



Rochelle Gutiérrez Interview

Conducted by Melinda Lanius and Simone Sisneros-Thiry

Communicated by Alexander Diaz-Lopez



Rochelle Gutiérrez is professor in the Department of Curriculum and Instruction at University of Illinois at Urbana-Champaign. Rochelle's research focuses on equity issues in mathematics education. She has published more than 20 journal articles, has co-authored more than 15 books, and in 2018 has given more than 10 talks related to the topic "Rehumanizing mathematics."

Lanius & Sisneros-Thiry: *When and how did you know you wanted to study mathematics education?*

Gutiérrez: In my senior year of college, I was a biology major, had already taken my MCATs, was working at Stanford Hospital, and applying to medical schools. I was focused and knew exactly where I was going. But, at Stanford, they want you to be well rounded, so they make you take all of these courses in areas you might not normally study, such as ethics, society, and art. For every one of those mandatory areas outside of science, I found ways to make them work for my very narrow-minded view of only wanting things that would help me become a better doctor. For example, for the course in ethics, I took bioethics. But in order to graduate I still needed one last course to fulfill the art requirement. My advisor had heard of a good professor in art education, Elliot Eisner, who offered a course on the Artistic Development of the Child. I wanted to become a pediatrician and thought maybe I could have my patients draw their pain. While I was in that course, I remember fighting a lot with the professor. He was world-renowned and one of the founders of the field, so other students just looked at me wondering how I could argue with someone so esteemed. But there were views discussed that didn't map onto my experiences or my family's, and I wasn't worried about getting a bad grade because I was planning to attend medical school and was really just checking off a box to graduate. After many arguments and many office hours, that professor and I became close. He respected that I stood my ground on things, especially providing views that other students hadn't heard (at the time Stanford was three percent students of color). Toward the end of the course, he said to me, "You know, Rochelle, you could become a great doctor. You are analytic, meticulous, and passionate. But, why not try something really difficult...like education?"

It should have been obvious. I had always loved puzzles, logic problems, and finding patterns all around me, especially in nature. In my free time, I was tutoring other kids in mathematics, working in programs like Mathematics Engineering Science Achievement (similar to Upward

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Bound) and Migrant Education at Stanford. After that conversation with Eisner, I worked in the José Valdés Summer Math Institute. But the message we receive in society about what's important or requires real intelligence to succeed isn't generally about education. Here was a professor challenging me to rethink what I was passionate about and to apply my expertise there. Many people I meet often wonder, well, then, why not go into *science* education if you already had a degree in biology? For me, it came down to understanding the power of mathematics as a gatekeeper in society, seeing that you cannot even enter the field of science without doing well in mathematics. So, that became one of my life goals—to change both how we think of education and how mathematics operates in society.

Lanius & Sisneros-Thiry: *How would you describe your work to a mathematics graduate student?*

Gutiérrez: My work requires becoming multilingual across fields so I can speak to lots of people. I often have one foot in one discipline, such as biology or education, and another foot in a different discipline, such as critical ethnic studies or mathematics. It is similar to mathematicians who do work in number theory and then ask how that might relate to topology; now just imagine that you expand that to a discipline outside of mathematics. My work requires staying abreast of literature in many rapidly changing fields.

In addressing problems in mathematics education, I'm always looking for new patterns, new ways of putting things together. Finding new angles on a problem often requires different tools. Often those tools don't yet exist, and I need to develop them by pulling things from different disciplines. The work I do is like weaving a tapestry. Each thread has a purpose and provides structure for the others.

For over 20 years, I've been committed to addressing equity, especially as it relates to issues of identity and power for people of color, women, and people living in areas of poverty. I'm not just interested in getting more diverse peoples to enter mathematics and do well in it, to "play the game," but to think about how such people will ask different questions, will have different goals, and will ultimately change mathematics and how we practice it, will "change the game." Lately, that work has shifted to what I call *rehumanizing mathematics*, which aims to capture more of the connections with emotions, the body, and our relationships with each other on this planet. In some ways, it's simply an expansion of the four dimensions of equity that I have written about before: access, achievement, identity, and power. However, while those four dimensions tended to relate exclusively to students and teachers, rehumanizing mathematics also takes up how everyday citizens think about, practice, and are affected by mathematics.

Lanius & Sisneros-Thiry: *What was your career trajectory? How did you end up working in the College of Education at the University of Illinois at Urbana-Champaign?*

Gutiérrez: When I graduated from the University of Chicago, I had several job offers. The University of Illinois was the most prestigious in terms of research. So, I figured

I'd start there and quickly move back to California as soon as I could. I grew up in the Bay Area, and as a Chicana my body needs sun and fresh fruit. I never thought I'd stay at the University of Illinois. I've had a number of job offers at excellent institutions over the years, but I keep coming back to the fact that the University of Illinois is set up in ways—working groups, funding, campus culture—that support interdisciplinary work.

