

# Μαθη Πηοβια ...

## eh, Math Phobia

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This is the transcript of an interview of Prof. Matt Fovia of the University of New York by Erica Wallen of the radio station, WFICT. The topic was math phobia.

*Erica Wallen (EW): Hi, Prof. Fovia. Thank you for joining us. Today, we are going to ask Prof. Matt Fovia of the University of New York about math phobia.*

Matt Fovia (MF): Hi, Erica. Thank you for having me.

*EW: So, I have encountered so many people with math phobia. Actually, I have to admit that I'm one of them. I'm really curious about what you can say to me.*

MF: All right. So, you are one of them, huh. But don't worry. There is nothing wrong with people with math phobia. It's just like acrophobia or ophidiophobia or whatever phobia. You name it. Some people are afraid of height. Human beings have an innate fear of snakes. A lot of people just hate math. But I think there is something special about math phobia. I think it's a man-made phobia.

*EW: Man-made? I don't really get it. Will you explain that?*

MF: Sure. Your math phobia had been created by a group of people. That includes your teachers, your parents, school district, state government, testing companies, etc. If you are forced to do things that doesn't interest you, you will grow to hate it. It's that simple. Of course, teachers and other adults *pretend* to believe that math is important for everyone.

Why did I use the word “pretend?” That’s because they don’t really believe in it. Most of them don’t use math in their adult lives and are not suffering from that. It’s really a sad story.

*EW: Well, I don’t know if I follow you. Then, are you saying that math is used as a torture tool or something like that?*

MF: Exactly. That’s why a lot of people hate it. Who likes torture tools? Just a small number of crazy and sadistic people in the math department ... like myself, right? We are very special. Museum quality.

*EW: That’s interesting. You completely shifted my viewpoint. Now, I’m curious. Then, you crazy professor, how did you end up with a math professor?*

MF: Well, that’s not a very interesting story. I will begin with my secret. During most of my school years, I didn’t like “math” at all. Luckily, I was able to pass all of my math courses without problems. I had minimal proficiency. But I never enjoyed doing the school math and I never got good grades either. Actually, I hated science classes more. It’s not that I hated science itself. I think I liked it and still like it. I just couldn’t stand the way the subject was taught. All the teachers were just following the district’s instructions. For some reason, those science teachers were like robots.

*EW: Uh, I got that you hated your science classes. Now, what about math? There must be some turning point when you became to like math, right?*

MF: Oh, sorry about the digression. Well, yes. There was a turning point. It wasn’t spectacular. It wasn’t what you would imagine. But, yes, there was a turning point. By the way, for my undergraduate degree, I majored jewelry making. You may not know that there is such a major. At least I didn’t. When I first learned about it, I was excited. I thought I was able to do something crafty. That’s what I was enjoying around that time. I thought I would like it. And I liked it indeed. I thought I would become a just plain jewelry maker. Of course, I didn’t need math ... except for when I needed it to design my products. Jewelry making is a creative endeavor. You need to set the conditions exactly right for a successful production. So, I started write down various conditions and the associated outcomes. I was and am a kind of obsessive person. I did this condition-and-outcome collection extensively. In some cases, I had some desirable outcome in my mind. Then, I tried to formulate the exact conditions for that particular outcome. Since I was collecting and studying the conditions and outcomes so meticulously, I was thinking that I could always create a set of conditions that would specify a desirable outcome. But the connection between the conditions and outcomes were incredibly elusive. For example, I realized that certain sets of conditions are satisfied by infinitely many unexpected outcomes in a specific way. There was another unexpected situation. Even for a certain simple outcome, it was *impossible* to formulate a set of conditions. I said “impossible” because I was able to prove that it was impossible.

*EW: Ah, this is getting complicated. I don't know if I am following you very well. It certainly seems like a turning point of some sort. But does this have anything to do with math?*

MF: Everything. I wrote my senior project on this topic of the connection between conditions and outcomes. My art professors were unimpressed. Maybe, they didn't understand the meaning or just wasn't interested in. Nevertheless, I was required to present my project near the end of my college years. Some external professors were also required to attend. One of them happened to be a math professor. He immediately noticed the significance of my project. He recommended me to pursue a graduate study in mathematics. He even said that I was already a mathematician. According to him, my only deficiency was that I didn't speak the conventional mathematical language. Even without being asked, he wrote a recommendation letter and sent it to the most suitable university. He also distributed my project to his colleagues and secured more recommendation letters. Of course, my original career plan was to become a jewelry maker. I was actually imagining myself as a traveling jewelry maker and was saving some money for a used van. But this senior project started to occupy my head more than anything else by this time. Soon afterward, I was accepted to the PhD program in Mathematics at the University of Los Angeles with full support and stipend. It was months past the application deadline. I never applied myself.

