QUIZ 2, BELIEFS AND BAYES RULE

Part 1. This Sunday (February 14) you are considering asking L for a date but you are a little worried that L is dating somebody else. The probability that L is dating somebody else is 1/4 . If L is dating somebody else, he/she is unlikely to accept your offer to go on a date: in fact, you think the probability of accepting is only 1/6. If L is not dating somebody else, you think the probability is of accepting is 2/3. What is the probability that L is dating somebody else but will accept your offer to go on a date anyway?

$P(D \cap A) = P(A|D)P(D) = (1/4)(1/6) = \frac{1}{24}$

Part 2. What is the probability that L is not dating somebody else and will accept your offer to go on a date?

$P(N \cap A) = P(A|N)P(N) = 2/3(3/4) = 6/12 = 1/2$

Part 3. What is the probability that L will accept your offer to go on a date?

$P(A) = P(A|N)P(N) + P(A|D)P(D) = 1/2 + 1/24 = \frac{13}{24}$

Part 4. Suppose L accepts your offer to go on a date. What's the probability that L is dating somebody else, given that L agreed to go on a date?

$P(D|A) = \frac{P(A|D)P(D)}{P(A)} = \frac{1/4(1/6)}{\frac{13}{24}} = \frac{1}{13}$

Part 5. Suppose now that L has rejected several proposals for going on a date. L considers each proposals as independent events. A friend tells you that now you have more chances of getting a yes, why is this not true, and from what bias your friend suffers?

Here this is an example of the Gambler's Fallacy, ignoring independence of events

Part 6. Your Mom tells you that you have less chances with L given her previous behavior, Why this is not true, and what is the name of this bias?

Here this is an example of the HotHand Fallacy, ignoring independence of events