Lanius & Sisneros-Thiry: *Do you teach? What type of courses do you teach?*

Gutiérrez: First, I LOVE to teach and feel so lucky that it is a part of my job!! There is no better feeling than helping someone come to that Aha moment of figuring out something that was previously puzzling, making a new connection, or rethinking something they *thought* they understood or believed to be true and grappling with that uncertainty. Teaching allows me to stay young because it's always a conversation between you and your students. I plan my course, but it's just a plan. There's always part of that plan that gets changed along the way—new things I need to learn, new sensibilities I need to develop, new material that changes how we think about our field, new things my students will teach me. At the undergraduate level, for the past 22 years, I have been teaching mathematics methods courses for students who are mathematics majors and who want to become high school teachers. A few years ago, I developed a new course called Social Justice, Schooling, and Society that has a pretty large enrollment (about 200 students) because it fulfills the intensive writing requirement. The course enrolls students from majors ranging from education to urban and regional planning to mechanical engineering. It makes me smile to think that I now teach a course that may change someone's view about education just as Eisner did for me! My graduate seminars range in topics from urban education to mathematics, science, and engineering to sociopolitical perspectives in mathematics and science education. In that latter course, I have doctoral students in mathematics, physics, biology, and mathematics and science education, along with practicing teachers in the local area. We apply my *abuela* (grandmother) rule, which means that when you talk, you need to use language that your grandmother would understand. Students create social justice projects that have immediate impact, such as new colloquia or working groups in their home departments, summer camps for girls, or advanced mathematics courses for locally incarcerated men.

Lanius & Sisneros-Thiry: *Do you have a professional support network? How did you make connections with a support system or community?*

Gutiérrez: My professional network includes faculty in Latina/Latino Studies, mathematics, anthropology, and other departments on campus. I also find that my interactions with graduate students serve as an amazing support system. They always push me to think about things differently and to read broadly to keep up with their areas of research.

I've recently become involved in Science for the People, a professional group of scientists that began in the 1970s

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in opposition to the war and in support of the civil rights movement. These were scientists who did not see themselves and their work as exempt from some of the social and political issues of their time. The organization started up again last year and had its national conference in Ann Arbor in February. I'm helping run a working group, which means I get to be in lively conversations with a lot of interesting scientists, many of whom have been involved in activist work since the 1960s and 1970s, so they have a lot of wisdom to share. I've also been involved with the Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) for several decades and even more recently with Latinx in the Mathematical Sciences, a great group of mathematicians who care deeply about the future of mathematics in relation to society.

Lanius & Sisneros-Thiry: *Do you work with mathematicians and math departments professionally? If so, how?*

Gutiérrez: Until recently, most of my invited talks were in schools of education or education conferences. Lately, I've been invited to present in mathematics colloquia and conferences. I attended my first Joint Mathematics Meeting this January and I really enjoyed it!

One person whom I love to bounce ideas off is Ricardo Cortez at Tulane University. We've known each other since 1988, when we were both graduate students and served together on the SACNAS board of directors. He listens intently and never assumes that he understands my field better than I do or that I should have to come to his way of thinking. He is also really good at explaining mathematical concepts and acknowledging when he doesn't know something in mathematics, which makes sense because not all mathematicians can know all topics in mathematics.

Lanius & Sisneros-Thiry: *How do you balance career and outside interests?*

Gutiérrez: I think having three beautiful children has forced me to keep balance. I had two of them before going up for tenure. Young people need a lot of attention, which keeps you from being defined by your job. When they were little, it meant staying abreast of all of the most powerful Chicana children's authors so I could raise them bilingually. I volunteered a lot in their schools—at times teaching their classes about how to make flour tortillas, other times about civil rights and protests, about Día de los Muertos (Day of the Dead holiday), and, of course, about the mathematics of *papel picado*, a form of art in México. As they got older, I was always running to their soccer, basketball, and volleyball games and cross country/track meets. For a number of years, I coached their robotics teams and learned a ton about cultivating design-based thinking. So, being involved with my children kept me open to new ideas that I would not otherwise have considered.

I am a puzzle and board game junkie. I created a bilingual after-school mathematics club, where we played games and did college-level mathematics with middle school students on a weekly basis out of the local library for four years. My husband says I did this just so I could have other people to play with; see Figure 1 for a selection of some of my games we used in the club. In that after-

school club, my undergraduate mathematics students created stations where you needed your body and other people to solve problems in graph theory, knot theory, number theory, and combinatorics. Each week, we'd solve new problems. The middle school students always impressed the undergraduate students with surprising ways of solving the problems, specifically because they were *not* trying to follow a known algorithm. I loved being with the middle school students in that space.



Figure 1. Gutiérrez, a self-proclaimed “puzzle and board game junkie,” created a bilingual after-school mathematics club, where they played games and did college-level mathematics with middle school students.

