Dan Meyer (00:00):

I find myself more and more curious about: is there something above the teachers and caregivers that is actually determining a lot of math anxiety?

Bethany Lockhart Johnson (00:12):

Hi, and welcome to Math Teacher Lounge. I'm Bethany Lockhart Johnson.

Dan Meyer (00:16):

And I'm Dan Meyer.

Bethany Lockhart Johnson (00:18):

This whole season we've been talking about math anxiety. We've been speaking to great thinkers, folks who are actively researching and trying to understand math anxiety. We definitely want you to listen to the previous five episodes in this season, if you haven't already. But as we wrap up this season, Dan, we are going to, just you and I, we're gonna share some of our biggest takeaways, some open questions.

Dan Meyer (00:47):

Let's vibe.

Bethany Lockhart Johnson (00:48):

And I wanna know ... you know, Dan, I don't get enough of your thoughts and opinions, Dan Meyer.

Dan Meyer (00:54):

Same. I should put you on my newsletter list. I mean, I have a math education newsletter, DanMeyer.substack.com. But also I have a personal newsletter, for non-math education ideas and theories and hypotheses. I'd be happy to include you on that.

Bethany Lockhart Johnson (01:10):

Oh, please.

Dan Meyer (01:10):

And I wanna say it is really good to see you too. It's been really good for me to digest a lot of the thinking that went on during our interviews. I'm excited to chop that up with you today. I would love to know, first, as you think about how we got into this season: what for you felt like exciting and necessary about a season on math anxiety?

Bethany Lockhart Johnson (01:33):

Well, listeners will know that we started doing more of a theme last season. We focused on joy in mathematics. And so, I already was really excited about having a whole season revolving around one idea, so we could kind of deep dive. And math anxiety ... you know, we shared about it in our math stories in a previous episode. And I navigated — and navigate — math anxiety, and it's something that I see every day in classrooms with other teachers, with other adults. It's real; it's pervasive. And so I was really excited to really talk to folks who are thinking about this and looking at it from different angles. So it's been something that we've gotten really good feedback on. I don't know, math anxiety has not really been something that you said has been really present for you, although there have been moments.

Dan Meyer (02:26):

Right.

Bethany Lockhart Johnson (02:26):

What did you feel? Did you feel like there were gonna be topics that were relevant? What were you feeling before the season?

Dan Meyer (02:33):

Yeah, you're right. I think we have had different relationships in mathematics to mathematics. You know, you and I are different people, different identities, that have been socialized in different ways to be seen as mathematically smart. And so, I obviously had a lot of that going on. Math anxiety was not ... for a lot of people that we interviewed — for yourself, maybe, also — this was a bit of self-study; we learned a bit about ourselves through this. For me, though, I think I feel really motivated. I love that math has such a high status in the world sometimes. I dig that 'cause I do math, and it's big for people, and the president shouts it out sometimes, and says, "We need more math teachers!" Or whatever. But it does seem a little

bit unfair sometimes, that all these kids are experiencing really negative emotions about a thing that society says you need to be good at. And in in fact, will force you to sit and learn for 180 days a year for upwards of 12 years of your only childhood. You've got one of them! And people like yourself, like many adults that I meet, they carry these kinds of scars of math anxiety well into adulthood. And so that, to me, just as a social phenomenon ... math anxiety to me is just really motivating. I don't wanna be a part of that. I don't wanna be a part of that story. It wasn't really my story, but I get how I am visiting that story on people inadvertently. How people experience that story. And I wanna understand it, and have nothing to do with it. So that's been what's excited me about all of our guests. And the interviews.

Bethany Lockhart Johnson (04:10):

Your math story definitely involved far fewer tears than mine. But think about your role. I mean, you created — you helped to create this curriculum, that is going to impact thousands and thousands of students. And the more teachers and parents and caregivers understand about math anxiety, the better we can help turn the tide away from math as being this big scary thing. It doesn't have to be your favorite subject, but it shouldn't cause pain and anxiety.

