The Role of Statistical Inference in Teaching and Achievement of Students

Ramesh Kapadia, Klagenfurt University, Austria
email: ramesh.kapadia@virgin.net

Abstract

The methods of teaching statistical inference vary and too often, insufficient links are made to the achievement of students. Many of the underlying ideas are counter-intuitive, as illustrated by the well-known examples of Kahneman & Tversky, and Gigerenzer. Recent testing of able students will be discussed. Simulations can also play a part, as demonstrated with an example from real-life of breathalysers.
The ideas of decision-making are not particularly deep and complex, but the application of ideas in practice proves to be difficult. For example it is not simple to use ideas of utility in conjunction with probability, where the differences are quite subtle and need practice to be well understood. Students find it hard to apply the expected utility theorem and ideas of the probability premium in insurance. They are also perplexed by Arrow's theorem showing that simple and intuitive conditions for voting lead to contradictions, undermining the idea of a fair ballot. We will make reference to students' reactions in recently presented courses to undergraduate students at Klagenfurt University.

Key words. Bayesian statistics, statistical inference, simulations.