305 Lecture 13.6 - Minimal Change Semantics

Brian Weatherson

Plan

To discuss the ‘nearest possible world’ approach to counterfactuals.

Reading

Still chapter 7 of Boxes and Diamonds

Basic Idea

- Replace the on/off accessibility relation between worlds with a distance measure d.
- So d(x, y), where x, y are worlds, measures how similar x and y are.
- But we'll sometimes talk as if it is a distance measure, that tracks 'how far apart' the worlds are.
- And for simplicity, we'll assume d(x, y) is always an integer - there are the worlds 1 unit apart, 2 units apart, etc.

Nearest World

- So if we're evaluating "If A were true, B would be true", we do the following.
- We find the nearest world, or worlds, where A is true.
- We see A is actually true, if not we look one unit away and see if there are any A worlds there, if not we look two units away and see if there are A worlds there, and so on until we find some A worlds.
- Say the distance they are separated from us is d.
- Then "If A were true, B would be true" is true just in case all the worlds distance d away where A is true also make B true.

Short Version

If A were true, B would be true, means

- All of the nearest A-worlds are B-worlds.

From now on, I'll sometimes write this as A $\Box\!\!\rightarrow$ B.

Variably Strict

- This makes the conditional a variably strict conditional.
- It's strict, because it requires all A worlds to be B worlds.
- But it's variably strict, because which worlds it ranges over varies with what the antecedent is.

Intuition Check

Here's the thought behind Lewis's view.

- When a counterfactual has a normal antecedent, the only worlds that matter to its truth are fairly normal worlds.
- To figure out what would have happened if I'd had bacon and eggs for breakfast, you only have to consider worlds that are really a lot like the actual world.
- But to figure out what would have happened if Columbus's fleet had sunk, you have to think about worlds that are really different to reality.

How Far Away

We can even try to think about really wild counterfactuals.

- What would happen if a vampire was the starting QB for the University of Michigan?

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Maybe some of those don’t make sense - there are no worlds, not even distant ones, where they are actual. But we can go a fair way until we get to that point.

Recap

The textbook calls this theory "minimal change semantics". Here's a reminder of how it works.

- Let's say we want to find out whether A $\Box\!\!\rightarrow$ B is true at w (we'll use $\Box\!\!\rightarrow$ for the conditional we're about to define).
- We find the world x such that A is true at x, and x is closest to w, i.e., is the least distance away.
- Then we look to see whether B is true.
- If so, A $\Box\!\!\rightarrow$ B is true.
- If not, A $\Box\!\!\rightarrow$ B is false.

Complication 1: No A-world

We'll just stipulate that if there are no A-worlds at all, then $A \mathrel{\Box\!\!\rightarrow} B$ is true for all B. These cases are weird, and I'll mostly set them aside.

Complication 2: No ‘closest’ A-world

Here’s something that can happen if you drop the assumption that the distances are integers.

- For any distance $d > 2$, there is a world x such that the distance between w and x is d, and A is true at x.
- But for any distance $d \leq 2$, there is no world x such that the distance between w and x is d, and A is true at x

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- But for any distance $d \leq 2$, there is no world x such that the distance between w and x is d, and A is true at x.
- So there isn’t a **closest** A-world, because you can get closer and closer to 2, and find a yet closer A-world.
- This is also a weird possibility, and I’ll set it aside.

Complication 3: Many equally closest A-worlds

This is more philosophically substantial.

- Imagine that for d less than 2, there is no A-world distance d away.
- But at distance 2, there are multiple worlds where A is true.
- And at some of them B is true, and at others B is false.

One solution: Require all of them to be B worlds

As I noted above David Lewis said that in that case we should say:

- A $\Box\!\!\rightarrow$ B is false.

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As I noted above David Lewis said that in that case we should say:

- $A \mathrel{\Box\!\!\rightarrow} B$ is false. But also
- $A \mathrel{\Box\!\!\rightarrow} \neg B$ is false.

In general $A \mathrel{\Box\!\!\rightarrow}$ something requires that the something is true at all the nearest A-worlds. And neither B nor ¬B is true at all of them, so neither is true.

Intuition Pump

Could you have 1 and 2 false, but 3 true?

1. If a UM student had been elected mayor of Ann Arbor, it would have been an undergraduate.
2. If a UM student had been elected mayor of Ann Arbor, it would have been a postgraduate.
3. If a UM student had been elected mayor of Ann Arbor, it would have been either an undergraduate or a postgraduate.

Lewis said that you could have 1 and 2 both false, but 3 true, and that's why $\Box\!\!\rightarrow$ should work this way.

Another solution: Deny this is possible

But the other great founder of this tradition, Robert Stalnaker, argued that we should want these things to be equivalent (at least if $\square\!\!\rightarrow$ was going to represent something in English).

1. $A \square\!\!\rightarrow B \vee A \square\!\!\rightarrow C$
2. $A \square\!\!\rightarrow (B \vee C)$

And we couldn't have that on Lewis's picture.

Stalnaker's Solution

- It is a constraint on the distance metric that there are no ties.
- The similarity measure is a strict ordering.
- And it's still a matter of debate whether Lewis or Stalnaker is right about this.

Next Time

- We'll talk more about this notion of similarity.