Why I hate statistics.

September 30, 2008 By Paul Dalton

I have been on 8 airplanes in the past week. When I travel, I pass the time with a combination of crossword puzzles, books, my iPod and the latest issue of Scientific American (yeah, yeah I know I am a dork).

One of the first things I look for in any issue of SciAm is Michael Shermer?s ?Skeptic? column. I genuinely appreciate his critical eye and steadfast rationalism. His most recent column has been giving me fits.

He wasn?t really writing about statistics, but something he calls the ?middle land? that we live in- where our brains are quite adept at perceiving phenomena of a middle scale- for example we are wired to understand time on the scale of seconds to decades, but nanoseconds or geologic time intuitively baffle us.

He opened the column with a retelling of what is known as the ?Monty Hall Problem?:

Imagine you are on Let?s Make a Deal, there are three doors, behind one door is a new car, behind the other two are goats. You pick one. Knowing what is behind each door, Monty opens one of the doors with a goat behind it. He then offers you the opportunity to change your pick. Do you? Does switching from your original choice change your chance of winning that coveted new set of wheels?

Like most people my answer is that it doesn?t matter. There are 2 doors, so I have a 50/50 shot at being right- right?

Uh, no.

Turns out, like most people I am wrong- you should switch doors, because it doubles your chance of being right.

Huh?

Let me see if I can explain this to myself: There are 3 doors- A, B and C. I pick door A. I have a 1 in 3 chance of being right. Hall, knowing what is behind each door opens one with a goat behind it.

Now you have only two doors. Most of us- including me- now recalculate our probability as being equal, but it isn?t. Each door had a 1/3 chance of having the car behind it- meaning I had a 1/3 chance of being right and 2/3 chance of being wrong. He knows where the car is, forcing him to pick a door with a goat. Your original 1 in 3 odds haven?t changed, he has just reveled that one of the other doors has a goat behind it. There was a 2 in 3 chance that the car was behind one of the doors I didn?t choose. That is still true, meaning that I double my odds of winning the car if I switch.

Wikipedia offers some help in explaining this. Instead of just three doors, imagine 1 million doors. You guess one door. He goes down the line opening every other door but yours and one other- and offers you a chance to switch. You have seen 999,998 wrong doors, and have two possible right doors. Did your original odds of being right (1 out a million) change? No- so you switch.

There- do you understand? I don?t for what it is worth, but I accept that it is true. I have to do that a lot in my work. I have never been really good with math, yet my work requires looking at statistics. Concepts like confidence intervals and power equations are beyond my ability to truly understand- but I look at them and use them in my work all the time. Is that a weakness for me as an treatment activist- probably.

And that is why I hate statistics.

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