

## **Diversity + Equity + Inclusion = Math?**

Math is universally feared from kindergarten to college, but could the problem be accessibility – or a lack of it? Dr. Theodore Chao, associate professor of mathematics education at The Ohio State University, sits with John Matze, host of *Greater Perspectives*, to explain why a more diverse, equitable and inclusive approach to teaching math is less about skin color and more about getting everyone to learn to love math again.

**This transcript is edited and condensed.**

### **John Matze, Host of *Greater Perspectives***

Hello, and welcome to *Greater Perspectives*. I'm really excited about our guest here today. He's a professor of mathematics education at The Ohio State University, an affiliate of the UCLA Mathematics Project, and was a former research fellow at Harvard.

He is a proponent of bringing equity to mathematics and teaching mathematics through social justice, a self-described storyteller and organizer. I'm really excited to have this conversation here today because it feels like we're going to learn a lot, not only about DEI, a concept which I'm personally a little skeptical of, but also about the possibility of questioning our own beliefs and learning a lot more today. And I hope you do too.

Dr. Theodore Chao, thank you so much for joining me today. I'm really excited about this.

### **Theodore Chao, Associate Professor, The Ohio State University**

Thank you. Thanks so much for the warm introduction, John. I'm looking forward to this conversation too.

### **John Matze**

Let's dive a little bit into your background.

### **Theodore Chao**

This work in particular – I started when I was a classroom teacher. I started my education career as a seventh and eighth grade middle-school teacher at [I.S. 318, Eugenio Maria De Hostos Intermediate School](#), in Brooklyn, New York.

I think that's where I really started to understand the role of education and how it plays a role into how we want our future societies to be. One of your employees, Nina Lin, was one of my students. I remember just really being struck by that – the very intense racial demographics that are in a place like Brooklyn, New York.

We had students who were Black with Caribbean ancestry. We had students who were Black with ancestry from the mainland United States. We had students who were Black who saw themselves as more African, whose ancestry was directly from Africa within one or two generations. And they saw each other very differently, right?

As a teacher coming in, as someone who's Chinese-American, it would have been easy for me to say, oh, these are all my Black students. But the nuances of the ways they interact with each other play into the ways that they socialize [and work together]. Like, if I wanted to put my students into groups of four and have them work on some graphing – how they're going to interact and listen to each other and even what sort of prior knowledge they're bringing back in.

My own background has always been centered around how learning happens. How do we ensure we create spaces for children to learn well?

And in my world of mathematics, it's how do I get kids to not hate math, right? How do I get kids to realize math is something that's really cool and something that really engages them to become the best version of themselves, and to have a lot of power in their own career and their own life?

Some of it's through activism, particularly through organizing around schools and communities, but a lot of it is really just trying to destigmatize some of the terrible ways that we teach math in this country – getting rid of a lot of our own mathematical traumas.

### **John Matze**

My background is in mathematics and computer science – emphasis more on the computer science than mathematics. If you were to ask me math questions, I would fail miserably today.

With that being said, the [age-old] question kids always have is ‘why do I need to know this? Why do I need to understand algebra? Why do I need to understand...’ whatever it might be. For me, personally, I think math is possibly the most important subject out of all of the elementary-level subjects that children should be learning.

### **Theodore Chao**

I don't want to categorize them. But it's hard not to, as a math teacher.

I think math is the most important. But, you know, everything else is important. Right now we live in a world in which we talk more about literacy rather than reading. We talk about social and emotional intelligence.

### **John Matze**

What's the difference between literacy and reading in your mind?

### **Theodore Chao**

Reading is the procedural skill of being able to understand how to read words, pronounce them, and then process them. Whereas literacy is being able to read and understand context, understand themes, understand the different nuances, and be critical. Understand when someone is trying to write something that has a specific spin or propaganda behind it, right?

### John Matze

I'm assuming that the equivalent in mathematics to literacy and reading is something like being able to do your adding and subtracting versus being able to apply whatever it is that you've learned in mathematics.

### Theodore Chao

Exactly.

So, you know, my background is also in computer science. Before I became a teacher, I lived in the start-up world. I started a streaming media company back in 2000 when, you know, at the time, only 10% of the United States had broadband access. It was probably the worst timing to start a streaming media company.

But, you know, in computer science – [being] an undergrad in college was when I really started to understand why I learned all this math. I remember, wow, eigenvectors. Now I get it. I'm understanding why we need to have these systems in which we have dimensions more than three. I'm starting to understand why it's important to sort things quickly, a large collection of numbers. And I think that that's the difference between what we call mathematical literacy and being able to do math.

For many of us in this country, math is often taught in a way where it really dehumanizes the child. It's, 'hey, I'm really curious about this. Can you tell me why exactly  $y = mx + b$ ?' This is the standard algorithm we use.

I've been in classrooms where a teacher says, "I don't really know, but you need to memorize this and just follow my lead."

