Causation Lecture 3

1 A ROLE FOR COUNTERFACTUALS?

- **Problem:** Mackie’s notion of a causal field seems interest-relative and thus mind-dependent. Hence, causal claims might be mind-dependent.
- **Alternative:** We have the context mind-independently fix the causal field. We take seriously the idea that causes are necessary for their effects in the context in which they occur: that if the cause had not happened, the effect would not have happened.

2 COUNTERFACTUALS AND POSSIBLE WORLDS

<table>
<thead>
<tr>
<th>Indicative Conditionals</th>
<th>Counterfactual (Subjunctive) Conditionals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Represented by ‘A → C’</td>
<td>Represented by ‘A □→ C’</td>
</tr>
<tr>
<td>Controversially symbolized by the material conditional.</td>
<td>Not symbolized by the material conditional, as the antecedent is typically counterpossible.</td>
</tr>
<tr>
<td>e.g. ‘if it rains, then I will take an umbrella’</td>
<td>e.g. ‘if it had rained, then I would have taken an umbrella’</td>
</tr>
</tbody>
</table>

- David Lewis (1986) provides truth-conditions for counterfactuals in terms of possible worlds.
- There is a possible world for each way the world could be. Lewis thinks that possible worlds are concrete, being maximal collections of connected entities. Plantinga (1974) argues that possible worlds are abstract, being maximal consistent sentences.
- We inhabit actuality. For Lewis, actuality (or @) is the possible world that we happen to be in.
- Some worlds are closer to actuality than others. A world \( w_1 \) is closer to actuality than world \( w_2 \) iff \( w_1 \) is more similar to actuality than \( w_2 \).
- From there, ‘A □→ C’ is true iff:
  1. The closest A-worlds are C-worlds; OR
  2. @ is both an A-world and a C-world (a special case of 1); OR
  3. There are no A-worlds (in which case the counterfactual is vacuously true).
- **Problem** (Fine 1975): Truth-conditions in terms of closeness intuitively gives the wrong result on some counterexamples, i.e. ‘If Nixon had pressed the red button, there would have been nuclear war’.
  - **Response** (Lewis 1979): Appeal to the direction of time.
- **Problem** (Quine 1960): The analysis makes the truth-conditions of counterfactuals vague. For example, ‘If the lectures had been cancelled, you would not have come to the lecture hall’.
  - **Response** (Lewis 1986): The analysis reflects the genuine vagueness in the truth-conditions of counterfactuals.

1
3 COUNTERFACTUAL AND CAUSAL DEPENDENCE

- A □→ C iff C counterfactually depends on A, when A and C are propositions.
  - Example: ‘The liquid is transparent’ counterfactually depends on ‘the liquid is water’, because ‘the liquid is water □→ the liquid is transparent’.
- C causally depends on A iff:
  1. C counterfactually depends on A; AND
  2. ¬C counterfactually depends on ¬A.
  - i.e. iff (A □→ C) & (¬A □→ ¬C)
- Counterfactual and causal dependence sometimes come together. Sometimes they come apart. It depends on the context given by actuality.
  - Example: When actuality is such that the liquid is tar, it follows that ‘the liquid is transparent’ causally depends on ‘the liquid is water’.
  - Example: However, when actuality is such that the liquid is lemonade, it does not follow that ‘the liquid is transparent’ causally depends on ‘the liquid is water’.
- Example: The house fire causally depends on the short circuit, because:
  1. ‘The occurrence of the short circuit □→ the occurrence of the house fire’; AND
  2. ‘¬(The occurrence of the short circuit) □→ ¬(the occurrence of the house fire)’.

4 FROM TOKENS TO TYPES

- We have been talking about individual propositions and thus event tokens. Sometimes we want to talk about types of events standing in the relation of causal dependence.
- We therefore talk about families of propositions.
  - Example: ‘the alarm went off at 8.00am’, ‘the alarm went off at 8.01am’ …
  - The family of propositions C consists of propositions C₁, C₂, …
- A family of propositions C counterfactually depends on a family of propositions A iff:
  - C₁ counterfactually depends on A₁ (i.e. A₁ □→ C₁); AND
  - C₂ counterfactually depends on A₂ (i.e. A₂ □→ C₂); AND
  - … so on.
- A family of propositions C causally depends on a family of propositions A iff:
  - C₁ causally depends on A₁ (i.e. A₁ □→ C₁); AND
  - C₂ causally depends on A₂ (i.e. A₂ □→ C₂); AND
  - … so on.

5 WHY ISN’T CAUSAL DEPENDENCE JUST CAUSATION?

- The short answer: causal dependence is intransitive, whilst causation is transitive.
- This means that causal dependence is unnecessary for causation. If A causes B, and B causes C, it follows that A causes C even if C is not causally dependent on A.
- However, causal dependence is sufficient for causation. If C is causally dependent on A, then A causes C.
6 Causal Dependence and Distinct Events

• Problem: It is not the case that my drawing a figure with three sides causes my drawing of a triangle. However, ‘drawing a triangle’ is causally dependent on ‘drawing a figure with three sides’.
  o Response: One proposition C is causally dependent on another proposition A only if the events corresponding to A and C are distinct.
• Consequently, C causally depends on A iff:
  ▪ C counterfactually depends on A; AND
  ▪ ¬C counterfactually depends on ¬A; AND
  ▪ The events corresponding to A and C are distinct.

7 Conclusion

• There is a conceptual structure to Lewis’ analysis:
  1. We analyse the truth-conditions of counterfactuals in terms of possible worlds.
  2. We analyse counterfactual dependence in terms of counterfactuals.
  3. We analyse causal dependence in terms of counterfactual dependence.
  4. (Next time) we analyse causation in terms of causal dependence.

8 Bibliography

FINE, Kit, ‘Critical Notice of Lewis, Counterfactuals’ in Mind 84 (335) (1975): 451-458
LEWIS, David, ‘Counterfactual Dependence and Time’s Arrow’ in Nous 13 (4) (1979): 455-476
LEWIS*, David, On the Plurality of Worlds (Oxford: Blackwell) (1986): ch. 1, sect. 1 & 2; ch.2; ch.3, sects 1-2; ch.4, sects. 1-2