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### The Metaphysics of Mental Causation<sup>1</sup>

A debate has been raging in the philosophy of mind for at least the past two decades. It concerns whether the mental can make a causal difference to the world. Suppose that I am reading the newspaper and it is getting dark. I switch on the light, and continue with my reading. One explanation of why my switching on of the light occurred is that a desiring with a particular content (that I continue reading), a noticing with a particular content (that it is getting dark), and a believing with a particular content (that by switching on the light I could continue reading) occurred in me, and these events caused my switching on of the light. This explanation works by citing the intentional contents of mental phenomena as causes of that action. It is because the intentional causes have the contents that they do, and because those contents play a causal role in bringing about my action, that my action is causally explained.

We think that a sufficient causal explanation can be given for my action solely in terms that make reference to its intentional causes and their intentional properties. However we have every reason to believe that there is a different causal story, a physical one, which can be told about my switching on of the light. This one will explain the physical movements that constitute my switching on of the light in terms that speak only of the physical events in my body and their properties. And we think that this story will be independent of the intentional one.

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Assuming that intentional content does not reduce to physical properties of physical phenomena, we are faced with a problem. For I act by moving my body. Indeed, my acting apparently just is my moving of my body as a (causal) result of certain of my mental states, certain beliefs and desires.<sup>2</sup> In this case, my switching on of the light just is my finger's flipping of the switch. So it looks like there is just one piece of behaviour that needs explaining when I switch on the light, namely, the physical movements of my finger that constitute that action. We thus appear to have two competing causal-explanatory stories that we can tell about a single piece of behavior. One way of causally explaining the movements of my body that constitute my switching on of the light will mention only the mental properties of their intentional causes. Another way will mention only the physical properties of those causes.

As this way of developing the problem clearly illustrates, the difficulty cannot be resolved simply by maintaining that both stories allude to the same complex of internal physical events and processes as causes of the behavior to be explained. True though this may be, the problem has to do, not merely with the events that are invoked in the explanations, but with their properties. As long as the mental properties alluded to in the intentional causal explanation of the action are viewed as irreducible to, and so distinct from, the physical properties of those physical events, the problem of explanatory competition remains.<sup>3</sup> The explanations compete because each purports to causally explain the resulting behavior in terms of the causally relevant properties of its cause –

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<sup>2</sup> On the view being articulated here, my moving of my body just is my causing of my body's moving, and is identical with my switching on of the light (which is my causing of the light to come on).

<sup>3</sup> The notion of irreducibility invoked here is specific to accounts of reduction that require of a reduction that it effect a property-identity uniting the two domains (as in the account offered by Robert Causey, *The Unity of Science* (Dordrecht: Reidel, 1977). Causey's "attributes" are our properties). These have been called 'conservative' reductions, the reduction preserving the reduced property. Property non-identity and irreducibility go together on these accounts. Eliminative, or replacement, accounts of reduction are not relevant here, as they would ensure the irrelevance of the replaced properties.

the properties in virtue of which that cause brings about the effects it does - and each purports to be, at least in principle, a complete and independent explanation of that behavior.<sup>4</sup>

Let us call the problem in question here the *qua* problem - the problem that mental events that are physical events appear to be causally efficacious in the physical world *qua* physical but not *qua* mental.<sup>5</sup> The problem here is not one of causal efficacy of events, but rather, one of what we shall call causal relevance of properties.<sup>6</sup> And let us call the position on the relation between the mental and physical that gives rise to this

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<sup>4</sup> As this makes clear, we assume the standard view that causal explanations cite causally relevant properties of the causes of the effects being explained. See for example, Jaegwon Kim, "Explanatory Realism, Causal Realism, and Explanatory Exclusion", *Midwest Studies in Philosophy*, Vol. 12, ed. P. A. French et al. (Notre Dame: University of Notre Dame Press, 1987): 225-39. The idea of a 'complete and independent' explanation derives from Jaegwon Kim's discussion of what he calls 'The Principle of Explanatory Exclusion', which we discuss in the text (pp. 8-9). (See, for example, "Mechanism, Purpose, and Explanatory Exclusion", *Philosophical Perspectives*, Vol. 3, ed. J. Tomberlin (California: Ridgeview Press, 1989): 77-108.)

<sup>5</sup> The debate about causal relevance has roots in the seminal work of Donald Davidson and the position he calls 'anomalous monism'. See his "Mental Events," in *Essays on Actions and Events* (Oxford: Oxford University Press, 1980), 207-24, and "Psychology as Philosophy" (along with his "Comments and Replies", *Ibid.*, 229-39 and 239-44). Davidson argues that psychophysical event interactions are only covered by laws couched in physical terms, so it appears that mental causes only count as such in virtue of their physical properties. For a defence of causal relevance of mental properties within the Davidsonian framework that differs from ours, see Terence Horgan, "Mental Quasation", *Philosophical Perspectives* 3, ed. J. Tomberlin (California: Ridgeview Press, 1989): 47-76.

<sup>6</sup> In earlier work we distinguished between causal efficacy of events and causal relevance of properties, taking the former to concern events in extension, and the latter to concern *both* the *qua* problem and the explanatory potential of properties of events (see "Mental Causes and Explanation of Action", *Philosophical Quarterly* 36 (1986): 145-58, reprinted in *Mind, Causation, and Action*, ed. L. Stevenson, R. Squires, and J. Haldane (Oxford: Basil Blackwell, 1986), pp. 35-48, and "How to Be Psychologically Relevant", in *Philosophy of Psychology: Debates on Psychological Explanation*, ed. C. Macdonald and G. Macdonald (Oxford: Basil Blackwell, 1995), pp. 60-77). We now think that the problem that goes under the name of 'causal relevance' concerns the problem of how mental events can bring about effects in virtue of their mental properties (the *qua* problem, or the problem of 'too little' causal relevance), and that this is an issue concerning the causal powers of mental properties. This issue is distinct from, though intimately related to, that of explanatory relevance. We also think that much of the criticism directed toward non-reductive monism, and in particular, the 'too much' causal relevance charge, conflates issues concerning causal efficacy of events with ones concerning causal relevance of properties. For an example of someone who moves from talk of one to talk of the other, see Stephen Yablo's "Mental Causation", *The Philosophical Review* 101 (1992): 245-80, and quoted material in note 14. Davidson ("Thinking Causes", in *Mental Causation*, eds. J. Heil and A. Mele (Oxford: Clarendon Press, 1993), pp. 1-17) argues that, because the causal relation holds between events in extension, it makes no sense to speak of an event's causing another in virtue of one or another of its properties. However, Brian McLaughlin demonstrates how one can make clear sense of such talk even given the claim about causation. See his "On Davidson's Response to the Charge of Epiphenomenalism", in *Mental Causation*, pp. 27-40.

problem ‘minimal physicalism’. Minimal physicalism is the view that although each mental event or phenomenon is a physical event or phenomenon, mental properties are wholly distinct from physical ones.