### John Matze

I've definitely heard that as well. And that's incredibly frustrating because kids want to know why.

### Theodore Chao

We have fundamental rights as students, right? And students should have a right to make sense of what they're learning. They should have a right to understand why it's important in their life.

And yet, I think a lot of math is often taught in [other] ways, right? It's, "hey, just stop thinking, stop trying to make sense of it and just follow along." Then math becomes this magical thing where you're just sort of guessing. "Maybe I memorized this right. Maybe I did it. I'm just going to guess." That just becomes really traumatic.

### John Matze

The real world application of any kind of mathematics is incredibly important because then it sticks in kids' heads and then they're going, "oh, now I get it. Now I understand why I need to learn this 100%."

We've talked about this concept of introducing diversity and kind of opening up mathematics for more people. How would you describe the problem today with mathematics and education in that regard?

### **Theodore Chao**

One of the issues, particularly when we talk about diversity and inclusion and equity as it connects to math education, is issues of access. That's the very first one.

I work at a university and I was at Harvard and I'm now a fellow at UCLA. All amazing, wonderful institutions.

If I were to take you with me to campus and I'd say, hey, we're going to go visit the engineering quad – take a guess as to what the ethnic and gender breakdown of all the faculty here in the math department are and the engineering department are? We could probably take a good guess as to ethnically what we're going to see and maybe in terms of gender what we're going to see.

We're going to see probably a lot more males than females. We'll probably see a lot of European, White, and Asian people. We probably won't see a lot of Black and Latinx people. We probably won't see a lot of differently abled people.

One thing that we talk about in terms of math is – why is that?

We know that there's not a particular ethnic connection to mathematics. But why, when we look into these spaces of who's at the university level – being able to become a professor of engineering or being able to become a professor of mathematics – they all kind of look the same.

That starts really early in elementary school, middle school, as to how we sort students into different tracks, how we tell students who is going to be worthy of being in the honors class or not. And even who has access to high level mathematics education.

So I think that's one of the first issues. That's the demographic disparity. The inequality in demographics.

### **John Matze**

Why is that a problem? And why do you think that's happened?

### **Theodore Chao**

To answer your first question, why is that a problem?

As a middle school math teacher, I honestly believe that every single one of my students can do anything they want – if you put your mind to it, if you work hard.

We live in a wonderful country where you really can, within one generation. In Brooklyn, many of my students were first and second generation immigrants. This idea of the American dream – if you work hard within one generation, you can do anything you want in the United States.

And while that is true, what would really hurt me sometimes as a seventh grade teacher, as an eighth grade teacher, is then I would hear my students who are brilliant and then they get in high school and they go, oh, you know what? I have to take algebra again because I couldn't pass the test. Or I got sorted into a class, and the class is huge. There's maybe 40 people, and it's just not me. And the teacher only calls on the boys anyway. And so I think I'm not going to try taking advanced level math classes anymore.

These stories of students self-selecting out because they've been positioned as “I'm not a math person,” or “Math is something that doesn't make sense to me,” – it occurs more to students who have less privilege.

I think over the last 40 years, we've done a really good job in math and STEM closing the gender gap, and bringing a lot of female scientists and mathematicians into the game. But we haven't done that as much in terms of diversity.

That's one of the issues, right? We want a world in which the kids that we're working with can look and say, “oh my goodness, I look at NASA, I look at the National Science Foundation, I look at scientists, I look at engineers around the country, and many of them look like me. I can do it too, right?”

### **John Matze**

So you think that part of the problem with this lack of diversity – there's a lack of [diverse examples] for people who are aspiring to those fields?

### **Theodore Chao**

A lot of it comes from representation, right? It's no coincidence.

Me, I'm a Chinese-American male. When I was growing up it wasn't hard for me to find role models who excelled in math and science.

Some of my other peers who might not have seen someone like themselves might have self-selected out of that because you just didn't see it.

### **John Matze**

I'm curious if the inverse has a little bit of an effect too. If you look at sports, for example, at the demographics that make up sports athletes, if people in those ethnic groups are more driven towards sports because they're seeing those examples there.

Sports, as we know, has a very high likelihood that people aren't going to go professional and be able to make a career out of it. If you're aspiring to be in the NFL, chances are you're

probably not going to be unless you're [seeing yourself] in the top one percent of the one percent of the people aspiring.

### Theodore Chao

That segues into one of my favorite math problems to work with kids. For many children, it hurts to burst their bubble.

Let's look at the probability of you becoming a professional athlete, particularly in the United States, and then look at what other probabilities there are. Is it more likely you'll be struck by lightning twice, or is it more likely you'll make it to the NBA?

But I like this analysis, right? The inverse of... maybe we only see ourselves as excellent or we only see ourselves in career choices in which we actually see people who look like us.

