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### Neath studies, teaches the uncertainties of life

Aldemaro Romero Jr.

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## Regional

# Neath studies, teaches the uncertainties of life

Statistics is defined as the science of decision making in the face of uncertainty. And, as we all know, life is full of uncertainties. Should we buy insurance? Should we play the lottery? Someone who studies and teaches about situations involving uncertainty is Andrew Neath, a professor in the department of mathematics and statistics at Southern Illinois University Edwardsville.

Neath was born in Chicago and received his bachelor's degree in applied mathematics from California State University at Chico and his master's and doctorate degrees in statistics from the University of California at Davis. Math has always played a dominant role in his life. Both of his parents are mathematicians.

"At home we were subjected to math even in our movies," Neath said. "I remember our parents bringing home the movie 'Donald in Math Magic Land,' a Disney film."

His interest in math goes well beyond the abstract. He once supervised a student project related to gambling.

"Blackjack is the only casino game where, if it is played correctly, is in the player's favor," he said. "Now the casinos don't do anything about this because it is only a slight edge in their favor and most players don't play that way. But if you play blackjack correctly the game is in your favor," explained Neath.

When it comes to explaining gaming theory to his students, Neath said that he is fascinated with how they respond to the whole notion that a lot of human behavior is based on unconscious bets we make about whether or not certain things will happen.

## Aldemaro Romero College Talk

"What is surprising is how often humans actually go against their best instincts," Neath said. "Humans, for example, have evolved to the point where they, for whatever reason, feel a loss or hurt more than they feel a gain or a happiness from winning and so that leads to some irrational behavior. If we could set aside personal and emotional feelings as poker players would have to do, we would make better decisions."

Given the extremely low odds of winning the lottery, one wonders to what extent statisticians like Neath play it. "I do not play the lottery," he answered firmly.

Odds of one in 250 million are too much of a long shot, he said.

Another area in which statisticians like Neath provide advice is insurance. In many ways both the client and the company are making bets on something going very wrong.

"Insurance is appropriate for models where you have a very small likelihood of something occurring but when it does occur it has an extreme impact," Neath said. "For example, there is very little chance that your house would burn down, yet if that were to occur that would be a catastrophic loss and so insurance is a way of protecting yourself against these very unlikely events but events that would have a disproportionate loss."

Because of the many applications of Neath's work, he gets lots of students interested in what he does. "I would like



Courtesy of Shan Lu

### Dr. Neath in his lab.

to think it is because what I do is interesting," he said. "I get students from all sorts of different backgrounds. I ran into two former students recently, both went

on to get degrees in business, both are highly successful. One used to work at the Federal Reserve Bank and he is now a professor. Another is trading in the energy

market and is highly successful in that and both of them say that their statistical training has helped them in their decision making."

Now, Neath is working on projects that have an application in politics. "I am working on a problem involving voting theory and it is very fascinating," he said. "People think that elections are very easy, that everybody casts a vote and the candidate with the most votes is the winner. Even when we have something like the Florida election in 2000, the focus was on who got more votes, George Bush or Al Gore. And politics aside, that is still somewhat questionable although the ruling went in favor of George Bush. But what is really the bigger underlying issue is, who should have won the election in a more mathematical sense." How did math play such a large role in that election?

"Well there was a spoiler involved and that was Ralph Nader," Neath said. "There was a spoiler on the conservative side but not to the same extent. There is very little doubt that between Gore and Bush, Gore is more popular, and very little doubt that between Gore and Nader, Gore was more popular."

"And so you have got these problems in voting theory that are not just solved by pluralistic ways of voting and so we have those same sorts of problems in statistical decision making as well."

*Aldemaro Romero is the Dean of the College of Arts and Sciences at Southern Illinois University Edwardsville. His show, "Segue," can be heard every Sunday morning at 9 a.m. on WSIE, 88.7 FM. He can be reached at [College\\_Arts\\_Sciences@siue.edu](mailto:College_Arts_Sciences@siue.edu).*