

No Fact of the Middle

Justin Khoo

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Some potential examples:



The quantum coin: flipping it initiates an indeterministic process that culminates in either heads or tails.

No one flips the coin ever.

(1) If it had been flipped, it would have landed heads.

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Some potential examples:

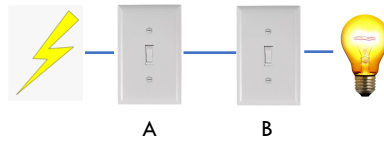


Jones has libertarian free will in situation S to choose between vanilla and chocolate. But he never ends up in situation S.

(2) If Jones had been in S, he would have chosen vanilla.

A **middle fact** is a true proposition expressed by a counterfactual with a false antecedent that isn't entailed by any (conjunction of) non-counterfactual facts.

Some potential examples:



In order for the light to be on, both switches A and B need to be flipped. In fact, both switches were flipped at the same time, so the light is on.

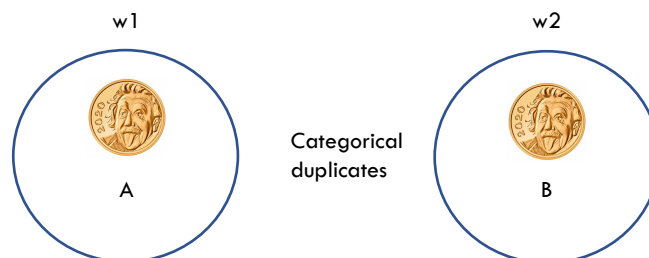
(3) If the light had been off, switch A would have been down.

Problems with middle facts

1. Violations of modal supervenience

Modal supervenience

Modal facts supervene on non-modal facts.



If A had been flipped, it would have landed **heads**.

If B had been flipped, it would have landed **tails**.

Problems with middle facts

1. Violations of modal supervenience

2. Ontologically profligate

Alan Hájek: “It introduces a new kind of entity. And it populates the world with many instances of it: one for each antecedent ... Similarly, counterfactism must countenance infinitely many primitive counterfactuals, and arguably too many to form a set.”

- Hájek (2020), *Contra Counterfactism*

Problems with middle facts

1. Violations of modal supervenience

2. Ontologically profligate

3. Multiplies the inexplicable

- Why did the particle end up in location x rather than y (given its starting position and momentum)? **It just did end up at x.**
- Why would the particle have ended up in location x rather than y (had it been released from such a position with such and thus momentum). **It just would have ended up at x.**
 - There are going to be uncountably many such facts.

Benefits of middle facts

1. Explains why it is rational to regard some conditionals as possible (and even likely true) when we know that the fact they state (if any) must be a middle fact.

(4) It's .5 likely that if the coin had been flipped, it would have landed heads.



(5) Since he prefers vanilla, it's more likely than not that if Jones had been in S , he would have chosen vanilla.



(6) It's possible that if the light had been off, switch A would have been down.



Benefits of middle facts

1. Explains why it is rational to regard some conditionals as possible (and even likely true) when we know that the fact they state (if any) must be a middle fact.
2. Allows us to avoid Hájek's arguments for counterfactual nihilism (the thesis that most counterfactuals are false).

One version of the argument:

- A. For most A, B: if A, *might* B is true.
- B. Duality: if A, *might* B is true iff if A *would not* B is false.
- C. So, for most A, B: if A *would not* B is false.

You are on a skydiving trip and just before you are going to jump, you learn that your parachute is malfunctioning and won't deploy. So you decide not to jump because **if you had jumped you would have died**. But it's also true that **if you had jumped, you might not have died (since you might have quantum tunneled safely to the ground)**. So **it's false that if you had jumped you would have died**.

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One version of the argument:

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The middle-facter denies **Duality** and instead accepts **Conditional Excluded**

Middle: Either *if A, would B* is true or *if A would not B* is true.

- Hawthorne (2005), *Chance and Counterfactuals*

Benefits of middle facts

1. Explains why it is rational to regard some conditionals are possible (and even likely true) when we know that the fact they state (if any) must be a middle fact.
2. Allows us to avoid Hájek's arguments for counterfactual nihilism (the thesis that most counterfactuals are false).
3. **God's middle knowledge provides a way to capture two features of divine interpretation: (i) the free will defense against the problem of evil, and (ii) the view that God takes no risk in creation.**

- God knows what choices free creatures would make in every possible situation. ← Middle knowledge (no risks)
- Such creatures are regrettably transworld deprived.
- God creates creatures with libertarian free will because that is a strong good that outweighs the known evil they will cause. ← Free will defense
- Evil in the world is the result of free choices made by creatures with libertarian free will. - Plantinga (1974), *God, Freedom, and Evil*

MY QUESTION: Are there middle facts?

- **Yes:** Alvin Plantinga, William Craig, John Hawthorne, Keith DeRose, H. Orri Stefánsson
- **No:** Robert Adams, Peter van Inwagen, Robert Stalnaker, David Lewis, Alan Hájek

MY ANSWER: There are no middle facts!

- My argument is independent of each of the challenges to middle facts raised above.

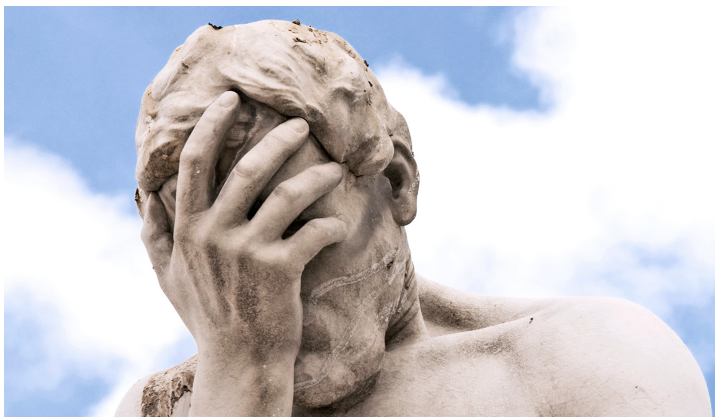
Plan for today:

Part 1: Two arguments against middle facts.

Part 2: A defense against one of the challenges of giving up middle facts.

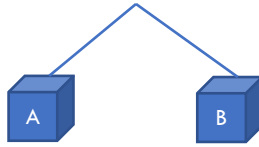
Argument 1

Regret

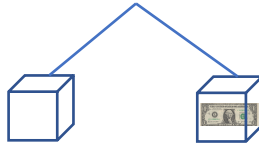


Regret is a negatively valenced attitude towards a choice that we have certain counterfactual beliefs about.