Dan Meyer (04:41):

Yeah, I feel apathetic about lots of subjects that I learned in my schooling, but they don't carry the same kinds of ... they weren't traumatizing in the way that that math was. So I think we'll share like a few of our takeaways. I'm very excited to learn about yours, Bethany. We'll share some ... the audience, you've been leaving comments and tweets and whatnot. And we'll share a bunch of those. And we also have a couple of questions that are still open, that we might pick up in a later season. And I think one of them is, to Bethany: "Your comment about the goal of helping caregivers and teachers do different stuff in math class to reduce math anxiety. I find myself more and more curious about, is there something above the teachers and caregivers that is actually determining a lot of math anxiety?" Like, if every teacher and every caregiver was doing the right stuff, let's say, whatever that is ... there are ways that math is positioned in society and used for social ends, that I wonder sometimes if that is part of what creates math anxiety, no matter what goes on in the home or the classroom. Anyway, I just wanna bracket that. Let's just put that at the end. I'll be super curious to circle back on that. But yeah, for now, can we talk about some of our takeaways?

Bethany Lockhart Johnson (05:59):

Let's dive in. You know, Dan, we had five episodes so far. What was your first ... what are you taking away from this season?

Dan Meyer (06:13):

So my first one I share with listener Bex Drummond, who said, "The idea of validation is one I'll be passing on to my student teachers. The importance of acknowledging not only that mistakes are good, but that math is hard and can feel alienating are great messages for them to take forward into the primary classroom." So I think that our guests walked an interesting line, or encouraged teachers to do the same, about what happens when someone expresses feelings of math anxiety. And I was really appreciative of Gerardo Ramirez and Erin Maloney, who were talking about, it's important to validate that, and say, "Hey, that is a real thing. You're not making that up." And then, also not to leave students within that feeling. So to validate it, but then not to say what we find, what the researchers that we interviewed found, for a lot of caregivers and teachers, which is that they'll, like, excuse it as a permanent condition. Like, "I always was no good at math, so that's OK you feel that way; there's no need for you to do anything about that." Or for a teacher to do the same thing. There was a line that our guests drew between validating and excusing, for instance, that I thought was really useful for me. If it's been a while since you've heard Gerardo Ramirez, here's a quick clip of what we're describing.

Dr. Gerardo Ramirez (07:36):

For a lot of kids, it becomes a normalized message that if you fear math, that's OK. Join the club. Right? But we have to be careful about that, 'cause a lot of math anxiety researchers will oftentimes say, part of what leads to math anxiety is adults normalizing that it's OK to be scared of math. So I think a lot of times adults, teachers, for instance, math teachers, they'll tell kids, you know, if you're scared, that's OK. And so a lot of the math anxiety community says, "No, no, no, you're not supposed to do that." But my recent view is it's different. I view that as a form of validation, because math is hard. And so telling kids, "Look, it's actually easy if you just try" — I don't think that's true. It's actually just hard! And I think even if it was easy to the kid, it FEELS hard. And I think something that's not really well studied right now in our field is the value of validating people's math negative math experiences. We don't want to validate that, 'cause we think that we're gonna reinforce that. But actually I think the opposite. I think when you

validate people's negative math experiences, it helps 'em to feel that they can handle it. They can start to take control over their own emotions.

Dan Meyer (08:44):

What'd you think about that?

Bethany Lockhart Johnson (08:46):

Yeah, definitely. This idea that it's not a fixed condition; it can be challenging; this can be hard: Yes! And what's also true is that we can navigate this together. And so I also ... you know, Erin Maloney and Gerardo Ramirez both touched on it and touched on that line, like you said. But I also remember Heidi Sabnani, we were talking to her about coaches and the way that coaches working with teachers can help carve out spaces where those teachers can ask questions.

