

# Introduction

Kevin Dorst  
kmdorst@mit.edu

24.223: Rationality

---

## I. Propositional attitude psychology

*Propositions (claims, events)* are ways the world could be.

Many psychological and rational explanations work via *propositional attitudes*—attitudes toward propositions.

Can distinguish *doxastic* (belief-like) from *bouletic* (desire-like) propositional attitudes.

We can evaluate many of these states from the standpoint of either *epistemic rationality* (is it well-supported by the evidence?) or *practical rationality* (does it serve your goals?)

Practical rationality tends to focus on the rationality of *actions* and *decisions*.

Epistemic rationality tends to focus on the rationality of *beliefs* or *degrees of belief*. In this class we'll mostly focus on *degrees of belief*, and learn how to model them using tools from probability theory.

Why?

## II. Why go quantitative?

We talk about what people *believe* (more colloquially: *think*) all the time. We sometimes talk about *how likely* we think various possibilities are (*pretty likely; sorta likely; more likely than not;...*). Rarely do we give quantitative probability estimates (*it's 92% likely that...*).

"Traditional" epistemology focused on outright belief.

Consider a **Simple Binarist**: for every proposition  $p$ , they either:

- Believe  $p$ ;
- Suspend judgment on  $p$ ; or
- Disbelieve  $p$

Supposing their beliefs are *logically closed*, we can get their **belief set** by *intersecting* all the claims they believe.

What's missing?

**Argument 1: Explaining belief dynamics.** Your attitudes should explain your dispositions.

"She left because she wanted to eat lunch"

"He knocked on the door because he thought she was in her office"

Anscombe's shopper & direction-of-fit

\$\$ for elephants

"Outright beliefs" or "full beliefs"

Why shouldn't we?

Believe neither  $p$  nor  $\neg p$

Believe  $\neg p$

I believe  $B = \text{my bike's brakes work}$ .

I also believe  $F = \text{fusion will become a viable energy source}$ .

But my attitudes toward the two are very different.

→ If I got a bit of evidence that my brakes don't work (eg your brakes froze up yesterday), I'd still believe  $B$ .

→ But a bit of evidence that fusion is not viable (eg the tokamak design can't be scaled up) would push me to suspend judgment about  $F$ .

To account for this, it's natural to introduce *comparative confidence*: I'm more confident of  $B$  than of  $F$ .

### Argument 2: Explaining actions.

We want your beliefs (together with your desires) to be sufficient to *explain what you (should) do*.

I'm willing to (it's rational to) bet my life on  $B$ . (I do it every day.)

I'm *not* willing to (it'd be irrational to) bet my life on  $F$ .

So I must have different attitudes toward them—and the *degree* to which I'm more confident must suffice for betting my life.

→ We need to be able to quantify *how much you'd be willing to bet* on your beliefs. . Mere comparisons aren't enough

### Argument 3: What are the norms on binary belief?

If Simple Binarist picture is right, beliefs should be both *consistent* and *logically closed*:

**Consistency:** Your beliefs should be mutually consistent.

If you believe  $p_1$  and you believe  $p_2$  and... and you believe  $p_n$ , then it must be possible for  $p_1 \& p_2 \& \dots \& p_n$  to be true.

**Closure:** You should believe anything that follows from your beliefs.

If you believe  $p_1$  and you believe  $p_2$ , then you should believe  $p_1 \& p_2$ .

Problem: the lottery paradox.

What should we say about the lottery? Assign probabilities!

Solution to the paradox? Either (1) *belief is strong* or (2) *belief is weak* (Lockeanism).

If (1), you don't (fully!) believe your ticket will lose.

If (2), weak beliefs needn't be closed or consistent.

Although I believe  $F$ , I don't believe it very strongly.

But *comparison* doesn't imply *quantitative measurement*. Baldness. Fitness.

I'm also more confident that  $C = \text{this coin won't land heads 10 times in a row than I am in } F$ . But I *wouldn't* bet my life on  $C$ .

Follow-up: the preface paradox