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Varieties of Multiple Antecedent Cause

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Abstract

A great deal has been written over the past decade defending 'higher-level' causes by arguing that overdetermination is more complex than many philosophers initially thought. Although two shooters overdetermine the death of a firing squad victim, a baseball and its parts do not overdetermine the breaking of a window. But while these analyses of overdetermination have no doubt been fruitful, the focus on overdetermination—while ignoring other varieties of causal relation—has limited the discussion. Many of the cases of interest resemble joint causes or a cause necessitating a simultaneous epiphenomenon as much as they resemble overdeterminers. If we are to fully understand higher-level causation, we need to distinguish it from these causal relations as well. This paper is dedicated to the task, focusing especially on the 'threat' that higher-level causes are epiphenomena necessitated by lower-level causes.

Keywords: mental causation; non-fundamentalia; overdetermination; epiphenomena; causal exclusion; non-reductive physicalism.

1 Introduction

A great deal has been written over the past decade arguing that overdetermination is more complex than the philosophical tradition had previously recognized. Although two bullets overdetermine the death of a firing squad victim, a baseball and its parts do not overdetermine the breaking of a window.[1] These points have been called on in defense of mental and other 'higher-level' causes against the claim that they, together with physical causes, overdetermine their effects.[2] But while these analyses of overdetermination have no doubt been fruitful, the focus on overdetermination—while ignoring other varieties of causal relation—has derailed a broader discussion. Many of the cases at issue resemble, for instance, joint causation as much as they resemble overdetermination. If we are to fully understand higher-level causation, we need to distinguish it from these causal

[1] See, inter multos alios: [Marcus, 2001], [Bennett, 2003, Bennett, 2008], [Thomasson, 2006], [Kroedel, 2008]: 129, [Wilson, 2009]: 152. Ancestral views may be found in [MacDonald and MacDonald, 1986], [Yablo, 1992], and many others.

[2] For the attacks, see, inter alios, [Malcolm, 1968], [Kim, 1989], [Merricks, 2001], [Ney, 2007].

relations as well. This paper is dedicated to the task, focusing especially on the 'threat' that alleged higher-level causes are in fact *epiphenomena* necessitated by lower-level causes.

1.1

In the traditional rubric of two-place causal relations, let me say that a Multiple Antecedent Causal Relation (henceforth MACR) has more than one event in the causal role.[3] The received view is that there are at most two varieties of MACR: joint-causes and (for some philosophers) overdeterminers. This paper contends that there is a third, *coupled* causes, and suggests that there are others.

Coupled causes are non-identical "causal equivalents" with respect to some effect. I call A and B "causal equivalents" if and only if there is some effect E for which it is true that:

CE (i) each is sufficient to cause E and (ii) A occurs iff B occurs.[4]

Where A = B and A (B) is a cause of E, this is uncontroversial. Every cause is 'causally equivalent' with itself. But if, in addition to being causal equivalents, A ≠ B, then A and B are coupled causes.

After giving plausible examples of coupled causes, I distinguish the case in which A and B are coupled causes from those cases in which (1) F and G jointly cause an effect, (2) H and J overdetermine an effect, and (3) L causes an effect and M is a necessary epiphenomenon of L. Briefly, each joint cause is insufficient to bring about the given effect; each coupled cause is sufficient. Overdetermining causes are both sufficient for the effect and they are independent of one another; coupled causes are mutually dependent, each on the other. Where one of two apparent causes is an epiphenomenon with respect to an effect, one of the two is *merely* an apparent cause of the relevant effect; and, as we shall see, it may be that an epiphenomenon M depends synchronically on the cause L *but not vice versa*. Where A and B are coupled causes, by contrast, each actually does cause the effect; moreover, each is necessary for the other, and thus their synchronic dependence is symmetric.

[3]Throughout this paper, I write as though events are the causal relata. If it is instead the case that tropes [Campbell, 1990], facts [Bennett, 1988], or some other entities are the causal relata, it would not much affect the kernel of my argument; examples and many details, though, would demand amendment. The same is true if the causal relata are three [Van Fraassen, 1980] [Hitchcock, 1993], [Hitchcock, 1995], [Hitchcock, 1996] or more [Schaffer, 2005].

[4]It is not assumed here that causes are sufficient for their effects *full stop*. Rather, I assume that they suffice *given background conditions*. For simplicity, I elide reference to background conditions.

2 Examples

Consider a weight, O, and its parts, O_1, O_2,...,O_n—its halves, its thirds, the molecules, atoms, or sub-atomic particles composing it, etc. The exact decomposition doesn't matter. What matters is that there is only one of O but there are many parts composing it and occupying the same space O does.[5] [6] Suppose that putting O on a scale at t caused it to tip. Call the scale's tipping event E, and let P be the property or set of properties involved in bringing E about, let's say *exerting force X on the scale's pan*.

