Lecture 32
Woodward on Interventions and Counterfactuals

Patrick Maher

Scientific Thought II
Spring 2010

Clarifying causal claims (114–17)

- According to a manipulability theory, the meaning of a causal claim is that intervening on some variable would change the value of another variable.
- People sometimes make causal claims in which it is unclear what the relevant intervention is.
- The manipulability theory says such claims are unclear, and they can be clarified by identifying the relevant intervention.
- *The fact that we can clarify the meaning of causal claims in this way is . . . an additional reason for accepting a manipulability account of causation.* (115)

Example

"Being female causes one to be discriminated against in hiring."

Woodward says claims like this are unclear because:

1. There are several different things that might be meant by manipulation of *being female.*
   - Replacing an X with a Y chromosome, or vice versa, shortly after conception.
   - Massive doses of hormones in utero that would change morphology at birth.
   - A sex change operation, either before or after birth.

   These may have different effects on whether a subject is hired.
2. The manipulations people have in mind probably don't involve change of gender at all. They might be:
   - Changing the employer's beliefs about the gender of an applicant.
   - Changing the hiring process so it is not discriminatory.

The claim can be clarified by specifying the intervention we have in mind.

Questions

1. Woodward says that claims like "Being female causes one to be discriminated against in hiring" are unclear. What are his reasons for saying this? How can such claims be clarified?
2. A review of Woodward's book said that on Woodward's view "genotype is not . . . even a remote cause of an individual's treatment by others" because "there are no interventions on [genotype] with suitable invariance" (Clark Glymour, *British Journal for the Philosophy of Science*, 2004). Is this correct? Justify your answer.

Realism about counterfactuals

Objection (122)

Counterfactuals have often been regarded with suspicion. It is frequently suggested that they lack a clear meaning or that their truth conditions are so vague and context-dependent that they are not suitable for understanding or elucidating any notion (of causation or anything else) that might be of scientific interest.

Example from Quine

If Julius Caesar had been in charge of U.N. Forces during the Korean War, then he would have used (a) nuclear weapons or (b) catapults.

It is hard to see on what basis one could decide whether the counterfactual with (a) as consequent or the counterfactual with (b) as consequent (or neither) is correct.

Woodward's response (122)

- *The appropriate counterfactuals for elucidating causal claims are not just any counterfactuals, but rather counterfactuals of a very special sort: those that have to do with the outcomes of hypothetical interventions.*
- *Counterfactuals that we do not know how to interpret as . . . claims about the outcomes of well-defined interventions will often lack a clear meaning or truth value. [The alternatives in Quine's example] seem unclear for just this reason. It isn't just that we lack the technological means to carry out an experimental manipulation in which Caesar is placed in charge of the U.N. Forces. The more fundamental problem is that we have no clear conception of what would be involved in carrying out such an experiment.*
- *By contrast, a similar sort of skepticism about counterfactuals that are interpretable as claims about the outcomes of hypothetical (but otherwise well-specified) interventions is much harder to sustain.*

Contrast with Lange

Lange's account of laws made strong claims about counterfactuals that are not about any intervention.

Example

- Let f = some object accelerated from rest travels faster than the speed of light, g = there is a gold cube with sides more than 1 mile long.
- Lange's P3 implies that $(f \vee g) > (\sim f \cdot g)$ is correct in all contexts.
  - $f \vee g$ is consistent with Λ and $\sim f \in \Lambda$.
  - So P3 implies $(f \vee g) > \sim f$ is correct.
  - Hence $(f \vee g) > (\sim f \cdot g)$ must be correct.
- "$f \vee g$" does not describe an intervention, or any definite experiment at all.
- Woodward doesn't use counterfactuals like this.

Possibility of interventions (127–33)

Woodward's definitions of total cause, direct cause, etc., all refer to *possible interventions*. What does "possible" mean here?

Interventions need not be humanly possible

- An intervention on X with respect to Y is a process that changes X in such a way that, if Y changes, it does so only in virtue of Y's relationship to X.
- This concept of intervention does not refer to human action; interventions can occur in nature without any involvement by humans.
- Causes often cannot be manipulated by humans, so Woodward's analyses would be incorrect if they required interventions to be humanly possible.
- E.g., the extinction of the dinosaurs is believed to have been caused by the impact of a large asteroid, though human beings can't change this.

Interventions need not be physically possible

- The concept of intervention does not require interventions to be physically possible (i.e., consistent with the laws of nature).
- If interventions were required to be physically possible then Woodward's analyses would be incorrect.

Examples

- *Let D = the distance of the moon from the earth, T = the motion of the tides. We believe that D is a cause of T.*

  Perhaps it is not physically possible to change D in such a way that any change in T results only from T's relationship to D.
- *Suppose Cs occur without any cause, but Cs cause Es.*

  Then there is no physically possible intervention that can change whether C occurs.

Interventions only need be logically possible

An intervention on X with respect to Y will be "possible" as long as it is logically or conceptually possible for a process meeting the conditions for an intervention on X with respect to Y to occur. (132)

Previous examples revisited

- It is logically possible that D could be changed in a way that does not itself change T. Newton's laws of gravitation and mechanics allow us to determine how T would change under such an intervention.
- It is logically possible for there to be a process that changes whether C occurs. We could determine whether that would change E by examining the correlation between C and E and intervening on any other variables that might be responsible for the correlation.

Questions

1. Woodward uses counterfactuals to analyze causal concepts, but some philosophers have said that counterfactuals are so vague and context-dependent that they are not suitable for elucidating any concept of scientific interest. What is Woodward's response to this criticism?
2. Woodward's definitions of total cause, direct cause, etc., all refer to *possible interventions*. What does "possible" mean here? What are some things it does not mean?
3. If an intervention is physically impossible, does it follow that we cannot know what the effect of such an intervention would be? Justify your answer.

Reference


James Woodward.
Making Things Happen.
Oxford University Press, 2003.
Online at Questia.
Numbers in parentheses are page numbers of this book.