

## BUILDING JUSTICE PODCAST



### CRISJ Building Justice Podcast

#### Season 3, Episode 3: Underrepresentation in Mathematics: why does it matter?

**Moderator:** Brianna Davis

**Guests:** Nikita Aleksandrova, Ruqshana Amiri, Derya Asaner, Jesse Chappell, Frankie Grijalva, and Jesus Marrot

**Please note:** This transcript may be imperfect. Please contact Brianna Davis at [briannadavis@csus.edu](mailto:briannadavis@csus.edu) directly should you have questions.

### TRANSCRIPT

**Music lyrics:** Company under construction, the function, justice for the human family we demand it. Justice, true freedom, equality is a must. Thus, decolonization of the planet. So bust this. People be the power now we're Building Justice. Pulling out divinations, now we're Building Justice. Welcome the planet to the Podcast, "Building Justice," "Building Justice," "Building Justice." Building is to add on, or to do away with.

Brianna: Welcome to Building Justice, a podcast by Sacramento State's Center on Race, Immigration and Social Justice (CRISJ). We explore critical issues affecting our communities with the hopes of creating a healthier and more just world.

Brianna: I'm Brianna Davis.

Brianna: I use pronouns she her hers.

Brianna: I'm a graduate student in mathematics here on campus, and I'm also a former PAL facilitator where I facilitated Math 32 for a few years.

Brianna: Today, we'll be discussing under-representation in mathematics and the ways in which this discussion is a social justice issue for our purposes today.

Brianna: We define under-representation as the act of ignoring,

Brianna: neglecting or making invisible people who belong in the field of mathematics and who need to be a part of the conversation.

Brianna: I'm here with several people from campus who will now introduce themselves.

Jessie: Hi, my name is Jessie Chappell and my pronouns are they them

Jessie: I'm a senior math student at SAC State and I'm hoping to become a high school teacher.

Nikita: Hello. My name is Nikita. I'm a fifth year math major with an emphasis in pure mathematics.

Nikita: I'm currently working with PAL as a math 31 lead facilitator.

Jesus: Hi everyone my name is Jesus Marrot and I'm a current mathematics and physics student.

Jesus: My pronouns are he him and his, and I'm currently working with math literacy and commit to study.

Frankie: Hello Everyone name is Frankie Grijalva and pronouns are he him his.

Frankie: I'm a master student in math here at Sac state and previous jobs that I've had on campus as a

Frankie: PAL facilitator for math 12 and I'm excited that I'm going to be math 12 instructor this semester.

Frank: So excited.

Brianna: Fantastic.

Derya: Hi there. My name is Derya and I am a previous sac state student.

Derya: I graduated this last spring. I go by she her hers for my pronouns, and I did work on campus while I was a student.

Derya: And I worked for PAL, where I served as a math 30 and Math 31 facilitator and a supervisor, and I also worked for the math partners program.

Ruqshana: Hello, everyone. My name is Ruqshana Amiri. My pronouns are she her hers.

Ruqshana: I'm currently mechanical engineering major at sac state, hoping to finish with my minor in mathematics.

Ruqshana: Some roles I currently carrying campus are as a mentor in the math literacy program,

Ruqshana: as well as working within the commit to study program on campus.

Brianna: Fantastic. Thank you all and thank you again for being here.

Brianna: We're going to have a great conversation today. Talk about a lot of important things and to get us started.

Brianna: Can you each tell us a bit about yourself? Why did you choose to study math?

Jesse: I chose to study math because it's the closest thing we have to objective truth.

Jesse: And I feel like it's the language of the universe and it really teases out the numinous from the mundane.

Nikita: I chose to study math because I've always had an affinity for it.

Nikita: It wasn't until high school that I actually fell in love with math.

Nikita: My high school teacher played a pivotal role in sparking that passion while excelled in math from an early age.

Nikita: It was his dedication and enthusiasm in the classroom that really transformed the math class from something that I needed to do for school that,

Nikita: you know, transformed into something that I love to do. And his classes were like really fun.

Jesus: I chose to study math because my peers told me in high school that I'm really good at math.

