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Married Causes

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Abstract

Many philosophers accept some version of a principle that says *for all x, if x exists, then x plays a unique causal role*. After briefly clarifying one version of the principle in §1, §2 gives reasons to doubt it by showing that there are non-identical "causal indiscernibles"—I call them "married causes". §3 then sketches a few philosophical puzzles for which married causes may be helpful.

Keywords Mental causation; Non-reductive physicalism; individuation of events; ontology.

1

Many philosophers explicitly accept some version of the following methodological principle: if x exists, then x plays a unique causal role. Some philosophers also implicitly accept the related claim that if X and Y play the same causal role or have the same causal profile—if 'they' are "causally indiscernible", as I will say—then X = Y.[1]. Call it the Principle of the Identity of Causal Indiscernibles, ICI:

[1]Stephen Mumford is one of few who acknowledge the assumption; he does so while arguing for the identity of dispositional and categorical properties: "[T]he numerically identical causal roles of any two tokens, p_1 and p_2, entails the identity of p_1 and p_2." ([Mumford, 1998]: 145) For implicit endorsement, see e.g. ([Peacocke, 1979]: 134). Given an example in which a token pain event, c_ψ, causes a hand to be withdrawn, e, and there is a token physical event, c_ϕ simultaneous with c_ψ, and given that (i) "we have a complete and wholly physical account ... of the causal route from c_ϕ to e in neurophysiological terms ... [which] completely explains how the event c_ϕ causes e" and (ii) there is no other physical event simultaneous with c_ϕ that causes e, Peacocke claims that "we have enough resources ... to demonstrate that $c_\psi = c_\phi$." Indeed, Peacocke says that in this argument, token identity between c_ϕ and c_ψ *follows* from the empirical premises. ([Peacocke, 1979]: 134) If the fact that c_ϕ and c_ψ both cause e demonstrates their identity, then so too should the fact that c_ϕ and c_ψ are causally indiscernible. In [Sosa, 1984]: 277-8 and [Dretske, 1989]: 1-2 either the given arguments beg the question against their opponents or assume that if A ≠ B, then it can't be that A and B are both causally relevant to the same effect—from which it would follow of course that A and B are causally discernible. For a discussion of how [Kim, 1989]: 85-6 presupposes ICI, see §3.1, especially footnote 35. Finally, [Papineau, 2001]: 9 affirms that if A and B bring about the same effect at the same time, then, on pain of overdetermination, A = B. Since causal indiscernibles bring about *all* of the same effects, this commitment entails ICI. He argues that (1) "all physical effects are fully determined by law by prior physical occurrences"; (2) "all mental occurrences have physical effects"; (3) "the physical effects of mental causes are not all overdetermined"; hence, (C) "mental occurrences must be identical with physical occurrences".

ICI If a and b are causally indiscernible, then a = b.[2]

This paper argues against ICI. After showing that ICI has implausible entailments, it is claimed that there can be non-identical X and Y that play the same causal role. I call such pairs "married causes".[3] Consider an event: I cut myself shaving this morning. When I cut myself with the razor, I also cut myself with its blades, and I cut myself quickly. Perhaps these are three distinct events with all the same causal features.

2 Against ICI

In this section, I give two general reasons to doubt ICI. First, it has metaphysically implausible entailments. For instance, if there is more than one entity with an empty or blank causal profile, then this is patently false. Though 7 and 9 plausibly play the same causal role, 7 is obviously not 9.

Even if we restrict ICI to the domain of causal relata, though, implausible entailments still loom. Whatever the causal relata are, it's dubious that they're universally individuated by their causal roles. Although we might individuate some of them by their causal roles, there shall remain others generated by "vertical" determination relations. Individuals compose into composites; second-order events may be abstracted from classes of first-order events; etc. Each of these relatively 'macro' entities plays the same causal role as some more basic entity or entities, but is identical to none of them.[4] I exemplify this point in terms of Jaegwon Kim's account of events.

Second, I argue that the facts about causation do not entail the facts about identities. That is, whatever causal relations reduce to, the conditions sufficient to make it the case that a and b play the same token causal role fall short of the conditions necessary to establish that a = b. Suppose, for example, that causal relations reduce to patterns of occurrence in actual and possible circumstances. The received view is that the causal possibilities do not exhaust the metaphysical possibilities.[5] A and B may then occur in all the same causal

[2] 'a' and 'b' denote tokens of whatever ontological type fills out the causal relata. So, if it turns out that event-tokens are the causal relata, then a and b are events: the principle says that the causal indiscernibility of events implies identity of events; if facts are the causal relata, then a and b are facts. And so on.

[3] The name is inspired by the assumption that causes and effects are related by nomic necessity, given background conditions. If so, then married causes are, like married persons, bound together by law, though each retains its individuality.

[4] The causally individuated entities may well be more fundamental or ontologically basic than the vertically determined ones—fair enough, though they may also be less fundamental—but the point remains: our ontology isn't fully determined by the causal roles, and the causal roles are not single-occupancy.

[5] I'm taking the received view to be, in part, that (1) there is a single, cohesive 'sphere' of causal possibilities, that (2) there is a single, cohesive 'sphere' of metaphysical possibilities, and that (3) the former sphere is a proper part of the latter sphere. Thus, I

possibilities without co-occurring in all the metaphysical possibilities. Their causal roles will then be the same, but their metaphysical/ontological roles needn't be. Their causal indiscernibility does not entail their complete indiscernibility.

2.1

A deductive argument against ICI would face a number of obstacles: (1) We don't know if causation is irreducible or, if it is reducible, what causation reduces to: counterfactual dependence, nomic necessitation, etc. Ignorant of this, we can't say with certainty what follows from two entities' causal indiscernibility. (2) We don't know the category of the causal relata: facts, events, tropes, etc., and so we don't know their identity conditions either. (3) Even if we did know the category of the causal relata, we don't know their nature: Kimian[6] or Davidsonian[7], etc.[8] And once these have been settled, it still remains unclear (4) how to compare sufficient conditions on causal indiscernibility with sufficient conditions for identity: whether A and B are causally indiscernible may depend on the laws that subsume A and B while their ontological (in)discernibility may turn on all of the properties each possesses. How do we compare the two?

