How to Cause the Inevitable

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(1)   Drinking poison caused Socrates' death.

Socrates' death was...

inevitable, and **had a cause**

How can contemporary analyses of causality account for this fact?

Plan

1. Existing analyses of actual causation
   - Counterfactual approaches
   - Probabilistic analyses of causation

2. A different death?
   - Previous responses to the problem of inevitable effects
   - Coreference

3. How to cause the inevitable
   - Beckers (2016)
   - A new definition of production

4. Conclusion

Plan

Counterfactual approaches to causation

Definition (Counterfactual dependence)

Given events C and E, we say E **counterfactually depends** on C iff

if C hadn't occurred, E wouldn't have occurred.

Popular commitment of counterfactual analyses of causation:
If C caused E, then there is a possible scenario where E does not occur.
e.g. Lewis (1973), Yablo (2002), Halpern (2016), Beckers (2016), Gerstenberg et al. (2020)

Effect contingency in counterfactual theories of causality

If C caused E, then E's occurrence was not inevitable.

Socrates' death

If Socrates' death was inevitable, then nothing caused it to occur.

Plan

Probabilistic analyses of causation

Popular commitment of probabilistic analyses of causation:
Causality as probability raising (and other conditions)

e.g. Reichenbach (1956), Suppes (1970), Cartwright (1979)

Entailments of probability-raising analyses of causality

$$C \text{ caused } E \quad \Rightarrow \quad P(E \mid C) > P(E) \quad \Rightarrow \quad P(E) < 1$$

Note: $P(E \mid C) > P(E)$ is equivalent to $P(E \mid C) > P(E \mid \neg C)$.

Socrates' death example, according to probabilistic approaches

If $P(\text{Socrates dies}) = 1$ then nothing caused Socrates' death.

The problem of inevitable effects

According to the two most prominent analyses of causation,
it is impossible for any event to both be inevitable and have a cause.

Plan

Paul & Lewis on inevitable effects

E depends causally on C iff C occurs, E occurs, and if C had not occurred, then E would not have occurred at all, or would have occurred later than the time that it actually did occur.

— L. A. Paul (1998, p. 193)

Suppose it were alleged that since we are all mortal, there is no such thing as a cause of death. Without the hanging that allegedly caused the death of Ned Kelly, for instance, he would sooner or later have died anyway. Yes. But he would have died a different death, and the event that actually was Kelly's death would never have occurred.

— David Lewis (2000, pp. 185)

The strategy: Deny that there really are inevitable effects

- Effects are specific
- It is not inevitable that Socrates dies in the way he actually did

Plan

Coreference and identity

1. Coreference expresses identity: coreferring terms refer to identical entities See Ángel Pinillos (2011) and Fiengo and May (1994)

2. Indiscernibility of identicals: identical entities have the same properties

(2) a. Milo picked up the book, **which** was a hardback.
     b. =Milo picked up the book. **The book Milo picked up** was a hardback.

A helpful, but loose distinction between two readings of events

   General Whether or not the event occurred
   Specific The particular event that occurred, including the time/manner/... in which it occurred

Coreference and inevitable effects

An inevitable event can corefer with one that has a cause:

(3)   a.   Since Socrates was mortal, his death was inevitable. According to Plato's *Phaedo*, **it** was caused by him drinking poison.

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

1. The coreferring terms refer to identical entities
2. Identical entities have the same properties

Upshot

The same event can both be inevitable and have a cause.

Plan

Beckers' schema

Definition (Beckers 2016)

C actually caused *E* iff *C* and *E* actually occurred, and:

1. **Production:** *C* produced *E*
2. **Difference making:** it is not the case that, if *C* had not occurred, ¬*C* would have produced *E*

How to invalidate effect contingency?

The problem:

> **Beckers (2016) validates effect contingency**
> If C caused E, E was not inevitable.

- C caused E
- $\Rightarrow$ C produced E
- $\Rightarrow$ There is a chain of occurring events $C, D_1, \ldots, D_n, E$ such that for each D_i on the chain, there is a set L_i such that L_i is not sufficient for D_{i+1}, but $L_i \cup \{D_i\}$ is sufficient for D_{i+1}
- $\Rightarrow$ In particular, $L_n \setminus \{D_n\}$ is not sufficient for E
- $\Rightarrow$ There is a scenario where L_n occurs but E does not occur
- $\Rightarrow$ E was not inevitable

Plan

Production without effect contingency

$$C \text{ caused } E \quad \Rightarrow \quad C \text{ produced } E \quad \textcolor{red}{\cancel{\Rightarrow}} \quad E \text{ was not inevitable}$$

Strategy inspired by Paul (1998):
Consider counterfactual dependence in the time of the event

Definition (Token event)

A token event is a formula at a time.

- If C is a formula and t a time interval, then C_t is an event token.
- Define that "C_t occurred" is true just in case C is true at t

A new definition of production

- L. A. Paul (1998): consider counterfactual dependence in the time of the event
- Adapt L. A. Paul's analysis: not about causation itself, but about production

Definition (Production, new definition)

C produced E just in case C's occurrence is sufficient for the existence of some chain of token events from C to E, such that each event is counterfactually dependent on the previous events.

Socrates' death in the new theory

Drinking poison caused Socrates' death just in case

1. Drinking poison produced Socrates' death, and
2. It is not the case that, if Socrates hadn't drank poison, him not drinking poison would have produced his death

1. **Production**
   - Socrates drinking poison is sufficient for the existence of a chain of token events from the token event of him drinking poison to the token event of his death, each counterfactually dependent on the previous events

2. **Difference making**
   - It is possible that if Socrates hadn't drunk poison, there would be no chain of token events from the token event of him not drinking poison to the token event of his death, with each counterfactually dependent on the previous events

Why Socrates drinking poison caused his death

1. **Production:** Socrates drinking poison produced his death
2. **Difference making:** It is not the case that not drinking poison would have also produced his death

- Examined most prominent analyses of causation: counterfactual and probabilistic
- These approaches predict that *being inevitable* and *having a cause* are incompatible
- Evidence from coreference that *being inevitable* and *having a cause* are compatible after all:

(3)   a.   Since Socrates was mortal, his death was inevitable. According to Plato's *Phaedo*, **it** was caused by him drinking poison.

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

Summary II

- Beckers (2016): actual causation = production + difference making
- L. A. Paul (1998): causation involves counterfactual dependence in the time of the event
- Modify Paul's observation: concerns production, not causation

Conclusion

Unlike previous analyses of causation, the present approach – using a new definition of production – explains how the properties of being inevitable and having a cause are compatible.

That's how to cause the inevitable

Thank you for listening!

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