ARE CAUSES PHYSICALLY CONNECTED TO THEIR EFFECTS?

It is common (at least among philosophers) to talk of causes being "connected" to their effects. This talk is usually metaphorical, but according to some ways of thinking about causation, causes are *literally* connected to their effects. The connection consists of a *causal process*, a certain kind of physical process that has been characterized in different ways by different authors. According to Phil Dowe, a causal process involves an object that possesses a conserved quantity. Such process theories of causation seem to run into trouble with *negative* causation: cases in which one event *prevents* another from occurring, or in which the *failure* of some event to occur brings about some outcome, or in which there is some other combination involving the nonoccurrence of events. Jonathan Schaffer presents this problem for process theories in his chapter. Phil Dowe claims that negative causation is not genuine causation: he calls it "quasi-causation." Although some cases of quasi-causation may look like genuine cases of causation, it is important to maintain a theoretical distinction. Schaffer, by contrast, argues that negative causation gives us everything we could want from causation, and criticizes Dowe's attempt to draw a dividing line between the different cases. The debate is interesting, in part, because of the nature of the examples discussed. Many mechanisms (whether causal or quasi-causal) turn out to work in a manner quite different from what common sense might assume.

CHAPTER
NINE

Causes are Physically Connected to their Effects: Why Preventers and Omissions are not Causes

Phil Dowe

9.1 Introduction

This morning I didn't throw a rock through the window across the road. Did I cause the window not to break? According to some theories of causation I didn't. The Salmon–Dowe theory of causation says that for there to be causation, there must be a set of causal processes and interactions, understood in terms of conserved quantities linking a cause with its effect.

To give more detail: the conserved quantity (CQ) theory of causation (Salmon, 1998; Dowe, 2000) can be expressed in two propositions:

CQ1. A *causal process* is a world-line of an object that possesses a conserved quantity.
CQ2. A *causal interaction* is an intersection of world-lines that involves exchange of a conserved quantity.

For example, suppose I had thrown the rock through the window. Then my throwing the rock caused the window to break precisely because there is a causal process, the trajectory of the rock, possessing momentum, which links my throw to the window's breaking. And the window's breaking involves an exchange of momentum. But quite clearly there is no such set of causal processes and interactions linking my not throwing the rock and the window (see also the theories of Fair, Aronson, Ellis, Bigelow and Pargetter, and Ehring).

According to other theories of causation, I did cause the window to break. The counterfactual theory says that it is causation since it is true that had I thrown the rock the window would have broken (the *sine qua non* condition). The agency theory says that it is causation because not throwing the rock is a good way of bringing about that the window does not break (Price, Gasking). The regularity theory says that

it is causation because there is a regular pattern – a "constant conjunction" – between not throwing rocks and windows not breaking (Hume), while the probabilistic theory says it is causation because not throwing the rock makes it more likely that the window won't break (Reichenbach, Suppes, Humphreys). The same can be said for non-Humean versions of these last two, such as those in terms of natural necessitation, and non-Humean notions of chance (Mellor).

However, there are also versions of these latter accounts according to which such cases are not causation. According to Lewis (1986), the most influential version of the counterfactual theory, any case that involves negative "events" exhibits no *relation* of counterfactual dependence (had event *A* obtained, event *B* would not have), a relation that is required for causation. (Later, Lewis argues that such cases count as causation on account of the relevant counterfactual *truth* – see Lewis, forthcoming). And David Armstrong's necessitation theory (1999) rules them out since the fact that I didn't throw the rock is not a first-order state of affairs.

Our case involves negative events (or facts): *not* throwing the rock and the window *not* breaking. This can be described as a case of prevention by omission. A similar divide arises for other cases involving negatives, in which only the alleged cause is a negative (causation by omission – for example, not taking the medication caused his death), in which only the alleged effect is a negative (prevention – for example, taking the medication "caused" him not to die), and other cases in which some intermediate events in an alleged causal chain is a negative (for example, she hid his medicine, thereby "causing" his death). Let's call the range of theories that count "causation" by negatives as causation *negative-friendly*, and those that do not *negative-excluding*.

