PROBABILITY AND THE LAW

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1A. THOMSON AND CAUSALITY

Thomson argues that statistical evidence is deficient when it fails to be causally connected, in the appropriate way, with the disputed events (i.e. with the facts to be established at trial).

A *first* challenge is from Schmalbeck (1986):

> Suppose the Internal Revenue Service has reliable aggregate taxpayer statistics indicating that sixty percent of taxpayers who have adjusted gross incomes between $100,000 and $200,000 overstate their charitable contributions deductions by at least $ 500. May the IRS properly assess a deficiency equal to the tax on $500 of additional taxable income with respect to any taxpayer within this income bracket?
>
> [...] *the assessment procedure described should not be viewed as impermissible.* (p. 234)

A *second*—somewhat less clear—challenge is from a criminal procedure textbook:

> A police officer sees a car driving erratically and signals the driver to pull over. By the time the officer reaches the car, however, three men are sitting in the back seat, and no one is in the driver's seat. The officer is confident that no one left the car after it was stopped. Therefore, the officer knows that one but only one of the three men was driving while intoxicated. If none of the three admits to being the driver, do police have probable cause to arrest all three?

1B. THOMSON AND PROTECTION FROM EPISTEMIC LUCK [NOT DISCUSSED IN CLASS]

Thomson thinks that whenever the supporting evidence is causally connected with the disputed event, the resulting evidence-based judgment is free from epistemic cluck (i.e. the judgment is not true as a matter of mere coincidence and luck). *But aren't most of our evidence-based judgments fallible and prone to error? If so, how can they be free from epistemic luck?*

> Imagine a trial system in which all the incriminating and exculpating evidence is collected with the greatest care and assessed in the most accurate way. Defendants can afford excellent lawyers who can challenge the case against them extensively. After a long and careful process, the result is a very precise estimate of the defendant's probability of guilt.
>
> When the guilt probability meets a high threshold, e.g. 0.99 or higher, the trial moves forward, otherwise it is dismissed.
>
> To decide whether the defendant should be convicted or not, the fact-finder tosses a weighted coin with two faces, *Guilt* and *Innocence*. The coin lands *Guilt* with a 0.99 probability, and it lands *Innocence* with 0.01 probability.

The scenario wants to suggest that even in the best (but still fallible) trial system, epistemic luck, coincidence, or "gambling" will inevitably affect trial outcomes whether we like it or not. (The coin toss feature of the scenario is a way to make this salient.) *Do you agree?*

2. THE EXPECTED UTILITY MODEL

Two errors affect criminal trials, i.e. convicting an innocent and acquitting a guilty defendant (abbreviated CI and AG). Suppose we can assign a probability value to guilt and innocence (abbreviated $P(G)$ and $1 - P(G)$). Further, suppose we can assign a (negative) utility u to CI and AG. Utilities can be negative. *On a simplified model*, a conviction maximizes expected utility provided:

$$1 - P(G) \times u(CI) > P(G) \times u(AG).$$

The inequality expresses the fact that the expected utility resulting from convicting an innocent is higher than the expected utility resulting from acquitting a guilty defendant. So, even in light of possible errors, convicting turns out to be better as far as expected utility goes. The inequality holds just in case:

$$\frac{1 - P(G)}{P(G)} > \frac{u(AG)}{u(CI)}.$$

Suppose $\frac{u(AG)}{u(CI)} = \frac{-1}{-99}$, i.e. convicting an innocent defendant is deemed far worse than acquitting a guilty defendant. It follows that $\frac{1-P(G)}{P(G)} > \frac{1}{99}$, so the threshold probability of guilt will be 0.99. If the ratio $\frac{u(AG)}{u(CI)} = 1$, the threshold will have to $\frac{1}{2}$.

3A. SINDELL (1980)

Traditional theory: Plaintiff has to establish that defendant *caused* the injury/harm.

Summers (1948):

IF (-) two (or more) defendants are negligent;
(-) one of the two (or more) defendant has caused the injury; and
(-) the plaintiff, despite its best effort, is unable to identify who caused the injury.

THEN the burden of proof shifts to the defendants to exculpate themselves.[1]

Rationale: defendants (in Summers) were in a better position than plaintiff to recover evidence.

Sindell (1980):

IF (-) the defendants marketed a *fungible product*;
(-) the defendant's overall *market share* of the product is *substantial*;
(-) specimens of the said product caused harm to the plaintiffs;
(-) plaintiffs, despite their best efforts, are unable to identify the culpable manufacturer;
[(-) defendants are not in a better position than plaintiffs to recover evidence;]

THEN
(-) defendants are *liable in proportion to their market share* UNLESS they show otherwise.

3B. TWO CONSIDERATIONS AT WORK IN SINDELL

Economic: How to apportion liability in an *economically and socially optimal way*?

Procedural: How to distribute the evidentiary burdens in a *procedurally fair way*?

[1] "Where the conduct of two or more actors is tortious, and it is proved that harm has been caused to the plaintiff by only one of them, but there is uncertainty as to which one has caused it, the burden is upon each such actor to prove that he has not caused the harm." Restatement 2nd of Torts, 433 B.