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Teachers must conquer maths anxiety says crime-busting statistics professor



Statistics professor Jeffrey Rosenthal says he is amazed at the bogus gambling strategies which people often believe. Jessica Hromas



by **Tim Dodd**

When Canadian statistics professor Jeffrey Rosenthal talks to a popular audience about maths he usually asks them if they've ever had an experience where they unexpectedly bump into someone they know and marvel that this meeting, which must have an extraordinarily low probability, has happened.

Professor Rosenthal, from the University of Toronto, had such as experience as a teenager when he [went with his family to Disney World](#) in Florida and they ran into his dad's cousin Phil.

Surely the chances of this happening must have been minuscule given that there were then 230 million people in the US?

Well actually no, says the professor, who is known in his home country as the author of a [best-selling book on probability](#).

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"A lot of people have what you might call maths anxiety," says Canadian professor Jeffrey Rosenthal. Jessica Hromas

When you take into account that there's a whole lot of people in your life whom you would be surprised to meet at Disney World, and the large number of people you see when you spend a couple of days there, Professor Rosenthal calculates that the probability of being surprised by a chance encounter is about 1 in 200.

Generally about half the people in his audiences say they have had such an experience. And given that most people go to crowded places like Disney World many times in their life that seems consistent with a 1 in 200 chance.

It illustrates, he says, that rigorous mathematical thinking is not something that humans are naturally good at.

Crime buster

So he's not surprised at the worry in Australia about lack of mathematical literacy, a concern only heightened by this week's [Trends in International Mathematics and Science Study \(TIMSS\)](#) report showing school maths achievement in Australia is [flat-lining](#) as other countries improve.

"I think our brains are not wired well to have good intuition about probability and randomness and numbers in general," Professor Rosenthal said.

One example: people are way more afraid of becoming a victim of crime than they should be.

"In the pre-historic days of little tribes if you heard that somebody had been killed by a lion, then that must be one of the 50 or 60 people in your pack. So there are probably lions about and you better be scared," he said.

"Whereas now if there's a front page story about a horrible, grisly murder that means one person out of millions and millions of people has been killed. It doesn't mean there is somebody around the corner who is going to kill you next."

A few years ago Professor Rosenthal used his statistical expertise to uncover [Ontario's](#)

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[biggest-ever lottery scandal](#), which led to people being jailed for fraud and millions of dollars being restituted.

Improv comedy

Somewhat improbably, he also does improvisational comedy and [sings songs](#) about maths and statistics – all in the service of improving the Canadian public's understanding of numbers. And on his current lecture tour of Australia he has scheduled talks to popular audiences to do the same here.

He thinks that, to some extent, children's problems with maths are due to their parents not enjoying it.

"The elementary school teachers also might not love maths that much. A lot of people have what you might call maths anxiety," he said.

Australian experts agree that poorly prepared primary school teachers contribute to the problem.

"A lot of primary teachers have maths anxiety themselves," said Geoff Prince, director of the Australian Mathematical Sciences Institute, who believes that teachers need specialist support to give them confidence in teaching maths.

Most of the questions which Professor Rosenthal gets from the public are about lotteries, and he says most people don't know how to distinguish between sensible and bogus strategies when it comes to gambling.

"It's amazing to me that when the lottery jackpot goes up more people buy tickets because they think they can win more money. But they don't stop to think about the probability of winning and that they might have to share their prize," he said.

He never buys a lottery ticket himself. He doesn't like the odds.

Professor Rosenthal will give [public lectures](#) at the University of Adelaide on December 13 and the University of Melbourne on December 15.

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