

# Clear Thinking in an Uncertain World: Human Reasoning and its Foundations

## Lecture 13

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# Causal Decision Theory

A. Egan. *Some Counterexamples to Causal Decision Theory*. *Philosophical Review*, 116(1), pgs. 93 - 114, 2007.

Susan is debating whether or not to smoke. She knows that smoking is strongly correlated with lung cancer, but only because there is a common cause—a condition that tends to cause both smoking and cancer. Once we fix the presence or absence of this condition, there is no additional correlation between smoking and cancer. Susan prefers smoking without cancer to not smoking without cancer, and prefers smoking with cancer to not smoking with cancer. Should Susan smoke? It seems clear that she should.

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In The Smoking Lesion there is a strong correlation between smoking and getting cancer, despite the fact that smoking has no tendency to cause cancer, due to the fact that smoking and cancer have a common cause. Still, since Susans  $p(\text{CANCER} \mid \text{SMOKE})$  is much higher than her  $p(\text{CANCER} \mid \text{NOT SMOKE})$ , EDT assigns not smoking a higher value than smoking. And this seems wrong.

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The Murder Lesion: Mary is debating whether to shoot Alfred. If she shoots and hits, things will be very good for her.

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The Murder Lesion: Mary is debating whether to shoot Alfred. If she shoots and hits, things will be very good for her. If she shoots and misses, things will be very bad. (Alfred always finds out about unsuccessful assassination attempts, and he is sensitive about such things.) If she doesn't shoot, things will go on in the usual, okay-but-not-great kind of way. She thinks that it is very likely that, if she were to shoot, then she would hit. So far, so good. But Mary also knows that there is a certain sort of brain lesion that tends to cause both murder attempts and bad aim at the critical moment. Happily for most of us (but not so happily for Mary) most shooters have this lesion, and so most shooters miss. Should Mary shoot? (Set aside your theoretical commitments and put yourself in Mary's situation. Would you shoot? Would you take yourself to be irrational for not doing so?)

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The Psychopath Button: Paul is debating whether to press the 'kill all psychopaths' button. It would, he thinks, be much better to live in a world with no psychopaths. Unfortunately, Paul is quite confident that only a psychopath would press such a button. Paul very strongly prefers living in a world with psychopaths to dying. Should Paul press the button? (Set aside your theoretical commitments and put yourself in Paul's situation. Would you press the button? Would you take yourself to be irrational for not doing so?)

$$p(\text{press button } \square \rightarrow \text{dead}) = 0.001$$

$$p(\text{press button } \square \rightarrow \text{live in a world without psychopaths}) = 0.999$$

*This is because Paul either is or is not a psychopath, and the probability of the two possibilities does not depend on what he decides to do.*

Press Button:

$$\begin{aligned} & p(\text{press button } \square \rightarrow \text{dead}) \cdot u(\text{dead}) + p(\text{press button } \square \rightarrow \\ & \text{live in a world without psychopaths}) \cdot \\ & u(\text{live in a world without psychopaths}) = \\ & (0.001 \cdot -100) + (0.99 \cdot 1) = 0.89 \end{aligned}$$

Do Not Press Button:

$$\begin{aligned} & p(\text{do not press button } \square \rightarrow \text{live in a world with psychopaths}) \cdot \\ & u(\text{live in a world with psychopaths}) = 1 \cdot 0 = 0 \end{aligned}$$