Heidi Sabnani (09:20):

If you listen to teachers, they will work with you if you validate what what happens to them and acknowledge that sometimes that still happens to us. I mean, I still have experiences like that. Sometimes I'll walk into a classroom and I'm like, "Oh, I forgot how to do that." And so stopping and saying, "OK, everybody, this is what's happening to me right now," <laugh> the vulnerability you have, you have to think about that, even if you don't have experiences of math anxiety in your own life. Let's say you always rocked out in math and you're now a math specialist and you love it. You think it's the most spectacular thing. There's some other element in your life where you face some anxiety. All of us do. So it's about thinking about, "OK, this is where I experience anxiety. Can I find that in the teachers that I work with? And then, can my teachers find that in the students they work with?"

Bethany Lockhart Johnson (10:15):

Because so often, for teachers, we think, "Oh, I'm supposed to have this figured out. I'm supposed to know how to do this." Or, "I've been teaching this for however many years, I should know it." And we're always learning, right? We're always trying to look at material in a new way, or we're being asked to look at a new way, or hopefully our students are bringing new ways for us to look at it. And so can there be a space where a teacher can have permission, feel safe, and have permission to be unsure? Right?

Dan Meyer (10:49):

I love that, yeah.

Bethany Lockhart Johnson (10:50):

And a coach can help create that space for a teacher.

Dan Meyer (10:55):

Yeah, I love that analog. As with so much of what we do in education, the same approaches and ideas about student learning apply to teacher learning. And yeah, I love that. I definitely resonate with this feeling of, "Oh no, I don't know what is going on." Like, "I don't understand how this student is thinking or I don't know where I went wrong in my solution of this problem." And for a teacher to be able to say, "This is real. I'm feeling anxious, but it's not where I'm gonna stay," feels very analogous to what we love for students as well. Another comment that I love was from listener Liesel, who mentioned that "ignoring people's past experiences with math isn't helpful. We need to go there, talk about it and heal from it." That was on Twitter. I just think that that speaks really loudly to a dimension of the work of teaching that is about. That's social; that's interpersonal; that restores a person's sense of themselves. So that was one of my big takeaways from our season-long investigation of math anxiety. Bethany, I'd love to know what you took away from that season. Any big observations from you?

Bethany Lockhart Johnson (12:01):

I'd say one of my favorite takeaways is really this idea of redefining math. About talking about math in fundamentally different ways. So we had two guests who I feel like really touched on that. Rosemarie Truglio from Sesame Workshop talked so much about ways that we can integrate math in just our everyday life. You know, she talked about how many moments caregivers can find to have these joyful interactions with their kiddos around mathematics. And of course, Rosemarie is from Sesame Workshop. And I actually ... I have a quick Sesame Street story. Dan Meyer, we recently introduced Sesame Street to my toddler, and he was saying something about Grover, which, hello, everybody loves Grover. And I said, "Oh, you mean like Super Grover?" We were talking about brushing your teeth or something. I was like, "Oh yeah, we're gonna brush our teeth like Super Grover." And he said, "Two point." And I said, "Two point?" He said, "Two point." And my husband had to tell me, "It's Super Grover 2.0." Look at that math happening! My child is talking about decimals! And he's two years old.

Dan Meyer (13:17):

Everywhere. <laughs> It's everywhere. Yeah, that's fantastic.

Bethany Lockhart Johnson (13:21):

I mean, Sesame Street is so iconic, and we talked about how we have these good associations with it, and it's a chance to sit down with your kiddo and experience some fun songs and games together. But as Rosemarie said, it's also everywhere all around us, and we can learn how to engage with our kiddos in these positive ways. I wanna also share a clip from Marjorie Schaeffer. She was one of our researchers and she was talking about an app, Bedtime Math. And I want you to first listen to this clip about expanding the definition of math.

Dr. Marjorie Schaeffer (14:01):

The hope is that for high math-anxious families, these interactions are fun and playful. They don't look like fights over homework. They're just conversations that families can have around topics that are naturally interesting to children. And our hope is that when families have lots of these positive, low-stakes interactions, they actually can see that we can talk about math in un-stressful ways. In lots of ways. We can also do this at the grocery store. We can also do this while we're cooking in the kitchen. It doesn't just have to be fights over homework.