Finally consider two Kimian events. Kimian events are triples of one or more individual, a constitutive property instantiated by the individual(s), and the time at which this instantiation occurs: $\langle$i, P, t$\rangle$. And event1 $\langle$i, P, t$\rangle$ = event2 $\langle i_1, P_1, t_1\rangle$ iff i = i_1, P = P_1, and t = t_1. ([Kim, 1993]) Using the individuals defined above and P, then, we are interested in the two different events: A = $\langle$O, P, t$\rangle$ and B = $\langle O_1, O_2,\ldots,O_n$, P, t$\rangle$. A is O's exerting force X at t and B is O's parts' exerting force X at t.

Clearly, A occurs iff B occurs. And A tips the pan of the scale iff B does, so each is sufficient to cause E and necessary for the other. That is, A and B are causal equivalents with respect to E. It is dubious, however, that A = B. If A were identical to B, then O would be identical to O_1, O_2, ..., O_n; and if this were true, then it would be true that a composite individual is identical to its parts. That is, the thesis known as "strong composition as identity" would hold. Many philosophers explicitly deny strong composition as identity.[7] Trenton Merricks provides a *reductio*: if O = O_1, O_2, ..., O_n, then identity sometimes holds one-to-many. But this is absurd. ([Merricks, 2001]: 21) "Identicals" have all the same properties, but O is one while O_1, O_2, O_3 are three. Merricks denies composition as identity on these grounds, and thus he would believe that A $\neq$ B. He should believe that A and B are coupled causes.[8]

[5] I use "," and "..." here and below to indicate the parts "taken together" rather than taken *as a sum*. The parts are many; their sum is one. Many philosophers deny 'strong Composition as Identity', i.e. that the parts are identical to the composite, on the grounds that the former are many while the latter is one. (E.g. [Merricks, 2001]: 21) This line of reasoning of course fails if applied to the sum of parts.

[6] I am grateful to XX not only for supplying this example but also for showing very clearly that it is apt for my purposes here.

[7] See, for example, [Lewis, 1991], [Yi, 1999], [Merricks, 2001], [Sider, 2007]; see [Baxter, 1988a, Baxter, 1988b] for the best known arguments to the contrary.

[8] But of course he does not. Instead, he denies that composite entities like object O *exist*. He avers that *if*

But even if strong composition as identity holds, there are still other examples of coupled causes. For it is sometimes the case that an event partly constituted by a composite is coupled with an event constituted by *just one* of the composite's parts. Think of the events involved when I cut myself shaving this morning. (1) the razor cut my face; (2) the razor's *blades* cut my face; (3) it cut me *quickly*. These differences may seem trivial, and perhaps one is inclined to deny that there are multiple events here. But notice that we typically do take these differences seriously. The first two events concern different objects: the razor in the first, its blades in the second. These are surely distinct objects, but the apparent triviality of their difference is thanks to the fact that the blades are part of the razor. They bear the relation of part to whole. With the third event, the razor instantiates a different property: it cuts quickly. This difference is apparently trivial because *cutting quickly* is a determinate of the first event's determinable property *cutting*.

But these differences are plausibly the very same that distinguish "levels" of events, of causal powers, and of scientific explanations. "Lower-level" events involve parts of higher-level wholes and/or determinate properties of higher-level determinables. Atoms are parts of molecules, which are parts of cells, which are parts of organs and neural chains, which are parts of language-users, which are parts of social groups... and so on. Whatever arguments may establish that events proprietary to distinct levels are distinct shall also establish that coupled causes are distinct; and if there are genuine causal powers appropriate to distinct levels, then there are coupled causes.

I've made the case that there are non-identical causal equivalents; let us now turn to distinguishing these cases from the more familiar MACRs.

3 Joint Causes

Consider the case in which F and G jointly cause an effect. Let us define the compound event Q as follows: Q = (F & G). That is, Q is the event of both F and G occurring. And let Q be a cause

composite entities existed, they wouldn't be identical to their parts but they would, together with their parts, overdetermine their effects. Since these effects aren't overdetermined, Merricks concludes that objects like O in fact do not exist. (He makes an exception for living macroscopica on the grounds that living things bring about effects distinct from those brought about by their parts.) Since coupled causes do not overdetermine their effects, they offer a more intuitive solution to the problem Merricks raises. Many other philosophers have solved the problem by similar appeals to a dependence relation between macro- and microscopica. (See, for instance, [Thomasson, 2006] [Kallestrup, 2006] [Bennett, 2003].)

of E: for whatever theory of causation is true, let Q and E satisfy the criteria for Q's being a cause of E on this theory.

