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Lies and Statistics

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I encourage the readers of "Teaching Bits" to read the two articles, "The Royal Statistical Society Schools Lecture 2004: 'Lies and Statistics'" Part 1 and Part 2. These articles are from Teaching Statistics, Volume 28, Number 2, Summer 2006, and Number 3, Autumn 2006, respectively, and can be found through the Blackwell Synergy website, www.blackwell-synergy.com. This site is the home of over 850 journals and holds the contents of Teaching Statistics journal as well as other Statistics journals published by Blackwell Publishing. One can review abstracts of articles in Teaching Statistics at the site. Although some articles are free, most articles do require a subscription fee. However, the two articles discussed here are free (albeit, finding them does require a little bit of searching).

The articles present a print version of a lecture which was presented to pre-university students in the UK by Frank Duckworth. The lecture series is part of the Royal Statistical Society's outreach program. According to the first article, "The text is adjusted for presentation as a written paper and customized for an international readership. Some author's comments on what happens during the lecture are given in square brackets, as are a few other asides." Written for "international readership" may be stretching the point a bit for an American audience. An instructor may have to help American students understand some of the references, e.g. "football" is "soccer." However, these articles would be excellent articles for either an AP Statistics course or an Introductory Statistics course or a quantitative literacy course. I would suggest that the second article, Part 2, be presented only if students have studied or will study probability in more detail. Whether an instructor discusses the articles at the beginning or the end of the course is debatable. Personally, I would bring them in at the end of the course, but it would be reasonable to use them at the beginning as an introduction to Statistics.

The first 5 parts of the Part 1 are essential reading for everyone! Duckworth's point is to "dispel any myths about statistics being associated with lies." In doing this, he explains the " . . . different meanings of the word 'statistics.'" There is the plural meaning "which is synonymous with 'data'", then there is the singular 'statistics' which refers to the discipline. He addresses an example of misleading statistics (plural), and ends the section with ". . . it is not the statistics that lie, and it is not the statisticians who lie; it is the people who present them in a way that conveys the wrong message who are to blame." (I want to get a T-shirt made with this statement on it!) In the section titled, "What Can and What Cannot Statistics Do?", he summarizes tests of significance in layman's terms Ð it is a very nice explanation.

The remaining sections address: cause and effect, the law of averages, coin tossing, and Bayes and the law of courts. This last section illustrates DNA profiling when it was still possible that a DNA profile could be shared by several others. The "prosecutorÕs fallacy" is presented which is a misinterpretation

of statistics. The article states, "The probability of a man having a matching DNA profile, given that he is innocent, is not the same as the probability of a man being innocent given that he has a matching DNA profile. The probability of the observation given the hypothesis is not the same as the probability of the hypothesis given the observation." Just working on the last part of the quote alone would be a great discussion day in most of our classes.

The second article, Part 2, is a continuation of the lecture but is more probabilistic in nature. The "Monty Hall" problem is presented. Duckworth even discusses the different strategies that the host may have when the host makes an offer to switch and how these different strategies can affect how one would approach deciding whether or not to switch. The next two sections, "Wise After The Event" and "What A Coincidence!" give nice explanations when someone observes an event and then calculates the probability of the event occurring, for example, Thursday being the wettest day of the week and Sunday being the driest day of the week, or winning a lottery twice in a year, or accidentally running into someone you knew 20 years ago while on vacation, etc. Finally, the article ends with two sections discussing gambling, specifically the lottery. Duckworth describes an activity that he has his audience do. This activity would be a great first day of class activity.

I hope that you and your students enjoy these two articles.

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