It is worth noting that minimal physicalism can generate problems not only for intentional explanations, but also for any other kinds of explanations, say biological ones, which make essential use of non-physical properties in the proffered explanations. For any such set of explanations the question will arise: in virtue of which property/ies does the effect occur? The threat will be the same as it is in the mental case, that the non-physical properties cited in the explanation do not produce the effect *qua* those properties. We are here concentrating on the mental, on intentional explanations and intentional properties, because the threat has received its sharpest formulation, and has been most widely discussed, for this case. It has been argued that the problem does not have the general application we think it has, but whether it does or not will not be relevant to our proposed solution.<sup>7</sup> That solution will generalize to other relevantly similar sets of explanations, if there are any, as will become evident in section 5.

Minimal physicalism, and more specifically, non-reductive monism, has been discarded by many as a viable position on the mind-body relation on the grounds that it gives rise to, but cannot resolve, the problem of the causal relevance of the mental.<sup>8</sup> In

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<sup>7</sup> Jaegwon Kim has argued (in *Mind in a Physical World* (Cambridge: MIT Press, 1998)) that the problem does not generalize; we think it does, for the reasons put forward by Thomas Bontly in “The Supervenience Argument Generalizes”, *Philosophical Studies* 109 (2002): 75-96.

<sup>8</sup> See, for example, Louise Antony, “Anomalous Monism and the Problem of Explanatory Force”, *The Philosophical Review* 98 (1989): 153-187; Fred Dretske, “Reasons and Causes” *Philosophical Perspectives* 3, ed. J. Tomberlin (California: Ridgeview Press, 1989): 1-15; Ted Honderich, “The Argument for Anomalous Monism”, *Analysis* 42 (1982): 59-64; Fred Dretske, *Explaining Behavior: Reasons in a World of Causes*, and “Reasons and Causes”, *Philosophical Perspectives* 3, ed. J. Tomberlin (California: Ridgeview Press, 1989): 1-15; Jaegwon Kim (“Epiphenomenal and Supervenient Causation”, in his *Supervenience and Mind: Selected Philosophical Essays* (New York: Cambridge University Press, 1993), pp. 92-108, and *Mind in a Physical World*; and Stephen Yablo, “Mental Causation”.

what follows, we want to defend a strategy – one that we argued for some time ago - for solving this problem. Specifically, we want to defend the view that non-reductive monism can resolve the problem if it is combined with a certain metaphysical view of the nature of events, the property exemplification view. This defense contrasts with another, increasingly popular, strategy for dealing with the problem, one that involves appeal to the view that mental events and other phenomena are, or involve, tropes. Those who endorse it think not only that the trope strategy can solve the problem of the causal relevance of the mental consistently with minimal physicalism, but also that appeal to other metaphysical views of events and properties (specifically, the property exemplification account) cannot do the job as well (if at all), so that appeal to trope theory has the explanatory edge over appeal to other metaphysical theories of events and properties.<sup>9</sup>

Since the view that non-reductive monism is a philosophically bankrupt position unless (and, perhaps, even if) it is combined with a trope conception of events and properties has become entrenched in the literature, we think it is time to set the record straight. In what follows we argue both against those who think that appeal to trope theory can rescue causal relevance of the mental for non-reductive monism, and against those who think that non-reductive monism is not a viable position on the mind-body relation because it cannot resolve the problem of the causal relevance of mental properties. The charge of causal irrelevance against non-reductive monism has two aspects: one specifically concerns the *qua* problem - the problem of how mental events

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<sup>9</sup> See especially Douglas Ehring, “Mental Causation, Determinables and Property Instances”, *Nous* 30 (1996): 461-480, *Causation & Persistence: A Theory of Causation* (Oxford: Oxford University Press, 1997), and “Tropeless in Seattle: The Cure For Insomnia”, *Analysis* 59 (1999):19-24; and David Robb “The Properties of Mental Causation”, *Philosophical Quarterly* 47 (1997): 178-95, and “Reply to Noordhof on Mental Causation” *The Philosophical Quarterly* 51 (2001): 90-4.

can bring about effects in virtue of their mental properties (the ‘too little’ causal relevance problem) - and the other concerns the complaint that the position cannot solve the *qua* problem in a way that does not lead to there being ‘too much’ causal relevance for mental properties.

We begin, in section 1 below, by briefly outlining the position, presuming the distinction, crucial to it, between causal efficacy of events and the causal relevance of properties of events, and explain how the *qua* problem arises. In sections 2 and 3, we clear the ground for our defense by exploring the trope-physicalist solution to the *qua* problem. We argue that that appeal to trope theory does not effectively deal with it. In section 4 we outline the version of the property exemplification account that we favor, and explain why the claim, made by those who appeal to the trope strategy, that appeal to this alternative account cannot help to solve the problem of the causal relevance of mental properties is false. Crucially, we argue that the property exemplification account has the resources to explain how mental properties of events *could* be causally relevant to the effects their instantings bring about without overdetermining them, and without competing for causal relevance with the physical properties of those events. Finally, in section 5, we defend our own strategy for dealing with the problem of the causal relevance of the mental, making use of our version of the property exemplification account.

### 1. Four Theses

How exactly does the charge that mental properties are causally irrelevant arise? Suppose that the minimal physicalism (MP), described above, is true, each mental event or phenomenon being identical with a physical event or phenomenon. What makes the

physicalism minimal is that the mental properties of mental/physical events, properties such as *being pain*, or *being a coming to believe that it is getting dark*, are assumed to be distinct from, and irreducible to, the physical properties of those events, such as *being C-fibres' firing*.<sup>10</sup> Then one claim that is involved in the charge that mental properties are causally irrelevant is this:

(PCR) Physical properties of physical events are causally relevant to the physical effects those events bring about.

Let us call the thesis embodied in PCR The Principle of the Causal Relevance of Physical Properties. What it says is that physical properties of physical events are such that their instances are causally effective in bringing about physical effects of those events.

Analogously, let us call the thesis embodied in the following claim:

(MCR) Mental properties of physical events are causally relevant to some of the mental and physical effects those events bring about.

The Principle of the Causal Relevance of Mental Properties. MCR is the denial of the claim that only physical properties are causally relevant, and so is the thesis whose defense is at issue.

PCR and MCR, taken together, generate causal tension when conjoined with a third claim, which we can call Exclusion:<sup>11</sup>

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<sup>10</sup> Again, we are assuming here that causal claims and explanations not only cite events, but also cite properties of events in virtue of which they are causally related, a view that is held by Kim ("Explanatory Exclusion and the Problem of Mental Causation", in *Information, Semantics, and Epistemology*, ed. Enrique Villanueva (Oxford: Blackwell, 1990), pp. 36-56) and Dretske ("Reasons and Causes"), amongst others (see note 7).

<sup>11</sup> Barring cases of over-determination.

