
Hypothetico-deductive method

- Deduce from a hypothesis H , plus auxiliary assumptions A , a consequence O that can be checked by observation
 - Check it:
 - If false, reject the hypothesis (or the auxiliary assumptions)
 - If true, hypothesis is corroborated.
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Why this can't be the whole story

- If $\sim O$: Do we reject H or A ?
 - Underdetermination: multiple hypotheses compatible with the data
 - Bring in extra-empirical criteria?
 - Not all predictions count equally in favour of a theory
 - Confidence in a theory, as well as evidential support, admits of degrees.
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Beginnings of a more adequate picture

- Model an ideally rational agent as have numerical degrees of belief, or credences.
 - These change by conditionalization on the evidence:
 - $cr(H|E) = cr(E|H)cr(H)/cr(E)$
 - $cr(H|E)/cr(H) = cr(E|H)/cr(E)$
 - E supports H if H “makes the improbable probable”
 - Comment: underdetermination argument harder to run in such a framework
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Anthropic arguments

- These can make sense in a Bayesian framework, *provided that*:
 - I have some way of (if only imprecisely) assessing reasonable prior credence about what I will observe
 - The theory permits me to say what I should expect to see, conditional on the supposition of the theory
 - Conclusion: some sorts of multiverse models can garner support from anthropic considerations.
 - Choice of measure should not lose sight of the role we want it to play in the argument
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Demarcation

- Verifiability (Wittgenstein, Vienna Circle)
 - contra metaphysical nonsense
 - Falsifiability (Popper)
 - contra Marx, Freud
 - Evidence probabilistically relevant (Reichenbach)
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My own view

- There is no sharp line of demarcation between scientific hypotheses and ordinary propositions
 - Scientific inference is continuous with methods of reasoning applicable in everyday life
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More interesting questions

- What sorts of hypotheses are capable of being well-supported by evidence?
 - For which hypotheses *do* we have strong evidential support?
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Allows too much in?

- What about:
 - Intelligent design
 - Astrology
 - Parapsychology



My answer to George's puzzle

My answer to George's puzzle

- H: coin landed heads
- T: coin landed tails
- A: I was born in the better observatory
- B: I was born in the worse observatory

- These seem reasonable:

- $\text{cr}(H|A) = \text{cr}(T|A)$
- $\text{cr}(A|T) = \text{cr}(B|T)$

- These yield $x = y = z = 1/3$.

	A	B
H	x	0
T	y	z