ASSESSING A HYPOTHESIS
via Inference To The Best Explanation

Which explanation best explains the data?

1. **Explanatory scope:** How many things a hypothesis explains. The more things it explains, the greater its explanatory scope.

2. **Explanatory power:** The degree to which an explanation makes the data in question more probable.

3. **Simplicity (Ockham's Razor):** Other things being equal, the more simple explanation (the one with fewer assumptions) is to be preferred. ILLUS: Motion of the planets explained by heliocentric vs. geocentric systems. The heliocentric system is simpler.

4. **Plausibility:** The best hypothesis is the one implied by a greater variety of accepted truths.

5. **Less ad hoc:** Fewer new suppositions not already implied.

6. **Accord w/accepted beliefs:** Implies fewer falsehoods.

7. **Comparative superiority:** Exceeds the other rival possibilities in 1-6 such that there is little possibility the rivals would succeed in doing so.

ASSESSING A HYPOTHESIS
via Bayes Theorem
(probability calculus)

One version of Bayes Theorem:

$$Pr(H \mid E) = [\frac{\Pr(H)\, xPr(E|H)}{[\Pr(H)\, xPr(E|H) + \Pr(\neg H)\, xPr(E|\neg H)]}]$$

Pr = probability **H** = hypothesis | = on or given
E = evidence ¬ = not or negation

$Pr(H \mid E)$ can be read as follows: "The probability (Pr) of the hypothesis (H) given (or on) the evidence (E)"

$Pr(E|\neg H)$ can be read as follows: "The probability (Pr) of the evidence (E) given that the hypothesis (H) is not (¬) true."

Values typically assigned in Bayes Theorem:

0 = not probable

1 = certain, or virtually certain

.5 = midway between not probable and certain

< = less than, less probable than probable

> = greater than, more probable than not probable