(EXCL) If a property,  $P$ , of a cause,  $c$ , is causally sufficient for an effect,  $e$ , then no other property,  $Q$ , distinct from and independent of  $P$ , is causally relevant for  $e$ ,

where  $P$ 's being causally sufficient for  $e$  means that an instance of  $P$  in an event  $c$  is causally sufficient for  $e$ . It follows from principle EXCL that mental properties and physical properties of physical events cannot both be completely and independently causally relevant to a single effect.

A brief comment on the origin and purport of EXCL is in order. Its origin is Kim's Principle of Explanatory Exclusion, which states, "No event can be given more than one *complete* and *independent* explanation".<sup>12</sup> Kim here leaves the notions *complete* and *independent* undefined, leaving it to our intuitions on particular cases to tease out their meaning, but it is fairly clear what restrictions need to be placed on any relation that can exist between two putatively independent *causes*,  $c_1$  and  $c_2$ , of the same event,  $e_1$ : they cannot be identical; they cannot be partial causes, constituents of a larger cause; they cannot be different links in the causal chain leading to  $e_1$ ; neither cause can be a 'part' of the other cause.

Explanatory completeness is to be understood in terms of sufficient causation, so if  $c_1$  is causally sufficient for  $e_1$  there will be a description of  $c_1$  that *will* yield an independent and complete explanation of  $e_1$  (since there will be no  $c_2$  such that  $c_1$  and  $c_2$  are independent causes of  $e$ ).<sup>13</sup> The notion of 'a description' of an event is too vague, however, as events will have many descriptions that do not yield any causal explanations of their effects, so a more precise account must limit the descriptions to those that

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<sup>12</sup> Kim, "Mechanism, Purpose, and Explanatory Exclusion", p. 79.

<sup>13</sup> Thanks here to John Carroll.

mention causally relevant properties. This version of EXCL is a descendant of Kim's, and is similar to Yablo's property version of a principle he labels *exclusion*, which reads: "If a property X is causally sufficient for an event y, then no property X\* distinct from X is causally relevant to y."<sup>14</sup> (Again, the notion of causal sufficiency is undefined, except to say that it could mean sufficient-in-the-circumstances or sufficient absolutely.) The present version is more explicit on what it means to say a property is causally sufficient, since this is necessary to avoid the conflation of causal efficacy with causal relevance.<sup>15</sup>

Given principles PCR, MCR, and EXCL, it might look as though a situation in which there are two causal explanations of a single piece of behavior such as my switching on of the light - one that cites only the mental properties of its mental/physical cause, and one that cites only the physical properties of that same cause - is a situation in which we must choose between them.

However, in order to generate the charge that mental properties are causally irrelevant (i.e., that MCR is false), something further is needed. What's needed is commitment to a view about physical causation and explanation. This view is that the

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<sup>14</sup> This derived from Yablo ("Mental Causation", p. 247), in line with his instructions (in his fn. 5) for translating the event-version into the above property-version of *exclusion*.

<sup>15</sup> Yablo ("Mental Causation") claims that "any credible reconstruction of the exclusion principle must respect the truism that determinates do not contend with their determinables for causal influence". (259). We agree, but he questions our rationale, using the example of Ella's singing at 80db, where her singing at more than 70db shatters a glass. His claim is that our attempt to explain why the property of singing at 80db does not compete for causal influence with the property of singing at under 90db either gives a result too strong ('too much' causal relevance) or is unsatisfactory because it makes properties "efficacious not absolutely, but only relative to some specified effect". This is a clear example where issues concerning causal efficacy of events are conflated with issues concerning causal relevance of properties. In Yablo's example, both properties are ones whose exemplifyings (events) are causally efficacious, but this does not show that both the property of being a singing at 80db and the property of being a singing at under 90db, properties of those events in virtue of which they are causally efficacious, are causally relevant, nor that they 'compete for causal influence', since causal efficacy of events is only a necessary condition on causal relevance of properties of those events. As this last point suggests, we also think that Yablo's discussion conflates properties whose exemplifyings (by persons) are (i.e. are identical with) events with properties of events. The issue of causal relevance, the *qua* problem, concerns properties of events.

physical domain is closed under causation and causal explanation. (This is sometimes referred to as Closure.)<sup>16</sup> Closure states:

(CLOS) If a physical event or phenomenon has any cause, it has a sufficient physical cause, whose physical properties are causally sufficient for its effect.<sup>17</sup>

Assuming that causal explanations are at least cause- and effect-citing, it follows from Closure that if a physical event has any causal explanation, it has one that alludes only to its causally sufficient physical properties.

How does CLOS work, together with PCR, and EXCL just mentioned, to generate the charge that MCR is false? Well, we know from MCR, PCR, and EXCL that if we have two properties (one mental and one physical) of a cause, each of which can be cited in two causal explanations (one mental and one physical) of a single explanandum, we cannot (by EXCL) accept both unless neither of those properties, taken alone, is causally sufficient. What CLOS entails is that there is some causally sufficient (physical) property.

In short, the combination of PCR, EXCL, CLOS and MCR appears to be inconsistent. If, then, we accept the former three principles, it seems that we must reject MCR and with it the view that mental properties of events are causally relevant to the effects those events bring about. But we want *both* to accept the former three principles and to accept MCR.

## 2. Tropes

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<sup>16</sup> See, for example, Robb, “The Properties of Mental Causation”, and citations therein.

<sup>17</sup> In recent work Kim has given this formulation of Closure: “If a physical event has a cause that occurs at *t*, it has a physical cause that occurs at *t*.” (“Blocking Causal Drainage and other Maintenance Chores with Mental Causation”, *Philosophy and Phenomenological Research* 67, no. 1, (July, 2003): 151-176, here p. 158.) Our formulation strengthens his to emphasise sufficient causation, which, together with EXCL, links closure to causal *relevance* for reasons that will become clear. Robb (in correspondence) has pointed out that PCR is strictly redundant, given EXCL and CLOS. We retain it just to emphasise the role that relevance plays in this debate.

The trope-physicalist claim is that appealing to trope theory offers a way of avoiding the charge that mental properties are causally irrelevant while maintaining PCR, EXCL, and CLOS, and, of course, the requirement on minimal physicalism that mental and physical properties are irreducibly distinct. In order to assess this claim, we need to know something about the theory of tropes on which it is based.

Consider a particular cardinal bird sitting on the branch of the tree just outside my window. It has certain properties: it is red, it has a particular size, shape, position, and so on. According to trope theory, these properties are particular properties of the bird. They are as particular as the bird itself; they are not particular instances of a property that can also be instantiated at the same or distinct times in other places or objects.

More precisely, in standard philosophical usage a property is construed as a universal, and an instance of a property is not a trope of that universal, but a thing that has (instantiates, exemplifies) that property. So a cardinal is an instance of the property of being red. For trope-theorists, however, the so-called particular redness of the cardinal, a trope, is not an instance of redness; it is a trope of redness. Just as the cardinal cannot be in more than one place at any given time – just as it is located all at once, wholly and completely, in the place it occupies at any given time – so too, its redness, its size and its shape cannot be in more than one place at any given time.