I wish to defend the claim that cases involving negatives in these ways are not, strictly speaking, cases of causation. However, more should be said about this class of cases. I will use the label *quasi-causation* for prevention, "causation" by omission, and the other cases just mentioned, and in section 9.3 I will explain what this amounts to, given that it is not causation. In section 9.4 I will show why it is that we sometimes are tempted to think that cases of quasi-causation really are causation. But first we need to clear the ground by thinking about some of the intuitions that lead people to take the view that these cases either are or are not cases of causation.

9.2 Arguments from Intuition

Arguments for and against the view that I am defending often appeal to "clear intuitions" that we supposedly have about this case or some other; for example, "I clearly didn't cause the death of those starving children in *x* because I'm thousands of miles away, and had nothing whatsoever to do with them," or "Clearly your failure to regularly clean your teeth is the cause of your tooth decay."

However, arguments that appeal simply to allegedly clear intuitions should be treated with suspicion. In the days before the Copernican theory was widely accepted, someone might have said "Our clear intuition is that the sun rises."

Of course, the Copernican theory had to give a clear account of what was going on, an account that explained why, loosely speaking – if not literally – it could be

taken as true to say the sun rises in the morning. (Sections 9.3 and 9.4 will do this for quasi-causation.) So common-sense intuitions about individual cases cannot be taken as sacrosanct.

Consider the following claims:

(A) I caused her death by holding her head under water for five minutes.
(B) I can see the darkness outside.
(C) I caused the terrorist attack in London by failing to report information that I had about it.
(D) The hospital administration caused the death of an elderly patient by refusing to release funds to ship expensive equipment from the USA and thereby allowing her to die by "natural causes."
(E) I caused the terrorist attack in London by failing to be in a pub on a certain night, where I would have overhead about the plot, and by failing to travel to the UK and blow up the terrorists' van before they could do any damage.
(F) I caused the death of some penguins by failing to hire a plane and travel to the Antarctic to intervene in a shark attack.
(G) A man is engrossed in the view at a lookout, and doesn't see a small girl (who he doesn't know) playing nearby. He sees her just as she is about to slip off the cliff, and runs as fast as he can to the edge, hurls himself headlong across the rocks, gets just a finger to the child's shirt as she slips off the edge, but is unable to prevent her from hurtling to her death. He caused her death by omission – had he not been so engrossed, he would have seen her earlier and been able to save her.
(H) My not throwing the rock caused the window not to break.

If we focus on what intuitions we might have about each of these cases, and ask "Is this a case of causation?" we get different answers for different cases. I submit that we would naturally suppose the earlier ones as causation and the later ones as not being causation. However, all the theories of causation mentioned above treat them uniformly. The negative-friendly theories say that these are *all* cases of causation, while the negative-excluding theories say that none of them are.

If this analysis is correct, it spells the failure of any argument that appeals simply to "folk intuitions" about some particular case to establish (1) that indeed it is a case of causation, and (2) that a theory of causation that gives the opposite result is therefore wrong.

So, any account that wishes in some sense to respect intuitions will need to explain why our intuitions vary across cases that are theoretically similar. (I don't myself place high importance on respecting intuitions (Dowe, 2000), but since many theorists do, let's grant this desideratum.)

There is a well-established tradition – probably originating with Mill – which appeals to so-called "pragmatic considerations" to explain why there are counterintuitive cases of causation. On Mill's theory, the scientific "total" cause of an event is sufficient for its effect, but we can consider any part of the total cause that is necessary for the effect a *partial cause*, and we could call partial causes "causes" if we wish. Two types of counterintuitive cases then arise. Intuitively, some partial causes count as causes and others do not (striking the match rather than the presence of oxygen is considered the cause of the explosion). And, intuitively, some very remote

sufficient or partial causes are also counterintuitive (the big bang is not, intuitively, the cause of the explosion, even if it were a sufficient condition). But "pragmatic considerations" explain this. Our intuitions arise in a context in which we focus on aspects of human interest. Some partial causes are of more interest to us for various reasons, and more or less proximate causes are of more interest to us than remote causes; for example, in establishing legal responsibility.