Regret

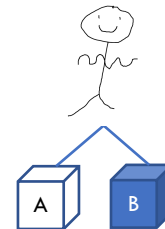


The prize is either in Box A or Box B. I choose Box A and learn it's not there. I regret my choice since I now know the prize is in Box B, so I should have chosen Box B.



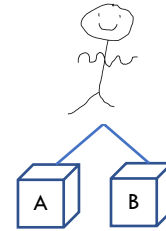
Regret

Some regrets are **rational** and others **aren't**. Take a different case. Told that there may be a prize in one of two boxes, A and B, Jones chooses box A and learns it's empty. Suppose Jones regrets his choice.



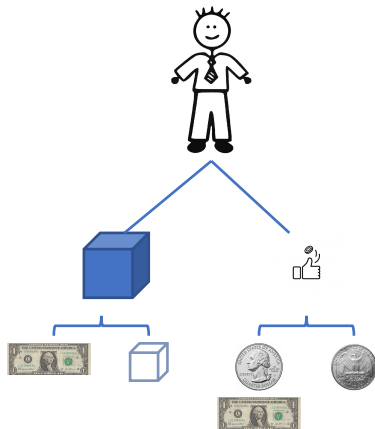
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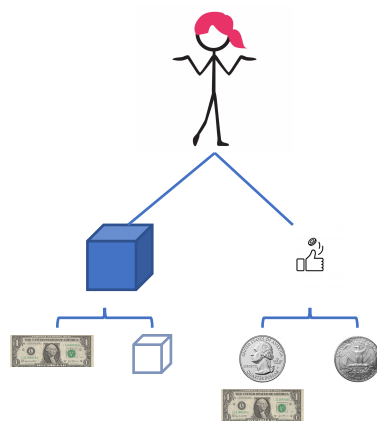


However, in this case both boxes are empty. Given this, Jones's regret here is misplaced—it is irrational because he couldn't have done any better choosing box B.

Boxy



Flippy



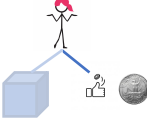
Boxy
Takes the box.

Boxy regrets choosing the box. And his regret is rational because **if he had flipped, he might have been better off, and wouldn't have been worse off!**

Flippy
Chooses to flip

Here, we don't know whether Flippy regretting flipping is rational; it depends on what's in the box.

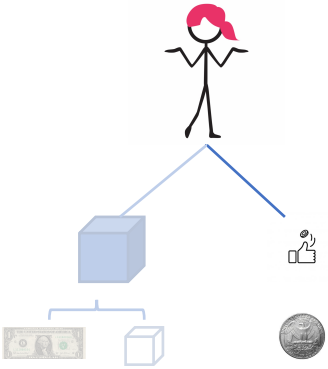
Flippy



Reasoning:

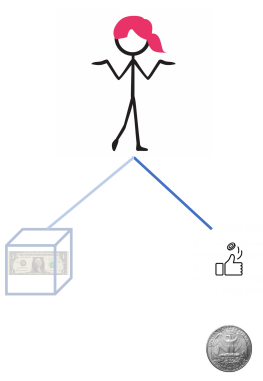
1. Suppose the box is empty. Then Flippy would have got the same amount of money had she taken the box. So she shouldn't regret in that case.
2. Suppose the box contains \$1. Then Flippy would have got more money had she taken the box. So, she should regret in that case.
3. We don't know whether the box is empty or contains \$1.
4. So we don't yet know whether it is rational for Flippy to regret.

Flippy



There is a non-conditional fact about what the box contains: either \$1 or \$0.

Flippy

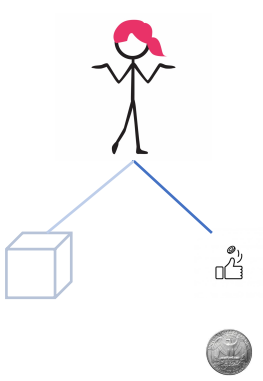


There is a non-conditional fact about what the box contains: either \$1 or \$0.
Suppose it contains \$1. This entails that:

(7) If Flippy had taken the box, she would have got more money.

Lesson: when there's a fact about whether if you had not φ -ed you would have been better off and we don't know which it would have been, we don't know whether it's rational for you to regret φ -ing.

Flippy



There is a non-conditional fact about what the box contains: either \$1 or \$0.
Suppose it contains \$0. This entails that:

(8) If Flippy had taken the box, she would not have got more money.

Boxy

In Boxy's case, there is no non-conditional fact that entails either of:

- (9) If Boxy had flipped, he would have got more money.
- (10) If Boxy had flipped, he wouldn't have got more money.

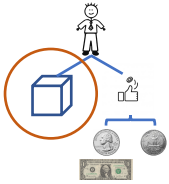
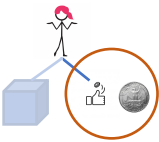
Thus, if one of these is true, it is a middle fact!

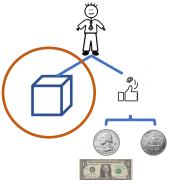
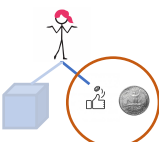
Boxy

In Boxy's case, there is no non-conditional fact that entails either of:

- (9) If Boxy had flipped, he would have got more money.
- (10) If Boxy had flipped, he wouldn't have got more money.

Suppose that is right: exactly one of these is true. (This is the middle-facter position)

<h3 style="text-align: center;">Boxy</h3>  <p>If there is a (middle) fact of the matter about whether Boxy would have got more money or not had he flipped, we expect our reasoning in Flippy's case to carry over to Boxy's case.</p>	<h3 style="text-align: center;">Flippy</h3>  <p>Reasoning:</p> <ol style="list-style-type: none"> 1. Suppose the box is empty. Then Flippy would have got the same amount of money had she taken the box. So she shouldn't regret in that case. 2. Suppose the box contains \$1. Then Flippy would have got more money had she taken the box. So, she should regret in that case. 3. We don't know whether the box is empty or contains \$1. 4. So we don't yet know whether it is rational for Flippy to regret.
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<h3 style="text-align: center;">Boxy</h3>  <ol style="list-style-type: none"> 1. Suppose Boxy would have got tails had he flipped. Then Boxy would have got the same amount of money had he flipped. So, he shouldn't regret taking the box in that case. 2. Suppose Boxy would have got heads had he flipped. Then Boxy would have got more money had he flipped. So he should regret taking the box. 3. We don't know whether Boxy would have got heads or tails had he flipped. 4. So, we don't know whether it is rational for Boxy to regret. <p>BUT THIS IS FALSE! We know it is rational for Boxy to regret taking the box.</p>	<h3 style="text-align: center;">Flippy</h3>  <p>Reasoning:</p> <ol style="list-style-type: none"> 1. Suppose the box is empty. Then Flippy would have got the same amount of money had she taken the box. So she shouldn't regret in that case. 2. Suppose the box contains \$1. Then Flippy would have got more money had she taken the box. So, she should regret in that case. 3. We don't know whether the box is empty or contains \$1. 4. So we don't yet know whether it is rational for Flippy to regret. <p><i>What explains the difference? My strategy:</i> there is no fact of the matter about whether Boxy would have got tails or would have got heads had he flipped.</p>
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An argument against middle facts:

1. If there is a fact about whether you would have been better off had you not φ -ed, it is rational for you to regret φ -ing only if you would have been better off had you not φ -ed.
2. We don't know whether Boxy would have been better off flipping.
3. We do know that it is rational for Boxy to regret taking the box.
4. A relevant instance of Closure. $[K(R \rightarrow B) \mid = K(R) \rightarrow K(B)]$
5. So, there is no fact about whether Boxy would have been better off had he flipped.

