

Daughter or Son

Question:

1. Sheldon says "Suppose I have two children. Younger one is a girl". What is the probability that both children are girls?
2. "Forget all that, and suppose I have two children, and at least one of them is a boy". Find probability of two boys.
3. "Suppose I have two kids, let's call them Bouba and Kiki", says Dr. Cooper, "and suppose Bouba is a girl!" What is the probability that I have two daughters?"

Solution:

1. Outcome of two children: $\{BB, BG, GB, GG\}$. Suppose the first is younger one. Then given younger one is a girl, the outcome: $\{GB, GG\}$. $P(\text{older is girl}) = 1/2$.
2. Outcome of two children: $\{BB, BG, GB, GG\}$. Given at least one of them is a boy, the outcome: $\{BB, BG, GB\}$. $P(\text{two boys}) = 1/3$.
3. Outcome of two children: $\{BB, BG, GB, GG\}$. Suppose the first is the name of Bouba. Then given Bouba is a girl, the outcome: $\{GB, GG\}$. $P(\text{Kiki is girl}) = 1/2$.