Bethany Lockhart Johnson (14:33):

So, fun, joyful, low-stress, casual conversations. I mean, these are words that we don't normally hear when we're talking about math. And these are invitations for us to talk about math in fundamentally different ways.

Dan Meyer (14:51):

Yeah, I loved the contributions we had. We had like researchers on like Dr. Erin Maloney, Dr. Gerardo Ramirez, and we had people who were more practitioner-oriented, like Rosemarie Truglio. And I would put Marjorie Schaffer in kind of both camps, where she's developing this app and also studying it. And what was great about having the practitioners on for me was that they were out there proposing some novel solutions to the issue, the problem of math anxiety. Where I feel like a lot of — this did not happen with OUR interviewees, but I hear a lot from researchers, they'll explain the problem of math anxiety

from the perspective of how it like reproduces through parents, through caregivers. Which for me it's a little bit unsatisfying. It's like, OK, well, where did they get it? And "Oh, well, it was their own parents! Their grandparents! And their teachers! And generationally, it keeps on propagating!" But I just wanna know, how do you interrupt it? Where did the, you know ... what was patient zero of math anxiety, who then spread it to the entirety of the human race? And so I love the conversations with Truglio and Schaeffer, where they're proposing some methods for interrupting math anxiety. That was really exciting. And I look forward to seeing more research on what they're up to.

Bethany Lockhart Johnson (16:08):

Kind of tying into that takeaway ... another takeaway I'm leaving this season with, Dan, is really figuring out how we make a math routine. So Marjorie Shaffer, when she talked about that at Bedtime Math, she was really talking about how this can be something that families do every night. Two to three minutes to have these conversations. And they really saw through their research that that it made an impact. It made an impact. And it was shifting the beliefs about when and where math can happen. But those routines don't just have to happen in the home. I loved how Gerardo Ramirez, and I wanna shout out one of our listeners, Megan, she shared that her favorite tidbit was how Dr. Ramirez suggested the teachers give this same assignment multiple times, to build students' confidence, and help them to see their progress. And I thought that was such a fun routine. Take a listen to his clip about that.

Dr. Gerardo Ramirez (17:10):

One of my favorite recommendations is to keep reassigning assignments. The same exact assignment, for, say, three weeks back-to-back. So if in week one you do the homework assignment, you do OK. You don't do so great. When week two you do it, you give the exact same assignment, and now the student can see like, "Wow, OK, this was much easier." And then week three, you give the exact same assignment, now the kid's feeling really confident. And the reason why that's great is because it helps kids to see that they're growing in confidence. A lot of times kids don't get to see that because we're constantly throwing new assessments at them. And so they're never seeing that growth. All they're seeing is a new challenge, a new challenge, a new challenge. So I think we need to set up situations where they can feel that they're growing, when we keep the assessment static. That can be a formative assessment, for instance; it doesn't have to be a summative assessment.

Bethany Lockhart Johnson (18:01):

I mean, that's a no-cost, potentially powerful routine that teachers could do in the classroom.

Dan Meyer (18:08):

Yeah, very into it. Yeah. First want to say that you've been very encouraging to me personally, Bethany, about routines in the home for decreasing math anxiety and increasing math thinking around, just like, "Let's count stuff up that we're doing." Or you know, like those kinds of ... I don't know, mostly around counting. Counting stuff. Or giving one kid three pieces of chocolate and the other kid one more and say, "How many more do you need for it to be equal?" Stuff like that has just been fun for me. And so I appreciate that. And we got a lot of that this season. And the other is, I definitely agree with both you and listener Megan, just how exciting it is that a small intervention like that could help students experience, like, "Oh, a thing that I felt anxious about then is not anxiety-producing for me now." Extremely cool. And I also wanna shout out to folks who weave that into their assessment practices, very intentionally. Where you receive an assessment on a math topic this week, and if you don't do well on it, we show that same assessment to you again multiple times. This is often called standards-based grading, where students have multiple chances to demonstrate their understanding of a math topic. 'Cause I don't care when you learn it, I care that you learn it. So that's just ... I found in my own practice that was really helpful for taking the temperature down on math anxiety. So, yeah, I love that we're not just talking about changing your beliefs and what's in your head about how you define math, but really you can act your way into new beliefs. Your assignments can help change beliefs, just as much as the other way around. Really cool stuff.

