as working-class women. This dissertation has pedagogical implications in teacher education, arguing for more identity-centered learning communities to grapple with issues of justice and mathematics. As this dissertation documents, engaging with such issues is complex and difficult. It also has methodological implications as it argues for more humanizing research approaches that center people's lived experiences.

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Acknowledgements

I have been blessed to know some remarkable people over the years. This work was only possible because of them. *De corazón, se los agradesco. Este logro es nuestro.*

First, I would like to thank Inez, Anahi, Jenni, and Luz for sharing their gift of stories in this project. You all inspire me to continue this work and to dream of a just future. It was an honor to learn alongside of you.

I am deeply grateful to Alan Schoenfeld for his supportive mentorship throughout my journey as a graduate student. Alan provided space for me to develop an understanding of what I cared about and use that as groundwork for the research I would then pursue. Thank you for helping me develop my voice and identity as a researcher. Your mentorship and your commitment to your students is truly inspiring, I take that with me as I continue my work in academia.

I am deeply grateful to Kris Gutiérrez for her support all these years as a graduate student. Kris, you took me into your research group and have supported me both academically and personally. Thank you for being a wonderful femtor and for showing me what could be possible when we create our own spaces in academia.

I am grateful to Tesha Sengupta-Irving, who has been the greatest cheerleader and pusher I needed. Tesha has nurtured and understood my commitments and has been a great person to think with. You have taught me the importance of grounding the work in people, and I hope to continue to do that throughout my journey as a researcher.

I am deeply grateful to Miguel López for pushing me all these years. Thank you for teaching me that it is possible to be *en la comunidad* and still do academic work. You inspire my commitment to continue to do work on the ground and to learn alongside the maestrxs. I also want to thank my comunidad, Las Comadres, who have been my rock all these years. Especially to my sister and comadre, Isela who invited me to her classroom when I felt completely lost. Your care and commitment to students is truly motivating.

I am immensely grateful to all my friends who held me and laughed with me during this wild journey. Especially to Patrick and Diana, your friendship carried me through these past few years.

I would also like to thank the TRU and Functions community. The Functions community was instrumental to my success as a scholar, and it has taught me the importance of community in academia. Immense thanks to Siqi, Xinyu, Anna W, Alyssa, and Evie for pushing my thinking and helping me formulate my ideas. I am deeply grateful to Mallika for supporting me during my early years at Cal and for becoming a friend and thinking partner in the later stages of my graduate school years. Anna Z, thank you for your support and generous feedback this past year. Heather, I am so grateful that we finished together, having you by my side was a true blessing.

Thank you, Adriana Guzman, for your research assistance.

I would like to acknowledge the sources of funding that have supported my research, including the National Academy of Education and Spencer Foundation and the Chancellor's Fellowship program.

Last and most importantly, I would like to thank my family for their constant support. To my mom, Maria, thank you for always believing in me since day one, this would not have been possible without you. To my brother, Juan, for his support and humor, thank you for showing up for me and Bryan. To my partner, Francisco, thank you for supporting my journey and for

always believing in me. My little Bryan, your love and smile carry me along this journey. And much love to my abuelitos for instilling in me the importance of hopes and dreams.

Chapter 1: Introduction

In this introduction, I describe the roots of my commitments to creating more just and humanizing learning spaces, commitments that stem from my experiences as an immigrant woman of color.[1] These commitments shape the project that is described in this dissertation. I then describe how this project came to be and end with an overview of the dissertation.

El Trabajo del Corazon

Three decades ago, my grandparents immigrated to the US dreaming of a "better life". This "better life" entailed having access to their necessities and having a better standard of living. Years later my mother, brother and I would follow with those same dreams and aspirations. We left everything behind and carried handfuls of hope into this new world. Being an immigrant and the daughter and granddaughter of immigrants shaped my perspective of schooling and educational attainment. I was highly motivated to do well in school and to live up to the dream that my mother and grandparents held when they arrived here. While I grew up hearing phrases like, "you have to be somebody" or "don't end up here like us" I was always impressed with my family's work ethic and desire to have a better life. I looked at my grandparents with pride as I wondered how much strength it took them to leave everything behind and arrive to a new country. Many years later, I would come to understand the deficit language employed towards people like my abuelitos and the immigrant community at large.

My abuelitos are now in their seventies, living back home, en la tierra que los vio crecer. I think about them when I think about the kind of work I want to do as a scholar: work that matters and that feels just. As I continue to reflect on my experiences growing up in an immigrant community, I can't stop thinking about how much hope immigrants have for this better future, for the American dream. In fact, a lot of that dream comes from our understandings of schools as places that care for children in ways far beyond knowledge production. I take seriously the commitment of cultivating learning experiences for children that center their lived experiences and their full humanity. And I attend to this commitment by grounding myself and my work within teacher education spaces to cultivate opportunities to create those experiences for children.

Inspired by my commitments to educational justice, I am interested in understanding how we can create work in mathematics teacher education that is humanizing. I think about this not only as engaging in humanizing projects but am also committed to thinking about how we can humanize the research process. That is, doing research in mathematics teacher education entails centering more humanizing research methods and methodologies. Thus, I consider the idea of centering relationality and centering people's ways of being as critical components to construct humanizing projects but also a way to do research beyond the normative. This project is grounded in such commitments and through the co-construction of a counterspace of pláticas, I seek to understand how women develop their understandings of justice and mathematics.

I grew up pláticando en familia. It was a daily practice to have pláticas over dinner, as we drove to run errands or as we cooked our favorite foods. These pláticas were filled with consejos,

[1] Note to the reader: This project is about people's lived experiences. I begin this chapter by sharing some of my lived experiences because they shape commitments to the kinds of research I do and what I care about. I do this to both honor the project but also to honor my own commitments to do research in a more humanizing way. In this chapter, I will not provide translations for the reader as I want to stay true to my own linguistic identity.

con advertencias y enseñansas para ser una mujer de bien. These pláticas often left me with more questions than answers, always challenging me to think beyond what we have now and what could exist in the future. Maybe it was just a form of daydreaming, of believing that things could change, and that life could indeed be better. But isn't that also what it means to become a social justice educator? As we continue developing our critical awareness, we begin to notice the way that systems operate to marginalize people. A couple of years ago, I had a conversation with a prospective educator as part of the CalTeach program and she asked me, "doesn't all of this feel somewhat hopeless?" I agreed that it does feel that way at times. Hence, I believe that engaging in this work requires a lot of hope and a lot of desire to create change.

The aim of this dissertation is to provide a glimpse of hope, of what could be possible when we focus on identity-centered spaces for prospective teachers of color that seek to develop more just understandings about mathematics.

The Creation of this Project

I began my graduate studies in 2016 when president 45 entered office, a year that was very difficult for the immigrant community. It was a really tough year. Toward the end of 2016, I decided to continue to participate in the pláticas with Las Comadres[2][3]. I made the decision because I believed that the community there would be integral to my well-being in academia. The pláticas were a space where I got to meet other women who were navigating the institution of schooling and were committed to justice in education. That same year, I met Itzel[4] a local sixth grade teacher who invited me to join her class and do math with her students. I visited a couple times in 2016 and early in 2017. During the academic year of 2017-2018 I continued to volunteer in her class and teach various math activities with her students. After I had known the students for a couple of months, this work led to the pilot study I discuss in Chapter 3. That experience led me to question a lot about my positionality as researcher and also as someone who shared the same ethnic identity as these students. It led me to reflect on my ethical commitments to my community, to the immigrant Mexicans/Latinx community at large and to grapple with my own identity as Mexicana and aspiring researcher.

Those first few years were integral for me to build relationships with the community of Las Comadres. I was not only a participant in pláticas with Las Comadres, but I was also a mentor and served as a mathematics tutor to support them with their math content courses. I was also a learner, listening to the historias of my comadres who sought to enter credential programs and struggled to be part of it all. It led me to think deeply about the challenges and hurdles the women were navigating as they sought to become educators. I heard of their struggles with the CBEST, of financial dilemmas, and of the many other challenges they had to navigate to try to be a teacher. And to be clear, it wasn't because they did not want to, but rather that systematic hurdles made it almost impossible for them to be and stay there. Hearing the stories about their struggles made me wonder "what we are doing to support teachers of color to enter the

[2] Comadres translates to co-mother. Comadres are women you choose to co-mother your children with. In this context, we use comadres as a way to speak about the relationality that has been built between women who seek to navigate the world of schooling. The group calls itself, Las Comadres.

[3] I had previously participated in 2014 but stopped attending pláticas when I was a graduate student at San Francisco State.

[4] Itzel is a senior teacher who teaches at a local elementary school. Her classroom was the place where most of the pláticas would take place. She often took the position of being a mentor for the younger teacher candidates and she would always invite others to her classroom. She is sometimes referenced in the pláticas.

profession and what should we do to support them to stay?" I believed that the spaces we were creating with pláticas could potentially be central to exemplify and guide creation of communities of affirmation, and that these communities could help create new forms of understandings about mathematics.

This dissertation emerged from the understanding that community is integral for people. Building community and creating learning spaces that center our full humanity are necessary both as a form of support and also as a form of learning. We need opportunities to be "us" and pláticas create such opportunities. I thus sent out an email to Dr. L who organized the pláticas with Las Comadres and asked him to send out a flyer inviting people to join. Inez, Anahi, Jenni, and Luz responded with an interest and desire to be in community. The four women were at different points of their life, but they wanted to be together and find a space of solidarity to build these new understandings collectively.

Overview of Dissertation

This dissertation aims to understand the collaborative co-construction of a designed counterspace intended to support a group of women to develop understandings about justice and mathematics within a cultural practice of pláticas. In the chapters that follow, described below, I situate this line of work within the relevant literature, outline the methodological approach to the design and analysis, present three chapters that analyze what occurred in the pláticas, and end with a discussion chapter that summarizes the findings and discusses the implications of the central arguments of this dissertation.

Chapter 2 provides an overview of relevant theoretical perspectives and a review of prior research that motivated and informed the methodological approach taken in this project. I begin this chapter by situating the reader within the theoretical perspectives, Critical Race Theory and LatCrit Theory. Taking such an approach centers identity by paying close attention to (counter)storytelling to center people's histories, lived experiences and aspirations. I then situate the dissertation in the prior research that guided this work. That research focuses on learning and design in teacher education and on the ongoing processes of becoming a social justice math educator.

Chapter 3 describes the study of the pláticas as a social design-based experiment intended to support the women's evolving understandings about mathematics and justice. The chapter begins with a description of the pilot study that established the groundwork for this dissertation project. Then I describe the research setting and characterize the co-participant's testimonios (including mine) and describe my own positionality as a researcher. I describe the design of the learning community, expanding on the data collection procedures and the data sources collected. The chapter concludes with a description of the methods I used to reduce and analyze the data in order to investigate the three research questions.

Chapter 4 considers the questions*: What was the design of the learning community and how did it evolve? What are pláticas?* To address the first research question, I paid attention to the kinds of activities we engaged with in the pláticas considering how the design principles evolved over time. Through this analysis, I found that the notion of practice emerged across time. I also found that by focusing on practice, we studied two classroom contexts coming from distinct and essentially independent perspectives: math and justice, with the goal of merging both understandings together. In addition, because pláticas shaped a lot of the interactions, there was co-design process as an iterative, collaborative and in-the moment process that cultivated opportunities for co-constructing new meanings related to mathematics and justice. To address

the second research question, I was interested in understanding the dimensions of pláticas. Using grounded theory, dimensions emerged. I conceptualize pláticas as a multidimensional practice, a form of storytelling, that embodies linguistic freedom, reciprocity, relationality, foregrounds the imaginative, centers everyday knowledge, moves fluidly across settings and time, and it is co-constructed and co-contested.

Whereas Chapter 4 focuses on the learning environment, Chapter 5 considers the research question: *How do the master narratives that comprise the mujeres' critical-racial-mathematical literacies evolve during the pláticas?* This chapter focuses on understanding the kinds of shifts in critical-racial-mathematical literacies happening for the women in the pláticas. These shifts were captured by looking at the way the women upheld, challenged, or amended four main master narratives in mathematics education: what is math, what does it mean to do math, who does math and what does it mean to be good at math? Through understanding these shifts, it was evident that these master narratives reinforce each other, contradict each other and that there is no consistency because they emerge and take shape in particular contexts. In this study, that context was their lived experiences and thus the complexity captured through the analysis shows how becoming social justice educators is complex and not straightforward.

Chapter 6 continues to explore more regarding the complexity of becoming social justice educators by considering the practical component of instruction. This chapter considers the research question: *What entanglements between theoretical aspirations and pragmatic ways of thinking about justice and mathematics do these prospective teachers experience?* To address that research question, I paid attention to when the women discussed challenges they foresaw when considering ideals of social justice. Through four vignettes, I show how three social justice ideals – social justice is action-driven work; social justice work engages explicitly with political issues; and social justice work transforms lives – are upheld, challenged and amended. Findings revealed that the women embraced these ideals but often struggled as tensions emerged. These tensions were individual-personal (e.g., I don't want to lose my job, Can I teach this?), considered students' well-being (e.g., these issues are complex for students so we must attend to trauma and the context) and considered the children's lived realities (e.g., teaching a lesson about building wealth even when it may perpetuate capitalism).

In Chapter 7, I reflect on the findings presented across the dissertation to consider implications for the design and study of justice-oriented learning communities. I then explore the limitations of this study and suggest directions for future research.

Chapter 2: Theoretical Perspectives and Prior Research

Introduction

A focus of this study is the philosophical question of becoming, *how does one become a social justice math educator?* Such a question is neither trivial nor straightforward. I conjecture that centering people and their imagined futures is critical to the notion of becoming. Thus, at multiple levels, this study centers people, their identities, their commitments – in other words, their full humanity. Part of the argument throughout this dissertation is that the maestras' lived experiences created possibilities of a future other than what is known: a future where relationality is central to teaching mathematics, a future where they can challenge problematic narratives and a future where they can teach mathematics through a justice-oriented approach. A future that challenges dominant ways of being that often dehumanize the mathematics experience for children.

I begin this chapter by grounding this work in the theoretical perspective of critical race theory and LatCrit Theory. Taking such an approach centers identity by paying close attention to (counter)storytelling to center people's histories, lived experiences and aspirations. I examine the research that takes a Latina/Chicana Feminist perspective and describe how such a perspective shapes how pláticas have been taken up in the literature. I then view my efforts through the lens of prior research at two levels, first at the macro level by focusing on learning and design in teacher education and at the individual level by focusing on the ongoing processes of becoming a social justice math educator. I conclude the chapter by connecting both levels to the methodological approach of this study as a social design-based experiment intended to support prospective maestras to develop understandings about justice and mathematics towards a justice-oriented perspective of teaching mathematics.

Critical Race Theory and LatCrit Theory

Critical Race Theory (CRT) draws on and builds from the broad literature of critical theory in law, history, sociology, ethnic studies, and women's studies. Mari Matsuda (1991) defines critical race theory as:

> ...the work of progressive legal scholars of color who are attempting to develop a jurisprudence that accounts for the role of racism in American law and that work toward the elimination of racism as part of a larger goal of eliminating all forms of subordination, (p. 1331)

Ladson-Billings and Tate (1995) argue for a critical race theory in education to challenge the status quo. Through their central proposition that US society is based on property rights, they document the ways in which the intersection of race and property create a tool, CRT, through which we can understand social inequity. They caution those who focus on studying race in education to not fall trap to what they call, *multicultural education* that often trivializes the use of ethnic and cultural artifacts only as a way to assimilate to dominant narratives of schooling. They argue that the current multicultural paradigm functions as,

> Instead of creating radically new paradigms that ensure justice, multicultural reforms are routinely "sucked back into the system" and just as traditional civil rights law is based on

> a foundation of human rights, the current multicultural paradigm is mired in liberal ideology that offers no radical change in the current order. (p. 62)

Daniel Solórzano (1997) identified five tenets of CRT that must inform theory, research, and pedagogy in education: 1. the centrality and intersectionality of race and racism, 2. the challenge to dominant ideology, 3. the commitment to social justice, 4. the centrality of experiential knowledge, and 5. the interdisciplinary perspective.

> *The centrality and intersectionality of race and racism*
>
> A CRT in education begins with the assumption that race and racism are endemic, permanent, and central factors to how one experiences the law. While racism and race are central to critical race analysis, they are also viewed at their intersection of other forms of oppression such as gender and class.
>
> *The challenge to dominant ideology*
>
> A CRT in education challenges the claims that the educational system and its institutions are objective, meritocratic and race neutral.
>
> *The commitment to social justice*
>
> CRT in education is committed to social justice and provides a transformative response to racial, gender and class oppression. The commitment to social justice leads toward: 1. The elimination of racism, sexism, and poverty and 2) empowerment of minoritized groups of people.
>
> *The centrality of experiential knowledge*
>
> CRT in education recognizes and affirms the experiential knowledge of students of color as legitimate and critical to understanding, analyzing, and teaching about racial oppression in education.
>
> *The interdisciplinary perspective*
>
> A CRT in education challenges ahistoricism and argues that analyzing race and racism in education must be placed in both the historical and contemporary context.

One of the critiques of CRT has been its primary focus on the Black and White binary. In particular, the two-dimensional discourse limits the understanding of the multiple ways in which African Americans, Native Americans, Asian/Pacific Islanders and Chicanxs/Latinx experience, respond and resist racism and other forms of oppression. Figure A shows the intellectual genealogy of critical race theory.

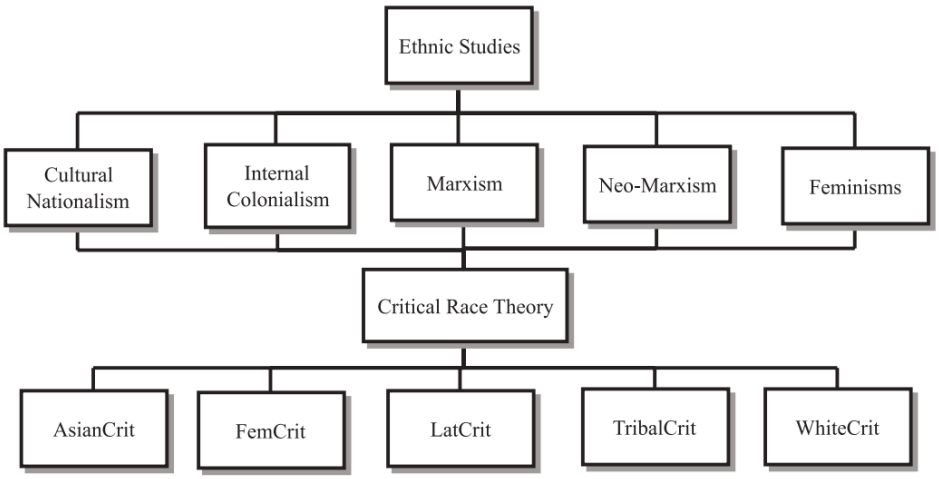


Figure 1: Intellectual genealogy of CRT (Yosso, 2005)

One branch of CRT seen in Figure 1 that is helpful in this project is LatCrit Theory, which extends critical race theory to address the layers of racialized experiences of Chicanxs and Latinxs people. LatCrit scholars argue that racism, sexism, and classism are experienced along other layers of subordination such as immigration status, sexuality, culture, identity, language, and accent (Montoya, 1994). LatCrit theory shows Chicanx/Latinx's multidimensional identities and through an intersectional perspective can address racism, classism and sexism and other forms of oppression. It is important to note that LatCrit along with its other branches (AsianCrit, FemCrit, TribalCrit and WhiteCrit) are not to be taken as competitive with CRT or to be seen as a form of hierarchies of oppression. LatCrit along with the other branches complement CRT and makes visible other forms of oppression that CRT does not make visible.

Counter-Storytelling

The fourth tenet of CRT, the centrality of experiential knowledge, can be used in conjunction with the experiences of Chicanx/Latinx people through a technique called storytelling. Delgado (1989) conceptualizes counter-storytelling both as a method of telling a story of those who are at the margins and a tool to challenge stories that are considered dominant in society. Solórzano and Yosso (2002) delineate what they conceptualize as majoritarian stories, master narratives, stories where racial, gender, class and other forms of privilege seem "natural." Focusing on majoritarian stories is helpful for framing the context within which this study takes place because it reminds us that people of color often buy into these narratives. For example, Mexican American author, Richard Rodriguez, has strong stands against bilingual education and affirmative action and is a big proponent of assimilation. Arguments against bilingual education and affirmative action perpetuate meritocracy and position English to be the norm language. The unspoken discourse is that Spanish is seen as a deficit and that if people are not successful it is because they have not worked hard enough. Majoritarian stories do little to challenge the status quo, placing the burden on minoritized people as opposed to highlighting or challenging systematic structures.

As mentioned earlier, counterstories are used as a tool to expose, analyze, and challenge majoritarian stories of privilege. One may be concerned that counterstories may unintentionally center majoritarian stories as they seek to counter them. Thus, counterstories should not only

respond to majoritarian stories but should strengthen the possibilities of what could be in education.

There are three general forms in which counterstories have been presented in education: personal stories or narratives, other's people's stories or narratives and composite stories or narratives. This dissertation focuses on the second form of counterstories, the sharing of people's stories through vignettes. This study aims at leveraging the stories of Mexicanas to directly challenge the apartheid of knowledge that exists in academia while simultaneously committing toward an understanding of racial and social justice with and of mathematics. Counterstories are very useful to challenge dominant narratives that ultimately uphold white supremacy, yet such approach feels reactive. I take storytelling as a useful construct that creates opportunities for learning and becoming for the maestras.

Chicana/Latina Feminist Perspectives

This study is aligned with Delgado Bernal and colleagues' (2006) call for educational researchers to "shift the terms by which we approach Latina/Chicana schooling and education from one of deficit to one of complexity, strength and hope" (p. 4). While their book is an edited compilation, the thread that holds all the chapters together is how they all challenged dominant Eurocentric ways of analyzing the world by explicitly focusing on the ways of knowing and the experiences of Chicanas/Latinas. The authors acknowledge that this book is still a work in progress and urge the next generation of mujerista scholars to add to the complex ways of knowing and being for Chicana/Latinas in the United States. Delgado Bernal et al.'s book is the first bridge from Chicana/Latina Feminist perspectives to education, in ways that honor people's lived experiences and as the editors note, doesn't just add to existing frameworks but rather "transforms the conceptual beginnings."

Chicana/Latina scholars have pushed the field of education forward by highlighting the importance of centering cultural knowledge and identity in methods and methodology (Fierros & Delgado Bernal, 2016). This approach is aligned with a theoretical framework of CRT and LatCrit, where the use of methods like testimonios and pláticas are leveraged. For example, Fierros and Delgado Bernal (2016) have argued that pláticas serve as the context for witnessing "shared memories, experiences, stories, ambiguities, and interpretations that impart us with a knowledge connected to personal, familial, and cultural history" (p. 103). In their conceptualization of pláticas as a feminist methodology, they argue for five principles. First, that research draws from Chicana/Latina feminist theory. Second, a plática methodology honors participants as co-constructors of knowledge. Third, the methodology makes connections between the research inquiry and everyday lived experiences. Fourth, when employing a plática methodology there is potential for healing. Fifth, plática methodology relies on relations of reciprocity and vulnerability including the researcher. As I will note in Chapter 4, the use of pláticas in educational research has been growing still leaving a lot of room for exploration.

Learning and Design in Mathematics Teacher Education

The Context

I begin this section of my review of the literature by situating the reader in the teacher education context. Two components are important guides to the organization of this context: the

teacher education context and the experiences of teachers committed to teaching for justice and the experiences of teachers of color. By taking this approach I want to begin by raising top level issues and then focusing into the issues that are specific to teachers of color.

Teacher education is in a pivotal moment as many changes have occurred in the recent years. The move to the Common Core and teaching during a pandemic have caused many difficulties for teachers. One major issue is the struggle to hire and retaine teachers in the profession. Issues such as stress, low pay, and the lack of support of institutions have pushed a lot of teachers out of the profession. Hence, it is critical to support teachers to enter and stay in the profession. A way to support teachers is the incorporation of a more equity- and diversity-focused approach in teacher preparation programs to support teachers teach in the ever-diverse classroom. This is pivotal as it has been documented that teachers often struggle to connect with their students. While such an approach has been fruitful, critical scholars have argued that teacher education programs are tailored to white teachers (Sleeter, 2001), leaving the experiences of teachers of color erased.

Reviews of the literature that center the experiences of prospective (PTCs), preservice and in-service teachers of color in general and in mathematics education are few. Part of such scarcity is due to the whiteness in teacher education and the teacher force (Sleeter, 2001). Recruitment and retention of teachers of color has been a primary focus in the literature with less attention being paid to investigate the preparation experiences of teachers of color (Villegas and Davis, 2008). This direction has been taken to support the efforts of diversifying the teaching force to meet the needs of our diverse classrooms. At a time when the number of K-12 classrooms are more diverse than ever, efforts have not been fruitful – fewer teachers of color are entering the profession. More concerning, Gold (2020) notes:

> "Overall, the number of students of color entering teacher preparation programs in institutions of higher education has decreased in recent years, reflecting an overall national trend. From 2010 to 2018, the numbers of Back and Latinx students decreased by 25 percent, and the numbers for those who identify as Native Hawaiians or Pacific Islanders and American Indian or Alaska Native decreased by 50 percent." (p. 9)

That is, while efforts are in place to diversify the teaching force and the US becomes more diverse, students of color are entering the profession in smaller numbers. Hence, understanding their experiences is important to center the needs of candidates of color and also to develop trajectories of possibility for them to enter and stay in the profession. The experiences of teacher candidates in credential programs have been documented to be marginalizing, hostile and not cultural affirming (Brown, 2014). For example, Gomez and colleagues (2008) found that group of Latinx preservice teachers experienced a cultural mismatch, often distrusted their White peers, and were positioned through a deficit lens by their faculty. And these experiences continue for teachers committed to justice. Kohli (2018) through stories of teachers of color committed to justice, found that urban schools operate as hostile racial climates that contribute to the stress and dissatisfaction of teachers of color. Her call to humanize both students and teachers is a shift of the current dehumanizing paradigm that exists within schools, even urban schools.

Thus, supporting and retaining teachers of color both as preservice and in-service teacher candidates is an important first step in addressing the challenges described above. One of the assumptions when teachers of color enter diverse classrooms is cultural match. Cultural match means that students of color have access to better learning opportunities if the classroom is cultural relevant, compatible, and responsive to their culture (Achinstein and Aguirre, 2008). In

their study with new teachers of color, Achinstein and Aguirre (2008) problematize the idea of cultural match as follows. To avoid an oversimplification of cultural match, they interrogate the assumption that teachers of color will tap on their cultural resources in the classroom and classrooms are sites of many cultural conflicts as students and teachers negotiated their situated identities. Moreover, Philip and colleagues (2017) found that a teacher of color committed to justice over-relied on cultural match and thus unintentionally reproduced deficit understandings of people of color. The study argues for the unique forms of support that teachers of color must receive for them to challenge racism and other forms of oppression.

The question remains, how does one support teachers of color to challenge racism and other forms of oppression? Teacher education programs have added courses to pay attention to diversity issues (Dilworth, 1992). Such efforts come with the challenge that the jump from theory to practice is difficult given the disconnect that teacher education programs often have from actual classrooms (Ladson-Billings, 2005). One way to challenge racism and other forms of oppression is through supporting teacher candidates to develop a sociopolitical consciousness through culturally relevant teaching (Ladson-Billings, 1994; Gay, 2002). For example, Jackson (2011) documented how the Children's Defense Fund Freedom Schools programs developed culturally responsive teaching among its summer interns, specifically looking at the cultivation of the sociopolitical consciousness. One strategy implemented in the training program was centering the social and political histories of communities of color. While this case was not within a formal teacher education program lessons can be learned about ways in which this can be a possibility to be incorporated in teacher education. Another challenge that has been documented is that teacher candidates hold ideological understandings of culturally relevant teaching but still struggle to think about how to enact it pedagogically (Brown et. al, 2019). Further, Lilia Bartolomé (2004) argues that teacher candidates must develop political and ideological clarity to support all students to be successful in schools. Later in the chapter I will expand on how I conceptualize developing a sociopolitical consciousness in mathematics education.

Learning and Design

This line of work is informed by sociocultural and sociopolitical perspectives of learning (Lave & Wenger, 1991; Martin, 2013; Rosa & King, 2007). I understand learning as situated but also consider it necessary to attend to issues of power, racialization, and identity. In this section, I outline how I think of learning as intertwined with ideology and how design shapes learning opportunities.

To conceptualize the intersection of justice and learning, I draw from work that conceptualizes learning and ideology as intrinsically linked (Philip, 2011; Philip et al., 2018; Philip & Gupta, 2020). I define ideology as "socially shared systems of representation" that guide how human beings experience and make sense of the world (Philip et al., 2018, p. 4). As people interact with their world, they develop different ideological chains of meaning such as what it means to be good at math. These systems of representation are intertwined with learning in that "the interactional forging and working out of ideological convergence can either afford or constrain learning as an activity of heterogeneous meaning making" (Philip et al., 2018, p. 6). This conception of ideology as dynamic, constructed in interaction, and shaping learning embodies what it means to support teacher learning toward justice-oriented mathematics teaching.

The notion of ideology has been explored in mathematics education in various ways. The sociopolitical turn (Gutiérrez, 2013a) has led to the emergence and understanding of mathematics and mathematics education as a racial project (Martin, 2009; 2013). This work helps situate constructions of mathematics and mathematical competence in a cultural and historical context that is designed to uphold racialized hierarchies of mathematical ability (Gutiérrez, 2013b). Building on these ideas, research on racial narratives and storylines has helped to illuminate how ideologies of mathematics and of race intertwine and shape meaning making in the mathematics classroom (Nasir et al., 2012; Nasir & Shah, 2011; Shah, 2017). Bringing this into the work of teaching, recent work on teacher noticing in mathematics education has begun to elaborate how what teachers attend to and interpret in the mathematics classroom is socially and culturally constructed, with implications for reproducing or disrupting dominant hierarchies of power and privilege (Louie, 2018; Shah & Coles, 2020; Wager, 2014).

In addition to how I conceptualize learning, I consider the way social design-based research considers learning. Social design-based research focuses on activity systems and attends to the ways in which aspects of design mediate learning toward a shared goal (Engeström, 2011; Gutiérrez & Jurow, 2016; Gutiérrez & Vossoughi, 2010). Aspects of design include tools, artifacts, and participation structures. Similar to design-based research (Sandoval & Bell, 2004), social design based experiments create opportunities for consequential learning as well as contribute to new theories of learning. Another powerful aspect of social design-based experiments is the focus on transforming systems and structures that work to disempower minoritized people. This shifts the focus from the people involved to the structures that need to be changed. Furthermore, social design-based experiments like this project, aim to be co-led and in solidarity with students and communities of color (Vakil et al, 2016). For example, Scott (2019) used this approach in her study with novice teachers, Math Crew, where doing mathematics was a central part of the design of the activity system with the purpose of supporting teachers to reconceptualize mathematics as a political activity. To design for this shared goal, she attended to the mathematical tasks used, the roles participants were able to take on, the artifacts and tools made available for engaging with mathematics, and the implicit and explicit norms that guided the interactions.

Counterspaces in Teacher Education

Given the nature of the teacher education context, one way to support prospective teachers of color is through the creation of communities that center their experiences. One such way to center the experiences of PCTs is through the creation of a counterspace. A counterspace is defined as a "safe space" created by marginalized people in response to the daily barrage of racial microaggressions (Solórzano, Ceja, & Yosso, 2000). In their study, Solórzano, Ceja and Yosso found that African American students who continued to experience racism in their college environment needed to create social and academic counterspaces. These counterspaces were not confined in or outside of any specific location but could be anywhere such as a classroom, inside a Black fraternity or peer groups. Solórzano and colleagues differentiate between an academic and a social counterspace; which is necessary or appropriate depends on the needs of the community. As Solórzano and Villalpando (1998) note, "academic counter-spaces allow African American students to foster their own learning and to nurture a supportive environment wherein their experiences are validated and viewed as important knowledge."

Recent efforts have conceptualized counterspaces as identity affirming spaces and as places of healing (Carter, 2007; Case & Hunter, 2012). In STEM, much of the literature on counterspaces is about supporting marginalized communities to continue in STEM (Ong, Smith, & Ko, 2018; Vaccaro & Camba-Kelsay, 2016). Although not much literature exists specifically addressing the context of mathematics, I find the notion of a counterspace attractive as a mechanism affording the centrality of the participants' lived experiences. Furthermore, the notion of a "safe space", although no space is a safe space, centers the relational in ways that other spaces do not. I find this as an opportunity to further conceptualize and think about learning within counterspaces. That is, counterspaces could be thought of as reactive, but I view them as proactive. Counterspaces can be designed with a set of goals and commitments. That is, we can take the initial definition of a "safe space," and incorporate a design aspect that moves participants towards consequential learning and justice as described earlier (K. D. Gutiérrez et al., 2019; K. D. Gutiérrez & Jurow, 2016). While very little exists in the literature investigating this space, some counterspaces have been created in teacher education (although not using that language). For example, Kohli and colleagues (2015) documented three forms of critical professional development where teachers engaged in a "cooperative dialectical process," there was a shared commitment towards justice and teachers were positioned as experts of their own learning. Such models countered traditional forms of professional development that positions teachers as receivers of knowledge.

In the next section, I conceptualize the ongoing process of becoming a social justice math educator by merging three forms of literacies: critical, racial, and mathematical literacy.

Ongoing Process of Becoming a Social Justice Mathematics Educator

In this section, I begin with how scholars have conceptualized critical and racial literacy and how they complement each other. I then focus on mathematical literacy and end with the merging of the three literacies. Figure 2 models the conceptual map that guided the organization of this section.

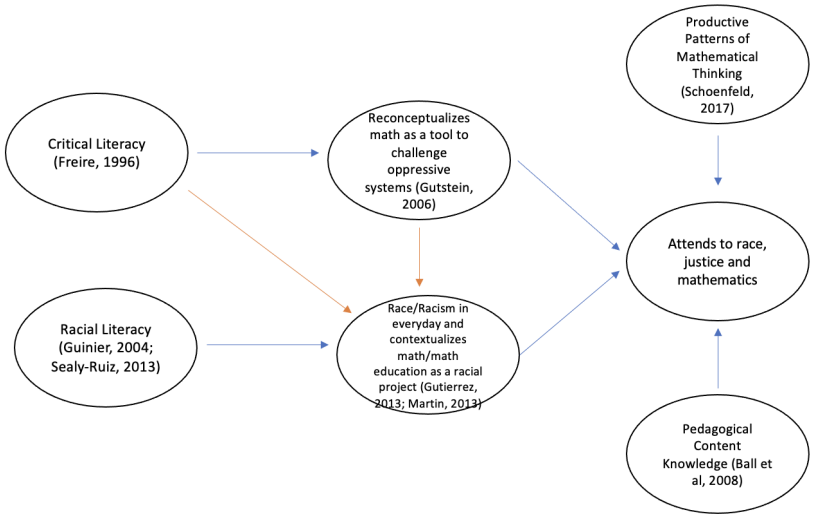


Figure 2: Conceptual map of three literacies

Critical and Racial Literacy

Although critical literacy has been defined in many ways, for this study, *critical literacy*[5] comes from Freire's (1996) notion of "reading and writing the world" toward liberation. Freire argues that true liberation for the oppressed must come from the oppressed; and it must come through praxis: dialogue and action. Action is an integral component of critical literacy as it seeks to change the inequities of society. Critical literacy has set the groundwork to really understand oppressive structures in our society. Yet in practice some of the challenges with critical literacy involve its limited inability to explicitly address issues of race, racialization, and racism. I agree with scholars that argue that race, racialization, and racism must be explicit, as they often receive negligible attention. I worry that much of the literature focused on social justice or critical literacy inadvertently perpetuates racial ideologies when not addressing issues of racism, racialization, and race. Hence, I ground my work in Lani Guinier's conceptualization of racial literacy. Through her analysis of the seminal court case, Brown v. Board, Guinier (2004) argued that Brown v. Board was a racial liberalism project that through a deficit-based approach to racial equality placed Black people as inferior without demanding whites to take an anti-racist stance. Guinier defines racial literacy as the "capacity to decipher durable racial grammar that structures racialized hierarchies and frames the narrative of our republic" (p. 6). Furthermore, racial literacy is contextual rather than universal, requires deep engagement between thought and action, emphasizes relationship between race and power, and constantly interrogates the dynamic relationship among race, class, geography, gender etc.

Sealy-Ruiz (2013) takes the work of Guinier and incorporates it into literacy education. "Racial literacy is a skill and practice in which individuals are able to probe the existence of racism and examine the effects of race and institutionalized systems on their experiences and representation in US society" (Sealy-Ruiz, 2013). Although Sealy-Ruiz's work is in literacy and not in mathematics education, her work serves as a grounding on how it can be applied in mathematics education. Furthermore, Sealy-Ruiz's conceptualizes a model that engages with the individual trajectory of how one can develop racial literacy. She argues that the development of racial literacy begins with critical love, critical humility, and critical reflection. The development requires historical literacy, a deep excavation and exploration of beliefs (archeology of the self) and ultimately ends in interruption. That is, it calls for interrupting racism and inequality at a personal and systematic level. This model is useful in two ways: it requires action very much like Freire's notion of praxis and it centers the need to focus on relational when doing justice-oriented work. Yet, I find room to build on this model. First, when one considered the trajectory as opportunities for learning, the model is not linear but rather multidimensional and complex. Secondly, paying attention to the individual leaves little room to investigate the collective aspect of the trajectory. That is, as Kohli et al. (2015) has argued, the importance of community was central to support teachers of color committed to justice, hence this work is not only individual work but rather collective.

Both literacies complement each other and offer opportunities to envision a more just society. Before investigating how these literacies intersect with mathematics literacy, I conceptualize math literacy.

Mathematical Literacy

[5] In this study I take critical literacy, sociopolitical consciousness and critical awareness to mean the same thing and will use them as synonyms.

Mathematics is critical to the ongoing process of becoming a social justice math educator. The motivation in conceptualizing math literacy explicitly is to both have a shared understanding of the term for this dissertation but to also allude to the expansive ways in which I think about the discipline. For example, one critique of social justice math is not paying close attention to the disciplinary interactions happening when students are learning the mathematics. This is problematic because learners do not have opportunities to grapple with rich mathematics and could potentially lead to further injustices. For example, most social justice lessons are geared toward Black, Indigenous and POC communities. Thus, not paying close attention to the mathematics will be a disservice to students.

I begin with conceptualizing mathematical activity. I start with the assumption that engaging in mathematics is a cultural practice that takes place inside and outside of schools (Saxe, 1988; Nasir et al, 2008). In other words, there are practices that people must learn as they enter the community of practice to go from peripheral to central participant of the community (Lave and Wenger, 1991). Schoenfeld (2017) characterizes productive patterns of mathematical thinking (PPMT) as all the ways in which scholars have talked about problem solving strategies, mathematical habits of mind, mathematical processes, mathematical practices etc. Being in a mathematical space requires participants to engage in its practices to be central participants. Yet, often, these practices are implicit and rarely explicit. For example, the work of Yackel & Cobb (1996) on sociomathematical norms focus on "normative aspects of mathematics discussions specific to students' mathematical activity (p. 461)." They argue that these norms are constructed through classroom interactions and thus established in all classrooms regardless of the instructional tradition. This means that teachers during instruction must be aware of such norms and must be able to support their students in developing these norms. Yet not much work has been done to learn about productive patterns of mathematical thinking and how one develops them (Schoenfeld, 2019). Developing mathematical literacy for teacher candidates means that teachers understand the way in which mathematical activity is a cultural practice and that sociomathematical norms are developed implicitly through the interactions when doing mathematics.

Teacher candidates that are developing a mathematical literacy must come to develop a deep understanding of mathematics content (Schoenfeld, 2014). I ground that conception through Schoenfeld's first dimension of the TRU framework. The conceptualization of mathematics as an integrated subject with multiple connections that moves beyond simple content. That is, teacher candidates both understand the ways in which mathematical ideas are connected and they understand the ways in which they create opportunities for cognitive demand, formative assessment, equitable access and agency, ownership, and identity (Schoenfeld, 2014). This is critical for teacher candidates to see that the mathematics plays a role in the kind of sense-making that happens in classrooms. For example, if one asks students to solve for x by using the procedure, the activity is so narrow that there is very room for sense-making.

Given the point at which this study took place – the women were not yet enrolled in a credential program – this study does not attend to pedagogical content knowledge. I view PCK as important and part of math literacy, but it will not be investigated further. To create productive learning environments, scholars argue that pedagogical content knowledge for teaching mathematics goes beyond content knowledge and requires knowledge of the content and students, content and teaching and knowledge of the curriculum (Ball et al, 2008; Hill, Ball, & Schilling, 2008). This is an extension of Shulman's seminal conceptualization of pedagogical content knowledge needed for teaching (Shulman, 1986,1987)

Mathematical literacy is not an outcome or an end goal. Rather, the notion of mathematical literacy is a process that we must continually engage in as teacher and teacher educators. The context of this study, the work with elementary teachers, is important to understand why math literacy needs to be explicitly addressed. Scholars have documented (often through a deficit approach) how elementary teachers struggle with mathematics, and often have negative mathematical experiences that in turn may lead to anxiety and negative mathematical identities (Beilock et al, 2010; Bursal & Paznokas, 2006). My goal is not to position the problem within elementary teacher candidates but rather ask, what other opportunities can elementary teacher candidates have to feel empowered with mathematics? Hence, I view design and a focus in the environment as opportunities for learning. In the next section, I merge both three literacies to understand how they have been conceptualized in the research.