These difficulties may seem insurmountable. We cannot hope to decide the nature of causation or of the causal relata, nor can we hope to survey all viable views and show that ICI is false for all of them. But all is not lost for an argument against ICI. On the contrary, although ICI may have some intuitive appeal, very shortly after we attend to some of the pertinent details, ICI's implausibility reveals itself.

Consider Kimian events. I take the far dominant view to be that event tokens are the causal relata[9]; Kimian events, as we shall see presently, are relatively coarse-grained, so far as causal relata are concerned. In a survey of the approaches to individuating causal relata, only Quine and Davidson propose to individuate

take it that there are causal possibilities and impossibilities *full stop*—not merely causal possibilities *relative to a world*. Anything that occurs outside the 'smaller' sphere occurs in a causally impossible world. Whatever occurs in the smaller sphere, by contrast, *is* causally possible. So, if X occurs in a causally impossible but metaphysically possible world, w, there's no guarantee that what X does in w is causally possible. We can ask then: do X's causal relations in w bear on X's (or X's counterpart's) causal role? It is taken for granted here that no, causal impossibilities do not bear on an entity's causal role. If it is impossible for X to have causal power c, then c should not be included in X's causal profile—even if there is a metaphysically possible world in which X has power c. I take this to be patently sensible: things X *can't do* are not included in the list of things X *can do*. I suggest that those who think otherwise bear the burden of arguing for their position; I am, however, aware of no such arguments.

[6] [Kim, 1993]

[7] [Davidson, 1980b, Davidson, 1980a, Davidson, 1980c, Davidson, 1985]

[8] See also [Lewis, 1986], [Bennett, 1988].

[9] See, inter alios, [Davidson, 1980b, Davidson, 1980a, Davidson, 1980c, Davidson, 1985], [Kim, 1993], [Lewis, 1986], [Bennett, 1988], [Paul and Hall, 2003]: 3. [Varzi and Casati, 1996] is a useful anthology.

causal relata more coarsely.[10] ICI proposes a remarkably coarse individuation of causal relata. Although, for example, the "layered" model of the sciences (as taken on its face) suggests a permissive stance on causal indiscernibles, ICI rejects it. That is, ICI says that the apparent differences between "levels" of analysis or between a composite and its parts are illusory. Rather, given that, say, a composite and its parts are causally indiscernible, it follows from ICI that a composite and its parts are identical.[11] If we wish to test ICI, then, we should appeal to a relatively coarse-grained account of the causal relata; I propose that we take Kimian events as our test case.

Let's assume for now, then, that if ICI is true, then it's true for Kimian events. That's to say, for all Kimian events A and B, if A and B are causally indiscernible, then A = B. In short, if A and B have all the same token causes and effects, then A = B.

We shall see that ICI is false for Kimian events thanks to their "fineness of grain".[12] Further, if the causal relata are not Kimian events, the arguments given here may militate against ICI. So long as the causal relata are distinguished as finely as or finer than Kimian events, then so long shall there be entities that are both discernible and causally indiscernible. But as we've said, of the proposed causal relata, most are distinguished more finely than are Kimian events. And so ICI is false for all such accounts of the causal relata.[13]

Kimian events are triples of an n-tuple of constitutive individuals, an m-tuple of constitutive properties instantiated by the individual(s), and an l-tuple of times at which this instantiation occurs, the constitutive time(s). In the simplest cases, where each constituent is a one-tuple, we symbolize a Kimian event as follows: $\langle i, P, t\rangle$; and event1 $\langle i_1, P_1, t_1\rangle$ = event2 $\langle i_2, P_2, t_2\rangle$ iff $i_1 = i_2$, $P_1 = P_2$, and $t_1 = t_2$.[14] (Let us identify one-tuples with their members so we can speak normally about an event as an individual instantiating a property at a time.)

Though Kimian events are individuated partly by their constitutive properties, it is not the case that each Kimian event has no properties besides those constituting it. Kim accepts that "the bolt's giving way and the

[10] [Schaffer, 2008] See §3.2 for a discussion of Davidson's view.

[11] Contrary to the consensus view on "Composition as Identity". See [Lewis, 1991], [Yi, 1999], [Merricks, 2001], [Sider, 2007]; see [Baxter, 1988a, Baxter, 1988b] for the best known defenses of the minority view that composition *is* identity.

[12] In short: differences in "constituent individual", "constituent property", or "constituent time" suffice to distinguish Kimian events. So far as any of these three things—individuals, properties, or times—may be distinguished in the absence of causal differences, so far may causally indiscernible Kimian events be nonetheless discernible.

[13] Again, the notable exception, Davidsonian events, are discussed in §3.2.

[14] [Kim, 1993]

bolt's giving way suddenly are different events."[15] And Kim accepts this even though the bolt's giving way suddenly necessitates its giving way, such that in both events, the bolt instantiates the property *giving way* at some time. Kim tells us that one of these events is "included" in the other, but he declines to elaborate on the inclusion relation.[16] I take it that the same goes for part-whole relations among constitutive individuals and times. Distinct events may involve the same individual, the same property, or the same time, so long as no two events are *constituted by* the same individual(s), the same property/ies, *and* the same time(s).

Kim's structure for events permits us to give a general schema for 'finding' events that are causally indiscernible but not identical. While every event is causally indiscernible with itself, let me reserve the name "married causes" for the non-identical causal indiscernibles. If there are married causes, then ICI is false. Intuitively, married causes differ from one another in manners that "matter" to ontological individuation but not to causal relations. In terms of Kimian events, these differences may arise from any of the pertinent events' constitutive elements: the individual(s), the property/ies, or the time(s). Let's survey the possibilities.