Bethany Lockhart Johnson (19:48):

I also think sometimes when teachers are presented with an idea like that, I feel like I hear that voice in the Lounge, the person saying, "But I don't have time to give them the assignment every week! We gotta keep moving; you know, we gotta get through this." But like you said, it's not about when you learn it; it's like, DO you learn it? And you don't have to do that with every assignment. Even doing it a couple times throughout the year could be enough of a touchstone, I think. Where you could say, "Hey, remember how that assignment felt impossible at first? This one might feel impossible today, but remember how we revisited it?" Or you know, mid-year, give an assignment from the beginning of the year that felt really big and scary, but you've learned so much. And so often we don't have that space and time to

pause and say, "Oh wait a second, here's a really like tangible concrete example of my growth!" And I think, yeah, diminishing the anxiety by finding ways to build up your reserves of ... I don't know how to say it, other than your "I can do it."

Dan Meyer (20:53):

Yeah. Your persistence. Yeah. Perseverance. All that feels very closely related to ideas of math anxiety, how to help people decrease one and increase the other. So, it's been great to check in with you, Bethany, on what you pulled away from the season, especially with a little bit of room to think about it. And I think that in addition to those takeaways, I also took away some ... there's some questions that are still open for me that I'd love to kick around with you just a little bit. And one of them was around the relationship between timed tests and math anxiety. And this came up towards the end, as almost a throwaway remark, with Dr. Erin Maloney. I thought she introduces it from her own perspective. And I'm not sure I agree with it or disagree with it yet. But I want to make sure that clip goes to the audience here, so we can think about it together.

Dr. Erin Maloney (21:46):

So I actually ... again, I'm gonna be a little bit controversial. So I don't hate timed tests in the way that a lot of people do. But I love time to practice. So I think once we've got to a point where children have a fairly decent understanding of a skill, once they've got a fairly decent grasp on it, then I love the idea of the timed practice. So it can be still in a low-pressure situation, where in many ways it doesn't matter if you get the answer to the question correct. But we're practicing doing it in a situation in which you might be feeling a little bit of pressure, but it's not REAL pressure, if that makes sense. And I think that can be really, really useful for students. And again, it can be done in a fun way, right? Like it doesn't have to be these super-intense ways. It can be fun, but I think that in life, there are situations in which the time that it takes you to complete a problem matter. And I think that we have to make sure that we don't get too far away from that.

Dan Meyer (22:47):

So, Bethany, I'd love to know what your reaction was to that clip. I don't remember that we actually did a whole lot of digesting with Erin, live, about it. We just kind of said, "So long! See you on holiday!" 'Cause

we all love each other now. <laughs> And I'm not gonna, like, you know, question anything you say, 'cause the vibe is so, so great! <laughs> But what's your take there? How are you feeling about that?

Bethany Lockhart Johnson (23:08):

Oh, you know, I actually asked a friend of mine whose daughter, I remembered her saying something about timed tests. 'Cause so often you hear, "Oh yeah, math anxiety, timed tests!" That's kind of the one thing that people say they can remember giving them like a moment of anxiety. And she was talking about how much her daughter loved timed tests, because it helped her to see how much better she did. And it was a challenge for her. And I was like, "That is such a different experience than I remember." So I don't know. I wonder about that, because if a student is already ... when I say I wonder about that, I mean about what Erin was suggesting, what Dr. Maloney was suggesting. If a student is already feeling anxious, and you say, "OK, we're gonna try this, but remember it's not pressure, we're just trying to see the time." I don't know, any time you put time on something, again, it's that question of, "Does math need to happen quickly in order for you to consider yourself a mathematician?" I always think about that in terms of, "OK, what's gonna take me ... it might take me a little longer. What about my student who it takes a little longer to figure it out?" or "I need a little bit more time to marinate on it." And if all of a sudden I'm put in this situation where I'm being asked to time something, I don't know. I don't disagree that it could be used as a tool. I just don't know that I would trust myself as a teacher to use it in a way that would not cause anxiety. A lot timed tests <laugh>, you know. What did you think about it, Dan?

