The point of refinement

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Bryson Brown (2000) argues that a refinement in my definition of the chances that effects have with and without their causes is empty. He is wrong, because he has missed the ontological point of the definition, which I must therefore restate in order to show why it needs my refinement.

In my (1995) I argue against Davidson (1967) and others that causes and effects are facts, in the minimal non-truthmaking sense of 'fact' given by the principle that a proposition, statement or sentence 'P' is true iff it is a fact that P. If for example a climber Don dies because he falls, I take the stated effect (E) to be the fact that Don dies (roughly when and where he does – a proviso I shall hereafter take as read), and its stated cause to be the fact (C) that Don falls (roughly when and where he does). In calling C and E 'facts', all I mean is that, as all parties agree, the sentences 'C' ('Don falls') and 'E' ('Don dies') are entailed by 'E because C': Don cannot die because he falls if he does not fall or does not die.

On this account, any true 'E because C' which says that C causes E will need a truthmaker with at least three constituents: two to make 'C' and 'E'

true and (since a causal 'E because C' will never be a complete truth func-tion of 'C' and 'E' and will generally if not always be contingent) a third to make 'E because C' true. The main aim of my theory of causation is there-fore to specify this third constituent, since that for me is what adds causa-tion to a world of otherwise causally unrelated facts.

I argue in (1995) that the core condition on my third constituent is that it must make C raise the relevant chance of E, which I write '$ch(E)$'. I say 'relevant' because E will have many chances, just as a tossed coin has many chances of landing heads, running from (say) 50% when it is tossed to 90% when it is about to land. These different chances of the coin landing heads are properties of different facts, the first of facts about how the coin is tossed, the last of facts about its orientation as it lands. Similarly with Don's dying, whose many chances include not only the chance that is a property of his falling as he does, but also the chances that his dying has when he starts to climb, and when he lands. Because these last two chances are properties of facts that include earlier and later causes of Don's dying – namely his climbing (without a rope) and his landing (head down on rocks) – only the first is relevant to the cause that concerns us, namely his falling. So the only chance of Don's dying which his falling must raise if Don is to die *because he falls* is the chance that is a property of his falling as he does. And so in general: the only $ch(E)$ that any cause C of E must raise is the one that is a property of the conjunction of C with the relevant circumstances S, including such facts as how far Don falls, which way up, and onto what.

But what then do I mean by saying that C 'raises' the $ch(E)$ that is a prop-erty of C&S? Since I am trying to say what causation is I cannot *mean* (even if it is true) that C *causes* this $ch(E)$ to be higher than it would otherwise have been. What I say instead is that this $ch(E)$ must be higher than it would be in S without C. That is, following Brown's numbering – taken from my (1995) – I require the conditionals

(4) $C \Rightarrow ch(E) = p$ and

(4~) $\sim C \Rightarrow ch(E) = p'$

to be true in S for some p and p' such that $p > p'$. For definiteness here I give (4) and (4~) the possible-world semantics of Lewis (1973) by taking them to be true iff their consequents are true in all the worlds closest to ours where their antecedents are true. Accepting this equivalence does not however commit me to the existence of Lewis's possible worlds and prim-itive relations of closeness between them. On the contrary, I would reduce both of these to the truth of conditionals for which Lewis's equivalence holds, rather than the other way round. (This is because, for reasons I cannot spell out here, I agree with the actualism memorably expressed by Nelson Goodman (1965, chap. II.4): 'We have come to think of the actual

as one among many possible worlds. We need to repaint that picture. All possible worlds lie within the actual one.' In particular, I think all contingent modal and counterfactual truths need actual truthmakers.)

Thus, as I note in chapter 14.1 of (1995), even if Lewis's equivalence tells us what (4) and (4~) *mean*, it does not tell us what in our world makes them *true*, which is what I want to discover. All (4) and (4~) tell us about that is that their truthmakers in S – which I call 'facta' to distinguish them from facts in my minimal sense of 'fact' – must make C give the relevant ch(E) a value p which is greater than the value p' that ~C would give it. Still, that is enough to dispel any mystery about these truthmakers, since many well-known facta fit just such conditional bills. The example I give in (1995) is of a thing d having an inertial mass M, a factum which for any net force F gives d's accelerating at F/M a chance of 1 if F is applied to d and a chance of 0 if it is not. This seems to require the factum Md to make true two deterministic special cases of (4) and (4~), namely (writing d's acceleration 'A')

'$Fd \Rightarrow ch(A = F/M) = 1$' and

'~$Fd \Rightarrow ch(A = F/M) = 0$'.

But this is not quite right, for if F alters d's mass M, it will *not* accelerate d at F/M and so will *not* make the chance of that acceleration 1: that it will only do if applying F to d does *not* alter M. So the conditionals which Md really makes true are not these special cases of (4) and (4~) but the slightly more complex

'Md & $Fd \Rightarrow ch(A = F/M) = 1$' and

'Md & ~$Fd \Rightarrow ch(A = F/M) = 0$'.

Similarly in general. To simplify matters we may assume that, as in the case of mass, a single factum R (together with the relevant laws of nature) will make both (4) and (4~) true for some p and p' such that $p > p'$ – provided R itself does not depend causally on C. But since R may depend on C, the conditionals it makes true are not in fact (4) and (4~) but those I shall label

(4*)   'R & $C \Rightarrow ch(E) = p$' and

(4~*)   'R & ~$C \Rightarrow ch(E) = p'$'.

Hence my refinement. I say that (4*) and (4~*), not (4) and (4~), are what a factum R must make true for some p and p' such that $p > p'$ if R is to make C raise E's chance and hence enable C to cause E.

Now it may well be, as Brown argues, that the R which makes (4*) and (4~*) true for certain values of p and p' will thereby also make (4) and (4~) true for the very same values of p and p'. If so, then abbreviating with Brown 'the p such that …' to '$(\iota p)(…)$',

$(\iota p)(R \& C \Rightarrow ch(E) = p) = (\iota p)(C \Rightarrow ch(E) = p)$, and

$(\iota p')(R \& {\sim}C \Rightarrow ch(E) = p') = (\iota p')({\sim}C \Rightarrow ch(E) = p')$.

It is his proof of this equality that Brown says makes my factum R redundant and my refinement empty.

But that does not follow. Equality of the values of p and p' defined respectively by (4) and (4~) and by (4*) and (4~*) does not make R redundant. To suppose that it does is to misunderstand the object of my theory of causation, which is to say what it takes in the actual world to make one actual fact C cause another actual fact E. To do that we must say what else must exist in this world, besides whatever makes 'C' and 'E' true, to make 'E because C' true. The core of my answer to that question is that our world must contain a factum R that meets a certain condition, my first stab at stating which was that, for some p and p' such that $p > p'$, R must make (4) and (4~) true. But that is not quite right, for the reason I have given. Hence my revised condition on R, that for some such p and p' R must make (4*) and (4~*) true.

If now, as Brown argues, Lewis's possible-world semantics for might-counterfactuals makes any R meet this condition iff it also makes (4) and (4~) true for the same p and p', so much the better for that semantics – as semantics. But not as an answer to my question about what in our world makes C cause E. To answer that question without committing myself to Lewis's possible worlds and their primitive closeness relations, I need an R in this world that will make (4*) and (4~*) true for suitable values of p and p', whether or not that R also makes (4) and (4~) true for those or any other values of p and p'. So for my purposes, if not for Brown's, my factum R is not redundant and my refinement is not empty.

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