Tropes have been called by many names, one common one being ‘abstract particular’. Keith Campbell tells us that resistance to the idea of a trope is based on a conflation of one pair of terms or concepts, that of universal and particular, with another,

that of abstract and concrete.<sup>18</sup> This conflation is responsible for the belief that since to be universal just is to be abstract, to be particular just is to be concrete. On this basis, the possibility that there should exist things that are both abstract and particular is ruled out.

However, Campbell goes on to say, what is universal is so because it is possible for it to be wholly and completely in more than one spatial position at any given time. In contrast, what is particular can only be wholly and completely in one spatial position at a given time. And this is different from the contrast between abstract and concrete. What is abstract is “what is got before the mind by an act of abstraction”. It is what comes to be known by attending to some part, or aspect, of “what is presented”.<sup>19</sup> In contrast, what is concrete is grasped by attending to all of what is presented, not by attending to some part or aspect of it. No special act of selective attending is involved in our grasp of concrete things.

Campbell’s work is a revival of the earlier foundational work of D.C. Williams.<sup>20</sup> Williams set forth a version of trope theory that is now regarded as the classic account.<sup>21</sup> This account will serve as the standard against which to evaluate the strategy of appealing to trope theory in order to resolve the problem of the causal relevance of mental properties.

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<sup>18</sup> “The Metaphysic of Abstract Particulars”, *Midwest Studies in Philosophy* 6, ed. P. A. French *et al* (Notre Dame: University of Notre Dame Press, 1981), pp. 477-88; and *Abstract Particulars* (Oxford: Basil Blackwell, 1990).

<sup>19</sup> *Abstract Particulars*, 48. This sense of ‘abstract’ is different from another, and more common understanding of the term in metaphysics. According to it, entities of a given kind are abstract if they are such that many of them can be in the same place at the same time. It contrasts with the sense of ‘concrete’, where to be concrete is to exclude other things of the same kind occupying the same space at the same time.

<sup>20</sup> Donald C. Williams, “The Elements of Being,” *Review of Metaphysics* 7 (1953): 3-18, 171-192; cited from *Principles of Empirical Realism* (Springfield: Charles C. Thomas 1966), pp. 74-109.

<sup>21</sup> John Bacon, *Universals and Property Instances: The Alphabet of Being* (Oxford: Basil Blackwell, 1995), and “Tropes”, *The Stanford Encyclopedia of Philosophy (Fall 2002 Edition)*, Edward N. Zalta (Ed.), URL = <<http://plato.stanford.edu/archives/fall2002/entries/tropes/>>. Bacon refers to the classic account as ‘trope cluster theory’.

According to the classic account, tropes are the foundations of all things, and so are the foundations of both individual objects and events, and properties or universals if there are any. Individual objects are bundles of compresent or concurrent tropes, tropes that are ‘bundled’ together by relations of compresence. For example, this redness, this shape, this size, and this position (along with other tropes), related to one another by compresence relations, together ‘constitute’ or comprise the cardinal sitting on the branch of the tree outside my window. And individual events are either tropes, or bundles of compresent tropes.<sup>22</sup>

Properties or universals, and relations are classes or sets of exactly resembling tropes. Individual tropes (e.g., all the rednesses of all the red things) that are members of the class or set of exactly resembling tropes with which a given property is identical are understood to be particular trope-instances of that property. For a substance or event to instantiate a property (universal, relation) is for the intersection of the set of compresent tropes that constitute the individual substance or event and the set of tropes that is the property to be non-empty.

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<sup>22</sup> Robb (in correspondence) claims that he assumes neither of these views in “The Properties of Mental Causation”, although he does in that paper say that the trope solution can be combined with a view of events as Kim-like structured particulars, and agrees that on this understanding of an event the causal efficacy/causal relevance distinction collapses on the trope strategy. In the paper, he takes events to be basic concrete Davidsonian (‘unstructured’) particulars that ‘instantiate’ tropes. But how are we to understand the claim that events ‘instantiate’ tropes? Robb (again in correspondence) takes the instantiation relation to be a relation between a particular and a property, irrespective of whether the latter is understood as a universal or as a trope. Understood this way, tropes characterize events. For example, phenomenal events, such as pains, hurt, and so have phenomenal tropes, and intentional mental events, like thinkings, have contents, in that they are characterized by certain content-tropes. However, given the distinction between causal efficacy of events and causal relevance of properties, this way of understanding the relation between an event and its trope-properties makes, say, the hurt-trope of a pain *inefficacious* in that event’s bringing about the effects it does, and similarly for the content-trope of a thinking. Quite apart from the implausibility of this view, if tropes of events are inefficacious it is hard to see how they could be causally relevant, since it is natural to suppose that a necessary condition on causal relevance of a property (universal or trope) is that its instantiation is causally efficacious. The more natural (and more plausible) reading of ‘instantiate’ for the trope theorist, then, is one according to which an event instantiates a trope by being constituted by it.

### 3. Trope Theory and the Problem of the Causal Relevance of Mental Properties

We are now in a somewhat better position to appreciate the basic commitments of trope theory and so of its prospects for resolving the conflict between MCR, PCR, EXCL, and CLOS, assuming minimal physicalism. The strategy appeals to a trope conception either of events, or of the mental and physical tropes that constitute events, in order to make sense of the claim that each mental event is identical with a physical event, and to a trope conception of properties in order to make sense of the claim that mental and physical properties are irreducibly distinct. According to it, to say that mental events are identical with physical events is to say that mental tropes and physical tropes are identical, where these tropes either are events, or constitute events and so are ‘parts’ of them. If the latter, events are, like any other object, complexes of many distinct tropes. Either way, because mental tropes are identical with physical tropes, the claim is that there is no problem about the causal efficacy of mental events. On both understandings of the trope conception, psycho-physical event identity is guaranteed by psycho-physical trope identity. Given that events are the relata of the causal relation, psycho-physical trope identity guarantees the causal efficacy of mental events.

What does the question of causal relevance of mental properties amount to on the trope conception, given minimal physicalism’s commitment to the irreducibility of mental properties? It depends, since, on the trope conception, ‘property’ is ambiguous: it might mean either ‘trope’ or ‘class of tropes’. Depending on how it is interpreted, there will be a different way of understanding the question. Accordingly, there are two ways in

which in the defense of MCR might be mounted.<sup>23</sup> We'll begin by considering the 'class of tropes' interpretation.

According to this conception, mental properties or types are sets or classes of exactly resembling mental tropes, and physical properties or types are classes of exactly resembling physical tropes. The strategy ensures the distinctness of the mental property-classes and the physical property-classes by viewing mental properties as higher-level properties of the events whose physical properties are lower-level ones, in something like the way in which, say, being soluble is a higher-level property of substances, such as salt, that have lower-level physical properties. That is to say, they are higher-level properties in virtue of the fact that although they are first-order properties of particular things like events and substances, they are possessed by those things in virtue of the possession by those things of other (first-level) properties. Thus, for example, being soluble is possessed by sugar cubes in virtue of those cubes' having the chemical constitution they have.<sup>24</sup>

Suppose that a necessary condition on causal relevance of a property or type is causal efficacy of its property instance or trope. Then, on this understanding of what it is to be a mental type or property, to say that mental tropes that are identical with physical

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<sup>23</sup> Ehring defends MCR by appeal to the class of tropes conception of mental properties, whereas Robb defends MCR by appeal to the tropes conception.

