

Evaluation and reporting of scientific evidence: the impact of partial probability assignments

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The evaluation of measurements on characteristics of trace evidence represents a task that forensic scientists are typically confronted with. The assessment of the value of evidence can be performed by the derivation of a Bayes factor, a rigorous concept that provides a measure of the change produced by an item of information in the odds in favor of a proposition as opposed to another. This represents a demanding task with several sources of uncertainty, typically linked to the complexity of the case, to sensitivity issues or to computational impasses.

While use of the such a metric to assess the probative value of evidence is well established and supported by operational standards in different forensic disciplines, opinions about what should be an appropriate way to deal with such sources of uncertainty while presenting expressions of evidential value at trial differ. Some quarters promote positions according to which, for sake of transparency and minimizing personal involvement, practitioners should state a range of values for the posterior probabilities of the evidence given competing propositions, and consequently report a range of values for the Bayes factor. However, such partial probability assignments may not make good use of available information, providing an augmented posterior uncertainty.