Critical and Racial Literacy with Mathematics

Freire's conceptualization of reading and writing the world laid the groundwork for what Gutstein (2006) calls reading and writing the world with mathematics. Gutstein reconceptualizes mathematics as a tool to critique systems of oppression (Gutstein, 2006). He argues that in order to read the world, students must also read the *word* (mathematics) and merge both to *read the world with mathematics.* This is in dialectical relationship with *writing the world with mathematics* (Gutstein, 2016). Gutstein's work has been the groundwork for much of the work centering social justice mathematics. Social justice mathematics has been fruitful in providing rich mathematical ideas and connecting them to issues of social justice, yet there are challenges. Bartell (2013) presents a compelling case of teaching mathematics for social justice where teachers had to negotiate social justice goals and mathematical goals. In Bartell's study, teachers struggled to balance both social justice goals and mathematical goals, pushing them to choose one or the other and thus creating pedagogical challenges. Furthermore, the unwillingness of participants to engage explicitly with issues of race and racism perpetuated colorblind approaches of schooling in their lesson. Bartell acknowledges such challenges and notes that she herself was not prepared to have those race conversations. In a recent piece, Gutstein (2016) provides insightful ideas about negotiating the work of balancing both social justice and mathematical ideas through the metaphor of "doing the dance." Rather than dichotomizing both, he argues that both are necessary to engage in social justice mathematics. And Gutstein further asserts the need to be explicit about race and racism when talking about social justice or critical literacy. Hence, the need to be explicit about race and racism needs to be at the core of critical mathematical literacy.

In the context of mathematics education, the critical analysis of Martin (2009) serves as the guiding force on how race and racism has been conceptualized in mathematics education and how it should be taken up moving forward. Martin argues that race should be taken up as a historical, sociopolitical construct and math education as a field should move away from simplistic notions of race. Although his critical analysis is over a decade old, I would argue very little work has been done to address his concern. In a similar vein, R. Gutiérrez, (2013), argues that mathematics itself is political. That is, mathematics itself has an unearned privileged position in society very much like whiteness. She posits that there exists a racialized hierarchy of mathematics where abstraction is assigned status above all other ways of engaging with mathematics. Thus, both Martin (2009) and Gutierrez (2013) argue that math and mathematics education are racial projects.

Conclusion

I end this chapter by weaving together the perspectives that I have expanded on and how they shape my thinking. I take seriously the call to think about learning within counterspaces as they create new ways of thinking and understanding learning. Through a social design based research perspective, I consider the design of transformative learning experiences in a counterspace. By focusing on the design of the learning environment, this study considered the principles, the artifacts, and tools to create opportunities to attend to the multiple forms of literacies outlined above. These opportunities were opportunities of (re)learning to make new meanings about race, justice, and mathematics. In this dissertation, I center stories as a way to center the mujeres' lived experiences, taking a Chicana/Latina Feminist perspective with the understanding that these lived experiences are critical for learning. This approach challenges the field of mathematics education to center the lived experiences of prospective teachers of color who are often at the margins in a way that honors their full humanity.

Chapter 3: Methods

Introduction

To understand the stories and the challenges of both co-designing and co-constructing new meanings about math and justice, I invited women of color committed to justice to engage in a series of self-defining pláticas[6] about who we are, about mathematics, and about justice. Those pláticas are the core of this dissertation. In this chapter, I begin by describing the pilot study that was the groundwork for the dissertation project. In what follows I document some of the findings from that project and outline both what I learned and how those understandings shaped the dissertation project. I then describe the research setting and characterize the co-participant's testimonios, a form of documentation that was created using interviews as their main data source. Given that I was also a co-participant of the learning community, I also expand on my testimonio and then describe my own positionality as a researcher. I then document the design of the learning community, expanding on the data collection procedures and the data sources collected. The chapter concludes with a description of the methods I used to reduce and analyze the data in order to investigate the three research questions.

Pilot Study – A Culturally Sustaining Project

In spring 2018 I met with a group of sixth graders for two months in Salinas, CA and engaged in a series of pláticas. The sixth graders all self-identified as Latinx and all lived in an agricultural and immigrant community. In addition to living there, the participants of the project had some connection to agriculture and/or the immigrant experience. In this pilot project, I sought to understand what it meant to create a learning space where culture was central to the community. In fact, I was interested in really investigating the notion of co-constructing a *culturally sustaining* (Paris and Alim, 2014) project. Moreover, I wanted to help develop an environment in which the participants were co-creators of the space as well as the guiding force of the activities. This pilot study helped me understand and navigate tensions that resulted from my participation both as researcher and participant in the community. It helped me understand the importance of using tools and artifacts to support the learning environment as well as staying committed to the community's needs. An outcome of this study is the conceptualization of the notion of *pláticando mathematics* as a process of learning that accounts for relational knowledge, trust, and care. These three components played a central role in the ways in which the children's ways of being were leveraged while providing a more humanized math learning experience. For more detail on the pilot project itself, see Zuniga Ruiz (2020) the position paper that documents what happened, and more findings related to that project.

This project was my first encounter with thinking about design and learning in the context of K-12 education. It was also the first time that I had an opportunity to engage with co-participants that had some shared history. That is, our project stemmed out of a yearlong commitment where I would participate in their whole-day class and build relationships with the children. Conducting this pilot allowed me to learn some lessons about my proposed dissertation project, First, this project did not include opportunities to know more about the participants' history and background. While during the conversations the children shared a lot about who they were, there were moments where I did not know much about their history, their aspirations, and

[6] Pláticas are deep trustful conversations. While I will not go into detail here, the next chapter documents and theorizes pláticas. Such theorization is grounded empirically from what happened during our conversations.

their familial relations. I conjectured that moving forward, knowing who they are, would be integral to the design of the learning environment. Secondly, although participants where co-creators of the learning environment, I often found that more structure was needed. My hesitancy in creating more structure came from the fact that the children were volunteering and often wanted to share more about their struggles with their daily activities. Another lesson that I learned was that it was necessary to create more opportunities for the children to think about and do mathematics together. All the children had various mathematical experiences but as they were making sense of their project, the children engaged in math in a collaborative manner. Thus, I believed that opportunities to do mathematics together would be an important opportunity in the next iteration of the project. I took all the lessons learned from the pilot study and incorporated them in this dissertation project.

Research Setting

The participants in the dissertation study are an educator (me) and 4 prospective teachers of color (PTCs) who self-identify as Mexicanas. The PTCs and researcher lived in the central coast region of California. All attended the same undergraduate institution in Monterey County. We all come from a predominantly immigrant, agricultural and Latinx community. Many of the women call this barrio[7] their home; it is the place they would like to continue to teach in. All the women met through a community network of mujeres, las comadres[8], where they had opportunities to pláticar about life, about teaching, about social justice and about self-healing and empowerment. Before the study began, all mujeres[9] had known each other for many years and their relationships varied. For example, Inez and Jenny had taken courses together in their undergraduate institution. Anahi and Jenny shared a close friendship outside of the institution, they would often talk about going dancing together and going on trips. Anahi and Sandra have a shared commitment to immigration justice. These are some of the ways in which the mujeres had connected with another before they officially became involved in the project. This was the first time the women "sat down" to pláticar about education, justice, and mathematics. Thus, while the women had known one another for some time, this was the first time they were having conversations together about mathematics and their own experiences with the discipline.

The initial plan was for the women to meet in person in a local classroom. Given the pandemic, that plan fell through, and the group met online through Zoom. While that was not an ideal situation it created opportunities for the women to join even when they were on a tight schedule. For example, Jenni at times would join when she was driving home from work. It did raise some challenges with participation, for example, Luz had a baby at that time and at times would have to step out to care for her child. A collective goal was also to accommodate the needs of the community.

Co-Participants

[7] Barrio translates to *hood.* I make the political decision to use barrio as home to disrupt the deficit discourse about barrio that is often used in academia.

[8] Comadres translates to co-mother. Comadres are women you choose to co-mother your children with. In this context, we use comadres as a way to speak about the relationality that has been built between women who seek to navigate the world of schooling.

[9] Mujeres translates to women.

I intentionally use the term co-participants instead of participants as I aim to disrupt the hierarchical aspect of dichotomizing research/participants. Aligned with a Chicana/Feminist perspective in which participants are co-constructors of knowledge, I position participants as co-participants (and thus co-designers) of pláticas. That is, I, the researcher that designed this study, am also positioned as a co-participant along with the mujeres who participated in the co-design. All the co-participants in this study self-identify as Mexicanas. The maestras are all college graduates who attended a Hispanic Serving Institution in a predominantly Latinx community. At the time of the study, the maestras had yet to begin a credential program even though some were formally teaching in a classroom[10]. All co-participants had the intention to continue to work in the community they grew up in. Even though the participants are in the same ethnic group, there is a great deal of diversity within the group. In a manner aligned with purposeful sampling (Patton, 1990) the participants were selected according to their willingness to engage in conversations about justice and mathematics. Table 1 shows a summary of the participant profiles. As part of this section, I compose the *testimonios* of the women in the project. These stories were constructed from the initial interviews as well as through the stories shared in the meetings.

Table 1. Participants

Co-Participants	Primary Language	Ethnic Identity	Currently…	Hopes to…
Inez	English	Mexicana born in the US	Teaching English and Journalism with Emergency Credential	obtain a multi-subject credential
Anahi	Spanish	Mexicana	Teaching Assistant for Newcomer Math Class	obtain a single-subject credential in Mathematics
Luz	Spanish	Mexicana born in the US	Working as a behavioral therapist	pass the CBEST this year and later join a credential program
Jenni	Spanish	Mexicana born in the US	Working at a hotel and tutoring	obtain a multi-subject credential
Sandra	Spanish and English	Mexicana	A doctoral student	finish her doctoral studies and land a job as a college professor

Inez

Inez is the daughter of an immigrant father and a first-generation Mexican American mother. Her mother was an elementary teacher and instilled the importance of education throughout her life. Before starting college, Inez was a stay-at-home mother for over a decade; she was returning to school to achieve her dream of becoming a teacher. Such aspirations along with her developing a justice-oriented perspective in schooling had created tensions in her

[10] In the state of California to teach in a public school you are required to hold a credential or be enrolled in a credential program. A way that the women discussed entering classrooms without being enrolled in a credential program is by obtaining a substitute credential. If for example, the women are hired to teach in a school they can take their substitute credential and turn it into an emergency credential. This emergency credential allows people to teach for a year (without having or being enrolled in a credential) with the assumption that they would enroll in a credential program the following year. This is how Inez is a classroom teacher without having been in a credential program with the expectation that in the summer after her first year teaching she will enroll in a credential program.

marriage and with her family. Inez talked about going to school and learning as a form of liberation that she wanted to continue to pursue in her journey as a teacher.

At the time of the study Inez had obtained an emergency teaching credential and was teaching English Language Arts (ELA) and Yearbook at a dual immersion school. She joked that it was unbelievable that a first-year teacher would be asked to lead in creating the school yearbook. Toward the end of the project, Inez applied to the CalState Teach program to obtain a multiple subject credential. She viewed obtaining a multiple subject credential as the springboard to her goal of becoming an Ethnic Studies teacher. She also aspired to obtain a master's degree in Ethnic Studies in the future.

Inez's mathematical journey had with very few bumps. She did not perceive herself as a math person at the beginning of the project; her mathematical identity was always tied with the belief that she needed to work hard to do well. She believed that there were people who understood math quickly and others who do not, and she knew that she was the latter. She worked hard to do well in math, and she was happy about having positive outcomes. Inez came into the project with a lot of understandings related to justice and race. She mentioned that she would listen to podcasts and would think about such issues with her mother and daughter. While she had developed a lot of understandings related to that, she struggled to make the connections with mathematics.

Anahi

Anahi immigrated to the United States with her mother and older brother when she was 12 years old. She grew up in Michoacan, Mexico and lived with her paternal grandparents in a rancho. She completed middle and high school in the US and then enrolled in a four-year university. She was the first in her family to obtain a college degree. She aspired to become an elementary teacher in part to experience that part of schooling that she never had the opportunity to go through. Yet, at the time of the study her plans had changed, she intended to obtain a single subject credential in Mathematics so she could teach Math in Spanish. This new plan was inspired by her work with newcomer students as a supporting teacher in a Spanish math class. Toward the middle of the project, Anahi found out that she was accepted to the single subject credential program but does not move forward with that plan. Toward the end of the project, she planned on applying to the CalState multiple subject credential program with Inez.

Anahi was always positioned as a "math person." She viewed her high school math classroom as a safe space. In her math classrooms, Anahi was always positioned as smart and as able to contribute. Such construction was directly linked to the ELD identity that was also constructed in school. Anahi shared about being seen as "the others" because they [ELD students] are always seen as less than other students. She viewed that ELD identity as something she would not be able to escape because her heavy accent followed her everywhere. The individualism that she experienced in mathematics was something she cherished because she did not have to talk to others.

Anahi was also very passionate about issues of justice and empowerment. She calls herself *empoderada* with her own life and her own learning. Although she was quite successful in school, Anahi did not feel her schooling experiences centered learning but rather things that needed to get done. This shaped Anahi's understanding and dedication to cultivating learning experiences that empower all children to learn.

Luz

Luz is the daughter of agricultural farmworkers. She had recently obtained her college degree in the Liberal Studies department, intending to become an elementary teacher. Luz wanted to work with disabled children, specifically children who had learning disabilities. She wanted to support children in the way that she was not supported. Luz had also recently become a mother and she was having some issues with postpartum depression. When asked about why she wanted to be part of the space, she said that she wanted to be part of the space to have a voice. She felt as if she was losing her voice because she did not have a community.

At the beginning of the project Luz was working part time with autistic children. She then was able to find a full-time job where she would be able to continue to work with autistic children. In her job she able to help children develop basic life skills like eating, going out for walks and so forth. Luz saw this job as an opening to continue to work with children with disabilities and although she was not in a formal classroom, she saw herself as a maestra.

Luz's mathematical journey was difficult. She perceived herself as someone who struggles and cannot do math. In the group, she is the one that has the most fixed feelings about who she is in relation to mathematics. She always spoke about how math was difficult, and it was never a doable task to do well in mathematics. She had taken the first math content course for elementary teachers multiple times and she felt a huge relief when she successfully passed the second course the first time. Toward the end of the study, Luz had put on hold her aspiration of becoming an elementary teacher because she still had not passed the CBEST; as a new mom with a full-time job she did not feel she had time to go back to school. She still hoped that one day she would be able to obtain her teaching credential.

Jenni

Jenni is a US-born Mexicana. She grew up in East Salinas and grew up in a large family. Jenni had obtained her college degree and was affiliated with schools, but teaching was not her primary job. Jenni talked about her job working at a hotel and helping her coworkers learn about the laws. Specifically, she challenged the managers and supervisors that often would dehumanize her colleagues simply because they did not know the rules of the job. In many ways, she supported her coworkers, older Mexican women, to not be taken advantage of by those in authority.

Jenni's mathematical journey was challenging but also one she had accepted. She knew she was not good at math in the way her peers were, and she accepted that. She shared multiple times about the work that she had to do to be successful and pass her math courses. Hence, she had constructed an understanding of mathematics as an effort task and something she knew she could be successful with even if it took her a longer period of time than her peers.

She talked about becoming a teacher to support students and care for students especially those that were falling behind. She would go into detail to talk about staying later and emotionally supporting students who were struggling on the daily basis. During the time of the project, Jenni found out that she was not accepted to the credential program. Although she noted that she was relieved to know the outcome, she was still somewhat sad about not being accepted to the program. Ultimately, she noted that this was a signal to work on herself before committing to a program again. Towards the end of the project, Jenni was hired to work with second graders in a summer program.

Sandra

Sandra immigrated to the United States with her family at the age of 8. Her immigrant identity shaped her belief in educational opportunities and her desire to continue working in the community that she grew up in. At the time of the project, Sandra was finishing her doctoral studies and this project would become her dissertation project. Sandra had known the women for some years and had various relationships with all of them.

Sandra's mathematical journey was always very positive. She had developed a positive mathematical identity throughout her high school years that ultimately led her to pursue her undergraduate studies in mathematics. She would later pursue her graduate studies in mathematics and learn more about mathematical research. Her mathematical experiences in grad school motivated her to imagine new ways of doing math beyond what was seen in the K-12 system. Sandra learned more perspectives about math as a collaborative and joyful experience something that she had not experienced in her K-12 schooling. This heavily shaped her view of thinking about mathematics as a problem-solving activity versus an approach focused on just covering math content. Throughout the project, Sandra would share updates about her studies such as having a proposal meeting and discussing a bit more about the struggles of writing and the motivation behind the project.

Researcher's Positionality Statement

It is critical for me to speak about my role as a Mexicana researcher who was both the designer of the project and a participant in the counterspace. Before starting this project, I had known the women for many years, and we had cultivated a trustful and respectful relationship grounded on an ethic of care. In the past, the women had been in other pláticas with me, but this was the first time that the women were having conversations about mathematics and justice and in which I served as the facilitator. In many ways, since in the past I was a mentor to the women, supporting them with their mathematical learning and providing consejos (advice) that positioned me as a mentor. Surely that shaped their willingness to participate in the study. Yet, in the initial interview the women stated that their participation in the learning community was a space to center their needs and thus they viewed the reciprocity from the beginning.

As a Mexicana who grew up in East Salinas, I share similar experiences to the women in this project. This provided the opportunity to build on my cultural intuition (Delgado Bernal, 1998) and apply my knowledge base throughout the research process to challenge what she calls "cultural hegemonic domination." In fact, much of the vulnerability that was documented in this study stems from that close relationship that was both cultivated before the project began and during the process. Thus, that created opportunities that would not have been present if it weren't for our closed relationship and our shared experiences.

Concerning scholars of color doing work with communities of color, an issue that is often raised is the possibility of tunnel vision or some form of limitation with regard to analyzing data. I find that in my work, I use my knowledge as an asset to understand the experiences of the women of color who participated in the project. For example, the sixth chapter of this dissertation entails understanding the entanglements the women foresee as they seek to imagine teaching for social justice. This chapter is understood through the lens of the intersectional identities that the women hold and using a combination of inductive/deductive approaches to data analysis, an understanding of the complicated nature of the endeavor. Thus, my perspective offers new understandings to what it means to become social justice educators committed to the community.

Design

The design of the *counterspace* draws on principles of social design-based experiments (Gutierrez & Jurow, 2016; Gutierrez and Vossoughi, 2010) with an aim of cultivating different kinds of mathematical experiences between the women. The design of the counterspace aimed at creating opportunities for the women to dig into critical issues related to justice and mathematics in ways that leveraged their knowledge and understanding. In many ways, it involved creating a space of safety and well-being alongside a space of learning and sense making. In this section, I outline how the counterspace served as a learning space to cultivate opportunities to make sense of such issues in ways that schools did not afford. I then outline the commitments of the learning community.

The learning community was created to build a space where the women could have a space to dialogue about issues related to mathematics and education and to cultivate the community of prospective teachers. Given the pushing out of teachers of color in the teacher education pipeline (Carver-Thomas, 2018) and what I had witnessed with many prospective teachers in the community, I believed that community would support the mujeres to continue the journey of becoming elementary teachers. In many ways our past relationship had been foundational to the creation of this learning community, and it established the groundwork for the type of community we sought to cultivate. That is, the community also served as a place where participates could motivate each other and could have conversations related to staying in the program – in essence have a more humanizing experience.

This more humanizing experience furnished a groundwork for the relational aspects of our conversations. Although the conversations were held via Zoom, the women saw the opportunities to speak about any issues they were experiencing themselves. When Anahi was accepted to the incorrect credential program, Inez stepped in to support Anahi with her alternative options and helped Anahi apply to the CalState Teach program. Later that year, the women entered the same cohort and were paired together in their sub-cohort where they were supporting each other in the journey of becoming teachers. While these kinds of conversations could be considered "off script" for the women, these exchanges were pivotal for their own trajectories of becoming elementary teachers. Thus, while such dialogues of imagining and becoming justice math educators are important, the material conditions to which one gets there is equally as important. I then outline the principles and goals of the learning community.

Principles and Goals

The design of the learning environment is an important component of this dissertation. If we seek consequential learning, then it is imperative that we design for it. I take a social design experiment perspective (Gutierrez and Jurow, 2016) and consider both the design of the learning environment and issues of social justice to center the realities of these women of color who seek to become educators. Below I describe the four principles that are foundational to the co-construction of the learning community with the maestras.

Design Principle 1: Participants as co-designers of the learning community

In social design-based experiments (Gutierrez & Jurow, 2016) participants are active collaborators regarding what happens in the learning community. More importantly, centering the needs of the co-participants aims at challenging the top-down approach in which the researcher is the knowledge holder while the participant of the learning community is the receiver.

To ground the project from day 1, during the initial interview I asked the co-participants whether there was anything they would like to see or get out of the learning community. All participants agreed that being in community with one another was important as well as creating opportunities for them to being seen fully as themselves. In other words, the counterspace would be a place where they could all be who they are. Thus, some routines were established. For example, at the beginning of each session we would all go around and check in. I would always try to share last unless other people came in late. Many times, their struggles and dilemmas came up during that check-in and they were followed through if the women needed advice or wanted to share further. There was never a time limit for the check-in and the assumption was the women would take the time they needed. For example, in Session 9, Anahi arrived and was not happy at all. She shared that she just bought a car and was frustrated about making such a big decision, noting, "I thought I would be all happy. After so many years of being on raite (asking for rides). No se (I dunno), I feel that money can be used wisely. I could have used that money to rent a house." This led the women to further discuss their lived realities of building credit and then to think about designing a lesson that incorporates ideas about building wealth. Thus, not only did the women discuss the struggles Anahi was going through but they used that as a springboard to think deeply about finding ways to support students to think about mathematics as a tool to challenge inequities.

The co-constructed nature of the community was intentional and somewhat daunting. In many ways this approach was aligned with the idea that learning must be taken in collaboration with the participants and their needs as they emerge through activity (Gutierrez and Jurow, 2016). Having the women guide the conversations does not mean that we had the same role in the community, I still facilitated all the sessions. But it meant that I took the role of bringing in artifacts or asking the women to bring artifacts from their everyday into our meetings. I would continually check in with the women and the women viewed our learning space as a place where they could be shape and reshape the work together. For example, when Inez asked help about teaching a lesson about justice, this was not planned out by me but rather it was something that came from Inez seeking help in her teaching practice.

Design Principle 2: Making space for the relational

A focus on the relational was intentionally designed for across the norms and the kinds of activities that we engaged in during our conversations. The women always had opportunities to leverage their everyday knowledge and experiences to contribute to the learning community. Even when at times the conversations were difficult, the women relied on their experiences to hold their argument and/or generatively push on each other's ideas. The women understood that to be central to that space, hence why the women felt free to share very personal stories about their current situations or about their past experiences.

My role as a facilitator and participant in the community was to cultivate and honor the principle by also responding to those moments of vulnerability of the need of support. So for example, when Inez spoke about a student who was in crisis and said that she felt like she was not doing enough, Anahi affirmed her actions and let her know that she was doing what she

needed to do and that a student takes that with them. At an interactional level this was very important for the women.

Design Principle 3: Expansive views of mathematics

An important principle that was designed across the community was to take an expansive view of mathematics. This is central for people to create just oriented classroom math communities that challenge narrow conceptions of what it means to do math. In this space, this came in various forms such as having conversations and Tik Tok math videos to doing mathematics together. This was an important step for the women to begin to develop a more robust and nuanced understanding of what it means to do mathematics and what mathematical competence could look like. Furthermore, after those activities the women reflected a lot on their past experiences, specifically thinking about the ways in which they had been excluded. While such an approach may seem reactive, it became a catalyst for the women to imagine other possibilities in a math classroom.

Design Principle 4: Expansive views of justice and race

Another important principle that was important in the design of the community was creating opportunities to view justice and race beyond their narrow conceptions. This is pivotal for the women who all self-identified Mexicanas and struggled with notions of race and identity. During the initial interviews the co-participants have had little opportunities to talk about race and social justice. When asked to provide definitions of such terms the co-participants struggled with articulating definitions, especially when asked about their role in math learning. For example, Anahi would often discuss the difficulty she experienced talking about race as a non-Black Latina. So, throughout the various activities the women would often push on narrow conceptions of justice towards their own understandings of justice grounded on their lived experiences. They had opportunities to reflect on what justice means to them, to define justice and to define mathematical justice in their own terms. They also got opportunities to make sense of social justice math lessons and discuss their own struggles of defining race.

The following are goals that I conjectured would be part of the outcomes of these discussions:

- First, individual, and collective learning transformation.
- Second, develop expansive and robust notions of what mathematics is and implications for teaching.
- Third, develop nuanced and more complex notions of race and social justice. That is, really push on one another's thinking about what race is and what social justice is in the context of schooling.
- Fourth, converge both expansive notions of what mathematics is and expansive notions of race and social justice and making visible the interconnectedness.

I want to end with a commitment as the researcher to the community.

Community is essential and central to this work and any future work.

Part of the challenge of justice-oriented mathematics teaching is that it is often a solitary journey. Kohli and colleagues (2021) have documented the importance of community in creating more affirming spaces for teachers of color committed to racial and social justice. This community building is one that does not happen in one project but rather is something that is continuous across time and place. Thus, while the pláticas ended a year ago, the women have continued to be in touch with me. We have chatted across the year, and Inez, Anahi, and Jenni are all in classrooms teaching. The goal is to continue to cultivate these affirming spaces to continue to nurture transformative learning experiences and sense of belonging. While the demands of their first-year teaching while also completing a credential degree has made the work of building community somewhat difficult, the women and I plan to meet over the summer to continue the learning that is happening as the women continue to navigate becoming social justice mathematics educators.

Structure of our Pláticas – Our Meetings

In this chapter, I will briefly speak about the nature of pláticas. Bear with me, that I will call them pláticas but in the next chapter, I will fully delineate why I call them pláticas and what I mean by them. In the past few years, there has been a growing amount of literature (particularly by Latinx scholars) using pláticas in educational research (Fierros &Delgado-Bernal, 2016). Pláticas were initially used to build rapport with Latinx communities but were not part of the research process. This was the case until Francisca Godinez's dissertation where she used pláticas both as a method and as part of her dissertation data (Godinez, 2006). More recently, Latinx scholars have begun to consider pláticas as both the method and methodological approach their line of inquiry. While such efforts are commendable, we need to be wary and careful to not reproduce oppressive or superfluous ways of using pláticas in educational research.

The pláticas in this study always start with a check in. Co-participants share about how their week is going, what was something that stood out for them and generally it is to share how they are doing. Then researcher begins with asking something related to the week before or asking the big question that we will talk about that day. I then would end the plática with a closure statement or asked the co-participants to think about something for the following week or to bring an artifact from their everyday. Table 2 below documents the overall recordings of the meetings with the central questions of each meeting.

At the end of each plática, co-participants are asked to respond to the following reflection prompt:

> As I think about our time together:
> I was struck by…
> I found myself wondering…
> I see a connection between what we've discussed to …
> I would like to continue the conversation by…

Table 2: Video Recordings of Meetings

		Participants	Length of Session	Central Questions	Notes
1	2/13/21	Inez, Anahi, Jenni, Luz, Sandra	2 hrs	Who are we?	
2	2/19/21	Inez, Anahi, Jenni, Sandra	2 hrs	What is math identity?	
3	3/5/21	Inez, Anahi, Jenni, Luz, Sandra	2 hrs	What is math?	
4	3/18/21	Inez, Anahi, Jenni, Luz, Sandra	2 hrs	What is justice?	
5	4/2/21	Inez, Anahi, Jenni, Sandra	2 hrs	What is justice in mathematics?	
6	4/21/21	Inez, Anahi, Jenni, Luz, Sandra	2 hrs	What is justice in a classroom?	
7	4/28/21	Inez, Anahi, Jenni, Luz, Sandra	2 hrs	What is race?	
8	5/5/21	Inez, Anahi, Jenni, Luz, Sandra	2 hrs	What does community look like in mathematics?	
9	5/12/21	Inez, Anahi, Jenni, Sandra	2 hrs	What is teaching for justice?	
10	5/19/21	Inez, Anahi, Jenni, Luz, Sandra	2 hrs	What are the constraints in our classrooms?	
11	6/2/21	Anahi, Jenni, Luz, Sandra	2 hrs	How do we co-design a math content course to be inclusive like a comunidad?	
12	6/14/21	Inez, Anahi, Jenni, Luz, Sandra	2 hrs	How do we co-design a math content course to be inclusive like a comunidad?	
13	6/23/21	Inez, Anahi, Luz, Sandra	2 hrs	How do we continue this work?	

Sample Session

This section provides the agenda for the fifth meeting, followed by a narrative description of this typical plática. This description is intended to provide the reader with a visualization of how the pláticas unfolded.

Agenda:

- Checking In
- Summary of Conceptions of Justice
- Discussion about justice in mathematics
- Discussion about the future of mathematics education
- Pláticas in a math classroom

Jenni was the first one to arrive. As it was customary, we chatted about how we were doing as we waited for others to join. Anahi was the next to arrive. I started asking about their trip, which I had seen posted on social media. The women discussed the legacy of Jenni Rivera, a Mexican American singer who rose to fame despite being a single mother and died abruptly in an accident in 2012. Once Inez arrives, I let the women know that Luz would not be joining us and we should start our check in. Inez is the first one to share and shares about her trip to Tahoe and her urge to do work, but she is trying to rest for her spring break. Anahi then follows and shares that she is doing well, she shares more about her trip to LA about being in different cities and the many emotions that brought to her. She specifically talks about being an unsafe town where she felt scared for her life and the immense privilege she feels living in a place where she does not feel scared for her life. The women then continue to discuss further about feeling safe or unsafe in places that are not home. Sandra goes next since Jenni is having some tech issues. She shares that she is doing well, trying to get some work done. Jenni then proceeds to share. She agrees with what Anahi was saying and adds that she finally took her manager to HR and discussed the issues they had. Jenni shares that he is jealous of her and thinks she is trying to take his job from her. Jenni reassures him in the meeting that he is not trying to take his job from him, and she is happy doing what she does because her end goal is to be a teacher.

After the check-in Sandra asks the women about the call to action that has been mentioned in the past. Sandra shares for example that she and Anahi were planning to start a podcast many years ago but that they have not had the opportunity to discuss it further. Starting with the last session, the women had discussed what justice meant to them. Sandra shares a diagram that she constructed from our conversation and ask the women the following question, *what is justice in math classroom?*

There is some silence, but Jenni laughs and says this is a difficult question. Anahi is the first one to begin discussing what she feels about justice, grounding it on the experiences of a young boy she tutors. She explains that he is not well, but he is expected to do well and learn what he was supposed to learn in two semesters into one. Jenni adds the classroom interactions that may contribute to a student being unwell and especially thinking about asking questions and having a voice. Inez discusses the exclusion that happens in mathematics where it is created to be a more individual and competitive learning space. So, she urges for a more collective learning environment where discovery and justice are centered.

Sandra follows up on that point and asks, *how do we build a collective environment in math?* Inez quickly responds that it is about discovery and community. Anahi agrees that individualism is what stands out to her in math classrooms. She notes that in other classes there is math but in math everyone basically is on their own. Sandra responds that in M308 and M309 they have implemented groupwork. The women laugh and grimace at the thought of the group work they experienced there. Jenni explains that groupwork sometimes do not work. She provides an example where children are sitting in groups and goes into explaining the competition that can happen in that space, specifically thinking about the pace of the math activity. Inez responds that part of the culture of math makes it hard to change the practice of math as a fast-paced activity. She explains that we cannot simply come in and ask students to do math and challenge what they have done in the past. Anahi agrees and argues for math to be taught at a slower pace. Sandra pushes back and says, well if we are not covering all the content materials, kids will not be able to do well in their content assessments. Inez does not see the challenge, but she prefers quality over quantity and that this needs to be evident in all classrooms

from a young age. Jenni shares another example of tutoring a young girl and feeling like the young girl is asked to do so much with very little guidance from teachers. She continues to share what she would do when she is a teacher. She would support her slow students to make sure that they are able to do math well and be able to be successful in school so they could achieve their dream of becoming whoever they want. Anahi agrees that following the curriculum may mean that you leave behind some students, so maybe we want to make sure they stay and are not left behind.

The women then turn to discussing the challenges of teaching. Jenni speaks first about some teachers not really caring about children and are just there to get a paycheck. Anahi responds that having a voice is so important, but she feels that in the future she will be doing all that intense work. Inez agrees and shares more about the challenges that she foresees for herself; she sees teaching as being for white middle class women because they can afford to teach. Inez continues to speak about the problems in asking children to come back to school during the pandemic when they are not ready. They discuss all the politics involved in asking people to come back to school, the recall and the kids paying the price.

Sandra takes the women back to when they would go after school to tutor other comadres with their Math 308 and 309 work. Anahi responds that care is what is needed to build those spaces from a younger age. Anahi continues to discuss the importance of caring and knowing children and that even though Jenni's comment about staying after school and supporting is important, she says, "that is her time." Inez vividly imagines a school where all of her comadres would teach in the same place and an ethic of care would be instilled in all grades. Her dream is idealistic. She does not know how to get there but she believes it will happen. Anahi quickly agrees and suggests they all come and teach in East Salinas.

Finally, Sandra leaves the women with the following question, *what would it mean for pláticas to be part of a math classroom?* Although the intention was not for the women to answer that question at that moment, they do. The women all agree that it is possible and note that there are ways in which dialogue can be incorporated in mathematical spaces. Jenni adds that being with one another and being comfortable to think freely is what is important in this space, so she sees it when they worked on the problem together.

Sandra thanks the women for a great discussion, reminds them of the reflection prompt and wishes them a good night.

Data Collection

This section describes in detail the multiple data sources that were collected as part of this project. Figure 3 summarizes all multiple data sources collected and the section continues in detail with the other data sources that were collected.

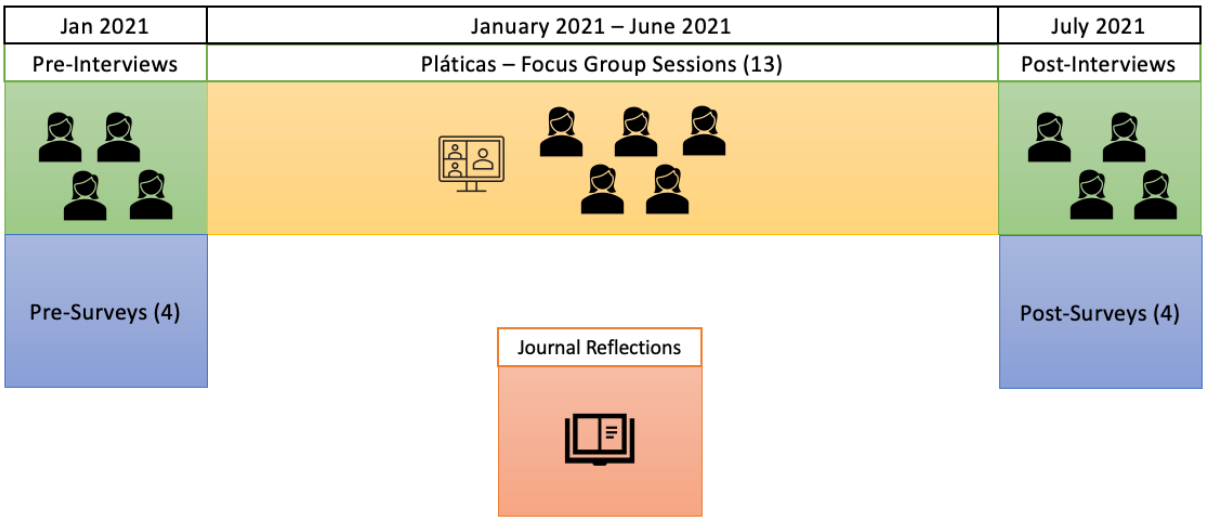


Figure 3: Summary of all data sources

Pre/Post Surveys

All the women in the project were asked to take a survey before the interviews and meetings. The survey was a way to understand the beliefs and ideas that the women were already coming to our group with. The women completed the survey at the end of the project to gage at any changes they have after our conversations. All the women completed both surveys as indicated in Table 3 by an asterisk.

Table 3: Summary of pre and post interviews

	Initial Interview	Duration	Post Interview	Duration	Initial Survey	Post Survey
Anahi	1/18/21	90 mins	7/8/21	100 mins	*	*
Inez	2/10/21	76 mins	7/6/21	102 mins	*	*
Luz	1/28/21	63 mins	7/20/21	44 mins	*	*
Jenni	1/20/21	40 mins	7/9/21	45 mins	*	*

Pre and Post Interviews

After the surveys, the women were asked to participate in semi-structured interviews that occurred via Zoom. The surveys were built on as references to ask more questions during the interviews. The interviews went over the co-participant's educational history, mathematical history, and their teaching goals. The women were asked to take another interview following the same interview protocol after the meetings. (See Appendix A for Interview Protocol.) These interviews ranged from 40 mins to 102 mins as shown in Table X.

Sessions – Pláticas

Over a period of 5 months, the women met weekly/biweekly to discuss issues about math, teaching, and justice. There was a total of 13 meetings, all roughly 2 hours long. These meetings occurred over Zoom, typically on a weekday night from 7-9 pm. These meetings were video recorded through Zoom. Thus, these sessions recorded the women's faces and the upper portion

of their bodies. Most of the time the women were in their homes during the sessions but there were times when women joined as they were getting home. For example, Jenni would often be on her way home so she would join as she was in her car or at the drive through grabbing some food to eat. Most of the sessions where Luz was present, she had to leave early due to some family obligations. Table Y above shows the date of each meeting, the co-participants who attended that meeting, the length of the session, and the central questions discussed that day.

Reflection Journal – Co-Participants

After each meeting, the women were asked to fill out a reflection prompt. The reflection prompt had four sentence starters and the women filled out their reflection through Qualtrics. Each reflection prompt was sent by me on the night after our meeting and they were asked to complete it within a couple days of our meeting. There was a total of 12 journal reflections – I forgot to send them a journal reflection prompt for June 14, as highlighted below. Table 4 summarizes the journal prompts completed by each co-participant.

As an example, this was Inez's reflection after the April 28 meeting.

> *I was struck by…*I have to admit that I am still unpacking the idea of social justice, race, equity, identity and mathematics. Sometimes I feel that I understand it but then I after engaging in further conversation about it with my Comadres, I feel like that understanding evolves.
>
> *I found myself wondering…*The idea of taking action and thinking about what some of those beginning steps could be.
>
> *I see a connection between what we've discussed to…* I am really starting to see some connections between math education specifically and other disciplines in our education system that rationalize "side stepping" the conversation about race and social justice.
>
> *I would like to continue the conversation by…* I would like to continue the conversation by just continuing the conversation. I feel like the somewhat organic nature of our conversation tends to lead to more revelations as we think about these issues/questions individually and collectively.

Table 4: Summary of prompts completed by the women

Journal Prompts		Anahi	Jenni	Inez	Luz
	2/13/21	*	*	*	*
	2/19/21	*	*	*	
	3/5/21	*	*	*	*
	3/18/21	*	*	*	*
	4/2/21	*	*	*	
I was struck by...	4/21/21		*		*
I found myself	4/28/21	*	*	*	*
wondering...	5/5/21	*			
I see a connection	5/12/21	*		*	*
between what we've	5/19/21	*	*		*
discussed to...	6/2/21	*			
I would like to continue	6/14/21				
the conversation by...	6/23/21				*

Reflection Journal – Researcher
As both researcher and as co-participant in the sessions, I kept a journal. Before and after each session, I documented what happened, what unfolded that was not expected or ideas for the next couple of sessions. This was an important place for me to document any changes to what I planned and did not occur.

Analytic Methods
This section outlines the analytic methods that I used for the findings reported in Chapters 4-6. The methods outlined were intended to be used to understand what happened in the learning community, how stories were shaping the notion of becoming math social justice educators, and to understand the entanglements were the co-participants were foreseeing as they grappled with becoming social justice educators. The video recordings of our conversations were the primary source of data. The other data sources (pre-post interviews, surveys, reflection journals) were used as supporting data sources for the argument. The following section is broken into three parts, outlining the analysis of each research question.

Understanding what happened – Research Question 1

Understanding the Evolution
To understand the learning community and its evolution, I used the four design principles outlined in this chapter to see emerging patterns within the session outlines. Using the activity as a unit of analysis, I was interested in understanding how the principles were instantiated within the activities of the sessions.

To reduce the video data, I created activity logs for the 13 meetings. The activity logs were broken down by activities, and by utterances, to create what I call the master logs. (Copies of the master logs are used in different ways to analyze the three different research questions.) The logs documented what we did and who spoke during the activity. These logs also included summaries of what happened, along with observer comments.

After the content logs were created, using the activity as a unit of analysis I wanted to understand how the four design principles were manifested in the data. During the first round of data reduction, I documented per activity when the principles were visible, flagging them and noting how they were coming to be. For example, Figure 4 outlines what this looks like for two sessions, Session 1 and Session 6.

Session 1	Co-design - led by others	Mathematics	social justice	Relational
Check in				x - bringing in from other place
Community Agreements				
What is identity?				X "confession time"
Identity and Mathematics		x - static	Representation	x
Math Tik Tok Video		x- puzzles //tricks		
Mathematical Identity				

Session 6		Co-design - led by others	Mathematics	social justice	Relational
Check in		x			x
	justice and math		x	x	x - grandparents
	Reimagining	x	x	x	
	common core		x		
	land acknowledgements	x		x	x
Math Justice	credential program	x			x
	reading the lesson		x	x	
	watch video				
	Children's well being	x		x	x
Social Justice Lesson	classroom context	- luz		x	x - white students vs kids

Figure 4: Session 1 and Session 6

Once those activities were flagged, I further looked through all sessions and the moments that were flagged. I realized that that there was a shift of discourse from theoretical to practical in the conversations and there was a shift in the way that co-design was more apparent as the sessions continued. Having identified these patterns, I then chose for further analysis vignettes that represented those shifts and that were representative of the data.

