

No signaling upper bound: solve by linear programming

find vector x

$$\max C^T x \quad \text{satisfying } Ax \leq b$$

$$X: P(a, b, c | x, y, z) \quad x: 8 \times 8 = 64 \text{ dim}$$

(i) Positivity.

$$(-1) P(a, b, c | x, y, z) \leq 0 \quad 64 \text{ constraints.}$$

(ii) Normalized.

$$\sum_{abc} P(a, b, c | x, y, z) = 1.$$

(iii) Non-signaling.

$$\begin{aligned} \text{example } P(a, b | x, y) &= P(a, b | x, y, z=0) \\ &= P(a, b | x, y, z=1) \end{aligned}$$

$$\rightarrow \sum_c P(a, b, c | x, y, z=0) = \sum_c P(a, b, c | x, y, z=1)$$

Then set

50% prob: AB

50% prob: AC

→
solve
LP by
computer

$$\frac{1}{2} (B_{AB} + B_{AC}) \leq 2$$

$$\Rightarrow B_{AB} + B_{AC} \leq 4$$