Jesus: So I just went with it because I was influenced by my peers. But when I started at community college, I struggled.

Jesus: I didn't like it. I was thinking about switching majors.

Jesus: But then I got to the point where some of the the community college I went to, the professors really weren't that great.

Jesus: There were only a couple, but not all of them were great. So at that point, I decided to continue with math, but also gained another major,

Jesus: which was physics,

Jesus: So my well, the reason that I studied math is so that I can become a teacher and to help better with the education system.

Jesus: And hopefully that can also help with spanish speaking students.

Ruqshana: The reason why I picked up mathematics is because I always had an affinity for it through high school.

Ruqshana: But going into college, it wasn't a singular pursuit.

Ruqshana: It was because I knew that I wanted to go into college as a mechanical engineering major and that majors surrounded by a lot of math.

Ruqshana: So I had to complete a lot of math courses. I had to be really good at it in general as a topic.

Ruqshana: So I was hopeful that by the end of my college completion that I'd have my minor in maths.

Ruqshana: And I know when I go into the industry being good at math and having that minor as well would lead to increased job satisfaction for me personally,

Ruqshana: as well as this interest in higher pay. Whenever I go into the workforce,

Derya: I chose to pursue math.

Derya: Similar to Jesus' story. I actually didn't enjoy math very much when I was younger and when I was in high school.

Derya: I found it really difficult and I was really intimidated by the process of struggling with mathematics.

Derya: And after taking a lot of math courses in college, I realized that this is actually the beauty of math,

Derya: that struggling is an integral part of mathematics and getting stuck and then

Derya: having this empowering journey of tackling a problem and making progress.

Frankie: Yeah, So I was kind of shocked. I chose to study math because like others here, I absolutely hate math in high school,

Frankie: and I think it was because the people or my family and then people that I was around always told me how hard math was.

Frankie: And so I kind of adopted that mindset as well, too, and thought that math wouldn't be for me, but it wasn't until

Frankie: I changed my major like four times that I kind of realized that I wanted to do math.

Frankie: I was a computer science major, and I didn't know that you needed math for that.

Frank: I thought you just, like, sat on the computer and just coded stuff, but then I had to take a college algebra class.

Frankie: And my math professor was a very passionate about it and really made me realize that it can be You don't have to like math, but you can respect it.

Frankie: And I definitely respected it. And then the actual liking that came later.

Frankie: And I think the biggest thing that I had to overcome with math is just like telling myself that I can do it.

Brianna: That's wonderful. Thank you all so much.

Brianna: And and something I find that we all have in common is we all have to build our resilience within math and sort of find that the

Brianna: productive struggle was something that we enjoyed and work past a lot of challenges to get to the point where we're at now,

Brianna: where we like math and where we love it, and where we're spending time studying it intentionally.

Brianna: So moving on to our next question.

Brianna: I'm curious, what kinds of leadership roles have you all held on or off campus related to math?

Brianna: You know, for myself, I've done different tutoring jobs on campus.

Brianna: I work for the PAL program, the Peer the peer assisted learning program.

Brianna: And I'm curious what you all have been involved in.

Nikita: Yeah.

Nikita: My most significant leadership role on campus has undoubtedly been my involvement with PAL.

Nikita: Like I mentioned previously, I am the lead for Math 31 in this exceptional program and I've been with them since fall of 22.

Nikita: If I believe this journey has been incredibly enriching, allowing me to contribute to an initiative that holds immense value.

Nikita: And prior to this, I had the privilege of working as a private tutor and later as a tutor with the math tutoring programs.

Nikita: These roles have all provided me with the opportunity to support students who encounter challenges in math.

Nikita: it's deeply fulfilling to be able to share valuable skills that can serve them well through their academic journey,

Nikita: you know, beyond just imparting math knowledge.

Nikita: My overarching aim is to foster a sense of community among students, and I strive to instill confidence in their abilities,

Nikita: not only within the realm of math, but also in their broader academic pursuits.

