

PROBABILITY AND THE LAW

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1. FOUR FALLACIES IN REASONING WITH PROBABILITIES (ESP. WITH DNA EVIDENCE)

Inversion fallacy
Base rate fallacy
Uniqueness fallacy
Database fallacy

2A. CAN WE DO AWAY WITH NUMBERS/STATISTICS/PROBABILITIES IN THE COURTROOM?

“How often have I said to you that when you have eliminated the impossible whatever remains, HOWEVER IMPROBABLE, must be the truth? We know that he did not come through the door, the window, or the chimney. We also know that he could not have been concealed in the room, as there is no concealment possible. Whence, then, did he come?” Conan Doyle, *The Sign of Four*.

2B. BUT...CAN WE PRESENT DNA EVIDENCE WITHOUT USING NUMBERS?

Option 1: jurors are only given a (declaration of the) DNA match, but no numbers.

Option 2: jurors are also given the frequency of the DNA profile or the RMP.

Option 3: jurors are also given the probability that the defendant is the source of the DNA traces at the crime scene (possibly through Bayes' theorem).

3. LEGAL PROBABILISM

Quantification Claim: The defendant's guilt can be probabilistically quantified.

Threshold Claim: The criminal standard of proof is met whenever the probability of the defendant's guilt is above a certain probabilistic threshold (e.g. 0.9).

4. NESSON

Nesson offers two arguments against legal probabilism (only the first is in the assigned reading):

- i. quantification of standards of proof threatens people's deference toward trial proceedings;
- ii. quantification of standards of proof focuses on the evidence, but legal trials are about facts.

5. THOMSON'S BUS HYPOTHETICAL (PP. 199-200)

“Mrs. Smith was driving home late one night. A taxi came towards her, weaving wildly from side to side across the road. She had to swerve to avoid it; her swerve took her into a parked car; in the crash, she suffered two broken legs. Mrs. Smith therefore sued Red Cab Company. Her evidence is as follows: she could see that it was a cab which caused her accident by weaving wildly across the road, and there are only two cab companies in town, Red Cab (all of whose cabs are red) and Green Cab (all of whose cabs are green), and of the cabs in town that night, six out of ten were operated by Red Cab.” [...]

“.6 is the degree of belief that, situated as we are, we ought to have in the hypothesis that the cab which caused the accident was operated by Red Cab.” [...]

“Is it right that Mrs. Smith win her suit against Red Cab? The standard of proof in a tort suit is “more probable than not,” which is plausibly interpretable as requiring only that the plaintiff establish a greater than .5 probability that the defendant (wrongfully) caused the harm. But most people feel uncomfortable at the idea of imposing liability on Red Cab on such evidence as Mrs. Smith here presents. Why? That is the problem.”

QUESTION: Does this hypothetical differ in significant ways from *Smith v. Rapid Transit*?

6. RECONSTRUCTING THOMSON’S ARGUMENT

Sec. III—What is individualized evidence?

Insight: Evidence in the bus case is not causally connected in the appropriate way with the disputed fact.¹ So, individualized evidence := evidence causally connected in the appropriate way with the disputed fact.

Illustrations: A witness saying that she saw a red bus would be individualized evidence.²

Some instances of statistical evidence could also count as individualized evidence.³

Sec. V—Why do we (or should we) value individualized evidence?⁴

Non-luck: Individualized evidence is better than non-individualized b/c it is *not* a matter of luck if one’s conclusion is correct when the conclusion is based on individualized evidence.⁵

Conclusion: Drawing a conclusion from individualized evidence is not a matter of luck b/c individualized evidence offers a guarantee, which should be understood in terms of the evidence being causally connected in the appropriate way with the disputed fact.⁶

QUESTION: Thomson says that individualized evidence is better because it offers a guarantee, which consists in the evidence being causally connected with the disputed fact. But “being causally connected” is what it takes for the evidence to count as individualized. So, she is saying that individualized evidence is better because it is individualized! *Isn’t this circular?*

¹“I strongly suspect that what people feel the lack of, and call individualized evidence, is evidence which is in an appropriate way causally connected with the (putative) fact that the defendant caused the harm.” (p. 203)

²“What sort of causal connection would be appropriate? Well, if a witness came forward to say he saw the accident, and that the cab which caused the accident looked red to him, then we would have what would be called individualized evidence against Red Cab; and my suggestion is that that is because the accident-causing cab’s actually being red (and therefor Red Cab’s) would causally explain its looking red to that witness.” (p. 203)

³“More important, numerical or statistical evidence too can be causally connected in an appropriate way with the (putative) fact it is presented to support. Suppose a plaintiff alleges that he was refused a job with a certain organization on grounds of race; in evidence, he presents statistics showing that the racial composition of the organization’s work force diverges widely from that of the local population. Those data suggest a causal hypothesis, namely that the organization intends to discriminate in its hiring practices.” (p. 205)

⁴“If we had individualized evidence (and thus, on my hypothesis, appropriately causally connected evidence) against Red Cab, in addition to the evidence we already have in hand, then we would feel considerably less reluctant to impose liability on Red Cab. Why is that?” (p. 205)

⁵“On my view of them, what is at work in the friends of individualized evidence is precisely the feeling that just imposition of liability requires that this stronger requirement be met. They believe, as they say, that “mathematical chances” or “quantitative probability” is not by itself enough; on my view of them, that is because they feel, rightly, that if a jury declares a defendant guilty on the ground of nonindividualized evidence alone, then it is just luck for the jury if what it declares true is true.” (p. 214)

⁶“What would make it not be just luck for the jury if what it declares true is true? A guarantee. I suggested that individualized evidence for a defendant’s guilt is evidence which is in an appropriate way causally connected with the (putative) fact that the defendant is guilty, and hence (putatively) guarantees the defendant’s guilt; so to require individualized evidence of guilt just is to be requiring a guarantee.” (p. 214)