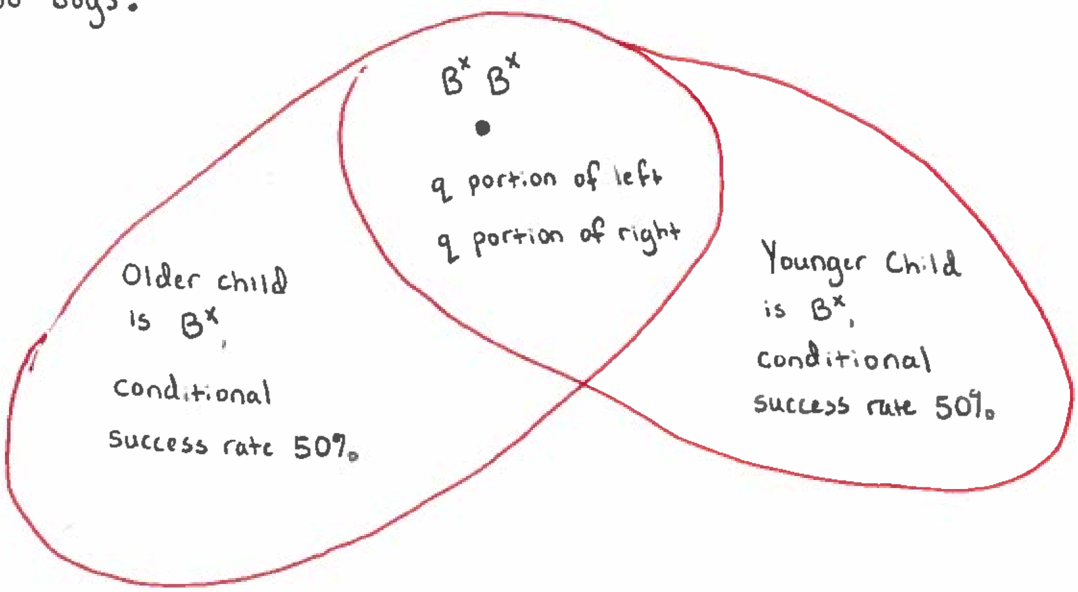
Further Generalization: It's all about the overlap!

Suppose X is a condition with the following property:

> If a child is one of two children, and the child's sibling is a boy satisfying X, then the child is also a boy satisfying X with probability q.

Note that the previously analyzed independent case does satisfy this property with $q = \frac{1}{2}p$.

Now suppose a man has exactly two children, at least one of which is a boy satisfying X. What is the chance he has two boys?



Let 1 = sample size of EACH bubble (equal by symmetry)

	Left		Right		Overlap		
Success	1/2	+	1/2	−	q	=	1 − q
Total	1	+	1	−	q	=	2 − q

Overall Success Rate: $\frac{1-q}{2-q}$

Part 1: $q = 1/2$

Part 2: $q = 1/14$

example: X = "named Jack"

$q = 0$

answer: 50%