Individuals. Consider my chair's falling over: my chair, c, falling over, F, just now, t: ⟨c, F, t⟩. Call it event A. A may be married to an event with a different individual, a different constitutive property, or a different time. Take, for example, an event which consists of all and only my chair's parts, p - p_n, collectively falling over at t: ⟨(p - p_n), F′, t⟩. Given that these events are causally indiscernible, they are married causes if c ≠ p - p_n, i.e. if "strong composition as identity" is false so that a composite individual like a chair is not *strictly* identical to its parts.[17]

But even if strong composition as identity holds, there are still married causes that differ in their constitutive individual(s). Consider a pair of tweezers, w, and the Swiss army knife, k, of which it is a part. Earlier, I had a splinter, s, in my hand, and I went to the medicine cabinet to get the knife; then I tweezed the splinter out. Let D = *tweezing*. The tweezers tweezed the splinter at t, ⟨(w,s), D, t⟩; and since the pair of tweezers is part of the knife, I used the knife to tweeze the splinter out as well, ⟨(k,s), D, t⟩. Since k ≠

[15] [Kim, 1993]: 42

[16] Kim tells us, "I will not try to give a characterization of 'inclusion' for events here; a completely general characterization gets, as far as I know, to be very complicated without being philosophically interesting…" [Kim, 1993]: 45 What Kim does say is that included events are "different, if not entirely distinct". (45) One might speculate that the married relation I introduce here is a special case of the inclusion relation.

[17] Again, see [Lewis, 1991], [Yi, 1999], [Merricks, 2001], [Sider, 2007] for the consensus view that it is false; see [Baxter, 1988a, Baxter, 1988b] for the minority view.

w, these are distinct events, but they plausibly have all the same causes and effects, and so I propose that they are married causes. Indeed, since the knife has the ability to tweeze by virtue of having the tweezers as a part, any event consisting of the knife's tweezing at a time shall be causally indiscernible with an event consisting of the tweezer's tweezing at the same time. And this generalizes. Wherever a composite, c, has a property, F, if and only if c's part, p, is F, then ⟨c, F, t⟩ shall be married to ⟨p, F, t⟩ for all values of t.[18] A razor cuts my face at a time if and only if its blades do; a pen writes at a time if and only if its point does; a mockingbird sings iff its singing parts do; a diamond ring shines iff its surface does; and so on.

There is also a third possibility here, one which exploits the alleged difference between a material entity and the matter constituting it. The familiar example involves Lumpl and Goliath.[19] Suppose that Lumpl, a lump of clay, sits on a shelf in the artist's studio; Goliath, the statue, does not yet exist. One day, Lumpl is formed into a statue of Goliath; now it seems that Lumpl and Goliath occupy the very same space. Nonetheless, they are distinct: Lumpl existed before Goliath, and if Goliath were to be flattened, Lumpl would exist after Goliath had perished. So long as they occupy the same space, however, the events they constitute are plausibly married.[20] Specifically, for all those properties that they instantiate at the same time, the resulting events shall be married. If Lumpl, l, reflects sunlight, S, onto the floor, f, at t, then so does Goliath, g. And so ⟨(l,f), S, t⟩ is causally indiscernible from ⟨(g,f), S, t⟩. I take it that this generalizes. Wherever a material entity and the matter constituting it are not identical, when they instantiate the same property at the same time, the resulting events shall be married.

Properties. Alternatively, married causes may differ in their constitutive properties. The differences may be any that do not make a difference to causal relations. So long as properties are not individuated solely by their causal features, as some propose[21], there should be married causes of this sort. For any

[18](1) Add "so long as p is a part of c", if you think part-whole relations may be temporary. (2) I have no proof that this schema succeeds in every case, but its success stands wheresoever differences in properties are "causally relevant" to causal relations and differences in constitutive individuals are not.

[19]See [Gibbard, 1975, Rea, 1997]

[20]Since events are dated, it's unnecessary to motivate the relation between Lumpl and Goliath in the usual way. As the example stands in the main text, it's not true that every event that Lumpl partly constitutes is married to an event that Goliath partly constitutes; it's true only for the non-modal properties that Lumpl and Goliath instantiate while they occupy the same space. If we motivate their relation in the usual way—say, two lumps are formed into a torso and trunk on Monday and stacked to make Lumpl/Goliath on Tuesday, but then the statue is shattered on Wednesday—then if it is still granted that Lumpl and Goliath are not identical, since they have distinct modal properties, we may say that the objects Lumpl and Goliath are married (granted that objects may stand in causal relations) and so are pairs of the events they partly constitute.

[21]Most notably, Shoemaker defends this claim ([Shoemaker, 1998, Shoemaker, 2004a]), but see also Alice Drewery ([Drewery, 2005]) and Chris Swoyer ([Swoyer, 1982]).

properties that do not differ in their causal features, an event constituted by an individual instantiating one at a time shall be married to an event constituted by the same individual instantiating the other(s) at the same time. Analogous to the above events whose individuals were related as part-to-whole, properties related as determinate-to-determinable plausibly make for married causes. An example should help.

When I cut my face shaving, I did it quickly. According to Kim's criteria, these are distinct events. Let C = *cutting* and Q = *cutting quickly*; let r be my razor, and let m be this morning. ⟨r, C, m⟩ is married to ⟨r, Q, m⟩ as long as C ≠ Q. In general, we may say that where an instantiation of a determinate is causally relevant if and only if the instantiation of its determinable is, then the event constituted by an individual i instantiating the determinate at a time shall be married to i's instantiating the determinable at that time. Given that this morning's cutting was quick, my *cutting quickly* draws blood if and only if my *cutting* does, and my movements cause quick cutting if and only if they cause my cutting.

In general, where one property, F, is causally relevant iff another property, G, is, then every event constituted by an individual's instantiating F at a time shall be married to an event constituted by that individual's instantiating G at the same time. Thus, Edward's *shooting* at t is likely married to his *pulling the trigger and shooting* at t, his *shooting or squaring a circle* at t, his *firing his gun* at t, and so on.

Times. Finally, a similar symmetric relation between times may underwrite another variety of married causes. Consider the sun's rising this morning and today. We have at least two Kimian events: let s be the sun, and let R be *rising*—or, more explicitly, let R denote a relationship that obtains between an individual x and a time interval y iff x first appears over the eastern horizon at some time t_1 in y; t_2 is today and t_3 is this morning. ⟨s, R, t_2⟩ is married to ⟨s, R, t_3⟩. Just as with the earlier examples, the relation between the times here is symmetric: the sun rises today if and only if it rises in the morning—that is, the sun's standing in R to this morning is married to its standing in R to today.[22] And once again, this generalizes. Wherever an individual i has a property, P, for a duration D if and only if i is P for a slice of D, t, then events involving i's being P during D shall be married to events involving i's being P at t.

