Expected utility theory

Notes on Behavioural Economics

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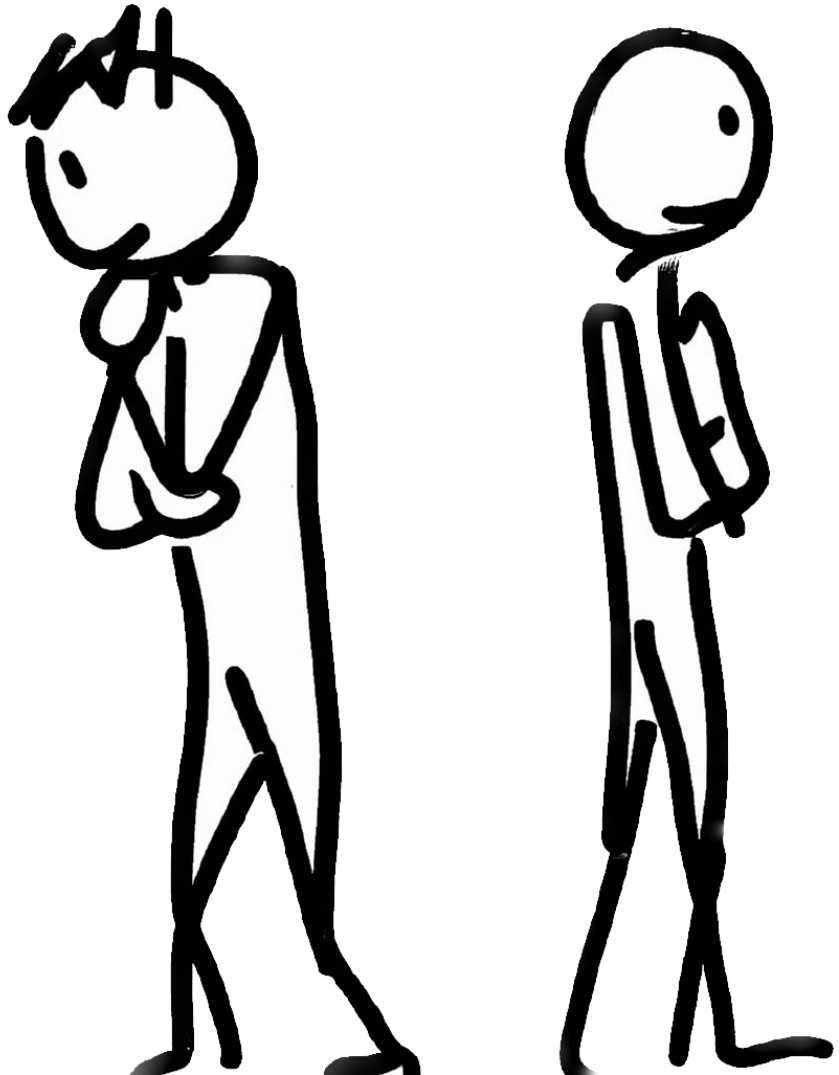

