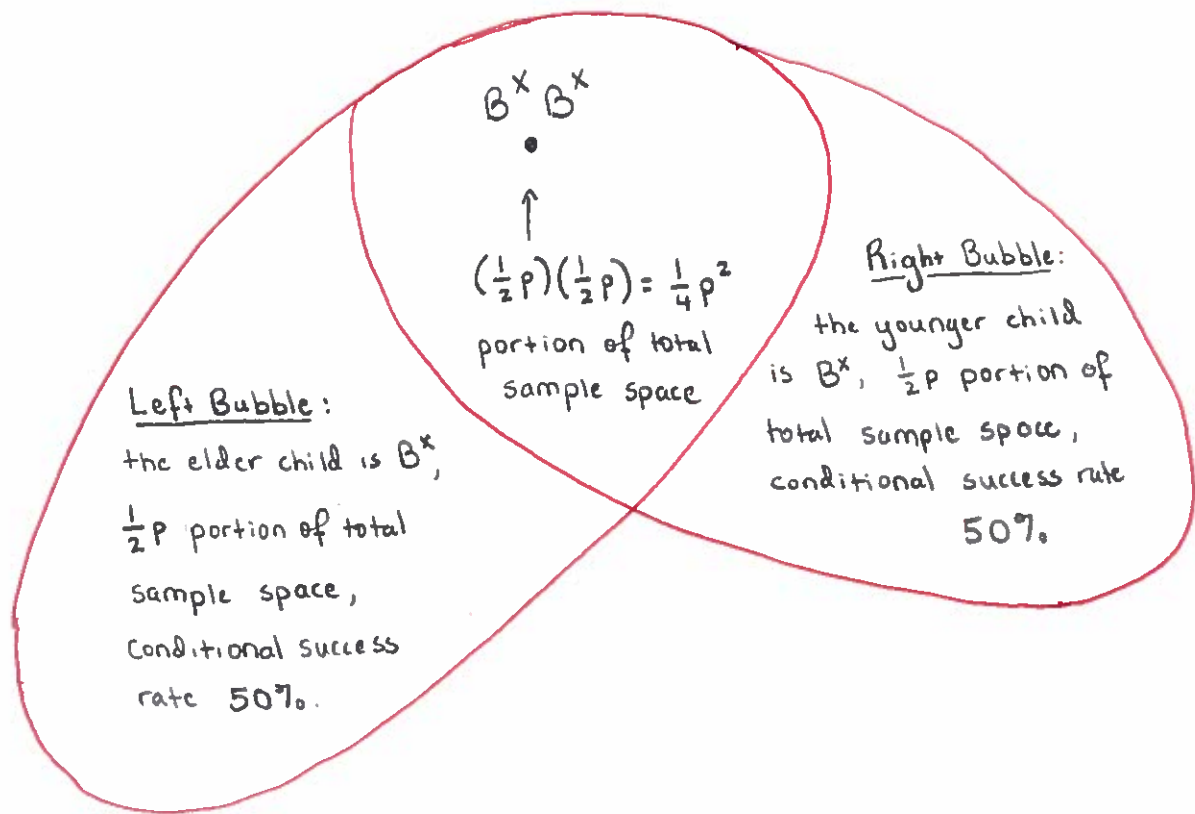


Generalization: A man has exactly two children, at least one of which is a boy satisfying a condition, X , which occurs in every child independently with probability p . What is the chance he has two boys?



	<u>Left</u>	<u>Right</u>	<u>Overlap</u>				
Success	$\frac{1}{4}p$	+	$\frac{1}{4}p$	-	$\frac{1}{4}p^2$	=	$\frac{1}{4}p(2-p)$

Total	$\frac{1}{2}p$	+	$\frac{1}{2}p$	-	$\frac{1}{4}p^2$	=	$\frac{1}{4}p(4-p)$
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Overall success rate: $\frac{\frac{1}{4}p(2-p)}{\frac{1}{4}p(4-p)} = \frac{2-p}{4-p}$

Example: Replace "born on a Tuesday" with "born on Christmas" (assuming equal distribution of birthdate), and instead of $\frac{13}{27} \approx 48.15\%$

the answer is $\frac{2 - \frac{1}{365}}{4 - \frac{1}{365}} = \frac{730-1}{1460-1} = \frac{729}{1459} \approx 49.97\%$.