Kutach on Derivative Causation: chapter 4

Kutach's overall aims in Ch 4: Providing an account of general causation based on the definition of difference-making called 'prob-dependence' that was discussed in the previous chapter. He does so by linking prob-dependence and a new notion: prob-influence. A general causal claim is a claim about prob-influence. Positive prob-influence is promotion.

Looking at the promotion relation allows him to consider some typical issues in the causation literature and give his own answers. These issues are include aspect causation, causation by omission and transitivity, with others. He also introduces at the end of the chapter a very weak notion of influence (partial influence).

Prob- and partial influence are operative at the derivative level, while contribution is influence at the fundamental level. Thus the chapter title: here we are dealing with causation in the middle layer of Kutach's overall account. As I see it, what we have here is translation of the fundamental stuff from chapter 2 into the middle layer via the notions of chapter 3.

Outline of chapter

1. Influence

We are first given some 'rhetorical grease' for the definition of prob-influence, though explicitly not justification. In short, Kutach wants us to be well-disposed to the idea that there is such a thing as influence, and that the fundamental laws are a good way to regiment formulations of it.

2. Prob-influence

Here we start to get beyond rhetoric, and into yet more definitions. Kutach gives us the following definition of prob-influence:

> A contrastive event $\hat{C}$ *prob-influences* a coarse-grained event E to the degree that E prob-depends on $\hat{C}$.

(recall, from last time, that the degree to which a course-grained event *prob-depends* on the difference between two contextualised events is the difference between the probability of the course-grained event on one and its probability on the other (and the pair of contextualised events is called a *contrastive event)*)

Now, if the degree of prob-influence is positive, $\hat{C}$ *promotes* E and if the degree of prob-influence if negative, $\hat{C}$ *inhibits* E.

This gives us the terminology. Kutach anticipates and responds to five immediate objections to his equating prob-influence with prob-dependence.

a) No temporal asymmetry. *Reply: no need for it. And if you want it, can add by force*
b) Some dependence is non-causal. *Reply: See chapter 6*
c) Influence should be associated with agency. *Reply: no it shouldn't*
d) Prob-influence is too precise. *Reply: we discard the precision in usual interpretation causal regularities, precision is for fundamental laws*
e) By using these theoretical tools we lose connection to actuality. *Reply: yes we do, prob-influence is independent of what actually happens (aka fundamental reality), it is derivative*

3. General Causation

Main thesis:

> The important content of general causal claims is adequately represented by relations of the form, $\hat{C}$ promotes E.

General causal claims describe probability-raising relations between contrastive events and coarse-grained events. Two examples follow:

(i) A light switch and a distant pristine beach. Select a contrastive event such that the first has the light switch on and the second off (these can be global time-slices exactly similar otherwise). This event will promote the light being on, but not any state of the beach.

Objection: I can pick any contrastive event, as contrast is a fundamentally arbitrary parameter. So I'll pick a contrastive event such that there is *the appropriate connection between the switch's position and the state of the beach. Now there is promotion, right?*

Reply: The contrastive event you pick isn't simply the switch's position, but the conjunction of this and the state of the beach. The latter does promote the state of the beach, trivially. The lesson is that promotion is by the whole contrastive event, not bits of it.

(ii) Lightning and thunder, forest fire and a bolting horse. In the right drought and horse-location circumstances, lightning promotes both forest fires and horses bolting. This can be shown by the fact that if we take an ordered pair of contextualised events, one in which the lightning occurs and the other which is identical bar the microphysical changed needed to remove the lightning, there is a positive probability difference between the probability of forest fires and horses bolting.

Thunder, by comparison, promotes the horse bolting but not the fire. This can be seen in two ways. Firstly, consider the scenario where there is lightning but no thunder: the forest fire is just as likely as with thunder but the immediate bolting is not. Secondly, consider the thunder with no lightning. The fire is as unlikely as of there were no thunder, but the bolting is not.

En passant, Kutach notes that a distinctive advantage his view has over other probability-raising accounts of causation is that he requires no rules for restricting background conditions: the special sciences will tell us which contrastive events are the right ones to consider. In a strange passage he

then states that the probabilities involved are neither objective nor subjective. Once more, we are referred to later in the book for further explanation (ch 8), in this case for how to practically apply the metaphysics to the practical sphere. In short, fundamental reality does determine everything we want, but perhaps in a way forever inaccessible to us. Special sciences therefore take appropriate shortcuts using ceteris paribus clauses and the like.

This concludes the positive part of the chapter. What remains are a series of responses to challenges and applications to issues in the causation literature.

4. Temporally Extended Events

Kutach has been talking about instantaneous contextualised events so far. But causal claims are not just about instantaneous events. So he extends his account to include these. His simple solution is to start with instantaneous contextualised events, run the fundamental laws for the period of the supposed cause, then chuck out any alternatives inconsistent with the temporally extended event and renormalize the probability distribution. This gives a probability that can be used to determine prob-influence. There might be further worries, but discussion of these is postponed to sects. 5.7.1. and 6.4.

5. Idiomatic Differences between Promotion and Causation

Use of the word 'cause' and Kutach's regimentation into promotion do not perfectly coincide. In his overall project, this doesn't much matter: empirical analysis is supposed to provide precisification and isn't hostage to 'recognised truths of the form "C's cause E's"'.

