$$P(A \mid B, C) > P(A \mid B)$$

$$\|$$

$$\frac{P(B, C \mid A) \cdot P(A)}{P(B, C)}$$

$$\|$$

$$\frac{[P(B \mid A) - P(B, C^c \mid A)] \cdot P(A)}{P(B) - P(B, C^c)} > P(A \mid B)$$

$$[P(B \mid A) - P(B, C^c \mid A)] \cdot P(A) > P(A \mid B)[P(B) - P(B, C^c)]$$

$$\cancel{P(A, B)} - P(B, C^c \mid A) \cdot P(A) > \cancel{P(A, B)} - P(A \mid B) \cdot P(B, C^c)$$

$$\frac{P(B, C^c \mid A) \cdot P(A)}{P(B, C^c)} < P(A \mid B)$$

$$\Downarrow \text{ Baye's}$$

$$P(A \mid B, C^c) < P(A \mid B)$$

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