Dan Meyer (24:44):

Yeah, I mean I've been tuned into some discussions of the research around this. And it's true that there's no studies, that I know of, that have been referred to me, that say timed tests cause math anxiety; here's some real correlational evidence. And it's also like really hard to study the issue, because you'd have to give one group of kids no timing and this other group, you'd have to give them this thing that there's anecdotal — but a LOT of anecdotal — evidence causes anxiety. That's ... there's some ethical considerations about studying it. I just, yeah, I guess the question for me hinges on, how much is timing inherent to the work of mathematics? Like, if I was trying to get good at having conversations about my relationship with my wife, for instance, that is not an area where timing is valuable. Like, we talk as long as it takes. Doing it quickly is not a virtue. And there's areas like changing the tires on a car in the pit of a racetrack, where timing is super-valuable. And so you'd want to practice that with a timer, and get faster

and faster. And for me, I just kind of question the premise: Is doing things fast a part of math? I think doing things fluently, like being able to work with sums and products and work with numbers fluently and automatically, without having to drag relationships up out of, you know ... to work them out in short-term memory, working memory ... again, that feels super-necessary, but is doing it FAST necessary? And that's why I just ... to me, I just say nope. And the fact that so many people, even though its anecdotally, are like, "This really hurt me," I'm like, "OK, that's enough for me." And also the fact that there's abundant, abundant ways to develop fluency, to develop automaticity, that don't involve a timer. It just ... the timer just feels to me like the least creative way to develop automaticity. Like, pick any game off the shelf, any video game off the shelf, and they are developing automaticity in its players in ways that often, very often, don't involve timing, and are often very successful at it. So those are some of my thoughts about it. It was a really provocative comment. And I'm not ... like, this is not Top 10 Most Confident Opinions Dan Meyer Has. But that's where I'm at right now.

Bethany Lockhart Johnson (27:11):

Yeah. And I do think it's one of those things where I would trust Dr. Maloney to, after having that conversation with her, I would wanna know more. I would trust her to try it in a way that would reflect her beliefs about her students in a way that would not cause more anxiety. But in general, like you said, here's something that we know a lot of people feel anxious about. Let's not ... let's cut it out. Right? Like, why do we need to do it? Are the potential gains worth it? And I'm learning how to play the piano. And I catch myself, like, it's supposed to be at a certain rate. It's about, you know, vibrato, and my teacher keeps saying, "OK, just go really slow." And then when I try to speed it up, or when I try to do it at pace, I feel anxious. And then I have to remember, I have to talk back to myself, and say, "Whoa. This is, remember, one, this is for fun <laugh>. And two, you don't have to be at that speed yet. But eventually that fluidity will come. And like you said, that fluency, those connections, will build. Dan, remember when Dr. Val Henry joined us on our past season? She was talking about fluency. And she was thinking about the timing that students would be able to come to an answer in three seconds or less, right? But her focus wasn't about ... she's not sitting there with a stopwatch — one, two, three! She's really just trying to see, is the answer there? Are they making that connection quickly? And if she was sitting there with a timer and a stopwatch, it would probably cause a lot of anxiety. I'm really glad you actually brought that quote up, Dan, because, you know, we definitely didn't think we were gonna solve math anxiety in five episodes or less. But I think it's so good to remember that there are these open questions that we can keep marinating on.