*EW: Isn't that something? But I still don't understand the connection between your jewelry-making project and mathematics.*

MF: Telling the truth, I didn't know the connection either. It turned out that what I was doing on my own corresponds to the area of mathematics known as Model Theory. It is a subfield of Mathematical Logic. And if you didn't know, Mathematical Logic is the foundation of all of mathematics and science. It's a big deal.

*EW: Wow! That's certainly something. You re-invented a part of that Modal Theory through you jewelry-making study.*

MF: Model Theory. Of course, I had no idea about the field. So, I didn't use the right terminology. But I came up with several important theorems on my own using my own words. The math professor at my college was able to translate them.

*EW: If I remember correctly, you said that you didn't like math and didn't take any undergraduate math courses. How did you manage the PhD program in math?*

MF: Well, I think I actually took one undergraduate math/computer science course. It was a required elective course called Introduction to Computational Modeling. That one was fine. It was actually interesting. I learned some ideas that was used in my senior project. But that was not difficult. Actually, the professor who taught the course did a great job designing the course. Students worked in groups and created various simulation programs such as bird flocking simulator and drug trafficking simulator. The topics were always something you can see: nature or social phenomena.

*EW: I see. But I guess that was not sufficient to handle the rigor of graduate level mathematics, right?*

MF: You are right. I didn't know the language of mathematics. So, I had to learn it. But I did it minimally to pass courses and preliminary exams. I realized that we can do a lot of things when really needed. I cleared all the requirements and focused on my Model Theory work all the time with Professor Modell. It was one of the most productive times in my life. My PhD thesis was well received by my professors and colleagues. All these paved the way for my current position at the University of New York. So, all went well, thanks to jewelry making. I'm sorry that it took a while to go over my not-so-interesting life story.

*EW: That was quite impressive and surprising. So, now back to math phobia. Maybe you can explain a little bit more about the man-made nature of math phobia.*

MF: Sure. It's pretty bad. I think there is no single bad guy. Everyone is collaborating, mostly unconsciously. And this is not just math. Math is just a prime example. It's about the whole of school education. In a sense, the current school education is creating school/education phobia. If you like school education other than recess or free time, there must be something wrong with you. Adults with a disadvantaged childhood think that college education is the key to success. So, they push their children toward that goal, without realizing that some of the intermediate points are meaningless or even harmful for their children. Adults with a privileged background want to transfer their wealth and status. So, they push their children toward that goal, without realizing that some of the intermediate points are meaningless or even harmful for their children. So, regardless of the socioeconomic status of their parents, most children are just being pushed around. The teachers push those children too. Because of the pressure, a lot of young people ended up drug addicts. Along the line, most of the teachers are simply following the district's mandate. The districts are simply following the state governments and testing companies. If this humongous chain is broken somewhere, the situation may change. But again, everyone is just *following*. And to make the matter worse, the current system is making followers.

*EW: Probably, many of us notice bits of what you said. But many of us probably don't have the courage to clearly see and articulate what you just said. What can we do now?*

MF: Many things. If you limit the case to math phobia, it's simple. Don't teach math until or unless needed. Many people won't need it ... at all. But if you eliminate math, you will bring in some else. That might be even worse. So, we need to deal with the source of the problem. The main idea is to *think*. Think hard. There will be ways to cut the chain I mentioned. Don't just follow. In most cases, it's better not to follow. Think before following.

*EW: Prof. Fovia. I'm curious. You are a professor. Are you also contributing to the chain you just mentioned? Are you too following something?*

MF: Good point. I have to say, yes. I am. I am as guilty as everyone else. Although I try to make my courses more student-centered, I still have to *follow* the University's requirements.

For example, I still have to assign a grade to each student. Grades mean nothing. This is ridiculous. I hate this. Some students are obsessed with test scores, grades, degrees. A lot of college education is becoming meaningless. I'm sad. I need to do something.

*EW: I'm sorry to hear that. What are you going to do?*

MF: Now, I would like to make an announcement. Right at this moment, I decided to leave my position as a mathematics professor. If math is *really* useful, it must be ridiculously easy for me to find a good job in the real world, not just in the academia. Maybe back to jewelry-making?

*EW: (speechless)*

The interview ended right then and there.