Now consider two of the ways in which this situation might obtain. (i) F and G are each sufficient to cause E; (ii) neither F nor G is sufficient to cause E. In case (ii), F and G are joint causes of E. In case (i), the two causes may be coupled causes or they may overdetermine the effect. Let us suppose for now that they are coupled causes.

Consider again events A and B. The former is a weight, O's, instantiating property P at a time; the latter is O's parts' instantiating P at the same time; each tips a scale. These suggest another tidy example. Suppose the scale is set up so that it tips only if force X is applied to the pan. Let the scale's tipping at a time be effect E. As defined above, P is *exerting force X on the scale's pan.* As we saw above A and B are causally equivalent with respect to E. Each is sufficient for the effect and necessary for its opposite in the couple. By contrast, an event involving one of O's halves without the other is insufficient to bring about E; two such events would be joint causes.

4 Overdeterminers

If E has two sufficient causes, however, then E seems to be overdetermined. As noted above, a great deal has been written on overdetermination cases of this sort; so I will be brief.

Two considerations show that coupled causes A and B should be distinguished from overdeterminers H and J. I'll sketch their outlines and then give a slightly more detailed explanation. First, there is an intuitive contrast between the familiar "firing squad" cases and cases involving coupled causes. Second, coupled causes are as "closely" related to one another as are adjacent links in a causal chain; if the latter do not overdetermine their effects, as many think[9], then neither should the former. In each case, the dependence relation between coupled causes is what differentiates them from overdeterminers. Overdeterminers H and J are independent of one another; coupled causes A and B are not.

In the "firing squad" cases of overdetermination, a man's death occurs as the result of two

[9]See [Goldman, 1969]: 471-3, [Kim, 1989]: 252, [Yablo, 1992]: 272, [Mellor, 1995]: 103-5, [Yablo, 1997]: 255, [Bennett, 2003]: 479.

independent and sufficient causes. The condemned man, call him Garcin, is brought before the line of executioners, and then "Ready... Aim... Fire!" Suppose that two of the shots strike him such that each would, under normal circumstances, be fatal. It seems that Garcin's death is overdetermined.

The shots are not coupled causes; they fail to meet the second condition of CE: "A occurs iff B occurs". It is certainly possible for one shot to have been fired and the other not. But there are also coupled causes of Garcin's death: *one* of the bullets and its parts. Dub one of the bullets O; then call its left half O_1 and its right half O_2. Suppose O struck the bridge of Garcin's nose with such and such a force at time t, and it was fatal. Call this event A, and let B be the event of O_1 and O_2 striking Garcin at time t with the same force. Since A is sufficient for Garcin's death iff B is, they satisfy CE. And, as above, given that composites are not identical to their parts, $A \neq B$. Do they overdetermine Garcin's death, then? Of course not.

We need not accept this to separate coupled causes from overdeterminers, though. We can instead appeal to similarities between coupled causes and links in a single causal chain. As noted above, it is widely held that earlier links in a single causal chain do not overdetermine later links in that chain. If A causally suffices for B and B suffices for E, then even though both A and B would be causally sufficient for E, it's dubious that A and B overdetermine E. Systematic overdetermination would be far more prevalant than we think, and it would become more prevalent as causal chains grow longer.[10] Intuitively, it's the very fact that there is a causal dependence between links A and B that prevents them from overdetermining E. If so, then the causal dependence between coupled causes should have the same effect. Coupled causes no more overdetermine their effects than do links in a single causal chain.

I conclude that coupled causes are not overdeterminers.

[10]The relevant terminology here is used inconsistently in the literature. The distinction is sometimes between what is called "overdetermined" and what is not [Bennett, 2003], and it is sometime between what is "objectionably" (or some similarly disapproving modifier) overdetermined [Thomasson, 2006] and what is merely "overdetermined". In either case, a theory that entails the former (overdetermined or objectionably overdetermined effects) is under suspicion while a theory committing to the latter is not. I adopt the former terminology, but nothing substantive turns on this choice. If there are good reasons to prefer another vocabulary, my arguments can be easily translated.

5 Coupled causes

Coupled causes bear a resemblance to causal relations proposed by various "Causal Compatibilists".[11] The separate remarks of D. Gene Witmer and Ausonio Marras come closest to the discussion here. Each author distinguishes between two kinds of overdetermination wherein dependence plays a role in one kind and not the other.[12] As with these proposals, coupled causes defuse Jaegwon Kim's "Supervenience Argument".[13] Unlike all other proposals in the literature, however, the dependence between coupled causes is symmetric in the nomologically possible worlds.[14] We shall see in the next section that this makes all the difference in distinguishing between coupled causes and a case in which a genuine cause necessitates an epiphenomenon. But first it is helpful to clarify coupled causes further.