Conceptualizing pláticas

To conceptualize pláticas, I used a combination of a bottom-up and a top-down approach to conceptualize the relevant empirical dimensions. Using the master activity logs, and examining one meeting at a time, I looked for characteristics of within the pláticas that were not reflective of typical conversations. From my previous experiences with pláticas, I had conjectured that there were some such characteristics. This is the top-down approach, coding for moments that center the everyday knowledge and centering the relational. Then, by looking at more data (the bottom-up approach) I came up with more characteristics: time, space, language spoken, discourse building-challenging, and imaginative. Those became codes to understand the way that pláticas were different than a conversation. The table below outlines the coding scheme:

Table 5: Coding Scheme to understand pláticas

Code	Description	Example
Everyday Knowledge	Bringing in everyday knowledge to the conversation	"My father worked at the farm and would take the elotes to go sell them, he had to be a salesman and those are the things that we expect for women. So maybe it was never expected for me to be a good at math. So, I owned it, I am not a math person. So I don't

		know, what went into how I am seeing myself with mathematics and what are we doing in the classroom to reinforce those ideas?" (Inez, Session 2)
Relational	The interactional aspect that both implicit or explicit attends to the interactional aspect of the conversation	Inez shares that the situation with her student who was in a crisis. "But then you know, it is hard. These messages that he was sending on my homework. He was stressed out about MY work, that I assigned him. And that made me feel awful, you know? And I tried really hard. And I have with him, to be flexible. I just need to know that there is a reason why you are not getting this done. I am taking this approach, and people say that this is wrong. They will walk all over you. But then I wonder, how much am I really helping the student? Because he is not going to have me next year, and they are not necessary going to be understanding and he will be back in this unnecessary pressure that teachers impose on students. About getting homework on time and completed and the grades suffering. I am trying to care for him and go out of my way to give him. Some kind of justice for him, and this situation he is in. But then, am I harming because next year he is going to another teacher who is going to rip him a new one? I don't know, it is so hard to know what to do. And sometimes the things you do might have unintended harmful consequences." Anahi then responds, "Inez, thank you so much for sharing. It is like yeah, I started to think a lot about that. When I was in the classroom, the special ed class. The children would cry and get emotional and I was not sure what to do. It was just too much. Cuando llegaba a la casa me ponia a llorar, iba con el maestro. (I would get home and cry, and I would go to the teacher) No se. (I don't know) It's like one of the things that I learned that yeah maybe, you know, you are doing like, tu le estas dando (you are giving them) that justice. And they will forever remember that.

		And you know, you did and are doing your part. Aunque vayan a otra clase o con otro maestro. (Even when they go to another class or with another teacher) They will remember you y saben que se siente que someone los haga humanize. (and they know what it feels like for someone to humanize them)" (Anahi and Inez, Session 4)
Time	Conversing about the past, present and future	But like sometimes we did not learn exactly o aprendimos (or learn) the right way, or they did not teach us the right way. I think that is where the voice comes in that setting, in a class setting. At least for me that is why I ask after class. That is the main reason or their office hours because if I do it during the class, everyone else is like 'otra ves, esta girl, otra ves.' (this girl again, this girl again) You know? Yeah." (Jenni, Session 4)
Space	Conversing about places that move beyond the virtual reality of our conversation	"La diferencia es que alla te pegan." (The difference is they hit you there.) There is laughter. She continues, "they are in strict. Pero como en el ranchito que apenas hay luz y maestros. (But in the ranchita there is barely electricity and teachers) Alla (There) they believe more in rules. Follow the rules and there are more consequences. Tienes que ir bien peinadito (You have to go well dressed), have everything ready." (Anahi, Session 3)
Language Spoken	The linguistic repertoires employed during our conversation.	"I think it would somewhat, asi que hay limite (there is a limit). There is a limite on how you push people. No todo se iso para todos. (Not everything was made for everyone) Y no es de que no son capazes si no es de que no les interesaba. (And it is not like they are not capable, it is just that they are not interested) I like it there. I like que me digan (that they tell me) you are good at this. Tambien ay (There was) tutoring for history but I don't like it but I went for math instead. The support was there, it was just my choice. Si no les interesa pues (If they are not interested) find that and push them there. I don't know what do you think?" (Anahi, session 2)

Discourse building-challenging	The building of each other's ideas and pushing generatively	Inez goes on. "One of the things that I was thinking about like Mexican-ness and math, and honestly, I don't think I saw that this much, until I saw that in our (to Jenny) M309 class. To me, we come together in community to help each other out, that is part of who we are. Like padrinos (godparents), we all pitch in. Being community with one another. Where in other times, it is really competitive as in there is an outreach for that. Sometimes you might ask, what did you get? Or what was your answers? The first time I saw that was with the comadres. Really help each other and support each other emotional. It is part of our culture as Mexicanas." Anahi responds, "I mean tambien es agarar las cosas buenas de nuestra cultura. (It is also about taking the good things from our culture) Como las padrinos, comadres (Like the godparents), supporting each other. I feel like in math, in learning history, y tambien con esta Mexicanidad (with this Mexicaness) through math we teach history con los Aztecas (with the Aztecs). Esa (That) Mexican way, learning our history through math. That is the thing, no se nos enseña (we are not taught) that we are good at math. Que somos capaces (That we are capable). Cosas que no nos ensenan y cositas asi que no somos capases (Things that are not taught and things that show us we are not capable) until we come into community. We come together y aprendemos (and we learn) y yeah. I was going to say something else y se me fue la onda. (I forgot)" (Inez and Anahi, Session 1)
Imagination	Conversing about envisioning possibilities beyond what exists now in schools	"I was thinking about how it would be if all the comadres taught in the same school. The community of the teachers would translate the caring of the kids, it would be an interconnected of the things. So, we do not start from the scratch, it would be amazing, and I can see that. I do not know how we get there, because it is idealistic. Like you all said there are people who are there just to get a

		paycheck and it is really hard to build community with people like that." (Inez, Session 5)

These codes were then explored further and grouped together to create the dimensions of pláticas. For example, time and place where combined to create the theme "Across Time and Place." In the next chapter, vignettes are chosen as representative of the data to highlight the dimensions of the pláticas.

Analyzing shifts in mathematical justice-oriented literacies – Research Question 2

To address the second research question, *how are mathematical justice-oriented literacies for the women changing during the pláticas?,* I began by looking at the master logs. Because the activity log is broken down by utterances, that is the turn talking of women, I was interested in finding conversations where women discussed their understandings of mathematics. Using "utterances" as unit of analysis and using both top-down and bottom-up approaches to coding, I looked for the types of experiences that where shared (bottom-up) and how those experiences were shaping the participants' justice-oriented perspectives on math teaching (top-down). After the data were reduced, the following themes about experiences of the past emerged: family, classroom, the self, and community.

For phase 2, once those stories were identified, I analyzed them further to understand how the stories were shaping the women's understanding about the mathematical-justice oriented literacies. Through a top-down approach, I specifically looked for ideologies related to mathematics within those stories. I choose ideologies or narratives (Nasir and Shah, 2011) that were specific to mathematics because they attend to the racialization that happens in math spaces and one that has not been investigated further in social justice mathematics. Narratives such as good at math, math as innate ability, who is positioned as doer of mathematics, meritocracy, math as a fast-paced activity emerged from the data and align with becoming a social justice math educator.

Thus, in the third phase, I themed together the data to the following themes: various conceptualizations of mathematics and math activity, various conceptualizations of race and justice in mathematics shaped by stories of family and classrooms. I then used these themes to structure the fifth chapter. I also examined journal entries as a secondary data source to support the argument.

Analyzing challenges – Research Question 3

To understand the third research question, *what are the entanglements between theoretical aspirations and pragmatic ways of thinking about justice and mathematics?,* I began by looking at the master logs. I created another copy of the excel sheet to document any comments that were different from the other research questions. I then conducted open coding to develop a list of moments where co-participants explicitly/implicitly shared about the complexity of enacting justice-oriented perspectives in the school setting (Charmaz, 2006). Although the coding was open, I was paying close attention to the moments where the women expressed confusion, contradictions etc. I used key words to characterize those kinds of confusions and contradictions. Table 6 below documents the parent and child codes that were created based on the open coding.

Table 6: Coding Scheme to characterize confusions and contradictions

Parent Code	Child Code	Description	Example
Perspective as Teachers	Well-being	Conversing about the well-being of teachers as they navigate schools	“Yeah, but that is why my question to Maria is that she says you must have a big ego and have a self-confidence. and we have to walk around like we own this place. and i agree, we do get a response. But there is corruption in doing that and losing sight of what we want.” (Inez)
	Action Focused	Conversations that center action	Anahi jokes that her highlight es estar endeudada (being in debt). She notes she cannot go to sleep because she is worried. "And Irma, I am so happy that you were able to do your lesson plan on social justice. Pero como lo implementamos. (How do we implement it?) Me iso sentir bien, no nomas es de decir de los dientes pa fuera. Lo podemos practicar. thank you for showing us que si se puede. (It made me feel good that it is not all talk. We can practice it. Thank you for showing us that it is possible)"
	Consequences of their livelihood	Conversations that explain the consequences of committed to justice within the system of schooling	“But I also worry about being getting in trouble for being political. Aqui en (Here in) Hollister we have one leading a crusade that teachers are indoctrinating kids on these progressive issues. Not even taking a stand but bringing the issue to a class is itself scary. But I love it, I love bringing these kinds of things into a classroom.” (Inez)
Perspective of Students	Well-being	Conversations that center the well-being of students	Inez agrees that she would not feel comfortable she explains that she does not want to be an hipocrita (hypocrite). Especially when using something like to be used as a lesson. It takes away from the people that

			are going through so in any way it is a bit dehumanizing.
	Consequences of their livelihood	Conversations that explain the consequences for students when committed to justice within the system of schooling	"I have heard people talk that POC need to learn how to find ways of building wealth. We do not venture into investing and things like that and that is how you can build wealth. If you were able to put $5000 in a Roth IRA by the time, they are ready to retire, they will have 1 million. They will have financial liberty to seek some greater value in life instead of going to college, to get a job and get the benefits to survive. Hence, here having a strong and positive math identity can be liberating."

After coding the data with the codes above I then revisited the data to contextualize those moments within the larger corpus of data and gathered big themes. In the third phase, I chose vignettes that represented those themes and their complexity. Most often these themes were interconnected within the vignettes, and so for Chapter 6, I highlight the themes within those vignettes.

Chapter 4

"Here we are just talking, we are having a plática. We are not only doing this, we are listening to each other, we are learning. Conversaciones que podemos usar en nuestras (Conversations that we can use in our) classrooms. I am getting ideas on how to implement with teaching math. For Luz, working with her kids. Sacamos algo productive (we get something productive out of it), with kids it is the same." – Anahi (Session 8)

Introduction

This quote from Anahi frames her understanding of what pláticas are, their purposes, and the diverse functions they serve, for each one of the *mujeres* who take part in the conversations. The kinds of conversations and understandings that we had were heavily influenced by our centering pláticas, critical conversations. Yet, many questions still arise as to what it means to center this cultural practice, pláticas, along with learning and teaching mathematics. This chapter aims at understanding what happened in the sessions and how we can conceptualize pláticas as important sites for learning and teaching mathematics. Thus, this chapter serves two purposes: the first part, Part 1, focuses on providing a rich documentation of our learning community which we had already conceptualized as pláticas for and by its participants. The second part, Part 2, characterizes pláticas in detail, providing dimensions of pláticas that both align with the cultural and academic goals of the learning community.

There has been a growing body of work in Chicana/Latina Feminist perspectives in education that centers pláticas as both a method and methodology (Fierros & Delgado Bernal, 2016). The majority if not all such studies conceptualize pláticas as "critical conversations" (Fierros & Delgado Bernal, 2016). The existing definition is a good first step to try to unpack what critical conversations are; it moves toward a more expansive understanding of what they are and could be. Thus, I argue that conceptualizing pláticas empirically can provide insights to their multidimensionality and establish them as a context for productive sense making about critical issues in mathematics education. Furthermore, this chapter serves as an existence case of the possibility to design a learning community that is culturally grounded and have cultural and academic goals.

It is important to note my positionality related to this chapter. I was both the designer of the project as well as a participant of the project and now I am analyzing what happened. I have knowledge about the project that another person who is just looking at my data would not have. Yet, I sought to document that knowledge in my journal reflections specifically considering moments where I was impressed, challenged, confused with what was happening. I also hold a different understanding about pláticas as someone who grew up with that cultural practice. I find that intimate knowledge is needed to both understand its design aspect and what occurred in the project. My goal is not to romanticize what happened in the project but rather to critically analyze the affordances and constraints of the kinds of things that happened during our pláticas.

Before, I speak more about the learning community and what happened it is important to provide a brief characterization of the dimensions of pláticas that are further elaborated in Part 2. This is important for the reader to understand how in the dissertation, the community that was designed for sought to honor the tradition of pláticas and advance the co-participants' goals of

new understandings related to math and justice. Pláticas are a community activity, a form of collective storytelling that:

- takes place across time and place
- is co-contested & co-constructed
- centers everyday knowledge
- foregrounds the imaginative
- centers linguistic freedom
- calls for relational reciprocity.

This chapter seeks to answer the following research question:

What are pláticas? What was the design of the learning community and how did it evolve?

Chapter Overview

The chapter is composed of two parts. Part 1 addresses questions related to the design of the learning community and how it evolved. I attend to the evolution by contrasting the initial plan with what occurred. I then go into detail about how the first session set up the kinds of things we would do in the pláticas. Then I then pay close attention to two things: how did the pláticas evolve and how did the co-design look as the pláticas continued. I pay attention to this as these help us see both the role that the women took in the pláticas as well as how the conversations began to shift as time progressed. Part 2 conceptualizes in detail the dimensions of pláticas. These dimensions are empirically grounded from a combination of top-down and bottom-up data analysis coding. I then showcase how the dimensions of pláticas come up in the vignettes. The first vignette is about the women's conversation related to land acknowledgements. The second vignette is about women doing mathematics together.

Part 1: What was the design of the learning community and how did it evolve? What were tensions and/or possibilities that emerged?

First, counterspaces are spaces constructed in the margins that become safe spaces for people from marginalized communities (Solórzano et al, 2000). The notion of counterspaces is often considered reactive in that it reacts to the multitude of microaggressions that are often part of schools or formal institutions. I consider counterspaces as spaces of potential sense making and learning. Their potential comes from the fact that these spaces are formed as spaces of solidarity and vulnerability, thus constructing a foundation of relationality that is central to learning. This positive framing of pláticas has not been investigated thus far. Doing so opens a space of possibilities of new understandings.

If one takes an ecological perspective aligned with social design-based experiments, transformative learning can be designed for by paying close attention to relevant artifacts, activities, and interactions (Gutierrez & Jurow, 2016; Gutierrez & Vossoughi, 2010). Thus, in many ways understanding and designing the ecology of the counterspace can open possibilities related to sense-making and understanding in mathematics. It is important to note that the goal of this chapter is not to prove that a particular design will work for any group of Latinx prospective educators; we know that the within the Latinx community there are broadly heterogenous experiences. Rather the goal is to understand what happened, what lessons can be learned

moving forward, and what design principles emerged empirically during the process of designing towards justice in mathematics.

To understand the learning community and its evolution, the data analysis can be summarized in 3 phases. First, I created activity logs for each session, activity logs were broken down by activities, and by utterances, to create what I call the master logs. Using activity as a unit of analysis, I then used the four design principles outlined in Chapter 3 to flag how they were manifesting in the data.[11] Once those activities were flagged, I further looked through all sessions and the moments that were flagged. I realized that that there was a shift of discourse from theoretical to practical in the conversations and there was a shift in the way that co-design was more apparent as the sessions continued. Having identified these patterns, I then chose for further analysis vignettes that represented those shifts and that were representative of the data.

I begin this section by characterizing the original plan and contrasting it with what happened. The implementation of the pláticas created unexpected opportunities; and some constraints also emerged. I then focus on describing the evolution of the sessions and focus on two findings – the evolving focus on "practice" and the merging of social justice and mathematics that emerged from the pláticas. Finally, I explicate the co-design aspect of the learning environment how it came, its opportunities and its limitations.

The Design Plan and the Outcome

Before the pláticas took place, I devised a plan with central questions that would create opportunities for the women to make sense of mathematics identity, mathematics learning, mathematics, and justice both in schools and in the community. The original plan outlined 15 sessions with no fixed activities but rather questions that would be investigated. Things changed. Instead of meeting 15 times we only met 13 times over a period of 6 months. These changes were made to accommodate the lives of the women as some sessions were cancelled and were pushed because of outside commitments. In addition, the hope was that all the women would attend all sessions; but that did not happen because of external commitments. It is important to note that it was not that the women did not care about being present but sometimes they had external issues that made their participation in the learning community difficult to navigate. In addition, the initial goal was for the women to meet in person. Because of COVID, that also did not happen. It is important to acknowledge that the change to zoom meetings did influence the women's participation. For example, Luz was a recent mom and since she was home there were times when she had to leave the meeting to care for her son.

The topics in the original plan progressed from the individual (math identity) towards the institution (see Figure A), a sequence intended to situate the conversation within teaching and the community. Starting with math identity was intentional as I wanted to center the person and who they were in this moment in time. I conjectured that such an approach had serious implications for how they would envision teaching for justice. The figure below outlines the various topics and the progression. The goal was to begin with centering understandings about issues related to math identity and move towards understandings related to justice and mathematics.

[11] Refer to the methods chapter for more details about the data analysis process.

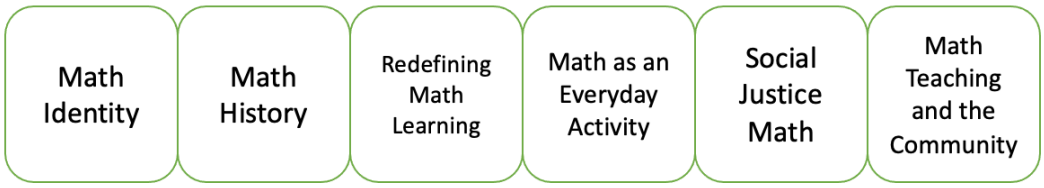


Figure 5: Overview of Session Topics

What happened

The substance and goals of topics were not changed during our conversations. For example, in the first session we did talk about mathematics identity. However, once the discussions began to take place and the women began to be interested in certain issues, there was a change in the trajectory of the topics. The topics were all discussed but the ideas of identity, various settings and societal issues were all in communication with one another throughout the discussions. So, rather than thinking about a linear journey as represented in Figure 5 the relationships between the topics discussed can be modeled by Figure 6, in which one sees key themes embedded within each other. That is, identity, community/classrooms/schools and society all coexisted in the discussions and during the discussions the women discursively moved across the various settings. In Figure B, the nested aspect of the diagram is very important to highlight since it centers the historical and political dimensions of how women of color come to exist and navigate the world. For example, speaking about math identity cannot happen without considering classrooms as places of math identity development and we cannot forget that narratives about what it means to do math are shaping both who we are and who we become in mathematical spaces.

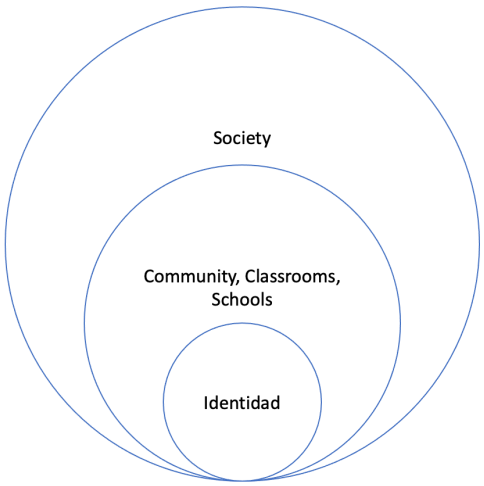


Figure 6: Diagram of the Nested Topics

So, what did the pláticas look like in practice? For example, in Session 5, the women were asked to discuss what mathematical justice looked like. The women had previously discussed what justice meant for them in broad terms, that is, situating themselves within conceptions of justice in society. To think about mathematical justice, they fluidly moved from their own conceptions

of justice in society to understand what that would look like in mathematics classrooms. Moreover, it should be noted that who they are – including their histories – in many ways shaped the understandings of justice/injustice that emerged in that conversation. For example, Anahi brought about nature and well-being which is something that she had previously talked in the initial interview. Thus, while the researcher's plan entailed exploring many of the issues separately, as a trajectory, the way they occurred demonstrated the interconnectedness of such issues. Such interconnectedness created opportunities to make sense of mathematics classrooms as political learning spaces.

Here is an example. Toward the end of this chapter, I discuss the vignette of the women engaging with the task of finding the sum of the first one hundred whole numbers. The context of asking the women to do a math problem situates them within the classroom setting and it is the second nested circle on Figure B. But as the women recount how they would approach the problem they begin to bring up stories about their own experiences with math. This brings up a lot of memories about their own classroom experiences and what the expectation is when doing mathematics. For example, Inez shares that she knows there is a shortcut to doing the problem, but she does not know how to approach it. Jenni shares about reading all the vocabulary, a strategy that is heavily used for emergent bilinguals. As the women recount the stories, they are fluidly moving between who they are, *and* the expectations they experienced when perceived as math learners. While in this vignette, the society is not central, it is invoked in two ways. First, in the ways in which the women recount what they are expected to do with the math problem and towards the end when I asked them to think about conjecturing and problem solving. This was pivotal for the women to connect both what they were practicing in that moment and why it mattered.

The initial plan took seriously the trajectory of individual towards society. As we see in Figure A, the topics progress and they keep moving up social levels. What happened was the opposite, a fluid movement between the nested levels that was guided by the women's understandings and their own lived experiences. An outcome that relates to the understanding that we were having pláticas, a place where the conversations about our lived experiences were not only welcomed but they were also nurtured.

In the next section, I discuss how the first session created a set of expectations about the kind of community we were engaging in.

The First Session: Setting up the Counterspace

Recall from Chapter 2, a counterspace is defined as a "safe space" created by marginalized people in response to the daily barrage of racial microaggressions (Solórzano, Ceja, & Yosso, 2000). Because we had engaged in other forms of pláticas and we had built relationships with one another, the women came in with an understanding that this was their own community. What they had not experienced in the past was the intentionality of the kinds of activities that I was asking them to engage in. Thus, in that sense, this space was somewhat different than what they had experienced in the past.

I begin to document the evolution of the sessions by paying close attention to the first session. During this session there were few opportunities for the women to guide the conversations because I came in with a strict plan. This was intentional. The plan for the first day, was that we would talk about *identidad,* something that had emerged in the initial interviews

(Researcher Journal, Memo 1). Once we had developed an understanding about identity, we would extend that understanding to make sense of mathematics identity.

After talking about math identity, the women discussed a Tik Tok video that I had mentioned, to spark conversation about math and the perceptions that are created socially. The math Tik Tok video we watched together claimed to show a "math hack.[12]" I chose the video because it had more than 3 million views, it had been "liked" close to 200,000 times and had been shared 20,000 times. Given its popularity, I imagined that watching this video together would be a way to connect to pop culture and have a rich conversation about the mathematics involved and the messages we were putting out into the community. Figure 7 shows the "math hack" featured in the video

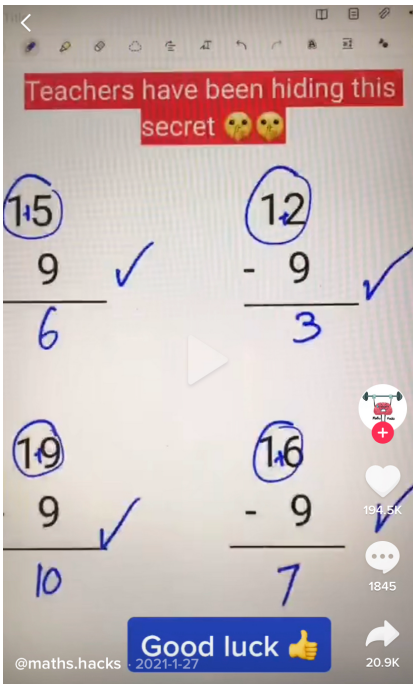


Figure 7: Screenshot of video showing a math hack

In many ways this first session established the foundation for what would happen every session. First, at the beginning of every session we all went around and checked in. We talked about how we were doing, what we were up to and what we looked forward to. There was no time limit to this check-in and the assumption was that people would share what they needed and/or wanted to share. Second, we incorporated artifacts into each session. These items were chosen by me, or they were items the co-participants were asked to bring with them to the session. The women only brought artifacts when I asked them to bring them. It is important to note that they would bring in dilemmas they were going through, so in that sense, they did bring those artifacts to the space. Finally, the sessions would build on the content from the previous session, to ensure that they would all be connected. For example, I wanted the women to see an expansive way of

[12] While I cannot access the video anymore, the "math hack" video is one of too many listed on the social media application where people present cases of mathematical ideas that are "hacks." Some of them are even explicit about noting that using these hacks means you "do not have to use your brain". While these videos are well intentioned, they move away from the idea that mathematics is a sensemaking activity.

thinking about math. This was both a principle and a goal to fully begin to see mathematics in new and expansive ways (Refer to Chapter 3 for a description of what this means). During the first session, the women had the opportunity to discuss the math Tik Tok video. For the next session, I hoped to continue that conversation by bringing in another artifact they could make sense of and that it related to different ways of engaging with mathematics. In my research journal I documented this occurrence,

> "The women had a very interesting conversation about the mathematics video – for the next session I will bring in a different way of doing math than what we are used to. The Oksapmin counting system can be a nice way for this or even talk about the candy sellers and the way they do math. (Researcher Journal, Memo 1)"

During session 2, the women watched a woman counting using the Oksapmin 27-body counting system and discussed the different ways of doing math. This was another artifact whose choice was very intentional, as it would spark some conversation about using the body as a form of counting. (Figure 8 below documents the overview of the sessions with segments connecting the topics of conversation across time.) During the end of Session 3 the women were asked to bring in their own forms of artifacts. Towards the end of the session, I asked the women to bring in five images that depicted justice or injustice to them. This was the first time the women were invited to bring an artifact and that we would all discuss it as a group. Although, the women were asked to bring something tangible it opened the door for the women to bring in their issues related to education and the women together would have a conversation about it. For example, this was followed up by Anahi some weeks later when she spoke about the dilemma of buying a new car. Such occurrence created an opportunity for Anahi to share her own struggles and have opportunities for the other women to collectively grapple with them. Inez later also asks for support when trying to enact a social justice lesson in her Yearbook class.

Evolution of sessions

This subsection discusses two findings related to the evolution of the sessions. The first *centering "practice" in dialogue* section highlights the development of pláticas from dialogue that is more theoretical to more practical. Note both phases are critical because moving towards practice too soon can gloss over deep issues related to understanding what race, justice and identity in math may mean. At the same time, only focusing on dialogue limits opportunities of taking action to combat injustices and create change in the community. For the women, it was very important to move beyond what they called *de dientes para afuera*[13] and move towards some change in the community or in a classroom. Hence, we see the emergence of the importance of the practical component within our pláticas. The second finding, *blending math and social justice in the classroom,* focuses on how the dialogue began to center the classroom context as site of merging both math and social justice. The focus centered in two classrooms, Inez's yearbook class and my own mathematics course that I teach at the college level. Both these contexts started in different places (my class context began with mathematics and Inez's class context began with social justice) but both ended up merging both social justice and mathematics in organic ways.

[13] This phrase translates to "teeth out." This is a common phrase that is used to reference something that is said for the sake of saying it with little sincerity and no action.

Centering "Practice" in Dialogue

The 13 sessions that can be divided into two parts based on their primary focus. The first part involved dialogue around understandings about justice, identity and mathematics and their multiple intersections. It is important to note that it wasn't that we weren't talking about the practical component in part 1. As a matter of fact, practice began emerging during the sessions in the first part. But it was until the second part that the conversations centered around the practical aspects of justice work by situating ourselves in the classroom context. (See Figure 8).

Understandings of Justice, Identity and Mathematics (and their intersections)								Understandings of Justice, Identity and Mathematics in Practice				
Session 1	**Session 2**	**Session 3**	**Session 4**	**Session 5**	**Session 6**	**Session 7**	**Session 8**	**Session 9**	**Session 10**	**Session 11**	**Session 12**	**Session 13**
Central Questions: *Who are we?* *What is mathematical identity?* *What is justice?* *What is justice in mathematics?* *What is race in mathematics?* *What does community look like in mathematics?*								Central Questions: *What does teaching for justice look like?* *What are curriculum implications for teaching for justice?* *How do we co-design a math content course to be inclusive like a comunidad?*				

Figure 8: Evolution of pláticas

As an illustration, during session 6 the women spoke about justice in math classrooms, and Inez recalled the importance and need to reimagine math classrooms. Anahi pushed back on such theoretical language.

> Anahi asks, "Yeah, how is that going to happen? Yeah, is there hope?" *Inez comes back and says everything is okay.*
>
> Luz asks Anahi what she means by 'if there is hope?"
>
> Anahi then responds, "So how Irma said to reimagine, of course we do it. In the first place how do we do it? Como lo empezamos? (How do we start it?) Es algo que tenemos que estar (Something that we have to be part of) from the beginning. Desde la raiz, si ya floresio esa raiz como empazamos otra ves. Como reimaginamos ese fruto que ya dio esa raiz. (From the roots – if it the roots already bloomed, how do we start again? How do we reimagine what has already bloomed?)"
>
> Luz responds that it is a tricky dilemma.

For Anahi, much of the dialogue happening in the pláticas was a great way to start this understanding but the action was equally if not more important. There is an emerging need for the theoretical conversations to move along with the practical component. Part of the action involved their own lived experiences and their own realities. And the question of hope speaks to her own feelings of not being able to create change within the system of schooling. It is important to note that for these women, when they spoke about community, they were talking

about home. Home is where they lived, and their own families resided which implied their siblings or nephews attended those schools as well.

After Anahi's push to really ground it in practice the women begin to challenge their own discourse of what they mean by reimagine. The following encounter happens as Inez begins to problematize her own language of reimagining mathematics education and again the need for action went in hand in hand with the theoretical language.

> Inez responds, "Yeah, huh. I agree with you, that is why I prefaced when I said "reimagine" - I know it is a little cheesy and corny. Yeah, you hear it but okay. Reimagine, great, I love the concept of it. But like that as far as it goes. How does that saying go? From *los dientes pa fuera* or something like that. You are just saying it, but you don't really mean to do anything. You just want to sound progressive and cool. *Laughter.* "Reimagine it" No, you actually have no plan on doing anything about that.
>
> *More laughter from all the women. Some silence.*
>
> Inez continues. "Like I was talking to Dr. M one time. I was watching this video, Dr. D (well-known critical Latinx scholar) was giving a talk. And he like… and a lot of these academics start their talks with "First and foremost, we want to like, you know, acknowledge and ask ancestors for permission to be here in this space." And then he continued on. Did the ancestors answer you? Did they tell you it was okay? It just felt like, why are you asking for permission? I don't know - did you get a response? *Laughter coming from all the screens.* I get the whole let's acknowledge our ancestors and everything, it is just so fake."

As Inez challenges her own theoretical language, she recalls a moment where practice was essential when enacting a justice-oriented perspective. Yet, practice that is very intentional and enacted through a justice perspective. Thus, in the two cases presented earlier, the practice component was very important but taking an ethical and critical approach was equally important. For Anahi, her understanding of change comes from the "raiz" and after such understanding the next steps would be to take action to reimagine education. For Inez, her practical component is also an ethical one that moves beyond dialogue. She believes that it is not enough to acknowledge Indigenous ancestors but rather to also think about what people are doing to change the living conditions of those who are historically marginalized.

The previous vignette occurred during the first part, Session 6, where the theoretical aspects of justice were central. We see the women desire and long for practice centered dialogue which is both what emerges and evolves in the second part of the pláticas. In the next section, we go deeper to understand the practice component that is central to Part 2, which happens within the classroom setting. The two classes discussed are Inez's Yearbook Class and my own math content course for prospective elementary teachers.

Blending Math and Social Justice in the classroom

At the beginning of the pláticas, the women began to have conversations about themselves and about their own understandings of the notions of identity, culture, and justice as related to mathematics. Although dialogue was a central feature of the math classrooms from the beginning, the dialogue came up as memories from the women. Anahi and Inez would bring up

at times their current situation in a classroom, but it was not the focus of the conversation. It makes sense that these two women brought up such issues since they were in a classroom at the time of the study. For the second part of the pláticas, a classroom focus became central to the group's conversations to connect justice-oriented perspectives to a teacher's practice. This occurred in two forms – focusing on Inez's yearbook class and then focusing on the math content course for prospective elementary teachers that I would teach in the Fall semester.

Inez's Yearbook Class

During the time of the project, Inez (with an emergency credential) was teaching Language Arts and Yearbook. She joked that she could not believe that a first-year teacher would be asked to teach a yearbook class given the amount of work that it required. Although she referenced the yearbook class during her check-ins much of the topic of conversation had to do with the stress that was involved completing the yearbook. Hence, it was a surprise when Inez sent a message to the group explaining the daunting step she took in her yearbook class. This opened the space to have a conversation about what can be done in her Yearbook class and created the opportunity to discuss a lesson that she could teach in her classroom.

The week prior to session 9, Inez sent the following text message to the group.

> "Hola comadres! I just wanted to share something with you all. Today I started a social justice lesson with my yearbook class, and it went surprisingly well! I didn't expect for the kids to be as interested in it as they were. I LOVED that even my kids that don't normally talk were very into the conversation. It was so interesting and very revealing to hear my 8th graders talk about what justice means to them. This experience made me hopeful about the possibility of taking this to next level. If you have any ideas, I'm open to them." (Text message, May 6)"

Anahi responded congratulating Inez and saying, "This is what they need to tener hambre de aprender!" I also responded saying that it is amazing and that we should talk about it during our next session.

During session 9's check-in, Inez shared more about the lesson she referenced in the text conversation we had on the previous week. She shares,

> "So, I shared with you already about the social justice lesson I did with my kids. That was my highlight of the week. It was so cool, to see kids who never talk. And now they are unmuting themselves. They are very choppy with their sentences. I know they are listening, and they are sensemaking. They unmute themselves and say, 'because of racism!' Like one kid, I was asking them today, we were going over the Amanda Gorman poem and I did with my Language Arts class. I asked them, 'did you at all talk about Amanda Gorman or her poem' I did this with my students. And I would assume that in language arts and history they would have talked about. So, I still did a more social justice lesson focus. Today we are at the part of the poem where it says "there is light, only if you are brave to see it. Only if you are brave to be it." And we talked about light and how bravery is required. It was such a good conversation, and you could tell, like

> Anahi said in her text message, tienen hambre de aprender. I just feel really lucky to have this freedom and do what I want with them. It was fun and I appreciate it."

Anahi shares about her week and then responds to Inez's check-in.

> "Inez, I am so happy that you are able to do your lesson on social justice. Muchas veces siento que we talk about it pero como lo implementamos? (A lot of times I feel like we talk about it but how do we implement it?) I feel like you are doing that already. Me ase sentir bien saber que si se puede. (It makes me feel good to know that it is possible.) No nomas es de los dientes para afuera. (It is not just all talk) Like we can also lo podemos practicar (We can practice it). And I am so happy that you are showing us que si se puede (it is possible)."

Inez responds,

> "Thank you. I am so happy too. I feel like this is a collective accomplishment. I would not have done this if I was not in this community. Actively talking and thinking about it. It was really cool and awesome so thank you for being part of that inspiration."

This interaction is very important for Anahi and Inez as Anahi is calling out the importance of focusing on the practical component of social justice work. This is a turning point for the women and our conversations as the focus now shifted to specifically consider Inez's classroom as a site for collective action. It is important to note, this was something that the women owned up together and not something that I intended for it to happen.

For the next two sessions we focused on supporting Inez in developing a lesson for her yearbook class. This led to conversations about nutrition and wealth – issues the women felt were important in their lives and they wanted to connect to the classroom. While the women do not finalize a plan, they had rich conversations about the challenges with enacting a social justice lesson. For example, when the women were talking about building wealth and having children understand the way Roth IRAs and stocks work two issues were raised by Inez. First, how do we connect to mathematics? What is the underlying understanding that children need to have to participate in the activity? This was important because Inez wanted to cover her bases and herself understand the mathematics at hand. Secondly, Inez raised an issue on capitalism and how problematic it could be to perpetuate these ideologies. These are two valid issues, and it is part of trying to teach for mathematical justice.

It was evident for the women that teaching for justice with mathematics is and will be challenging. Inez took the first step to have conversations about justice in her yearbook class with content (literacy) she felt the most comfortable. Furthermore, the act of bringing her dilemmas into the sessions, created an opportunity to collectively grapple with Inez's hesitations but also helped build her confidence. Many times, Inez raised issues on feeling inadequate or getting backlash for teaching "politically charged" issues. The relationality and vulnerability that women embodied in the space created these kinds of opportunities. And again, this was an organic event that happened as part of the women's goals to also enact justice beyond dialogue.

Sandra's M308-309 College Course

The second turn to an integrated math and justice classroom focus occurred after we discussed Inez's social justice lesson. This also emerged as part of the conversation as it was never intended that the women would provide feedback on how to make the math content course a more just learning space. The intention was to bring in the math problem so we could think collectively about creating just learning opportunities by specifically looking at the mathematics. The women had all taken the same college math content course as required by their undergraduate degree. Before I proceed with what happened I want to highlight the context of the class within the university.

M308 and M309 are math content courses for prospective elementary teachers that satisfy the CSET waiver and the Liberal Studies degree requirements. The CSET waiver imposes certain guidelines in the courses such as to pass the class, students must average at least 60% in their exams. When the women took the courses, the classes had two exams (a midterm and final) and they made up about 50% of their grade. During the pandemic there were changes to the courses and exams was one of those big changes. The course is structured in such a way that students are collaborating most of the time through groupwork. In addition, there is an emphasis in highlighting the conceptual aspect of the mathematics versus the procedural. Since it is not a methods course, students do not focus on *how to teach* the mathematics, but they do have opportunities to make sense of student thinking. Both courses were deemed gatekeepers for many Liberal Studies students as it was quite common for students to retake the course multiple times. Jenny and Luz took M308 and/or M309 multiple times in the past.

During the 11th session, I brought the following math problem that was used in the M309 class.

1. Use the tile sequence below to answer the following questions. **NOTE**: The first two figures in the sequence are missing. **It's starting with the 3rd figure.**

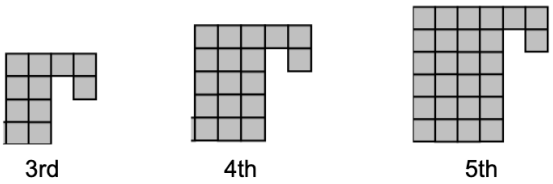


Figure 9: Sequence of Patterns

The focus of M309 is to make sense of 6-8th grade mathematics, the course is divided into two parts: algebraic thinking and geometry. The tile sequence is an algebraic thinking problem where students are provided opportunities to play around with the patterns, predict future patterns and then write an expression for the nth term of the sequence that counts the number of tiles. The task is difficult for two reasons. First, the students are expected to understand the general pattern of the sequence of tiles, that is, they must come up with an understanding on the relationship of the figure number and the pattern itself. Secondly, students come in with the idea that if they can count the number of tiles they can quickly come up with the formula. Of course, taking the second approach is not productive and often leads to multiple trial and error situations. Furthermore, students are asked to make sense of the algebraic expression and connect to the pattern. In the example above, the expression that counts the number of tiles is $(n-1)(n+1)+3$. The 3 comes from the 3 tiles in the top right corner, and the $(n-1)(n+1)$ comes from the area of the rectangle that is visible in the pattern. If students take the counting-guessing approach, there is no connection between the pattern and the algebraic expression.

When I shared the sequence problem, my goal was for us to focus on the mathematics, paying close attention to the patterns, their representations, and the possibilities that can emerge. Again, this was very important because often when speaking about mathematical justice we do not specifically talk about the mathematics. Creating opportunities for prospective teachers to experience rich mathematics was important and it was something that I was attending to when I brought in the artifact. Furthermore, because the women had all taken Math 309 this served as a shared experience to which they could also have something to contribute. The women's first response to the problem was to share their own feelings about how they had a difficult time with those problems. And as they responded to how they would think justice in mathematics – they shared about their struggles in thinking about it all together.

Anahi remarked,

> "We have talked about it already. And it is difficult for me. If we were working on groups, I would just solve it alone. But I guess, how do we do this problem in comunidad (community)? Maybe como el video de la semana pasada (Maybe like the video we discussed last week). Going in front of, en frente del pizarron (in front of the whiteboard). And what are our thoughts and why? Start a discussion from there."

Anahi is referencing the video that we had discussed the previous week. The women had the opportunity to watch the Sean's Number video and discuss that kinds of interactions the kids had as well as the teacher and so forth. Jenni affirms Anahi and they agree that this will help their peers also be motivated to work. As the women continue to make sense of the problem, Anahi shares that leveraging multiple ways of approaching the problem is also important.