Dan Meyer (28:59):

Yeah, yeah, definitely. And indeed, may marinate on them in a future season. Who knows? Watch out. Let's see. I guess I wanna just get your thoughts on one other open question for me. Which is, as I alluded to at the start of the episode, everything we talked about, every guest, was focused at the home, the school, or below. Like, all the action took place in the home or inside the school. And I don't recall much discussion of what happense outside of the school, outside of the home. Like what the world is doing with mathematics and how that might affect students and their feelings of anxiety. So before this call, I was just kind of curious. There's other countries in the world — which is wild — and it winds up being the case that math is experienced differently there. You know, math is not a uniform abstract thing which everyone experiences in the same way worldwide. So we have these exams like PISA, administered by the OECD. And it is a test of math knowledge, but it also asks students a bunch of questions about their experience in math, some of which are around math anxiety. Like, they ask students to agree or disagree with this statement: "I often worry that it'll be difficult for me in mathematics classes." Or "I get very tense when I have to do mathematics homework." And so on. Questions like that. And it winds up being the case that there are countries where the students experience much less math anxiety than the United States. Especially Scandinavian countries: Denmark, Finland, Norway, Sweden. Just as examples. And so, I don't know, do you have any thoughts about that? About why, nationally, we have a certain kind of experience of anxiety that is by no means the most — we're by no means not the most math anxious country. But what are your thoughts about what society is doing with math that might contribute to students' sense of anxiety in mathematics?

Bethany Lockhart Johnson (31:06):

Wow, Dan. Way to throw in that bit. I guess ... I don't know. I think I just go back to the takeaway I shared, about needing to really shift the conversation about math. Shift the conversation about what math is and the way that we talk about math. And I go back to how I see examples of math portrayed, You know, it's the easy joke on Saturday Night Live. It's the little dig in the joke book, or in the board book I was reading to my toddler where the mom is stumped by a math problem, and oh, ha ha ha. It's this kind of pervasive conversation. I liken it to when Michelle Obama started bringing up conversations about nutrition and about movement, and she was trying to shift the conversation about how we talk about moving every day, how we talk about food, right? And there were some folks who were really politicizing that. And regardless of your politics, she's trying to shift a discourse, right? She's trying to have a conversation about what we eat, how we move our bodies. And so I kind of feel like it's at that

level. Like, how do we — not necessarily who's in the presidency — but how do we, in these broader spaces, shift the conversation about what math is and what it looks like? And where do we see it happening in all careers? Where do we speak back when we hear somebody saying like, you know, "Oh, I hated math too!" Or, "Oh, you'll never need math!" I don't have the answer. But I think there is a certain amount of, like, acceptable digs for mathematics—

Dan Meyer (32:54):

Yeah.

Bethany Lockhart Johnson (32:56):

—that we are so used to that we might not even recognize it. That I think basically gives us a low buzz of anxiety across the nation, kind of thing.

Dan Meyer (33:05):

Yeah, that makes a lot of sense to me. There's a lot of value in, you know, spokespeople for the value of math. That's all valuable. Math could definitely use a better public relations manager. I think I wonder about, for instance, campaigns. Like, can we just talk? Have better messages about math? And get people who are very skilled, like Michelle Obama, at talking about them? But then there's this social stuff that happens around the message, that makes the message just not effective. Like, for instance, what good does it do for me to hear a message about good nutrition if I live in a food desert? Or to hear about the value of exercise if I'm working 16 hours, for instance? And so I just wonder about the good messages about math. What is above them that is limiting their effect? And a theory that I'll just toss to you, just to think about, is like, those digs happen because math kind of feels like Michael Scott in The Office. Maybe it's your boss who you don't respect. Like, math is your boss. Like, math determines so much of what jobs you are allowed to have. It determines whether you can go to college. Like, "Oh, you didn't pass the placement exam." Like, "Enjoy remedial math as a college freshman, which you may not get out of." You know, math is calling all these shots. And I think that people don't respect the boss for some good reason. Because they know that they don't need math to be, you know, a marketing manager. Or they don't need that much math to be a nurse, for instance. And so I think that might be where the digs come from. As a kind of catharsis. Just like people in The Office make fun of their boss. It's cathartic. I don't know, just riffing here with you.