Above, we defined a compound event Q: Q = (F & G). We added that Q is a cause of E, and we said that if F and G are each insufficient to bring about E, then F and G are joint causes. But if F and G are each sufficient for E, then either E is overdetermined or F and G are coupled causes. We now know what distinguishes these two latter possibilities: whether or not each cause depends on the other.

So let us define another compound event K: K = (A & B). K is a cause of E; unlike joint causes F and G, A and B are each sufficient for this same effect, E. And unlike overdetermining causes H and J, each depends on the other in actuality—by which I just mean that if either A or B fails to occur in the relevant worlds, the other fails to occur as well. So A and B are coupled causes. And

[11] "Causal Compatibilism" comes from Terence Horgan [Horgan, 1998]. Jens Harbecke refers to many of the same ideas under the banner "New Compatibilism" [Harbecke, 2009]: 163. See also Simon Blackburn [Blackburn, 1991], Derk Pereboom and Hilary Kornblith [Pereboom and Kornblith, 1991], Stephen Yablo [Yablo, 1992, Yablo, 1997], Tyler Burge [Burge, 1993], D.H. Mellor [Mellor, 1995], Paul Noordhof [Noordhof, 1997], Eric Marcus [Marcus, 2001]: 58, Derk Pereboom [Pereboom, 2002], Karen Bennett [Bennett, 2003]: 480, Sydney Shoemaker [Shoemaker, 2004], Amie L. Thomasson [Thomasson, 2006]: 353, and John Carroll and William Carter [Carroll and Carter, 2005]: 14-5

[12] See [Witmer, 2003]: 205 and [Marras, 2007]: 318-9. In Witmer's "dependent overdetermination", one overdetermining cause depends upon its partner "not merely nomologically"; in his "autonomous overdetermination", the overdetermining causes are independent. ([Witmer, 2003]: 205) In Marras's "non-ordinary, dependent overdetermination", one overdetermining cause supervenes on the other cause while in "ordinary" or "standard" overdetermination, the causes are independent. ([Marras, 2007]: 318-9) In contrast to Witmer's emphasis on a dependence that is more than nomologically necessary, Marras focuses on the nomological necessity of supervenience.

[13] I won't rehearse the argument or the Compatibilist response to it here; others have already done a better job than I could hope to do. See, for instance, [Sider, 2003], [Bennett, 2003], [Marras, 2007], [Wilson, 2009].

[14] Note that this is consistent with the dependence being asymmetric in the metaphysically possible but nomologically impossible worlds. So higher-level or non-fundamental causes may still be metaphysically grounded in the lower-level or fundamental causes with which they are coupled. For further discussion, see §6.1.3

since A and B are the causes of E in actuality, E's occurrence depends on them, and so E is also absent in the relevant nearby worlds.

It may seem obscure how A and B relate to K. Since we've said that both A and B are sufficient causes of E, it appears that the occurrence of either A or B suffices for the occurrence of K. It may be mysterious, then, how A could be sufficient for K's occurrence if B is necessary for the same. For one might assume that A's being sufficient for K means that A's *occurring in the absence of any other events* suffices for K; but surely A cannot suffice for K in the absence of other events if K cannot occur without B.

A does not need to suffice for K in isolation, however, in order to suffice for K. Rather, it need only be the case that A $\Box\!\!\rightarrow$ K holds in actuality and relevant nearby possible worlds, as is the case.

Similarly, it may be puzzling how B can be necessary for K if A is sufficient for the same—how can K depend on the presence of B if A's presence suffices for K? But B need not prevent any other occurrences from sufficing for K in order to be necessary for K. It need be only that K $\Box\!\!\rightarrow$ B holds in actuality and relevant nearby worlds; and this is the case.

Let us be explicit about the principle that would preclude such relations between sufficiency and necessity: if A suffices for E, then no B is necessary for E.[15] First, note that if A = B = E, then the principle carries an implausible entailment. Assuming that A (= B = E) suffices for itself (E), it would follow that it (B) is not necessary for itself (E). Indeed, if this principle is true and if every E suffices for itself, it follows that B is not necessary for E no matter what B's value. That is, it follows that no individual is necessary for itself or for any other: there are no necessary dependencies.