> "Now that Luz was talking - it made me think - es mejor visualisar (it is better to visualize). She was like reading in her mind the problem so ella no los estaba visualizando (she was visualizing it for us)- how she was reading it. Es como de tener los dos (It is about having both). No nomas de decir (Not only say) here is a pattern, tener una (have a) description to see what is going on in the pattern. Maybe una escena (a scene), un script asi para nosotros podamos visualizar (so we can also visualize it) or what is happening in this pattern. And not just a pattern there."

Jenni then shares her perspective that she did not think much other than look at the pattern and try to make connections. I then asked the women to imagine a classroom where they are doing these kinds of problems, how would they build comunidad there? Anahi suggests that maybe showcasing that math has multiple ways of approaching problems and asking students to listen to each other. Anahi remarks,

> "But really try to escuchar a los demas (listen to others) and I feel like this is a good practice for students or you know, it is good to escuchar a las otras personas aunque no tomemos ese paso (to listen to other people even when we didn't take that approach). Es importante escucharlo y ver que hay otros pasos para llegar a la misma conclusion. (It is important to hear and see that there are other approaches to get to the same conclusion)"

After the women end the discussion of the problem, I ask if they think their ideas could be used in my M308 and M309 courses and the women quickly say no. They talk about the competition that is embedded in that context and Anahi feels the context is complex. Jenni then asks if I was seriously thinking about implementing some of the recommendations that the women were having in the plática. The women associate the Math 308/309 courses as the place where opportunities for relationality are rare and difficult to cultivate. This is clear from their quickness in saying not but also their disbelief. When Jenni asks me whether I was serious two interpretations come to mind: first the opportunity to position the women as having the ability to offer something that can create change was something different and probably novel. That is, in the past no one took their recommendations seriously. Secondly, the idea that M308 and M309 could change feels quite revolutionary to the women. As mentioned earlier, Jenni took this course multiple times and even with different instructors she rarely saw change. So, the possibility of creating change was both novel and important for them.

For the next two sessions, the women discussed how to incorporate comunidad and justice-oriented practices in M309, a course that I would teach in the Fall of 2021. This moment was pivotal for many reasons but first, it positioned the women as critical thinkers and that they had something to contribute to creating M308-309 as a more justice-oriented learning environment. They would be the co-designers of what M309 would look like for future students. Having taken that approach, we all acknowledged that those courses were not safe or empowering spaces for themselves. It was very important for the women to be pushed to think about justice and mathematical content side by side. And the women acknowledged the difficulties with that but by bringing their past experiences they co-created the kinds of experiences they wished they had as mathematical learners in a classroom. The last point is one that I would argue served two purposes. First, I positioned myself as a learner. Someone who is still learning how to cultivate a justice-oriented math learning community. The women typically positioned me as someone who has a lot of knowledge and understanding of such issues so in many ways when Jenni asked if I was serious, she was surprised. This instance along with many others is part of why there was a lot of vulnerability, I, as a critical scholar positioned me as vulnerable. And they were positioned as having something to offer, that we would be learning together. Secondly, it modeled hope for cultivating these kinds of environments through a collective reflection. Kohli (2018) has documented the number of challenges teachers of color navigate as they seek to enact a justice teaching perspective. The thinking collectively is a model to which the women can successfully attend to enact perspectives and to understand the work as not individual. Such approach is powerful because it builds on an understanding that working together as teachers with the same justice vision can result in change.

Co-designing with Pláticas

What did the co-design process look like in the pláticas? I understand the co-design process as a collaborative approach to develop an innovation, one that relies on multiple stakeholders' involvement with the design of the educational innovations (Penuel et al., 2007). Because pláticas shaped a lot of the interactions, I see the co-design process as an iterative, collaborative and in-the moment process that cultivated opportunities for co-constructing new meanings with mathematics and justice. In this project it came up in two ways. First, it comes up as the act of the women asking questions and guiding the discussion towards more rich understandings of justice and mathematics, an in the moment innovation. Second, it comes up as the way that the

ideas shaped the kinds of activities and artifacts that I brought to the learning community. That is, the needs of the community were met with my facilitation of bringing artifacts to the community. This subsection presents three cases of the Mujeres guiding the discussions. The three cases each cast a different light on the women's developing understandings. In the next section, iterative nature of the co-design, I share the way the dialogue within the session shaped the kinds of artifacts and activities we engaged in along the sessions. I end this section with challenges that emerged in the sessions.

Mujeres guiding the discussions

The following vignettes were chosen because they were guided by the mujeres but also because they created opportunities for rich understandings related to mathematics, teaching and justice. The first vignette, *Teaching the Mexican Way,* explores Luz's comment about Mexican teachers not teaching the Mexican way and moving away from reductive understandings of representation. In other words, just because your teacher is Mexican does not mean they teach "the Mexican way," a concept they explore. In the second vignette, *Is math a gift or something we work for?,* Anahi struggles to make sense of her perceived math gift and shares her struggles with the collective. In the third vignette, *Collective Math Environment*, Inez states her belief that justice embodies building a collective environment in math. Her comment sparks a conversation about the issue. These three cases create opportunities for the women to center their own needs and understandings and robustly push on the understandings related to math and justice.

Teaching the Mexican Way

The first moment where the women led part of the discussion happened during the first session when I asked the women to think about identity and mathematics together. Luz responded that she believes mathematics is "genderized" that in math we see it more for men and not women. The other mujeres nod in agreement. Jenni then said that for her, when she took M308 and M309, that was the first time that she saw women teaching math. The women all agree that not only where they mostly women but also, they were white women. Luz, was a former student of mine, responds,

> "Before Sandra, I have had two Mexican teachers in high school. They didn't teach the Mexican way, they were Americanized."
>
> Sandra responds, "I think Luz is pushing us to think about representation and how important it is. But not to be taken for granted."
>
> Jenny looks up and asks, "Luz what is the Mexican way?"
>
> Luz responds and covers her face, "I don't know."
>
> Everyone else laughs and Inez asks, "pero de veras what is the Mexican way." "

After Inez's question, the women address what Luz might have meant when she said the "Mexican way."

Such discussion is important as it disrupts and problematizes the rhetoric of representation without taking a critical perspective. That is, Luz speaks to the idea that just because someone is Mexican does not mean that they cannot be "Americanized." The notion itself of "Americanized" is important as it alludes to the way whiteness is prevalent even within a group of "Mexican" teachers. And in later sessions, when we speak explicitly about race it is still evident how much the women struggle to speak about issues related to race even when they have already talked about such issues. But the fact that in this first session the women had the opportunity to delve into a topic that was not part of the initial discussion provided the opening for the women to know that their needs would be considered and taken seriously. That is, Jenni asked what she meant because she was trying to understand her perspective and not simply gloss over it.

Furthermore, the fact that the women went around interpreting Luz's notion of the "Mexican way" also speaks to the way that it was understood that such ideas were important, and they would be thought about in a collective and respectful manner. As the women are making sense of what it means to do it the Mexican way, Anahi responds,

> "I am not going to put words en su boca (in her mouth), pero (but) you know lo que yo entiendo a ella (what I understand). A lo que se refiera, incluirla pa ponerla con quien se siente mas identificada (She meant to include her, to feel like she belongs). Maybe not the Mexican way. Nomas incluirla (just include her) so she doesn't feel like she doesn't belong. So make her feel like she belongs, and que es capaz (she is capable)."

It is a very powerful moment when Anahi takes the perspective of Luz to both affirm and validate her way of thinking and to expand her understanding of the "Mexican way" in a respectful manner. When Anahi is speaking, Luz keeps nodding in agreement to what Anahi is saying, in some ways, Anahi was able to put words to Luz's perspective.

The following case looks at Anahi's dilemma of figuring out whether she is good at math as a natural gift or something she worked for in high school. In this vignette, Anahi brings the dilemma on her own and we follow through with her inquiry and questions. It highlights the importance of providing opportunities for the women to guide the discussion.

Is math a gift or something we work for?

This vignette centers Anahi's struggle as she questions whether math is a gift or something she worked for during her schooling years. This vignette developed over 2 sessions (Sessions 2 and 3). During the second session, after the check-in, I asked the women if they had thought more about math identity. Inez shares about her father being a salesman and things being expected of him versus herself. Inez briefly speaks about her father's mathematical identity and his experience as a salesman. We follow the initial plan of speaking about the Oksapmin number system and watch a video about it. The mujeres discuss it, discuss colonization and the erasure of other ways of being. At the end, I say to Inez, "reminds me about your dad and selling elotes". This gives Inez room for her to speak about her dad and his mathematical experiences. Which in turn allows Anahi to also create such opportunities to discuss about her mother. Specifically, Anahi contrasts her relationship with her own mother and begins to realize the mathematical knowledge that her mother possesses even with very little formal schooling. Anahi had previously believed that she was good at math as a form of innate ability but through our pláticas she begins to question that belief.

While in Chapter 5, I will analyze this vignette closely, what is important here is that two things occurred that helped shape the learning space. First, after the women talk about their parents, one of the things that comes up is Anahi's questioning about the difference in mathematical identities between herself and her mother. So, she asks, "Is that her identity with math? And my identity is more like school?" I respond that she should ask her mother because you never know what you might find out. So, towards the end of the session, the women commit to interviewing their parents and asking them what they believe about their own mathematical identity. Such move was powerful, because it was the instance – one of many – where the women through action would blur the boundaries between our pláticas and the world as it exists. This is very important, as action goes hand in hand with dialogue (Freire, 1996). But the action of understanding their parents' history is a form of a historicizing their own experiences and pushing on existing boundaries that mathematics only happens in a classroom. Secondly, towards the next session, Anahi comes in still making sense of the idea about her and her mother's mathematical identity which leads her to question, *is math a gift or something we work for?* When Anahi posed the question, it was not a question that was intended to be discussed but rather something that she was struggling to make sense of on her own. This issue was personal for Anahi but when she brought her dilemma to the group, it went from a personal to a collective issue. Thus, the women begin to grapple with their own understandings about math based on their experiences and have opportunities to discuss them as a group.

This conversation was evidently important for Anahi. In her journal entry (Anahi, Journal Entry 3) after that session she begins to think about issues related to smartness and her own experiences as a recent immigrant who was labeled ELD and was positioned as smart in mathematics. But more importantly, stories about families and having discussions about them led to think about narratives related to smartness and math as an innate ability. Having discussions about narratives is central to disrupt problematic ideologies that uphold hierarchies that exist within mathematics education. And such opportunity arose from the fact that women were able to speak about their parents and having the freedom to raise issues that they may be grappling with individually.

The following case looks at another way in which the conversation is led by the women to build new meanings about mathematics. Inez remarks about the need to build a collective environment. I ask what that would look like, and the women begin to have a conversation about it.

Collective Environment in Mathematics

The next issue that comes up occurs as the women are trying to make sense of what justice could look like in the math classroom. Anahi begins by using the example of a boy she tutors to ground her own understanding of what she sees as just.

> During our fifth session, the women are discussing what justice means in math classrooms. Anahi explains that for her one of the challenges is the speed in which math is taught. She shares about a student she tutors who is "behind" with the mathematical content. She explains, "he was given extra time, but he is not going to learn a whole new school year. He is not going to learn the concept with doing two homeworks, and he is not given the right to feel well or esa paz interior or que math se siente bien. Weekends are for him to enjoy but now he spends them with me working on math."

> Jenni asks more details about the encounter and shares the challenges with expecting students to already know the content. She explains that having a voice is important to really understand mathematics and she uses herself as an example because she is always asking questions after class or during office hours.
>
> Inez begins to build on the ideas, and she thinks a lot about how to build a collective aspect. She notes that part of why the students struggle is because their parents do not have resources or are not equipped to support them. She compares the situation to parents who have already navigated the system, so she notes that there is a sense of exclusion that happens. She continues to say that there should be a collective math community. She situates math as an individual and competitive space. So, she sees it as something that they discover together, and justice could be in part of a math classroom.
>
> S poses the following question: How do we build a collective environment in math? (Activity Log 5)

The previous encounter began with the question, what is justice in mathematics? And it starts with Anahi discussing her interactions with the boy she tutors and the injustice she sees with mathematics feeling like a fast-paced activity that just needs to get done. While Jenni wants to understand further, she really moves the conversation to be situated in the classroom and speaks about the fact that voice is important and often that voice is diminished with empty statements like, "you should have learned this." Inez again brings in an understanding about parents but begins to think about exclusion in classrooms, believing that there should be a collective math community, that is justice to her.

The idea of building a collective community is powerful because it demands a shift in the kinds of understanding that as an educator one must hold about learning. That is, learning is not only understanding as an individual achievement but rather as a collective one – and this is difficult. Teaching also must ground the work in the understanding of the brilliance of children and the assets they must contribute to the community. In this case, I took the question posed by Inez and turned it into a focal moment of our conversation. The conversation highlights the interconnectedness of the bouncing of ideas between me and the women in the project. But it also highlights the necessity of someone to understand the big picture of the ideas. Building a collective math community is no easy task and it was an idea that needed to be investigated further by all the women. The approach of thinking about collective math communities because as teachers are seeking to enact common core and more group work in math spaces, they must have opportunities to make sense of what means.

Iterative Process of Co-design

To understand the co-design of the pláticas as they developed, I begin by characterizing the development of the sessions and discussing how the conversations guided the kinds of artifacts that were brought to the sessions. In the first subsection, I present an overview of the kinds of activities and signify with arrows the connectedness of the sessions. I then present two cases that dig into the iterative co-construction of the pláticas and raise some affordances to possibilities when thinking about merging conceptions of justice and mathematics. I end the section by discussing some of the challenges that were raised in the iterative process.

Overview

To understand how co-construction was iterative I sought to understand how I as a researcher followed the mujeres' interests and how that then shaped which artifacts I brought to the learning environment.

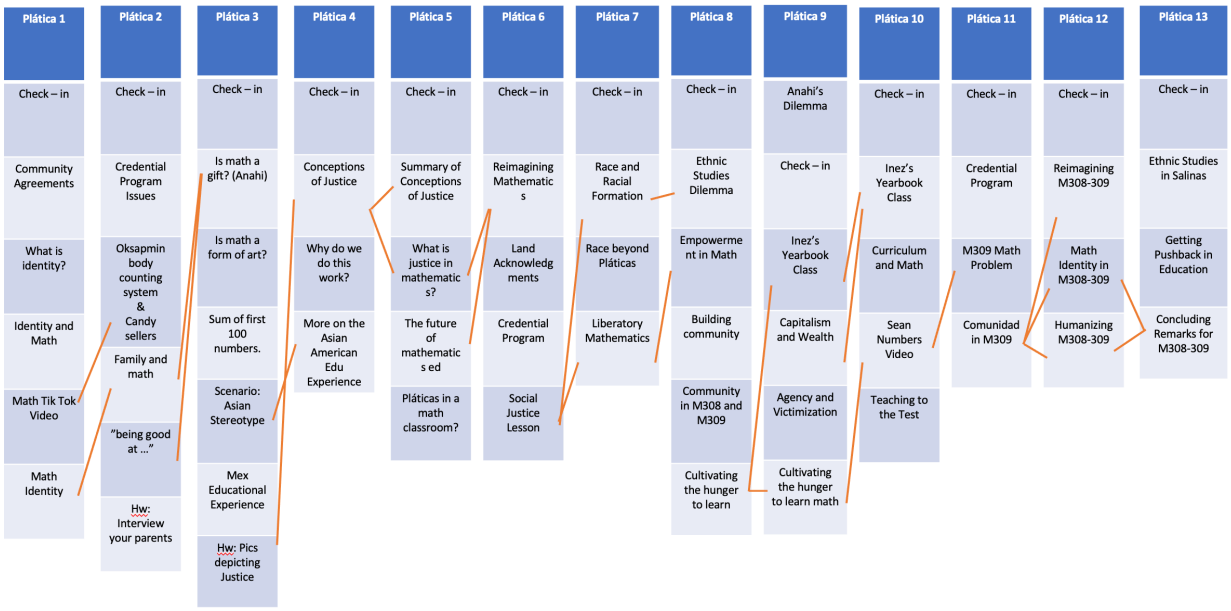


Figure 10: Iterative Nature of Ideas

Figure 10 depicts the outline of the sessions. Note that between the sessions there are orange segments pointing to the connective aspects of the conversation. For example, the math tik tok video session that occurred in session 1 influenced the plan of bringing in another view of mathematics by bringing the Oksapmin counting video as an artifact to make sense of together. Another example: during the third session we had a scenario where we brough the "Asians are good at math" narrative and we talked a bit about how problematic and dehumanizing it could be. The women struggled to talk about Asians and mathematics (Researcher Journal Entry 3) and so it was necessary for the women to continue to discuss more about the Asian American educational experience. Thus, in session four, we discussed more about the Asian American experience, about the model minority myth, and about challenges addressing such issues.

In plática 6 towards the end, the women discussed the social justice lesson about immigration. As the women talked about issues of immigration, I felt it was necessary for the women to think about race because their conversation was only centered on the Mexican experience (Researcher Journal 6). So, during the next session I brought in a video that spoke about racial formation and a second video of Danny Martin speaking about liberatory mathematics. I wanted the women to have a shared experience where they conversed about race and race and math. Another example of the connectedness of design is evident towards the end of session 9, the women discuss the idea of cultivating the hunger to learn math for children. Anahi argues if we can cultivate such opportunities then children will find joy and desire to learn. I felt this was powerful, but it was necessary to investigate this in an actual classroom and

by seeing kids doing mathematics (Researcher Journal, 9). So, during the next session, I shared the Sean's Numbers video which created opportunities for the women to discuss how children can make sense of ideas collaboratively and with less help from teachers. The women would come to discuss about how to make M309 a better learning community. This stemmed from us looking together at a math problem that is currently taught in M309 and thus M309 became the center of the conversation for the next 2 more sessions. It was important for the women to feel like they could contribute to something that went beyond the conversations and created some change.

As shown throughout the outlines of the sessions, the women and I guided the discussions through an iterative approach of understanding the needs of the community and me bringing in artifacts to continue to make sense of such understandings. This was something that not only happened for one or two sessions but rather that it continued to happen throughout the 13 sessions we met. In essence, the co-construction of knowledge shaped the iterative aspect of pláticas that shared a common goal of making sense of ideas related to justice and mathematics.

In the next section, I share in more detail two cases of the iterative nature of the co-construction and explain the possibilities it created for the women to investigate issues of justice and mathematics together.

Building from Definitions of Justice

At the end of the third session, I asked the women to bring five images that depicted justice to them. I initially asked them to select actual pictures that depicted justice in their community. However, the only person who succeeded in doing that was Anahi, who noted that she struggled with the task. Asking them for pictures that depicted justice would be a way to really push them to come to terms with what they understood to be justice. I wanted the women to bring their own images because I conjectured that they would focus on different things. When the women shared their images as predicted they all brought up different images and when they explained their rationale – they focused on different aspects. Figure G presents the images that the women brought to the session. They all emailed me or messaged me the images and I grouped them together in a google document to be shared during the discussion.

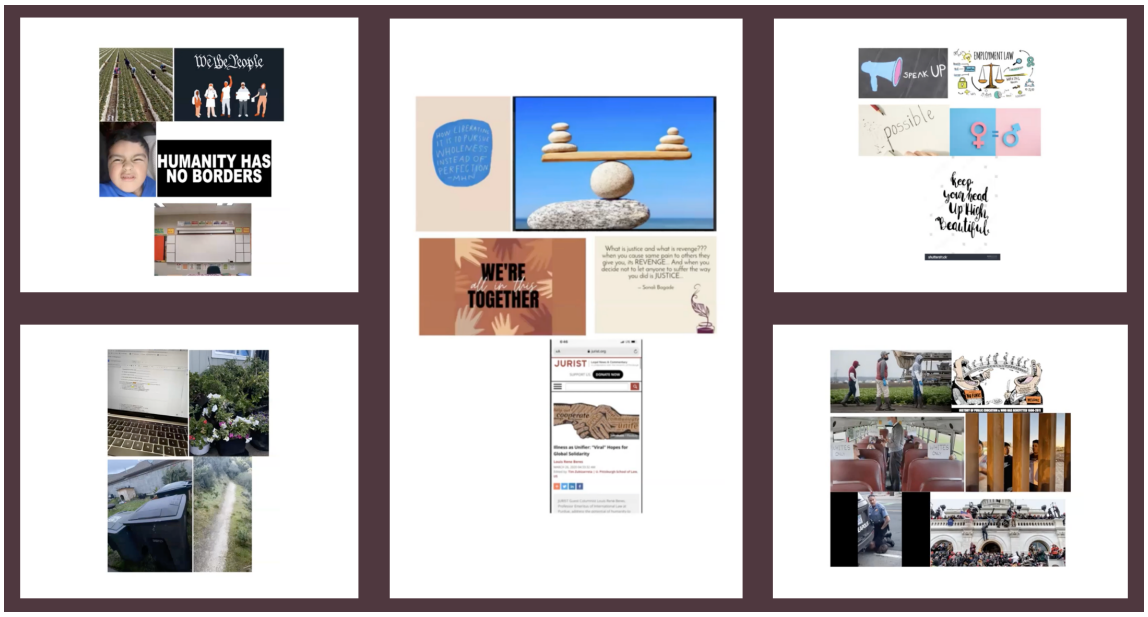


Figure 11: Multiple conceptions of Justice through Images

During the session, we spent some minutes looking at each group of 5 images. The women then shared their rationale for bringing in the images. This was then followed by the other women speaking about what they appreciated about such perspective. This activity occurred over the whole session. When the women came back for the next session, I had taken their own depictions and rationales and created the image in Figure 11.

Figure 12: Conceptions of Justice

This conception would ground our conversation in the upcoming session about justice in mathematics classrooms. This move was intentional as I wanted the women to think about justice

and mathematics together. Given how difficult having conversations about justice in the context of mathematics can be, I wanted the women to feel empowered that they had already some groundwork and they would be adding to that strong grounding. When I summarized the conceptions of justice for the women, I left my own definition of justice out and just included the women's conceptions. This was not intentional, it just happened that I did not include my own definition.[14] It is unclear whether that would have changed the outcome, but it is evident that centering the women's understandings is what I focused on and was central to the learning community.

Another aspect of why this two-day activity was important was because the concept of justice is talked about, but very little time is spent understanding what justice means to people. That is, by virtue of the diverse ways of being and knowing people come to understand the idea of justice in different ways. This was evident in the women's images and their own understanding of justice when they spoke about it. For example, for Luz racial equality was intrinsically connected to justice/injustice while for Jenni gender equality was intrinsically connected to justice. This was evident in both their images and when they shared out their rationale for choosing the images. Furthermore, taking some of that groundwork was important to be followed in the context of mathematics and that was evident when they discussed for example, *what it means to have a voice in the math classroom?* Or the question of *how do we build a collective environment in mathematics?* This is the groundwork of thinking about different ways of thinking and imagining possibilities in the math context.

The next example shows how the idea of empowerment came up in Session 7 as the women discussed Danny Martin's video about math liberation. I take up the idea of empowerment in Session 8 where we discuss about ethnic studies in schools and how it serves as a form of empowerment for historically oppressed people.

Math for Liberation and Empowerment

The women have just finished watching Danny Martin's video about math for liberation. The women discuss what that means for them.

> Anahi responds, "Se escucha padre. (It sounds nice) Today I had a student tell me para que ocupamos matemáticas si no lo vamos a usar (why do we need mathematics if we will not use it)? Using this way or seeing thing, you know how teachers nomas estan para enseñar (teachers are there just to teach), so we need to teach them about how the system works and not to fit in the system."
>
> Sandra explains that she appreciated what he said about empowering people, and not just about get to into STEM or convince everyone to go do more math.
>
> Inez responds, "So math for liberation. There is a real sense to that. Meaning there is a lot of us who have a negative math identity and sometimes are triggered where we have to do or use math and we shut down. And there are many situations where we have to have a basic understanding of math for example: legal things, finances and money. For

[14] My own definition of justice came from the conversation the women had after I showed my images. This definition came from the women when they discussed my images. According to Inez and Anahi, my images of justice depicted humanity and action.

> example, my husband is so good. He says that at this interest rate with down payment, mortgage. and he is good with that, and there are people that are overwhelmed because they are not good at math, but I can see financial liberation. I have heard people talk that people of color need to learn how to find ways of building wealth. We do not venture into investing and things like that and that is how you can build wealth. If you were able to put $5000 in a Roth IRA by the time, they are ready to retire, they will have 1 million. They will have financial liberty to seek some greater value in life instead of going to college, to get a job and get the benefits to survive. Hence, here having a strong and positive math identity can be liberating."

During the session the women have discussed about math liberation. Note that both Anahi and Inez respond to liberation in two very different ways. Anahi sees the value in mathematics being used to understand the world but also acknowledge the systems that are in place, and it is not enough to be part of the system. Inez on the other hand is specific by looking at financial liberation and really understanding interest rates, Roth IRAs and so forth. Yet, Inez's stand while it is valid given the current living situation does not attend to the way Danny Martin thinks about liberatory education. Thus, I noted the importance of thinking about empowerment that goes beyond understanding the ways in which systems work, in this case wealth (Researcher Journal 7). Thus, I felt it was important to ground it back into their own experiences about empowerment that possibly could provide a more holistic approach to understanding it.

For the next session, Session 8, the artifact that I brought was an article addressing the backlash going on related to Ethnic Studies and Math happening in Washington. The women discussed what ethnic studies and their own experiences with that. I explained the reason I brought that up was because part of the goals of Ethnic studies has to do with empowerment both individual and collective. And so, I ask them what it means to be an empowered Mexicana in mathematics.

> Sandra asks, "what does it look like to be an empowered Mexicana in a math space?"
>
> Inez responds, "I am trying to think, how could you go on with that empowerment? I don't know. I can only think that in some ways, it would have to tie down to social studies curriculum. Merge both with math. Maybe there is a math concept to teach but you tie that into social-racial justice issue as it pertains to your cultural background. A historical context and then merge with some sort of teaching of math. I can't think of an specific example. There is always numbers, description of people, demographics. Maybe connect a social justice issue and relate it to math. Find something that is empowering and relate it to math. I don't know. I think it is hard to wrap our head around this, math is a separate thing. This doesn't connect to math. Math is supposed to be a neutral space. That is the current structure."
>
> Sandra remarks, "Inez you bring up a good point, can you name a moment where you have been empowered in math?"
>
> Luz shakes her head, and the other women were silent as well. So, Sandra asks again, "if you cannot think about a moment, why? what would you have wanted?"

> Inez responds, “I don't think I have ever felt empowered in math based on my cultural background. For me, it has given me an opportunity to experience humanity. I feel empowered being with others. I have been in situations where I have been good enough. I work at it, I can do it, and because of that it has allowed me to help others to uplift others who have not gotten the same experiences. It practices humanity. Kindness to others.”
>
> More silence and Anahi asked, “empower en tu persona? (empowered based on your identity?) What encouraged me to go on when I was not learning anything? Ahorita me siento empoderada me puedo defender, ya se, se poquito but it is like, tengo el hambre de seguir aprendiendo. (Right now I feel empowered, I can defend myself, I know a little but I have this hunger to keep learning) That is what I was missing. In high school no tenia motivacion, no tenia motivacion de seguir aprendiendo. (I did not have the motivation to continue learning) Learn for what and for whom? now I do it for myself and help others. eso me ase sentir bien. (That makes me feel good) I can relate to the comunidad that I am learning. Me ase sentir bien. (That makes me feel good) that is what I was looking for when I was in college. And in high school I don’t even know why I was there.”
>
> Inez responds to Anahi, “It made me think, maybe another way we can view empowerment finding community. When I took math, I was not part of the comadres. But you could feel that there was this unit, we were empowering each other, we were helping each other. We had this like confianza (trust) with one another, we weren’t worried about feeling stupid and we used that as part of our advantage. We know how often we are left behind and how often we struggle. So, like, you cannot think of a moment where you are not empowered, why? Math education is more transactional in nature. You got it right or not. You passed or not. You either get it or not. It just chugs along, it just goes, and you are supposed to check all the boxes and learn multiplication, learn geometry and it doesn’t stop, it is really dehumanizing. When I think of math, I think of it as a disempowering thing. It is really hard, and it goes at this insane pace and it doesn’t help that they [teachers] are mostly white men and white women.”
>
> Anahi adds, “One of the things with the comadres, we are not used to ask for help. If you pass then you are la que sabes, but if you do not pass that means no sabes. (If you pass then you are one of the ones that know and if you do not pass then that means you don’t know) Then you are embarrassed, and we are not used to it. Si me preguntan yo les ayudo, pero (If they ask me, I will help but) I would never offer them because I don’t want you think that I know more than you. It is all about the competition. Tenemos que crear mas comunidad en math classes. (We have to create a community in math classes)” (Activity Log 8)

The exchange regarding empowerment was a result of thinking together about ethnic studies in schools and the Mujeres’ aim at empowering students from marginalized communities. It led me to ask them about their own experiences of empowerment. This was pivotal because the women realize that they had never been empowered in the past in mathematics. Anahi questions what kept her going and Inez begins to think about the dehumanizing process of mathematics. But towards the end the women situate themselves in their own spaces of empowerment and wonder what it would look like to create those spaces in their own mathematical comunidad. This

encounter is a bit different than how Inez had thought about financial empowerment. Financial empowerment is indeed important, but the mathematical content is very different than what currently exists in the classroom. It was important for the women to go back to their own mathematical experiences and then use that to situate themselves in a mathematics classroom. Here the iterative process pushed on more nuanced understandings of justice and mathematics and created avenues for the women to go back to their lived experiences and use them as a resource for new meanings.

The previous cases presented different kinds of opportunities that the women had as a result of the iterative co-constructive nature of the learning environment. The fluid movement between participants' needs and the researcher bringing in artifacts to push forward justice-oriented and expansive views of mathematics was essential to create those opportunities. The goal here is to not romanticize the process hence, in the following section I provide some challenges that also arose from taking that approach.

Challenges

One of the challenges with the co-design aspect is that there were times when things were planned, and because of time constraints the plan was not enacted. For example, one routine that was planned and did not happen constantly was doing mathematics together. The goal of doing math together was so that the women could experience math beyond just discussing it. For example, during Session 3, the women did in fact get an opportunity to collectively engage in the math activity and they loved that. Jenni remarked some weeks later that she had a lot of fun doing that problem. In Session 6, when we discussed the social justice lesson, we did not get a chance to discuss the mathematics aspect of the lesson. A reason why we did not get a chance to discuss the mathematics together was because the women were not feeling comfortable with the mathematics. As the sessions continued, the time constraints made it even more difficult to engage in the practice of doing mathematics together. But there were moments that they were incorporated to an activity. For example, during the next session, the women did get opportunities to talk about even and odd numbers when they watched the Sean's Numbers video. We then discussed the sequence problem that was discussed earlier.

Another challenge that arose from the co-design process is that some ideas would be followed more than others. So, for example, much of the work was guided by Anahi and Inez because they were the most vocal and had the most experience connected to classroom. It is not to say that Luz and Jenni's ideas were not followed or were not cared for, it is just that in the case of pláticas, being vocal is very important. The other women would chime in and guide the discussions in some ways but mostly Anahi and Inez were the central players of the conversation. And Luz and Jenni would still be involved by nodding when the women spoke to show that they also agreed with the points that were made.

My role as researcher, designer and participant of the learning community was guided by the idea of developing a sociopolitical consciousness with mathematics. That is, my role was to create opportunities for the women to make sense of ideas related to math and justice, and to push on their current understandings. For the women, that meant that for the first time they had opportunities to talk about what it means to think about race and math together. It meant that for the first time they discussed about empowerment in math classrooms and reflect on their experiences. But it also meant that I would offer and guide them to make sense of new and nuance perspectives. In some ways part of the goal was to cultivate that sense-making of

expansive ideas related to math, justice, and its intersection. This was often at odds with the narrowing down of the pláticas to mathematics.

Another challenge is that when doing co-design work there is a tangible innovation like curriculum, or a technological program that would then be evaluated. That did not happen here, because in many ways those innovations were in the moment as the women built those new understandings. There was no formal evaluation to really measure whether the women now had more expansive understandings about math and justice. Part of pláticas is centering people and their lived experiences and that I believe took away from the co-design process of tangible innovations.

In summary, the co-design helped the women see the conversations as their own and gave them opportunities to push their understanding of math and justice. At the same time, this co-construction is still very much a work in process, and, like all teaching, is characterized my many tensions from competing (although synergistic) goals and time constraints. In the next section, I conceptualize pláticas and present two vignettes to highlight its multidimensionality.

Part 2: What are pláticas?

This project from the beginning conjectured that pláticas would be central to what would happen in the learning community. But what are pláticas? As the term is continues to increasingly be used in education, how do we know what a plática is? The field centering the work of Chicana Latina Feminist Perspectives have understood pláticas as a methodology – and the rich opportunities that come to exist by taking such approach (Fierros & Delgado Bernal, 2016). The theorization of pláticas is still nonexistent and is something fruitful to further investigate and think more about. I believe that understanding pláticas and learning side by side can offer Chicana/Latina Feminist Perspectives a new view of pláticas as a site of sense-making and learning. On the other side, the learning sciences can move towards a more relational and connected theory of learning that centers stories, relationships, and avoids static conceptions of justice.

In Chapter 3, I outline the data analysis process, and using grounded theory (Charmaz, 2006) the codes and themes that emerged. The themes were then combined to form the various dimensions that define pláticas. Pláticas are a multidimensional practice, a form of storytelling, that embodies linguistic freedom, reciprocity, relationality, foregrounds the imaginative, centers everyday knowledge, moves fluidly across settings and time, and it is co-constructed and co-contested. Such dimensions are not static but rather they serve a particular function, towards being and becoming, towards learning. I take a sociocultural approach to learning (Lave and Wenger, 1991), thus in this work learning and identity are intrinsically connected. The notion of becoming is an essence the idea of learning that is happening in the pláticas. In some ways, pláticas serve a future-oriented purpose both in the learning (being and becoming) but also towards a particular function that serves the groundwork for action towards justice. In Chapter 5, I discuss the ways in which pláticas help shift understandings related to race and justice in mathematics.

Conceptualizing pláticas

Pláticas are critical conversations. The figure below outlines the multiple dimensions of pláticas that moves across time and space and that serve a function towards being and becoming with mathematics.

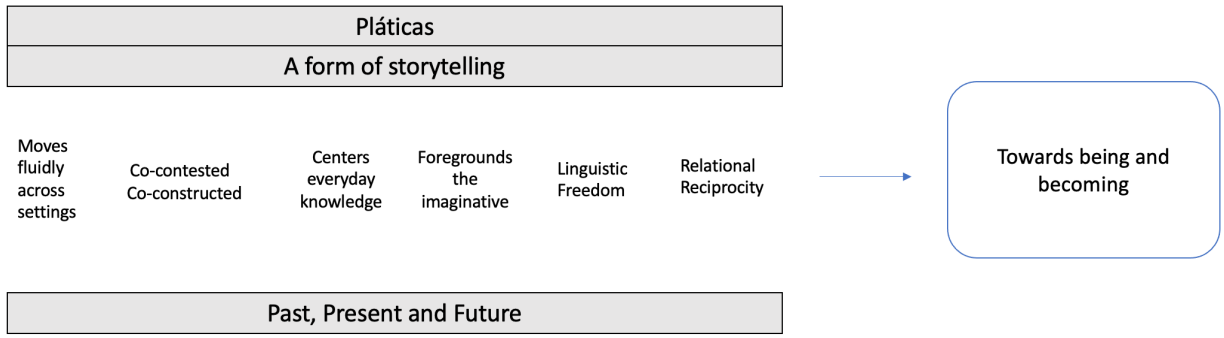


Figure 13: Diagram of Dimensions of Pláticas

The dimensions of pláticas are summarized below.

Across Time and Place
Pláticas help the platicadores (those involved in the plática) move across time and place. Stories are not only situated within the present but rather they move to the past and the future. In addition, the setting is not only that of the present but rather they shift from one setting to another. In essence pláticas have no borders. For example, Anahi would constantly tell stories about her life in Mexico when she was a child.

Co-contested & Co-constructed
Co-contested means that pláticas push generatively on the ideas discussed. For example, when Anahi and Jenni discussed groupwork in Session 11 they both had different perspectives on what groupwork should look like. Anahi pushed on Jenni's idea of randomly selecting groups because she felt that would take away from the relationality that could be created when people already know each other. Jenni pushed back and argued that it was important to know other people.

The co-constructed aspect means that pláticas are building off each other. The previous section detailed how that happened through various forms both by the women guiding the discussions and through design.

Centers everyday knowledge
Pláticas center everyday knowledge. A lot of the pláticas bring in stories that are part of their daily lives such as dichos, consejos, or simply stories about their lives. They can also allude to things that are used everyday life.

Foregrounds the Imaginative
The ability to move across time (past, present and future) sets up the possibilities of what could be in the future. Thus, pláticas foregrounds the imaginative in two ways. First, it creates possibilities to imagine (and later enact) a just future. Secondly, in many ways the imaginative

comes into action – that is enacting an imagined space of possibilities. In the second vignette, the women enact an imagined mathematics community where they all can contribute.

Linguistic Freedom
Pláticas center linguistic freedom. That is, they blur of the lines between formal and informal language and where no dominant language exists. So, platicadores have opportunities to speak in the language of their choosing, at times incorporating both English and Spanish together, a form of translanguaging. Even when the women were doing more "formal activities" such as doing mathematics together, the women had the freedom to speak about that however they wanted without the assumption that it had to be a particular way.

Relational Reciprocity
Relational reciprocity in pláticas means that we center the relational but in such a way that it is reciprocal. For example, in this case it means that meaningful caring relationships are two-way, so it is not enough for Anahi to care for Jenni, but the other way must also be true. For example, Inez shared about her struggles with a student she wanted to support but it ended up backfiring and her student instead became distant. Anahi showed empathy towards Inez by sharing a similar situation where a student shared something personal, and she reported it and affirmed Inez that she was trying her best. In another instance, Anahi shared her struggles with not being able to speak up for children because she could barely speak for herself. Inez affirmed her emotions that this was difficult work but also encouraged her to continue this work because it needed to get done. Relational reciprocity also means bringing in our full selves – our full humanity in the space.

Through the following vignettes, I highlight the dimensions offered by conceptualizing pláticas and offer understandings of being and becoming that are central to the critical conversations.

Vignette 1: Land Acknowledgements

During Session 4, the women were asked to talk about mathematical justice. They were asked to come up with their own definitions of mathematical justice. The women are discussing about reimagining math education, a term that was brought up by Inez. Anahi pushes on such language and the vignette begins.

> Inez responds, "Yeah, huh. I agree with you, that is why I prefaced when I said "reimagine" - I know it is a little cheesy and corny. Yeah, you hear it but okay. Reimagine, great, I love the concept of it. But like that as far as it goes. How does that saying go? From los dientes pa fuera or something like that. You are just saying it, but you don't really mean to do anything. You just want to sound progressive and cool. Laughter. 'Reimagine it' - No, you actually have no plan on doing anything about that."
>
> More laughter from all the women. Some silence.
>
> Inez continues. "Like I was talking to Dr. M one time. I was watching this video, Dr. D, (well-known critical Latinx scholar) was giving a talk. And he like… and a lot of these academics start their talks with 'First and foremost, we want to like, you know,

acknowledge and ask ancestors for permission to be here in this space.' And then he continued. Did the ancestors answer you? Did they tell you it was okay? It just felt like, why are you asking for permission? I don't know - did you get a response? Laughter coming from all the screens. I get the whole let's acknowledge our ancestors and everything, it is just so fake."

S agrees, "I have heard a lot of people do acknowledgements. Have any of you heard these land acknowledgements? They typically start with 'We want to acknowledge the original people in this land' And here I believe it is the Ohlone people. I always wonder what was the purpose of you doing that?"

Anahi at the same time responds "Yeah!" There is more laughter coming from all the women.

Anahi continues, "I am like, yeah! I am like -" Jenni responds to something but because of Zoom - we can only hear Anahi. "Cuz, when I joined, what is it called? Meetings about poetry or whatever. And they always do that! And I just go - I am just from Salinas. *More laughter.* The most recent one that I joined, Sandra the one you shared with me, and they were giving thanks to you know, the land y comunidad de Indígenas de donde ellos eran [and community of Indigenous people that belong in their land]. Well, I am just from Salinas and you know "My name is …" Me quede pensando [I left thinking], am I just ignorant on why they do that? Why? What is the reason behind that? So, do any of you know why they do that?"

All women laugh as they shake their head to signify no.

Inez responds, "I think it just serves as a reminder, a reminder that this is stolen land, that it doesn't belong to the US or the people that occupy it. It was stolen from [Indigenous] people. It was an acknowledgement of that. For that, I understand it, but I just feel like it is very theatrical in nature. I do not know why; do you really mean that? Do you really mean that you care that this is stolen land? Do you want to pay tribute or are you just saying that because it makes you look, you know, like somebody that cares, a progressive? I don't know. That is why I always wonder about that. Not so much about the acknowledgement but asking for permission to be in that space, not receiving permission and then going on to your talk. You know? That doesn't make sense to me. More laughter. Is there someone representing and giving you the permission? I don't know."

Luz responds, "It is probably all in their heads." Inez agrees and the women continue to laugh. Inez continues, "They told me yes, so let's go!"

Anahi continues, "The first time that I heard about it, and I thought they were going to talk about it. That is what I thought and then they just started talking about themselves. Okay - I guess."

More laughter coming from the women.

