



Jurisprudence Section - 2016

F16 Reporting and Presenting the Probative Value of Forensic Evidence in the Courtroom

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After attending this presentation, attendees will better understand how best to present qualitative and quantitative data in court.

This presentation will impact the forensic science community by reviewing research on how data is understood.

Over the past two decades, the legal and scientific academic communities converged toward a consensus on the fairest and most balanced manner of reporting the probative value of forensic evidence. Both communities acknowledge that a trace recovered at a crime scene, on a victim, or on a suspect needs to be evaluated under two alternative propositions (one considering that the trace originated from a specific putative source (e.g., a suspect) and the other one considering that the trace came from some other source). The result of such evaluation is commonly reported as a “likelihood ratio.”

There are several concerns often associated with likelihood ratios. The first concern is that courts do not necessarily share the sentiments of legal and scientific scholars and have repeatedly admitted scientifically unjustifiable forensic conclusions. The second concern is related to the ability of the forensic community to assign appropriate likelihood ratios for any type of evidence in any given case. During this presentation, there will be focus on a third concern: that of the presentation of likelihood ratios to lay individuals such that the probative value of the evidence is effectively understood and used in courts. Review of the jury study literature shows that researchers have mostly focused on descriptive studies of the jury’s perception of heuristic conclusions (whether logical and justifiable, or not). Unfortunately, they have seldom attempted to build on psychological theories of human memory and reasoning to propose novel presentation methods, in particular for statistics as complex as likelihood ratios.

The objectives of this presentation are numerous. First, various heuristic methods currently used to report forensic evidence, from categorical statements to likelihood ratios, will be reviewed and their respective level of appropriateness and limitations will be discussed. Then, the foundations of a cognitive psychological theory that examines how humans remember, reason, and make decisions under uncertainty will be presented. It was found that, according to this theory, individuals remember in parallel the precise nature of information (e.g., a given number) and its essence (e.g., *a lot vs. small*). Individuals then use the least amount of information they believe is necessary to make their decisions. This theory not only explains how humans reason, but also illuminates reasoning fallacies and provides a basis to discuss, with the audience, the main findings of jury studies published to date. For instance, this theory enables us to understand the differences observed when potential jurors are presented with probabilities or relative frequencies, or when they are presented with likelihood ratios and error rates combined or separated. Finally, that theory will be drawn on to provide recommendations on how to best present and combine different aspects of forensic conclusions, such as similarity between trace and control samples, rarity of the trace characteristics in a population, probative value, and error rates.

Qualitative, Quantitative, Evidence