## Logic, Reasoning, and Persuasion 07; Wed Dec 10

### 1 | Decision Theory

**The Problem of the Points**: I'll roll a die.

1. If it comes up 1, 2, or 3, Player A gets 3 points.
2. If it comes up 4 or 5, Player B gets 5 points.
3. If it comes up 6, Player C gets 8 points.

First to 30 points wins.

**Newcomb's Boxes**: You walk into a room, and there is a clear box and an opaque box. You see that the clear box has $100. You can't see into the opaque box. You can either (1) take *only* the opaque box, or (2) take *both* the opaque box and the clear box. A predicting machine has predicted what you will do.

1. If the predictor predicted you would **not** take the clear box (option 1), then $10,000 was placed in the opaque box.
2. Otherwise, nothing was placed in the opaque box.

We don't know how, but the predictor is 99% accurate at predicting.

*Decision Theory* uses the tools of probability theory and the notion of "expected value" to study optimal decision making under uncertainty about what will happen. It's foundational work in economics and social science. *For more:*

1. **Philosophy 109**: Introduction to Formal Reasoning and Decision Making

### 2 | Formal Logic

The following argument is truth-preserving:

(P1) If Patrick is at the party, then Quentin will be at the party.
(P2) If Rachel is at the party, then Quentin will be at the party.
(P3) Either Patrick or Rachel will be at the party.
(C) **Quentin will be at the party.**

How can we show rigorously that it is truth-preserving?

**A "Natural Deduction" Proof:** Prove $\{(P \to Q), (R \to Q), (P \vee R)\} \vdash Q$.

| | | |
|---|---|---|
| 1 | $P \to Q$ | PR |
| 2 | $R \to Q$ | PR |
| 3 | $P \vee R$ | PR |
| 4 | $\quad P$ | AS |
| 5 | $\quad Q$ | $\to$E, 1, 4 |
| 6 | $\quad R$ | AS |
| 7 | $\quad Q$ | $\to$E, 2, 6 |
| 8 | $Q$ | $\vee$E, 3, 4–5, 6–7 |

*Formal Logic* creates systems for showing and testing for truth-preserving, and for translating sentences like these (and much more complicated ones) into standard "forms" (hence *formal*). *For more:*

1. **Philosophy 109**: Introduction to Formal Reasoning and Decision Making
2. **Philosophy 201**: Introduction to Logic

## 3 | Evidence and Knowledge

*You are driving through farm country and see a barn. Unbeknownst to you, this is **fake barn country**: a bunch of large fake barns have been put up so that from the road, they look real. However, you happened to see the* one *real barn. Do you **know** that you saw a barn*? Questions about what knowledge is, what justifies your beliefs, how to revise our opinions in light of new evidence, are the domain of **epistemology**. *For more:*

1. **Philosophy 220**: Theory of Knowledge
2. **Philosophy 413**: Social Epistemology

If epistemology asks how we can get justified beliefs from the outside world, philosophy of mind asks what *thinking* and *reasoning* are, and what it means to say that you are capable of *conscious thought* and a rock is not. *For more:*

1. **Philosophy 329:** Minds, Machines, and Persons
2. **Philosophy 418**: Philosophy of Mind

## 4 | Ethics

Should you use ChatGPT to write your papers? Do you have an obligation to obey the law in an unjust system? What counts as a *just* social structure? **Ethics** in philosophy tries to systematically study these ethical or moral issues, from both an individual and a social perspective.

1. **Philosophy 105**: Current Moral and Social Issues
2. **Philosophy 206**: Introduction to Ethics
3. **Philosophy 242**: Ethics of Artificial Intelligence and Other Technology

## 5 | Last Thoughts

1. Always feel free to email me if you want to chat or have questions about what classes to take, further reading on topics, philosophy in general, or other things!
2. I'm teaching *Buddhist Philosophy* in the winter, and there *might* still be space in the religion section. It will be a very different class (fast, content-heavy, and completely asynchronous and online).
3. If you performed well in my class, I would be happy to write you a letter of recommendation if you need one from an instructor. *However:* in general such letters will hold more weight from professors (people who actually have the title "professor" in their name; you can figure this out by googling them.)