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Support for (1)

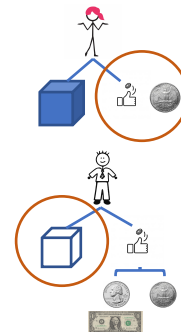
Predicts:

- Don't know whether it's rational for Flippy to regret.
- Compatible with: we do know that it's rational for Boxy to regret

Compare:

1*. It is rational to regret φ -ing only if you would have been better off had you not φ -ed.

This is false given (2), (3), (4).



1. If there is a fact about whether you would have been better off had you not ϕ -ed, it is rational for you to regret ϕ -ing only if you would have been better off had you not ϕ -ed.
2. We don't know whether Boxy would have been better off flipping.
3. We do know that it is rational for Boxy to regret taking the box.
4. A relevant instance of Closure. $[K(R \rightarrow B) \mid = K(R) \rightarrow K(B)]$
5. So, there is no fact about whether Boxy would have been better off had he flipped.

Support for (1)

If false, then it could be true that:

It is rational for you to regret ϕ -ing but you wouldn't have been better off not ϕ -ing.

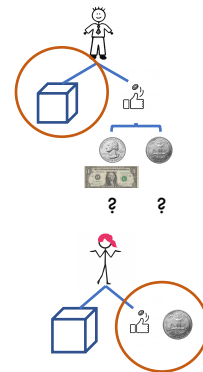
But this seems **incoherent**.

1. If there is a fact about whether you would have been better off had you not ϕ -ed, it is rational for you to regret ϕ -ing only if you would have been better off had you not ϕ -ed.
2. We don't know whether Boxy would have been better off flipping.
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5. So, there is no fact about whether Boxy would have been better off had he flipped.

Support for (2)

Whether Boxy would have been better off flipping depends on whether he would have got heads or tails. But we don't know whether he would have got heads or tails.

- *Counter:* Boxy would have been better off with a chance at \$1 than no chance at \$1.
- *Reply:* No, he *might* have been better off with a chance at \$1 than no chance at \$1 – it depends on whether the chance paid off.
 - Suppose Flippy's box was empty. Then, both Flippy and Boxy got \$0, but Flippy had a chance at \$1. **Was Flippy better off?** Seems not: notice that it doesn't make sense for Boxy to wish that he had been Flippy.

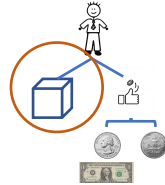


1. If there is a fact about whether you would have been better off had you not φ -ed, it is rational for you to regret φ -ing only if you would have been better off had you not φ -ed.
2. We don't know whether Boxy would have been better off flipping.
3. **We do know that it is rational for Boxy to regret taking the box.**
4. A relevant instance of Closure. $[K(R \rightarrow B) \mid = K(R) \rightarrow K(B)]$
5. So, there is no fact about whether Boxy would have been better off had he flipped.

Support for (3)

It is rational to regret choosing an option that is **weakly dominated** by another option.

- Option A is weakly dominated by option B iff B might yield a result that is better than A and is guaranteed to yield a result that is no worse than option A.



Given that the box is empty, flipping might have been better and wouldn't have been worse.

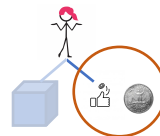
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4. A relevant instance of Closure. $[K(R \rightarrow B) \mid = K(R) \rightarrow K(B)]$
5. So, there is no fact about whether Boxy would have been better off had he flipped.

Support for (4)

I assume that (1) is conceptually true if true. Maybe knowledge isn't in general closed under conceptual entailments. But notice that we seem to appeal to the relevant instance of Closure to explain why we don't know whether it is rational for Flippy to regret.

2*. We don't know whether Flippy would have been better off taking the box.

3*. So, we don't know whether it is rational for Flippy to regret flipping.



1. If there is a fact about whether you would have been better off had you not φ -ed, it is rational for you to regret φ -ing only if you would have been better off had you not φ -ed.
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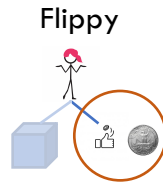
But what sufficient condition for regret could explain the contrast between Boxy and Flippy?



Argument 2

Regret

It is rational to regret φ -ing if you might have been better off, and wouldn't have been worse off, had you not φ -ed.

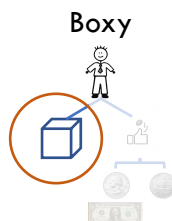


We don't know whether Flippy might have been better off and wouldn't have been worse off, had she taken the box.

- If the box contains \$1, then Flippy would have been better off taking the box. (Hence, regret would be rational)
- If the box contains \$0, then it's not the case that Flippy might have been better off taking the box. (Hence regret wouldn't be rational)

Regret

It is rational to regret φ -ing if you might have been better off, and wouldn't have been worse off, had you not φ -ed.



We know that Boxy might have been better off and wouldn't have been worse off, had he flipped.

- Boxy might have been better off because he might have flipped heads and got more money.
- Boxy wouldn't have been worse off because he might have flipped tails and wouldn't have got less money.

Regret

It is rational to regret φ -ing if you might have been better off, and wouldn't have been worse off, had you not φ -ed.

Is the **Regret** explanation of the contrast between Boxy and Flippy compatible with middle facts? It will depend on what they think *if A might B* means...

Two strategies:

1. Duality Thesis (Lewis): *if A might B* is true iff *if A would not B* is false.
2. Epistemic Thesis (DeRose): *if A might B* is true iff *if A would B* is epistemically possible.

Duality Thesis

If A might B is true iff *if A would not B* is false.

This does not sit well with the middle facter position, which is committed to Conditional Excluded Middle.

Conditional Excluded Middle

One of *if A would B* or *if A would not B* is true.

