

Phil 420: *Metaphysics*
Spring 2008

[Handout 13]

Professor JeeLoo Liu

Lewis: Causation

§ Lewis's Main Contentions

- (1) To argue against the regularity account (the causal law account) of causation.
- (2) To defend instead a counterfactual account of causation.

§ Hume's First Definition of 'Causation':

[A]. The Regularity Account

___ A causal succession is a succession that instantiates a regularity.

[The Causal Law (Regularity) Theory]:

___ Two causal events (cause and effect) are subsumed under regularity by means of descriptions they satisfy.

Let C be the proposition that *c* occurs.

Let E be the proposition that *e* occurs.

c causes *e*, iff

1. C and E are true;
2. For some nonempty set Ψ of true law-propositions and some set \mathfrak{S} of true propositions of particular fact, Ψ and \mathfrak{S} jointly imply $C \supset E$, although Ψ and \mathfrak{S} jointly do not imply E, and \mathfrak{S} alone does not imply $C \supset E$.

[Note]:

___ What the above says is that for a causal statement to be true, both events must exist (occur) and that there have to be some laws and some factual statements that jointly determine this causal statement to be true. Without the causal law covering the particular causal statement, that particular causal statement does not hold.

* Problems with the regularity account:

1. [the problem of effects]: *c* might have been an effect of *e*. (The regularity theory cannot tell the two cases apart.)
2. [the problem of epiphenomenon]: *c* might have been an epiphenomenon of the causal history of *e*. (e.g. Both sore throat and running nose are related regularly, but there is no genuine causal relation in between. What is the real cause is the virus that is responsible for both symptoms. In this case, both of the symptoms are epiphenomena.) [“epiphenomenon” – a secondary phenomenon that results from (as a consequence of) another phenomenon, but which does not have any causal power on its own]

3. **[the problem of preemption]:** c might be a preempted potential cause of e : something that did not cause e , but what would have done so in the absence of whatever really did cause e . (e.g. a gun shot in the heart would have caused Sam's death if he had not had a heart attack at that moment. The gun shot is the preempted cause while the heart attack is the actual cause.)

§ Hume's Second Definition of 'Causation':

[B]. The Counterfactual Account

___ **If the cause had not been, the effect never had existed.**

§ Lewis's Theory of Causation (derived from [B])

(I) Lewis's Theory of *Comparative Overall Similarity* among Possible Worlds:

___ **One world is *closer to actuality* more than another if the first resembles our actual world more than the other does, taking account of all the respects of similarity and difference and balancing them off one against another.**

(II) Lewis's Theory of Counterfactuals:

___ **A counterfactual is nonvacuously true iff it takes less of a departure from actuality to make the consequent true along with the antecedent than it does to make the antecedent true without the consequent.**

___ **Two propositions, A (e.g., 'Event c occurs') and C (e.g. 'Event e occurs')**

We have a counterfactual $A \square \rightarrow C$: If A were true, then C would also be true

$A \square \rightarrow C$ is true (at a world w) iff either

1. **there are no possible A-worlds (then $A \square \rightarrow C$ is vacuous); or**
2. **some A-worlds where C holds is closer (to the actual w) than is any A-world where C does not hold.**

[In other words: The counterfactual $A \square \rightarrow C$ is true (at the actual world) if, and only if, the possible worlds most similar to *the actual world where A is true* are worlds where C is true.]

[Note]: Differences between counterfactual conditional, indicative conditional and material conditional

- ___ (1) Counterfactual conditional ($p \square \rightarrow q$): A conditional statement whose antecedent is known (or, at least, believed) to be contrary to fact. E.g. 'If the American people had known the truth about the Watergate, then Nixon would not have been re-elected.'
- (2) Indicative conditional ($p \rightarrow q$): The consequent follows from the antecedent. E.g. 'If I jump from the Empire State building today, I will not be alive tomorrow.'
- (3) Material conditional ($p \supset q$): A conditional which is true except when the antecedent is true while the consequent false. E.g. 'If I were to jump from the Empire State building today, I would be alive tomorrow' has a false antecedent, and it is thus a true material conditional.

3. Lewis's Theory of Counterfactual Dependence (among Propositions)

Let A_1, A_2, \dots be a family of (distinct) possible propositions, no two of which are compossible (able to exist along with each other or able to coexist);

Let C_1, C_2, \dots be another such family (of equal size).

If all the counterfactuals $A_1 \square \rightarrow C_1, A_2 \square \rightarrow C_2, \dots$ between corresponding propositions in the two families are true.

→ The C's depend *counterfactually* on the A's.

[Note]:

___ For example, a family of possible proposition could be the family of 'It is below 32F', which would include 'it is 31F, 30F, 29F....'. The temperature cannot be *both* 31F and 29F; hence, the two are not *compossible*. The family of C could be 'water on the ground has turned into ice; water in the air has turned into snow...'. If the temperature had not been any of the family 'below 32', then water would not have frozen. We thus get the statement: water's freezing *depends counterfactually* on the temperature's being below 32F. This gives us the causal relation: the temperature's being below 32F causes the water to freeze.

4. Lewis's Theory of Causal Dependence (among Actual Events)

Events: e

⇒ **Propositions: O(e)...** [The proposition that holds *at all and only those* worlds where e occurs.]

(1) Family of events

Let c_1, c_2, \dots and e_1, e_2, \dots be distinct possible events.

The family e_1, e_2, \dots of events *depends causally* on the family c_1, c_2, \dots iff the propositions $O(e_1), O(e_2), \dots$ *depends counterfactually* on the family of propositions $O(c_1), O(c_2), \dots$

(2) Single events

Let c and e be two distinct possible particular events.

Then e *depends causally* on c (whether e occurs depends on whether c occurs) if the following counterfactuals are true:

(i) $O(c) \square \rightarrow O(e)$ [If c had occurred, then e would have occurred.] ⇐ when c and e do not actually occur.

(ii) $\sim O(c) \square \rightarrow \sim O(e)$ [If c had not been, then e never had existed.] ⇐ when c and e are actual events.

* (ii) = Hume's second definition of causation (the [B] from above).

5. Lewis's Theory of Causation

1. A counterfactual analysis:

___ If c and e are two actual events such that e would not have occurred without c (OR: when e *depends causally* on c), then c is a cause of e .

2. Causal dependence implies causation.

___ Causal dependence \rightarrow causation

___ But \sim (causation \rightarrow causal dependence): there can be causation without causal dependence.

e.g. If c caused d and d caused e , then c is a cause of e even if e would still have occurred (otherwise caused) without c .

3. Causation is transitive.

4. If all events are causally dependent on one other, then a *causal chain* is formed.

5. One event is a *cause* of another iff there exists a causal chain leading from the first to the second.

§ How the counterfactual account avoids the three problems for the causal law (the regularity) theory

[the problem of effects]

___ Under Lewis's theory, if e had been absent, it is not the case that c would have been absent. Rather, c would have occurred but would have failed to cause e . So c is *not* causally dependent on e .

[the problem of epiphenomenon]

___ Solution: Let's reject the counterfactual. It is not the case that if e had not been, then f would not have been either. We could hold c and f fixed, while considering the counterfactual absence of e . (To get rid of an actual event e with the least overall departure from actuality, it will normally be best not to diverge at all from the actual course of events until just before the time of e .)

[the problem of preemption]

___ Lewis's theory can avoid this problem because under his theory of causal chain, the real cause is linked to the effect through a causal chain while the preempted cause is not.