For such cases to obtain, it need only be the case that, for whatever reason, an event may occur only during a duration, t_1, if and only if it is part of another duration D. Suppose, for instance, that Tim plays in a basketball league with games on Saturday only. For any given week, Tim can instantiate the property

[22] I assume there is no nearby world in which the sun rises after noon today. If you're wondering how to figure out which possibilities are pertinent here, be patient. It's addressed explicitly in the next section.

scoring in the league only on Saturday. Tim's scoring in the first week of the season occurs iff Tim's scoring in the first game of the season does, and the two have all the same causes and effects. ⟨t, S, g⟩ is married to ⟨t, S, w⟩. Similarly, it's true for most of us that one's death occurs iff it occurs in the time before the Stoic 'great conflagration', duration D. When his time is up, Tim's death at t shall be married to his death during D.

2.2 Causal Relatum Pluralism

The argument just delineated may be extended in another direction. First, it's unclear why we should accept that all causal relata are of the same ontological category. That is, the received view is that the causal relata are events, or facts, or tropes, or individuals, with an *exclusive* 'or'. But why shouldn't the 'or' be inclusive? I shall not here defend the claim that not all causal relata are of the same ontological category, but suppose it is granted. Suppose, that is, that more than one of events, tropes, facts, or objects are the causal relata. Then in addition to the 'intra-ontological category' married causes we've just sketched among events, there may be *inter*-category married causes. The *event* of the ball's flying through the window is married to the *fact* that it flew through the window and the causally relevant *trope* instantiated at the time the window broke. If one is skeptical about intra-category married causes, inter-category married causes may still be granted.

Causal Relatum Pluralism is attractive for at least two reasons. First, it saves our intuitions that objects, events, facts, and tropes are all causes. These familiar intuitions are 'pumped' by arguments or narratives that purport to motivate the apparently distinct views of the causal relata. Appeal to the intuition that causal relations are dated motivates the claim that events stand in causal relations. Appeal to every day observations like a bat's hitting a ball motivates the claim that objects stand in causal relations while noting that it's not just the objects but some or other of their properties that *make a difference*—the force of the bat's swing made the ball fly so far. Appeal to the intuition that the absence of, say, a safety net can have an effect—say, a death—motivates the claim that facts—like the absence of the safety net—are the causal relata. And so on. Causal relatum pluralism let's us save all of these intuitions. Second, given CRP, we can restructure the debate over the nature of the causal relata. Rather than asking which of the proposed classes of entities stand in causal relations, we should ask which of the classes underwrite the *fundamental* causal relations.

2.3

In the 2006 German film *Das Leben der Anderen* (The Lives of Others), an interrogator for the Stasi shares a trade heuristic: (according to the subtitles) "People who tell the truth can re-formulate things, and they do. A liar has prepared sentences which he falls back on when under pressure." An analog for philosophers might focus on the metaphors that sometimes overshadow or replace a theory: if there's only one way to say it, it's likely false.[23] It speaks in favor of married causes, then, that we can also clarify them by considering theories of causation.

The general idea involves three steps. We begin with a particular theory of causation, and we ask what it demands of the cause and effect relation. This may be nomic necessitation, counterfactual dependence, mark-transmission, etc. Second, given these demands, we ask under what conditions two individuals, A and B, may meet them for all the same token causes and effects. A and B may necessitate and be necessitated by all the same things, they may depend counterfactually on and counterfactually determine all the same things, etc. These shall be sufficient conditions for A's causal indiscernibility from B. Third, we compare these conditions to some necessary condition on identity. A fairly anodyne choice is as follows: A = B only if for all properties P, it holds by metaphysical necessity that A is P iff B is P. If the conditions in the second step are at least as strong as those in step three, then ICI may be true. Otherwise, ICI is false.

As I hope this brief overview suggests, ICI doesn't stand much of a chance. For, on all theories of causation I know of, the conditions discerned in step two require nothing stronger than nomic necessitation. But identity requires at least metaphysical necessitation. As long as nomic necessity is weaker than metaphysical necessity, then, ICI fails.[24]

[23] Without addressing the content of the associated views whatsoever, let me say that the following metaphors come to mind: "the norms go all the way out/down", "the sideways-on view", "light dawns gradually over the whole". There are doubtless many others. I first heard the philosophical version from Chauncey Maher, who later pointed me toward the film as the source of his inspiration.

[24] Whether nomic necessity is in fact weaker than metaphysical necessity is of course contested. I address this concern directly in §2.3.1. But I would also like to make a speculative note on which I will not elaborate in the main text. The claim that the two forces of necessity are equivalent rests on the proposal that physical laws are necessary. We might, however, divorce that discussion from the present discussion of *causal* possibility as follows. (i) The laws for which Necessitarianism is most plausible are not causal laws, i.e. they do not connect entities' causal properties. Rather, they connect entities' spacetime positions according to the particle-wave function; they connect fields, they connect strings. (ii) The metaphysical necessity of causal laws is not established by the metaphysical necessity of these laws. (iii) The causal laws are metaphysically contingent even though the fundamental physical laws are metaphysically necessary. Hence, (iv) causal necessity remains weaker than metaphysical necessity, even if there is no difference in force between nomic and metaphysical necessity. Finally, John T. Roberts [Roberts, 2009] has an interesting discussion in which he defends the claim proposed in the title: "Some Laws of Nature are Metaphysically Contingent."

Let me rehearse all this more deliberately. We must start with a theory of causation; so suppose that it suffices for C's being a cause of E that E causally depends on C. And let's use the account of causal dependence found in [Lewis, 1973]. Roughly, Lewis proposes that E causally depends on C iff (1) E occurs in the nearest world where C occurs, and (2) E fails to occur in the nearest world where C fails to occur.

That's step one: deciding what the given theory of causation demands of a cause and effect pair. Now we need to decide what are the sufficient conditions for A and B to have all the same causes and effects on this account of causation. Fortunately, it's fairly simple. It must be that for all effects E, E is causally dependent on A iff it is causally dependent on B; and for all causes C, A is causally dependent on C iff B is.