And I think that that's partially true, right? I think that there's a lot to be said about that in the way that we see sports. It also shows the gatekeeping effect in different industries.

Math and engineering and science, particularly for me as an Asian American, there were very few barriers. It was very easy to see people who look like me excelling in higher education. And for me, getting my doctorate, getting a postdoc, were not things in which I really felt like I'm the first person who looks like me walking through these doors. I'm not. There's many, many people who look like me in those spaces.

But there are particular gatekeeping mechanisms that mean that that's one of the only places that I can excel, right? Sports – I would have loved to be an NBA player. But you know, it's not just not just that I'm not that great at basketball, but also that those spaces are just not as open. There's a lot of barriers for an Asian American making it into sports.

I see a lot of parallels in math. There's a lot of systems in place that are just used to sort people.

### John Matze

Going to push back on that point a little bit and try to figure out why that is. Me, personally, I tend to pick the most difficult path [in life] for some reason. And I also tend not to really care what other people think and what people around me look like or act like.

I think there's a big emphasis in – not just education, but for the youth today – people need to feel like they're a victim at some times. And that victim mentality is really present. It wasn't my generation when I graduated high school and I don't remember when I graduated high school in 2011, but it was already there, right? You could already see a lot of people making excuses for themselves because of either their background or just because they wanted to be a victim and they had to make up their own category to [belong to.]

Today, I think it's even worse where people are told, you know, you're not going to be successful because of XYZ, that the chances of you being successful are less because of your ethnic

background or whatever it might be. And I think that is really a bad effect on kids, too, to even acknowledge that, to say that to them.

### Theodore Chao

You're bringing up some really good points that I would say, in my mind, are more effects of a system as opposed to the causes of things that are happening.

The idea of a victim mentality is real. You know, as a college professor, I've seen a lot of students [think that] everything is tough. It's really hard. "I can't do this. And therefore I won't."

And that baffles me. Everything here [in college] is designed to support you. Why, why, why can't you do it?

### John Matze

It's also really easy in life to find reasons why things won't work and why you won't succeed. It's easier to do that than to do it.

### Theodore Chao

That's been a frustrating part as an educator.

But I would also say, this generation – we're talking about Gen Z, the kids coming up – I would say that they also see through a lot of the ridiculousness of society that we had to get through. Like this idea that it's a meritocracy, that if you bust your butt and you work hard, that means you'll excel – this creates this idea of competition, that we're fighting amongst each other. We're fighting amongst our friends for maybe a coveted position at a university or in a fellowship or in a company.

Sometimes there's some strength in saying "you know what, I don't want to play this game. I see people who are successful and they're not happy. And so why would I want to do that? I want to maintain a level of my own success to find the ways I want to do it?"

I'm not necessarily pushing back, but I would say I, as an educator, have started to have a lot more compassion over the ways that students are busier than ever. And trying to understand that I'm actually part of the system.

I work at a university. If the students stop coming to my university, I have no tuition revenue and I'd probably be out of a job. So I'm actually part of a system in which I see a lot of inequities played out – we want students in the classrooms, whether or not they're emotionally ready to engage.

### John Matze

[We've actually talked about that on the podcast before.](#) The education industry as representing the underprivileged and representing people who are trying to fight against the man.

Yet the inverse is true. It's the largest industry in the United States. I'd say one of the largest industries in the United States. And on the previous podcast, we actually discussed a little bit of numbers around it. If you combine the gross revenue of Apple, Google, and I believe, Facebook, and the gross income for all the electricity bought in the United States together, it's still less than the annual income for the education sector in the United States. So it's pretty crazy to think about how powerful these institutions are.

### Theodore Chao

The numbers don't lie. And that's a really nice math problem to jump into. But I wouldn't say that it's power, right? I would say as someone who works in education. Tech companies probably have a lot more societal power.

### John Matze

I don't know. Like, that's tough, right? Because a lot of people, especially [after what just happened with Harvard](#). We saw a lot of – what seemed to the average person – crazy opinions. There's a disconnect between the top universities who create our next presidents, our next senators or top business people in the world. It's hard for people to understand.

How do you feel about that?

### Theodore Chao

I can understand the multiple perspectives and particularly the distrust of elite institutions – of not being able to really understand the ideas and opinions of most of the people, their own students and the families that support them.

I would say, though, from my insider perspective as a professor – I think the modern university has become very much a corporation too.

Our presidents are wonderful people. And at one time, they were probably amazing academics and scholars. But they are put in a place where they're the public face of a large corporation and are in charge of fundraising and maintaining relationships.

Oftentimes what happens is that they become extremely disconnected.

### John Matze

We talked about the absolute size of the industry. They are actually very active. I never actually even thought of it that way. But these university presidents are actually probably more active running what is an enterprise than being a part of the day to day in the school.