This approach can explain why, for example, we might have different intuitions about (C) and (E). (C) involves additional knowledge, and arguably negligence, features that don't obtain in (E). Or it can explain the difference between (A) and (G) in terms of the agent's intention.

So, in general terms, this solution takes all cases involving negatives as causation and appeals to "pragmatic considerations" to explain why some are counterintuitive. There are two problems with this answer. First, at best it works for those negative-friendly theories of causation that take negatives to be causes or effects, but it won't work for negative-excluding theories. Secondly, it's not clear how this solution works in detail. Take (H), the case of my not throwing the rock causing the window to not break – intuitively not a case of causation, compared with the case in which my throwing the rock causes the window to break. Considerations of human interest – for example, involving partial causes, remoteness, negligence, or value – don't appear to distinguish these cases. This does not mean that no such account could be given, but this remains an unanswered challenge.

If we could give an alternative account that (1) is available to all theories of causation, and (2) that does deliver an explanation for the inconsistency of our intuitions, that account would therefore have to be the preferred answer. We now turn to such an alternative account.

9.3 The Counterfactual Theory of Quasi-Causation

The general outline of this account is to assert that negatives cannot be linked by genuine causation, but we can give a principled account of the near relative to causation, quasi-causation. So what is quasi-causation? (For more details, see Dowe (2000, ch. 6) and Dowe (2001), which the following summarizes.)

> Prevention by omission: not-A quasi-caused not-B if neither A nor B occurred, and
> (1) if A had occurred, A would have caused B.
> where A and B name positive events or facts.

This is the case in which an omission prevents something simply by not causing it. So, for example, "My not throwing the rock caused the window not to break", is true in the circumstances if the counterfactual "If I had thrown the rock it would have caused the window to break" is true; a counterfactual about genuine causation. So quasi-causation is essentially the mere possibility of genuine causation.

The counterfactual account of standard prevention is as follows:

> Prevention: A prevented B if A occurred and B did not, and there occurred an *x* such that
> (P1) there was a causal interaction between A and the process due to *x*, and

(P2) if A had not occurred, *x* would have caused B.
where A and B name positive events or facts, and *x* is a variable ranging over events and/or facts.

The reason this is expressed only as a sufficient condition is that there are other kinds of preventions (see Dowe, 2001).

For example, "I prevented the terrorist attack in London by blowing up the terrorists' van before they could do any damage" is true in virtue of the fact that I blew up the terrorists' van, the attack didn't occur, and there was a genuine causal process – the terrorists beginning to carry out their plan – where (P1) I interacted with that process by blowing up the van, and where (P2) had I not blown up the van, the terrorists beginning to carry out their plan would have led the attack, via a genuine causal process.

Again, quasi-causation is essentially the mere possibility of genuine causation (P2). Such prevention does involve some actual genuine causation (P1), but this is not a relation between A and B, nor A and not-B.

In the case of omissions, we have quasi-causation by omission whenever not-A quasi-causes B, where A and B are positive events or facts, and not-A is an "act of omission":

Omission: not-A quasi-caused B if B occurred and A did not, and there occurred an *x* such that
(O1) *x* caused B, and
(O2) if A had occurred then A would have prevented B by interacting with *x* where A and B name positive events/facts and *x* is a variable ranging over facts or events, and where prevention is analyzed as above.

To illustrate, "I caused the terrorist attack in London by failing to travel to the UK and blow up the terrorists' van before they could do any damage" is true in virtue of the fact that I didn't blow up the terrorists' van, the attack did occur, and there was a genuine causal process – the terrorists carrying through their plan – and the truth of the counterfactual "Had I interacted with that process by blowing up the van, that would have prevented the attack."