Suppose *if A might B* is true. Then by the Duality Thesis, *if A would not B* is false. Then by Conditional Excluded Middle, *if A would B* is true. So, it predicts (1) entails (2):

1. Boxy he might have got heads had he flipped the coin.
2. So, Boxy would have got heads had he flipped the coin.

But (1) is true and (2) is false.

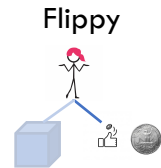
Epistemic Thesis

If A might B is true iff if A would B is epistemically possible.

This is a much more plausible strategy for the middle-facter. The problem is that it predicts the wrong results when combined with **Regret**.

Regret

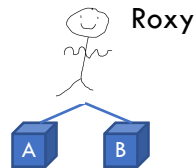
It is rational to regret ϕ -ing if you might have been better off, and wouldn't have been worse off, had you not ϕ -ed.



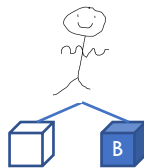
Prediction: We **do know** that Flippy might have been better off had she taken the box (since we know it is epistemically possible that she would have been better off taking the box). And of course we know she wouldn't have been worse off. So, it follows that we do know that it's rational for Flippy to regret!

But this is false: without knowing the contents of the box, we don't know whether it's rational for Flippy to regret.

Merely lacking information about whether you would have been better off not ϕ -ing is not sufficient for regret to be rational.



Roxy is given the choice between two boxes, A and B. He knows that either both boxes contain \$1, only one contains \$1, or neither contains \$1.



Roxy chooses box A and finds out that it contains nothing. In this case, we don't yet know whether regret is rational for Roxy, since we don't know what B contains.

- If B contains \$1, regret would be rational.
- If B contains \$0, regret wouldn't be rational.

Regret

It is rational to regret φ -ing if you might have been better off, and wouldn't have been worse off, had you not φ -ed.

So, *might* here doesn't mean "not known whether..." (i.e., not epistemic).

But then what could *if A might B* mean for the middle factor?

More to be said here, but we'll leave this argument for now...

Interim summary

- We have cast doubt on the existence of middle facts. If there were any, we wouldn't know whether regret is rational in cases where it clearly is; attempts to rescue the middle-facter position by appealing to the Epistemic Thesis fail.



Not even God knows how the quantum coin would have landed had it been flipped!

- But recall one of the central motivations behind middle-facts: they explain why it can be rational to regard some conditionals as possible (and even likely true) when we know that the fact they state (if any) must be a middle fact.
- If there are no middle facts, then how could it be an open possibility that:

If Boxy had flipped, he would have got heads and won \$1.
- I turn to responding to this problem on behalf of the anti-middle-facter now.

Part 2: Ignorance in the absence of fact

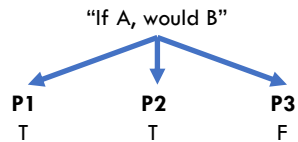
Question

How could it be rational to think that it's possible that if A, it would have been that B, when you know no categorical fact entails that it would have been that B if A or that it would not have been that B if A?

- If you're a middle-facter, there is an easy answer: you think it's possible that if A, it would have been that B because you think the middle fact it expresses is possibly true.
- If you're an anti-middle-facter, what answer could you give?

Dramatizing the problem

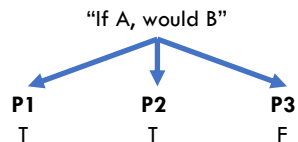
Suppose you think the reason there is no fact of the matter about whether if A, would B is because you think its semantic content is indeterminate between some propositions that are true and some that are false (cf. Stalnaker 1980).



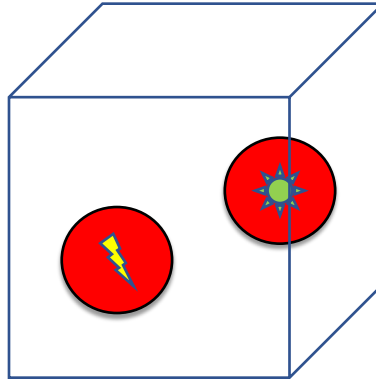
- (1) If the coin had been flipped, it would have landed heads.
 = At the closest world in which the coin is flipped, it lands heads.
- w1: coin is flipped and lands heads.
 - w2: coin is flipped and lands tails.
 - w1 and w2 are equally close worlds where the coin is flipped.

Dramatizing the problem

Suppose you think the reason there is no fact of the matter about whether if A, would B is because you think its semantic content is indeterminate between some propositions that are true and some that are false (cf. Stalnaker 1980).

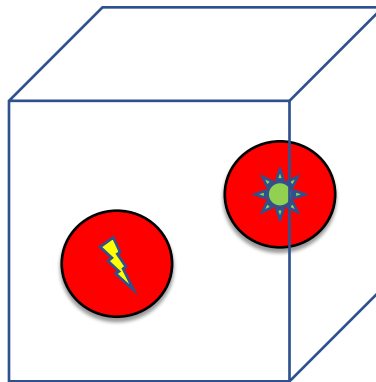


Trouble: Since probability and possibility are properties of propositions, and the proposition "if A, would B" expresses is indeterminate, we expect the proposition "It is .5 likely that if A, would B" expresses to likewise be indeterminate.



- (11) #The red ball in the box is John's favorite.
 (Suppose uttered by someone with no referential intentions to pick out one of the two balls)

This is a candidate case for semantic indeterminacy: there is no fact of the matter about whether the sentence is true or false.



- (11) #The red ball in the box is John's favorite.
 (12) #Probably, the red ball in the box is John's favorite.
 (13) #It's possible that the red ball in the box is John's favorite.

Like (11), neither of these can be felicitously asserted (absent the requisite referential intentions).

By contrast, as we've seen...

(1) #If it had been flipped, it would have landed heads.

(4) It's .5 likely that if the coin had been flipped, it would have landed heads.

Even though (1) is unassertable because we know there is no fact of the matter about it, (4) is assertable (given that we know the coin was fair).

Lesson: the lack of a fact of the matter about middle-fact-stating conditionals is not due to semantic indeterminacy.

My strategy: the nonfactuality of "if A, would B" comes from the content it expresses rather than indeterminacy in what content it expresses.

But what nonfactual content does a conditional express?

Conditionals and Inferential Dispositions

Guiding insight: “ ‘If P , Q ’ ... expresses a disposition to infer Q from P . In other words, fully to accept a simple ‘If P , Q ’ is to be disposed fully to believe Q if I fully believe P .”

- Mellor (1993), *How to believe a conditional*
(See also Ryle (1951), *If, so, and because.*)

I want to generalize this insight to all conditionals, including counterfactuals.

- An inferential disposition is a disposition to infer some proposition **B** given certain triggering conditions.
 - Not a way things could have been. Rather, a property of your doxastic state of mind.