### Theodore Chao

Look at universities – when a president leaves, oftentimes they're run by an interim president or sometimes they might not even have a president and the university still runs fine.

They might not be raising the same amount of funds. They might not have as many events. But I think this shows a sort of corporatization of education.

### John Matze

Why should somebody who's interested in going into higher education go into debt for the next 10 to 15 years? It doesn't make sense. It makes no sense.

### Theodore Chao

Absolutely. The math is sort of ridiculous. This is the sort of moment that we're in, right, figuring out how people are gonna survive in the future?

This comes back to why I do what I do in terms of math. You have to be able to make logical decisions. You have to be able to understand numbers.

You have to be able to understand [how much a degree] costs. If you're taking out these loans, how much is it really gonna cost to pay them off? If you want to study for a while, if you want to go to college, you want to study something specific, right? Do you want to study something that you're passionate about? Or do you want to study something that's going to allow you to earn the wage you think you deserve?

### John Matze

If you're going to earn 5% to 10% more and you're going to have to spend the next 10 years paying that off... I don't know.

Do you ever talk to your students, about the math problem that they might face as a result of their choice to be in your classroom?

### Theodore Chao

It's a tough conversation I often have with my students.

I work in math education – many of my students are people who are involved in education. They're people who want to become teachers, administrators, or they're practicing teachers or administrators or math coaches.

I get to work with a really beautiful and amazing group of people – these are people who have dedicated their lives to education, oftentimes public education, working with anybody who just shows up in our country or just ends up in a school.

What kills me is that many of them very much know they're making a huge sacrifice in their lifetime earning potential, in their comfort in life, even in their ability to choose where to live because they've chosen education as a pathway. That's really terrifying. It's almost seen as you're making a substantial sacrifice just to become an educator.

### John Matze

It shouldn't be that way. We should have better incentive structures for that.

I played around with a lot of fun education app ideas, nothing serious. Once my daughter started going to school and I was like, well, how come nothing's really set up for the high-tech world here? Why is it that I can't go to the marketplace of teachers and find the best one that I'd like and pay them whatever they want.

I don't mean that we can throw around as much money as we want to hire these teachers. Teachers often want to make more money. If we had a marketplace for them to compete where people could select...like, "I want this teacher because they've excelled at teaching kids between the age of five and ten in mathematics." I'm going to hire that teacher and people are fighting over that teacher. The price is going to continue to go up and it'll be justified based off of their merits.

That kind of stuff seemed really exciting to me. And I'm like, why does that not exist today still?

### **Theodore Chao**

John, I love this idea – but I think that, on a much more hidden level, that system does exist, particularly here in the United States.

I was at Harvard. I did my undergrad at Johns Hopkins. There is a very hidden curriculum in the United States as to which institutions are the elite institutions, which spaces to go, where to send your kids – if you have the money to pay, so that they'll have access to higher quality education, right? We know these things.

We know – tests such as the SAT or ACT, what we're really measuring is the level of privilege and maybe the neighborhoods they grew up in, as opposed to their actual math or literacy levels. We know that public education in the United States is very much about how much money you have in order to play the game well. The public system or the private system – I would say the entire education system.

And so if you have the money, it's not hard to find out where the best private schools are.

### **John Matze**

You said that finances and the ability for parents to contribute to an education system for somebody or to education for somebody seems to dictate the potential success they might have. The more well-off somebody is, even if they're in the public education system, they will tend to do better in their educational career.

Why?

### **Theodore Chao**

A lot of it has to do with the ways that our public education system is based on real estate tax revenue.

You can do this with any institution. Look at the high schools that the kids are coming from? At Stanford or at UC Berkeley, these elite institutions – what are the high schools that the kids are coming from?

Oftentimes you have a lot of kids coming from the same schools. You can see that there's a few districts across the nation that are producing a disproportionate amount of our students who get sent to these elite schools.

### **John Matze**

I've actually looked up the information before in the past on revenue for the local school district here that I'm in from, for my daughter. I've always heard that the area where I live has a very good school district for the public system. I was trying to determine, do we do public or private – that whole conversation.

So I looked up the revenue for the local school district here. And a lot of it comes from the federal government. The county and city and local taxes from real estate didn't make up as much of a percentage of it as I thought.

Although I would say the fact that the area that I'm in has a much higher-than-average income, I would presume that the teachers, the education system here is probably better for a number of reasons, not just limited to the real estate tax income.

You have higher income families in the area. They're probably donating more to the school, contributing more for the extracurriculars. The teachers that are in the area, you know, are sourced from similar families, et cetera. Is this why you think that a lot of areas that are [lower income] generally have [lower performing schools]?

### **Theodore Chao**

Kind of. As a teacher, if I'm working in a place in which almost all of my students have families where every adult in the household is working two, three jobs just to survive – I'll never see those parents show up at a math night. Or a parent teacher conference. I'll never be able to get them to show up to a field trip in which we go visit a science museum.