> After some silence, S shares, "I have never given a land acknowledgement. And I feel like I should do it because everyone does it. But I feel hypocrita doing it because I am not actively doing anything for the Indigenous community. [Nodding coming from Inez and Anahi]

Across Time and Place
In the vignette, Inez remembers the interaction with Dr. M and the performative aspect of what she witnessed in the video where Dr. D asked the ancestors for permission before an academic talk. Such event had happened many years ago and in a different place than this conversation. The fluidity of movement of place and time is powerful because it serves as a particular purpose in the vignette. Inez was pushed to think about her own word choice of "reimagining math education" and she realized that she herself has been critical and aware of such choices that often feel too "theatrical" in nature. This pushes her to question why people do certain things and how it helps and shapes actual practice.

Co-contested & Co-constructed
The co-contested aspect deals with the opportunities to be pushed generatively on ideas that may be reductive, oversimplifying or in some ways to offer another perspective. In this vignette, the co-contestation comes from Anahi to Inez as she is pushed to think about what she means by reimagine. This happens early in the vignette and is what pushes Inez to think about the example that she found to be quite theatrical.

The co-constructed can be seen in the affirmation Anahi provides when she also acknowledges her lack of understanding related to land acknowledgements. Anahi shares about the event that happened to her weeks ago when she attended a poetry conference where people acknowledged their Indigenous communities and Anahi was unsure what to say. Furthermore, towards the end of the vignette, I also note the pressures that I as a woman of color in academia feel when I feel the expectation is to make a land acknowledgement. That positions me, the researcher, as a participant of the learning community that is also building into the ideas that the women are exploring and the challenges that they are also grappling with.

Centers everyday knowledge
In the vignette above, Inez uses a well-known Spanish *dicho*, *de los tientes para afuera*. A dicho that was understood by everyone in the conversation, a saying that all women had recognized and have heard at some point in their life. Dichos are part of everyday and cultural knowledge that attends to the ways of being that come up for the women outside of the pláticas.

Foregrounds the Imaginative – Future Oriented
This plática critiques performativity in academic practices and raises issues of what could possibly become to have authentic practices in academia. While the women do not explicitly talk about such issues the women all agree that land acknowledgments often feel like things people performatively do and do not really consider serious implications of action. Thus, they are calling out for something that indeed honors indigenous people.

Linguistic Freedom

Linguistic freedom in a plática is the ability for an individual to use their full linguistic repertoire when conversing. That is, not confined by either formal/informal or English/Spanish boundaries that often place formal and English at the top of the hierarchy. In the vignette, Inez uses the phrase "de los dientes para afuera" a common Spanish saying to signify the "all talk" nature of some of these performative things that have very little effect on the community. Furthermore, Inez's use of the Spanish phrase is important as she had previously mentioned her insecurities with Spanish as she is not deemed a "Spanish speaker" by others. This speaks to the comfort and safety that the pláticas provide Inez to speak Spanish even when other spaces make her feel like her Spanish is not enough. Anahi in the vignette also shares about the instance when she felt somewhat pressured to think about doing a land acknowledgement. Her use of both Spanish and English fluidly to share about her experience at a poetry conference speaks to the linguistic freedom that she experiences. In the plática, both women do not have to provide any rationale or translation, there is a mutual understanding that what is happening is related to who they are.

Relational Reciprocity

The relational reciprocity dimension deals with the relational aspect of the interactions, understanding of seeing the women as whole people but that it is not only an individual encounter rather that relationality is something that occurs at the interaction (reciprocity). The women had known each other for some years and thus it makes sense that much of the relationality did not need to be developed in pláticas since they were already in place. But in many ways, the humanity of the women played a key role in the conversations. The topic of land acknowledgements is complex and something that is not necessarily talked about in social justice spaces, it is something that just happens and no one questions. Part of why such things would not be questioned is the fact that of course we want to acknowledge that we are on stolen lands and the truth is that Indigenous communities and their repertoires of practice are erased from academic discourse, especially in mathematics. But the women are trying to make sense of these foreign practices and pushing on more active approaches to honor Indigenous communities than doing just what feels performative.

The vignette about land acknowledgements does not necessarily look at mathematics specifically but stems from the conversation about reimagining mathematics education. It is evident that Inez has been around that language and she herself has adopted the view that somehow something needs to be done to do math education in different ways. Anahi pushes on that because she wants to know how that would look like in practice, to which Inez agrees and then is pushed to rethink her own approach. This is important because it models to the other women to reflect more on these "cheesy and corny" terms that often are empty and do very little to change the outcomes of society. This vignette also aligns with the work centering teaching for social justice (Gutstein, 2003) that demands action to change inequities. Although Gutstein's work centers children's understanding the same principles hold about developing a sociopolitical consciousness and create change. Such interactions and conversations, lead to question, *how can we become action-oriented social justice math educators?* In this plática, making sense of land acknowledgements became the springboard to push on the understanding that justice involves moving towards authentic and actionable steps that have an effect in communities.

The following vignette is a bit different because there is more structure; the women are thinking about a math problem together. I highlight the various dimensions of pláticas as I did for the previous vignette.

Vignette 2: What is the sum of the first 100 numbers?

After the women discuss issues related to art and mathematics in Session 2, I ask the women to engage in this mathematics problem. This was the first math problem we did together, but I wanted the women to start off making sense of the problem. I did not ask them to do the problem but rather start off by asking them their thoughts when they saw the problem. This was done to avoid the women shut down or feel like they could not attempt the problem.

> Luz, Anahi, Jenni and Inez all in their separate homes looked at the screen as Sandra posed the following math problem, "What is the sum of the first 100 whole numbers?" Sandra shared her screen so the women could see in text what was verbally asked. After a couple of seconds, Sandra then said, "I want you to think about this problem. What reactions do you have? Anything that comes to mind when you see this problem."
>
> Some seconds passed, and Inez was the first one to respond. "I mean when I always see a problem and it's kinda like - word problem - even though this is not an extensive word problem. But my instant reaction is to re-read it. Like I always read it, and then I go back and reread it. Umm… just a little bit slower to make sure I really understand what it is asking me to do. Ummm … and I have a feeling this will be a long problem." She laughed out loud, and Luz quickly nodded as we heard an "uh huh" coming from her screen box. Inez continued, "Um…. And I am sure there is probably a shortcut. I am sure there is a simpler way to find the sum of the first one hundred whole numbers. But, I just don't know what that would be."
>
> There is some silence as the women continued to look at the screen.
>
> Luz responded, "If I am looking at it. *Pause.* This is going to be hard just because it is going to be 100 numbers. And if you are using the calculator, I would get lost. I barely know how to put like five numbers in the calculator and I am still trying to remember which I put. But that is just me."
>
> Jenni nodded in response to Luz's comment. Again, some silence as the women continue to look at the screen.
>
> Jenni responded, "For me, I am checking the vocabulary words in the problem. So "sum", I have to add. Then I saw "whole numbers" and I am like, what are whole numbers? Okay, let me go back again to see what whole numbers are. Then I will see a 100. I would make a list. I would do the long way, visually write everything down. I don't think I would not use the calculator. I will always do the long way, that is how I work."
>
> In the background, an "hmmm" can be heard coming from Inez's screen.

“And when you mean the long way, do you mean it like this?” Sandra asked as she wrote down the number 1-7 vertically on the screen.

“Yes. That is what I would do and write the numbers. I would write every number and then towards the end, I would add them. I would do long way. But for me, that helps me.” Jenni responded and laughed.

“Yeah. I was thinking, initially that is what I thought. You would add every single number. How could you break that number in a way that makes sense? There has to be some kind of shortcut. If I was asked to do this problem. I would do what you said, Jenni. I wouldn’t do 1-100, but I would do 1-10, 11-20 and I would put them in columns. Then I would go back and do the sums at the end. Just to find a way to break it up a little bit. I would get lost if I had to add like that, so many numbers.” Inez responded to Jenni.

Sandra now has the numbers 1-10 written vertically on the screen.

Jenni who was nodding consistently as Inez talked about the different groupings responded, “See I didn’t think that far. I am still thinking about…” Her voice trailed off as there was laughter coming from both her and Inez’s screen.

There is some silence as Sandra has now written two vertical lines of numbers.

Luz who was looking down now looks up and says, “just by looking at it like, (with her hand she creates the ‘v’ shape using her index and middle fingers) I am not sure if you are seeing me. You can do the little sign that goes like that. So do 3 (1+2), 7 (3+4)… and then start by doing them in pairs.”

Jenni and Inez both chime in and talk (because of zoom audio settings we can only hear one person at a time, so we only hear Jenni).

“That is a good idea.” Jenni quietly responded.

“I feel like that is still longer but… I can understand how Jenni was saying, that could be more longer to do.” Luz continues.

“That is how I saw it. No shortcut at all!” Jenni laughed.

The women notice that in the next group of numbers the one’s digit is constant but now they are being added by 20s. (1+2 = 3 and 11+12 = 23). Jenni looking at the screen remarks, “oohhh. Interesting” as she sees the pattern herself. As the women continue adding in pairs, they notice that there is a 20 difference across the sums of pairs. Jenni remarked, “So if you go all the way to 100, we will have the same pattern.”

Sandra summarized what happened and organized the mujeres’ responses. She called the ideas shared within the conversation as mathematical conjectures. She remarked, “When

engaging in math activity we want to come up with these conjectures because they help us think about math proofs and theorems."

The women use their conjectures to find the sum of the first hundred whole numbers together. As the activity came to an end, Sandra explained her rationale for asking the co-participants to engage with this problem. Sandra noted that this problem is not a quick 2-minute problem and there are multiple ways to figure out the sum. The mujeres then continue to converse about the ways these kinds of problems are utilized in math classrooms and how they can create more opportunities for equitable math learning.

Across Time and Place

As the women discuss what they would do first, the women are now traversing time and space to think about how to approach this math problem from their past experiences in math spaces. Jenni notes that she would look at vocabulary and try to understand what everything means, a common practice that is often taught in mathematics especially with "word problems." Students are asked to look at key words and then try to figure out the next steps based on such terminology. This is meant to help students, especially students classified as ESL or ELLs with their language, but an unintentional consequence is reducing mathematics to key words and matching to an established procedure. Such approach often gives little room to grapple and play with the mathematics. Inez also shares how she would approach the problem by understanding that there is a long and a short way to do these problems.

Co-contested & Co-constructed

The women took turns sharing how they approached the problem. The women shared different ways of looking at a problem. Jenni notes that she would do it the long way, that is, she would write down all the numbers and add them. To that Inez responds that she would group them in groups of 10 and so forth. Jenni responds that she had not gotten that far with that. In this case, Inez pushes Jenni's thinking about how to approach in a generative way.

The co-constructed nature comes from the women building on each other's ideas on how they would approach the problem. Inez thinking that she is going to group the numbers and Luz adding those numbers together by showing with her hand how she would combine through a "v".

Centers everyday knowledge

In this pure mathematics vignette, everyday knowledge is not central to what occurred. Luz references that doing a problem like this would be so tedious to do with a calculator. While in math classes we often move away from using the calculator as teachers find it sometimes to hinder problem solving, Luz discards such idea not because she is told to not use it but rather because it is in fact not useful. A calculator is both an artifact in the math classroom but also one that we use on the everyday when needing to make calculations. While it is not followed up, the reference to it is important as the women continue to think together on how to solve the problem.

Foregrounds the Imaginative – Enacting an imagined math community

In this vignette, the women begin to talk about mathematics approaches to the problem. The women go around and start sharing what they would do, as a way to visualize what the women were expressing, I start using the draw function on zoom and start writing what they are saying.

But there is a moment when the activity went from talking about mathematics to doing mathematics together. After I wrote down what Inez and Jenni had alluded to [listing the numbers], Luz says, "just by looking at it like, (with her hand she creates the 'v' shape using her index and middle fingers) I am not sure if you are seeing me. You can do the little sign that goes like that. So do 3 (1+2), 7 (3+4)… and then start by doing them in pairs." The women went from approaching the problem to actually trying to find the sum of the first hundred whole numbers.

The women were enacting an imagined mathematics community they felt they needed, a place where they could wonder and think possibilities without feeling like they had to do it quickly. They took time to share multiple approaches to the problem. Then, when they shared their various approaches, Luz took the women and attempted to do the math problem collectively. To which they do, and it is the beginning of creating different kinds of experiences of engaging with mathematics.

Linguistic Freedom
In this vignette the women blur the lines between the formal and informal language. Although they are doing a math problem together, the women discuss it as if they are having a conversation with one another. The women do not bring in Spanish to the conversation, but I conjecture that is because the women do not associate Spanish with doing mathematics.

Relational Reciprocity
The women push each other with their ideas but do so in a respectful manner. Inez builds on Jenni's idea of writing it all down but instead of writing down all the number she suggests a shorter list. The women take the ideas and add to them, mold them towards a goal without putting each other's ideas. This is an important way to enact a care relationship with the women. Furthermore, there is laughter from the women as they are bringing in their full selves into the conversation.

In this vignette, the women do mathematics together, but it doesn't start as actually doing math together. Rather, it begins as, how would we approach this problem? This way, the women begin to bring in their approaches based on their previous experiences. At some point, the vignette goes from thinking about the problem together to doing the problem together. The women find a lot of joy and excitement from doing this problem together. (In later session, Jenni notes that she had a lot of fun doing the problem, Researcher Journal 5). This plática is the grounding for different kinds of mathematics experiences. Towards the end, the women discuss more about these kinds of problems and think together about the possibilities they can have for children. Thus, in many ways, it sets up to think about what it would mean to center these kinds of experiences with children.

Conclusion

This chapter delved into the questions of, *what was the design of the learning community and how did it evolve? What are pláticas?* The first part documented the ways in which my researcher's planned and what happened was very different. I had designed the plan to fit a linear form of dialogue about identity towards the society but what occurred was that topics followed a nested approach to topics that involved identity, community, classrooms and schools, and society. That is, I naively planned for a linear approach when in reality because of pláticas that

created a nested of topics that were central to what happened in our discussions. In the first part, I also document the emerging focus on "practice" as the pláticas progressed and the organic emergence of focusing on two classrooms to create change. I also conceptualize the co-design process as an iterative, collaborative and in-the moment process that cultivated opportunities for co-constructing new meanings with mathematics and justice. In the second part, I conceptualized pláticas and their multidimensionality. I showcased those dimensions by focusing on two different vignettes.

Chapter 5

> "That thing is, Anahi, doing this work, you are going to come across opposition. This is not the thing that people want to see in public education. You will be accused of politicizing education. Not talking about it is a political act."
> - Inez (Session 10)

Introduction

Inez's response to Anahi's dilemma of building confidence to center justice in teaching captures Inez's understanding of and commitment to what she views as teaching for social justice. In her response to Anahi, she is affirming Anahi in acknowledging that she will face opposition but more than anything reminding Anahi that not acting is also a political act. In many ways, much of the discourse in social justice math education urges teachers to engage with the idea that teaching is a political act. Gutierrez (2013) and Martin (2013) have set the groundwork to situate and understand mathematics and mathematics education as racial projects. The question, then, is, *how does one become a social justice math educator?* Unlike other disciplines, the fact that mathematics is culturally positioned as an objective field creates unique challenges when one seeks to take a critical perspective on mathematics education. For example, one challenge that arises for social justice math teachers is to think about how to negotiate justice goals with mathematical goals (Bartell, 2013).

As discussed in Chapter 2, I conceptualize a mathematics social justice educator as someone who has and will continue to develop critical, racial, and mathematical literacy, and who acknowledges that these forms of literacy are interconnected. It is important to acknowledge that the idea of *becoming* is an ongoing process, because learning is ongoing and never ending. The notion of critical literacy is derived from Freire's work in which he argues that the "oppressed" must lead the changes or the fight of injustice (Freire, 1996). Gutstein (2013) extends Freire's work and conceptualizes *reading and writing the world with mathematics*. This means that we reconceptualize mathematics as a tool to understand injustices in society such as racism in housing, unlivable wages and so on with the goal of acting to fight that injustice. While such work has been fruitful, Freire's work does not explicitly attend to issues of race, racism, and racialization. The need to also account for these issues leads me to consider the theme of racial literacy. Racial literacy is grounded in Lani Guinier's (2004) demand that we account for understanding the racial grammar of society. Sealy-Ruiz (2011) takes Guinier's notion of racial literacy and incorporates it into teacher education, specifically through a literacy lens. Mathematical literacy is also at the core of being a math social justice educator, as we need to hold expansive understandings of mathematics and what it means to do mathematics (Schoenfeld, 2014). Although I conceptualize a math social justice educator by reflecting on these three forms of literacy and their interconnectedness, in practice they are multifaceted and interconnected. This multifaceted conception attends to the dynamic and ongoing aspects of becoming a mathematics social justice educator, attending contextually to issues of mathematics, social justice, and race.

In Chapter 4, I analyzed and discussed the design of the environment and what occurred during the pláticas. Recall that pláticas are a multidimensional practice, a form of storytelling that embodies linguistic freedom, reciprocity, relationality, foregrounds the imaginative, centers

everyday knowledge, moves fluidly across settings and time, and it is co-constructed and co-contested. These dimensions together function toward being and becoming with mathematics, toward new forms of learning. This characterization highlights the essence of the learning community as being inherently personal and relational, with stories about their past experiences at the center and the core of the dialogue that we had throughout the pláticas. In this chapter, I seek to answer the following research question:

> *How do the master narratives that comprise the mujeres' critical-racial-mathematical literacies evolve during the pláticas?*

To understand how the literacies are shifting for the women during the pláticas I look at the kinds of stories they share (stories about the family and stories about the classroom) and try to understand how, within the pláticas, the women challenge, uphold and/or amend master narratives of mathematics education. I choose to focus on master narratives as they provide opportunities to implicitly consider issues of racialization as race talk is often not explicit. Master narratives in these contexts are racialized storylines that are taken up, reproduced, and resisted in multiple ways both in and outside of school (Nasir and Shah, 2011). In mathematics education, there are narratives about "math as an innate ability" and "Asians are good at math." The first narrative is problematic because it positions some people as good and others as not good at math. Because being good at math equates to smartness, this leads to the othering of those who are "not good." The second example is problematic because it homogenizes Asian Americans and their experiences, as though there was one monolithic way of being. There are numerous problematic narratives about gender and race in mathematics. Messages about who is a mathematician and who is not are prevalent in society, often affirming these problematic narratives. Thus, I pay attention to narratives because they are important to these mujeres' development of racial and critical literacy with and of mathematics – and in general.

The purpose of this chapter is to understand the kinds of shifts in critical-racial-mathematical literacies happening for the women in the pláticas. These shifts were captured by looking at the way the women upheld, challenged, or amended four main master narratives in mathematics education: what is math, what does it mean to do math, who does math and what does it mean to be good at math? This is not an exhaustive list – there are other master narratives, but I choose to focus on these because they capture what emerged in the data. Some of these master narratives reinforce each other, contradict each other and there is no consistency because they show up in various ways based on the context. The context, in this case the stories, portrayed the complexity of the master narratives as they were evoked and often were contradicted even within one vignette. These captures the complexity of the master narratives that are evoked through stories and the way they are entangled for the women as they continue to bring up their past experiences during the pláticas. Thus, I argue, that the evolution of literacies are indications of increased awareness toward the development of the women becoming social justice mathematics educators. Yet, as the reader will see, the progress of increased awareness is not simple nor straightforward.

I list the master narratives below and organize them by questions. The rest of this chapter will follow this structure.

Master Narrative 1: *What is mathematics?*

This narrative concerns what we take as for granted in our society regarding what mathematics is. Thus, this narrative shapes a view of mathematics as rules and rote procedures in k-12 education. Mathematics is also often seen as a set of disconnected concepts. Globally, math is seen as an apolitical and abstract subject. Even within the subject of mathematics, there are hierarchies of math topics: abstraction is at the top of the hierarchy, applications are not as highly regarded, and contextual math (such as ethnomathematics) is less well regarded.

Master Narrative 2: *Who does mathematics?*
This narrative concerns what we as society take to mean when we think about who does mathematics. In society, a mathematician imagined as a white or Asian man, perhaps wearing a white coat lab. Most often, men are seen as doers of math and women are not. Whites and Asians are expected to be good at math, while Black and Brown people are not.

Master Narrative 3: *What does it mean to do math?*
This narrative concerns what society takes it to mean when imagining people doing mathematics. Doing mathematics is often perceived as an individual, fast paced activity that centers around competition – getting answers quickly and accurately. Doing mathematics is also seen as a linear trajectory, with ideas building on each other. Mistakes are often high stakes – if you have something wrong, you can't build on it.

Master Narrative 4: *What does it mean to be good at math?*
This narrative concerns what we as society take to comprise mathematical competence. In mathematics, exams often test material that students are expected to have "mastered," so that they can solve problems rapidly and correctly. Being able to do so is to be mathematically competent. Mathematical competence is often seen as an innate ability that some people possess, and others do not. This creates the idea that there are math people and non-math people.

Chapter Overview

Chapter 3 (methods) outlined the data analysis process used in this dissertation. In brief, I sought trends in the types of stories that were shared during pláticas using bottom-up analyses, and I explored how they shaped justice-oriented perspectives of math teaching using top-down analyses. Two main themes emerged: stories about family and stories about the math classroom. This chapter is organized by those two themes. For each theme I present vignettes documenting the ways in which participants' stories evoked their underlying master narratives – the narratives that shape their views about what it means to be a mathematics social justice educator.

This chapter is organized in three parts. Part 1 centers pláticas about the family. Part 2 centers pláticas about the classroom, and Part 3 centers pláticas about the classroom grounded in a vision of possibility. It is important to note that my goal is disrupt the dichotomy of in-versus-out school scenarios. Rather, I wish to create a complementary focus that emphasizes the duality of the narratives that are constructed about mathematics outside of a formal math classroom and within it (Nasir and Shah, 2011). Each part of the chapter contains one long vignette with multiple episodes and some smaller episodes. These narratives showcase how the women challenged, upheld, or amended the master narratives, and document shifts in their racial-critical-mathematical literacy.

Historias de Familia

Throughout the project, stories about familia were part of the pláticas. As mentioned in Chapter 4, family was not something that I specifically asked them about. Rather, it is something that the women mentioned frequently, with the stories often connecting to their vision of justice. I would argue that a reason that stories about family emerged is because the women in the project were from an immigrant community where familial relations were central to their upbringing. This was something that emerged in the initial interviews as the women shared about who they were and their commitments to their community. It is important to note that in this community the centrality of familial relations was a regularity, but there is always variance within communities. For example, in this community because of the various experiences all the women viewed family differently, and they talked about it in different ways. My goal is also not to say that familia mattered for some women more than others but rather that because of their different experiences the stories that emerged for each woman was different.

Vignette: Is math a gift or something we work for?

This first vignette documents the way in which the four master narratives – what is math, who does math, what does it mean to do math, and what does it mean to be good at math? – show up for the women as they speak about their family's experiences. These four master narratives construct shifts of critical, racial, and mathematical literacy. In this vignette, Anahi and Inez talk about their parents and how they do mathematics outside of a classroom. This leads to Anahi's shift of her own previous understandings about these master narratives. The following vignette is broken in three episodes for clarity to the reader.

Episode 1

In this episode, Inez amends the master narrative of who does mathematics by recounting her father's experiences in Mexico. This supports Anahi in developing an understanding of mathematics as a cultural practice situated within a particular context, mathematical literacy.

> After the customary check in, Sandra asked the four women if they had the opportunity to think more about what they had discussed the previous week. The previous week the mujeres had discussed *identidad* and Sandra introduced the notion of mathematics identity. The mujeres had all remarked that math identity was a novel term, and they were intrigued that it existed. While they were not asked to think about it further, Sandra still wanted to ask them if they had thought more about this concept.
>
> Inez began, "My father worked at the farm and would take the elotes [corn] to go sell them, he had to be a salesman and those are the things that we don't expect for women. So maybe it was never expected for me to be good at math. So, I owned it, I am not a math person. So, I don't know, what went into how I am seeing myself with mathematics and what are we doing in the classroom to reinforce those ideas?"
>
> Although Inez posed a question, there is silence from the mujeres. Sandra continued with her plan and talked about the Oksapmin community and how they used their body as a counting system. She then shared about the Brazilian candy sellers and how they conceptualized mathematics as a cultural practice embedded in the system of selling

candy (Saxe, 1988). Towards the end of that discussion, Sandra looked at Inez and remarked, "reminds me about your dad and selling elotes [corn]."

Who does math?

From the initial interview, Inez had shared that her father was an immigrant man who arrived in the US at a young age and was not formally schooled. Inez begins to construct an understanding of herself and her own mathematical identity. In particular, she focuses on gender and labor. The expectations of being a man in a heteropatriarchal neoliberal society positions her father as a laborer and the breadwinner of the family. The context of labor offers Inez a site to see her father as a doer of mathematics. In this role, he developed a mathematical identity that Inez did not get a chance to develop. Her father's mathematical identity and his positioning challenged the master narrative of a cis/hetero white man in a white coat as someone who does math because her father is Mexicano immigrant laborer. But at the same time, this also still upheld the master narrative that men do math. Hence, in this case, Inez challenges and upholds at the same time the master narrative, in what I call an amend. Importantly, this positioning provides Inez the opportunity to begin to understand multiple perspectives regarding who does math within a various context. This is an important part of the mathematical literacy that we aim for teachers to develop when they begin to understand math as a cultural practice.

In what follows, Anahi shares more about her mother as she is trying to understand her and her mother's mathematical identity. In this episode, the four master narratives support the women to begin to develop understandings related to critical-racial-math literacy.

Episode 2

> Inez responded, "That is how it is for my dad, he can write down problems and can do math quickly. And he is really good with money, and he knows, and he keeps a tally. But yeah, the more, the more formal math problems, he would probably struggle a little bit more. I am the opposite. I am terrible at mental math. I can give you an estimate, where my dad has everything tracked to the pennies. Yeah, I can see how that could happen. The reverse could be true."
>
> Anahi quickly asked, "Is that like identidad [identity]? How your math identity changes. Because that is what I was thinking. My mom no termino la primaria [didn't finish school] and she barely reads. But with numbers, with mental math and money. She is really good at that. She used to sell fruta [fruit]. She goes to sell in the temporada de maíz, y luego vendían eso en el pueblo con medidas [corn season and they would sell it in town with measurements]. She was really good at that. Y le pregunto, cuanto es un litro. [I ask her, how much is a liter?] And she would be like es mas o menos esto [It is approximately this]. Y yo ni se que es un litro! [I don't even know how much a liter is!] Pero, it's like, a ella se le introdujo, iso experience. [She was introduced through experience.] Is that her identity with math? And my identity is more like school?"
>
> Sandra suggested that she ask her mother. Sandra continues, "I think it might be, you might be surprised with what she says. And not in a bad way, you never know what they might think." Sandra suggested the same to Inez. Inez continues to share that her father is pretty vocal about how he believes he is good at math. "So, I think he has a positive

> identity, but I am curious to know what he will say. He says, 'yo soy bien listo pa las cuentas. [I am really smart with calculations.]'"
>
> Anahi laughed as she knows her mother is the same way. Anahi continued, "sometimes we ask my mom, 'cuanto es esto mas esto' [how much is this plus this?] and my mom nos arrebata los recibos [takes the receipts away] and makes the calculations quickly. She is really good at that." There is more laughter and Inez agreed that her dad and her husband are the same way contrary to her own experience with school mathematics. Anahi then asked, "so Sandra what is your relationship with math now?" Sandra responded, "It is a love and hate. And it will never fully be on one side. When you begin to see collectively and how unfair it is for some students. I began to see it as more complicated. *There is some nodding*. And that it is a gatekeeper and a lot of people do not get opportunities like the ones I got."
>
> Anahi then proceeds. "I have never thought about it, yeah, I love math and all that. Pero tambien now that I think about my mom. I am not like her [mother]. The reason why I went to math was because I came here, in Mexico I was not into math. No, le di importancia. [I didn't care for it.] [In the US] I would do the math because I had to. It was the only subject que le entendia [I understood]. It was a review, you are good at it, me la crei [I believed it] and I stuck with it. I am so good at math, but I had to work extra for that. I would stay after school; I would tutor in the morning. At 6 am I was already at my high school. And people would tell me I was good at it, and I would then work hard for it so I could be good at it! Aahh! So maybe I am not as good at math as I thought." Jenni laughed and affirmed Anahi by saying, "Damn. You tutored me in math 308 and 309, relajate [relax] you are."

The following analysis is organized by the master narratives for clarity.

What is math?

This episode challenges narrow conceptions of what mathematics is by Anahi articulating her mother's knowledge of math, "a ella se le introdujo experience." When Anahi explains that her mother knows what un *litro* is, she begins to see there are multiple ways to know what math is, that math knowledge is not only constrained within institutions of schooling. Anahi is beginning to have a more expansive understanding of mathematics that goes beyond school math. This helps Anahi shift in understanding math literacy.

Who does math?

The different ways of doing math sets up the positioning of both Inez and Anahi's parents as doers of mathematics. This challenges the master narrative that those who do math are white men. Both Inez and Anahi have previously mentioned that their parents have limited schooling opportunities. Anahi notes about her mother, "she barely reads" and Inez remarked earlier that her father did not attend school in the US when he immigrated. Thus, understanding their parents' experiences as doers of mathematics disrupts the way that society positions people like Anahi and Inez's parents. Historically and more explicitly during the 2016 election, immigrants, specifically people who come from Mexico were dehumanized and remarked as uneducated or

not smart. Both Anahi and Inez begin to see the brilliance of their parents. The example that Anahi uses of un litro,

> Y le pregunto, cuanto es un litro. [I ask her, how much is a liter?] And she would be like es mas o menos esto [It is approximately this]. Y yo ni se que es un litro! [I don't even know how much a liter is!] Pero, it's like, a ella se le introdujo, iso experience.

This reinforces the positioning of the parents as doers of math and the way they *know* math. Anahi contrasts her mother's understanding with her own and says, "I don't even know how much a liter is!" Anahi is a woman with a college degree, and she doesn't even know that.

Both Inez and Anahi's challenges to the master narrative supports the women in resisting and constructing new visions of who is seen as a doer of mathematics. This is the beginning of a shift in understanding who is perceived as a doer of mathematics that is important when developing a critical-racial-math literacy. That is, this is a shift away from narrow understandings of who can do math even when society positions the women's parents ("my mom no termino la primary") as not "educated."

What does it mean to do math?

Both Anahi and Inez describe *how* their parents do mathematics – mentally and quickly. In many ways this again reinforces the master narrative that doing math well means doing it quickly and accurately. Yet, in the context where both women's parents used math, doing math quickly and accurately is important. Inez remarks about her father, "That is how it is for my dad, he can write down problems and can do math quickly. And he is really good with money, and he knows, and he keeps a tally." Anahi also remarks about her mother, "But with numbers, with mental math and money. She is really good at that." That is, they describe mathematical activity situated within a different context than schooling; in that context doing math quickly and accurate is necessary. In that context, you need to calculate things in the moment, and you might lose money (or customers) if those calculations are incorrect. When taking a justice perspective, in our classrooms we seek to avoid quickly and accurately as it is a dehumanizing practice; but in the context that the parents work speed and accuracy are a resource and something great to possess. This means that critical literacy needs to be investigated further for the women to begin to contrast doing quickly and accurately within multiple contexts. This master narrative needs to be further problematized.

What does it mean to be good at math?

Towards the end of the vignette, Anahi remarks that she believed that she was "good at math" which means she understood that as an innate ability. When she remarks that she had to work extra hard for it, she is beginning to realize that she put a lot of effort in understanding mathematics to continue to be positioned as someone who was "good at math." Such understanding is very important because Anahi is challenging the master narrative of being good at math as an innate ability and rather is realizing that her agency contributed to that positioning. This is very important as it is the beginning of the disruption of being good at math as an innate ability that is necessary for teaching. It should be noted that for Anahi this is confusing and something inherently personal: she is challenging a belief that she has held for a long time. She notes in her reflection journal,

> "I see a connection between what we've discussed to how my relationship with math is not as "good" as I thought. My identity as a math "lover" was created by forcing myself to understand it and prove my other teachers wrong about how "smart I was." (Anahi, Journal Reflection 2)

This shows how Anahi's understanding of her relationship with math had become more nuanced – her use of "good at math" was expanding to include her position both in math and in her other classes. Anahi was beginning to connect ideas about being good at math as an innate ability, smartness and how that positioned her a particular way in the eyes of her "other teachers" who positioned her in a low status because of being an ESL student. These ideas are inherently connected to racialized hierarchies about who is considered smart and who can do mathematics. This is a shift towards the development of a critical racial literacy where Anahi is beginning to connect ideas related to innate ability and smartness within mathematics that ultimately served to position her at the top within the hierarchies of schooling and mathematics.

In the next episode, Anahi continues to grapple with the master narrative of what it means to do mathematics.

Episode 3

> After the plática, co-participants were encouraged to have a plática with their own parents about how they see their relationship with mathematics. During the next plática (our third meeting), Sandra asked the mujeres if there was something they wanted to share about whether they had interviewed their parents or not. Both women agreed their parents believed that they knew mathematics because it was part of their everyday experience and that they had never considered the idea of a "mathematical identity".
>
> Anahi then shared, "Me quede pensando, [I left thinking] we are not really as good as… I mean, you know. We are not as good at something as we thought. No se como sucedio el tema, [I am not sure how the topic came to be] I was thinking about how I always say I was good at math. And that was like because it was explained well at the beginning. And plus, I worked extra hard, but I didn't think about it. I used to say I was good it and y nomas me la creia [I believed it]. Is it a gift? It is not really a gift; I was going at 6 am to school and going back at 5 pm. I would go back to tutoring. So now I am thinking, is it a gift or something we work for?"
>
> The mujeres discussed Anahi's question. They share the challenges and tensions. Towards the end of the conversation, they parallel math ability to artistic ability and begin to question whether mathematics is a form of art.

What does it mean to be good at math?

Anahi continues to struggle with her own understanding and belief of being "good at math" while also trying to make sense of her experiences being at the tutoring center in the morning and in the afternoon. She perceived herself as good at math, yet her view was static, upholding the master narrative that being good at math is innate. She felt that she just happened to be good - but then on reflection she sees herself as someone who understood well because it was

"explained well." She begins to think about the many times she attended tutoring to continue to do well. Her final question to the women, *Is it [math] a gift or something we work for?* seems to perpetuate a binary that either you have innate ability or you do not – but the very question opens the door to problematizing the issue of innate ability.

After that meeting, Anahi wrote in her reflection,

> *I was struck by…* How much a school subject such as Math can traumatize a student. How much we have been traumatize by it, either by thinking we are good at it and dedicating most of our school hrs to understand it to demonstrate that we are as good as people think. Or, by questioning every single problem we solve because we don't trust our ability to add two simple numbers. There is not a between when we talk about math, is either you are smart and good at it or dumb for not understand it. (Reflection Entry 3, Anahi)
>
> *I found myself wondering,* about how we can make a change to the culture of math. How we can dismantle our believes about math and transmit that to our students.

During her reflection, Anahi grapples with master narrative that people are either smart and thus good at math or they are dumb for not understanding it. Yet, she understands that that is a cultural narrative and she calls for a humanizing approach that centers students' experiences. While initially her reflection centers a student being traumatized, her shift to "we" speaks to her and the mujeres' experiences with mathematics. This leads to not only grappling with the idea that these are beliefs that one holds but then the question of how such disruption can shape student's mathematical experiences. This is part of the ongoing journey of becoming social justice educators and developing critical racial literacy.

In summary, this vignette referenced the four master narratives in multiple ways throughout the episodes. Analysis showed that these master narratives were challenged, upheld and amended by the women as they shared stories about their parents. Such actions (challenging, upholding, amending) created possibilities for the women to develop understandings about critical-racial-mathematical literacy in different ways at different points of the vignette.

In the next episode, Inez shares more about her husband and his relationship with mathematics. There, Inez invokes three master narratives: who does math, what does it mean to be good at math, and what is math.

Inez and her husband

Throughout the pláticas, Inez shares multiple times about her father and her husband and their use of math in their every day. Anahi shares more about positioning her husband as a doer of mathematics, an amending of the narrative of who does math.

Inez shares about her husband,

> "Yeah, my husband is good with math too. My husband is very good with mental math, the same thing. He is in the car business, the same thing, he does numbers all day long. And he does things in his head and he will spew the math to me. It is just weird because it

> is context. He is really good at the kind of math, you give all of these big numbers because car business is big numbers. You are talking from anywhere the low thousands to 60 thousand dollars, sometimes more because there are people that buy multiple cars at the same time. He is able to calculate interest and all of that. But then like, when we have to help our daughter with homework, with math homework, it is not easy for him. Like he doesn't, he defers to me even though I see him as having a far more positive math identity than me. But I guess, I don't know. It just does depend on the context. Within the school context, he sees me as having a better math identity, I am good at it because I got good grades in math. But I don't see myself that way, I always felt like I had to work hard to get there. While I see my dad and my husband, that they are able to calculate all of these things and my head is spinning. I have always thought that their math identity is more positive than mine. (Inez, Meeting 2)

Who does math? What does it mean to be good at math?

Inez positions her husband as a doer of math in the context of his job. She shares that he is able to calculate all these numbers in his head when her head is spinning. She upholds the master narrative that men do math while also challenging the whiteness embedded in that narrative as she positions her Mexican husband as a doer of math. In this episode, her husband positions her as a doer of math when Inez shares that she helps her daughter with her schoolwork. This distinction is important as it reinforces again the idea that who does math is connected to the context in which the math is done. Yet, Inez does not see herself as a doer of math because she doesn't think she is naturally good at math. In this episode, according to Inez, doing mathematics is connected to a positive mathematical identity, which is tied to being good at math. Thus, in many ways, Inez is holding on to the belief that math is still a fixed ability even when she is being positioned as an expert by her husband. Helping her daughter is an important role that she takes on, and that in many ways disrupts the gender narrative that men do math and women do not. Such move is powerful as it is helping her daughter see her mother as someone who can support her with mathematics. Yet, Inez is still unable to see that because she believes that she doesn't have a positive math identity and thus is not good at math.

In this episode we see through Inez's articulation of the contrast between her own and her husband's mathematical identity how the two master narratives, who does math and what does it mean to be good at math, are in tension with each other. That is, Inez is developing critical-racial-literacy by articulating different contexts to which one can do math. Yet, she still grappling with thinking about mathematics identity as something that is fixed, which is aligned with the fixed ability of being good at math.

Some weeks later, during session 7, the women have finished watching Danny Martin's video about math for liberation. In this encounter Inez invokes the master narratives of what is math and who does math.

Inez has been silent for a while and is looking at a distance and responds,

> "So, math for liberation. There is a literal sense to that. Meaning there is a lot of us who have a negative math identity, right, we feel we are not good at math, we do not know. And sometimes are triggered where we have to do math or we have to understand math and then we get like, shut down. And there could be really important situations that

> require some type of basic understanding of mathematics. Like taking out loans, sometimes legal things, things that involve finances and money. You know? You gotta be able to understand. My husband for example, is so good at it. He will sit there and be like 'you know if I have a buy a house with this interest and a loan of that amount, then this is how much I am going to be paying. And that is just like making me a slave and forever be indebted.' He can figure those things out because he is good at it. Whereas some people might you know, be overwhelmed by the notion of trying to really think it out and just you know? Because they are not good at math, 'I am not good at math but everyone does this? Why not?' So yeah, I think that it can be actual like a form liberation in that way. Financial liberation, also, I have heard people talk about how umm, people of color need to learn, we need to learn different ways of building wealth because we are so used to work, work, work, save, save, save. We work for a pension so we can retire but we do not like really dare venture to investing, getting to the stock market and things like that. That is how you can build wealth, he says something like, if you were to put 5,000 dollars in a Roth IRA for your 13-year-old, by the time they are to retire, they will have a million dollars. They will not make their lives all about working for a pension. They will have that financial liberty to seek some greater value in life, or some greater experience in life, more than worrying about going to school, so I can go to college, so I can get the job, so I can get the benefits to just survive. I think in that way, having a strong math identity and understanding of mathematics can be liberation."

What is math?

Inez takes the concept of math for liberation and ties it to what she calls, "financial liberty." Financial liberty is the ability to understand mathematics to be able to make financial decisions that enable you to do more than just to survive. In this way, Inez reconceptualizes math as a tool for upward mobility. In many ways, she views math as something that is necessary in society beyond what is taught in a classroom. While this reconceptualizing is important, Inez does not she does so without questioning the underlying societal narratives related to capitalism and neoliberalism. As she continues speaking, Inez frames financial liberty as being proactive; she explains the importance of building wealth and learning about ways to do that. She explains the pattern that many low-income students progress that ultimately gets them stuck into the never-ending cycle of just surviving. Inez views that being able to move away from that never ending cycle is a form of liberation. This contrasts with the way she previously saw mathematics,

> "From personal experience, math is a set of rules. That's how I always saw math. There are procedures and rules that you have to learn. I was never a math whiz. It did not come easy for me. But I was always able to do well because I had to work hard. I've always had to work hard. And that meant repetition." (Inez, initial interview)

Previously Inez viewed mathematics as something done in a classroom, where rules needed to be followed and "working hard" often meant repeating the same kinds of problems over and over again. Yet, this is different from what she is thinking about in financial liberation. Here Inez is beginning to develop a more expansive understanding of mathematics. Yet, she still needs opportunities to grapple with how these narratives fit into societal issues such as capitalism and neoliberalism.

Who does math?

Again, the master narrative of who does math, her husband, is also being upheld. In a similar way to her father, Inez views her husband, someone who did not continue to higher education as someone who is good at this difficult subject. This, in addition to the fact that her husband is a Latino man, adds to the move to resist master narratives that are constructed about men of color. Gender and math is an issue Inez is still struggling with. While she doesn't see her role of a knowledge holder, she views knowledge as more related to experience. To further develop more nuanced understandings related to the master narrative of who does math, Inez will need to further delve into issues related to innate ability.