Conditionals and Inferential Dispositions

1. Conditionals encode inferential dispositions.
2. What it is to believe, leave open, or assign some probability to a conditional is a matter of the agent's inferential dispositions.
3. An agent's inferential dispositions are determined by their factual beliefs.

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This is both intuitively plausible and captures the nonfactuality of conditionals.

- There is no fact of the matter about whether disposed to infer B from A.
 - (This is not a typo, this is deliberately ungrammatical!)
- Of course, there may be facts about whether someone is so-disposed or **ought** to be so-disposed. These are not the same thing!
- Take my proposal here as a working hypothesis, to be confirmed or disconfirmed once we see what predictions it makes.

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To bring both indicative and subjunctive conditionals under this umbrella, while preserving their differences, I propose that the inferential disposition conditionals encode is to infer their consequents from their antecedents together with their domains.

"If A, B" is associated with a domain of A-worlds.

- For indicatives, it's the epistemically possible A-worlds.
- For counterfactuals, it's (roughly) the historically possible A-worlds at the relevant past time.

"If A, B" encodes the disposition to infer B from A + Domain.

Conditionals and Inferential Dispositions

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2. What it is to believe, leave open, or assign some probability to a conditional is a matter of the agent's inferential dispositions.
3. An agent's inferential dispositions are determined by their factual beliefs.

You believe a conditional just if you are inferentially disposed in accordance with it.

You believe a conditional just if you're disposed to infer its consequent from its antecedent + its domain.

Upon first examining the crime scene, you think there are three suspects: the butler, the gardener, and the chauffeur. However, you then get strong evidence that chauffeur had an airtight alibi, so you rule him out. Now, you are prepared to infer that the butler did it upon learning that the gardener didn't do it; and on that basis you accept that if the gardener didn't do it, the butler did.

Conditionals and Inferential Dispositions

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Objection: Subjunctives don't have this property.

Suppose I accept that if Hitler had decided to invade England in 1940, Germany would have won the war. But if I were to learn that Hitler did in fact decide to invade England in 1940, I would not thereby infer that Germany did win the war. Rather, "my rejection of the antecedent was an essential presupposition to my acceptance of the counterfactual, and so gives me reason to give up the counterfactual rather than to accept its consequent, [were I to] learn the antecedent is true." (Stalnaker 1984, *Inquiry*: 105-6)

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Objection: Subjunctives don't have this property.

Reply: we need to distinguish your **counterfactual inferential dispositions** from how you **would revise** ones beliefs upon learning something incompatible with your beliefs.

- Counterfactual inferential disposition: what you are disposed to infer upon learning something incompatible with your beliefs. This is entirely a matter of your actual beliefs.
- How you would revise your beliefs is a matter of other factors.

Conditionals and Inferential Dispositions

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Objection: Subjunctives don't have this property.

Consider Jones, a committed atheist. Given that he completely rules out the possibility of any god, he has no disposition to infer that the Christian God exists upon learning that a god exists.

But suppose he were to have believed that a god exists. Then, given the fact that he was raised in a Christian household, he would have in that case believed that the Christian God exists.

Lesson: your **counterfactual inferential dispositions** \neq how you **would revise** your beliefs upon learning something incompatible with your beliefs.

Conditionals and Inferential Dispositions

1. Conditionals encode inferential dispositions.
2. What it is to believe, leave open, or assign some probability to a conditional is a matter of the agent's inferential dispositions.
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You believe a conditional just if you're disposed to infer its consequent from its antecedent + its domain.

You leave open the possibility of a conditional just if you are not disposed to infer in accordance with its negation.

- This makes believing and leaving open duals.
- S believes p iff S does not leave open the possibility of $\sim p$.

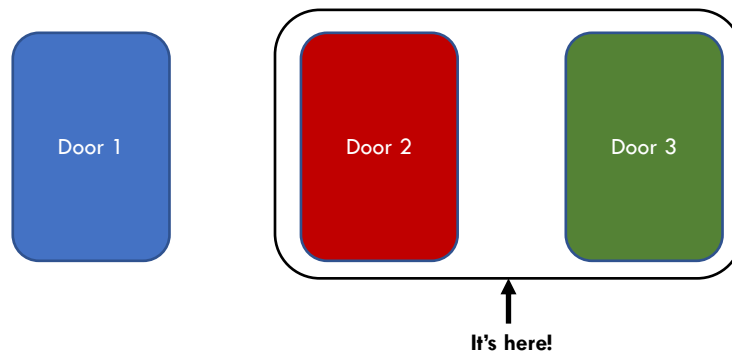
So, if the conditional encodes the disposition to infer B from A + Domain, to leave open the possibility of the conditional just is to not be disposed to infer $\sim B$ from A + Domain.

Probabilities will have to wait for another day.

Conditionals and Inferential Dispositions

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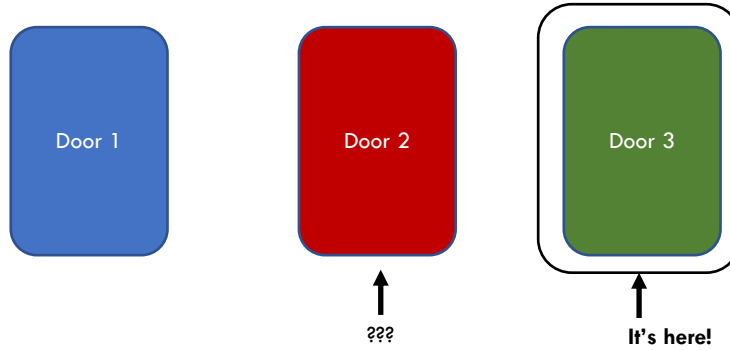
The prize is behind one of three doors.



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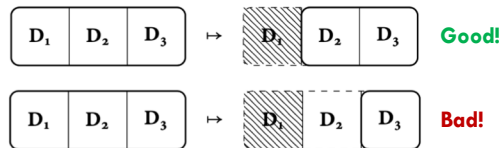
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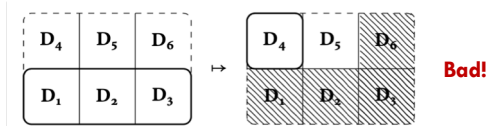
Conditionals and Inferential Dispositions

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2. What it is to believe, leave open, or assign some probability to a conditional is a matter of the agent's inferential dispositions.
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For any proposition A compatible with your beliefs, you are disposed to infer B from A iff you believe $A \supset B$.



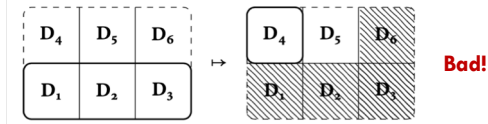
For any proposition A that is not compatible with your beliefs, you are disposed to infer B from A iff you believe $\Box(A \supset B)$.