More complex cases, which we will pass over here, include cases of prevention by omission where had A occurred, it would have quasi-caused B (one reason why the definition above is just a sufficient condition), prevention by prevention (where both relata are positive but there are some quasi-causal links), and the preventing of such prevention-by-prevention, where A prevents B, but in more complex fashion than that described above (this is why the definition of prevention is given just as a sufficient condition) (see Dowe, 2000, ch. 6).

The counterfactual account of quasi-causation presumes nothing about causation itself. Notice that causation appears in the definition – in other words, is primitive in the theory – so quasi-causation is defined in terms of genuine causation. For this reason, the account is compatible with any theory of causation – one can plug any theory into the definition. This shows us why the counterfactual account of quasi-causation is compatible with any theory of causation. If causation is *x*, we merely stipulate that negatives may not enter into causation, and analyze quasi-causation as

counterfactuals about *x*. This will work even for the counterfactual theory: moreover, it solves the problem that Lewis (1986) has with negative events.

But the account does nothing yet to explain why we have a variety of intuitions about cases of quasi-causation. It takes all our cases to be cases of quasi-causation, not causation. We now turn to this question.

9.4 Epistemic Blur and Practical Equivalence

First, although the theoretical distinction is clear enough, in practice it may not always be clear to us whether an event or fact in question is positive or negative. Events that we think of as negative may turn out really to be positive. In those cases, apparent omissions and preventions turn out to be cases of ordinary genuine causation. Alternatively, apparently positive events may turn out to be negative events and, consequently, cases of apparently genuine causation may turn out to be omissions or preventions. The latter is especially convincing. Take the case of "causing" drowning. Actually, this is quasi-causation, since holding her head under water prevents her from getting oxygen. Thus there is an epistemic blur between quasi-causation and causation.

So, preventions and omissions may be very much more commonplace than we commonly recognize. "Smoking causes heart disease," but perhaps the actual effect of smoke is to prevent normal processes from impacting certain cells in a certain way, so that, in the absence of those processes, diseased cells prosper (causation by omission).

These considerations are of merely epistemic concern. We may not know whether a given case is a prevention or genuine causation, but the conceptual distinction between genuine causation and omissions/preventions is clear enough.

But this widespread uncertainty shows why it is useful practically to treat causation and quasi-causation as if they were the same thing. And the epistemic blur may explain why we might not immediately see the distinction.

Secondly, causation and quasi-causation play very similar practical roles. Negatives (negative facts or events), when they figure in quasi-causation, can be ends and means, and can raise chances. As well as serving as means and ends, since they raise chances they can be evidence for their quasi-effects and quasi-causes, and they can also feature in explanation. Arguably, quasi-causation may also, subject to "pragmatic" considerations, track moral responsibility in just the way that causation does. This is why it does not matter that for practical purposes we don't bother to, or can't, distinguish quasi-causation from causation. The distinction only becomes important theoretically, in metaphysics.

The counterfactual theory can also explain why there is a practical equivalence, given a significant theoretical difference. The unity of causation and quasi-causation lies in the fact that, in essence, quasi-causation is possible causation. That *a* causes *b* is not the same thing as the nonactual possibility that *a* causes *b*. But if *a* might have caused *b*, then *a*'s absence explains and is evidence for *b*'s absence, and bringing about *a*'s absence was a good strategy for ensuring the absence of *b*.

9.5 Explaining Intuitions

It remains to draw together the argument that *negative-excluding* theories explain the range of intuitions better than *negative-friendly* theories. First, pragmatic considerations appealing to knowledge, intention, duties of care, and remoteness are available to *negative-excluding* theories as much as to *negative-friendly* theories. Any difference of this sort that can be used to explain the cases that are counterintuitively causation in virtue of the obtaining of such factors can, on the other side of the coin, also be used to explain cases that counterintuitively are not causation in virtue of the lack of the same factors.