In the following episode both Jenni and Luz share about the men in their life as teachers. This helps them understand multiple ways to think about math and who does math.

Math and Art as Gifts

In this episode, the master narratives that are evoked are who does math, what does it mean to do math, and what does it mean to be good at math. These narratives are challenged and amended by Jenni and Inez as they grapple with the question of whether math is a gift and how math may serve the metaphor of art.

Following up on the previous vignette about math being a gift, Jenni shares her thoughts:

> "When I see Anahi doing math or when she was teaching or teaches me. The way she thinks, I don't see that stuff. It is not because I am dumb or I do not understand what she sees. I was never taught that when I was younger. One think that I did notice, my dad, he taught my older brother how to do math. And he would teach him these different methods. And my dad never taught me! And my brother was the top student of the class, he never sat with me. Maybe it was not a gift in that way, but I do not see it. It takes time! And then some people see it instantly! And I am like let me check my calculator. So, sometimes I feel like a gift. They see different things for other people. Kind of like artists, who draw very well, and I can barely hold a pencil! That is how I see it, you know? I can see it both ways."
>
> Luz grimaces and responds, "Art relaxes you. Math is like, for me it gives me headaches. And it is like, ooookay, next! I don't know. Unless I have a good teacher to show me. And I don't. It is my husband, and he goes by super fast. So screw you too!"

What does it mean to be good at math? What does it mean to do math?

Jenni grapples with the question of whether math is a gift, problematizing the implicit dichotomy in that framing. She notes that she doesn't see what others see not because she is dumb but rather because maybe she didn't learn to see those things from a younger age. Yet, she still says that she doesn't see "it" referencing to how people approach math problems. Jenni begins to invoke the master narrative about doing mathematics quickly and accurately. In particular, Jenni sees that as something that she lacks but does not attribute it to her being dumb or not being able to do it, she notes it just takes time. This would be the beginning of the many instances where she speaks to not doing mathematics quickly, something she accepts and works

with. Hence, she both constructs the idea of people seeing math quickly with smartness. At the same time, she knows that you can learn mathematics if people teach you by showing multiple ways, as she described what happened with her brother. Thus, it is possible that people that by knowing multiple ways, one could be deemed smart, very much like her brother.

Luz offers another perspective about quickness by focusing on her husband as a teacher. She notes that her husband goes by "super-fast" which Luz has a response of "screw you too!" The "too" alludes to all the teachers who by so fast and dehumanize Luz. In many ways, Luz gets that quickness happens in classrooms, and she does not really question it but when her husband does the same thing, there is an emotional response. Luz challenges the master narrative of what it means to do math through centering her humanity. Both Jenni and Luz begin to challenge these narratives and begin to build more expansive understandings of critical-racial-mathematical literacy by noting that slowness is problematic when doing mathematics.

Who does math?

Jenni then shares the example about her father and her brother doing mathematics together. This relational activity does not include Jenni, but Jenni sees that her father would teach her brother multiple ways of thinking about mathematics. She then correlates this with her brother doing well in school and being the top of the class. While it is unclear if this narrative is actually the case, what is true is that Jenni understands that when you see multiple perspectives of mathematics you can begin to see it in new ways. Moreover, she sees this as something that is cultivated over time and from an early age. Luz speaks about her husband being her teacher. From our personal communication, I know that her husband supported her and taught her mathematics to be able to successful in M308 and M309. Although her husband is not college educated, he still is positioned as a doer of mathematics by being positioned as her teacher. And she doesn't hesitate to speak out about what he is not doing correctly to support her with her mathematical ideas.

In summary, the women continued to grapple with the master narratives about who does math, what is math, what does it mean to do math and what does it mean to be good at math. In fact, these episodes showed that these master narratives interact in complex ways. That was the case of Inez and Jenni as outlined in the previous episodes.

The next section delves into stories about the classroom and how the master narratives are challenged, upheld and/or amended.

Historias de la classroom

The women had a shared experience of having taken (at different points of their careers) the same math content course for prospective elementary teachers. (Chapter 4 talks more about this and how those experiences guided conversations about redesigning the course) This section focuses on stories that were invoked in the pláticas about the classroom. This is important: a math social justice educator pays close attention to the ways of being in a classroom that move beyond the curriculum. These include paying attention to the interactions between people and between people and mathematics, centering the well-being of the community. This is consequential for classrooms that seek to cultivate joy and learning of mathematics even though that is not a specific component of the curriculum.

One of the group's assumptions is that social justice math educators must teach particular lessons that seek to dismantle oppression. While that is important, I believe that it is not enough because we have to pay attention to what happens in the classroom and how those interactions

help cultivate more just learning communities that honor people's history and dignity (Espinoza et. al, 2020).

This section is composed of a vignette and smaller episodes that invoke the four master narratives that are outlined in the introduction. The first vignette reflects a twenty-minute conversation about what it means to construct a collective learning environment in mathematics. The smaller episodes center a conversation about quickness in mathematics and justice mathematics classroom.

Vignette: Bajale a la intensidad de matemáticas

During this vignette I ask the women what it would mean to build a collective environment in mathematics. In this vignette the master narratives that are invoked are: what does it mean to do math, what does it mean to be good at math and who does math. In this first episode, Inez and Anahi challenge the master narrative of what it means to do mathematics.

Episode 1:

Sandra asks, "How do we build a collective learning environment?"

Inez quickly responds, "I feel it has to be about discovery, you know? Versus lecturing, umm, kind of like those, what are they called? The Montessori schools. You just kind of learn through discovery. There is some guidance from the instructor, maybe an introduction to certain but I think the bulk of the learning should be that way. In community, hey, here is this, play around with it. See what you guys come up with. I don't know."

Some silence.

Anahi responds, "Tambien es muy interesente lo que dijo Inez (It is also very interesting what Inez said). How math is, like, solitario (individual). Eh, you know, like como dice, cada quien que se razca como pueda (like the saying, everyone is out for themselves). I feel like in all the subjects, you are always working in groups. In math you do not really see groupwork. There is no really groupwork, and in any other subject I can think of there is groupwork. In math there is always going so fast, yeah, cada quien literal se estan rascando como puedan (literally people are looking out for themselves). Muchos no tienen esa apoyo en la casa (many do not have the support at home), or those parents who can afford a tutor. And so yeah, you know, so it will be about trying to include more work. Make it a norm, to have to do work in math. Y los estudiantes mismos apoyarse a si mismos. (And that students have to support one another)"

Sandra responds, "Kind of like M308 and M309?"

Anahi quickly makes a grimace and shakes her head. The women start laughing.

Sandra responds laughing, "You are all talking about groupwork, isn't that what we did there? So what are we talking about here?"

What does it mean to do math?

Inez begins explaining that learning has to be about discovery. She challenges the meaning of math activity as simple lecturing and positions the learning within students. She then suggests that the bulk of the learning must be in a community where students play around with mathematics. Her proposition begins to challenge the master narrative that exists about what it means to do mathematics, and Anahi builds on it. Anahi challenges the master narrative of doing mathematics as a fast paced, individual activity. Her phrase of "cada quien se rasca como" pueda alludes to the fact that learning math is a matter of survival of the fittest. She argues that the individualism that is part of the American culture is also part of the way we do mathematics. She also compares math to other subjects and notes that somehow math just seems to be the only subject where people are not working in groups. So, Anahi views the solution as doing more groupwork, making it a norm for the way that math activities will take place. She adds the expectation that students are expected to support one another.

Anahi offers the thought that math should a be a collective endeavor, one that she seems to not have experienced in the past. When I ask them about Math 308 and Math 309, the women grimace and laugh because they never experienced what Anahi was describing. It is critical to recall that changes don't simply happen because students are put in groups but that the interactional level is essential – attention to one another is what makes mathematics a subject "donde no se rasquen como puedan". This discussion is helping the women develop a more relational understanding about mathematics, a part of developing a critical-racial-mathematical literacy. This is important as they are beginning to center community and being with one another as a central component of learning and teaching mathematics.

In the next episode the women grapple with why groupwork did not work for them when they took the M308-309 sequence. They further continue to challenge the master narrative of what it means to do mathematics, specifically thinking about individualism and pace while also upholding the master narrative of who does math.

Episode 2

> Jenni quickly says, "Sometimes about groupwork, sometimes it doesn't help. If you are, let's say in a fifth grade class. And you have four kids, 2 boys and 2 girls y uno de ellos understands the material faster than the other ones. He is going to try to get the answer faster and he is trying to do the work faster. They automatically know they will do the work faster, and the other ones that are like, it is not that … it takes them time to get the material. They are taking their time to get the material. They are taking their time in even understanding what is there in the paper. So los otros (the others), they are ahead of the game. So sometimes ellos van a decir (they will say), they will do it. And if the teacher says, 'Okay 5 minutes for the problem.' And then they share their answer, you know? But then the other two did not do much, it is not because they did not want to. They were still trying to understand the question. So that is the downfall of working on a group of 4, sometimes it is always like, 'do you know this answer? Do you know this?' And the one that knows it la hase rapido (do it fast), you know? They do not let, among each other, we do not let each other think. Why do you think it is 7? I got 3. It is very rare that you get a group where you can each answer, porque (because) the one that gets the material la quiere aser rapido (wants to do it fast). Me a pasado a mi (It has happened to me)

personally. So, they do not even ask for the answer. I am just saying, you know? That is how I see it about groupwork. Especially the teacher gives a 2 minute or a 3-minute limit. They are going to want to do it faster, you know?"

Inez responds, "I know. I was going to say like, I feel like part of the whole collective learning thing because it is so not a part of the culture of mathematics. At least within our educational system, there would be, we would have to invest time on teaching kids how that is done. Probably be done as a whole class. As a sort of a collective learning as a class in a way modeling how it is done. Ummm, and then from there we can possibly we can break it off into smaller parcels or groups of students. Like but I think that thing about learning how to work in a group and learning how to learn collectively that would have to be done, kind of like as a whole. As a whole guided by the teacher. That is just not the way we are used to with math. Like you said, there may have been groups of activities that we were given but that doesn't change the way we are programmed to do math. The whole competitive thing, where it is like 'I am sorry that you do not get it but I do not have the time to explain it to you. I am just going to get this answer for the group.' So we have to like deprogram ourselves, take that individualistic out of it. That competitiveness out of it. And we have to teach each out how to do that. That is not our instinct."

Anahi responds, "Yeah, Inez, that is what I was thinking. En este, como dice, estamos tan acostumbrados a (We are so used to it) especially in math. That is what I remember when I was in a math class even 308 and 309. Yea, I was in a group, but I was by myself. So I wouldn't even notice, I was there con la otras (the other) comadres who would not get the math pero you ni interada (I was not even aware). It is because, throughout my high school education and everything I was just so used to be myself. It is like, es algo que debemos de empezar a inculcarnos desde, desde temprana edad (we have to start building it from a young age). Asumir que (Assume that) you are already en la Universidad (at the university) and now you are working in groups. Well I am not used to do that. And como dice (like) Jenni and I will just find the answer. And math goes by so fast that you do not want to perder tiempo (lose time) to explain it to your group. When the teacher is already on another a concept. Either you get the concept and follow the same speed, I guess. I feel like it just goes by so fast. And now I am realizing every day it is just a different thing. So one subject, yeah. Bajale a la intensidad de matemáticas (Lower the intensity of math)."

The women laugh and nod.

What does it mean to do math? Who does math?

As the women seek to construct their own definition of building a collective community, they identify what they need to challenge: pace and individualism. This is a direct challenge to the master narrative of what it means to do math as a fast-paced activity that is done individually. Jenni's example of a group doing math highlights the way she views pace as impeding children's thinking and learning. She positions the boy as someone who is going to do it quickly and accurately, leaving very little opportunities for the others to understand the question. Her

example of the boy doing math quickly fits the narrative of men being mathematically competent.

Jenni notes that when teachers warn students about time that is another form of constraining learning and the opportunities to think about the problem. Thus, rapid pacing is something Jenni sees as a social construction between teachers and students, which leaves behind other students who need more time to think about the ideas. Toward the end of the vignette, Anahi comes back to the idea of pace. She notes, "math goes by so fast you do not want to *perder tiempo* to explain it to your group" taking the perspective of someone who could support the group but doesn't because more content is to come. She refers to ideas going by so fast that mathematics is experienced as a disconnected discipline. Anahi also constructs the idea of "fast" not as an individual problem or a teacher problem but rather a structural problem. She ends with, *bajale la intensidad de matemáticas* to call for a less intense subject than what we have now.

The second challenge is to the culture of math as an individualistic activity. Inez's response to Jenni note that the view of math they have been discussing is a whole cultural thing that we have been programmed to do and so we must "deprogram ourselves, take the individualistic out of it." Anahi agrees. She notes that in math class, she was not even aware of her peers. Both Inez and Anahi believe that to be in comunidad means start early (Anahi) and needs to be modeled (Inez). Their critiques of the individualism in mathematics come with an action component, the modeling that needs to happen as a whole class.

Here, the women begin to conceptualize how the master narratives can be modified by interactions that move away from placing the fault in the individual. This is central to developing a critical racial mathematical literacy. It identifies the importance of what happens at the interactional level in the classroom and also pushes away from a deficit view that focuses on people as the problem.

In episode 3, the women continue to discuss ideas related to a collective math community as I challenge them by raising some standard arguments that support the master narratives. The women push back on my arguments as they challenge the master narrative of doing mathematics quickly through centering the humanizing process of math learning.

Episode 3

> Sandra responds after some silence. "Can I push you all a bit?" The women nod and Sandra continues, "So, I understand the idea that si le bajamos a la intensidad the kids will not do well in assessments. You know? And those rankings where the US is all the way at the bottom? So how do we do it?" Inez, not challenged about the question, asks "Why would they not do well? Why would they decrease their competency?" Sandra explains that content issue and if teachers are going at a slower pace, there will be math content where they will not be covered. Sandra explains situations when the math must be covered with little time.
>
> Inez responds, "I do not know, I mean I think it is kind of hard that this would not work. Because we have really not done math before. From the beginning, right? From the elementary school because I think that, umm, it is quality over quantity. So many of our students and I can include myself. Yeah you can keep going with the pace but what sense does that make? A lot of percentage of the students do not understand it, they do not get it. what does that matter? Maybe you have a small percentage of kids who can do well

with the standardized because they can keep up with the pace but the majority of the students, you know? Probably are not, obviously like you said, we are ranked very low when it comes with mathematics. As a whole we are not getting it right. So, what are other countries doing? How are they learning mathematics that is different from what we are doing? I don't know, that is my philosophy with curriculum. That is how I am, I am not trying to keep up with the pacing schedule. To just blow past things when the kids didn't understand anything. It just doesn't make sense. And maybe that is not good teaching, but I just don't see it as, umm, fair to the kids. Like we are just going through the motions and not getting it. That is what I would say, I don't think it would be fair that is not going to work if we haven't had a math education that has tried that before. Umm, and that we have been able to see the progression of that over the year and where that ends up. And again, the quality over quantity. That is what I would say."

Jenni responds, "Umm. Adding to that Inez. Like, umm, I had a little girl de umm, I think she was five. She is the daughter of a coworker mia (of mine), I was tutoring her for some months. They gave her a packet asi de grande de (this big of) math. And I was tripping, and I was like why are giving her all of this information. And I was talking to her mom, and I was asking if they had taught all of this addition and subtraction. And it was all online since last year. And her mom said no. Her mom pays attention to everything and she remembers she learned this and that, so I asked her and the little girl no sabia ni hacer (how to) add. I don't understand a kindergarten teacher le da eso a una niñita (gives that to a little girl). And they expect them to have that done in a classroom. And they expect a little girl to read a book and that little girl doesn't read. And it was all very intense. I have tutored in a kindergarten class, and I had never seen that. I was surprised that she had a lot of work. I couldn't believe it. And how you say the pace, it is like how do you expect a child to know all of that in a short amount of time."

Inez responds, "Yeah."

What does it mean to do math?

Inez and Jenni both challenge the master narratives of what it means to do math by problematizing quickness. They visualize the current state of mathematics education as only working for a select few. Inez notes, "as a whole we are not getting it right" and challenges the group to think about other ways get it right. So for Inez and Jenni, math learning should be about quality and not quantity. Inez and Jenni try to humanize the learning process, because the current approach is in fact not serving children. Jenni's example of the little girl she tutors speaks to the pace and expectations for children, when they are just children who have not had enough time to understand all the topics at the pace they are presented. Again, Inez and Jenni reinforce the idea that change doesn't happen overnight and needs to be implemented in schools at the earlier grades. Their approach is structural – they are calling for a change in the way things are done across schools and the nation. Through this challenge the women begin to develop a critical-racial-mathematical literacy that centers a justice perspective, through humanizing the process of learning within institutions of schooling.

While such proposals are drastic and idealistic, in the next episode, Jenni offers her own perspective of how she would go about it. Her perspective challenges what it means to do math and what it means to be good at math.

Episode 4

> Jenni continues, "Yeah. I think I would do different as a teacher. Once I am si dios quiere (god willing). One thing I would really like, I am not sure how it is when you have planning and you have each day. But whatever it is, I would observe every student that I have regardless of their grade. I would pick the students that take the longest to do work. I would try to focus on them and maybe they have a 10 min recess and talk to them. For myself to help them and encourage them. I would try to help them where they might need help. I think that is what I would do as a teacher to make a difference. For my kids to remember me, oh so Ms. Espinoza me ayudo como aser (helped me learn how to) add, how to see these things differently. So once they are no longer here, it could be easier for them going to college or whatever it is they are going to do after. You know? I would pay attention to my students, and I would gladly stay extra to help them. I would make time for them, how Isela would do that all that time. To motivate them to become someone in life, whatever it is. A construction worker, a manager, whatever they want to do. As long as they learn what they have to learn. Whatever it is beneficial for them, that they need to learn for their lives. Like math. It is beneficial for us to learn. Yo siento que yo aria eso (I feel like I would do that). I would love for them to learn something."
>
> Anahi responds, "I mean, there is always teachers that are trying to follow the curriculum. But I feel like you leave more people behind trying to do that. They are still not going to learn, they are still not learning, they are still leaving them behind. Even if you test them, you allow to like, go to the speed, bajale a la intensidad (lower the intensity). Si le bajamos a la intensidad de matematics (If we lower the intensity of math) more students are going to get it. There will be more space, more time for them to understand the subject. They need time. That is one thing we are not giving them because it is too much. Ummm and even though, si seguimos con esa intensidad (if we continue with this intensity) it is like, the students are going to be left behind. Que es mejor? Que se queden asta mero atras o que suban un escalonsito en un largo plazo? (what is better? That they fall behind or that they move up a step in the long run?) So, yeah, I will say to that teacher if they ask me, about tests and things like that."

What does it mean to do mathematics? What does it mean to be good at mathematics?
Jenni knows that she is not familiar with all there is to know about being a teacher since she is not in a classroom, yet she constructs a vision of her future self as someone who will attend to students who take the longest to do work. She uses this vision as a way to challenge the master narrative about doing math quickly. More implicitly, her vision also challenges the idea that those who take the longest are not seem as smart. She sees her personal responsibility as one that should not be guided by grades but rather by her classroom observations. She notes she would look for the children that take the longest and help them, support them. It is unclear why she chooses the "children that take the longest to do work" but one conjecture is because they are a reflection of her. In many ways, taking longer when doing math or anything else is seen as a

deficit. Hence, she is not going to meet with them because she wants them to be fast, she does it to support them emotionally, to motivate them to continue with schooling or as she says, "to becomes someone, whatever it is they want to do." This is critical: she does not position "children that take longest to do work" through a deficit lens, but rather she positions them as kids who take a while to get things done and that supporting them will keep them from falling behind.

Anahi agrees with Jenni and Inez (Episode 3) about how marching through a curriculum leaves people behind. Her choice of language again moves away from deficit views of children and focuses on the structural component of curriculum demands. This challenges the meritocratic individualism that is embedded in American culture. Thus, all these women are developing critical-racial-mathematical literacy that attends to the ways in which fast-paced mathematical learning is harmful in the classroom context and moves away from deficit views of children. Another important aspect of this episode is the call to pay attention to the nature of learning. It seems that ultimately even when going through a fast-paced curriculum there is a lot of learning that does not happen because children are just going through the motions and catching up.

In summary, this vignette centered the classroom environment as a place to investigate how to build a collective math community. As the women formulate their understanding of what this could be, they begin to challenge master narratives about what does it mean to do math, who does math and what does it mean to be good at math. In the next shorter vignettes, the women discuss further similar issues that occur within formal math spaces.

Shortcuts in Mathematics

The women have finished doing a math problem together. They were able to find the sum of the first hundred numbers and are now discussing whether they had experienced problems similar to this one when they took math classes. In this vignette, Jenni begins to ask whether all these problems had shortcuts which leads to a discussion about quickness and multiple ways of representing problems. This conversation helps Jenni push on the idea that there are multiple ways to do math problems, a challenge to the master narrative that there is one way of doing math.

Session 3

> Sandra asks if the women had done math problems where the push is for problem solving. Jenni quickly responds in Math 308 and Luz nods. Inez responds that she feels she has seen something similar. Jenni then asks, if we think all word problems have a pattern? She then explains what she means by a "pattern."
>
> Jenni responds, "Adding to that Inez, I was trying to think about pattern/shortcut. Seeing that there is an easier way to do this, to get the answer. In that sense. Not really the pattern, in this case it was a pattern but yeah. In that sense."
>
> Inez responds to Jenni, "Like a shortcut."

Inez continues, “I think there are shortcuts, I think of word problems. There are so many ways to get to the answer. We all have our ways of going about it. I am sure there is a more, like a shorter way, right? To go about it. Then maybe we will be able to conceptualize it, or rationalize it in our minds. I tend to be in the middle. I take a longer route but that is because that is what works for me. That is what I feel confident. But yeah. To answer question, my opinion is yes. There is always a short way to get to the answer.”

Sandra responds, “From your experiences, do you recall that? You were doing these problems and patterns or strategies, you came up with them? You discovered them? In your past experiences in math?

Inez asks, “That we discovered it? Or that we realized it because someone pointed it out?”

Sandra responds, “It is a distinction, and I am not sure. Whichever one.”

Jenni begins, “For me, when I was taking math 308 and 309. We would always be checking the homework. We would have problems like that. And some similar to those types and I remember that a lot of people around the table, we would have different answers. No same answers but different ways of doing. And I would always do the long way. I didn’t know how to do it their way. I don’t know what happened to you, Inez. When we were in class”

Inez laughs, “I can’t think of any examples that class in particular that stands out or that I discovered a faster way of doing things. I can’t even think of an example from my community college. I remember being in that class and we got a lot of word problems. And they were really hard. Really hard to visualize, umm, he was all about that. And so, I remember that for me, it became super fundamental. I would say in all my math career, it was the first time that a teacher engrained in me how visual instruments would be helpful for me. Drawing it out to visually see it. I could say that was a shortcut, or a tool that I learned, helped me to get through solving problems in a quicker manner. By drawing things out. That is what I was telling you earlier, when I could not understand why 2 – (-1) was -3[15], I sat there and started drawing out number lines. I need to see why, that doesn’t work. How is that possible? And yeah, that has really helped me.”

What does it mean to do math?

In the vignette, Jenni and Inez both share experiences where problem solving involved multiple approaches to doing math. This is a direct challenge to the master narrative of doing math as a procedural one-way approach. Specifically, Jenni asks whether there are always “patterns” for word problems – implicitly, that there are shortcuts for solving such problems. In the problem that we had done together, the women noticed that there was a strategy one could use to find the sum of the first one hundred numbers, pair the first and last numbers to create 50 pairs of 101

[15] Inez had shared earlier that her daughter’s textbook asked them to show why 2 – (-1) = -3, this sent Inez in a spiral as she knew that it was 3. She explained her body’s response because she knew the correct answer was 3 and not -3. Until she was able to accept that the textbook was incorrect, she felt a release in her body.

and then sum them up. While this probing began with Jenni's question of whether all problems have a shortcut, it led her to reflect on her previous experiences. She recalled the Math 308 class that she took with Inez; she knew that there were multiple ways of solving math problems. These kinds of problems were intended to get away from the idea that there is one single way of doing math problems. Yet, Jenni suggests that there is a hierarchical way to viewing these various solutions. She says, "I remember that a lot of people around the table, we would have different answers. No. Same answers but different ways of doing. And I would always do the long way." Tacitly, the long way is not as good as shorter ways.

Yet, Jenni never speaks about quickness as she talks about shortcuts and long ways. It is an implicit assumption that Inez picks up and instead of speaking about shortcuts talks about a "faster way of doing things." As Inez begins to reflect on her experiences in college math classes, she begins to realize that modeling things visually sets it up for her to do mathematics quickly. That evokes the master narrative about quickness. In many ways, the women begin to think about how their own experiences in math classrooms have communicated the messages that even when there are multiple ways to do mathematics, some approaches are preferred versus others. In many ways, the approaches or solutions that give you an answer quickly are preferred. As the women challenge these normative ways of being in mathematics classes, they are coming to see as well what is socially constructed as being important in classrooms. Ultimately in math classes, the short way is what is desired.

The following vignette shows more explicitly how speed is talked about, through Anahi's conception of a justice perspective. Anahi shares some thoughts from the perspective of having been a tutor trying to help a student keep up with his schoolwork. Jenni adds to the conversation by focusing on the notion of voice. The vignette challenges two master narratives: what does it mean to do math and what is math.

What is justice in mathematics classrooms?

> Sandra poses the following question to the women, *what is justice in math classrooms?* Jenni laughs and says this is a difficult question. The other women nod in agreement and start laughing.
>
> Anahi begins, "Pues es todo eso. Having a voice, being able to feel like a … let me see.. se me olvido. Feeling justice in math is like having the right to choose … or the right to like como a que speed or eh, que speed you want to learn math. I feel like math just goes by. Like everyday you are learning something new. Right now, I am tutoring a high school Math 2 student. And he is so behind. Every day it is a new thing, so he is so behind, he is lost. Right now, I work with him twice, he is so behind, he is so lost. He doesn't even know how to connect every subject they are doing because everyday it is something different. So, he is barely learning what he learned last semester or he is barely getting the concept of last semester but we are now in another semester. Now it is a different thing. It is no longer algebra, it is geometry. And now it is not… if he is barely getting the concept of geometry and now, they are doing advanced algebra. All of these topics, he doesn't feel – he is not given the right to go on the speed that he needs. So that he can get the concepts. He is not given the voice or the right to have a voice and decide, you know what, I am going to take a full week to learn one concept. Everything it is something new. And I feel like he is not given the justice in his math class. Umm, even

though his mom has sent a ton of emails to the teacher, complaining, or not complaining but to ask for extensions. So, he is given the time, but es mas homework that has been added. So yeah, he has until the end of the semester but he is not going to learn a whole school in just one semester. Nomas tiene una oportunidad to work with me to do one or two homeworks. He will not learn those concepts with those two homeworks. While everyone else is already on their tenth homework. That is part of it. And now given the right to feel well in the classroom or esa paz interior. Math se siente bien. Math, I can feel, se esta estresando. It is stressful for him. Math is not giving him the, como dice Inez, I have so much work to do. I am in spring break but mi mente esta en otro lado. Mi body esta en spring break y mente esta en otro lado. That is the same way for him. The weekends are for him to enjoy. But his weekends he has to work with me for two hours. So, yeah."

Jenni asks Anahi, "What grade is he in, Anahi?"

"He is in 10th, a sophomore." Anahi responds.

Jenni nods and continues, "Now that she [Anahi] explained that, I feel like raising your voice in the classroom, even when all students are understanding the material faster than you. I feel like sometimes that you do not have a voice to ask a question because you might think the kids near you are getting it. They are like, 'Oh my gosh she is asking that?' And the teacher gets irritated and sometimes they are older women y se enojan mas rapido, o se molestan (they get upset faster or get frustrated). When you ask certain questions for them that, even though they are questions that you can ask, but for them it is like sometimes in younger grades we should already supposed to know this. But like sometimes we did not learn exactly o aprendimos (or learned) the right way, or they did not teach us the right way. I think that is where the voice comes in that setting, in a class setting. At least for me that is why I ask after class. That is the main reason or their office hours because if I do it during the class, everyone else is like 'otra ves, esta girl, otra ves.' (again, this girl, again) You know? Yeah."

What is math?

Anahi shares the story of a student who is really struggling with keeping up with his work. He has missed the previous semester and is now catching up, doing two semesters at the same time. Anahi sees how fast paced the course is, in a different way than how the women previously spoke about pace. Anahi in many ways conceptualizes the way the student experiences math as a disconnected and fast-paced subject. She notes that the student is given extensions, but it doesn't really matter because the expectation is for him to complete the assignments without centering learning. And most importantly, what Anahi sees is that this is not just about this particular student. Here Anahi challenges the way math is constructed as a set of disconnected concepts that ultimately lead to no learning. Furthermore, she argues that the student having to rush through the material does not provide "paz interior" and that instead math is stressing him. Anahi's experience is that when speed is not considered within a justice perspective in mathematics it creates unjust learning experiences for students. This is important for a critical racial math literacy that attends to students' humanity and critiques the way that the math content is structured in schools.

What does it mean to do math?

Jenni offers another case situated within a classroom, that is socially constructed by peers and the instructor. Jenni shares about the importance of having a voice even when everyone is understanding it faster than "you." She explains that sometimes people do feel they can ask questions because of what others might think. She mimics responses from peers but also one from a teacher. Hence, the conception of voice offers a direct challenge to the master narrative of math as a fast paced activity, contrasting producing fast answers with supporting student thinking. Toward the end of the vignette, Jenni shifts the you's into I's and she shares her rationale for not sharing during class. This is very important because the hypothetical situation that she began with became a description of her lived experiences. For Jenni, voice is silenced when quickness is prioritized by both the teacher and the other peers. Thus, when considering through a justice perspective Jenni develops an understanding of the need to center student voice when doing math. This is critical for developing a critical-racial literacy.

In summary, the vignettes and the short episodes showcased how the master narratives where challenged in mathematics classrooms. For the women, much of their challenges centered around students' humanity and dignity in learning.

A Future of Possibilities: Cultura, Comadres y Comunidad

The previous section offered cases of the women sharing stories about their families and the classroom, and how the pláticas provided opportunities for the women to challenge, amend or uphold master narratives about mathematics education. As I shared in Chapter 4, pláticas offer opportunities to foreground the imaginative, constructing new opportunities for learning and being with one another. This section offers instances of when the women expressed their desire to imagine other ways in which schooling can be more humane for them and for future students. Their ideas are grounded in their own experiences in the group Las comadres, where things were done differently. Such instances directly challenged the master narratives. In the episodes that follow I showcase the possibilities that are co-constructed by the women.

In these episodes the master narratives that are invoked are what it means to do math and what is math. These master narratives are explicitly challenged through the construction of an imagined classroom that is grounded on relationality.

During the first session, the women come to discuss what Luz calls "teaching the Mexican way," noting that even when teachers were Latinx they did not embody that. Inez offers her own interpretation of the Mexican way and says,

> "One of the things that I was thinking about like Mexican-ness and math, and honestly, I don't think I saw that this much, until I saw that in our (to Jenni) M309 class. To me, we come together in community to help each other out, that is part of who we are. Like padrinos, we all pitch in. Being community with one another. Where in other times, it is really competitive as in there is an outreach for that. Sometimes you might ask, what did you get? Or what was your answers? The first time I saw that was with the comadres. Really help each other and support each other emotional. It is part of our culture as Mexicanas."

> Anahi responds, "I mean tambien es agarar las cosas buenas de nuestra cultura (it is also about taking the good of our culture). Como las padrinos, comadres, (godparents) supporting each other. I feel like in math, in learning history, y tambien con esta Mexicanidad through math we teach history con los Aztecas (the Aztecs). Esa Mexican way, learning our history through math. That is the thing, no se nos enseña (we are not taught) that we are good at math. Que somos capaces. (We are capable) Cosas que no nos enseñan y cositas asi que no somos capases (Things that we are not taught and we are taught we are not capable) until we come into community. We come together y aprendemos (we learn).

What does it mean to do math? What is math?

Inez begins by discussing the community that was constructed outside of the competitive nature of the math 309 classroom to support one another mathematically and emotionally. She notes this is the first time she has seen it and it is part of the shared history of being Mexicanas. She provides the example of padrinos who are like "godparents" that historically serve to pitch in when people are having expensive celebrations or need help. Thus, making it a communal activity versus an individual one. This is a direct challenge to mathematical activity that is conceptualized as individual and constructs an idea of participating in mathematics where one is nurtured emotionally.

Anahi builds on this, arguing that culture is not all good but that we take the good and build on that. She also offers another way in which she thinks about Mexicanness in a classroom: learning math to learn "our history." This reconceptualization offers a new way of thinking about mathematics that also captures people's cultural identity as well as opportunities of empowerment. Part of being a mathematics social justice educator entails beginning to image the kinds of changes that are possible when seeking to affirm their own cultural practices and cultivate them in the math classroom.

In the coming weeks discussions of empowerment and community come up again. Anahi connects it back to their community with las comadres. She argues that it is not only about being in groups but about building community.

> "Tambien una de las cosas que dijo (one of the things mentioned by) Inez. One of the ways to empower or to make it, you know, we found that when we were in Las Comadres. I feel like that is one of the things, I have met people in my math classes that I have taken that where like, we are not and not just them, just in general. In math we are not used to asking for help. We are scared that they might think we fail or pass. If we pass then they see you as la que sabes and if you fail then no sabes (you are seen as if you know and if you fail then you do not know). And if you don't know then I am embarrassed to ask for help. I feel that is one of the things tambien. We are not used to doing that. Como si a mi me preguntan por ayuda, (if they asked me for help) I will help. Pero before las comadres, I would not offer myself to help because I didn't want to make others feel less or that I was presumiendo (showing off) that I know more than you. That is one of things, in math, ay mucha competicion (a lot of competition). Either you know or you do not know. Y si no sabes ya te chingaste y si sabes ya que bien por ti (If you do not know then you are screwed and if you know then good for you). One of the ways to empower is through comunidades (communities) in math classes."

Anahi continues,

> "Y tambien no como, I was thinking, que nada mas vamos a ir a juntarnos a estar en grupito. (Also, it is not like I am thinking let's just hang out be a group.) Because we do, we work in groups. But that is not creando comunidad (creating community), that is creando un grupito (creating a group). Tu ases todo el trabajo y ya los demas (You do all the work and the other people) receives the grade. Es mas como (that is like), las comadres es un example. It is not just any people, we not only learn but we share something in comun (common). Nos miramos reflejados en los demas (We see ourselves reflecting with each other). Es como you know, compartimos, creamos confianza para pedir ayuda (We built trust to ask for help). Sin confianza no puedes pedir ayuda (If you do not trust people then you cannot ask for help). Dr. Lopez nos iso crear confianza entre nosotros (he made us trust one another). Before I would not talk in our pláticas. I would be there calladita y poco a poquito empese a crear confianza (silent and slowly I began to build confianza) and that allowed me to offer my help. Ya despues tuve la fuerza de decir (Later I would then have the strength to say) 'I am willing to help' and even myself to ask for help. So, how do we create confianza (trust)?"

Jenni then joked, saying we need to build clickas. The women went on to discuss the way in which there are few opportunities to ask for help.

What does it mean to do math?

In this conversation, Anahi conceptualizes further comunidad in mathematics within their community of comadres. This shift pushes on what it means to do math in a classroom centered on people's humanity. Anahi begins discussing the hierarchies that exist even in that community space – it often positions some people as the ones who do know and others as the ones who do not. These hierarchies made Anahi aware of her position. Her way of disrupting the hierarchy is by not offering help. Her not offering help was important for Anahi to not make her comadres feel less than her; she was attending to their well-being. And she would go on to continue to say that it is not enough to just create groups in mathematics. She centers relationality, trust, among people to really build on the strong relationships that are required when one seeks help in mathematics. She uses her own example of not speaking during our pláticas, not offering help, and not asking for help because she had not built that trust with people. Anahi was also trying to protect herself specifically because speaking up meant she had to be vulnerable. Anahi was so used to math being an individual activity, something that she loved about it because she did not have to talk to other people about it. When she says, "even myself ask for help" is a big step in also being vulnerable that she needs the help. Hence, Anahi is constructing an understanding of the relationality that is necessary when it comes to being in community with one another.

What is also powerful in the stories is that Anahi is connecting back to las comadres, and her math classes help shape opportunities of possibility. That is, it is an opening for Anahi to not feel stuck or constrained in what is present and can imagine what is not there yet but could be possible in more settings. Again, something that is necessary as a social justice educator committed to cultivating different kinds of learning experiences for children.

In the next encounter, Inez and Anahi co-imagine the possibility of cultivating an ethic of care from a young age. In this encounter they continue to challenge the master narrative of what it means to do math by taking a more relational approach. Anahi begins,

> "That is the type of care we need to build. Desde una temprana edad. (From a young age) It takes time and effort. It is not like we came and said we want to be part of this space. I did not want to be part of it, it was too much caring for me. I was not used to feel that way. At the end of the day, this was the result and now we have comadres passing the class, passing the CBEST and passing ... If we had that time to build that type of community in the classroom. But teachers only care about the cantidad de matemáticas (the amount of mathematical content) but not the cantidad (amount) of getting to know students. Like Lupe said, I can stay after school but that is her time. Like Itzel, she stays in the classroom until 7 pm. She doesn't mind sharing that time, but she should, but that time is the time that the curriculum didn't let her take the time. Ella lo esta sacando de ella (she is taking it from her), it should be in the morning time. For all the kids, so para sentirse todos en comunidad pero no nomas 2 o 3 estudiantes (so all could be in community but not only to the 2 or 3 students) because I bet more students needed that and they couldn't stay after school."
>
> Inez responds, "I was thinking about how it would be if all the comadres taught in the same school. The community of the teachers would translate of the caring of the kids, it would be an interconnected of the things. So, we do not start from the scratch, it would be amazing, and I can see that. I do not know how we get there, because it is idealistic. Like you all said there are people who are there just to get a paycheck and it is really hard to build community with people like that."
>
> Anahi agrees, "We should take the school here in East Salinas. Or at least we all apply!" All the women agree and laugh.

What does it mean to do mathematics?

Anahi argues that doing mathematics and being in mathematical spaces requires centering relationality, care. Anahi continues to push on the idea that like trust, care is not something that is built easily. She uses herself again as an example and the willingness that took her to care for others. She found that care to be meaningful not only at the interactional level but also has had material consequences. That is, women were passing classes, passing CBESTs and doing well academically in their journey to becoming teachers. And she connects that to students, that students deserve those kinds of opportunities. Jenni had earlier commented on supporting students after class, which is what Anahi references when she says that it should be done for all students. That all students deserve opportunities to be in community, to be cared for; that those opportunities were not there because curriculum hindered it. Because Anahi and Inez have witnessed other forms of being and becoming with their comadres, they are inspired to do that in their classrooms. In their ideal world there would a school in which likeminded people would teach, and their teaching vision and philosophy would be interconnected. That is the kind of the work that they would love to be part.

These episodes were about building different kinds of possibilities in mathematical learning spaces challenging the normative and dehumanizing ways of what it means to do mathematics. These possibilities of the future are integral aspects of being a social justice educator that entails imagining what exists and its constraints. Yet, the last episode ends with Inez acknowledging some of that idealistic nature of the conversations, grounding it back to reality.

Summary

The four master narratives that were introduced at the beginning of the chapter were problematized through the stories the women shared during the pláticas. Often one single invoked multiple master narratives, for example, the first vignette explored the four master narratives through its three episodes. These narratives were challenged or upheld by the women as they shared their stories about their parents doing mathematics quickly and accurately. Another example that highlights the complexity of the master narratives within the stories is the example of Jenni explaining her rationale as to whether math is a gift or not. Jenni problematizes the dichotomy of the question and through her explaining she constructs the idea of "seeing math quickly" with smartness. Yet, as she shares the story of her brother, and be taught multiple perspectives on how to do math, she reinforces how through multiples perspective he can be seen as smart. Thus, working hard when doing mathematics can be a form of perpetuating smartness which deals with the master narrative about math competence.

Throughout the vignettes we got a chance to see how these master narratives were invoked, often contradicting, and coming in tension with one another. In fact, they operate as a system, which is complex and not straightforward. As the vignettes allude to, engaging with one master narrative on the basis of a lived experience may potentially reinforce another master narrative. Hence, these master narratives are dependent on the local context which in this case are the stories that the women share about their lived experiences.

Chapter 6:

"This is why this work is hard, you really have to look at it from so many different angles and approach it cautiously. I think also with the understanding that, unfortunately, messiness is a part of it."
- Inez (Session 9)

Introduction

The quote from Inez given above highlights the complexity involved when teaching for social justice that is the focus of this chapter. There are no clear-cut solutions to how one teaches for social justice, how one navigates the institution of schooling or how one designs curriculum. The data presented in this chapter highlight the complexities that the women explore as they specifically ask the questions, how do I navigate the institution of schooling when I seek to change it? And how do I understand social justice lessons more deeply?

Chapter 5 showed how pláticas created opportunities for the women to build new understandings related to justice and math. This chapter highlights how the maestras vulnerably and authentically grapple with the questions posed above. These conversations highlight their commitment to justice and how they seek to embody it, documenting the ways they uncover the complexity of the issues they are dealing with. Consistent with the identity-focused nature of pláticas, this chapter (like the whole dissertation) centers people's experiences and addresses how they imagine enacting social justice work. It addresses the following research question:

> *What entanglements between theoretical aspirations and pragmatic ways of thinking about justice and mathematics do these prospective teachers experience?*

To address this question, I wanted to investigate how the women's emerging views and experiences came into conversation with the ideals of teaching for social justice. In essence, all four vignettes grapple with social justice ideals that are challenged, rejected, or amended by the women. Their stance highlights the complexity of merging practice and theory (Bartell, 2013; Brown et. al, 2019; Gutstein, 2016; Ladson-Billings, 2014). The women's perspectives are increasingly nuanced and complex, contributing to the argument that social justice work in practice is quite complex and not linear. The three ideals underlying the women's perspectives are listed below.