But suppose we stipulate that the principle applies only if A, B, and E are all distinct from one another. Still it is implausible: (A $\Box\!\!\rightarrow$ E) clearly doesn't establish that $\neg$(E $\Box\!\!\rightarrow$ B). Consider an example:

[15] See, for example, Ausonio Marras, "Ordinarily, when we say that a cause *c* is sufficient for an effect *e* (under the prevailing circumstances), we imply that *no other condition is necessary*." (Emphasis in the original; [Marras, 2007]: 319) Initially, Marras claims on the basis of this principle that if causes A and B are mutually dependent, then "it is *not true* that each qualifies as a *sufficient* cause" of any effect. (Emphases in original; ibid) I argue against this inference here. But further along, Marras draws a conclusion that he doesn't seem to distinguish from its forerunner, "neither [of the causes] qualifies as an *independently* sufficient cause" of an effect. (Emphasis added; ibid.) I have no qualms with this conclusion.

A ABC is an equilateral triangle

B ABC has at least one 60 degree angle

E ABC has at least two 60 degree angles

A suffices for E while B is also necessary for it. As regards causal sufficiency and necessity, let A, B, and E be the events from the second appearance of our earlier example, in which the scale tips only if force X is applied to the pan:

a The weight O's exerting force X on the scale's pan at t

b O's parts' exerting force X on the pan at t

e The pan's tipping at t + n

This is perhaps less intuitive than the previous case, but given what we've said it strikes me as clear that A suffices for E and B is necessary for the same.

Furthermore, where events A and B are coupled causes, the relation between them is symmetrical. A suffices for E and B is necessary for the same; and B suffices for E while A is necessary for the same. The principle that would support worries about coupled causes is thus false. And, as we have seen, non-identical events A and B may each be sufficient and necessary for the same effect E; the requirement is that A $\leftrightarrow$ B holds in actuality and the relevant nearby worlds. The apparatus of possible worlds is powerful and useful partly because it reveals and clarifies such distinctions. Indeed, it has permitted us to discover an arrangement between cause and effect that has hitherto been obscured. Events that jointly cause an effect are each insufficient for the presence of a cause. Events that overdetermine an effect are each sufficient but at least one is unnecessary for the presence of a cause. And, finally, coupled causes are each both necessary and sufficient for the presence of the given cause.

The following is a list of the salient relations that hold in actuality and nearby worlds between coupled causes A, B, and the cause K (= A & B).

1. A $\leftrightarrow$ K
2. B $\leftrightarrow$ K

3. A $\leftrightarrow$ B

4. (A $\vee$ B) $\leftrightarrow$ K

6 A Cause that Necessitates a Simultaneous Epiphenomenon

But now there arises the difficult issue of a necessary epiphenomenon. Suppose L causes E, and L $\leftrightarrow$ M holds with causal necessity, while M is an epiphenomenon of L.[16] Now let us define N: N = (L & M). And let us add that N is a cause of E. Thanks to L $\leftrightarrow$ M, then, it's true that (L $\vee$ M) $\leftrightarrow$ N. And thus, L $\leftrightarrow$ N and M $\leftrightarrow$ N. Of course, L, M, and N now stand in the relations delineated just above for A, B, and K. Does nothing, then, distinguish coupled causes A and B from a cause and epiphenomenon like L and M?

The answer is qualified: nothing in the relation between A, B, and K suffices to distinguish them from L, M, and N. But there is nonetheless a difference: in the relation between A or B and E on the one hand and M and E on the other. Both A and B are causes of the relevant E while M is not.

But of course this incites the rejoinder: *but nothing in what I've said so far justifies this distinction.* This is true, but it's not my problem. So far as M's causal relation to E depends on the pattern of actual and counterfactual occurrences they cut in the relevant worlds, so far shall cases like A and B remain indiscernible from cases like L and M. In other words, we have just as much reason to think that M is a cause of E as to think that A, B, or L is.

And this reveals the pressing question in the epiphenomenon case on offer: on what grounds is it supposed that M is an epiphenomenon with respect to E? By hypothesis, M occurs in the same pattern of actual and counterfactual occurrences as L does. And, by our assumption, this same pattern of occurrences establishes that L is a cause of E. Why, then, should we suppose that M is not a cause of E? Whatever reasons there may be, they are ancillary to an account of coupled causes. Our analysis is general: *whatever* conditions establish that a cause is sufficient for an effect, coupled causes satisfy them; epiphenomena don't.

[16] Or, if you are skeptical about the existence of completely impotent events, then suppose simply that M is not a cause of E. Perhaps the individual constituting L and M is the candy that made you sick, and L has its glucose properties while M has its color properties.

In addition, where there should be tension between these conditions and whatever evidence there might be that some event is an epiphenomenon, the conflict has nothing to do with the account of coupled causes. Rather, it obtains between the evidence for the pertinent event's being a cause and the evidence for its being an epiphenomenon.