Let's take the first part first: for all effects E, E is causally dependent on A iff it is causally dependent on B. Recall that E is causally dependent on A iff E occurs in the nearest world with A and E fails to occur in the nearest world without A. And so, all the events that causally depend on A shall occur in the nearest A-world and fail to occur in the nearest non-A-world. And the same holds for all the events that are causally dependent on B. If A and B are causally indiscernible, then these are all the same events. We can assure this is the case, then, if the nearest A-world is also the nearest B-world and the nearest world without A is also the nearest world without B. This way, since the worlds at issue are the same, the causal dependencies shall be the same.

Thus, suppose A and B both occur in actuality; then they have all the same effects if the nearest world without one is also the nearest world without the other. This suffices for A and B to have all the same effects. Now we need to discern the conditions sufficient for A and B to have all the same causes.

We move on, then, to the second part: for all causes C, A is causally dependent on C iff B is. This is the case if, for all C, (i) the nearest world without C is also without A iff it is without B, and (ii) the nearest world with C also has A iff it has B. Suppose, for example, that C, A, and B occur in actuality. In order for it to be the case that C causes A iff it causes B, then, it would have to be that A is absent from the nearest non-C-world if and only if B is absent from that world. And this has to be true for all actual causes of A or B. This no doubt demands that A and B co-occur in more than just two worlds. In order to have all the same causes, then, A and B must co-vary (that is, by both being absent) in all the nearest worlds from which an actual cause is absent. This is a great many worlds.

But it is not all the metaphysically possible worlds; it's not even all the nomically possible worlds. For

many nomically possible worlds are irrelevant to A's having all and only the same causes as B. Suppose again that C, A, and B all occur in actuality. If it's true that C causes A iff it causes B, then both must either occur or fail to occur in the nearest world without C. This much we know. But think of all the non-actual worlds in which C occurs (or the more distant ones in which it doesn't). These are immaterial to C's causing A iff it causes B. And, as long as these worlds aren't relevant to A's and B's causal relations for other reasons (e.g. for being the nearest in which another cause, D, fails to occur) they are irrelevant to the causal indiscernibility of A and B. And thus, A and B needn't co-occur in these worlds. Finally, it's plausible that some of these worlds are nomically possible, and so A and B needn't co-occur in all the nomically possible worlds.

Let's take an example, the razor's and the blades' cutting me this morning. If these two are married, then whatever causes one causes the other. On the account of causation presently under consideration, then, since both are actual, they should either both occur or both fail to occur in the nearest world where some other actual event fails to occur. Consider, then, that I also stubbed my toe when I got out of bed this morning. Call it event D. D is of course not a cause of either my razor's cutting me or of the blades' cutting[25]; and so, appropriately, I still cut my face with the razor and its blades in the nearest world where I do not stub my toe. That is, the cutting events are not counterfactually dependent on the stubbing event.

Since this suffices for the cutting events to be indiscernible with respect to potential cause D, the cutting events are otherwise unencumbered when it comes to D. Aside from actuality, they are free to act as they please in all the worlds where I stub my toe. Assuming that some of these are nomically possible and otherwise irrelevant to the causal indiscernibility of A and B, it follows that A and B may be married without co-occurring in all the nomically possible worlds. For instance, where I do not stub my toe and I take the blades from the razor before shaving, I can cut myself with the blades but not the razor. Although the cutting events don't depend causally on my not disassembling the razor, their causal indiscernibility does. It is nomically possible for me to act so as to causally discern the event-types at issue here, but the tokens at issue are causally indiscernible.

Now the third step: consider some necessary condition on the identity of A and B. Here, we may assume

[25]Or, let's assume that the cutting events aren't dependent on the stubbing event. If, in actuality, a bullet whizzed just over me as I doubled-over in pain from the stubbing, and I wouldn't have been alive to shave had I not stubbed my toe, then we should pick some event other than the stubbing. My assumption is that not all events depend on all of their temporal antecedents in this way.

a rather weak condition: if A = B, then A and B co-vary in all the nomically possible worlds. Since the sufficient conditions for the causal indiscernibility of A and B are weaker, ICI fails. Indiscernibility of causal dependencies does not suffice for complete indiscernibility.

Things turn out much the same for other theories of causation: sufficient conditions for causal indiscernibility fall short of necessary conditions for identity. Consider a nomological regularity account. Say that C is a cause of E if (1) in all the nomically possible worlds where some background conditions are satisfied, C's occurrence guarantees E's occurrence, and (2) in some nomically possible worlds, neither C nor E occurs. So, where background conditions are met, C's occurrence is sufficient for E's by nomic necessity, but E may have other causes as well, and neither C nor E is nomically necessary.

Events A and B are causally indiscernible on this view if they co-vary in all the nomically possible worlds. Thus, for all E, if A causes E, E occurs in every nomically possible world that has A and the requisite background conditions. And if B co-varies with A in all the nomically possible worlds, then B shall be a cause of any given E iff A is. Similarly and straightforwardly for every cause of A. Events involving the relata of a wide variety of ontological dependence relations plausibly exemplify this class of married causes. As we noted in §2.1, depending on one's view of composition, it may be that a composite co-varies with its parts in all the nomically possible worlds, and so every actual event involving one co-occurs by nomic necessity with an event involving the other. Such events are then causally indiscernible. The dominant view in the literature on mereology, however, is that a composite's relation to its parts is "like" identity but is not identity, strictly speaking.[26] Similarly for material entities and their constitutive matter, second-order properties and their first-order realizers, and perhaps others as well.

In general, on a nomological regularity account of causation, A and B are causally indiscernible if A and B co-occur by nomic necessity. We now compare this sufficient condition for causal indiscernibility with a necessary condition on identity. I take it that if A = B, then A and B co-occur in all the metaphysically possible worlds. If there are metaphysically possible, nomically impossible worlds, then causal indiscernibles A and B need not co-occur in such worlds. Some have rejected this last claim[27], but the received view is that

[26] See [Lewis, 1991] and [Sider, 2007] for discussions.