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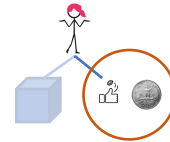
For any proposition A that is not compatible with your beliefs, you are disposed to infer B from A iff A entails B.



It follows that you believe a counterfactual "if A would B" iff you believe some non-conditional fact X which entails that its domain of A-worlds entails B.

- This is how we believe "categorical counterfactuals" – those whose truth is entailed by some non-conditional fact.

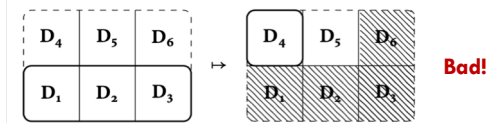
Flippy



Conditionals and Inferential Dispositions

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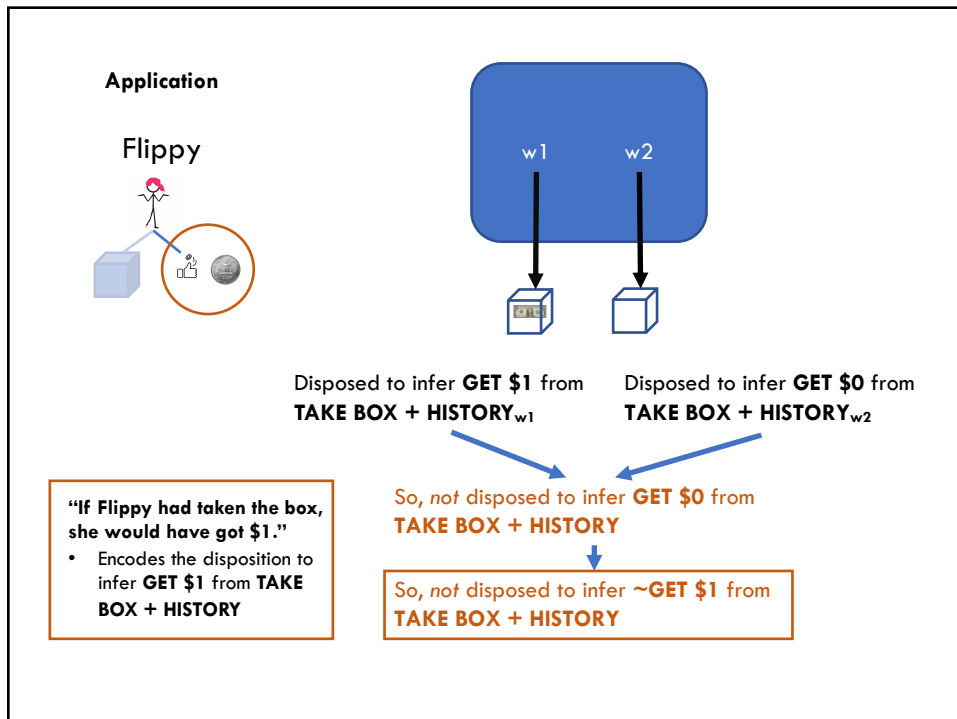
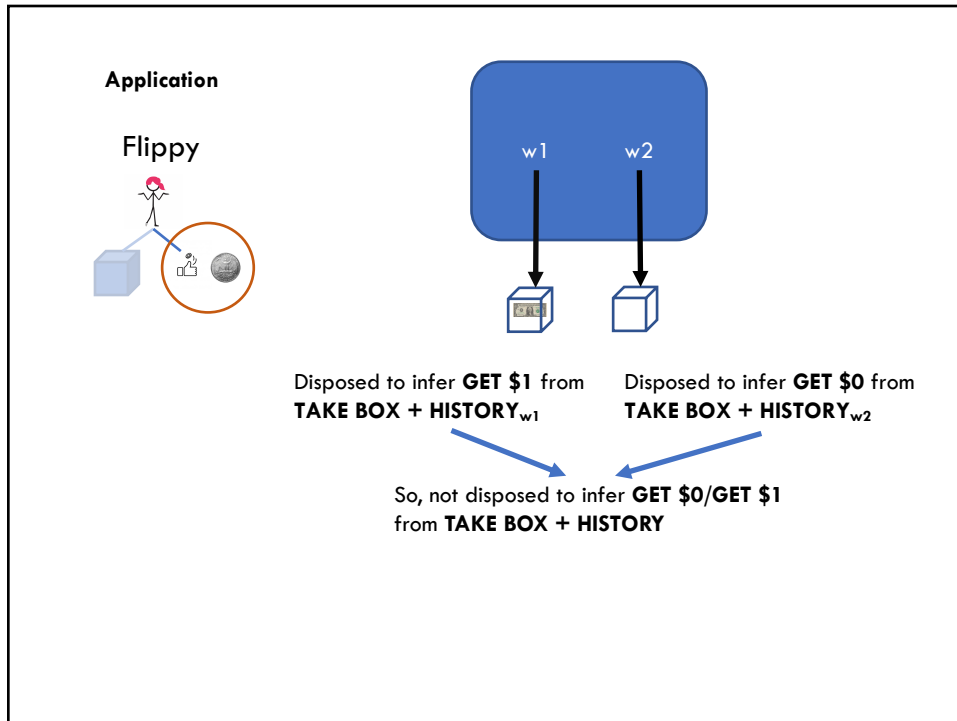