Jesus: As I've held like tutoring or positions or helping people in the past, that was in high school and community college,

Jesus: but when I can here to sac state, the two leadership roles I've encountered here at sac state were the math literacy which.

Jesus: I will do math activities. I will table and will show math activities to students.

Jesus: How a Rubik's Cube or just folding like origami is related to mathematics.

Jesus: I found that interesting because it was a different view from mathematics.

Jesus: It gave me the opportunity to teach to show people that another point of view of mathematics and for to commit to study.

Jesus: I enjoyed it too, because instead of tutoring or showing students how to do something,

Jesus: I'm trying to give them resources they can use to hopefully they can improve on themselves so they can improve in their classes.

Ruqshana: And similar to Jesus, I also worked.

Ruqshana: Well I also currently work in the math literacy program as well as the commit to study program.

Ruqshana: The math literacy program was something that really changed my perspective around this world of mathematics.

Ruqshana: And like Jesus said, we did a lot of stuff that was different from just numbers and tables and stuff

Ruqshana: that we typically see within the classroom that have to do with outreach, working with students.

Ruqshana: And I think the reason why this changed my perspective was we saw mathematical.

Ruqshana: I saw mathematics not just as something where you have to pioneer like new breakthroughs

Ruqshana: or have far reaching implications on the world of research or mathematics in general,

Ruqshana: but also mathematics. It has a pivotal role in outreach in diversity and inclusion.

Ruqshana: This is a lot of stuff that we were doing where we were introducing mathematics to maybe groups that don't have access to it,

Ruqshana: whether that's within the field of study that they're in or maybe their upbringing in their,

Ruqshana: I guess, hate towards mathematics or their just disliking of it.

Ruqshana: So I think that was that was something that was a really great turning role

Rushana: and changing my perspective on how I see mathematics and the world around it.

Derya: So I held a few different positions on campus and off campus.

Derya: But while I was a student at SAC State, I, along with many of the wonderful people that are talking here today, served as a PAL facilitator.

Derya: Again, for math 30 and 31. I was a lead for math 30 and 31, and I was a supervisor.

Derya: And some of our roles included holding office hours, working with students on problem sets and.

Derya: Being a support system for these students who are struggling through these difficult classes.

Derya: I also worked for the math Partners Program, where I was a mentor for students who were taking second semester of abstract algebra,

Derya: where I would attend lectures and hold office hours and I would use my skill set, which is scaffolding and not really giving students answers.

Derya: And I would just try to help students build their own confidence in their own problem solving techniques and methods.

Derya: And then I also worked as a K through 12 tutor excuse me, tutor off campus where I primarily

Derya: primarily focused on math, but I also helped with some other subjects for the younger students.

Derya: And it was really nice, you know, to practice scaffolding students at a completely different level,

Derya: which can be really hard when you're dealing with really foundational concepts like math concepts.

Derya: How do you scaffold someone through addition and these kinds of things?

Derya: So that was a really great experience to.

Brianna: So from all of you, again, what is one example of the time that your math class content made you feel like you belong in mathematics?

Brianna: And then why did you feel that way?

Jesse: Well, calculus was the first time I really felt that way in math.

Jesse: I struggled a lot in algebra and never passed it in high school.

Jesse: Actually got a GED because I struggled a lot with mental health issues in high school and bullying.

Jesse: So calculus was like what I took in college and I just really fell in love with the subject.

Jesse: I felt the thrill of peering beneath the surface into the mechanisms behind reality.

Jesse: I was dealing with the concept of infinity, which is so cool,

Jesse: and then also trying to precisely quantify something as abstract and universal as change.

Jesse: It just seemed so powerful.

Nikita: There was a particular instance during class when I was taking math 105b For those who don't know, it's advanced math for science and engineering.

Nikita: When the content resonated deeply with me and like solidified my sense of belonging,

Nikita: we were discussing real world applications of advanced calculus concepts,

Nikita: and it finally sunk in that math wasn't just theory or practice problems,



Nikita: but a tool that can be widely used to understand and solve tangible problems.

Nikita: This made me feel like there was an active like I was an active participant in

Nikita: the world of math where my skills and passion can make a meaningful impact.