This then suggests a second rejoinder: *is it not evidence for an event's being epiphenomenal that its putative effect also appears to be effected by a simultaneous event?* This sentiment is at the heart of the challenge from epiphenomena. But what could justify it? This is a difficult question, and one worth exploring thoroughly. Jaegwon Kim defended a very similar principle in one of his earliest expositions of "the exclusion argument" ([Kim, 1989]), though it is less explicit in his later formulations. As we shall see, the force of the exclusion problem, as articulated there, comes less from the threat of overdetermination and more from epiphenomenalism[17]; neither threaten coupled causes, though.

6.1 Kim's Argument Against "Nomic Equivalents"

Kim addresses "simultaneous nomic equivalents", as found in [Goldman, 1969]. Simultaneous nomic equivalents are necessary and sufficient for one another by nomic necessity. Kim alleges that the relation between nomic equivalents is "inherently unstable".

Since nomic equivalents are necessary and sufficient for one another by nomic necessity, they are causally equivalent with respect to all of their nomically possible effects; thus, all nomic equivalents are causal equivalents. And, since Goldman proposes that nomic equivalents are distinct events, all nomic equivalents are coupled causes. But not all coupled causes are nomic equivalents. A and B may be coupled causes with respect to some events but not others, or they may not be caused by all of the same events. Thus, if Kim's argument against nomic equivalents holds, it may not impugn coupled causes; but if it fails against nomic equivalents, it fails against coupled causes as well. We shall see that it fails for both.

In what follows, I rehearse Kim's many arguments, refuting each in turn.

[17] As Kim himself claims [Kim, 1998]: 53, though many have assumed otherwise [Bennett, 2003,Merricks, 2001,Sider, 2003].

6.1.1 The Principle of Explanatory Exclusion

Kim sets out to defend the following principle:

EE No event can be given more than one complete and independent [causal] explanation. ([Kim, 1989]: 79)

Kim's defense of EE is an attempt to show that where there are two purported causes of a single effect, each is a 'complete' cause only if it is not 'independent' of the other, and they are independent of one another only if one or the other is not a complete cause of the effect.

But Goldman does not dispute this, and it is consistent with all we've said so far as regards coupled causes. Each nomic equivalent depends on the other by nomic necessity, and each coupled cause depends on its mate in all the relevant nearby worlds. Coupled causes are not independent and neither are nomic equivalents.

But notice that (i) these dependency relations are symmetric, and that (ii) Kim doesn't have symmetric dependence in mind. Rather, he claims that there must be an *asymmetric* dependence between nomic equivalents.

> The kind of situation Goldman describes... is an inherently unstable situation... The instability of the situation generates a strong pressure to find an acceptable account of the relationship between [causes] C and C*, and, by extension, that between the two systems to which they belong; the instability is dissipated and a cognitive equilibrium restored when we come to see a more specific relationship between the two explanations. As we shall see, in cases of interest, the specific relationship replacing equivalence will be either identity or some asymmetric dependency relation. ([Kim, 1989]: 85-6)

As it is stated, then, EE is irrelevant. All parties agree that coupled causes are dependent on one another. The disagreement, rather, is over another principle that Kim does not explicitly defend; let's call it EE*.

EE* No event has more than one cause unless one of the causes is *asymmetrically* dependent on the other.

Indeed, Kim's case that one simultaneous nomic equivalent is an epiphenomenon turns on the asymmetric dependence Kim alleges to hold between them. Kim endorses the following two principles:

1. No symmetric dependence relation short of identity holds between synchronic events.

> . . . a certain instability exists in a situation in which two distinct events are claimed to be nomologically *equivalent* causes or explanations of the same phenomenon; stability is restored when *equivalence is replaced by identity or some asymmetric relation of dependence*. (Emphasis in the original; [Kim, 1998]: 86)

2. Where an asymmetric dependence relation holds between synchronic events, one is an epiphenomenon of the other.

> . . . either two explanations (or causes) in effect collapse into one or, if there indeed are two distinct explanations (or causes) here, we must see one of them as dependent on, or derivative from, the other—or, what is the same, one of them as gaining explanatory or causal dominance over the other. ([Kim, 1998]: 86)

Kim's thought seems to be that if one simultaneous nomic equivalent has 'causal dominance' over the other, then it preempts its partner, much the way a temporally prior cause preempts a later one. This is an interesting proposal, and it should be taken seriously in order to understand why higher-level causes are not epiphenomenal. But such considerations do not threaten simultaneous nomic equivalents because neither causal equivalent causally dominates the other. And the same goes for coupled causes. This is possible because 1 is false.

6.1.2 Two arguments for *dependence*

Kim provides two arguments for EE that he apparently believes to support EE* as well. But they do not: they establish that there is a dependence relation between coupled causes, but they do not establish that this dependence is asymmetric.