[27] See Sydney Shoemaker ([Shoemaker, 1998, Shoemaker, 2004a]), Alice Drewery ([Drewery, 2005]), Chris Swoyer ([Swoyer, 1982]) My response, in brief, is that where Shoemaker argues that properties are individuated by their causal features *because they have their causal features essentially*, we may concede that properties have their causal features essentially while denying that properties are causally individuated. Properties may, and plausibly do, have some non-causal essential features as well.

there are metaphysical possibilities that are nomically impossible. Even if there are not, ICI remains dubious for nomological regularity accounts of causation so long as co-occurrence in all possible worlds does not *suffice* for identity. Indeed, though a composite and one of its parts may co-occur by necessity, it remains dubious that they are identical. Moreover, as mentioned above, the dominant view is that composition *is not* identity, and the identity claims are similarly dubious for the other ontological dependence relations mentioned in the previous paragraph. In all theses cases, ICI fails again.

2.3.1 Nomic and Metaphysical Necessity

In arguing that the facts about causation do not determine the facts about identities, I have assumed that there are nomically impossible metaphysical possibilities. Given that A and B are causally indiscernible if they're indiscernible in the nomically possible worlds but that A = B only if they're indiscernible in all the worlds, this assumption played a decisive role in establishing my conclusion. Some, however, have given reason to doubt this assumption. Call them "Necessitarians". They say that physical laws are metaphysically necessary, so that there are no metaphysically possible worlds in which the laws fail, and thus no nomically impossible but metaphysically possible worlds.

The Necessitarian strategy, however, is inadequate. Although it would seem that there is a possible world where, say, mass doesn't obey the inverse square law, the Necessitarian says this is mistaken. Rather, obeying the inverse square law is essential to mass, she says. ([Swoyer, 1982] [Shoemaker, 1998,Shoemaker, 2004a] [Drewery, 2005]) So, when one seems to conceive of mass obeying, say, the inverse *cube* law, one is in fact conceiving of *something else*—i.e. something that is not mass.[28,29] Call it "schmass". But this doesn't show that there are no nomically impossible but metaphysically possible worlds—indeed, it *posits* such a world: the one with schmass.

Faced with a purported possibility in which an actual X exists in a nomically impossible world, then, the Necessitarian faces a dilemma. If she accepts the counter-example, then of course there are metaphysically possible nomic impossibilities—wherein, for example, bodies with mass attract one another according to the

[28]I take this example from [Fine, 2002], where he also develops the line of reasoning to follow; and, like Fine there, I take an oversimplified view of the physical laws for expository purposes. For reasons noted in FN 23, I take it that the Necessitarian benefits from this simplification.

[29]This line of reasoning is undoubtedly very familiar from Kripke [Kripke, 1980], though, notably, Kripke himself does not adopt Necessitarianism.

inverse cube law. If she wishes to reject the counter-example, however, she herself posits a metaphysically possible nomic impossibility. In exchange for the metaphysical impossibility of an actual entity obeying a non-actual law, she gives her opponent the metaphysical possibility of a nomically impossible entity. In either case, then, there are indeed nomically impossible metaphysical possibilities.

Now, it's obvious how the first horn of the dilemma helps to establish that there are married causes, but the support for married causes is not so clear on the other horn of the dilemma. If it's not pain and C-fiber firing that are instantiated in the purported counter-example to ICI, then the example does not establish that some causal indiscernibles are discernible. The behaviors of not-pain and not-C-fiber-firing have no bearing on the alleged identity of pain and C-fiber firing.

And yet, the possibility of schmass is significant. Recall that on this horn of the dilemma, schmass is nomically impossible but metaphysically possible. What happens in a schmassy possibility, then, has no bearing on the causal roles of any actual entities, but schmassy possibilities may still bear on the *identities* of actual entities. First, note that while we may grant that it's essential to *mass* that it abides by the inverse square law, we need not thereby accept that this much is essential to all massy entities. The claim that an actual entity has its law abiding properties essentially is difficult to maintain for many entities that are essentially functional, normative, or phenomenal. Many 'everyday' objects plausibly fall into the first category. If it's used to serve soup and stew, is it not a ladle just because it's made of schmass? My intuition is clear that it is a ladle, and although my ladle has mass by nomic necessity, I don't see why it's impossible for it to have schmass. Similarly, it's prima facie possible that wars, economic crises, political parties, and legal tender could be schmassy.

An event partly constituted by an individual that has mass in actuality could be partly constituted by an individual that has schmass in a nomically impossible world; and this event could be married to an event partly constituted by an individual that has mass essentially. This latter event will not exist in a world with schmass, in which case there'd be no doubt that the events are discernible.

Similarly, it's prima facie plausible that the property *being red* could have determinates where the actual laws constraining light are broken. Instead of particle-wave light, it's metaphysically possible that there's schmight, which consists entirely of particles (or schmarticles); and it seems possible that the identity conditions for colors are consistent with their being determined by schmight.

The received view is that metaphysical possibility outstrips nomic possibility, but this is contentious. In response to the opponents of the traditional view, I (i) accept the nomically impossible entities they posit, and (ii) propose that many of the higher-level entities that would be married to lower-level entities in actuality are married to these 'alien' lower-level entities in nomically impossible worlds.

3 Why Marry?

I take it that the foregoing suffices to establish the existence of married causes, but their importance is perhaps in question. Indeed, we seem to have opened the door to an ontological deluge where one might have hoped for a drought[30]; so we should note some of the discussions to which married causes are more immediately germane.

3.1

Think of the relations that hold between the constitutive elements of pairs of married causes. The constitutive individuals in some pairs are related as part-to-whole, as are the times in some others; and the constitutive properties in others still are related as determinate-to-determinable. 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, and perhaps lower-level events persist for only part of the time that their higher-level counterparts do. Atoms are parts of molecules, which are parts of cells, which are parts of organs and neural pathways, which are parts of language-users, which are parts of social groups... and so on. If it's true that every effect has a lowest-level cause, then it may be that the universe has room for higher-level causes only if each is married to a cause at the lowest level and realism about higher-level explanations depends crucially on causal matrimony.