<sup>24</sup> Higher-level properties should not be confused with higher-order ones. Higher-order properties are properties of properties, not properties of the things that have them in virtue of their possession of other properties. It is common, especially in functionalist treatments in the philosophy of mind, to use 'higher-order' rather than 'higher-level' when talking about mental properties such as being pain, or dispositional properties like being soluble. But this is quite different from the contemporary logician's usage (though similar to Russell's and Ramsey's). In contemporary terms, 'being soluble', like 'being a number', is a first-order predicate and so stands for a first-order property because its instances are particulars. However both predicates might be classed as impredicative, i.e., specificiable by phrases that include second-order quantification over all properties, including those properties themselves. Thus, ' $\exists x(x \text{ is soluble})$ ' might be specified by something like, ' $\exists F(Fx \ \& \ \exists y(Fy \ \& \ y \text{ is placed in a relevant liquid} \ \& \ y \text{ dissolves})$ ', where we have a second-order quantifier, ' $\exists F$ ', which ranges over all properties, including being soluble (just as the bound variable in ' $\exists x(\exists y(x \ \> \ y \ \& \ x \text{ is taller than } y))$ ' impredicatively specifies the tallest person. Thanks to Alan Weir for discussion on this point.

tropes are causally efficacious in virtue of their mental properties is to say that the mental tropes that comprise mental/physical events fall into two classes, a mental one and a physical one. Being physical tropes, they fall into a class of exactly resembling physical tropes. This class, class A, is determined to be the class it is in virtue of resemblance relations that hold between its members. The very same tropes that fall into this class (as well as ones that fall into other classes of physical tropes), however, fall into another, higher-level class, class B. They do so in virtue of falling into the first-level classes that they do.

Class B is higher-level: it is a class of tropes whose members fall into it in virtue of falling into other classes of exactly resembling physical tropes. This class is a class of mental tropes, and it is a class whose members are physical tropes that are not exactly resembling in ways that make for their membership in any physical class. They are not exactly resembling because class B's tropes fall into distinct classes of exactly resembling physical tropes, such classes being distinct because the members of each such class do not exactly resemble the members of the others. Thus, for example, the mental property, being pain, is a class of tropes, whose members fall into it in virtue of falling into other, first-level classes, such as, for example, the class, being C-fibres' firing, the class, being H-fibres' firing, and so on. On the assumption that mental properties are variably realizable by physical ones, there may be an indefinite number of such first-level classes.

It is crucial here that the resemblance relations binding class B's members together are not the same resemblance relations as those that bind the members of each first-level physical class together. The resemblances that bind the members of the higher-

level class together are themselves higher-level resemblances. Consider, again, the higher-level property, being soluble. Members of the class that, on the present version of the strategy, just is this property are exactly resembling in this way: each thing (substance) that has (/is partly constituted by) a member (trope) of that class is apt to dissolve if placed in a relevant liquid. The property itself is higher-level, because its members exactly resemble one another in this way in virtue of falling into other, chemical compound classes (e.g. the *NaCl* class). Members of this lower-level class are chemical tropes. These very tropes, however, fall into higher-level classes in virtue of being members of a class of exactly resembling chemical tropes.

Suppose, now, that we define a given mental property, or class of tropes, in terms of its causal role. Its members are occupants of that causal role; they are what discharge it. Then the claim is that physical tropes, which have physical properties in that they are members of physical classes, are the occupants of the causal role definitive of the mental property or class. It follows that mental tropes are physical tropes. This view we shall call trope functionalism, since it is a functionalist account of the relation between the mental and the physical, applied to tropes.<sup>25</sup>

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<sup>25</sup> Robb, unlike Ehring, does not specifically advocate trope functionalism with respect to mental property-types, but advocates what calls ‘trope monism’. However, he distinguishes mental property-types and physical property-types, where types are taken to be universals or classes, and construes such types as classes or sets of resembling tropes. On this basis he claims, “if trope monism is true, a given mental type is a set of physical tropes. But multiple realizability entails that these physical tropes do not themselves resemble one another in the way that members of a physical type must: they will be wildly dissimilar physically. So the mental type is not itself a physical type (hence *Distinctness*), though of course it has many physical types as subsets: these just are the physical types that ‘realize’ the mental one.” (Robb, “The Properties of Mental Causation”, p. 188). This is consistent with a form of trope functionalism with regard to mental types. Ehring explicitly takes mental properties (property-types) to be a species of dispositional properties, takes dispositional properties to be a species of functional properties, and takes functional properties to be second-order properties as defined thus: “A second-order property is the property of having some property *X* or other that satisfies a certain specification *H*” (“Tropeless in Seattle”, p. 19). So, both Ehring and Robb are trope monists, and both Ehring and Robb take mental property-types to be second-level classes of physical tropes.

There are several advantages to this position. First, by maintaining that mental and physical tropes are identical, it ensures the causal efficacy of mental events.<sup>26</sup> Second, by maintaining that the tropes that fall into both physical and mental classes are physical tropes, it ensures the primacy of the physical, and with it the vindication of principles CLOS and PCR. Finally, by maintaining that mental properties are second-level classes of physical tropes that fall into first-level (physical) classes, it ensures the distinctness of mental and physical properties. Further, it seems capable of meeting the Exclusion requirement, since the causal roles by which mental properties are defined open up space for physical tropes to occupy. Given the distinction between role and occupant, there seems to be no real problem of exclusion to address.

This leaves MCR and the charge of causal irrelevance of mental properties. But here the strategy founders. Either it is landed with a version of the *qua* problem, and so cannot handle the problem of the causal relevance of mental properties, or it avoids the *qua* problem, but only by sacrificing MCR altogether.

Let P1, P2, P3, P4 be physical property-classes, each being comprised by exactly resembling physical tropes, and let M be a mental property-class. Here we are talking about mental and physical property-types. Then the trope view is that M is a class of physical tropes (that are not exactly resembling): it is the class whose members just are the members of P1, P2, P3, and P4.