Ruqshana: I would have to kind of jump off Nikita's idea here, because I think before really taking before even before going into the Math Literacy program,

Ruqshana: I saw I saw mathematics as this like abstract thing that just had to do with solutions and equations.

Ruqshana: But really, I think whenever you introduce a role like that historical concept, they get the historical context behind math.

Ruqshana: And I guess this intersection of curiosity about mathematics and real, real world phenomena, phenomena.

Ruqshana: You can see how I guess how math is a tool to understand the rest of the natural world and how math kind of simplifies complex things.

Ruqshana: Even though before that whole idea, I thought math was the complex thing that that makes sense.

Derya: So I don't have a specific experience,

Derya: but overall times when I have felt included and a sense of belonging in a math classroom is pretty

Derya: much any time professors facilitate group work and you speak with other students and you realize,

Derya: Oh, I'm not the only one who doesn't understand this, and I'm not the only one who's struggling.

Derya: Those are the times where I felt really included in my classroom because I suffer from imposter syndrome all the time.

Derya: And whenever professors do this,

Derya: it really makes me feel like a sense of community and makes me feel like I'm not alone in the in that struggle of math.

Frankie: Yeah, my answer is going to be very similar to Derya's.

Frankie: Yes, I think the class concept that was probably the hardest for me was the real, real analysis and it was super hard.

Frankie: So it kind of forced me to form study groups with other people and that within that was how I was able

Frankie: to kind of find community and made me feel like I belong in mathematics just because we were all,

Frankie: you know, struggling together. And I think it's a lot better to struggle as a group than just, you know, by yourself at a desk locked in your room.

Brianna: Yeah, absolutely.

Brianna: And I really also enjoyed, you know, hearing about how, you know, other people have been so integral to our success in different ways, you know,

Brianna: be they professors or study group partners or classmates, you know,

Brianna: And all of these people really do have a huge impact on how we move through our education and how how we feel about math.

Brianna: And I love that. That's that's great. So the flip side of this is what is one example of a time that you felt invisible or nonexistent in mathematics.

Jesse: Yeah, well, I mentioned I didn't finish high school.

Jesse: I got a GED instead, and that was because I was bullied a lot in high school, being dealing with mental illness and then also being trans.

Jesse: I dealt with a lot of problems that led me to just finishing my high school education.

Jesse: So when I came to community college, I wasn't very socialized and I remember asking somebody where the math club was that semester,

Jesse: and they lied and told me it wasn't even happening.

Jesse: And it's just like little things like that that can bug you, but it's just a part of being older and getting used to a community.

Jesse: And now that I've gone farther along in math and I'm with people who are like minded and really love the subject,

Jesse: I found so much acceptance and I really loved being a math major for that reason.

Nikita: I think I've been very fortunate enough to never experience the feeling of being invisible, even during times of struggle with my math courses.

Nikita: This could probably be attributed to the incredible luck and privilege I've had in being consistently surrounded by

Nikita: individuals and professors who genuinely prioritize their students well-being and acknowledged the challenges we face.

Nikita: However, I also believe, you know,

Nikita: my own strong personality and determination played a significant role in that you know when forging my own path in various situations.

Nikita: I've been very assertive and resolute. And in instances where I might not immediately find a place, I'm driven to create one for myself.

Jesus: One example for me is back in high school, I used to help a lot of the ELD kids.

Jesus: If I remember, that's initially called the ELD kids because they didn't know English and in math.

Jesus: And mostly when it comes to Hispanic or Latinx culture, usually we are not very good.

Jesus: Back I think in my class in high school, I think there were only three of us like in Pre-cal honors and every and everybody else

Jesus: either was an algebra two or wasn't taking math that semester or that year.

Jesus: So I would go and help the ELD kids because I knew I knew some of them we were in.

Jesus: We had the same teacher for English. So I would help .

Jesus: I would help them but I felt invisible because I didn't know the specific names or how to say certain words in Spanish.

Jesus: So every time I would stutter, or I would try to like speak Spanglish, which I felt I felt awkward doing it.