Small things like that have large repercussions into the access that the kids have to really fun things that happen maybe outside of the classroom, outside of the day-to-day curriculum.

### **John Matze**

And the reason they're not showing up for those things is strictly financial, or is it because these families – every parent – is busy working, they can't take off work to even show up to the parent-teacher conference? What do you think is the driving factor there?

### **Theodore Chao**

There's a lot of this inequity that we see in the United States. You have people who live in areas in which it's hard to make a living. Or you have immigrant families who are not able to get hired, maybe because they don't have the training or they don't have the education.

A good school district, a bad school district – these are all relative terms. School districts or schools that know how to play the game of achievement well are very different than whether they're doing well in school, right?

There are very specific assessment metrics that we use for schools. How many [students] graduate from high school and then enter into a four-year institution? How many of them do well on the SAT? How many of them take AP credits?

Those don't necessarily mean that their kids are smarter, right? But they're really nice metrics to be able to show success.

### John Matze

I definitely agree with that. Tests won't show the brilliance of one kid or another.

We've established there are some issues that people are trying to solve today. And one of the proposed solutions for that is DEI.

What is DEI? And how do we think that's going to actually help solve these problems?

### Theodore Chao

It's been sort of interesting for me that this term just sort of shows up and now it's everywhere. Diversity, equity, inclusion. I've been connecting my work in math education to equity for 20 years now. And then now suddenly I'm being lumped into working around diversity, equity, and education.

I've never said we need more diversity in what I do in math education. I just always assume that more diversity is nice.

But [diversity] is not the end goal. It's a start. It's good to have more people in the room with different ideas, different backgrounds. You have a better conversation. You learn better.

The term 'equity' is thrown around so much that I don't think it really means anything anymore in our public discourse.

### John Matze

It's become a part of propaganda.

### Theodore Chao

My definition of equity is that we're able to help fix injustices in the past, so that everyone, no matter who they are or where they come from, not just has an equal access to education, but

has one that's catered to them. That one understands the backgrounds that they come from and maybe the hardships that their family might or might not have faced.

In terms of inclusion – in my own classroom, it's really, really hard for students who might learn differently to succeed. And that's just because of the structures that we have in math, right?

One of my colleagues, Tiffany Wild, does a lot of work with students with visual impairments. These students, some of them call themselves blind. Some of them say that I'm a student with visual impairments, they're not fully blind.

But man, do we as math teachers not know how to work with them in terms of even simple things! Like, how do you graph? How do you understand and build a histogram? How do you do a statistical analysis and look at the curve, right?

For me, this focus on DEI has helped me realize, okay, we're really going to be inclusive. Can we imagine what it means to do calculus and do statistics without constantly looking at visual representations of graphs?

### John Matze

See, that explanation of DEI is very reasonable, and that sounds like something that education in general should be pursuing, right?

What I think has become the public conversation today is [the concept of] DEI is seen as handpicking people based off their ethnic backgrounds, to try to make up a classroom that's diverse while ignoring people's merits.

That's what that term has become for a lot of people either in the center or right of center. And Elon Musk being one of the big people out there cheering about how terrible it is.

### Theodore Chao

I was a fan of Elon Musk, but there's some things he knows a lot about, then there are some things that he just talks about.

### John Matze

I figured that out when he started running Twitter and saw what he was doing to it. I was like, if he would have just – he could have just texted me, “Is this a good idea?” I could have told him – no! It would have saved him a few billion.

### John Matze

So what's the difference between DEI and the way you see it and the way that I guess it's become politically?

### Theodore Chao

The term DEI, and just like the term CRT – critical race theory – I think a lot of times people are using them in public discourse and really just saying that they're terrible things without fully understanding that it's not what they're talking about.

I saw yesterday this horrible tragedy that happened in Baltimore, right? With the Francis Scott Key Bridge. The mayor of Baltimore comes out and then he's been labeled on Twitter as the DEI mayor, right? What does that necessarily mean? Is he a proponent of diversity, equity, education, or is it because he's a young black male in leadership? And maybe people see that as a threat.

### John Matze

I don't think it's either one, to be honest. I think it's the people who are against him politically. That he's advocating for people to either join his administration, join the workforce, whatever he can do within his control. I think they believe that he's going to pick people based off their ethnicity and background rather than off their merits.

That concern that I think they have – I'm not saying that's mine. But from what I've seen, that's what it feels like.

### Theodore Chao

I understand that fear. If we live in a world in which we're told that there's only space for so many people, that only some people can make it to the top.

This happens in math classes all the time. I hate that I keep bringing it back to math class, but I think math class is where the roots of a lot of our trauma exist. Only some students are going to get an A.

I remember being in college, and I have arguments with math professors all the time who still grade on a curve. They're like – you know what? Even though every kid in my class is brilliant, two of them are going to fail. [Because that's just the way the curve works](#). And it drives me crazy.