I also teach INSANITY® (jump training) and PiYo® (power yoga) at a really great gym. So I have friends outside of academia who love to talk about training and who welcome my recipes for kale and *Moringa*-infused smoothies, while most of my colleagues at work would just think “yuck.” And, does chocolate qualify as a hobby? I have chocolate in almost every room of my house; my favorite is Pralus Le 100 percent. When I travel, I'm always searching for new brands I haven't tried.

Lanius & Sisneros-Thiry: *What obstacles have you encountered and how did you handle them?*

Gutiérrez: Like a lot of women of color in the field, I've had my share of challenges. For example, some of my early research focused on effective mathematics departments, ones that supported students of color and students living in poverty to advance to calculus. When I presented my research findings, people would sometimes suggest that perhaps the students weren't as successful as I thought and maybe I was just seeing what I wanted to see, that I was biased as a Latina studying my own community. I did not see white men presented with the same arguments or critique when they studied white boys doing mathematics. I also experienced some backlash from the far right community when I published a book chapter last year that included the phrase “mathematics operates as whiteness.” I was referring to the fact that mathematics operates as whiteness when we don't acknowledge the contributions of all cultures/peoples to the field and when we use math-

ematics as norm by which we measure people in society. However, that message got twisted through social media and I was reported to have claimed, “Teaching mathematics is racist.” It just goes to show what a crazy moment we are in with social media right now. Many mathematicians and scholars in mathematics education supported me as I navigated the hate mail and trolls on Twitter. You can read a bit about it at ed-osprey.gsu.edu/ojs/index.php/JUME/ and see some of the timeline and how it relates to other mathematicians and mathematics education scholars who have come under attack, as well as find some resources for supporting colleagues under attack at <https://mathedcollective.wordpress.com/>. Although the attack was meant to divide us, I am pleased that we came together and created alliances and structures for supporting each other and launching some important conversations about our future.

Lanius & Sisneros-Thiry: *What advice do you have for graduate students?*

Gutiérrez: Your advisor, in some ways, will become your parent in the sense that this person will model for you how to move through the world as a professional; in a sense, they will “raise” you. Although not all children end up becoming their parents, most do not end up falling far from the tree. So, when looking for an advisor, ask yourself if you can imagine yourself becoming like this person? How does this person interact with students? How does this person interact with their network? What kinds of jobs do this advisor’s students obtain upon graduating? What is the relationship of the advisor to their students after they graduate?

I always tell my graduate students that the best dissertation is one that only you could write. You need to bring your full self to the dissertation process. It is extremely difficult to contribute something new to the field if you are trying to be someone other than yourself. I would avoid writing a thesis that you think your advisor wants you to write or solving a problem that is meaningless to you but your advisor or others want you to solve. You need to learn how to figure out what makes a good problem, and that involves developing some intuition and learning to trust your gut at times. If you are always waiting for others to find a good problem for you, you may find yourself feeling lost after graduate school, when you are on your own. Sometimes solving a problem will require that you use new tools or break with rules that have been followed in the past. Be open to that.

Lanius & Sisneros-Thiry: *If you could recommend one book to mathematics graduate students, what would it be?*

Gutiérrez: One book I very much enjoyed reading was *Pi in the Sky: Counting, Thinking, and Being* by John D. Barrow. It covers the history of counting throughout the world, and it includes a discussion of the question that many mathematicians like to ask: Is mathematics invented or discovered?

Lanius & Sisneros-Thiry: *What should a mathematics graduate student do if they want to learn more about your work or want to be more involved in mathematics education in general?*

Gutiérrez: To become more involved in the mathematics education community, consider attending a mathematics education conference like the Critical Issues in Mathematics Education workshop at the Mathematical Sciences Research Institute (MSRI) or the annual meeting of the International Group for the Psychology of Mathematics Education (the North American chapter offers its own version of the conference every year). MSRI has archived on its website¹ the plenaries of its CIME workshops with detailed notes. So, you can get a sense of the kinds of issues discussed at their meetings.

To learn more about my work, you might consider listening to my podcast on “Equity in the Mathematics Classroom.”² It is an interview with me about my research over the years. If anything seems interesting from that podcast, you could reach out to me at rg1@illinois.edu and I’d be more than happy to suggest a paper to read or a video to listen to. My more recent work on rehumanizing mathematics has been featured at MSRI, and you could find a video on their website.³

Lanius & Sisneros-Thiry: *Any final comments or advice?*

Gutiérrez: Do what you love, not what you think others will value. If you are really passionate about something, you’ll find that you always have the desire to learn more about that and to have really important insights that others might not come to naturally.

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ABOUT THE INTERVIEWERS

Melinsa Lanius, a Wellesley College graduate, is currently earning her PhD in mathematics at the University of Illinois at Urbana-Champaign.



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Simone Sisneros-Thiry

¹ See for example <https://www.msri.org/workshops/877>.

² <https://tinyurl.com/yb6nck8j>.

³ <https://www.msri.org/workshops/877/schedules/23134>.