Jesus: I felt like. That this is not helping them. And they still they're still trusting me with their math knowledge.

Jesus: I just felt horrible because I, I had doubts of me being someone who can they rely on.

Ruqshana: Yeah. I think my my personal feelings of invisibility, like, Jesus did have to go back to classroom interactions.

Ruqshana: And I think that in my experiences in classrooms, mostly in college level math courses,

Ruqshana: was that I feel like most professors, they kind of favor more vocal peers.

Ruqshana: So it's not that, you know, I would feel like I'm less capable of answering questions, but you know I take more time to process information and answer.

Ruqshana: But it was almost like my hesitation caused like a lot of cause, almost like a dismissal from peers or from professors alike.

Ruqshana: So even though my answers would take the same approach as those who are quick to answer,

Ruqshana: I feel almost like a lack of confidence to even raise my hand.

Ruqshana: And I that feeling of invisibility is something I put on myself because the more like favoritism I saw or the quickness with other

Ruqshana: people and how how quick they are to get to their own answers made me feel like my insights or my information that I could give out.

Ruqshana My answers were almost lacking. So I think that's something that I had to overcome personally to teach myself, you know,

Ruqshana: just because I'm answering more slowly or I'm not seeing stuff as quickly as other people doesn't mean that I'm lacking.

Derya: I definitely am relating to what Ruqshana said because I take a long time to problem solve and to think about problems.

Derya: And I think that times I have felt invisible or isolated in the classroom is when other students answer really quickly,

Derya: or if we have some sort of timed activity.

Derya: I get really nervous and it takes me a long time to finish, and I kind of feel isolated in that sense because I may not finish all of the problems and there may be other students who completely finish it.

Derya: So I think that's a specific example of when I felt invisible in the class,

Frankie: I'm just going to kind of repeat what they said.

Frankie: Yeah, I think the one example that I could think of is when I was taking one's math 117 linear algebra,

Frankie: and then there were people in that class that were like near like all this remembered everything from my group theory and stuff.

Frankie: And I didn't remember everything from group theory.

Frankie: So I kind of felt like I was invisible, I guess I'm like, you know, Derya saying like imposter syndrome a little bit.

Frankie: But I think it really like just comes down to like, just comparing yourself to others when you should only just be comparing yourself to your own,

Frankie: you know, to see if you're just basically improving or not.

Frankie: So and that's what I've been trying to start to do more recently is just, you know, look at your own improvements.

Brianna: Yeah, I think I think that's fantastic. Especially, you know, not comparing ourselves constantly to other people.

Brianna: And like, you Nikita, what you were saying really resonated with me,

Brianna: and that's something that I personally aspire to being able to create a space for myself when one isn't presented to me is is really hard for me.

Brianna: Okay, So our next question is, are there people who represent you in leadership roles on campus and how does that impact you?

Jesse: I believe there are. I have a lot of benefits, you know, like of a white privilege and a middle class family.

Jesse: I also do have disadvantages as a disabled student and a first generation student who's neurodivergent and transgender.

Jesse: But I've met a lot of professors on campus who were first generation students

Jesse: and have dealt with mental health issues and anxiety and also just in general,

Jesse: how the whole campus is so supportive of LGBTQIA stuff.

Jesse: And it's just a wonderful environment.

Nikita: Yeah, absolutely.

Nikita: There is a strong presence of individuals who serve as inspiring representatives in leadership roles on campus.

Nikita: You know, within the mathematics department, numerous professors embody those qualities and actions that resonate deeply with me and my experiences.

Nikita: And, you know, the sense of community they foster is something I'm genuinely proud to be a part of.

Nikita: You know, when focusing on my own peers. Some standout examples are you, Brianna, Derya and Frankie as well, for all the hard work you've done

Jesus: Yeah. So continuing with the leadership role.

Jesus: So like professors, as you mentioned, professors are really great.

Jesus: They're all friendly, even though they're from different cultures, everybody very different cultures.

Jesus: There is no one majority of culture, I think, in the math department, but everybody is so nice.