Even if they're all brilliant mathematicians, two of them still have to fail. That's just how the curve works, right?

### John Matze

I've also been on the inverse side of that, I think it was operating systems class in college. So many people failed that they had to make a curve because the scores were so bad, just so that somebody would pass.

### Theodore Chao

I think I might have been in a similar class. I remember being in an operating systems class and the average score in the class was like a 14. I was like, “oh, I got a 13? Yes!”

But I think, you know, that mentality, that there have to be some people who are at the top and some people at the bottom, permeates the way a lot of us see the world. It leads to this idea that [life is] a zero sum game. If some people are going to be in the top, some people are going to be forced out.

**If I have been told my whole life that I live** in this amazing democratic meritocracy of the United States and I will be judged on the merit of that work – and then suddenly the game is switched on me where it's about ethnic background, or race, or whether or not they have a much more tragic life story than I do, then I totally understand that anger.

Things have been shifted on me, and now the game is unfair. This is not the system that I was told I need to work towards. And that sucks.

For me, living as an Asian American and then living through all the rhetoric around affirmative action, it's been really interesting because there are many people in my own community who are on multiple sides of the issue of affirmative action. Are people being chosen because of their race? I would say no, right? But are there longer, bigger picture systemic issues that deal with historical injustices that we're trying to rectify through policy,

When it's done well, it's a wonderful thing. But when it's done haphazardly, that's when people get really angry. Justifiably so.

But it also leads to getting rid of all racial-based decision-making. And I think that when we try to make one blanket rule, sometimes everyone loses, right?

### John Matze

You said that there is a certain systemic kind of...historical pattern where some people were kept down or some groups of people are really just kept down or, you know, they're just getting to the table today and they have to work their way up.

How can you effectively help those people without putting somebody else down? I know you're saying it's not a zero-sum game but there is a fixed number of slots of entry into universities and there's a fixed number of dollars to allocate towards scholarships.

If you want to help one group that has been disproportionately affected in a negative way, how do you do that without pulling down people who are coming from more statistically successful groups, but it feels like you're moving away from the ideal of meritocracy to do that?

### Theodore Chao

This is exactly the issue that's going on with affirmative action in the United States.

I think that within my own community of Asian Americans, there's been a lot of Asian Americans who feel like – hey, getting rid of affirmative action is actually helpful for us because universities might not admit it, but they're trying to cap [slots] at maybe 45%, 50% Asian American.

And they realize that, you know, they actually like, you know, if we just follow these numbers, it'd be like 70% or 80% Asian American.

I keep going back to math class – maybe I'm idealistic. But I think that everybody can succeed and maybe everyone might not succeed in the ways that they might think are successful now.

Like in my math class, maybe only a handful of my kids will go on to become engineers, mathematicians, or do something in their job that actually relates to mathematics, right? But everybody will become confident in who they are and learn to trust their own instincts and know that they can solve any problem they can.

Whether they become mathematicians or not, I'm still happy. I'm still happy because they've learned to question the world. They've learned to make sense of the world around them. They've learned that any problem can be solved if they're thoughtful about it and they break it down. And they can work with other people.

Perhaps I'm being idealistic. But this idea that – if we take away something from one group, or if we try to rectify past injustices, inequalities, that we're actually taking away something from a group that has dominant power now... I understand the anger behind it, but I think there's a very short-term loss.

In reality, what happens when we create a more diverse society? Just like in my math class, when we focus more on reasoning and inquiry and having math fun, as opposed to everyone doing well on a test? Those long-term skills that my students develop end up staying with them for life.

I'm hopeful that, in a society in which we have a more diverse and just ways of defining success, that – okay, now we don't have as many spaces at the top institutions for people who maybe look like me, Asian Americans, or White Americans. But in reality, that'll actually lead to a better society.

### John Matze

If I was to put this in business terms, it sounds like you're saying – let's take some profits off the table and invest it into the future. And that's what it sounds like, right? Let's take a certain percentage of our profits, not distribute it to our stakeholders, and let's invest it into the future of the company.

I get that argument. But I think that there's a lot of people who don't buy that – you know, reserving slots for certain groups to make up for historical biases or historical problems. I think there's a lot of people who are saying “I don't think that's fair and I don't think that's worth it, especially not to my kids today as we see it.”

### Theodore Chao

Right. I get that. As a parent myself, I selfishly want the best for my kids. No matter what it costs.

You know, it's really easy for me – being able to choose the right education system and schooling for [my] kids because of the access that I have as an educator and as someone who lives and works in school districts and those schools. It's really easy for me to make choices as to which schools I want my kids to go to.

I feel guilty. I know exactly which school is the best. But I also know that schools that are not doing very well actually need really good parents in their schools to become better.

