How to Cause the Inevitable

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Dependence analyses of actual causation

Most analyses of actual causation appeal to **counterfactual dependence**:

Lewis (1973); Paul (1998); Yablo (2002); Halpern and Pearl (2005); Halpern (2016); Beckers (2016)

(3) If C caused E, then it was possible for C and E not to occur.

This implies effect contingency:

(4) **Effect contingency**
If C caused E,
E's occurrence was not inevitable.

In these analyses of actual causation:

- Causation is understood as relating *event types*
- That is, counterfactual dependence relates *whether or not* an effect occurs with *whether or not* its cause occurs.

Since Socrates' death had a cause, contemporary analyses wrongly predict that his death was not inevitable.

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References

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Causation does not require counterfactual dependence of any kind.

1. Socrates drinking poison caused **an event**, his death, **which** was bound to happen eventually.

2. Socrates' death was inevitable. According to the *Phaedo*, **it** was caused by him drinking poison.

(1) and (2) are true.
$\therefore$ The *very same thing* can both:
be inevitable and have a cause.
$\therefore$ Causation does not require any counterfactual dependence from the cause to the effect.

Why does causation relate event *types*?

Consider a scenario from Collins et al.:

> A train rushes toward a fork in the tracks. If a switch is flipped, the train will take the shorter side track, and if the switch is in its original position, the train will take the main track. Further on, the left and the right tracks merge.
> The switch is flipped, the train takes the side track, converges with the main track and reaches its destination.

- Pulling the lever **did not** cause the train to reach its destination.
- But pulling the lever **did** change the token event; e.g. *when* it occurred.

Production without effect contingency

- C is *sufficient* for E given A iff for any A-world and time t, if C occurs at t then E occurs at some later time.
- A *token event* is an event type (i.e. a proposition) located at a time.
- A chain of token events $\{C_t\}_{t\in T}$ is *dense* iff for any times $t, t' \in T$ and time t^*, if $t < t^* < t'$ then $t^* \in T$.
- A chain of token events is *sufficiency-preserving given* A iff every token event on the chain is sufficient given A for every later event on the chain.
- C **produced** E just in case there was a dense, sufficiency-preserving chain of token events from C to E.

Causation via production

C **actually cause** E just in case there is a set of actual facts A such that:

1. C produced E given A, and
2. If C had not occurred, but A had still occurred, $\neg C$ **would not have produced** E **given** A.

(Based on a schema by Beckers (2016))