Ideal 1: Social justice work is action-driven work

The core component of social justice work is the need to act and challenge existing forms of oppression. This ideal is embedded in lessons that teachers teach, it is embedded in teachers' teaching philosophy, and it is grounded on an urgency of change. From this perspective the world as it exists is racist, anti-black, capitalistic, homophobic, transphobic, and other forms of isms that makes it hard for marginalized people to exist. Thus, action must occur at multiple levels: individual, collective, and societal.

Ideal 2: Social justice work engages explicitly with political issues

Teaching and learning are political acts. Often, people assume that when educators talk about race, they are making it political. In fact, not talking about race is also a political move. Thus,

while I understand both choosing to or choosing not to address issues of justice as political, social justice asks for an explicit to attention to the political aligned with an understanding of justice. That is, we engage in the political to understand the world through a new lens to which we could then act upon.

Ideal 3: Social justice work transforms lives

As Ideal 2 and Ideal 3 are further taken up, the hope is that social justice work will transform lives. This is a result of taking action and paying attention to the ways systems function to oppress people. The transformation can occur individually and collectively.

Chapter Overview

See Chapter 3 for a detailed view of the data analysis process. In brief, I approached data analysis in 3 phases. First, content logs were developed for thirteen video recorded sessions of pláticas. I conducted open coding to develop a list of moments where co-participants explicitly or implicitly discussed the complexity of enacting justice perspectives in a school setting (Charmaz, 2006). Although the coding was open, I paid close attention to the moments where the women expressed confusion, contradictions etc. I then revisited the data to contextualize those moments within the larger corpus of data and identified key narrative themes. In the third phase, I chose moments that highlighted those themes, specifically digging into the complexity of the vignettes.

In Part 1 of this chapter, two vignettes highlight the women grappling with how to challenge the institution of schooling and the tensions that may arise as a result. As the women challenge the institution of schooling in general, they are faced with dilemmas about staying true to their justice-oriented commitments given the realities of their personal lives: If they act on their commitments, they might face material consequences such as losing their jobs. They come to realize that they need to learn how to safely navigate being part of the institution. In Part 2, two vignettes center the women grappling with teaching about social justice mathematics by focusing on curriculum. In the first vignette concerning a social justice lesson, the women grapple with the challenges of raising political issues in class. They are faced with dilemmas about getting in trouble, surfacing trauma and calling out justice-oriented commitments beyond schools. In the second vignette, the women discuss designing their own lesson about social justice and they grapple with centering the lived reality of children, perpetuating capitalism, and reinforcing a victim mentality.

Context for reading the vignettes

In the vignettes below Inez makes a vital reference. Inez mentions Maria Hinojosa and her book *Once I was You,* a memoir of her experiences growing up in the United States as an immigrant child. At the time these pláticas were occurring, Anahi, Inez and I participated in other pláticas with other mujeres where we discussed this book; we even held a plática with Maria Hinojosa. Inez had quite conflicted views about Hinojosa and specifically some of the language she used about her book. For example, from our personal conversation we discussed an Instagram post where Hinojosa stated that she was "the voice of the voiceless." We found the language problematic since it positions immigrants through a deficit lens, as if immigrants do not have a voice. In the first part of this chapter, Inez references the advice Hinojosa had shared about having an ego and in the second part Inez talks about Hinojosa's book and her thoughts related to journalism.

Part 1: Challenging the institution of schooling

One of the core components of being a social justice educator is enacting change both within and outside of institutions of oppression. In the following two vignettes, the women embody that core component as they seek to transform the educational system they will now be part of as educators. These two vignettes center the assumption that systems of schooling are inequitable and thus, their duty as social justice educators of color is to transform them. This is easier said than done. These two vignettes center the complexity entailed.

In the first vignette the maestras grapple with how to challenge the institution by centering students' humanity, learning to find a balance, and not losing their job or their values. In the second vignette the maestras continue to grapple with how to challenge the institution, understanding the way the system works, and having the courage to speak up and not lose yourself.

Vignette 1: Navigating the institution of schooling

This vignette is presented in three parts. In each part, the women grapple with the idea of challenging the way institution works and the possible tensions that may arise as a result. Through this vignette, the participants takes a teacher perspective that is connected to the personal realities that they are navigating.

The women are discussing their conceptualizations of justice through their selected images. Sandra is the last person to share. Figure 14 shows Sandra's screen and the five images she chose to depict justice.

Figure 14: Sandra's depictions of justice

Episode 1:

> Sandra had shared her images depicting the images that represent justice for her and what each image represents for her.
>
> After some silence, Anahi begins, "Algo que se vino a la mente (Something that came to mind) when Sandra was talking was that we are always working towards justice por un mejor futuro (for a better future). Her images show de esa manera, we should all be working for justice. I guess, dar lo que no recibiste (give what you did not receive). Going back to the quote de Inez, what was your quote? *Laughs* Ahorita me acorde de la House on Mango Street que dice come back. Porque when we think about it, ve a la escuela por un futuro mejor y muchas veces (Because when we think about it, go to school for a better future and a lot of the times) we want to get out of the hood. Justice is like come back, as algo mas mejor (do something better [here]). Give back to your community, dar lo que no recibiste (give what you did not receive)."
>
> Inez then says, "Will you scroll back to yours Sandra? Something that stood out to me was like, I feel like, I don't know, maybe because it is just in my face. This humanity thing. There is a lot of humanity in your images, and I think that is really central, I feel like it is central to your message here. The importance of humanizing people, right? And I love it, I mean yeah, the classroom one is also really compelling. As a teacher it has been really hard to be there and be a part of something that has like so much injustice embedded in it and feeling like, God I cannot believe that I am taking part of this and trying your best to make changes. Make changes somehow, do things off the radar, you know? That makes a difference and I wanted to let you guys know when Anahi was talking about, the whole notion of confianza with the parents and teachers and how that really makes differences for students overall. Yeah, that really stuck with me a lot. That has been my work, that is what I have been trying to do, to restore some sense of justice for my students and for the families. That really stood out to me as well."

Both women in this vignette challenge the inequities of schools by disrupting the way that institutions work. In this episode, this shows up in different ways for Anahi and for Inez.

Anahi challenges the way the institutions are set up by calling out the deficit views of communities (the hood) that people may hold, and demanding people be accountable to come back. Her use of the "us" also includes herself and how she possibly also held the idea that home, the hood, was not a good place.

Inez seeks to challenge the way the institution works by learning to navigate it and centering humanity – but this work has to be "off the radar." She seems to have experienced the dehumanization of schooling as she notes that it has "been really hard to be there and be part of something with so much injustice." Her way of navigating the institution is by making changes "off the radar" so that others do not notice. Another form is by creating more dignified relationships with students and their families. Inez is beginning to grapple with how to navigate the institution and make changes within it in such a way that is not too radical. Inez is pointing to the challenges of embodying the core aspect of social justice – action – and the need to learn to navigate those challenges.

In episode 2, Inez continues to grapple with the complexity of challenging the institution and balancing it all out to not come off as radical.

Episode 2:

> After some silence Sandra asks the women, "I really like one of the things that Inez said, being in a system that is unfair and like having to navigate that. Thinking about Lupe and her workplace, this is something that is across spaces and people experience these things and then what do you do? I was thinking a lot about what Lupe said, 'yeah it is fine, if they fire me, I am going to sue them' but I think that your coworkers are going to miss you. The people that you tell them that something is not fair. So, it is kind of like, what do you do? Do you leave and say eff this thing because it is messed up? Or do you go in there and cause problems?"
>
> Jenni responds, "I advocate for them! That is what I do. So, I am there. You know? And I hope to God that they learn something from me, and they will remember and learn from it."
>
> Sandra affirms Jenni's response. She reminds them that we will not be there forever so we hope that students will advocate for themselves.
>
> Inez responds, "Yeah, I totally agree what you are sharing and how complicated it is. I walk the fine line all the time. Where you feel like, *deep sigh you* know, that you should do something. You know that you should take more bold action, you should probably call it out and name it explicitly and you know that action is going to do some good. Not only because you are going to model, you are going to model for the kids and you may cause some sort of change. But then you may get fired and you may go and then who takes your place? Someone that causes them more harm? I don't know. It is a really hard thing. It is very complicated to navigate, how you do something. To be calculated about the things that you do so you can maintain that balance of like I need to cause waves but then I need to not make them so bad I lose my position here. But then it is sometimes like you question the whole thing. Do I even want to be part of this? This is what kids are subjected to and kids don't have a choice. So, like, I kind of need to be here, you know? But sometimes I am seriously disgusted, and it is hard."

Inez continues to challenge the inequities of schooling by arguing that one must take "more bold action." As she explains "I walk the fine line all the time" and the "you should probably call it out" and "you know that action is going to do some good," Inez is grounding herself in the core component of justice, action. Yet, her personal responsibility to act is coming in tension with her own livelihood and the material consequence of losing her position. Being on guard and walking the fine line all the time is a heavy burden to carry. Yet, she ends with "I kind of need to be here," a personal responsibility to being in the institution. In terms of the consequence to losing her job, Inez understands that if she causes too many waves, she is easily replaceable. Yet, she worries that whoever replaces her might not be as critical as she is and ultimately may cause more harm to children. Hence, her solution to this tension is to try to balance it all out.

Episode 3:

> "It is hard too because we are also compelled by other things. For example, financial reasons or economic reasons, you know? God, yeah, I mean, I say that all the time. Fire me, I say this all the time. Fire me, it is fine. But it is not fine, I kind of need my job too. It gets to the point that I put all my chips on the table. This is how much I am committed to my values, and I am not going to stray from that and if this is something that is so offensive to you, that I have to be fired from then I will be fired. Otherwise, I can't in good consciousness, I will be sick to my stomach if I continue on this path. And I would love to be in a place, and most of us would love to be in this place, to wheel the power that we do not need you. We don't need this job but it is no true, you know? And that is another thing that plays a factor that further complicates that situation for us." Inez adds.
>
> Sandra shares the quote she heard at the Speculative Education conference where a professor shared that as long as schools exist then she will be there doing that work. Inez nods and responds, "Yeah."

In this episode, Inez continues to grapple with working within the institution of schooling and making changes. She notes the material consequence of losing her job, and attends to the fact that losing it have a significant impact on her life. A job provides financial security but at the same time, her commitment to her values is equally important. She cannot stay in this path in "good consciousness" if things do not change. Hence, Inez is grappling with whether she should leave/get at fired or staying and potentially lose herself. Both situations have a direct impact on Inez's livelihood. Values and security are in tension: being true to her values may cost Inez her job, while suppressing her responses to social injustices may make her untrue to her values.

In summary, the three episodes were evidence of the maestras commitment to enact change within the institution of schooling. Yet, as they sought to challenge the way the institution worked, they constructed three tensions: how to navigate it off the radar, staying true to their justice-oriented commitments and the material consequences of losing their teaching job. Vignette 2 continues to focus on the women's commitment to enact change within the institution of schooling. This vignette centers the teacher's perspective and continues to delve into similar issues as Vignette 1 but now another important dimension emerges, the student perspective, as they continue to grapple with these issues.

Vignette 2: Reimagining Math Education

This vignette is presented in two episodes. During the first episode Inez outlines a plan to challenge the way math education is currently practiced and tensions emerge about the ability for teachers to do that. The second episode builds on the personal dimension of "can I do it?" and begins to move the discussion away from individual to collective by accounting the student perspective. Both these episodes grapple with the notion of creating change within math education, with tensions arising between the agency of teachers and the possibility of teachers losing sight of what matters.

Episode 1:

Inez speaks about the need to reimagine mathematics. She leaves for a moment to check on some noise she hears in her house. Anahi asks if there is hope to which Luz asks what she means about.

Anahi responds, “Oh no, you know how Inez said about like reimaging the school. So if we reimagine, yeah of course we have to reimagine it. In the first place, how do we do that? Como lo reimaginamos? Como lo empesamos? And si es algo que temenos que start from the beginning. Desde la raiz. Right? So, it is like, entonces ya floresio esa raiz entonces como comensamos otra ves? Like otra ves? Como reimaginamos ese fruto que ya dio ese raiz?”

Luz responds, “Si, that is tricky.”

Inez jokes, “We have to rip it out and tear out the roots. Make it all go away. I know.”

Anahi responds, “La forma mas facil! Amonos!”

The women laugh.

Inez responds, “No but what I get what you are saying. Let’s be real. That is an idealistic way of thinking, fuera tan facil, let’s just rip it up. We know it is not easy. So, what are the realistic steps to making that happen. I don’t know what it is. I know that from what I have seen so far, this my first-year teaching, and my own exposure of the culture of teachers and admin and stuff like that. I mean, you know, you could, I could see this getting attention. But it is something that you have to be to be the squeaky wheel. You have to be out there, constantly talking about it, constantly proving it, doing research presenting possibilities and advocating for this alternative way of doing math. And starting it from the bottom, it is almost like the dual language program where I worked at. They started all at kinder through second grade and then every year they added another grade. So, I could see that, you know, presenting a new way of doing math, a new curriculum and really advocating for it at the primary level. You know? I am not sure if kinder would matter too much, maybe it does, because they are expecting so much more out of kindergarteners. I think it is possible, it is just a matter of, as dumb as that sounds, you really have to be the person to be annoying, the squeaky wheel, compel them to say no and to give a good reason. Let it be on the record to say no for something that completely makes sense. Our superintendent is always talking about disrupting the prison to school pipeline, it is the thing he talks about all the time. I am sure, if we think about it in my context, if I could present something to him with the spin, on how we could cause a disruption from the school to prison pipeline, through mathematics. A transformation of mathematics education. Mathematics statewide, nationwide, the US performs pretty low in general. Any kind of suggestion to how we could prove would be received and if you frame it in such a way it suits their own goals and the narratives, they are putting out there then it would work. If I would do that with my superintendent and then just hammer it home, I can see how it could happen. But *deep sigh* but I would probably be shut down quite a bit. I probably would have to get support. I think that is how it happens because I have never enacted some change like that. But if I were to take steps that is what I would

> do, organize myself, be vocal and get support so it is more than one person coming at them. And you have to be annoying, unfortunately."
>
> Anahi responds laughing, "Yeah. But then it is like, de donde agarras valor (where do you get the courage)? I feel like it is that I have all of these ideas. Let's do this and that. For me, it is like, de donde agarro valor (where do I get the courage)? I can't even, you know, talk for myself and I want to talk for all the kids." The other women join laughing or smiling.

In this episode, the women grapple with challenging the institution and the tension of playing the game. The question, *can I do it?,* emerges for Anahi. Inez outlines a plan that radically seeks to transform the way mathematics is taught within mathematics classrooms. This is a direct challenge to the (perceived-as-unjust) way that the institution currently works. While how to make productive change is not apparent, the assumption is that this project will create better learning opportunities for students. In this plan, Inez outlines the need to be the "squeaky wheel" and do the work, prove the work, get other people who believe in the work and strategically align yourself. What Inez outlines is a very concise, straightforward, and doable way to create change within the institution of schooling – a strategic plan. Yet even Inez's "realistic" plan does not seem that realistic to Anahi. Hence, Anahi pushes, arguing that for people to create change they should be willing to put themselves on the line for change, and speak up. Anahi's struggle with the plan is that she is unsure that she can enact change, that she can speak and fight for children when she can fight for herself. Thus, Anahi is experiencing a tension between her own capacity to speak up and expectations of her to create change.

In the next episode the women continue to grapple with that tension of "can I do it?" and the potential consequences of building an identity as someone brave enough to speak out. The women also begin to discuss the implications of building that kind of courage for students, another form of creating change within the institution of schooling.

Episode 2:

> Inez responds, "That is why my question to Maria centered around that notion of like, how she says you have to have a big ego. You have to have a really big ego and a lot of self-confidence because in general we are always written off. So, in order to give yourself visibility, credibility you have to walk around feeling that way. And I appreciate that because I think she is right. I do think that you get responses that way. I worry about the corruption that the ego can cause. Because it is very easy for you to be super full of yourself and to lose sight of what you are doing or to become so egocentric that you know, you are doing it for the wrong reasons. You know? But I think she is right, tenemos que (we have to), it is easier said than done. To have the confianza, valor and do something like that but I mean we have to though. Otherwise, it doesn't change, it doesn't change, it will always stay like that."
>
> Sandra responds, "I think that reminds me of Jenni's justice images and the idea of having a voice and speaking out. And how that is central to justice and so I think it is about like justice for us because our ideas are validated but towards something else."

Inez and Anahi nod.

Anahi, "And it goes back once again como enseñarles a los niños, porque esta falta de confianza de voz (how to teach children because there is this lack of feeling and whatever, it starts from there. From the beginning. I am a grownup ya se me ase dificil. So it starts from there, it starts from the school eh que fue donde todo esto comenzo. So, I guess, you know? That would be a form of social justice, a voice. Porque las matemáticas es como de siempre algo bien individual and that was the subject that gave me more confidence to get me where I am at. Fue el trabajo mas individual so it was just me. And there it felt like I could it, I could do the job because it was just me and I didn't need anyone else. And the other subjects, I felt intimidated by the rest. Right? And in math, en mi propia burbujita porque nadie me molestaba and I felt good being there, not being bothered by anyone or having to give presentations. Having to work with this and that, I didn't have to do any of that. That is one of the things that I liked about it, for me, that was what I was encouraged throughout all my schooling. And when I was in math because it did approve that isolation and I guess it goes back to make math more inclusive. Make it more like you have a voice, it is not just you. Yeah."

Sandra reminds the women about common core and says that the reimagination started there. Inez laughs and Sandra asks her why she is laughing. "It is true! The moment I stopped saying, that thought came to me. And it could change it in the opposite direction if the wrong people are reimagining. You are right! But that is my point, we have to get the right people in there, doing that reimagining."

Both Anahi and Inez seek to create change within the institution. They grapple with the complexity of the task in different ways.

Inez's complexity comes with the potential risk of "losing sight of what you are doing." Inez begins with the focus on the "ego" as was the advice that author and prolific Latina journalist Maria Hinojosa offered Inez during a previous encounter. Having the ego would make others believe in the need to change the systems of schooling that are unjust. And she agrees that this is true, that this is in fact how one could navigate not having the "valor" as Anahi had previously mentioned in Episode 1. Inez doesn't romanticize this approach, she understands that it is easier said than done and notes to Anahi, "temenos que," a signal of solidarity towards Anahi that creates a collective "us" to create change. Inez problematizes having the ego and the potential corruption that could come from that. Another form of losing herself and doing this work for the wrong reasons.

Anahi's complexity comes from her own sense of not feeling brave enough to speak up. While the commitment is there, the jump to create change is daunting. Thus, she seeks to challenge the way the institution works as a form of silencing students. She begins to argue for the need to teach children to have a voice from an early age. She views this change as necessary so that more students will not have to learn about how to build courage to speak up. Anahi notes that for her this is difficult, "I am a grownup ya se me ase dificil," and teaching children from an early age is necessary. In particular, she references her experience in the math classroom that affirmed that silence and that individualism and she had to unlearn all of that. In the previous chapter (Chapter 5), she spoke about the vulnerability and work that was needed for her to offer

and ask for her. Anahi is fundamentally asking for children to develop their voice and a sense of agency that is not only about learning mathematics but also about speaking out regarding injustices. This collective approach challenges both the system that is in place to sustain that silence but also challenges Inez's earlier individualistic approach.

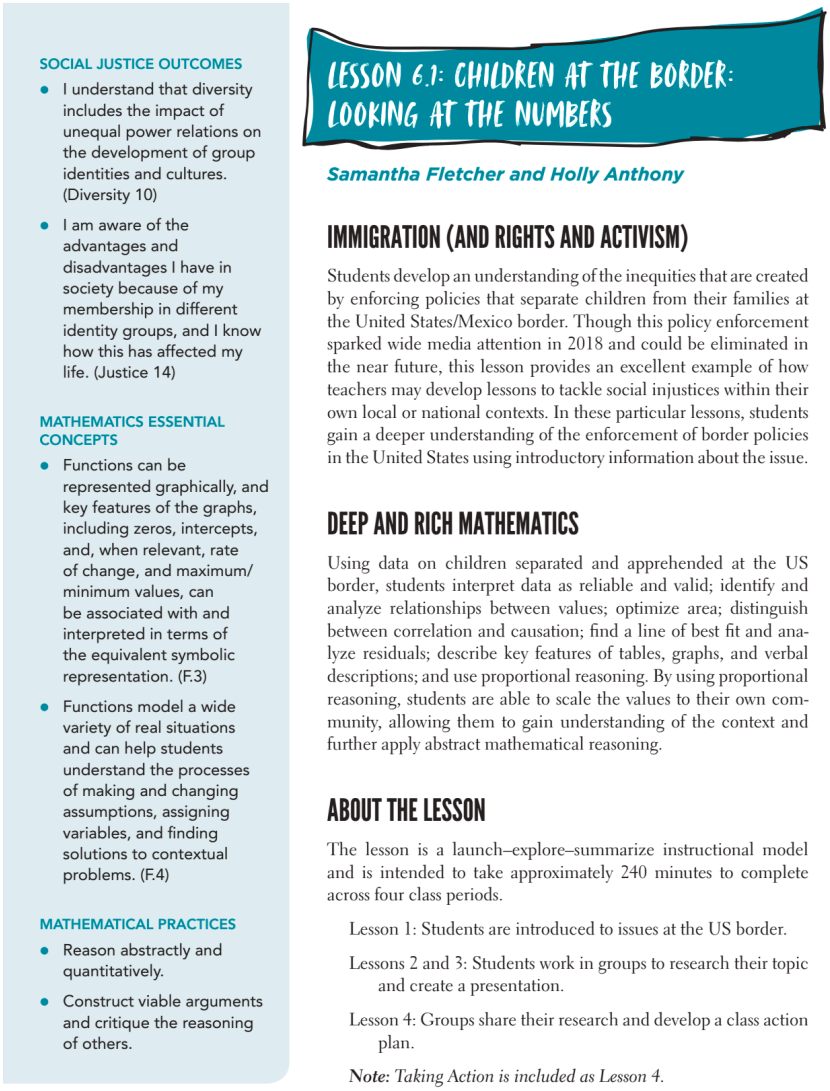
In summary, both vignettes center the need to challenge the way that the institution of schooling exists. Yet wanting change and enacting change are not the same. Hence, the women grapple with situating their personal feelings of ability, repercussions such as losing a job and the possibility of losing one's self.

Part 2: Social Justice and Curriculum

The second part of this chapter investigates the complexity of teaching for social justice. The first vignette focuses on what occurred when the women discussed a social justice lesson that was premade and recently published. The second vignette focuses on the women discussing what social justice lesson they could design for Inez's students. Both vignettes focus on issues that emerge when situating the discussion in a classroom context, attending to the needs of the students they are teaching.

Vignette 3: Children at the Border: Looking at the Numbers

In this vignette the women discuss a social justice lesson published in the book *High School Mathematics Lessons to Explore, Understand and Respond to Social Injustice* (Berry et al., 2020). The book is composed of three parts: 1. Teaching Math for Social Justice 2. Social Justice Lessons and 3. Next Steps. In essence, the book is aimed at supporting people to read about and understand social justice, using extended lessons as examples: a teacher could read about social justice, see some examples of lessons and use the book's advice on how to implement such lessons. The group of authors' advice often spoke about the possibility of pushback or the difficulties of teaching the lesson. The lesson this vignette focuses on is called, "Children at the Border: Looking at the Numbers." It aims at supporting students to develop an understanding of functions and understand that "diversity includes the impact of unequal power relations on the development of group identities and cultures. (page 110)"



SOCIAL JUSTICE OUTCOMES

- I understand that diversity includes the impact of unequal power relations on the development of group identities and cultures. (Diversity 10)
- I am aware of the advantages and disadvantages I have in society because of my membership in different identity groups, and I know how this has affected my life. (Justice 14)

MATHEMATICS ESSENTIAL CONCEPTS

- Functions can be represented graphically, and key features of the graphs, including zeros, intercepts, and, when relevant, rate of change, and maximum/minimum values, can be associated with and interpreted in terms of the equivalent symbolic representation. (F.3)
- Functions model a wide variety of real situations and can help students understand the processes of making and changing assumptions, assigning variables, and finding solutions to contextual problems. (F.4)

MATHEMATICAL PRACTICES

- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.

LESSON 6.1: CHILDREN AT THE BORDER: LOOKING AT THE NUMBERS

Samantha Fletcher and Holly Anthony

IMMIGRATION (AND RIGHTS AND ACTIVISM)

Students develop an understanding of the inequities that are created by enforcing policies that separate children from their families at the United States/Mexico border. Though this policy enforcement sparked wide media attention in 2018 and could be eliminated in the near future, this lesson provides an excellent example of how teachers may develop lessons to tackle social injustices within their own local or national contexts. In these particular lessons, students gain a deeper understanding of the enforcement of border policies in the United States using introductory information about the issue.

DEEP AND RICH MATHEMATICS

Using data on children separated and apprehended at the US border, students interpret data as reliable and valid; identify and analyze relationships between values; optimize area; distinguish between correlation and causation; find a line of best fit and analyze residuals; describe key features of tables, graphs, and verbal descriptions; and use proportional reasoning. By using proportional reasoning, students are able to scale the values to their own community, allowing them to gain understanding of the context and further apply abstract mathematical reasoning.

ABOUT THE LESSON

The lesson is a launch–explore–summarize instructional model and is intended to take approximately 240 minutes to complete across four class periods.

Lesson 1: Students are introduced to issues at the US border.

Lessons 2 and 3: Students work in groups to research their topic and create a presentation.

Lesson 4: Groups share their research and develop a class action plan.

Note: *Taking Action is included as Lesson 4.*

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Figure 15: Overview of Lesson

Figure 15 shows the image of the first page of the lesson, which describes the justice issue, the mathematics involved, and the sequence of the lesson. On the following page there are some resources and materials. In the vignette below participants watch a video together that is part of the materials. The video is part of the launch for the first day of the lesson. My rationale for bringing this artifact to the learning community was two-fold. First, I wanted the women to see and engage with an actual lesson that was not simply an abstract idea but something concrete to explore. Second, the issue the lesson tackles is about immigration; I thought it was highly relevant in our community and it made sense to discuss it further. The women have the opportunity to read the first pages of the lesson before we watch the video together and continue the discussion.

This 20-minute conversation is divided into 3 episodes for clarity. Throughout the vignette the women all agree that students (kids) need to know about political issues. Yet through that stance, as they begin to discuss the issues further, they realize that the following tensions emerge: getting in trouble for being political, (re)surface student trauma and engaging in the ethical commitments of doing this work inside and outside the institution of schooling.

In this first episode, the women grapple with believing that students to know about political issues and the consequences of teachers being "political".

Episode 1:

Sandra shares her screen with a slideshow of the text of the social justice lesson. The mujeres begin by reading the social justice lesson. Sandra explains that this is the overview of the lesson and there is a video as part of the material. She asks the women if they want to watch the video and they all say yes. As Sandra is pulling up the video, she asks the women have any thoughts and reactions to what they just read.

Ines begins, "Yeah, my reaction is. Ummm, I was actually talking to my kids this week because I was telling them about, well I have been talking about the reading of this book, *Once I was you.* And I was telling them about Maria, the work that she does and so to preface that, I would ask the kids, how many of you guys know what is going in the US-Mexican border? And nadie. (no one) No one knows what is happening. And that was disturbing to me, my kids are 13, you know? And the fact that they do not know about this tragedy that is happening at the border, it is upsetting. Umm, and so it definitely makes me want to talk about these things more and teach them. But I also worry that I am going to get in trouble, by being political. You know what I mean? Because tenemos una, aqui en (we have someone here in) MidTown (pseudonym), leading a crusade to end the liberal indoctrination of our students. Because teachers are indoctrinating kids with liberal ideologies, so you know? It makes me scared. Just talking about something that is happening, not even taking a side but addressing it. It is going to be taken as being inappropriate in school. But I love it, I love the notion of incorporating those things and bringing that awareness, like our kids should know that. They are living in a world where this is happening. The fact that they do not know that is crazy."

Jenni shares about a recent discussion she had with a young man about immigration at his job. There is silence and Sandra shares her screen playing the video that was listed in the lesson.

The women watch the video. [The video is a four-minute 2018 YouTube video that explores Trump's new immigration policy, documenting the presence of unaccompanied minors and many children who are reported missing.]

"So, the idea is that you start a lesson, you watch the video students are asked about what is known about the policy. Then the idea is that they use mathematics to understand that policy, students take notes, observe things and then the group has a whole class discussion. There is some use of data there and then on the last day, they summarize what all the kids did." Sandra explains as an overview of the lesson.

Students (kids) need to know about political issues, the teacher is being politically risky

Inez understands and embraces the need to engage in discussions of political issues with students, of issues that are relevant to the community – this is a what social justice education embodies. Yet, Inez finds that there are material consequences for her to engage in the work. During this episode, I asked the women about their thoughts, and no one really responds to the prompt. Inez is the first to be vocal, but even then, she begins talking about her students and about the book *Once I was You.* Inez believes that students need to know about the political issues that are occurring in the country, she notes that it is "upsetting" that children are not aware of the "tragedy" that is happening. Yet, Inez is worried about personal repercussions that may happen when she becomes "political." Her focus shifts, her use of Spanish is important, so that only *us*, those who speak Spanish could understand her reference to the woman who is leading the crusade. In this case, unlike the first part of this chapter, Inez doesn't reference the possibility of losing her job but rather the pushback that can come from the community. Hence, the material consequences are not just confined within an institution of schooling but rather something that is at the societal level, which challenges her livelihood beyond being a teacher.

In this episode, much of the discourse is about the individual act of engaging in a political conversation with students and how risky it could potentially be. In the next episode, the women continue to grapple with the challenges. While this episode concerned the material consequences for the teacher, the next episode adds another dimension and problematizes how to engage in these kinds of conversations with students.

Episode 2:

There is silence. "Do you all have thoughts, reactions?"

Jenni asks, "do you think they sell the children?" More silence, Inez takes a deep breath.

More silence.

Sandra responds, "I feel like we are having a hard time talking about this, can you imagine having this conversation with your students?" Both Anahi and Inez nod in agreement.

Inez responds, "Yeah. Also, I was just thinking about this, man this is important but traumatic. You know what I mean? That was my thought, you expose the kids to this and then, you know, okay, let's do the lesson and carry out this math lesson and I mean, yeah. Like, I don't know, you can, at least now, our curriculum is not in the habit teaching kids these types of things. Exposing them to these truths and realities and I don't think you can drop something like this to kids. I am thinking about my kids, I cannot drop this on my students without having in place some sort of space or you know, attachment to this lesson. For dealing with that, for processing that, I don't know, I almost think that it is really traumatic to just show kids this and then just expect them to go about their lesson and not actually take in the significance of what they are seeing. It is important they are exposed to it but I think that needs to be addressed as well."

> Some silence.
>
> Luz says, “I don't know if I what I am going to say correlates to what we saw. It kind of took me back to, *son cries,* forget it.” Luz leaves to pick up her child.
>
> More silence as we wait for Luz to come back. Sandra notes, “I have never taught anything related to this and I am not sure I would feel very comfortable doing this.”
>
> Inez responds, “That kind of like, for me, I agree with you Sandra. I don’t feel comfortable, and I think it goes back to the notion what Anahi was saying, ties into Anahi’s question to Maria, this question which is, you don’t want to be an hipocrita (hypocrite) and teach this as if it is something to be used for a lesson. If it is something like that it takes away from the people that are living this, that are suffering, it is dehumanizing in a way to treat this as information. As a lesson it is something to teach your kids. Which is why I had some unresolved issues with Maria Hinojosa and journalists overview. Seeing all the cameras pointing at these kids as they are walking in to the detention centers as if they are some kind of show and the anchor said, “sounds like what we need to do is more reporting.” Like no, what you need to do something about this and report on it. That is what Dr. W said, think of something that is really like unjust and something that needs radical transformation and a lot of people said that kids living in cages. And she asked us flatly, what are you doing about it? What are you actually doing, what is the action? That is what she was trying to preface, our capstone was supposed to be an action-based project. And what are you actually going to do to change this. And to make it, to resolve it, to bring it back to a state of humanity or justice. That is why I agree with you Sandra, I would not feel comfortable, it is important for children to be exposed but it is not enough to be only used as a tool for a lesson.”

Students (kids) need to know about political issues, may cause student trauma

Inez believes that kids need to know about important political issues, yet, when taking a student perspective she has the realization that this lesson could be “traumatic.” Inez understands that exposing kids to “these truths and realities” can be quite shocking because the way the current curriculum is taught, such “truths and realities” are not part of the curriculum. Thus, Inez is grappling with “we need to teach this” but there is a whole other dimension of kids’ humanity that needs to be addressed in social justice work. In this way, Inez is both embracing the need for kids to know about political issues but also problematizing the way it is done. The realization is that one must attend to the interactional dimensions that foster an inclusive and “safe” classroom environment. Thus, when teaching lessons about social justice there is all this hidden work that needs to be built in the classroom to prepare for such a lesson like this one.

Teachers who teach Social Justice lessons, must enact it beyond institution of schooling

As Inez continues to reflect on the conversation she had with her previous professor, she begins to pursue the question, “what are you doing about it?” - a question that is directed to other teachers who may be teaching these lessons and may not be doing anything to confront the issue as a society. While in the first part of this chapter, Inez grappled with the repercussions of

changing the institution of schooling, she is now also asking, what are we doing outside the classroom? For Inez, teaching about a particular issue in a classroom is not enough; (social justice-oriented) teachers should also be enacting change outside the classroom. Inez ends with, "I would not feel comfortable" to teach this immigration lesson because according to her standards, she is not doing anything to enact change outside of the institution. This perspective hasn't been attended to in social justice spaces because of the assumption is that the cultivation of change is happening within schools.

In this episode, having agreed that students that need to engage in political discussions, the women grapple with the consideration that this work may cause trauma for students. While also considering issues about students, the women also demand for social justice work to be pushed outside of the institution challenging the way social justice lessons are structured to only happen within a classroom.

In this final episode of the vignette, the women further problematize the idea of students needing to know about political issues by attending to the classroom context.

Episode 3:

Sandra asks Luz if she wanted to share what she was intending to share earlier.

> "Just going back to Itzel, she showed the kids a movie based on the borders, but it was not in Mexico. Mas bien it was El Salvador. Then she did a substitute con (with) Dr. L with social justice class and instead of doing social justice she showed the movie de la icebox which is about children in 'cages.' And they are mistreated and everything and just looking at the news that Sandra shared, it made me go back into the movie you know what I mean? Kind of show what it is all about. It was different that I got to see the perspective of the little kids and she brought it to the university, two different frames but aca en la university it was all white kind of students. And in school, son hijos de Mexicanos (they are children of Mexicans) so they are like, "my dad did go through this and that." And then you go to the university, and they are like, we did not know that, we thought it was different. It was just like, I don't know, that is what I thought. It is true, it is just bad but like what Inez said, it is just bad putting the cameras in front of the children and making a movie about it."
>
> Anahi, "I feel like there is a difference in the context. It depends on the comunidad de estudiantes (community of students) we are teaching. Going back to Luz's context and how Itzel was doing the lesson in different contexts, la comunidad de estudiantes (the community of students) that she was working with se sienten identificado (they feel identified). It is more about validating, de sentir la confianza (feeling confident), many of us through our journey in school, we should feel proud. We shouldn't be ashamed of it, we should not feel con esta de necesidad de decir con esta verguenza de decir que no tengo papeles (with this need, with this shame to say that we are undocumented). La verguenza de decir yo cruze la frontera (The shame of saying I crossed the border), we should not feel shame. It all depends on the community, what Itzel was doing, she was doing, les dio valides (she validating them), your story matters. Be proud of it. That pride is what we should all be feeling pero tambien (but also) if we go to a classroom where it is all about, a different community of students then it would be, como comienzo, por

donde comienzo (how do I start, where do I start)? De donde agarro valor (where do I get the courage)? You know? What Inez was saying, not even us, we were able to come up with something. We weren't able porque no se nos enseña (because we are not taught), many of us we don't even know the stats, we don't know this thing. Because we don't even know what is happening there! We just hear the news we do not really know what is going there because I don't know, we don't care enough?"

Sandra then says, "Anahi maybe what you are saying is that maybe we should be doing these problems. We should be doing those statistics because maybe that will help us make sense of the issue. An issue that we know that exists."

Anahi responds "Yeah, I mean de alli empieza (that is where it starts), if we do not know what is wrong, como se dice (how I do I say this), journaling, take pictures, we shouldn't be doing it. We shouldn't be having to see a video of kids in cages. We shouldn't because they are just kids, and we shouldn't be showing that to students. But if we don't show them, we are just hiding the problem. Es como dice, estamos tratando de protegerlos (It is like, we are trying to protect them) but it is like, if we are trying to protect them but los que van a estar sufriendo (those who are suffering), we are not going to see them. I feel like, maybe I am wrong, but in order for us to do something we need to learn. We need to learn about it. And you know, por muy malo que suene (as bad as this sounds), once again, que tan hipocrita uno puede ser (how hypocritical can we be)? y que tan real uno puede ser (and how real can we be)?"

The women continue discussing issues about immigration, deservingness, race and silence within our communities. Anahi ends with a dicho, "si no te afecta no te hase daño" to comment on the individual nature of the cultura.

Students (kids) need to know about the political issues, context matters

In this episode Luz further problematizes the way that context matters when teaching about political issues. As an undergraduate, Luz volunteered in Itzel's classes. She witnessed Itzel teaching a lesson about immigration to sixth graders and to college students. As she reflects on what happened, she noted that both classrooms had different reactions to the same lesson. Anahi builds on that and argues for the importance of children of immigrants or immigrants themselves to know about these political issues because understanding them serves as an affirmation. Her positioning as an immigrant woman and her evolution as an empowered woman, shapes her perspective involves resisting narratives about shame and illegalization and cultivating dignified forms of affirmation for children. Yet, this perspective is inherently connected to the context of the community that Luz referenced, which is an immigrant Latinx community. Thus, when considering issues related to justice it is not enough to assume that students need to know about political issues. Rather, context provides an opening to grapple with why is "this issue" important in the particular context.

Students (kids) need to know about the political issues, how do I do it?

Anahi also agrees that students need to know about the political issues but is faced with the dilemma of not being sure how to do it. Anahi shifts the context and now situates herself in a "different community of students" and she grapples with having the "valor" to teach a lesson

about this. In this case, her own position as an immigrant hinders what she feels she could do in that space; feeling like she does not have the courage to teach such a lesson. She references their own inability to have the conversation here in this very own plática. Very much like Inez, the women agree that they are not really doing anything to create change, and ultimately question "we don't care enough?" This kind of individualistic perspective is problematic as it places the blame on the people versus the system, which does not create these kinds of opportunities. But their commitments to justice and their deep belief in change make them believe that it is their fault.

This vignette, in which the women discussed a published lesson, brought many mixed reactions from the women. Their responses were shaped by their own perspectives and their commitment to ideals of justice and enacting change. The women agree that students need to know about political issues but face the dilemma of getting into trouble, potentially causing harm as it may cause trauma and towards the end they grapple with the importance of context.

In the following vignette, the women discuss a lesson Inez could potentially teach in her Yearbook class. While no lesson is taught, the women grapple with the tensions and issues that might emerge regarding what kind of social justice lesson Inez should teach in her classroom.

Vignette 4: Wealth

As the women discuss what kind of lesson to teach in this vignette, they grapple with the question, what should children learn about, guided by their own experiences. The four episodes embrace and amend normative social justice perspectives as the women grapple with how to teach a lesson that would enact change.

In the first episode, Inez offers a social justice lesson that she thought about before coming to our meeting. The lesson she offers embraces normative social justice perspectives and is a typical lesson that could be used in almost any classroom across the country.

Episode 1:

> In the previous meeting, I asked the women to think about issues in our community that they felt would be relevant and important to speak about with their students. Anahi is the first one to arrive, she just bought a car and feels very anxious about that decision. During our check-in meeting she discusses her need to own a car, her internal struggles to give up her saved money and housing instability. Anahi brings up that issue to talk about.
>
> Inez asks, "So, Anahi, you thought about credit. The need to understand credit and finances, right? Did I hear you right?"
>
> Anahi responds, "Yes."
>
> Inez nodding says, "Yeah. What I was thinking, I was really trying to think about something to build community, umm, I was having a hard time thinking about something. I think about things through a middle school lens, because I am a middle school teacher. What would they be interested in or what would, you know, essentially results in community building? Umm, and the things that I was thinking about, and I don't know, I

think it is because my classroom is right next to the cafeteria. Right next to the multipurpose room, and they do all of like the food preparation there that they give out to families. And so I see all the trucks come and pick up all the meals that they are taking. They distribute the food from somewhere else but that got me on the train of thought of thinking about food and like nutrition and how umm the school lunches that the kids get are crap. They are not nutritious at all, they do not really have access to a lot of fresh fruits and veggies. There are some that are incorporated in the lunches but not really a whole lot. For example, there is an upper class school, it is a public school but it is for the rich white people. All their kids go to that school and it is out in the country and they have a salad bar there for their kids. And they have a bunch of others healthy food options for them. And so that is kinda my thought, in terms of food and nutrition. There is a lot of math involved when thinking about calorie intake and how many calories the body burns in active mode. And how many calories do we need to consume? Just in terms of percentages. That is something that we really don't teach a lot, health education and nutrition and let's just be real. We got a lot of illnesses within our communities, like obesity, diabetes, high blood pressure, and a lot of those in my mind are caused by poverty. We don't know have access to those things all the time, junk food is cheaper. Like dollar menu, McDonalds, 5-dollar Little Caesar pizza. That was my thought, maybe try to get to some research-based project with the class. Like how do we get that, here? For our school? How can we make that a possibility? What would be the type of things we would want to incorporate here? What do we want to bring in our school lunches? And then that goes into money, and when you said finances, not only will we talk about nutrition but also money because that is ultimately what it comes done to. Right? I don't know how that school out there is getting their salad bar, but I am willing to bet PTO has something to do with that. Umm, and so I am wondering if that would be something that would really motivate kids. It affects them directly, and it is the food they are eating. To have some better awareness about their body and their health. That is the thing that I came up with."

