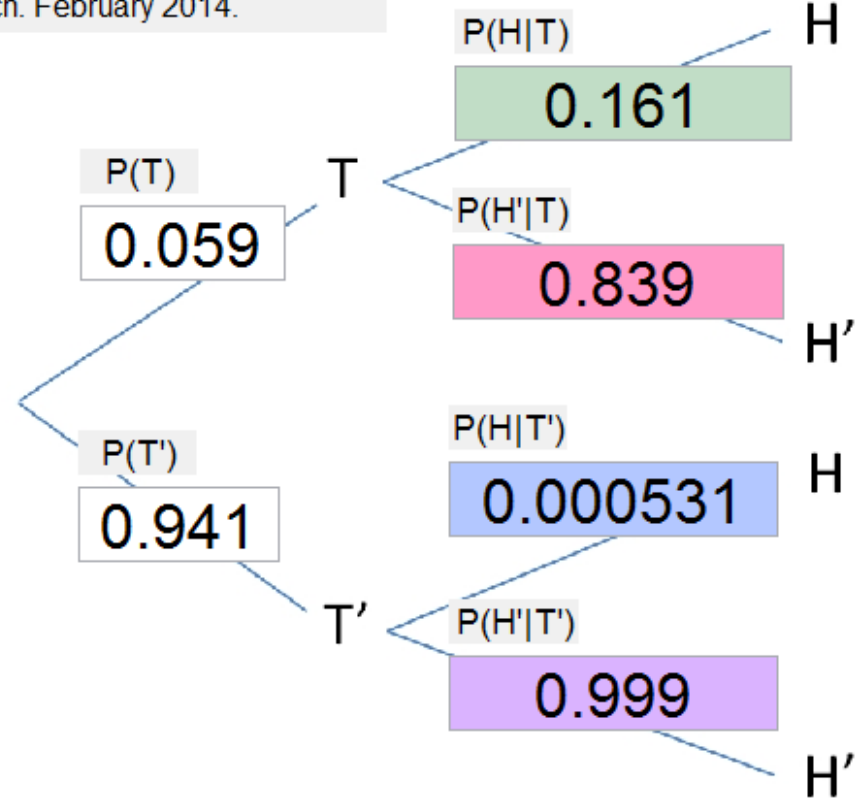
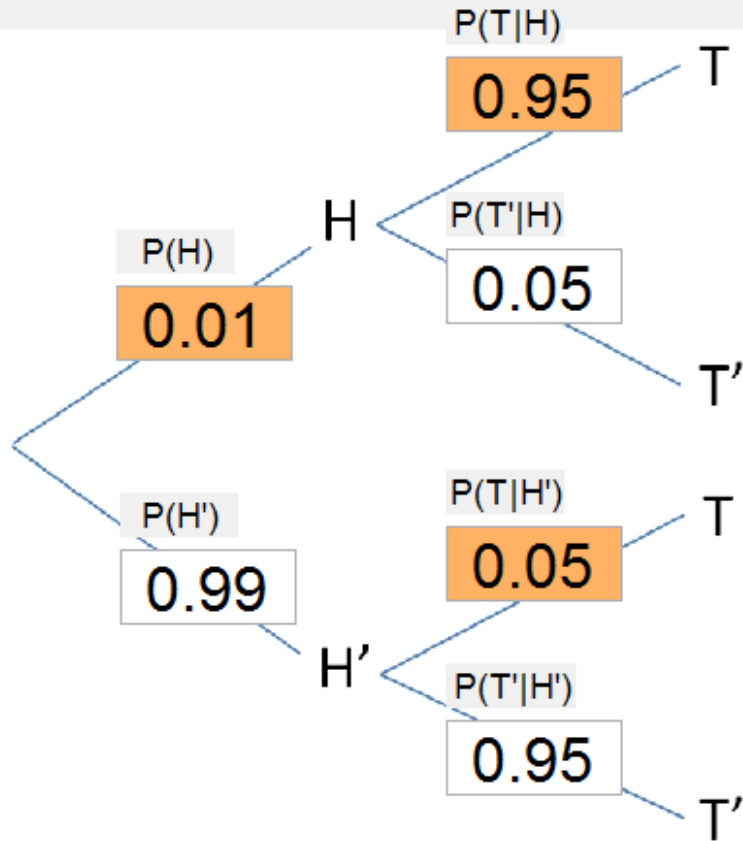