Suppose now that particular  $P_i$  in P1 causes an effect  $e$ . We can ask, in virtue of which property-type does  $P_i$  cause  $e$ ? Does it cause  $e$  in virtue of being a member of P1

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<sup>26</sup> This is so irrespective of whether one endorses the view that it is events that are the causal relata or whether one endorses the view that it is tropes that are the causal relata. On a trope view, events are 'bundles' of compresent tropes, so if mental events are causally efficacious, then mental tropes of mental events are causally efficacious.

or in virtue of being a member of M? If as seems inevitable, the answer is: in virtue of being a member of P1, then PCR is purchased but at the expense of the causal relevance of the property-type M. So the principle MCR is jettisoned. It is jettisoned because M is a higher-level property, whose causal relevance is purchased only by its members' (physical tropes) being physical (i.e., being members of P1).<sup>27</sup>

Suppose that the trope theorist responds by claiming that, since one and the same trope,  $P_i$ , is (i.e., is identical with) an instance of both P1 *and* M (i.e, there is just one, physical trope here), if P1 is causally relevant so too is M. Then another, different problem arises. Consider once again the higher-level property, being soluble, and one of its lower-level realizing properties, being NaCl. All of the tropes that are members of the being NaCl class are also members of the being soluble class. Nevertheless, we want to say that the properties are distinct, since the former is a first-level class whereas the latter is a second-level one.

The problem is not that the strategy cannot ensure the distinctness of first-level and second-level properties, since it can.<sup>28</sup> However, as the being soluble example makes plain, the distinction between higher-level and lower-level properties does not by itself ensure that those higher-level properties that things have in virtue of having lower-level

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<sup>27</sup> Robb ("Reply to Noordhof on Mental Causation") interprets Noordhof ("Do Tropes Resolve the Problem of Mental Causation?", *Philosophical Quarterly* 48 (1998): 221-6) as objecting to his position for something like this reason. Robb's reply is that it makes no sense to speak of tropes being causally relevant in virtue of their properties, if properties are construed as types or classes, since classes aren't the sort of things that can be causally relevant. So Robb, though not Ehring, does not endorse this version of the trope strategy. We develop it and our objection to it here partly because it does apply to Ehring's version, and partly because, as we shall see, it is not clear that Robb's attempt to distinguish causal efficacy of events from causal efficacy and causal relevance of properties at the level of tropes can succeed (see also note 21), in which case his strategy too fails to deal with the problem of causal relevance of mental properties.

<sup>28</sup> For, even if we consider all the possible occupants of the causal role definitive of a higher-level property, such as being soluble, there is still the distinction between the property specified impredicatively, i.e., specifiable by phrases that include second-order quantification over all properties, including those properties themselves, as, say, ' $\forall F(Fx \ \& \ \exists y(Fy \ \& \ y \text{ is placed in a relevant liquid} \ \supset \ y \text{ dissolves})$ ' and the things that truly instantiate  $F$ , i.e., all assignments to  $x$  which satisfy it in virtue of falling into lower-level, physical classes.

physical properties are not themselves physical properties. For *being soluble* is a physical property! Applied to the psychophysical case, there is no reason to call the higher-level property/class ‘mental’. In fact, we have every reason not to if all its members (i.e., tropes) are physical.

Of course, it is open to a trope functionalist to respond by saying that the earmark of the mental is not having a functional role *per se*, but having a *particular* functional role, and that the functional role that binds all the being soluble tropes together just isn’t the right sort of functional role. But even if this response is acceptable, a more fundamental problem with the strategy remains, and that is that it simply doesn’t follow from the fact that  $P_i$  is an instance of both P1 and M1 that if P1 is causally relevant, so is M1.  $P_i$  will be an instance of any number of property-types, at least some of which (such as the property-type that is some heterogeneous class whose members bear only some weird kind of resemblance to one another) are plainly not causally relevant. Given this, we really have no reason to think the M1 is causally relevant. This is so even if the resemblance between the members of M1 is not functional.<sup>29</sup>

So this version of the trope strategy by itself does not ensure the truth of the principle MCR. But there is a deeper problem for the trope-physicalist lurking here. To see this, we need to look at the second avenue available to the trope theorist for defending MCR mentioned earlier in connection with the two ways of understanding ‘property’ recognized by trope theory.

The trope theorist is not forced to defend MCR by construing mental properties as property-types, i.e., classes of tropes. She can maintain instead the *qua* problem can only

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<sup>29</sup> We are indebted here to John Carroll.

arise at the level of individual tropes, and insist that if one accepts that mental properties are higher-level classes of physical tropes whose members fall into them in virtue of falling into lower-level classes, then there is no problem about mental causation or causal relevance at that level.<sup>30</sup> The grounds given for this might be that the items doing the work are not the classes but their members (the tropes); and no member does anything in virtue of its class membership. Indeed, it might be claimed, it makes no sense to say that a given trope caused (or figured in a cause of) *e* in virtue of being in one class or another.

Pursuing this strategy seems to avoid both of the above charges. By rejecting the view that the problem of causal relevance of mental properties concerns property-types altogether, it apparently avoids the charge that the *qua* problem arises again at the level of property-types. But it also appears to avoid the charge that MCR is jettisoned because there is no reason to think that higher-level classes of physical tropes are anything other than physical properties. For, according to the present way of understanding the problem of causal relevance of properties, though it may be true that higher-level classes of physical tropes are themselves physical property-types, it is irrelevant to the question of whether mental properties are causally relevant, this question being one that concerns individual tropes, not classes of tropes.

But it is not at all clear that the question concerns only tropes. According to the trope theorist, the trope strategy does not face the *qua* problem at the level of property-types, but this is not to say that there is no problem of causal relevance of properties, as distinct from causal efficacy, that arises at the level of tropes. According to the present strategy, when a given mental event, *c*, causes another event, *e* (where an event is an

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<sup>30</sup> This is the strategy that Heil and Robb pursue in "Mental Properties", *American Philosophical Quarterly* 40 (2003): 175-96. See also Heil's *From an Ontological Point of View* (Oxford: Clarendon Press, 2003).

object's possessing a property at a time and where property = trope), there are two questions that can be asked, one about causal efficacy of events or event-tropes and another about causal relevance of properties. We can ask what that event  $c$  causes, and this is the question of causal efficacy. But we can also ask whether  $c$ 's possessing  $P_i$  (where  $P_i$  is a member of the P1 class) caused  $e$ 's being  $B_i$  (where  $B_i$  is a member of the class of physical tropes, B). This, we're *told*, is the question of causal relevance. But in this case,  $c$ 's possessing  $P_i$ , that event, or event-trope, is identical with  $c$ 's possessing  $M_i$ , where  $M_i$  is a member of the mental class M. Thus, it follows that if  $c$ 's possessing  $P_i$  caused  $e$ 's possessing  $B_i$ , then  $c$ 's possessing  $M_i$  caused  $e$ 's possessing  $B_i$ .

But this is *not* the question of causal relevance. The 'relevance' question *only* arises if we ask whether that event, or event-trope,  $c$ 's possessing  $P_i$ , that is,  $c$ 's possessing  $M_i$ , succeeded in causing  $e$ 's possessing  $B_i$  *in virtue of* being a  $P_i$ -ing or *in virtue of* being an  $M_i$ -ing. And this question, it seems, cannot be answered just by appeal to mental/physical tropes, but requires appeal to properties of tropes in virtue of which they are causally efficacious.