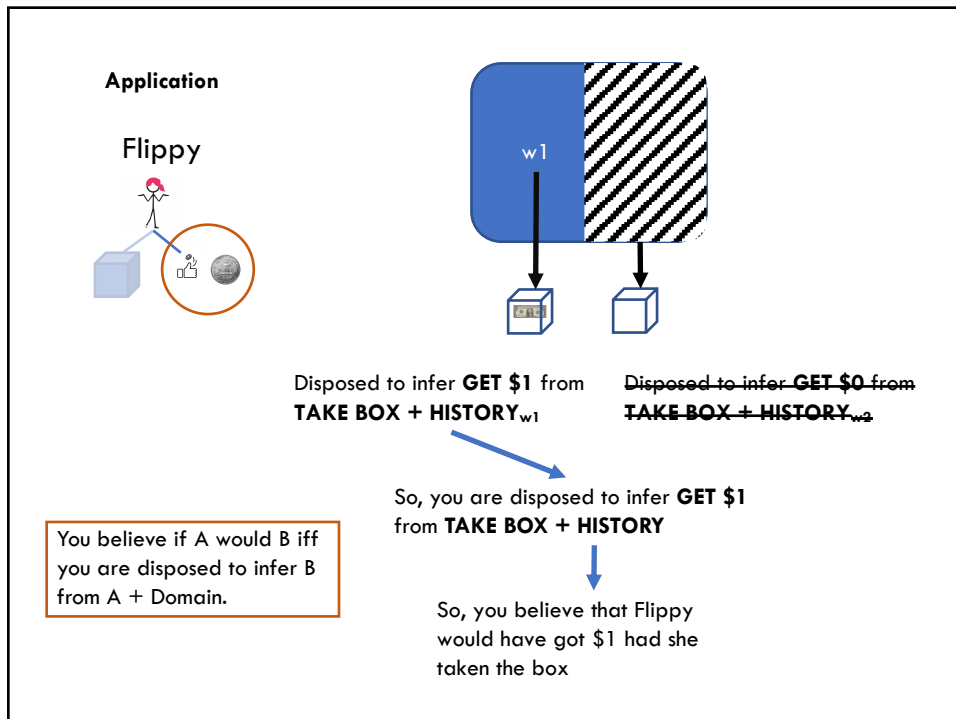
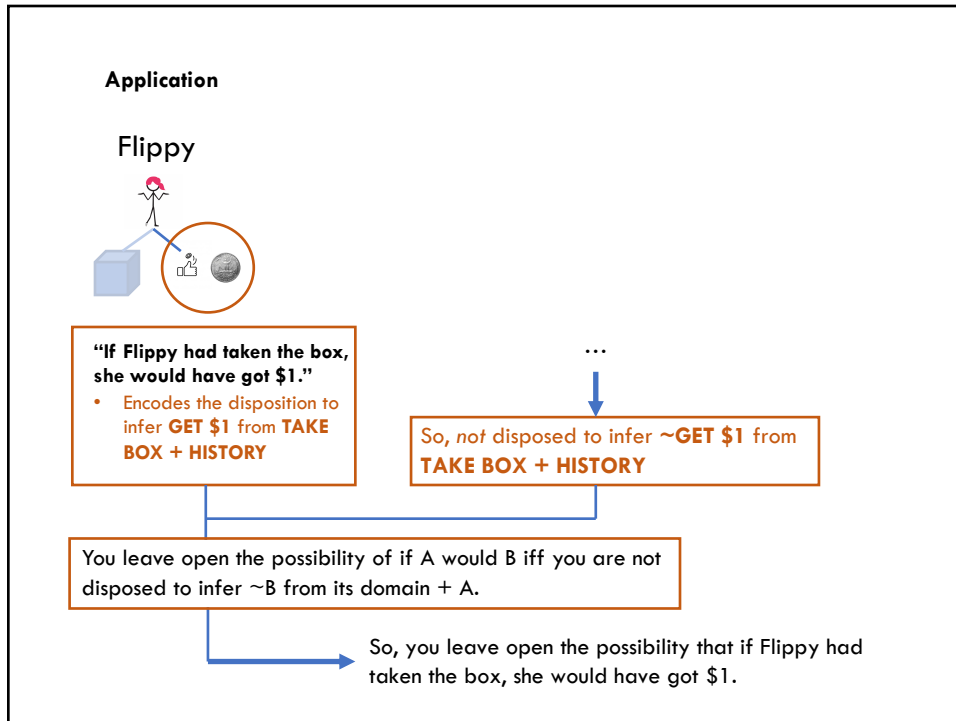
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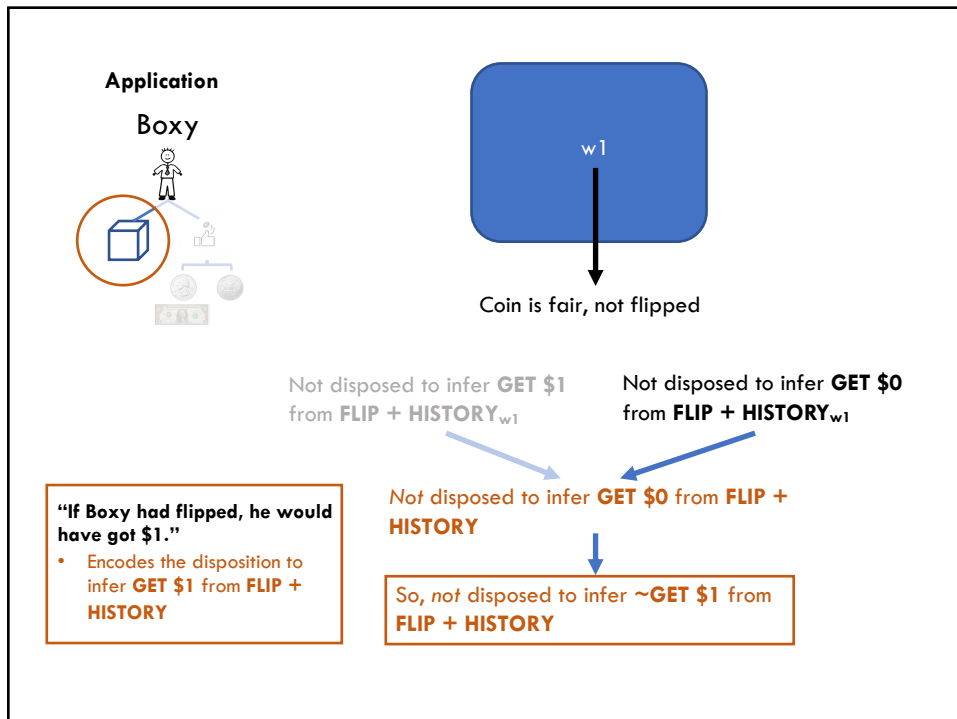
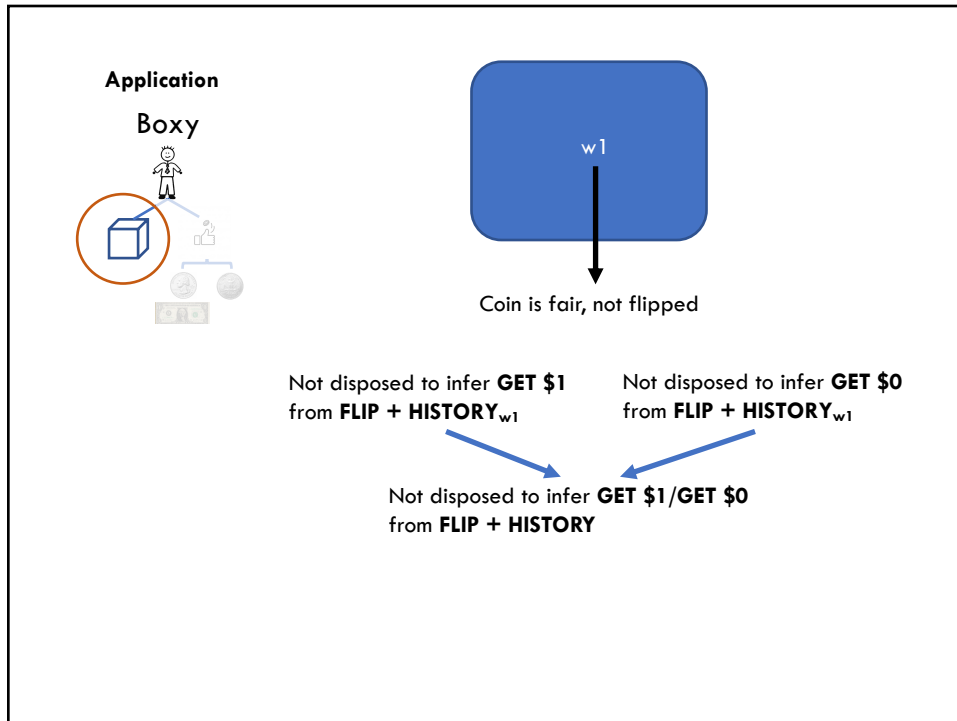
- So, we cannot come to believe "middle-fact" counterfactuals – we know there is no fact that entails that their domain of A-worlds entails B.

