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Try out your own six degrees of separation

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A couple of weeks ago, I made my way out to Irvine, Calif., where I was invited to give a public lecture on the topic of math and music for the National Academy of Sciences.

I took the opportunity afforded by long flights to start up a conversation with whoever was next to me.

On the first flight, I sat next to an engineer from Philadelphia who was going out to Irvine to make a proposal for a research grant. Within a few minutes, we had drawn a connection between our lives, finding common ground in both having lived in Toronto for a time.

On another flight, I found myself sitting next to a man who I was certain was an academic because he spoke to me for 15 minutes with his eyes fixated on the seat in front of him, never making eye contact.

This reminds me of a favourite joke of mine. How do you tell the difference between an extroverted mathematician and an introverted one?

The extroverted mathematician stares at your feet while he is talking to you.

Anyway, I was right, he was a retired history professor from Concordia University in Montreal, and again, I could draw a connection via a well-known political scientist from the University of California at San Diego whom I had recently met.

Was this just dumb luck, forging such connections?

In fact, no.

There is a mathematical principle called six degrees of separation that states that for any two individuals in the world (as in all mathematical circles, we will call them A and B), there is a short chain of, at most, five other people that will connect them socially.

For example, A knows the brother of a woman whose second husband worked overseas with the sister of B. The principle is really a mathematical one, stating something about the social distance between people in the human network of the world.

It may be utterly astounding to know that you and some random person on the other side of the globe could be connected in this way. After all, there are about seven billion people on Earth. But it is not as impossible as you think.

For example, suppose that you are or have been acquainted with, say, 400 people. Each of those may know 400 others, giving rise to about 400 times 400, or 160,000 people, you may know in two steps.

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may know in two steps.

Again if each of those individuals knows 400 people, you would only be three steps away from about 400 times 160,000, or 64 million people, and so on.

Of course, there may be some over-counting, as some of your friends know each other and have the same friends, but you can see that the math certainly allows this to be possible.

People's friends tend to be friends with one another, and if this is so, it would indeed be hard to find connections with others in far off lands. But what makes this all work is that many people have a few acquaintances from unlikely locales — a co-worker in Japan, a colleague who has moved to Italy or a relative who has gone off to live in New Zealand.

It is these unexpected links that draw the world closer together.

And it happens in all sorts of social networks, from the world's social network to Facebook to LinkedIn. It is a mathematical property of the way people tend to connect to one another.

So on your next trip anywhere, turn to the stranger beside you and start up a conversation.

What do they do for a living? Where have they lived? What are they interested in? With only a little bit of digging, you should be able to forge a short chain of connections, and this will not only surprise and delight your companion, but build social bridges all around the world.

If a shy mathematician can do it, so can you.

Jason I. Brown is a professor of mathematics at Dalhousie University in Halifax. His research that used mathematics to uncover how the Beatles played the opening chord of A Hard Day's Night has garnered worldwide attention. He is also the author of Our Days Are Numbered: How Mathematics Orders Our Lives.

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