The problem can be put more simply like this. Take event  $c$  to be the trope  $P_i$ , and take event  $e$  to be the trope  $B_i$ . The question that the trope-physicalist tells us is the question of causal efficacy is the question of what  $c$ , i.e.,  $P_i$ , causes. Since  $P_i$  just is  $M_i$ , if  $P_i$  is causally efficacious,  $M_i$  is. But there's also a 'relevance' question: it's the question whether  $P_i$  caused  $B_i$  in virtue of being  $P_i$ , or in virtue of being  $M_i$ . Being  $P_i$  and being  $M_i$  are properties *of* tropes – where 'property' here means either 'trope' or 'class of tropes'. Minimal physicalism takes these latter properties to be distinct. On either of the two readings of 'property' available, there is a problem of causal relevance. If the reading is

‘class of tropes’, then, for reasons already given, principle MCR is jettisoned. If, on the other hand, the reading is ‘trope’ the problem of causal relevance re-emerges, and the trope strategy does not solve it.

So, neither the ‘trope’ interpretation nor the ‘class of tropes’ interpretation of ‘property’ works to show how appeal to trope theory solves the problem of the causal relevance of mental properties. Of course, it is open to the trope theorist to deny that tropes have properties. If this option is taken, though, the result will be that the distinction between causal efficacy and causal relevance cannot be made out. And if it cannot, MCR cannot be salvaged.

Thus, irrespective of whether the trope strategy construes the issue of the causal relevance of mental properties to be one that concerns property-types (i.e. classes of tropes), or one that concerns tropes alone, it cannot give an effective response to the charge that minimal physicalism leads to the causal irrelevance of mental properties. Its attempts to do so fail to engage with the problem of causal relevance of properties as posed at the outset of our discussion.

#### 4. Appealing to the Property exemplification Account (PEA) of Events

How, then, might one go about attempting to rescue mental properties from the threat of causal irrelevance without rejecting the independently plausible three principles, PCR, EXCL, and CLOS? Our view is that one can do so by appealing to a version of the property exemplification account (PEA), *developed in a particular way*. According to this, events, such as my having pain now, not only have properties, such as the property of being a pain event, but are the exemplifyings of properties, such as the property, has pain. That is to say, they are identical with exemplifyings of (*n*-adic) act-or event

properties at (or during intervals of) times in objects.<sup>31</sup> The objects in which such exemplifyings occur are the subjects of those events. And the properties, whose exemplifyings in subjects just are events, are properties, not of events, but of their subjects. For example, the event of my having pain now just is the exemplifying in me of a property of me, the property, *has pain*, now. Such properties are sometimes termed constitutive properties of events, and are so termed because they are the properties of subjects whose exemplifyings in those subjects just are events. So when it is said that

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<sup>31</sup> In the terminology preferred by Kim, whose version of the account we describe and develop further here, events are *exemplifications* of properties by objects at times. See “Events as Property Exemplifications”, in *Action Theory*, eds. M. Brand and D. Walton (Dordrecht: D. Reidel, 1976), pp. 159-77. But Kim himself, and many others who take a Universalist rather than a tropist view of properties, often use the terms ‘instance’ as alternatives to the term ‘exemplification’ (and thus claim, for example, that a mental event is an instance of a property at a time in an object). We ourselves prefer ‘exemplifyings’ to ‘exemplifications’ (for reasons akin to those given by Lawrence Lombard in *Events: A Metaphysical Study* (London: Routledge & Kegan Paul, 1986)), since it makes clear that events are fundamentally changes, whose ‘constitutive’ properties are dynamic rather than static, or its cognate term, ‘instancings’; since we think that failure to do so blurs the crucial distinction between a substance and an event (see Cynthia Macdonald, *Mind-Body Identity Theories*, Chapter 4 (London: Routledge, 1989)). Given the Universalist (as contrasted with a tropist) view of properties, according to which an exemplification/instance of a property just is the thing that has it, we would have to say that *Jones* is the instance of the property, *runs*, since, according to the property exemplification account, as developed by Kim, this is a property of Jones, and so is a constitutive property of the event which is Jones’s running. But although Kim wants to say that the subject of that event is Jones, the exemplification of the property *runs* by Jones is an *event*, a running, not the event’s subject. We can avoid this problem altogether if we distinguish instances from instancings (i.e., exemplifyings), since we can then maintain (1) that an instance of a property is the thing that has it (whether this is an object or an event), (2) that events just are (i.e., are identical with) exemplifyings of dynamic properties of objects in those objects, and (3) that an instance of a property of an event just is the event that has that property. Events, like any other entity, have properties by instantiating them, but their constitutive properties are not, according to PEA, properties that they possess. These distinctions are important to our solution to the problem of causal relevance, since only certain ways of developing the PEA will make that solution possible. For more on the distinction between static and dynamic properties, and the differences between Kim’s and Lombard’s versions of the PEA, see Macdonald (*Mind-Body Identity Theories*, and *Varieties of Things: Foundations of Contemporary Metaphysics* (Oxford: Basil Blackwell, 2005)).

We now prefer to avoid the term ‘instances’ entirely, since it suggests a trope view of properties, which we reject. But, since many parties to the dispute concerning the problem of mental causation, (e.g. P. Pettit (*The Common Mind: An Essay on Psychology, Society, and Politics* (New York: Oxford University Press, 1993) and Kim himself (*Supervenience and Mind, Mind in a Physical World*)), regularly talk of events as instances of properties – intending the Universalist view of properties as multiply-exemplifiable entities that can be (wholly) present in many places at the same time – we will, for present purposes, speak in these terms too.

events ‘have’ constitutive properties, this is not to be understood as the claim that they possess such properties.<sup>32</sup>

Events construed along these lines are sometimes referred to as ‘structured particulars’. They are deemed so because they have not only constitutive properties, but also constitutive objects (or subjects) and constitutive times. That is to say, it is in the nature of any event to be an exemplifying of a property (of its subject) in a subject at a time. Two conditions on events are essential to the account, one an existence condition and one an identity condition. These are formulated for monadic events as follows:<sup>33</sup>

*Existence Condition:* Event  $[x,P,t]$  exists if and only if the object  $x$  has the property  $P$  at time  $t$ .

*Identity Condition:* Event  $[x,P,t]$  is identical with event  $[y,Q,t_]$  if and only if the object  $x$  is identical with the object  $y$ , the property  $P$  is identical with the property  $Q$ , and the time  $t$  is identical with the time  $t_$ ,

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<sup>32</sup> An event’s constitutive property can no more be viewed as a property *of* it than its constitutive object can be viewed as a property of it. The claim that  $P$  is a constitutive property of  $e$  entails, not that  $P$  is a property of  $e$ , but rather, that being an exemplifying of  $P$  is a property of  $e$ . Thus, for example, the claim that the property, *firing*, is a constitutive property of the event which is Joe’s firing a gun at  $t$  entails, not that *firing* is a property of that event, but rather, that being an exemplifying of the property, *firing*, is a property of that event.