Four differences between promotion and causation as used idiomatically are noted, but none of these are important for Kutach:

(A) Promotion is not factive, i.e. is independent of actuality
(B) Promotion comes in degrees, i.e. is not binary
(C) Promotion applies equally to foreground and background causes
(D) Promotion rules out inhibition, while causation seems not to

6./7. Aspect Promotion and Promotion by Omission

Sometimes an aspect of an event or object is a cause. This is fine for prob-influence, as we simply pick the right contextualised events and get the right result. Aspect talk helps to identify the intended contrast. Promotion by omission is supposed to be a special case of aspect promotion.

8. Contrastivity

Causal claims can be contrastive, e.g. things being this way rather than that caused the following to happen. The contrast can be in the cause or the effect part of the claim (or both). Causal contrastivity is neatly handled by the contrastive element in the contrastive event in prob-influence. Effects can be easily made contrastive, e.g. by making the effect a contrastive event rather than a coarse-grained event.

9. Transitivity

There are three forms of transitivity in the middle layer, weak, unidirectional and strong. These are defined as below:

> *Weak Transitivity of Fixing*: If E fixes a contextualized event throughout region R, any event fixing E also fixes a contextualized event throughout region R.

> *Unidirectional Transitivity of Fixing*: For any E_1, E_2, and E_3, if E_1 fixes E_2 and E_2 fixes E_3 and E_2 is intermediate between E_1 and E_2, then E_1 fixes E_3.

> *Strong Transitivity of Fixing:* For any E_1, E_2, and E_3, if E_1 fixes E_2 and E_2 fixes E_3, then E_1 fixes E_3.

Drawing on ch. 2, Kutach takes Weak Transitivity to be uncontroversial, Unidirection Transitivity to follow if fundamental reality displays shielding and Strong Transitivity to follow from a reasonable regimentation if continuity and shielding both hold (to be discussed shortly).

Basically, Kutach is a fan of transitivity. He deals with purported counterexamples to it by noting that the middle event in an alleged case of the failure of transitivity is a different contrastive event by his lights. Thus, by using contrastive events rather than simply actual events, we can recognise that transitivity isn't violated by these cases. Rather, we have A promoting B, C promoting D and a mistaken identification of B and C.

10./11. Continuity and Shielding

Promotion is continuous if terminance is continuous. I.e. if fundamental reality is such that the fundamental interactions between events is always mediated between what happens in between them (2.7) then whatever is promoted by an event will be promoted by the same degree by something intermediate that the promoter fixes.

Likewise for promotion and shielding: it obeys shielding principles if the fundamental laws do.

12. Partial Influence

Here we come to a final aspect of Kutach's account of derivative causation. Thus far, we have been talking about prob-influence: a relation that is of primary importance to Kutach. But there's another derivative form of influence that he wants in his 'conceptual tool-box': partial influence. We have yet more definitions here:

> A *regular contrastivization* of a coarse-grained event C is a contrastive event (C_1, C_2) such that all three of the following conditions hold: (1) for every member of C_1, there is a member of C agreeing with it throughout the region where they overlap; (2) none of C_2's members agrees with any of C's members where their regions overlap; and (3) C_1 and C_2 agree with each other everywhere outside C's region.

Using this, we can say:

> An event C *partially influences* an event E iff some contrastivization of C prob-influences E to a non-zero degree.

So an event partially influences another if there is some contrastive event such that the contrastive events agree outside a defined region, they disagree within this region and this prob-influences the latter event (to a non-zero degree). If we only allow contrastivizations space-like separated from *C*, partial influence becomes 'nearly equivalent' to contribution. (There's irregular contrastivisation too, but I'll pass over that.)

The central idea here, I take it, is to capture a notion of making any difference at all to something. As an example, we can consider an event C simultaneous with another event E and such that the world being C given initial conditions S makes is more likely that E, because E happens due to S more often when C also happens than when it doesn't. C is a partial influence on E, despite having no prob-influence relation to it.

Kutach realises that it is controversial to take as causative any probabilistic relationship like this that could be extremely weak. But, again, he's not too concerned by this sort of controversy.

Conclusions and questions

We are quite a long way down the rabbit-hole at this point in the book, so questions and criticisms about the overall project are not likely to arise. However, it is clear from the chapter that Kutach wants to apply the fundamental level relations in an analogous way to the derivative level. The derivative level is the level that the typical metaphysics of causation literature uses for examples, so the tension here between Kutach's empirical analysis project and the other approaches to metaphysics is particularly stark.

Some questions:

Does it really not matter whether the folk-concept/idiom/intuitive view corresponds to his regimentation? Why the rhetorical grease?

Why reasons do we have for thinking that the fundamental and derivative levels ought to behave in parallel? (Or have I missed something?)

How does discussion of the field of possibilities get cashed out? I.e. do we have to be Lewisian concretists about possible worlds to warrant the apparent view that actual events are no more important than merely possible events for influence?

Is influence connected to causation or could a sceptic say that Kutach is providing a definition of a *sui generis* thing that is completely distinct?

Are there particular problems within Kutach's own set-up? (I couldn't see any, but was largely focusing on exegesis!)

If this explains general causal claims, what are we to say about specific ones? Is that coming in analysis of the top conceptual layer?

Are all the definitions necessary for the required precision, or are they an artefact of Kutach's idiosyncratic philosophical style?!