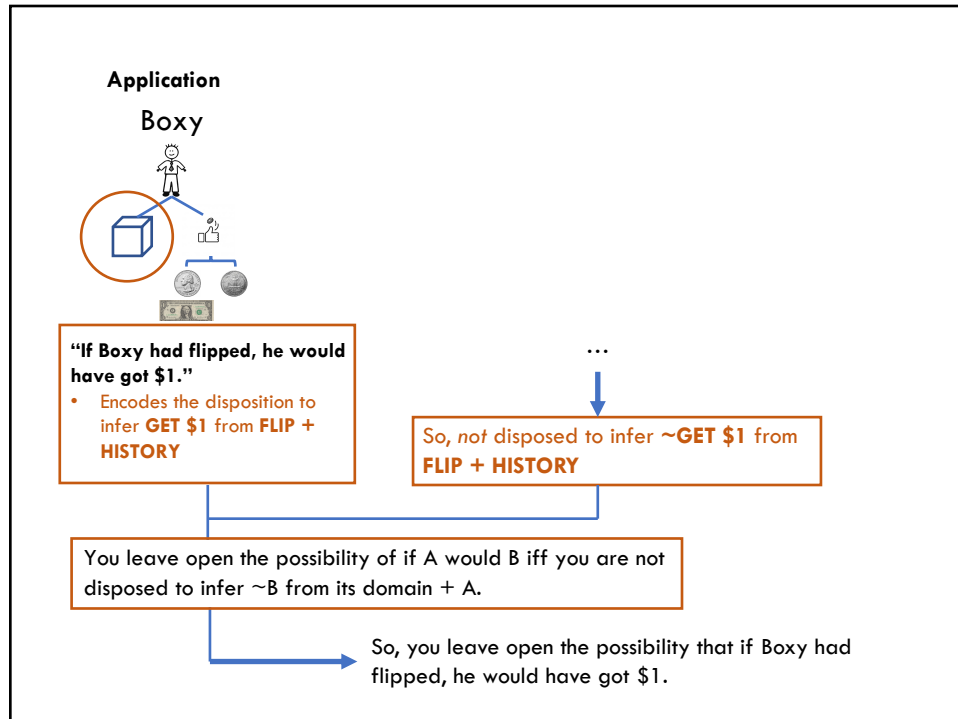
Boxy











Recap

Part 1: There are no middle facts.

- Argument 1: if there were, we would not know whether it is rational to regret in cases where we do know it is rational to regret.
- Argument 2: an intuitive principle – that it is rational to regret a choice if you know it is weakly dominated by another option you had – is hard to square with the middle fact position.

Part 2: But, if there are no middle facts, how could it be an open possibility that:

If Boxy had flipped, he would have got heads and won \$1.

Answer:

- Conditionals encode inferential dispositions. $A > B$ encodes the disposition to infer B from its domain + A.
- To believe a conditional is to be disposed in accordance with it.
- To leave open the possibility of a conditional is to not be disposed in accordance with its negation.

End

Addendum on *might*-counterfactuals

Here is a contrasting, anti-middle-facter theory of *if A might B* (Stalnaker's "quasi-epistemic" *might* strategy):

A. Boxy might have got tails if he had flipped

This is true. And its truth entails the non-truth of:

C. Boxy would have got heads if he had flipped

[Not covered today, but...] The non-truth of (C) and the truth of (A) are compossible and even might be likely together; but they can't both be fully believed/accepted!

The non-truth of (C) is compatible with the truth of (B) or the non-truth of (B):

B. Boxy would have got tails if he had flipped

When there is no middle fact, both (B) and (C) are non-true.

Call a conjunction of "if A, would have B" and "if A, might have not-B" a *would-might-conjunction*.

Observation 1

Would-might-conjunctions are infelicitous to assert and suppose:

(11) #Boxy might have got tails if he had flipped and would have got heads if he had flipped.

(12) #Suppose that Boxy might have got tails if he had flipped and would have got heads if he had flipped.

This is some evidence of the Epistemic Thesis, which is the most plausible strategy for a middle-facter to pursue about *might*-conditionals:

Epistemic Thesis

"If A, might have B" is equivalent to "It might be the case that if A, would have B"

Since *P* and *might not P* behaves like this (call these "epistemic contradictions"):

(13) #It might be raining and it isn't.

(14) #Suppose it might be raining and it isn't.

Observation 2

We can felicitously wonder about and think possible would-might-conjunctions.

Suppose that Boxy had before him a coin, and it's unknown whether it was fair or double headed. Boxy didn't flip the coin.

(15) I wonder whether Boxy might have got tails if he had flipped, and would have got heads if he had flipped.

(16) It's possible that Boxy might have got tails if he had flipped, and would have got heads if he had flipped.

Observation 3

It is not felicitous to wonder or think possible an epistemic contradiction.

(17) #I wonder whether it might be raining and isn't.

(18) #It's possible that it might be raining and isn't.

(19) #I wonder whether it might be the case that Boxy would have got tails if he had flipped even though Boxy would have got heads if he had flipped.

(20) #It's possible that it might be the case that Boxy would have got tails if he had flipped even though Boxy would have got heads if he had flipped.

Summarizing:

Observation 1

Would-might-conjunctions are infelicitous to assert and suppose.

Observation 2

We can felicitously wonder about and think possible would-might-conjunctions.

Observation 3

It is not felicitous to wonder about or think possible an epistemic contradiction.

Conclusion

Would-might-conjunctions are not epistemic contradictions.

So, the Epistemic Thesis is wrong.