### John Matze

Yeah, well, I definitely get that. If you go to an underperforming area and you introduce children or parents from an over performing area, that could certainly help to bring them up. I definitely get that argument.

I just don't get the concept. Say we've got the top 100 mathematicians in the United States. And these are the ones who want to be in your classroom. And we go, "yeah, but we're going to take out 20% to 30% of the best mathematicians because we need to meet certain quotas."

I get why people want to invest in that future. I understand it. But for a lot of people, you know, it doesn't seem right. And I don't know that just because I understand it, that I would even support it.

### Theodore Chao

I hear you. And I understand that anger. I understand that if you're in a system – like I've done everything I should do to succeed. And then suddenly I've been told that I can't succeed, not based on the work that I've done and the hard work I put in, but because of who I am. That hurts, right?

But actually it is kind of weirdly realistic. You know, "I was always told it is a meritocracy and I've worked really hard. I've always worked my butt off trying to create a future for myself and then I realized, 'oh wait, it doesn't matter how hard I work because that person over there negotiated a better contract and I'm working harder. I got screwed.'"

Part of life is also recognizing that [life is] unfair, and then learning to be okay with that. Learning to learn from what was unfair.

I try to tell my students, it's like the first time a student fails a math test. The first time someone does terribly in school, I'm like, "you know what? It's better that this happens to you now, right? Because it's really hard to deal with, right?"

Part of being an adult is learning to deal with failure and learning to move on.

### John Matze

Absolutely.

[I want to bring in some questions from Hedgehog](#), the social media platform. We can start with the comment that's up there. People have strong opinions. This one reads, "how is lowering or removing academic standards because they have a negative impact on minorities, not saying minorities are less intelligent?" I think it's a little bit of an offensive take, but that is what some people are saying, right? So how would you address that?

### Theodore Chao

I'm not sure that I know of anyone who's lowering or removing academic standards.

I think people are looking at things like assessments and looking at things like testing and understanding the biases that are deeply embedded within them.

A lot of our standardized tests traditionally have really just been about how well you understand middle-class American culture and how well you read American English. Very little to do with actual mathematical thinking.

### John Matze

I actually agree with that quite a bit, actually. Tests are not for everybody. There's only a certain kind of person that's really excelling at tests. And if you look at the makeup of the people who are most successful in business and in innovation, they're probably not the ones getting A's.

### Theodore Chao

I think this is one of the beautiful parts about our American education system. It's really easy to rag on it. But I think that in the United States, we're really good at producing creative thinkers and we're really good at getting students to learn to work with each other.

When I see a post like this – I think it's a little bit exaggerated, but I can understand the sentiment. "Hey, we're making things dumber. We're making school dumber."

We're actually focusing more on things like collaboration. It's different, not necessarily dumber.

### John Matze

Having gone through the education system, I can tell you it was not designed for me. And I'm sure it's not designed for a lot of other people in this country.

The next question that we had on there. I asked what question they would ask. And they said, "No question, because it can only be sarcastic. They should know when something is logical, if they are in to math and what isn't. Maybe it's time to remove things like sex and color from all applications and base everything solely on merit. Again, we're watching too many things be infected by some crazy notion." I will just end it there.

That still gets at the sentiment, right? This is the brand that DEI [discourse] has created in society today. And this is ultimately what people are talking about when they talk about it, at least when they're coming from a highly critical perspective.

### Theodore Chao

People oftentimes think of math as just periodological. Like math only exists in this cultural/political-free zone. That students should think about it, but it shouldn't connect to history.

It's a myth that mathematics can be just about logic and completely politically and culturally neutral. I think that there's no way that that happens.

In a lot of classes, when math is taught devoid of connections to the real world, it is taught in a cold and calculating way that is just about regurgitation and being able to memorize procedures. And maybe, – you know, this is what I hate to say – a lot of people actually excelled in that. A lot of people excelled in a form of mathematics that was just about regurgitation.

They found happiness in getting the A and doing well on a test and maybe having their test put on the board and getting a yellow ribbon. That's their comfort of success.

Now, the tables have been turned because now as they get into the real world, it's like, no, math is actually much more complex and it connects to all sorts of different things. I can see them being angry, like – "Oh my gosh, I was told that math was just about logic. Not that it actually has deeper applications into everything that I do."

### John Matze

And that's absolutely correct. We don't even look at people's college degrees anymore at all when we hire for any type of software engineering role.

I've had people that I went to college with who are excellent at every task. They were getting straight A's. They were killing all the projects, doing great. And then they go out in the real world and they're useless. They can't justify their value to the company based off the salary we're paying them. And so it's like, well, how do you beat that?

### John Matze

I got one more question from you from Olin.

"Which would the professor feel more safe flying with? A, a highly trained pilot that has proven to be one of the best, or B, a DEI-based hire because of their ethnicity?"