1. Let us consider the more succinct argument first.

> These considerations suggest the following simple argument for explanatory exclusion for causal explanations: Suppose that C and C* are invoked as each giving a complete explanation of E. Consider the two questions: (1) Would E have occurred if C had not occurred? and (2) Would E have occurred if C* had not occurred? If the answer is "yes" to both questions, this is a classic case of overdetermination. . . If the answer is a "no" to at least one of the questions, say the first, that must be because if C had not occurred, C* would not have either. And this means that C and C* are not independent, and hence that the two explanations are not independent explanations of E. ([Kim, 1989]: 92)

As we have seen, A $\leftrightarrow$ B holds in actuality and the nearby worlds for coupled causes A and B; so we answer "no" to both questions (provided that all else is held equal and that there are no other

causes of E in the context, of course). Thus, there is, as Kim says, a dependence relation between them. But we have no reason to believe that this dependence is asymmetric. The same goes for nomic equivalents. On to the other argument.

2. The argument we're addressing second in fact comes first in Kim's article (it is the referent of "these considerations" in the preceding quotation). Kim's strategy here is to give an exhaustive list of the possible relations between nomic equivalents, showing that unless E is overdetermined, the relation between the causes is a dependence relation. If the relation is identity, then E has only one cause, and so EE stands; if it is a dependence relation weaker than identity, then EE still stands. EE* remains unsupported, though. Here is Kim's list:

1. C = C* (89)
2. "C is distinct from C*, but is in some clear sense 'reducible' to, or 'supervenient' on C*." (90)
3. "Neither C nor C* is in itself a "sufficient cause" of E, though each is an indispensable component of a sufficient cause." (90)
4. "C and C* are different links in the same causal chain leading, say, from C to C* and then to E. In this case again we do not have two independent causal explanations; the explanans of one, C*, is causally dependent on the explanans of the other, C." (91)
5. C and C* overdetermine E. (91)

We have distinguished single causes from 3, joint causes, and 5, overdeterminers, above. 1 is true only if, for instance, the weight is identical to its parts, the razor is identical to its blades, *cutting* is identical to *cutting quickly*, etc.; moreover, Goldman proposes nomic equivalents as incompatible with 1. If we assume that links in a causal chain are not simultaneous, 4 is also inconsistent with Goldman's simultaneous nomic equivalents. And of course the coupled causes we've discussed are not different links in the same causal chain (though I have left it open that there are such coupled causes).

Thus, only 2 remains. As stated, it does not entail asymmetric dependence: supervenience is sometimes symmetric, and Kim admits as much in a later work, *Mind in a Physical World*: "... mind-body supervenience as stated isn't symmetric; in general, the supervenience of A on B does not exclude the supervenience of B on A." ([Kim, 1998]: 11)

Supervenience is a relation between sets of properties: a *supervenience set*, call it set *Alpha*, and a *base set*, call it set *Beta*. The popular slogan for the relation is: *Alpha* supervenes on *Beta* if and only if no two individuals can differ in their *Alpha* properties without also differing with respect to their *Beta* properties.[18] If {P, ¬P} is the base set and {Q, ¬Q} is the supervenience set, then for all x and y, if x and y are both P, then x and y must either both be Q or both be ¬Q. They must have the same properties from the supervenience set since they have the same properties from the base set.

And this relation does not always hold asymmetrically. For instance, a set of "positive" properties {A, B, C...} supervenes on the set of its complements {¬A, ¬B, ¬C...}, and vice versa: x and y cannot differ in their "positive" properties without differing in their "negative" properties. Similarly, notice that every set of properties supervenes on itself. For all x and y, if x and y have the same *Alpha*-properties, x and y must have the same *Alpha*-properties. The dependence herein is not asymmetric.

Moreover, if 2 did state that there must be an asymmetric relation between C and C*, it would be implausible that the list is exhaustive: the foregoing accounts of coupled causes and nomic equivalents demonstrate as much. Insofar as these accounts are plausible, it is thus far *im*plausible that such a revised edition of Kim's list would be exhaustive.

6.1.3 An argument for asymmetric dependence

But Kim does attempt to show that reduction is an asymmetric relation, and he does attempt to show that nomic equivalents satisfy the conditions for reduction. Let us grant that each psychological event has a physical nomic equivalent; this licenses the inference to P1.

(P1) Every psychological event depends on a physical event by nomic necessity.

(P2) If psychological events are dependent on physical events by nomic necessity, then psychological events are reducible to physical events.

(P3) If psychological events are reducible to physical events, then psychological events asymmetrically depend on physical events.

[18] There are in fact a number of supervenience relations. For simplicity, I am reviewing only local, strong supervenience, which is Kim's preferred relation. See, for example, [Kim, 1998]: 9.

