Evelyn Lamb:	00:00	Hello and welcome to the Lathisms Podcast. I'm your host, Evelyn Lamb. In each episode we invite a Hispanic or Latinx mathematician to share their journey in mathematics. I'm very excited today to be talking with Rochelle Gutiérrez. Hi, how are you?
Rochelle G.:	00:26	I'm doing well, and yourself?
Evelyn Lamb:	00:28	Doing well today. So can you tell us a little bit about yourself?
Rochelle G.:	00:32	So I work at the University of Illinois, in Urbana-Champaign, on faculty in curriculum and instruction and also in Latina/Latino studies. I come from the Bay Area in California. My parents, [inaudible 00:00:43] and Ruben Gutiérrez, are from Aguascalientes and Chihuahua, Mexico.
Evelyn Lamb:	00:48	As a child, did you enjoy math? Is that something that you have a lot of memories of?
Rochelle G.:	00:54	I actually do. I have a lot of good memories of mathematics and, I guess, mathematics not necessarily even tied to school. I'm one of four children, and so because we were four kids, we played a lot of games together, and especially my mother instilled in me the love of logic puzzles and board games. And I played a lot of Lego with my brother. I sewed a lot of dolls. My mom sewed a lot. And so I sewed a lot for my dolls, and I made a lot of doll furniture when I was little. I did a lot of thinking about proportions and kind of getting angles right on making something very, very small.
Rochelle G.:	01:34	And I was part of an experimental program in the late 1960s, early 70s. The education system was kind of undergoing a progressive movement and I was part of this program that was non-graded. So we had kids that were like grades one through three were all in a class, and grades four through six were all in a class, and we did all these really interesting things. There was not a class that was called mathematics, but we did things like point perspective drawings and we were constantly doing logic puzzles and brain teasers, and we were doing kind of the equivalent of pre-algebra in grades three and four, and we were learning to add and multiply in other bases. And so I think there was a lot of things that I was exposed to, that told me that mathematics was not just adding and subtracting, when I was young.
Evelyn Lamb:	02:27	Did you come into math education more from the math side or from the education side, or is that even a false dichotomy?

Rochelle G.:	02:36	I did well at math in school. I think it appealed to my kind of analytic way of thinking. I wouldn't say I was necessarily encouraged or discouraged to go into mathematics. I mean, I think that I was encouraged in the sense that my family was always exposing me to things and supporting me to do things that maybe for other people might not look like that's what she should spend her time on. And I think in school, again, I was encouraged, as I said, and I was in this program, was doing all these really kind of different ways of thinking, but then discouraged by the time I kind of got to, I'd say middle school.
Rochelle G.:	03:12	So I think I came into the work that I'm doing, I would say pretty honestly... So I have a degree in biology and I was planning to go to med school. So I wasn't thinking I was going to be a mathematician or be in math education. But it was something that I always did in my free time. It was something I loved to play with. It was something that I liked to tutor other people. I was working in programs that were reaching out to the community in mathematics. But I think I came into it really thinking about the role of mathematics as a gatekeeper.
Rochelle G.:	03:44	I said that I was one of four kids, and my two older sisters were not in this kind of special program that I was in, and my younger brother was. When I saw the effect that it had, the kind of distancing effect it had on our family. My sisters were incredibly smart, but they weren't positioned in that program in the way that I was. And so that created distance between us personally. And I thought, gosh, tracking systems and this idea of intelligence and what counts as important to society through mathematics is a problem. And that's actually why my early research was on tracking.
Rochelle G.:	04:26	And I went into grad school thinking I want to try to understand why we're using these tests, why we are valuing certain forms of thinking and analyzing as more important than others. And then ascribing certain economic benefits and certain status benefits and things like that. Because although I was in this great program and I got a lot out of it academically, I was also really made to feel like an outsider.
Evelyn Lamb:	04:59	So I know your research today deals with who is belonging and who is not. Can you talk a little bit more about that?
Rochelle G.:	05:07	Yeah, so I have three lines of research. The first is around rehumanizing mathematics. I did a lot of work in equity. Let's see, that was almost 25 years of work, trying to theorize and understand the notion of equity in mathematics. And I've really

gotten to the point where that word equity's not very useful word for me anymore. It feels like everyone thinks they know what they're talking about, but we haven't really even fully agreed upon what we're talking about. So I've moved to rehumanizing mathematics, because I think I'm really interested in this notion of body and emotions and living practice and cultures and histories and things like that. And I guess, in some ways, it's getting at that idea of belonging and who gets to decide.

Rochelle G.: 05:56 So the rehumanizing math work that I've been doing offers these eight dimensions for thinking about how we could change our relationship to each other through mathematics. And it really kind of honors the fact that... The reason I have that word, the part rehumanizing instead of just humanizing, is because the re part is honoring the fact that humans have always done math in very humane ways, like for millennia. So as we were talking about women who sew, or mothers who put away leftovers, or Latin jazz musicians who are riffing on different beats and making them kind of come together with other instruments, or one hand doing one drum and the other hand doing another drum, things like that.