Jesus: What I find interesting, like how they impact us. What I find very interesting is that they really try it out.

Jesus: They really try to bring out the best in us and also give us opportunities.

Jesus: That for me, I was mostly raised with no one giving opportunities.

Jesus: Nobody have nobody have faith in me. Nobody thought I can do anything. When I came here, these professors actually met say, Hey, this opportunity.

Jesus: Please try it. You'll do great. So just them having.

Jesus: Hope or just giving us opportunities at hand and having them think that we can bring out the best them bring out the best in us.

Ruqshana: I think you three really did a great job of summarizing how leadership roles in the mathematic department itself faculty in different programs.

Ruqshana: They play a really huge role in shaping how we see ourselves in the projects we take on personally.

Ruqshana: Even my own mentor, Dr. Hajra, she's so cool.

Ruqshana: She has like numerous roles on campus in SAC State.

Ruqshana: Below her email address, there's like a list of just ongoing titles of different programs that she takes on.

Ruqshana: And really one thing, one major thing that I learned from her about leadership roles on campus in my own taking

Ruqshana: on of her math literacy program is even if I don't see myself in other roles on campus,

Ruqshana: other leadership roles on campus to other people, I can at least, you know,

Ruqshana: join programs like Math Literacy program and take on outreach and inclusion through going around campus and having a role in this program, too.

Ruqshana: So at least, you know, if I don't see myself in other people,

Rqushana: other people can see me and see themselves in what I'm doing and maybe have more interest

Ruqshana: or pursue of the programs I'm taking on or mathematics through the work that I do.

Ruqshana: So I think her, especially her role in my endeavors has been really impactful.

Derya: So I'm really fortunate to say that there are individuals who represent me in leadership roles on campus.

Derya: I've been really fortunate to get to know some of these incredible female faculty members

Derya: in the math department and also have had the opportunity to be mentored by some as well.

Derya: I was also mentored and worked with Dr. Ghosh Hajra who, like Ruqshana said,

Derya: is such an inspiring person to work with because she's so involved with the community,

Derya: but she's also so involved with outreach and promoting diversity within the math department and all of these incredible things she does.

Derya: And I don't know how all of it,

Derya: but I think like Ruqshana was saying these members on campus have such a huge impact on the student body and on mathematics as a whole.

Derya: And having diversity in leadership positions is really important because.

Derya: You know, we need the range of perspectives, and having these diverse perspectives may lie more and with your own struggles within academia.

Derya: And I think that they approach teaching and working with students and dealing with issues in the department differently because of this.

Derya: So I had a really great experience at sac state with the faculty.

Derya: In that way,

Frankie: I would say, I've got to think about this like kind of culturely, I guess.

Frankie: I think there is like some Latinx faculty members, at least in the math department, but I feel like there's not that many.

Frankie: And it was kind of this is like kind of going beyond the question, I guess.

Frankie: But I never had like. Like a Latinx teacher.

Frankie: That thought math. Up until I went to sac state. So, I mean, that kind of impacted me in a way that like it kind of, I guess, enforced.

Frankie: You know, people in my culture teaching this subject.

Frankie: So like, it kind of reinforced why, maybe math isn't for me.

Frankie: When I was like, you know, in high school and stuff like that. But yeah, I mean, it's just kind of inspired me now to like,

Frankie: even push me even further to want to, like, get a PHD and stuff like that and, yeah, like there is other people, that, you know, can look differently, can, you know, also still teach math and be knowledgeable in it.

Derya: Okay. So it's something else that Ruqshana said that actually resonated with me a lot

Derya: was how she views herself in the community to kind of act as that leadership,

Derya: to act as a leadership role. And I was just thinking,

Derya: I think the most diverse people I've encountered in leadership positions on campus are students and students working on campus.

Derya: So I think that's a really good resource to utilize.

Derya: If anyone is ever looking for someone from from their cultural identity or

Derya: any of these things to connect with and kind of gain perspective in that way.

Brianna: Excellent. Yeah. You you all are such an amazing group of students and people on campus, and you all are becoming those role models for other people.