Bethany Lockhart Johnson (34:59):

No, I appreciate that perspective. And it reminds me, we had an amazing guest, from this organization, Public Math, Omo Moses. And his father, Bob Moses, started The Algebra Project. And we talked about that a little bit, really recognizing math as a gatekeeper. Math as a way of actually ... the lack of passing these certain math courses, or being even open to taking certain math courses. Being told by counselors, "Oh no, you can't take that course," or "That course isn't for you," was ultimately gonna prevent students from having access to certain fields, certain career fields, graduating. I mean, it's huge, right?

Dan Meyer (35:40):

Right.

Bethany Lockhart Johnson (35:40):

And it's pervasive. And I think there is a much bigger conversation. And, yeah, I'm a little distracted by you bringing up The Office, Dan, 'cause you know how much I love The Office.

Dan Meyer (35:51):

I do. I knew it was a risk when I brought it up. But I felt like it was a really useful touchstone. And I appreciate you powering through. Yeah, you know, I do not want to present myself as disagreeing with Bob Moses, who is — or his son Omo. They've both done so much for math and for people. I do think ... it's interesting to me. There is a gatekeeper. And one approach is to help people get through the gate, and the other is to tear down the gate. And I'm just feeling right now, we've offered — I think our guests have offered teachers and parents so many ideas for how to reduce math anxiety. But another approach that I hope we'll all consider is that math anxiety could be reduced if math's use as a gatekeeper were dismantled. If math were not limiting you from a livelihood you deserve as a human being, then like we'd feel less anxious about it. But right now, math is this thing that people perceive as irrelevant, but which also holds just bonkers power over your life, and your ability to live with dignity. Those are two different problems we could try to solve. One is teachers and one is citizens. And I like thinking about them both.

Bethany Lockhart Johnson (36:59):

I love that. Dan, I really appreciate you offering that perspective. It's interesting, I think I'm not in a gate-tearing-down mental space, so it is helpful for me to remember that it is that the gate is

constructed <laugh> and that it is not an inherent and real thing, and it is something that is made. And I think sometimes I'm aware of that. And then other times when I'm like in the midst of a bunch of bureaucratic stuff <laughs> that I'm trying to navigate, I'm like, "Well of course, this is just the way it is." So it is a reminder that it is a construct. And it is possible to experience math in a more organic, juicy way that's just out in the world, that's just a part of our lives, and really shift that conversation. So today as we're recording this, I need that reminder, Dan. So I appreciate it.

Dan Meyer (37:56):

I always appreciate chopping up big ideas with you, Bethany. It's been quite a ride this season. Really, I've loved having like a single theme, a big one, to dig into, deeply. And I look forward to chopping up something equally big with you next season.

Bethany Lockhart Johnson (38:12):

We have actually got some special summer episodes in the works. And we're gonna be looking forward to diving into the world of AI and math.

Dan Meyer (38:20):

So hot right now.

Special summer episode preview (38:21):

This new generation of AI is a step function different. Venture capitalists and those in this space are really identifying education as one of the first sectors that it will dramatically change.

Bethany Lockhart Johnson (38:35):

To make sure you catch all of that, subscribe to Math Teacher Lounge, wherever you get your podcasts. And if you liked this season, we'd love for you to leave us a review. But even more than that, please tell someone about this. Summer break, if you're listening to this real-time, as it's being released, what better way to spread some teacher love than to say, "You know what helped me think about my practice, maybe in a potentially different way, is this podcast. Give it a listen, whenever you're ready to listen."

Dan Meyer (39:08):

If you folks want to get in touch with us, by all means, hit us up at @MTLShow on Twitter, or Math Teacher Lounge @ gmail.com, or the Math Teacher Lounge community on Facebook. We'd love to hear from you what you've been taking away from this season, and what you're up to right now in the world of math and teaching.

Bethany Lockhart Johnson (39:25):

Thanks so much for joining us, and we really look forward to diving into more topics and episodes with you very soon.