Rochelle G.: 06:39 All those things we're already doing in terms of practices that aren't sanctioned necessarily, or seen as mathematics by maybe everyday people, but also, I think, sometimes by mathematicians. That unless we can name, oh yes, this musician is thinking about these common denominators when he's thinking about this drum beat is at this rate and this drum beat is this rate. And at one point they're going to come together and they're going... That somehow we have to have this universal way of thinking about things. And so the rehumanizing math for me is offering those dimensions to say what kinds of things do we need to pay attention to in our practices, both inside schools and outside of schools, but primarily inside schools, that would, again, change our relationship to each other.

Rochelle G.: 07:24 The second kind of research that I have, and it's very much related to that first, is called living mathematx. And in living mathematx, I'm really saying I'm interested in recognizing that our relatives, land nations, water nations, animals, plants, our relatives, and we are all doing mathematics. We are all performing mathematics in ways that sometimes are acknowledged and sometimes are not. And that if we kind of take that notion that it's not just humans who are doing mathematics. So from an indigenous perspective, kind of de-centering humans and thinking about how to reattach to land

and other nations, That's the work of the kind of living mathematx stuff.

Rochelle G.: 08:13 And the last line of research that I'm currently working on is political conocimiento in teaching mathematics. And what that's about is saying, okay, if we understand that there is this politics of mathematics, if we understand that there have been decisions that have been made along the way, historically, about what we count as mathematics, or what we don't count as mathematics, that are being practiced. And so if we say, okay, there's all this stuff that's going on, there's these politics, there's issues of power and belongingness and other things that are coming into play with mathematics, how do teachers understand that? And then what do they do with that? Right now we're in a moment where the politics of teaching and the politics of mathematics, in particular, are preventing us from being able to really change what happens in classrooms and what happens in society.

Rochelle G.: 09:08 So the political conocimiento in teaching mathematics is me saying, I've been developing tools and methods for building within teachers their deep understanding of the politics of mathematics and the politics of teaching. I refer to that as the mind. And they're also developing within teachers their commitment and their willingness to take risks, which I refer to as creative insubordination. And I've referred to that as the heart. So I'm saying we need both the heart and the mind. You can't just prepare teachers to be upset with the conditions that are happening, and go out there and stand up for students, and then get fired, if they don't understand the politics of teaching, the politics of mathematics, that they can't speak articulately about ethnomathematics, or about why we've had other mathematics before and why those have been pushed out, or why mathematics in school might take a different kind of approach than this algebra to calculus pipeline that we seem to be stuck in.

Evelyn Lamb: 10:10 Is this mostly pre-service teachers that you're working with and teaching, or do you also work with currently teaching teachers?

Rochelle G.: 10:19 I actually work with all different kinds of people. I work with pre-service teachers. I work with practicing teachers to think about how could they change the dynamics of what's happening in their schools. We have a scenario and then we help people think about, well, this thing came up in your classroom, or in a department meeting, or in a professional development seminar. So what basically, in each of these scenarios, we ask people,

"What would you do if you were in that scenario?" And then we have people unpack that and role-play and then start to think about how do you learn how to talk to other people and create dialogue so that you're not just dismissed? How do you invite people to see the problem as a shared problem, rather than you trying to convince them that you're on some higher ground than they are, and that they don't know any better? How do you help people kind of learn how to do the right thing and put pressure on other people, so that you have system-wide change and not just change about that one little instance?

Rochelle G.: 11:14 Over the past couple of years, I've been doing some of that work with mathematicians. I offered a course at PCMI that was on rehumanizing mathematics and helping mathematicians think about if they wanted to change something in their home context, whether it was something in their math department, or whether it was something on a bridge program they were doing, or they wanted to change how they do office hours, or how they train TAs or anything like that, and they wanted to come from that perspective of rehumanizing mathematics. As you say, all these pieces are all interconnected, because if we understand that we want to change something fundamentally about mathematics, not just get more people into it, not just help them do well by the standards of society, but we actually want to engage with our bodies and our emotions, understand mathematics as a living practice, think about creation and ownership and broadening what even counts as mathematics, then we're going to probably ruffle some feathers. We're probably going to get some people pretty upset with us, because we're not trying to just tinker with the system, but we're actually trying to overhaul the system.

Evelyn Lamb: 12:18 And you have managed to get some people upset with you. You've ruffled a few feathers.

Rochelle G.: 12:23 Yeah. So yeah. So in the fall of 2017, I came under attack from Fox News. That kind of went viral. And also from Turning Point USA. They had this professors' watchlist. There was a lot of vitriol that was kind of projected towards me, because in a book chapter I had written, I had said that mathematics operates as whiteness. And what I meant by that was that mathematics operates as whiteness when we don't consider the contributions that other peoples have made to the practice and to the discipline, and that are still currently making and are practicing and are performing, and when we use mathematics as a kind of standard that's somehow pure and always good that we measure everything else up against. I liken it to when we

think about how whiteness is a norm in the United States, whiteness is seen as kind of the standard that other people are either expected to measure up against, or that are pressured to do that.