Brianna: So that's that's wonderful. I love it. So moving on from that, a very related subject.

Brianna: Have you seen your math heritage in the math curriculum?

Commented [MA1]: Checkpoint

Jesse: So I did take history of mathematics, which is a required class for math majors.

Jesse: And in that class, we talked about math from ancient cultures all over the world China, South America, and the Middle East.

Jesse: And we really dispensed with the myth that math was invented by a bunch of old white guys

Jesse: The Pythagorean theorem, for example, is wrongly named and had been invented thousands of years before in multiple cultures.



Nikita: I can't say that I have personally and admittedly, I don't know many Bulgarian mathematicians.

Nikita: I am also a first generation student,

Nikita: so not a lot of my own family has been in school to tell me about any of these people who have transformed math in some type of way.

Nikita: From what I've gathered, there is notable presence of Bulgarian mathematics mathematicians who have made significant contributions,

Nikita: particularly in the field of differential equations.

Nikita: And this discovery was very fascinating for me, given that my interest for differential equations aligns with that.

Nikita: So I was like, Oh wow, my heritage actually it makes sense now.

Nikita: why really like this type of math.

Ruqshana: As an African-American woman in math,

Ruqshana: I think that Jesse brought up a great point about how the historical context and the fundamentals and

Ruqshana: theories behind math had a lot of white male dominated names

Ruqshana: And one kind of sad overturning that I saw from high school into college math courses

Ruqshana: was the lack of female figures as professors in the classroom within these classrooms.

Ruqshana: It just kind of made me sad about how that overtaking kind of takes place and about how,

Ruqshana: you know, if I would ever go into these roles, maybe it'd be more challenging for me.

Ruqshana: Maybe it makes it easier to take on higher math roles, you know,

Ruqshana: given your role in society, or maybe it's easier for some people compared to other people.

Ruqshan: So I just thought that was maybe like in my role, maybe would be harder.

Ruqshana: So that was something.

Ruqshana: It's almost like I was thinking of like apprehensions for my future roles and how I would come to take those on, if that makes sense,

Derya: So like many of the other participants, I have not seen much of my math heritage in curriculum kind of as I was younger and in college.

Derya: So taking mathematics courses and in a lot of mathematics textbooks, it's predominantly males who are presented.

Derya: Sometimes there are little blurbs on the side, like historical blurbs in a math textbook,

Derya: and it's always about the male who created whatever it is that you're studying.

Derya: And it's unfortunate, of course, because it doesn't promote diversity and doesn't promote inclusion within mathematics.

Derya: I think especially for younger children. I would love to see at least when I was going through the K through 12 system,

Derya: I would love to see a little bit more spotlight on different groups of people.

Derya: For example, like the First Fields Women Fields medalist was Maryam Mirzakhani.

Derya: I'm not sure if I'm pronouncing that right, but she was an Iranian woman and I never learned about her

Derya: You know I think something as cool as that should definitely be something that's maybe more common knowledge among mathematicians.

Brianna: Yes, absolutely.

Brianna: And similar to you, Derya, I never heard about Maryam Mirzakhani until my grandfather actually saw an article about her because she passed away.

Brianna: And then I was reading this and going, oh, my gosh, she's amazing.

Brianna: I would love to meet her. She sounds so interesting and so smart and so creative.

Brianna: And that's the first I'd ever heard about her. And I was mid-twenties at that point.

Brianna: Now how would you be able to share your perspectives on what you think

Brianna: mathematics should look like to make it accessible and inclusive to all groups,

Nikita: I think it's crucial to diversify the teaching methods and materials like we previously discussed.

Nikita: This involves incorporating real world examples that resonates with students experiences,

Nikita: celebrating contributions from historically marginalized mathematics mathematicians, and promoting an open and respectful classroom environment.

Nikita: Moreover,

Nikita: there should be a wide variety of mentorship and support programs that can help nurture underrepresented talent and foster that sense of belonging.

Jesus: From my perspective, one way we can make mathematics accessible to all and inclusive to all groups for me was take one for me.