Anahi responds to Inez, "I feel like it all depends. I feel like el tema de Inez, va a aser interesante para la mayoria de grados porque es comida (Inez's topic is going to be interesting to most grade students because it is about food). Todos entienden comida y les afecta directamente (everyone understands about food and they are directly affected by it). Y si hablamos de credito a muchos tal ves no les interesa (And if we talk about credit they might not be interested). With credit, I would say that it would like, tambien, aserlos entender de que manera les afecta pero (they have to understand how it affects them) if they tambien (also) don't have someone at home. Como si nunca an escuchado de eso y no entiendon (It is like if they have never heard about that and do not understand) it will be somewhat challenging for them to engage into the theme of credit. But if it is about food, it is an easier to get their attention. Mostly because right now, most of them are the grade level or age that Inez is working with the students. They are starting to eh, como este tema (like this topic) de working out. And they just like because why do you want to work out? Because I am working with high school students and they talk about comete un huevo crudito y vas a tener mucha proteina (eat a raw egg and it will have more protein). *Laughs* esos temas que ahorita (those topics that) Inez was talking about it, siento que a esa edad si les va interesar y los atrae (aligns with that age group and they wil be attracted

to it). It is a good topic and es algo (it is something) we should ser educados mas (be more educated on)."

Embracing Normative Social Justice Perspectives

Inez shares her idea for a lesson about nutrition that embraces the ideals of a typical social justice lesson. The lesson involves students investigating the issue, contrasting their own experience to that of the wealthy school which is an opening for understanding inequities within schools. The topic is relevant to students, and it could be considered "less political". Inez believes that this topic could be motivating for students and can lead to action both by creating awareness about their heath and their decision making when it comes to food. Inez connects possible mathematical topics with nutrition and reframes math as a way to understand calorie intake and so forth. All of this is what the women expect of a social justice lesson, there is a lot of action and awareness involved.

Inez's position as a current teacher and as a woman with a lot of cultural capital – she knows about PTOs and she was constantly involved in schools even before getting her college degree as a mother (Inez, Initial Interview) – frames her choice of topic. It was something that she knew quite a lot about, and she felt comfortable teaching and bringing awareness to for her students. Anahi agrees with Inez and doesn't offer any pushback other than it is possible that students might not want to know about credit if they have not really heard about it at home. Her comment contradicts the check-in conversation because earlier that day she felt that students needed to know about issues related to credit. She argued that there are lot of students who would be the first in their family to make these new moves of building wealth.

While both Anahi and Inez agree that nutrition could be a lesson of interest to children, in the next episode the women dismiss Inez's idea about nutrition in favor of the belief that children might be interested in learning more about money, investing, and stocks. This new perspective is grounded in the women's experiences as working class women and is guided by their new conceptualization of "enacting change" to mean changing their lived reality.

Episode 2:

Jenni responds, "She is talking about middle school kids, right? I feel like middle school kids will be interested in money. And like investing or stuff like that? At that age they are learning about money and how to spend it and stuff like that. I don't know, that is how I see it. More than food, pero maybe?"

Anahi, "And that is something too. Investing. We don't really know much about it. What are options to invest? Muchas veces pensamos que ocupamos mucho, es algo que no se introduce a ninguna etapa de nuestra vida (A lot of times we think we need a lot of money and it is never introduced at any point of our life) . And it is like no lo entendemos, no lo sabemos, entendemos lo que es pero muchas veces pensamos que tenemos que tener una cantidad una gran cantidad de dinero. (we do not understand, we do not know what it is but we think is that we must have a lot of money) Or we really need to be good at it, in order for us to understand it."

Jenni responds, "Umm, one of the things they say like umm, basically to invest in stocks. Umm a good one, when you buy houses and you just rent them, and they are getting paid

by themselves. And when you have kids then you have something for them. You know? Little things like that. So, like Anahi said, your mom brought you here and she started something and you feel the need of having something more. And your kids the same, something higher. Como dicen (like they say), we have to see how we can invest in something that we are going to have something for later in life, and then for your children. Or your parents included, you know? So, I don't know, I always thought about that. Like houses, en ese sentido (in that sense), I don't know people said that especially stocks and you get money out of it. I have never gotten a stock in life and casi todas mis housemates tienen (mostly all of my housemates have some) and they make money by having that. I am not sure how it works but you have to be really into that. That is how I see it, you can have a regular job and your education job then I feel like if you know how to value your money and doing something with it, not just spending it. Que no tengas nada pues en ese sentido (That you do not have something in that sense). I feel like once you invest it in something, whatever it is, you will see growth. For example, Anahi thinks she is in debt. Well, she is, but she sees it as a negative. But in reality, she is investing on a car that will last her for her life if she takes care of it. Gets maintenance, rotations and all that stuff. If you think about it, you are not going to spend on a car in the future, you might even use it for your kids. Once you are done with that debt, you are going to have money to spend on a house. Si me entiendes? (You know what I mean?) In that sense, you made an investment on something you need it. I don't really see it as a debt, sooner or later you had to do it. Si era aqui o en (If it was now or in) five years or ten. You needed a car girl, regardless. O vas a andar en el (Or were you going to ride the) bus o uber? You know? I feel that is a good example of an investment. And later comes in life, when you are going to do it for a house with your parents, you know?

The women continue to converse about Jenni's sister who has a small business and Anahi agrees that students sometimes want to know more about how to start a business. The women believe that understanding all of this will be helpful for students who graduate high school and seek to start a business.

Amending Normative Social Justice Perspectives & Capitalism

In this episode the women amend normative social justice perspectives by reconceptualizing the notion of "enacting change" to mean enacting change in children's lived realities. This perspective is shaped by their experiences as working-class women.

Inez and Anahi take the discussion of the lesson toward another direction, focusing on stocks and building wealth. Their position, as first-generation working-class Americans or immigrants (in Anahi's case) shapes this need to learn about building wealth and investments. Jenni frames Anahi's buying a car as a form of investment, something that she needed to do and that if she takes care of her car, she will have for a long time. While buying a car is not the best financial decision given the fact that car values depreciate, Anahi needed a car to travel reliably and this is her way of investing in her future. In this episode, the shared background between the students they will teach and who they are as working-class women, is critical for them to believe in the importance of investments and building wealth because their livelihood is on the line.

The women reconceptualize "enact change" not to dismantle systems of oppression but rather to really enact change in the everyday life of students. The women believe that through

math students could potentially understand about stocks, passive income and learning to build wealth. One of the challenges with teaching lessons like these through a social justice perspective is the possibility of inadvertently teaching students just to play the game and not change it. Furthermore, this topic may inadvertently perpetuate capitalism and other forms of "isms" that do very little to change the structures in place. Yet, for the women letting students know about the way finances work is a form of liberation.

As the women continue the discussion, Inez chimes in and agrees with the women about the importance of financial literacy. The discussion shifts to a consensus that financial literacy can help with everyday tasks as well as to move up the social ladder but also grapples with the lack of preparation to teach about these kinds of topics.

Episode 3:

Inez is back and we loop her back into the conversation. She had family arrive unexpectedly and has now moved back to her office.

Inez: "I heard about the investments and like you know, teaching kids about that and how to build wealth. And it made me think about the business, that was another thing that I did think about but I didn't follow line that train of thought. I guess I feel less comfortable about that. I feel less comfortable, how do you start a business? I wouldn't even know where to start, let alone teach it. How to start a business. But it made me think of Diana[16], she said, 'Que hubiera pasado de en ves de los papas nos hubieran dicho echanle mucha ganas con la escuela, (What would have happened if instead of our parents telling use to do well in school) if they would have should us how to start a business? How would our reality be different if it was let me show you how to generate money for yourself and create a business. Versus put all of your effort and focus on school. And it made me think about that comment she made. It is true, right? What happens when we go to school? Don't get me wrong I am not knocking school down, I love it. We get in debt, we have student loans and sometimes the job we end up getting at the end of all that college doesn't necessarily help us to get out of that school debt. So, it is true, well, if you look at the wealthiest people, umm, they are business owners. They are people that did not necessarily people who finished college. They were able to create all this wealth from having a business. I like that idea, I also like it because my kids told me before, at the beginning of school, they were saying that one of the things that they hate about school is that school doesn't show them anything to help them with real life. school doesn't teach them about banking, school doesn't teach them how to pay bills, how to cool or any of that stuff. And those are things, actual skills that you need to know from the moment you are own your own. And that it would be nice if schools had a role to hope to teach it, what if you don't learn them at home from your family? Or whatever, no one ever talks to you about it. I think all of that goes well perfectly in line with what students want. They want for us to teach them about money, and I don't even know if they have an awareness about investments, but I am sure they would want to know about that too. Again, I shied away from business because I don't know. I have never been brave enough to do that. But are we teaching them the legit ways of business, or you know, the street vendor ways of business? Right, because there are also permits and

[16] Diana is a young Chicana scholar who was involved in some platicas years ago. We all know Diana and son when Inez referenced Diana's comment we all knew who she was talking.

things like that, obviously there are people who do not get permits, how deep are we thinking about this?

Anahi responds laughing: "Ay que ensenarles a haser una tanda[17]. (Let's show them how to start a tanda" Ines laughs and responds, "Yes, a tanda, exactly." Jenni shares more about tandas and their usefulness to save money. Anahi comments on the work ethic of parents and wonders how much they would do if they had the right opportunities. Sandra also wonders about businesses and social media promoting capitalism and whether it is a US issue.

Inez responds, "hmm. Yeah, I was thinking about that too, just in terms of like, how much capitalism do we want to promote in these social justice lessons. It is a reality that we are living in, and kids will navigate through. So? We are not going to snap our fingers and make it all go away. So, it is important to teach some of all that. Yes, maybe it is a US thing and the reach the US, I guess doesn't make it a US thing uniquely. When I think of my relatives that I have in Mexico, they all have the business mindset. Whether it is a small thing, que voy a poner un puesto en el tianguis, (I am going to put table on the fleamarket) I have a tia who does that. Or to starting a restaurant, voy a vender tacos (I am going to sell tacos). I have a tio (uncle) who opened a pancakes and coffee place because pancakes were popular in that pueblito (town). But I feel like most of my family down there are very business oriented, I can only think of one family member who doesn't make a living in some way related to getting the hustle mode. And that family member is an educator, but that is it. Everyone else has the business, I have a tio that has a taxi and before that he drove a school bus and charged that as well. He also has animals where he can make money. That is what he is doing, most of the relatives in both of my family do that. I don't think it is US thing, but it could be that it is also *deep sigh* maybe again, far reaches of colonialism and capitalism that have reached into Mexico. It could be that Mexico has been influenced by that, but I don't know in my lifetime it has always been that way."

Sandra pushes back from the individual aspect and reminds the women that systems work to create obstacles for people. She worries that we might place the blame on the people and not the systems of oppression.

Challenging Normative Social Justice Perspectives: Business Mindset

Education will not save us

As Inez returns, she begins grappling with the issues the women were discussing in Episode 2. She comes to the realization that college education, while it has been great, hasn't really lived up to the dream of creating opportunities to move up the social ladder. She reflects on the business owners who are not necessarily college educated but are well off – being successful business owners and are building that wealth. When I push further about capitalism and the possibility of

[17] A tanda is a collective and informal way of loaning money. In essence, x number of people pitch in the same amount of money for x number of weeks and each week a person gets the total sum. When Jenni shared about the tanda with her coworkers she joked that she liked being the last one because she can get the total and the tanda would be over. This practice is used to save money.

it being a US issue, Inez responds by agreeing that we are promoting capitalism. Yet, she challenges that pushback by noting that capitalism will not go away. As a matter of fact, her examples about family in Mexico creating businesses speaks to the ways in which capitalism exists beyond America and is a product of colonialism and capitalism. Hence, creating awareness of how to build wealth and start business is a strategic move to both build wealth and business mentality and getting the "hustle mode" perpetuates ideologies of meritocracy, individualism that calls for productivity and one may lose sight of the changes that are needed in society

We are not prepared to teach about this

As Inez continues to discuss issues related to supporting students with information about investments and businesses, she vulnerably shares that she is not prepared to talk about this with students. In many ways, this is something that is not taught in classrooms in the K-12 context, and she is not a business owner who may have some inside knowledge; this makes her less willing to teach these sorts of lessons. This is a big challenge for her. So, although she believes that knowing about these issues is important, she does not feel comfortable teaching about them. This is the reality of designing curriculum that is different and does not fully align to the curriculum as it exists in schools.

In sum, this episode grappled with issues related to challenging normative aspects of teaching for justice that may perpetuate capitalism while centering the lived reality of working-class communities. It also further emphasized participants' desire to teach lessons like this but also the lack of preparation that makes it a hurdle for these women to try these novel topics with students.

The conversation shifts in Episode 4, as the women begin to grapple with the consequences that go beyond teaching the curriculum. They delve into the question of whether lessons like these perpetuate the victim mentality and discuss how the pervasiveness of colorblindness creates challenges as one thinks about justice in education.

Episode 4:

> Inez responds, "It is funny because my class today, one of my kids, he is one of my sarcastic bunch. He tells me, 'Twitter would not like this conversation right now.' Because we were talking about what does it mean to be an American? What does an American look like? Well, you know, why? why wouldn't Twitter like this? What is so bad about that? Shouldn't you question the fact that we are having this conversation and you automatically have to look out for who is not going to like what we are talking about here. Doesn't that make you think like, wait a second, I should be able to talk about these things. I have the right to question these things, I have the right to understand it and take it apart. That right there, I can see definitely, those are the things that they are not talked about. For that reason, you know? It is such a politically charged conversation. Pulling yourself by your bootstraps, it is on the individual. I get on this argument with my husband all the time, ALL the time. There are exceptions of course, you know? There are exceptions of people who are able to make it out. People who are able to get lucky and find the right opportunities, maybe a combination of luck and hard work. But it is not fair that just because a couple of make it out of their circumstances we should expect the

same for everyone. That it is your fault because you did not make the right choices, you did not want it enough and not acknowledge those systems that are playing a role. So, I think kids will love this conversation, it is a taboo, that is what makes it an intriguing conversation and it should be part of the lesson. Do you think there is some merit, in enforcing the victim mentality? Like that is one of the arguments I hear a lot. That when we talk about these things, when we bring to light, that we reinforce a victim mentality? Sometimes I find that point hard to argue because I can see both sides. I can see where some people lean on that and not take ownership of their own choices and decisions? But I don't know. What do you think? Is that a problematic thing to talk about that? Because we may inadvertently cause some kind of harm while trying to do good?

Anahi responds, "I mean, it is our reality. You know? I guess it just depends. Like if you were victim, then you obviously are. Siento que muchas veces crecimos siendo agredecidios (I feel like a lot of times we grew up being thankful), I feel like that is how I was. Que todo depende de ti (it all depends on you), it was all about me, and I realized it was also a system. It wasn't all my fault, so it is okay for me taking time for school. It is okay because, pues por el dinero (because of the money). So, I feel like I am not taking el lado de la victima (the victim's perspective), it is just a reality. I am the victim." Anahi laughs.

Inez then responds, "Yeah, this is why it is complicated, Anahi. What you are saying is true, to some extent I guess, because this is the reality we need to hear that to give ourselves some slack and a break. To help us understand the reality, right? So, like people need that understanding, that this is not something that you did. It is not something that is your fault, or because you didn't try hard enough. Because if we don't give that understanding to people that could result in hopelessness. But my concern is the opposite as well. Then you have people who are just going to say, be angry all the time and just feel like this is something that has been done to them. Instead of taking that awareness and do something with it, they will feel like everything is owed to them. You know what I mean? Because this is not their fault, they shouldn't be responsible for fixing it, someone is responsible. I mean, I don't want to foster that mentality either."

Sandra reminds the women that we are all agentic people who live in a racially structured society.

Inez continues, "Yeah, that is ultimate what it is. This is why this work is hard, you really have to look at it from so many different angles and approach it cautiously. I think also with the understanding that, unfortunately, messiness is a part of it. You know what I mean? Messiness is part of this work there will be situations where you kinda have, this like unintended consequence, you know? This inadvertent thing that happens because I mean, you know, you just didn't think about that. And it can also be perspective. Like, you know? You don't live a reality. I can honestly say that the undocumented thing, I don't know that reality. It might not be something that comes to my mind. And the triggers that it could cause, it really does take a lot of intentionality, you know? About thinking these things through thoroughly and understanding who your students are and potentially, you know, what their experiences may be."

Challenging Normative Social Justice Perspectives: The lived reality

Colorblindness is Pervasive
In this episode, Inez reminds the group that having political conversations can produce unexpected reactions such as "Twitter would not like this conversation right now." In many ways, colorblindness – and the avoidance of talking about political issues – is the norm. Not only in classrooms but also outside of classrooms. The idea that people pull themselves by the bootstraps is a racial narrative that guides a lot of educational discourse as well as business discourse. And Inez sees the challenges that come up for people who are not "successful" and do not have the right opportunities. She understands that systems play a role in people being successful but also people have to work really hard to move along. This perspective is shaped by her husband but also in many ways her own experiences as a college educated woman of color who is now a teacher.

Perpetuating the Victim Mentality
As Inez continues to grapple with the roles of structural oppression and agency in social justice-oriented work she brings up a common critique about such work: perpetuating the victim mentality. Inez views two potential responses one build on: 1. People will feel hopeless 2. People will be angry and say everything is owed to them. Her dichotomy is reductive, but it speaks to potential outcomes that can occur when one learns about injustices. Anahi also acknowledges that dichotomy and problematizes by arguing this is her lived reality, sharing her perspective of being an "agradecida" and that she believed that it all depended on her work. She never questioned the system, and now she has a new perspective. This realization both shifted her understanding that the issue is not only about individuals but that there is a system that often makes it more challenging to be successful.

In summary, the two vignettes grounded in teaching social justice lessons further expanded the women's understandings of tensions that may emerge as the women seek to teach for social justice. The first vignette grappled with wanting students to know about political issues and potential challenges that emerged such as: getting in trouble, bringing up trauma and the need to contextually ground this work. The second vignette grappled with the women embracing, amending and challenging normative social justice perspectives by considering how one may teach a lesson and potentially uphold capitalism while also attending to students' lived realities.

Summary
This chapter highlighted the complexity of bridging theory and practice when thinking about social justice and mathematics. Pláticas created the opportunities for these women to embrace the complexity and, through their discussions, to push on their own assumptions and beliefs about what it would mean to make progress on the practical component of instruction. I organize the summary of the complexity that was highlighted throughout the chapter based on the ideals outlined in the introduction.

Ideal 1: Social justice work is action-driven work
The first part of this chapter embraced this ideal. In particular, the women felt their social justice commitments were inherently tied to creating change within the institution of schooling. Yet, as

they sought to challenge the way the institution worked, three tensions emerged: how to navigate it off the radar, staying true to their justice-oriented commitments and the material consequences of losing their teaching job.

Ideal 2: Social justice work engages explicitly with political issues
In vignette 3 participants embraced the idea that students need to know about political issues. As the women discussed the social justice lesson, they realized that the following tensions emerge: getting in trouble for being political, (re)surfacing student trauma and engaging in the ethical commitments of doing this work inside and outside the institution of schooling. The trajectory of their understanding moves from individual concerns (e.g., I might get intro for being political) toward collective concerns (e.g., these issues are complex for students so we must attend to trauma and the context).

Ideal 3: Social justice work transforms lives
The idea that social justice work transforms lives is something that we hold to be true. Vignette 4 centers this idea by taking the student perspective, with the women reflecting on their lived realities and arguing for social justice work that holds material consequences for students. This brings up dilemmas such as perpetuating capitalism, inability to teach lessons that are novel and perpetuating the victim mentality.

These three ideals highlight how complex it is to imagine enacting social justice beyond the pláticas.

Chapter 7: Discussion

"I will overcome the tradition of silence."
- Gloria Anzaldúa

Introduction

Gloria Anzaldúa was a Chicana, queer writer and scholar who argued for new forms of theory that captured the experiences of Mexicanxs/Chicanxs on the northern side of the US/Mexico border. Her quote both centers the patriarchal aspect of our cultura as Mexicanxs/Chicanxs and the ways in which women were and are constantly silenced. As mujeres we grew up listening to sayings like, *calladita te ves mas bonita*[18], that aim to put us in our place, to be silenced. And we have resisted, we have challenged these patriarchal notions often becoming rebeldes (rebels) and fighting for our livelihood. This dissertation explicitly challenges forms of silencing and centers the historias of four Mexicanas committed to justice as they made sense of issues related to justice and mathematics learning and teaching.

In this final chapter I reflect on several themes from this research project that I hope will contribute to our understanding of how people can engage with issues of social justice and mathematics. I then consider the implications of these contributions for research and for teacher education. Finally, I discuss some limitations of this study and suggest possible directions for future research.

Reflections across Findings

This section highlights several themes that emerged in this dissertation project and that serve as contributions to the field of math education. Each theme is connected to findings offered in this dissertation and discusses its implications.

Pláticas, learning and its possibilities in mathematics education

The incorporation of pláticas in education has become increasingly common in recent years (Flores & Morales, 2021). A growing number of scholars is incorporating pláticas as a methodology, as praxis and as pedagogy (Fierros and Delgado Bernal, 2016; Saavedra & Esquierdo, 2019). The power of pláticas is their relational dimension, which creates possibilities beyond dialogue. In Chapter 4, I conceptualized pláticas as a form of collective storytelling that takes place across time and place, is co-contested and co-constructed, centers everyday knowledge, foregrounds the imaginative, centers linguistic freedom and calls for relational reciprocity. These dimensions are not a checklist but rather a way to document the multidimensionality of pláticas and their affordances for building new understandings about mathematics and justice. Throughout this dissertation, I argued that justice work is complex and often entails tensions and contradictions. I believe that relationality and paying attention to the maestras' humanity created opportunities to make sense of those tensions and contradictions.

The relationality in the pláticas created a mechanism to investigate the shifts in the maestras' racial, critical, and mathematical literacies (Chapter 5). It also created generative opportunities to investigate how the women vulnerably and authentically talked about the struggles of enacting social justice driven work (Chapter 6). These two chapters highlighted the

[18] This saying translates to "you look prettier when you are silent."

complexity of new understandings about mathematics but also new understandings of how to be a social justice educator. These new understandings were neither simple nor straightforward, but they offered a glimpse of the underlying complexity of being a social justice educator. Of course, more needs to be investigated regarding how those understandings can be connected to practice – but for the women this is the first step. I believe that the relationality that was evident in this project needs to be emphasized in teacher education communities as our commitments to justice both institutionally and outside of the institution continue to grow. Hence, I envision pláticas becoming the bridge to theoretical and practical components that aim to support prospective teachers of color develop their critical awareness with mathematics. Pláticas can become a space where we engage in authentic conversations about what we envision justice work to be in mathematics. That is not, as this dissertation suggests, a straightforward task.

As mentioned earlier, challenges emerged when we centered pláticas. My goal is not to romanticize pláticas or their role as a mechanism by which we create possibilities, nor is my goal to argue that everyone should be doing pláticas. The pláticas affirmed identity-centered stories but at the same time they were always intentional – but, *toward what ends?* There were times when conversations about their own individual struggles took over the conversations. For example, the women often discussed issues related to credential programs. This happened in various ways, for example, supporting Jenni when she was not accepted to the credential program. Anahi was accepted to the single subject math credential but ultimately decided to not pursue it. Inez took the role of supporter and encouraged Anahi to apply to CalState Teach and offered advice about navigating the program while teaching full time. Such conversations came up for the women because they claimed the space as their own, thus providing them with opportunities to discuss such issues. How could we talk about mathematical justice without acknowledging and grappling with the hurdles that the maestras were experiencing as they sought to become educators? Their understandings related to dealing with all these issues also meant that they had to center their own needs. That is a tension that may emerge when engaging with this kind of work, balancing out the individual and collective needs.

Historias as vessels of investigation

When we center pláticas, we center people's historias[19]. We center people's lived experiences, their complexity, the raw feelings those historias may invoke, and emotions that result of in the moment conversations. In Chapter 5, the women shared stories about their lived experiences through our pláticas. The pláticas provided the maestras that space to do so, and that helped them shape new understandings with mathematics. These new understandings helped the maestras develop more justice-oriented perspectives with mathematics but also highlighted how complex and challenging it is to center lived experiences. The lived experiences often invoked multiple master narratives often at the same time and contradicting each other. Thus, I understand historias as vessels of investigation that attend to both individual and collective learning. For example, in Chapter 5, Anahi grappled with the master narrative of mathematical competency as innate ability. This struggle was her struggle because she always believed herself to be good at math. Yet, when she brought her issue to the pláticas, it became a collective endeavor and more master narratives were invoked through our conversation. Investigating historias adds to the

[19] I use the term historia in contract to stories as I understand historias to be collective and historical beyond the individual person.

work of Cynthia Dillard with Black teachers on (re)membering (Dillard, 2021) and what Gloria Anzaldúa calls the Coyolxauhqui imperative (Anzaldúa, 1984).

Understanding our historias is essential for these women of color who have been successful in schools and who are committed to justice. In particular, it is essential to avoid potentially adopting the perspective of the majoritarian storyteller (Yosso, 2013) which may inadvertently perpetuate ideologies that uphold white supremacy when we come educators. Furthermore, considering historias as vessels of investigation grounds us, the math education community, in a sociohistorical and sociopolitical landscape. When we situate our historias through a sociohistorical perspective we can see the past, we understand the present, but we can also co-imagine something that does not exist yet. Toward the end of Chapter 5, I alluded to those possibilities of co-imagining something that is not there yet but could be, when we pay attention to the ways that classrooms can humanize children. When we center the historias in pláticas we also attend to the sociopolitical and argue that this work pays attention to societal issues beyond pláticas and our mathematics classrooms.

I end this section with the acknowledgement that sharing historias is not an easy task. It requires a lot of trust and relationality within the community. We cannot expect to know people and then ask them "tell me your historias." Unlearning what we have learned for so long could be very painful. Thus, I caution teacher educators who may want to incorporate historias in their coursework or within their research paradigm to build community and relationships. As researchers and teacher educators, we must have clear understandings regarding our ethical commitments to the communities we are working with. These commitments must be explicit, and we must also critically reflect on the work we are partaking in. This is critical to both attend to the needs of the community ethically but also to make sure that our work is not inadvertently causing harm to teacher candidates.

Master narratives shaping possibilities of becoming

In Chapter 5, I found that master narratives operate within a system and that they are invoked in local contexts. Because master narratives shape who we are in society it makes sense that multiple master narratives maybe invoked when sharing one story. And these master narratives often reinforce or challenge one another in ways that are not straightforward. In this dissertation I was able to address how four specific mathematics master narratives were invoked through people's lived experiences. People's complex personhood and their understanding of how to navigate a racially structured society causes multiple tensions and contradictions. And so, it speaks to complex and non-linear journey of becoming a social justice educator. In fact, I would argue that when trajectories of becoming critically aware that are constructed to be linear or follow a direct path are likely to reify problematic notions of becoming social justice educators. The evidence in Chapter 5 documents showing how lived experience often resisted but then affirmed other master narratives speaks to the fact that becoming a social justice educator is an "ongoing process" with no final resolution.

I believe there is room to further investigate master narratives in the way that Shah (2017) talks about through the notion of relationality. Shah articulates the need to understand relationality as the linkages between racial narratives, including narratives that do not explicitly refer to mathematics. While he calls for investigating these linkages within various ethnic groups, I find it productive to investigate the relationality of the narratives within the Latinx community. Through a LatCrit perspective we know that the Latinx community is heterogenous

and there are various forms of identity that were invoked in the pláticas. Thus, this study offers the perspective of seeing that relationality within the four master narratives about mathematics. There is still room to investigate how these four master narratives relate to other master narratives that are nonmathematical.

Centering the livelihood of Maestras

One of the goals of teaching for justice, or "teaching through an equity lens" or taking a justice perspective approach to teaching is to address the need to humanize our students (Goffney et. al, 2018) This dissertation aligns with that goal and for opportunities to cultivate humanized learning opportunities in mathematics. Throughout the project, one of the main arguments is that we need to create more humanized experiences for prospective educators committed to justice. Chapter 4 spoke to the vulnerability and relationality that was created through pláticas for the four women. Women spoke their minds in pláticas, often sharing very personal things about their practice or about their struggles with getting accepted to a credential program or even feeling anxious about being in debt. Revealing and building on personal issues was deeply embedded in the cultural practice of pláticas – and it was essential in order for the women to build and construct new understandings about mathematics and justice.

These understandings were complex and challenging for the women. Chapter 5 documented the way in which master narratives were challenged, upheld, and amended as the women discussed their experiences in schools and with their families. In Chapter 6, the complexity was further emphasized as the women grappled with how to work within a dehumanizing institution of schooling, with personal resolutions in tension with the rhetoric of social justice. This speaks to the complex personhood of the maestras and the way that building these understandings is challenging and messy. People do not wake up one day and suddenly become "woke." To believe that people's lived experiences will comfortably fit with the rhetoric of social justice education is an illusion. In fact, the lived experiences of the four working class women in this project contradicted some of that rhetoric. The intention of this project is to cultivate new understandings about what could be possible when working class people are guiding the discourse.

And yet, while the maestras challenged and even amended the ideals of social justice, they still embraced being social justice educators. The action component of social justice work was central to Chapter 6, and it leaves me wondering, how much action should an educator feel responsible for? Are we as a field pushing teachers to hold on to the responsibility of enacting change as part of their obligations as teachers? What is our responsibility as teacher educators committed to justice in engaging in the work that goes beyond research?

Limitations and Suggestions for Future Research

In this section I share some limitations of this dissertation project and suggest possible directions for future research.

Bridging the theoretical and practical

One of the things that emerged when I studied what happened in the pláticas was the women's evolving need to center practice. The women believed that the kinds of conversations we were having were very important but there was a need to really move beyond dialogue. As

they embraced becoming mathematics social justice educators, they yearned for a way to create change within the institution of schooling. That evolution captured the limitation of the study, that this project only centered pláticas – and it was important to move beyond them. There is a tension to navigate between really grappling with how complex these issues are and then to realize how to act upon them. A multi-sited research project is necessary, and it is something that should be done moving forward. The first step concerns how to support participants as one develops these understandings. Then the question is how to bridge the theoretical and the practical. That is no easy task. It is challenging to embrace core ideals of social justice and then enact a teaching vision grounded in those ideals (Brown et. al, 2019).

Future research should take this into consideration and design studies that are multi-sited to investigate learning across settings (Vossoughi & Gutierrez, 2014). This could be of the form where pláticas create opportunities for the women to bring in issues of practice. In this kind of organization group members could collaborate, share feedback with one another and be in community through the school context. Another possibility is to attend carefully to teacher candidates' practice, attending their classes and potentially observing lessons. While this last suggestion may be a significant reach given the vulnerability required in these situations, pláticas can serve as catalysts to create those kinds of opportunities. Finally, another issue that feels very important and that should be incorporated moving forward is a deep understanding of mathematical ideas that are connected to the classroom setting. This project attempted to do that but was not successful given the fact that not all the women were in a classroom where mathematics was taught. Thus, moving forward, this would be a necessary component as part of the design of pláticas or the learning community.

Working within the formal institution

One of the goals of this project was to create opportunities for the women to be with one another and build a community that supported one another. I believe that pláticas and counterspaces are integral to moving forward to support the recruitment and retention of teachers of color. The goal of this dissertation was not to prove that this intervention would solve that problem. As a matter of fact, out of the four women, 2 entered a credential program, one was rejected, and one decided to not pursue a credential during the time of the project. Ultimately, in the academic year of 2021-2022, all three women were in classrooms as the teacher of record. There are structural issues that pláticas or counterspaces will not challenge, thus I believe, that moving forward, research encompassing social justice goals needs to be embedded within the formal institution of the university.

Future research would include two things that I believe are essential to continue to support teachers of color to enter and stay in the profession. First, there needs to be a bridge between methods courses and pláticas that connects to their teaching practice. When pláticas become part of the institution the connection to participants' humanity exists, and participants' vulnerability is central. In this project that was not the case. When we consider what happened in the pláticas, two of the four women, Anahi and Inez, shared the most in terms of talking about teaching practices. This is because at the time of the project they were in formal classrooms and thus they had more access to these kinds of understandings. Thus, there should be bridge to the institutional aspect of teacher education. Second, moving forward it is necessary to find resources to support women either financially, either by resources, or other forms of support that help the women in the journey of enrolling and staying in credential programs. These women

faced significant challenges as they tried to become teachers. If we wish to diversify the teaching force, there needs to be institutional forms of support can help the teacher candidates focus on their journey of becoming without having to deal with another layer of challenges related to their financial difficulties.

Long Term Commitments to the Maestras

Another goal of this project was to consider these pláticas as a long-term commitment. That becomes very difficult when you are working with women who have full time jobs and are parents. This project lasted about sixth months which I think is a reasonable amount of time but not enough. In addition, I had known these women for many years, and we had already built relationships that were grounded in an ethic of care and respect. That was crucial to enact these pláticas. Yet, I believe that our meetings comprised the first steppingstone to much of the learning that the women were going to go through. As mentioned earlier, in the academic year of 2021-2022, Anahi, Inez and Jenni were all classroom teachers. Anahi and Inez were both in the CalState program earning their multiple subject credentials and it is unclear whether Jenni was able to obtain an emergency credential to teach. Currently there is a teacher shortage, where substitutes become the primary teachers for many students. This in turn may exacerbate educational inequities for students. While I wanted to continue the pláticas with these women, they were not able to engage because of all the commitments and work they needed to balance. Although my goal is to have monthly pláticas with the women focusing on their teaching and their commitments to justice, it is not clear if that can happen given the amount of work the women must deal with.

As mentioned earlier, in future studies, I would like to think that it is possible to imagine similar projects like this one within teacher education programs. This adds an extra challenge because teacher education programs are not created to sustain long-term commitments to teacher candidates. Thus, future studies would require systematic support to create the kind of long-term relationships that are necessary to engage in vulnerable conversations about identity, justice and math learning. One possible way is through the support from the department to create opportunities for the research to co-occur with teaching. For example, a teacher educator may teach a cohort in a way that they teach the methods courses and then follow the candidates through supervision. In this way, the candidates get to have pláticas within a methods course for example and get an opportunity to see them in a classroom setting as well. This would also mean that for a long-term project, there is a need for institutional support to work with candidates in their first year of teaching and. In many ways, this could be possible when multiple stakeholders are on the same page of how these communities could be supported.

Intergenerational Spaces

Because of the pandemic, not a lot of things happened the way that I had planned them. A limitation of the study is that there were only four people who participated, and I had planned for more people to be involved. In addition to that, the pláticas occurred over Zoom; this created another set of challenges. But, in addition to participant size, I also have come to an understanding that if we seek to cultivate and honor spaces of community, there must be an intergenerational component. In many ways, as a researcher, I am not in a classroom, the maestras are in classrooms. As we had our pláticas, I would notice Inez take the role of a more

experienced teacher (because she was) and really help and guide Anahi and Jenni. This made realize the need to create opportunities for this kind of mentoring that could help with their sustainability as a community.

Future studies would need to attend to that intergenerational dimension, to ground sustainability within the community. This is integral to create multiple forms of mentorship that can ease the transition for novice teachers as well as create visions of possibility within schools. Chapter 6 documented how the women embraced action – but a lot of complexity emerged and there were moments of uncertainty for the women. Creating spaces where senior teachers participate might help with those kinds of complex issues. It is also important to note that as we co-create communities like the one documented in this dissertation, there has to be a way for the women to sustain themselves without me. I organized and facilitated those meetings and ultimately when I no longer was doing that, the women did not follow up with another. I believe that once the community is built, the community would look out for each other. I believe that is a way we can retain teachers of color to stay in the profession.

Conclusion

In this dissertation I hope I offered a story of possibility aimed at redefining how we can support prospective teachers of color develop understandings related to mathematics and justice, by centering their historias and who they are as Mexicanas committed to justice. I proposed that pláticas, a rich cultural practice, created possibilities of becoming and learning with mathematics and justice. Through designing a learning community, I envisioned possibilities for the women to discuss and grapple with ideas about mathematics and justice. I hope that the ideas offered in this dissertation will spark future research that builds on these beginnings and goes further to support teacher candidates to build communities that are just, transformative, and sustainable.

May we continue overcoming traditions of silence. *Y pa' delante que pa' atras ni para tomar impulso!*

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Appendix

Appendix A: Interview Protocol (Pre & Post)

Tell me about yourself.

- Name, what do you do, do you have family?
- What do you identify as?

How would you describe yourself to someone else?
What is important to you?

About being a prospective teacher

Why do you want to be an elementary teacher?
What do you think is necessary to become a teacher? Based on that, how prepared are you to go in a classroom?
In your ideal future, what is necessary to be a "successful" teacher?

Culture and identity

What does culture mean to you?

- Do you think it is related to schooling? If so, how?

How about identity? What do you know about it?

- Is it important? How so?

How has your schooling experiences prepared you to think about culture and identity in classrooms?

About race and social justice

What is race?

- How is it important?
- Do you think it's important in mathematics? Why or why not?

About mathematics

What is mathematics?
How would you describe your relationship with mathematics?
What have been your experiences with mathematics in your k-12 education?

- What was significant about them?
- What made you feel like a great learner?
- What do you think was needed?

How has your college experience been with mathematics?

- How many courses did you take as an undergrad?

- How did math 308-309 go?

Have you done any work in classrooms related to mathematics?

- How did that go?
- If no, why do you think that is, and how important do you see it?

Based on your preparation, how are you feeling about the mathematical content you learned?

About race and social justice

1. Do you think learning math is related to race, class, language, gender, or any other bit of information about a person? How?[20]
2. How do you think being Latina/o plays a role in how you learn math?
3. How do you think speaking Spanish plays a role in how you learn math?

About learning and student thinking

What is learning? How do you know when it is happening?
What are some of the moments in your life that you have valued learning?
How do you see learning mathematics?

- What is important when we learn mathematics?
- What do you see it as not important?

Math 308/309[21], incorporated a lot of trying to make sense of student thinking. What were your thoughts on that?

- How did that support you in becoming a future teacher?
- How do you see students because of that?

In your ideal world, describe an ideal student learning mathematics moment?

About the future

What are your plans for the future?
Are there any obstacles that you are facing now in order to get there? What are they and what do you need in order to be supported?
Is there anything else you would like to add that I did not asked?

Appendix B: Survey

Individual

My mathematical experiences have been positive.

Strongly Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Strongly Disagree*

[20] Obtained from Zavala (2014)

[21] Course taken at their undergraduate institution that sought to support mathematical content competency as well as opportunities to make sense of student thinking

I can learn mathematics.

Strongly Agree *Somewhat Agree* *Neutral* *Somewhat Disagree* *Strongly Disagree*

I learn best on my own.

Strongly Agree *Somewhat Agree* *Neutral* *Somewhat Disagree* *Strongly Disagree*

I learn mathematics best on my own.

Strongly Agree *Somewhat Agree* *Neutral* *Somewhat Disagree* *Strongly Disagree*

I am a problem solver.

Strongly Agree *Somewhat Agree* *Neutral* *Somewhat Disagree* *Strongly Disagree*

I am a problem solver when doing mathematics.

Strongly Agree *Somewhat Agree* *Neutral* *Somewhat Disagree* *Strongly Disagree*

I am an active mathematics person.

Strongly Agree *Somewhat Agree* *Neutral* *Somewhat Disagree* *Strongly Disagree*

I can use mathematics to understand problems in my real life.

Strongly Agree *Somewhat Agree* *Neutral* *Somewhat Disagree* *Strongly Disagree*

Collective

I learn best when I collaborate with others.

Strongly Agree *Somewhat Agree* *Neutral* *Somewhat Disagree* *Strongly Disagree*

Mathematics is a collective activity.

Strongly Agree *Somewhat Agree* *Neutral* *Somewhat Disagree* *Strongly Disagree*

I learn best when I collaborate with others.

Strongly Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Strongly Disagree*

My collaborative math experiences have been negative.

Strongly Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Strongly Disagree*

Working with others brings out the best in me.

Strongly Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Strongly Disagree*

Everyone can do and learn mathematics.

Strongly Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Strongly Disagree*

Mathematics

Mathematics is a set of rules and procedures.

Strongly Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Strongly Disagree*

Mathematics is about being creative and innovative.

Strongly Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Strongly Disagree*

Mathematics is a changing discipline.

Strongly Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Strongly Disagree*

School mathematics is the same as real life mathematics.

Strongly Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Strongly Disagree*

Knowing mathematics is a social justice issue.

Strongly Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Strongly Disagree*

Knowing mathematics has power.

Strongly Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Strongly Disagree*

Appendix C: Reflection Prompt

As I think about our time together:

- I was struck by…
- I found myself wondering…
- I see a connection between what we've discussed to …
- I would like to continue the conversation by…