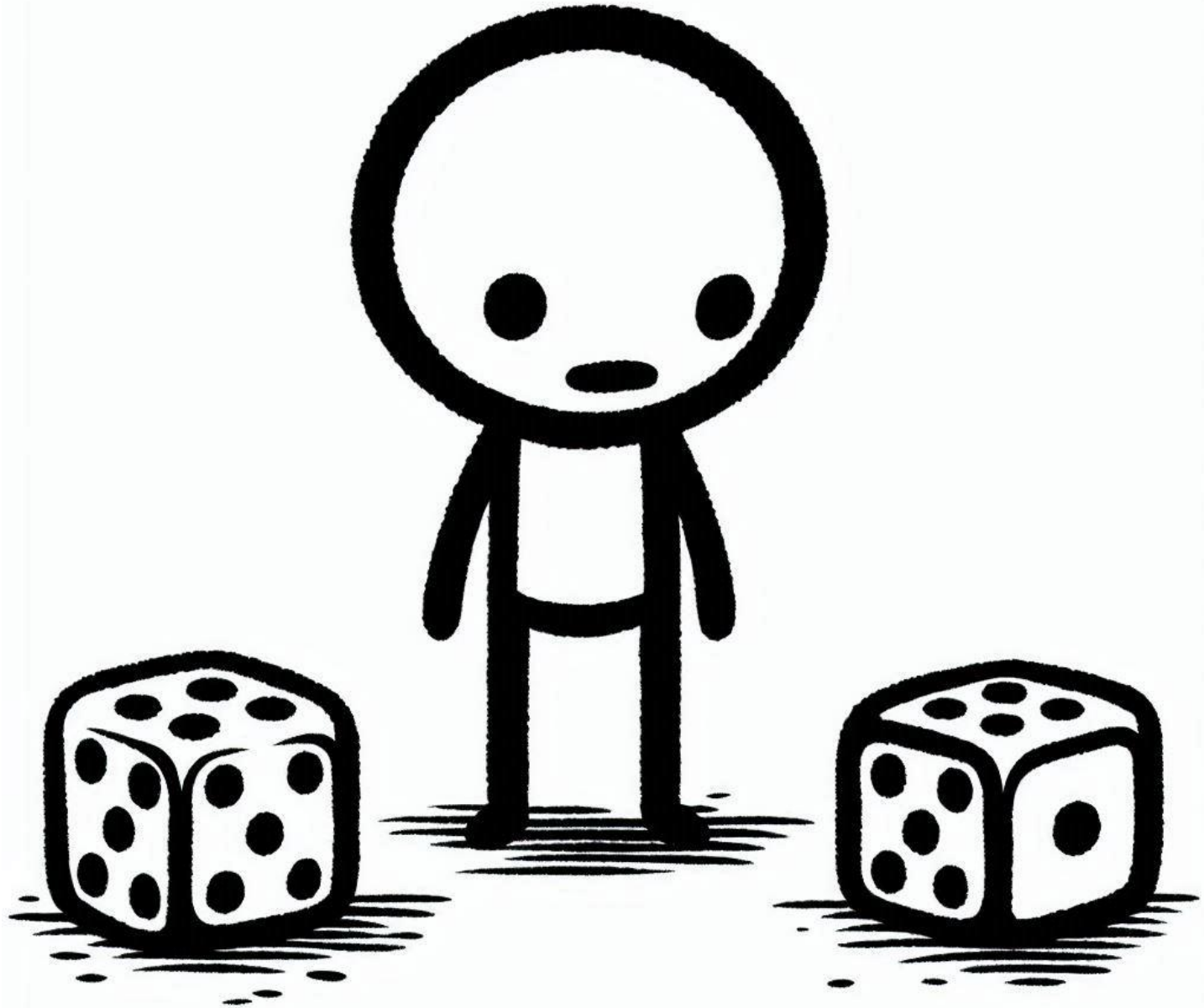

Expected utility theory

$$X = (p_1, x_1;\ p_2, x_2;\ \ldots\ ;\ p_n x_n)$$

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$$E[U(X)] = p_1 U(x_1)\ + p_2 U(x_2) + \ \ldots\ + p_n U(x_n)$$

$$= \sum_{i=1}^{n} p_i U(x_i)$$

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1. Define utility $U(x_i)$ over final outcomes x_1 through to x_n

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2. Weight the utility of each outcome $U(x_i)$ by the probability p_i of outcome x_i

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$$= \sum_{i=1}^{n} p_i U(x_i)$$

3. Add the weighted utilities.

Expected utility theory

$$X = (0.5, \$10;\ 0.5, -\$10)$$

$$E[U(X)] = 0.5 \times U(\$10) + 0.5 \times U(-\$10)$$

Expected utility theory

$$X = (p_1, x_1;\ p_2, x_2;\ \ldots\ ;\ p_n x_n)$$

$$E[U(W + X)] = p_1 U(W + x_1)\ + p_2 U(W + x_2) + \ \ldots\ + p_n U(W + x_n)$$

$$= \sum_{i=1}^{n} p_i U(W + x_i)$$

Expected utility theory

$$X = (0.5, \$10;\ 0.5, -\$10)$$

$$E[U(X)] = 0.5 \times U(\$90) + 0.5 \times U(\$110)$$