This may still seem ontologically extravagant; so let me say something more to motivate it a bit further. First, a modest ontological conservatism would require us to posit only those concrete events that stand in causal relations. Second, realism about scientific explanations would take it that at least some of the causally potent events invoked in explanations from the myriad sciences (i) exist, and (ii) are distinct

[30] See Quine's "Wyman's overpopulated universe is in many ways unlovely. It offends the aesthetic sense of us who have a taste for desert landscapes...". [Quine, 1953]: 4

from those invoked in other explanations. These two together suggest that there are chemical, geological, meteorological, etc. causes. But if every effect has a lowest-level cause, and given that the lowest level is the micro-physical, then some effects seem to have at least two causes. One chemical, geological, meteorological, or whatever and one micro-physical. One may now have the intuition that micro-physical causes "pre-empt" their higher-level counterparts. The problem that arises from this intuition is called the problem of causal exclusion, since micro-physical causes seem to exclude all others.

Responses to this problem are legion. For the most part, it is assumed that overdetermination is leveraging the threat of exclusion.[31] The thought is that if some effects were to have both meteorological and micro-physical causes, then those effects would be overdetermined; assuming that these effects are not overdetermined, there are too many causes. Thus, philosophers have tried to show that higher-level causes' dependence on their lower-level counterparts mitigates (or should mitigate) the intuition that higher-level causes in conjunction with their lower-level counterparts would overdetermine their effects. The dependence proposed is uniformly asymmetric; higher-level causes depend on lower-levels, but not vice-versa (as the levels metaphor suggests).

The author who has argued most vigorously for the problem of causal exclusion, however, denies that overdetermined effects are the 'true' threat. Instead, Jaegwon Kim suggests that the problem is the asymmetric dependence between higher- and lower-level causes.

> The exclusion problem doesn't go away when we recognize the two purported causes as in some way related to each other, perhaps one being dependent on the other...[32] our problem is not exactly that of causal overdetermination, although both have to do with an overabundance of causes. It is important to see that the problem that we face arises *because* the two putative causes are *not* independent events. The difficulty is exactly that the causal status of the dependent event is threatened by the event on which it depends. ([Kim, 1998]: 53, emphasis in original)

Notice that it's not so much the multiplicity of causes that's bothering Kim here, but the asymmetry between them. The dependent event is threatened by the event on which it depends. A similar theme runs though

[31] See, among others, Simon Blackburn [Blackburn, 1991], Derk Pereboom and Hilary Kornblith [Pereboom and Kornblith, 1991], D. Gene Witmer [Witmer, 2003]: 204-5, Sydney Shoemaker [Shoemaker, 2004b], Amie L. Thomasson [Thomasson, 2006]: 353, John Carroll and William Carter [Carroll and Carter, 2005]: 14-5, and Karen Bennett [Bennett, 2008, Bennett, 2003].

[32] Kim claims here that the problem remains so long as the purported causes are distinct: "As long as they are recognized as distinct events, each claiming to be a full cause of a single event, the problem remains." (1) In a footnote above, I speculated that the married relation may be a special case of the inclusion relation; (2) although he doesn't specify the inclusion relation, Kim does say that included events are "different, if not entirely distinct". ([Kim, 1993]: 45) If married causes are a subspecies of included events, then I take it Kim would not object to the solution proposed here, at least not on grounds of distinctness. But since Kim doesn't clarify the inclusion relation, this is simply speculative, and so I have relegated it to footnotes.

[Kim, 1989].[33] If Kim is right, then a straightforward solution would propose that the dependence between higher- and lower-level causes is symmetric. Married causes bear just this relation.[34]

Moreover, it's plausible that married causes do not overdetermine their effects. We can motivate the point simply here. First, recall that married causes are causally dependent on one another—in the causally possible worlds, each occurs iff the other does. Second, note another case in which causes A and B each suffice for C but do not overdetermine it: A and B are links in a single causal chain. Let's say that A necessitates B, and B necessitates C. Both A and B thus suffice for C. Why shouldn't C be overdetermined? An obvious answer is that the causal dependence between A and B "insulates" them from over-determinative causation. If so, then the same should hold for married causes, since each is causally dependent on the other.[35]

And, finally, notice that if the individuals in higher-level causes have individuals in lower-level causes as parts, this explains why higher-level causes would be married to lower-level counterparts.[36] As David Lewis says:

> If Mary's lamb goes everywhere that Mary goes, and if this is so not just as a matter of fact but as a matter of absolute necessity, we have a highly mysterious necessary connection between distinct existences. But... if it turns out that the lamb is part of Mary... then... the inseparability is automatic, and in no way mysterious. ([Lewis, 1991]: 85-6)

I believe all this together makes it plausible that counterpart higher- and lower-level events are married causes. Given that married causes are not identical but are very nearly so, we might call this view The Very Nearly Identity Theory.

[33] See, especially, pp. 85-6, in which Kim argues that the "nomic equivalents" proposed in [Goldman, 1969] are "unstable" because they *must* stand in an asymmetric dependency relation, contrary to Goldman's claims. Kim does not say, however, why he believes that there is no symmetric dependence relation short of identity. See [Engelhardt, 2012] for further discussion.

[34] To be clear: they are symmetrically dependent *so far as causation is concerned*. It is an open possibility for one cause to be *ontologically* dependent on its spouse but not vice versa, though each is causally dependent on the other. In terms of possible worlds, we might say that each married cause is dependent on its spouse in the causally possible worlds, but in the metaphysically possible worlds, one may depend asymmetrically on the other or the two may be independent. Plausibly, for instance, a composite depends ontologically on its parts, but the two are causally 'on a par'.

[35] See, inter alios, Alvin Goldman [Goldman, 1969]: 471, Brian Jonathan Garrett [Garrett, 1998]: 371-2, Jonathan Schaffer [Schaffer, 2003]: 28, Jesper Kallestrup [Kallestrup, 2006]: 472-3, Thomas Kroedel [Kroedel, 2008]: 129, and Jeff Engelhardt [Engelhardt, 2012].

[36] Most of the punch in [Ney, 2007] comes from demanding exactly this from constitution views of explanatory levels.

3.2

Married causes may help us to make sense of certain empirical findings. Consider the claim that neuroscientists have discovered the neural substrates of knowledge.[37] Suppose the evidence is that whatever would cause Jack to know P causes activity in some region of Jack's brain; and for whatever effects Jack's knowing P would bring about, those effects are caused by activity in this same brain region. We seem now to stand in an awkward position vis-a-vis interpreting this result. On the one hand, Jack's knowing that P is no doubt partly dependent on circumstances outside of Jack's skull. P must be true; and, plausibly, at least some of the criteria Jack must satisfy in order to count as knowing that P are determined by (somewhat) local norms. So it's implausible that Jack's knowing that P is simply some activity in Jack's brain. On the other hand, it seems that the event of Jack's knowing that P is no different, in causal features, from the event of Jack's having activity in the given brain region.