# What are the odds of a *hypothesis*, given a test of it?

## BAYES-O-METER

A. French. February 2014.



$P(H|T)$   
Probability of hypothesis true  
given pass of test

0.161

$P(H'|T)$  (False positive)  
Probability of hypothesis false  
given pass of test

0.839



Thomas Bayes  
1701-1761

$P(H|T')$  (False negative)  
Probability of hypothesis true  
given fail of test

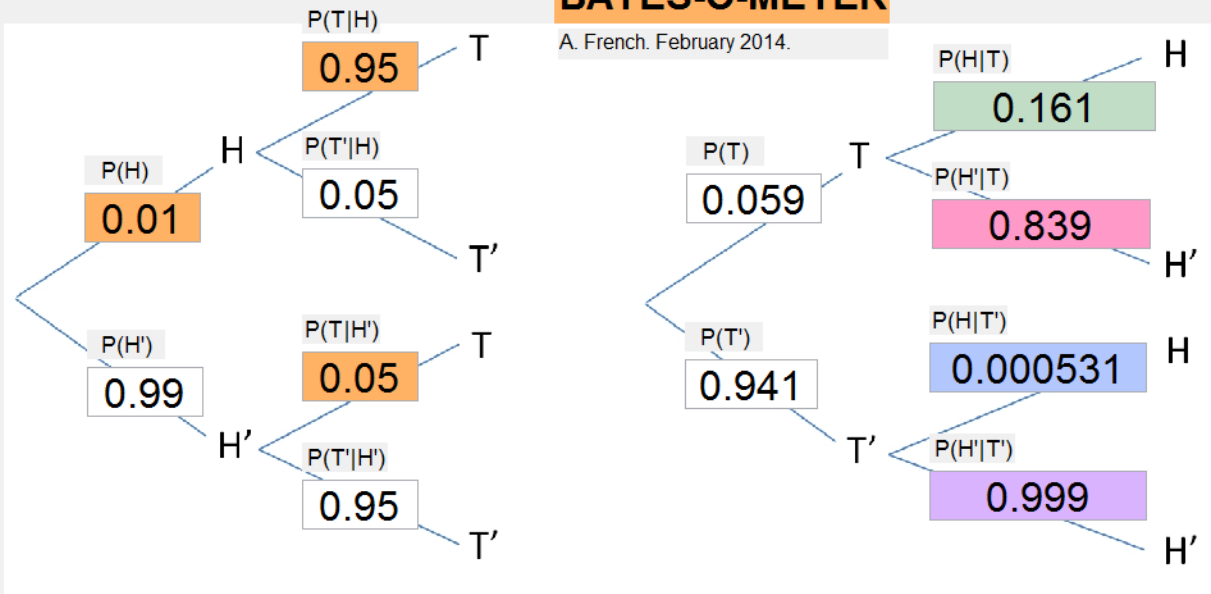
0.000531

$P(H'|T')$   
Probability of hypothesis false  
given fail of test

0.999

# BAYES-O-METER

A. French. February 2014.



$$P(H \& T) = P(H) \times P(T|H)$$

$$P(T \& H) = P(T) \times P(H|T)$$

$P(H|T)$   
Probability of hypothesis true  
given pass of test

0.161

$P(H'|T)$  (False positive)  
Probability of hypothesis false  
given pass of test

0.839

$P(H|T')$  (False negative)  
Probability of hypothesis true  
given fail of test

0.000531

$P(H'|T')$   
Probability of hypothesis false  
given fail of test

0.999



Thomas Bayes  
1701-1761

$$P(H|T) = \left( 1 + \frac{P(H') \times P(T|H')}{P(H) \times P(T|H)} \right)^{-1}$$

$$P(H'|T') = \left( 1 + \frac{P(H) \times P(T'|H)}{P(H') \times P(T'|H')} \right)^{-1}$$

$$P(H'|T) = 1 - P(H|T)$$

$$P(H|T') = 1 - P(H'|T')$$

Probability of urn given data. Urn was actually B  
 $p=0.6, q=0.55$