Secondly, the two facts outlined in the previous section – the epistemic blur and the practical equivalence – furnish the answer to cases such as (A) "I caused her death by holding her head under water for five minutes." The answer is that the epistemic problem and the practical equivalence together suggest that we take our undoubted intuition of causation as an intuition that the case is either causation or quasi-causation, rather than as an intuition that it is causation not quasi-causation. It's hard to see how folk could intuit the latter given the deep epistemic problem, and it's hard to see why folk would have such as intuition as the latter given the practical equivalence.

Thirdly, there is a straightforward explanation for the difficult case of *negative-friendly* theories; that is, as to why we think that cases such as (H), my not throwing the rock causing the window not to break, intuitively are not causation. The explanation is simply that this is not causation, as directly entailed by *negative-excluding* theories. The details will depend on which theory of causation we are trying to defend, but will involve features such as the fact that nothing happened and that there is no process between the two "events." I submit that these factors place the *negative-excluding* theories ahead of *negative-friendly* theories in explaining the range of differing intuitions that we have about quasi-causation.

Bibliography

Armstrong, D. 1997: *A World of States of Affairs*. Cambridge: Cambridge University Press.

—— 1999: The open door. In H. Sankey (ed.), *Causation and Laws of Nature*. Dordrecht: Kluwer, 175–85.

Aronson, J. 1971: On the grammar of "cause." *Synthese*, 22, 414–30.

Beebee, H. unpublished: Causes, omissions and conditions.

Bennett, J. 1995: *The Act Itself*. New York: The Clarendon Press.

Bigelow, J. and Pargetter, R. 1990: *Science and Necessity*. Cambridge: Cambridge University Press.

Collingwood, R. 1974: Three senses of the word "cause." In T. Beauchamp (ed.), *Philosophical Problems of Causation*. Encino, CA: Dickenson, 118–26.

Dowe, P. 2000: *Physical Causation*. New York: Cambridge University Press.

—— 2001: A counterfactual theory of prevention and "causation" by omission. *Australasian Journal of Philosophy* 79(2), 216–26.

Ehring, D. 1998: *Causation and Persistence*. Oxford: Oxford University Press.

Fair, D. 1979: Causation and the flow of energy. *Erkenntnis*, 14, 219–50.
Gasking, D. 1996: *Language, Logic and Causation*. Melbourne: Melbourne University Press.
Glover, J. 1977: *Causing Death and Saving Lives*. Harmondsworth: Penguin.
Hart, H. and Honoré, T. 1985: *Causation in the Law*. Oxford: The Clarendon Press.
Hausman, D. 1998: *Causal Asymmetries*. New York: Cambridge University Press.
Lewis, D. 1986: *Philosophical Papers*, vol. II. New York: Oxford University Press.
—— forthcoming: Void and object. In J. Collins, N. Hall, and L. A. Paul (eds.), *Causation and Counterfactuals*. Cambridge, MA: The MIT Press.
Mellor, D. 1995: *The Facts of Causation*. London: Routledge.
Salmon, W. 1997: Causality and explanation: a reply to two critiques. *Philosophy of Science*, 64, 461–77.
—— 1998: *Causality and Explanation*. New York: Oxford University Press.
Suppes, P. 1970: *A Probabilistic Theory of Causality*. Amsterdam: North Holland.
von Wright, G. 1971: *Explanation and Understanding*. Ithaca, NY: Cornell University Press.

Further reading

Dowe, P., Causal processes. In E. Zalta (ed.), *Stanford Encyclopedia of Philosophy*. Stanford University: http://plato.stanford.edu/entries/causation-process/causation-process.html
Hart, H. and Honoré, T. 1985: *Causation in the Law*. Oxford: The Clarendon Press.
Salmon, W. 1998: *Causality and Explanation*. New York: Oxford University Press.

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