Jesus: For me was textbooks being able to have access to just textbooks, math textbooks are pretty expensive are really expensive.

Jesus: So just having free textbooks, so having just access to technology.

Jesus: So having a professor or someone in the know, Hey,

Jesus: if you don't have access to a computer there this on campus or if you want access to something else, that's something else.

Jesus: So a library that's in Sacramento or in your city, because usually in libraries have computers in there.

Jesus: And that's why that's why I used to do back in high school, I used to go to a library after school because I didn't have a computer.

Jesus: So I would go to a library and just log on to a computer and hope and just use like desmos or anything for graphing.

Jesus: If I needed help, I can hopefully find it on the internet because I didn't have textbooks at the time,

Jesus: so I had to use the Internet for most of my research.

Ruqshana: And I think a lot of what Jesus just described has to also do with ensuring that learning materials are also available in multiple formats,

Ruqshana: including digital print, audio, just to accommodate for different learning needs as well.

Ruqshana: And then I'm kind of quoting Nikita here, but also thinking of mathematics in a more accessible,

Ruqshana: inclusive way I think has a lot to do with celebrating achievement.

Ruqshana: So even if professors in a classroom can't provide culturally relevant, relevant content for the classroom, you could at least celebrate achievement.

Ruqshana: So that means like recognizing and celebrating diverse achievements in mathematics.

Ruqshana: So that's both in a historical and contemporary way.

Ruqshana: So just even showcasing the contributions of mathematics mathematicians from different backgrounds,

Ruqshana: I think really makes people from different groups feel more included.

Ruqshana: I think this goes really hand-in-hand with the support of learning environment.

Ruqshana: So that means just create classroom culture where questions are encouraged,

Ruqshana: mistakes are seen as opportunities for growth and then also encouraging collaborative learning and peer support.

Ruqshana: So I think foster an inclusive community.

Derya: So I think it's important to start this process of creating an inclusive environment and learning

Derya: environment within mathematics for younger children and to break these math barriers early on,

Derya: such as the one that I once told myself about the struggle with mathematics.

Derya: So I think, of course, teaching children about the incredible and diverse group of mathematicians

Derya: who have made significant contributions to the field is extremely important.

Derya: And I also think normalizing the struggle of mathematics is really important to destigmatize this idea that math is really hard and you know,

Derya: only the people who can do it on the first shot really know what they're doing.

Derya: But also something else that I think is really important That's I've personally never had the experience of it being emphasized,

Derya: is highlighting the creativity behind mathematics,

Derya: because I think a lot of times mathematics is seen as like this very logical and very concrete thing, which it is.

Derya: But at the same time, to solve these incredibly complex problems requires a lot of creativity.

Derya: And I think if people realized how creative the field was,

Derya: it would make people with different perspectives and coming from different backgrounds feel a little more included because in creative environments,

Derya: different perspectives and diversity is encouraged, welcomed.

Derya: So I think that's something I would like to see more as well.

Ruqshana: Can I just add in something before closing?

Ruqshana: I really like what Derya mentioned about destigmatizing mathematics because I think that's something

Ruqshana: that plays a really pivotal role from a young age onto high school and to college,

Ruqshana: because I think you have to introduce real world applications like highlighting the practical applications of math in various fields.

Ruqshana: So not just for mathematicians, but fields like technology, social sciences and the arts as well,

Ruqshana: because I think demonstrating how math is used in everyday life and in different fields can make it more approachable and relatable.

Ruqshana: Like Derya mentioned,

Brianna: I was going to make a couple of points but y'all.

Brianna: Knocked that out of the park. That was fantastic.

Brianna: You mentioned all of the things that I was thinking of and way more too, and so I think I think we all did a really fantastic job.

Brianna: Thank you so much.

Brianna: So briefly, I'd like to extend a special thank you to Dr. Sayonita Ghosh Hajra and Dr. Monicka Tutschka for helping us produce this episode.

Brianna: It literally would not have happened or gone smoothly without their support.

Brianna: So thank you both so much and our listeners, thank you all for listening.

**OUTRO STATEMENT**

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