This situation recalls Donald Davidson's theory of events (in [Davidson, 1980b]): event A = event B iff A and B have all the same causes and effects. If events are individuated *solely* by their causal features, then Jack's knowing P is the same event as Jack's having activity in the given brain region. But if we're to take the "external" features of knowledge seriously, then this can't be. I propose that married causes offer an attractive solution. They permit us to say that Jack's knowing that P is distinct from Jack's having activity in the given brain region, but without denying that the two play the same causal role—without denying the importance, in a sense, of the empirical discovery. Moreover, since many of the married causes we've reviewed have involved part-whole relations, we may say that activity in the given brain region is a part of knowing that P. And so, Jack's having activity in that region is married to Jack's knowing that P. Again, this affirms the importance of the empirical discovery. In general, this strikes me as a very attractive way to proceed when it comes to genetic pre-dispositions or neural substrates of phenomena that seem to have both causal and normative or conventional features. Thus, I take it that similar considerations apply to claims regarding the neural substrate(s) of happiness ([Kringelbach and Berridge, 2009]), of sarcasm ([Uchiyama et al., 2006]), of love ([Beauregard et al., 2009], [Bartels and Zeki, 2004]), or of certain addictions ([Li et al., 2009], who claim to give the neural substrates of internet addiction).

A similar strategy could help to make sense of mental causation for a wide variety of theories of mental

[37] [Damasio, 1990] proposes an "organization for the neural substrates of knowledge".

content. Given the familiarity of the general problem and the extent to which particular formulations of it are disputatious, let me be brief and loose. The problem is that there seems to be a conflict between our intuitions regarding causal powers and the majority of philosophical theories of content. First, there is a (related) philosophical problem about how it is (or seems to be) that mental phenomena *represent*, how a thought of a tree is somehow *about* a tree without being a tree. Some philosophers find it dubious that this "aboutness" is an intrinsic property. As John Haugeland puts it, "no single patch of matter can, purely in virtue of its own physical structure, and regardless of the rest of the universe, [be about] exactly one thing."[38] Rather, the philosophical consensus seems to be that "... the intentionality [i.e. the aboutness] of any individual state or occurrence always depends on some larger pattern into which it fits...".[39]

On the other hand, many think that causal properties are intrinsic—they do accrue to an individual purely in virtue of its physical structure. As a result, it seems that content is causally impotent. Since they're not intrinsic, content properties can't be causally potent. But this is at odds with the apparent truth that our thoughts bring about the actions they do partly in virtue of what they're about. Jack goes up the hill partly because he thinks there's a pail of water up there. But if Jack's thinking as much is causally impotent, then this seems to be mistaken.

Consider this situation in terms of Kimian events and grant for the sake of discussion that causal properties are intrinsic. Let c be part of Jack's central nervous system, the part causally responsible for Jack's going up the hill at t_1, and let F be the property that c instantiates at t and is causally relevant to Jack's going up the hill. According to the foregoing problem, this event is distinct from Jack's believing that there's water up the hill at t_2 (which presumably includes t). The former involves properties intrinsic to c, while the latter involves properties extrinsic to c and perhaps extrinsic even to Jack. And, moreover, the widespread impression is that the latter event is causally impotent by virtue of its causally irrelevant (since non-intrinsic) constitutive property.

But suppose that F is a determinate of the determinable property bearing the content of Jack's belief.[40] Note furthermore that c is no doubt a part of Jack, and t is plausibly a part of t_2. These relations correspond to those we noted above: the constitutive elements of married causes are often related as part-to-whole or

[38] See [Haugeland, 1990]: 386.
[39] Ibid.
[40] [Yablo, 1992] famously defends the view that fundamental physical properties determine mental properties.

determinate-to-determinable. This lends credence to the claim that Jack believes at t_2 that there's water up the hill if and only if c is F at t. Perhaps, then, these two events are married. If so, we can say (roughly) that c's being F at t is *part of* Jack's believing there's water up the hill without denying that Jack's belief caused him to go up the hill and without denying that content properties are non-intrinsic. Instead, we can say that the causal part of a mental event is intrinsic, but its contentful part is not.

It is worth pointing out here a difference between two challenges to all theories of mind-body relations—one reasonable and one unreasonable. The problem at hand charges that mental events or properties, qua mental, are causally impotent because they are extrinsic, and it challenges any theory of mind-body relations to show otherwise. This problem is sometimes confused with the unreasonable challenge to show that *whatever distinguishes mental properties from physical properties* is causally potent. If there were reason to make the second demand on theories of mind-body relations, then the account on offer would indeed fail to meet it. I have affirmed that the contentful features of the belief event in question above are extrinsic, and we have granted that causal properties are intrinsic. I cannot hope to show, then, that these extrinsic properties meet a necessary condition on being causal—being intrinsic.

But I see no reason to accept the second challenge. For it assumes that for any property F (or event m), F (m) is a causally potent property (event) only if *all* of F's features (m's properties) are intrinsic. Given that every property (event) has extrinsic features (properties), this assumption would show that no property (event) is causal. But this is surely absurd. It's imperative that we show how mental phenomena are causally efficacious, and it is imperative that we show how mental phenomena differ from physical phenomena (if indeed the 'two' are different); it is not at all imperative that we show that the features by which mental phenomena differ from physical phenomena are causally efficacious.

On my view, the mental event and property in the given example are causally relevant qua mental. The proposal is that the mental property indeed has causal features, and these features, like all causal features, are essential to it. It is not—and needn't be—causally potent *in virtue of all its features*.

4 Conclusion

I have argued that ICI is false because there exist married causes. Married causes are non-identical token events with all the same token causes and effects. I have demonstrated and exemplified them in terms of

both Kim's theory of events and two prominent theories of causation. In addition, I have proposed that married causes may shed light on inter-theoretic relations, empirical discoveries pertaining to phenomena with extrinsic (e.g. normative, conventional, phenomenal) features, and mental causation.

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