Once again, I think that shows that people always tie [DEI discourse] back to ethnicity. That also is, I think, a reference to Elon Musk on Twitter, who has been raving about all the conspiracy around the plane issues we've been having lately.

I'd like to let you answer the question, but I think everybody would say we want the pilot based on their qualifications alone.

### **Theodore Chao**

I'll answer this question by asking another question.

One thing I've been thinking a lot about – there's a prominent cheerleader, I think for the Kansas City Chiefs – who's a Black female who died during childbirth.

We know that for Black women in the United States, childbirth is a very dangerous thing. There's a number of Black women who died during childbirth. And so if you were a Black woman who was going into the maternity ward and having a baby, would you rather have a highly respected OBGYN who is a white man, who's dynamite and has gone to the best schools and had the best training, or would you rather have a Black woman who might not have gone to the top universities, but is an OBGYN who also shares and understands the plight of a Black woman in modern medicine?

I think the idea that maybe someone got hired just because their ethnicity is a little bit obtuse. But, you know, I think that when we really think about these things, we have to understand there are complex issues and there's many people involved. And as the end user and also in the hiring process, right?

### **John Matze**

I can see the future vision that's being sold. The idea that you want to introduce people from a more diverse background into these fields so that in the future, we've laid the groundwork and we've invested and getting more people into the marketplace of competition so that people are pushed to be better over time. The argument makes sense. The logic seems sound.

It's just whether or not it might have negative side effects in fields like flying.

### **John Matze**

I also don't think that's what DEI is necessarily about, but it is certainly the perception that people are getting. And I think it's a – I don't know if you'd describe it as a fringe group that are pushing it that way – or it is actually reflective of universities and professors as a whole.

### **Theodore Chao**

That's a whole other topic, right? I think that there's something happening with the ways every issue is seen as having two sides, and people having to choose one side or another. That leads to some very stilted discourse.

I appreciate, John, this moment to just talk deeply about these issues and not just sort of say whether they're right or wrong.

### **John Matze**

You're not necessarily giving up on a meritocracy to pursue this. The idea, it sounds like, is that you're trying to invest into a future better meritocracy.

I think I've had a more of an open mind about [DEI in higher education]. It doesn't necessarily sell me on thinking, "hey, DEI is necessarily the answer" because I don't really know what the answer is. It's a super complex problem that we have in our society. And I think it sucks for anybody who's going to try to solve it.

### **Theodore Chao**

These are long, historically complex problems that are not solved just with some simple policy. But I think that having an awareness about them and having discourse like this, being able to talk about them openly without villainizing each other, is important.

### **John Matze**

Is there any other things you'd like my audience to know and that you'd like to share with the world?

### **Theodore Chao**

I enjoy this conversation and this talk about DEI. I would say, particularly for Hedgehog and your audience, it's really easy to vilify something and to call someone a DEI hire or to use DEI as a boogeyman or a punching bag for particular policies they don't like.

I'm always thinking about the future. And maybe that's because of my framework as an educator. I'm always thinking about how to leave the world better than it was in the past.

I think that if we have this mentality that the world used to be better and it's actually getting worse, then anything that's coming out that sort of represents the reason it's getting worse can be seen as making our future a worse, worse, worse place.

And so I would say it's about empathy, and it's also about thinking about the perspectives of everybody in our society. How can we make our future better? How can we make a more just and wonderful space for all of our children?

The world right now, especially in the United States, works for a certain amount of people, right? It's worked very much for me. John, it seems to have worked for you, right?

Your educational background sounds very similar to mine, in that I didn't like school as a kid. It's one of the reasons I became an educator because I thought that education needs to be shaken up a lot, right? But I still am hopeful that we're moving towards a better future.

DEI, affirmative action, critical race theory – these are concepts. These are theoretical ideas. Let's talk about them and open them up.

Can we have grace? Can we talk about it? Can we organize? To have conversations and do it better as opposed to just vilifying it?

## John Matze

It's always easy to vilify change too, especially when you feel like society as a whole is getting worse over time, whatever the cause of that is. It's easy to vilify anything that's kind of new. That's unfortunate, but it is the world we live in.

The other takeaway that I've kind of gotten from this conversation that's worth highlighting, is that we've mentioned the concept of a zero-sum game. It's hard to conceptualize that it isn't. History is built upon the shoulder of giants, if you will.

The software engineering industry is...if I write a framework and somebody else builds on top of that, and then somebody else builds on top of it, somebody has built the foundation for most of what ChatGPT is, for example, in the AI space. And now you have an entire industry built around that framework. That's what I mean by shoulder of giants.

I think the same thing is true of education and economics. Just because someone's successful doesn't mean someone else is less successful. It's possible that everybody has won as a result of that transaction. And if we remember that when we're talking about concepts like DEI, that for one group to succeed more than they have historically doesn't mean that you're tearing somebody else down to get there. I think that's... I think that's an important part to remember for a lot of people.

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