



Last week

- Suggestion: Standards of proof (BARD, preponderance, etc.) can be interpreted as **probability thresholds**
- Puzzle: **base rate statistics** can meet the threshold yet seem insufficient for legal judgment (Red Taxi, Gatecrasher, Prisoner)
- Two types of responses:
 - **epistemic** responses (sensitivity of evidence)
 - **pragmatic** responses (incentive effects of evidence types)

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This week

- Three threads, building on last week:
 - **Setting the standards:** how error-cost considerations might determine the threshold
 - **The Presumption of Innocence:** what it means to say that someone is innocent until proven guilty
 - **Allocating the burden of proof:** who must prove what and the puzzle of affirmative defences

SETTING THE STANDARDS

The Arbitrator's Problem

- Kaplan [1]: Like Pascal's wagerer, the legal **arbitrator** (judge, jury,...) faces a **decision problem**

Where $U(\cdot)$ = society's utility for each act-state pair, we have

	guilty	innocent
convict	$U(cg)$	$U(ci)$
acquit	$U(ag)$	$U(ai)$

- Two kinds of error: false positives (ci) and false negatives (ag)
- Every adjudicative system must **balance** these two errors: reducing one typically increases the other (see our discussion of James)
- Note: Kaplan (implausibly?) assumes that $U(cg) = U(ai)$

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Expected Utility Comparison

- Kaplan: decision under **risk** (known probabilities given evidence)
- Upshot: apply **expected utility** theory to determine where the **standards of proof** should be set

Above what value of $\Pr(g)$ should the arbitrator convict?

$\Leftrightarrow$ Above what value of $\Pr(g)$ is $EU(c) > EU(a)$?

- Now $EU(c) > EU(a)$ iff

$$\Pr(g)U(cg) + (1 - \Pr(g))U(ci) > \Pr(g)U(ag) + (1 - \Pr(g))U(ai)$$

- Rearranging:

$$\Pr(g)(U(cg) - U(ag)) > (1 - \Pr(g))(U(ai) - U(ci))$$

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Expected Utility Comparison (cont.)

- Useful concept: **losses**, i.e. utility gaps between correct and wrong acts in each column

$$L(i) = U(ai) - U(ci) \quad (\text{loss from wrongful conviction})$$

$$L(g) = U(cg) - U(ag) \quad (\text{loss from wrongful acquittal})$$

	guilty	innocent
convict	$U(cg)$	$U(ci)$
acquit	$U(ag)$	$U(ai)$

- The inequality becomes $\Pr(g)L(g) > (1 - \Pr(g))L(i)$, or equivalently:

$$\Pr(g) > \frac{L(i)}{L(i) + L(g)}$$

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The Formula in Action

- If wrongful conviction is roughly **5 times** worse than wrongful acquittal ($L(i) = 5L(g)$):

$$\Pr(g) > \frac{L(i)}{L(i) + L(g)} = \frac{5L(g)}{5L(g) + L(g)} = \frac{5}{6} \approx 0.83$$

- If wrongful conviction **20 times** worse ($L(i) = 20L(g)$):

$$\Pr(g) > \frac{20L(g)}{20L(g) + L(g)} = \frac{20}{21} \approx 0.95$$

- The more weight society places on avoiding wrongful conviction, the higher the threshold for conviction

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Justifying the Standards

- The formula has been invoked to justify the different **fixed standards** in both civil and criminal cases:
- **Civil** case:
 - a matter of allocating compensations between two private parties, so $U(ag) \approx U(ci)$ and $L(i) \approx L(g)$
 - threshold ≈ 0.5 (**Preponderance of the Evidence (POE)**)
- **Criminal** case:
 - a matter of punishing a single party, so $U(ag) \gg U(ci)$ and $L(i) \gg L(g)$
 - threshold close to 1 (**Beyond a Reasonable Doubt (BARD)**)
 - Blackstone's Ratio: "better ten guilty escape than one innocent suffer"

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Beyond the Binary

- The civil/criminal split is a useful first pass, but real systems use **intermediate** standards as well
- Serious civil allegations (fraud, termination of parental rights) involving grave punishments raise $L(i)$.
- In these cases many US jurisdictions require **clear and convincing evidence**, a standard between POE and BARD

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Beyond the Binary (cont.)

- Australia: **preponderance**, but **better supported by evidence**

"The ordinary standard of proof required of a party who bears the onus in civil litigation in this country is proof on the balance of probabilities. That remains so even where the matter to be proved involves criminal conduct or fraud. On the other hand, the strength of the evidence necessary to establish a fact... on the balance of probabilities may vary according to the nature of what it is sought to prove." (High Court in Neat Holdings v Karajan Holdings)
- Analogy:
 - (a) Having strong evidence that a coin is fair (50K tails / 100K tosses) vs (b) having weak evidence that it is (5 tails / 10 tosses)
 - The **balance of probabilities** is the same in both cases (50-50) but that balance is different **degrees of support**

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Fixed Standards and Punishment Calibration

- **Worry**: Standards end up fixed only if the loss ratio is the **same** across criminal cases and across civil cases: **is this plausible?**
- $L(g)$ varies across offences: failing to convict a murderer costs society more than failing to convict a shoplifter
- $L(i)$ varies with the punishment: imprisoning an innocent costs more than fining one
- But if $L(i)$ and $L(g)$ **move in lockstep** across types of cases, the ratio stays constant and a single fixed threshold is optimal for every case
- So sentencing is a **calibration** dial the legislature can turn:
 - Murder: severe impact (large $L(g)$), long sentence (large $L(i)$)
 - Petty theft: small impact (small $L(g)$), small fine (small $L(i)$)

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Fixed Standards and Punishment Calibration (cont.)

- The dial is finer-grained than offence type
- Sentencing also calibrates to **character and prior record**:
 - US: offence level $\times$ criminal-history grid
 - Australia: priors elevate within range, but capped at the proportionality ceiling set by the gravity of the current offence

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Decision Theory and Belief

- **Popular claim #1**: legal adjudication is **theoretical** reasoning (what to believe), not merely **practical** reasoning (what to do)
- Ross [2]: because conviction involves blame, which requires the support of the population

“Imagine that criminal courts routinely found people guilty on the basis of evidence too weak to persuade people in the community to believe that the person was guilty. If this was to become common knowledge, there would be a huge tension between the legal system blaming and punishing following a guilty verdict, and the fact that people in society wouldn’t personally feel comfortable blaming the accused. This would be a recipe for the criminal justice system to become alienated from the community that it is supposed to represent; courts would no longer be viewed as holding people to account on behalf of the community.”

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Decision Theory and Belief (cont.)

- **Popular claim #2**: utilities give reasons for **action**, not for **belief** (see discussion of Pascal, James and Clifford)
- Upshot: utilities can’t legitimately set the threshold for finding guilt

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References

- [1] John Kaplan. Decision theory and the factfinding process. *Stanford Law Review*, 20(6): 1065–1092, 1968. doi: 10.2307/1227491.
- [2] Lewis Ross. *The Philosophy of Legal Proof*. Cambridge Elements: Philosophy of Law. Cambridge University Press, Cambridge, 2024. ISBN 9781009125048. doi: 10.1017/9781009127745.

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