(C1) Psychological events asymmetrically depend on physical events.
([Kim, 1989]: 88)

This argument is valid, but either P2 or P3 is false. I am sympathetic with P2, but if P3 is true as well, then the "one-way" dependence of psychological events on physical events logically precludes dependence in the other direction.

The general principle is that A's depending on B precludes B from depending on A. Thus, there are no symmetric dependence relations short of identity. This is implausible on its face. In addition to the examples provided in the foregoing text, symmetric dependencies short of identity abound. The movements of a baseball bat's heavy end depend on those of the light end and vice versa. Where $x = y^2$, the value of x depends on y and vice versa. And, given the way the rear wheels of a car are connected to the drive shaft, the left wheel can turn only if the right wheel does and vice versa.[19]

Given that the principle fails in general, Kim must convince us that it holds in the special case of nomic equivalents or in the case of psychological and physical nomic equivalents. It is important to note that the force of dependence at issue here is nomic or 'causal'—the point is to ensure that psychological and physical causes are 'causally on a par', causally equivalent. It is consistent with symmetric nomic or causal dependence between them that one metaphysically or ontologically depends on the other. In other words, the coupling of mental and physical causes is consistent with the ontological priority of the physical over the mental (or vice versa). In the case of macroscopic objects and their parts, it is plausible that they are 'on a par', causally speaking; if they are not identical, then Kim's principle fails, and there is no 'instability' between nomic equivalents or coupled causes.

I take it, then, that Kim's arguments against coupled causes and nomic equivalents are impotent. It is worth pointing out, however, that the many Causal Compatibilist proposals noted above do not fare so well.[20] Since they invoke asymmetric dependence, Kim's arguments suggest that on those theories, mental causes are epiphenomenal.

[19] Thanks again to XX for this last example.
[20] See footnote 11.

7 Conclusion

In addition to joint causes and overdeterminers, there are coupled causes. Where K is a cause of E, A and B are coupled causes of E if each is both necessary and sufficient for K. In addition to their inherent interest, attending to the distinct features of coupled causes helps to clarify mental and other higher-level causes. This paper has focussed on the contrast between coupled causes and a cause that necessitates a simultaneous epiphenomenon, aiming to distinguish higher level causes from epiphenomena.

Furthermore, the account of coupled causes suggests that there are in fact several other MACRs that have received little attention, if any at all. Discussions of MACRs have tended to focus on (i) sufficiency and insufficiency, and (ii) symmetric cases. Thus, joint causes are both insufficient for a given effect; overdeterminers are both sufficient for some effect. As noted above, Causal Compatibilists have pointed out that overdetermination may be more complex than this.[21] If one antecedent depends on the other, then perhaps the effect is not overdetermined; at any rate, the result differs from the standard firing-squad cases of overdetermination. Let's say such effects are either "overdetermined*" or, as Kim would have it, a cause that necessitates an epiphenomenon. Coupled causes are then an additional deviation from overdetermination: *each* antecedent depends on the other, and they are immune to Kim's worries about synchronic asymmetric dependence.

Figure 1 charts overdeterminers, overdeterminers*, and coupled causes. An X in the leftmost column indicates a sufficient cause; an X in the second-to-leftmost column indicates a dependence relation between the causes. For convenience, I have charted only two-cause cases. Thus, where there is no X below '□', the causes are independent; a single X indicates an asymmetric dependence between them; and, if there are two Xs, then they depend on one another; i.e. they are coupled causes.

As has been shown in the foregoing, the causal relations represented in figure 1 are indeed distinct varieties of MACR: whether the antecedents are necessary for one another makes a difference to the effect's status as overdetermined, overdetermined*, or not overdetermined at all. The same

[21] Among others, [Marcus, 2001], [Bennett, 2003, Bennett, 2008], [Thomasson, 2006], [Kroedel, 2008]: 129, [Wilson, 2009]: 152. See also footnote 11

→	□	effect is:
XX	–	Overdetermined
XX	X	Overdetermined*/Cause & Epiphenomenon
XX	XX	coupled caused

may be true for cases in which only one of the antecedents is sufficient for the effect or neither is. Schematically at least, the causal relations represented in figure 2 are all distinct MACRs:

→	□	antecedents are:
X	–	A Cause
X	X	Cause & Epiphenomenon
X	XX	Identical?
–	–	Joint Causes
–	X	Sub- & Supervener?
–	XX	Epiphenomenon/a?

Causation is no doubt central to our philosophical, scientific, and common sense understandings of the world. Disentangling coupled causes from other varieties of causal relation partly helps to clarify the nature of higher-level causes. We should be keen to explore and clarify the other under-appreciated varieties of MACR for their inherent interest, for their potential to solve conceptual puzzles, and for their centrality to how we understand the world and our place in it.

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