Rochelle G.: 13:30 But when I said that, Fox News changed the language that I said, and said that I was saying that teaching mathematics is racist. And then this became the big thing that everyone saw me as this professor who was saying that teaching mathematics is racist. And they twisted the message so much that I even had people who were writing to me. And I've been talking on this interview about how important things like understanding the contributions of other cultures, and understanding cultures and histories and decisions we've made in mathematics that have caused us to have a current version that we have. And I would have people who saw those tweets about this professor saying teaching math is racist. And they were writing to me saying, "I'm an Iranian woman and can't believe that you are suggesting that mathematics is only white, and that only white people can do mathematics."

Rochelle G.: 14:18 And so, again, it was kind of funny the way that message got twisted, but it was clear that what is it about our society and about the history of mathematics that when we try to make connections between mathematics and issues of violence, or oppression, or dominance, or power, identity, that that's seen as such an affront that we would have a national attack on somebody. And that really raises questions for like why aren't we able to question what counts as mathematics? Why aren't we able to question who is mathematics buy-in for? Why is that seen as such a threat?

Rochelle G.: 15:06 Again, I know many, many mathematicians who came to my support when this happened that shows that we are in a different moment in terms of the relationship between mathematicians and mathematics education scholars than maybe we were when there was the attack on Jo Boaler at Stanford University, and mathematicians were part of the attack against her as a mathematics education scholar. So the work that I've been doing around this political conocimiento in teaching mathematics and around rehumanizing mathematics has now moved towards working with mathematicians and helping mathematicians see that like, okay, if you really want to do something more than just offer more kids access to your university and create more support classes for these students, or decrease your class sizes or something, but if you're really interested in changing the nature of the experience for people

in terms of what they think mathematics is, who does it, why we do it, and that there's a place for them to learn how mathematics can contribute to problems in their home communities and to their lives, and that they would actually be authors on mathematics and not just consumers of mathematics.

Rochelle G.: 16:24 Then again, you're going to piss some people off. And if you do, then you're going to have to know how do you navigate those politics, and that's where the creative insubordination comes through and that's where the different tools for both understanding the politics, and then also being committed to take risk, and knowing how to take strategic risks so that you, again, aren't fired, or that you aren't just dismissed as somebody who's really not part of the group.

Evelyn Lamb: 16:52 That, obviously, was a big challenge for you. I'm sure that's not the only challenge that's happened in your career. In general, how have you overcome these challenges in your academic career?

Rochelle G.: 17:06 I guess one of the main driving forces for me is just kind of remembering my place in this world. I know my ancestors are with me. My family raised me to know that I have gifts to give in this world, and that our people have resisted when we've faced challenges. And I'm just one of many, many people who's continuing this work. And so part of that is just kind of a moral compass. It's just kind of this is the work I'm meant to do, and I'm supposed to keep doing it. And so that's kind of, I guess, one piece of it.

Rochelle G.: 17:39 And then again, I mean, I learned creative insubordination through my mom. I mean, this was work I saw her doing on a regular basis, and I saw activists doing on a regular basis, because I was raised in a Chicanx activist community. We were always advocating for campesinos, farm workers, and janitors and other people. And you knew that you couldn't just ask, "Could you do this thing," on behalf of somebody else. And when they said no, you just smiled and you moved around them and you found someone else. You learned how to bend the rules. You learned how to have dialogue with people. You learned how to do these things.

Rochelle G.: 18:17 And so some of it is kind of recognizing that this is my responsibility to do this work, and so I kind of can't give up. And it's also, I guess there's a part of me that enjoys challenge. I think when I have things that I have to overcome, I mean, not

		the Fox News stuff, but when I have things that I have to overcome, I guess I think of it as that means that there's so much more that I need to learn, and it's in that learning that kind of reminds me that I'm alive, that I get to learn new things. I pull from a lot of different fields, and I guess I thrive on that idea that challenge is good, that challenge broadens us. It makes you be able to be multilingual. It makes you be able to move in different spaces than maybe you would if you avoided challenge. And I guess you really can't avoid challenge anyhow. It's going to happen.
Evelyn Lamb:	19:18	Right. Part of being human and doing mathematics or any other human discipline. You've given me, personally, and I'm sure our listeners as well, so much to think about. I really appreciate your taking the time to talk with me today.
Rochelle G.:	19:34	Sure. Thank you for having me.
Evelyn Lamb:	19:39	Thank you for listening to the Lathisms Podcast. It's produced by me, Evelyn Lamb, and made possible by a Tensor-SUMMA grant from the Mathematical Association of America. Our music is Volveré by La Floresta. Lathisms is an initiative to celebrate the accomplishments of Hispanic and Latinx mathematicians. It was founded in 2016 by Alexander Diaz-Lopez, Pamela Harris, Alicia Prieto Langarica, and Gabriel Sosa. You can find more information about the project at lathisms.org. That's L-A-T-H-I-S-M-S.O-R-G. Join us next time to hear from another inspiring mathematician.