<sup>33</sup> The exposition of the PEA here is based on this work of Kim’s (see especially “Causation, Nomic Subsumption, and the Concept of Event”, *Journal of Philosophy* 70 (1973): 217-236 and “Events as Property Exemplifications”). According to Kim, although the first condition is indispensable to the theory, the second, as formulated, is not. The theory could proceed, for example, by defining the predicate ‘is an event’ over ordered  $n$ -tuples of objects, properties, and times. In this case, the ordered triple,  $\langle x,P,t \rangle$ , would be an event if and only if  $x$  has  $P$  at  $t$ ; and the principles of set theory would guarantee the existence of the triple (assuming, of course, that  $x$ ,  $P$ , and  $t$  exist). But Kim himself appears to favor the first method over the second, and it is certainly the preferable one from the point of view of the phenomenon of causal interaction between events, where this is assume to entail their positionality.

where  $x$  and  $y$ ,  $P$  and  $Q$ , and  $t$  and  $t_*$ , are variables ranging over objects, properties, and times, respectively.<sup>34</sup> Descriptions of the form ‘ $[x,P,t]$ ’ are known as canonical descriptions of events because they pick such events out in terms of their constitutive objects, properties and times.

It is worth noting here that, although Kim himself assumes that events have only one, unique, constitutive property, the version of the account we favor, developed by Lawrence Lombard, allows for an event’s having more than one constitutive property.<sup>35</sup> This version is predicated on the assumption that events are paradigmatically and fundamentally changes, where these are *not* to be understood as states or persisting conditions. This assumption is founded on the intuition that some properties are such that their possession by an object at a time implies change, whereas others are not. Lombard labels these two sorts of properties ‘dynamic’ and ‘static’ respectively, and argues that only exemplifyings of the dynamic ones imply the existence of events.

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<sup>34</sup> More precisely, objects that are *minimal subjects* of events, since, as stated in the text, we prefer the version of the account developed by Lawrence Lombard (*Events: A Metaphysical Study*). According to this, an object,  $x$ , is the minimal subject of an event  $e$  if it is the minimally involved subject of  $e$ , where the notions of an object’s involvement and minimal involvement in an event are defined as follows:

If  $x$  is any object,  $e$  is any event, and  $t$  is a time, then  $x$  is involved in  $e$  at  $t$  if and only if it is the case that if  $e$  occurs (or is occurring) at  $t$ , then  $x$  changes (or is changing) at  $t$ , and a change in  $x$  at  $t$  is identical with  $e$  at  $t$ ; and

If  $x$  is any object,  $e$  is any event, and  $t$  is a time, then  $x$  is the minimally involved subject of  $e$  at  $t$  if and only if (a)  $x$  is involved in  $e$  at  $t$ , and (b)  $x$  is the smallest object which is such that a change in  $x$  at  $t$  is identical with  $e$  at  $t$ . (*Events: A Metaphysical Study*, 122-3)

For more on the details of Lombard’s version of the PEA, and his reasons for distinguishing subjects from minimal subjects of events, see *Events: A Metaphysical Study*. That mental and physical events might have different subjects – mental ones having, say, persons, and physical ones having, say, brains – does not preclude identity between mental and physical events on the PEA, since the distinction between subjects and minimal subjects allows for the possibility that persons are not minimal subjects of mental events. For more on this, see Macdonald (*Mind-Body Identity Theories*).

<sup>35</sup> See his *Events: A Metaphysical Study* (esp. p.55.) Lombard points out that the view that events may have more than one constitutive property is *not* inconsistent with the existence and identity conditions of events as stated by the PEA (though it is inconsistent with Kim’s claims on behalf of that account).

If a material substance has a dynamic property during an interval of time, then it will be true that that substance is changing during that interval from having one static property to having another. This will be true because a dynamic property just *is* the property of first having one, then another, static property. Thus Lombard's version of the PEA, unlike Kim's, not only countenances the possibility that an event may have more than one constitutive property, but actually requires it.

The claim that events have constitutive objects, properties, and times, shouldn't be confused with the claim that they are in some way constituted by or composed of objects, properties, and times.<sup>36</sup> In this respect at least, describing events as 'structured particulars' is misleading. It invites us to view events as somehow composed of objects, properties, and times, related to each other in something like the way that a chair or any other complex physical object or, perhaps, biological organism is often viewed as composed of or constituted by its parts, arranged in a certain way. But the relationships that the 'components' of events bear to one another are very different from the relations that the components of physical things bear to one another. In the case of an event, one component is exemplified by another, at yet another; and it is clear that, whatever the constituents of a biological organism or an artifact may be, they do not bear this relationship to one another.

For this reason, as well as others, talk of events as 'structured particulars' is best avoided altogether, and the claim that the components of events are constitutive of them should probably be understood as the claim that events have essentially the structure they

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<sup>36</sup> Ehring ("Tropeless in Seattle: The Cure for Insomnia") and Robb ("The Properties of Mental Causation") are both guilty of talk of the 'components' of events in this misleading way when discussing the PEA. It encourages a trope conception of properties.

have.<sup>37</sup> Indeed, Kim explicitly commits himself to some version of the latter - specifically, to the claim that events are essentially exemplifications of act or event properties at times in objects, and hence, that, for any event, *e*, being an exemplifying of an act or event property at a time in an object is an essential property of *e*.<sup>38</sup> Notice, though, that this would appear to follow from the two basic tenets of the PEA alone. For, irrespective of how the existence condition is interpreted, the mere existence of the relevant *x*, *P*, and *t* are not enough to guarantee the existence of an event. No entity *could* be an event, according to this account, unless it was the exemplifying of a property at a time in a substance.

As the above discussion suggests, in addition to constitutive properties, events also have characterizing properties. These are properties that events possess, at least some of which they possess in virtue of having the constitutive properties they have. Thus, for example, the event that is my having pain now has the property of being a having of a pain. The event that is the exemplifying of the property, *runs*, in Jones at time *t*, has as its constitutive property a property of Jones. That event has the property of being a running.

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<sup>37</sup> One reason for avoiding such talk is that it encourages the view that the PEA is a 'reductive' account of events, a view that Kim himself is quick to deny. Thus, he says, "The account so far presented is not an "eliminative" or "reductive" theory of events; that is, it does not attempt to show that events are in some eliminative sense "reducible" to substances, properties, and times. ... the account, however, attempts to tell us something about the metaphysical nature of events by relating them to such other ontological categories as substances, properties, and times." ("Events as Property Exemplifications", p. 162)

<sup>38</sup> "Events as Property Exemplifications", p. 173. Kim is also inclined, though not without qualification, to endorse the claim that each individual event has at least some of its constitutive components essentially, namely, its constitutive object and possibly its constitutive property. Whereas the claim in the text says what, in general, events essentially are, this latter claim says what each individual is essentially. We are more directly concerned with the claim in the text.

Kim takes the constitutive properties of events as being the ones that figure in laws connecting the events that are the exemplifyings of them.<sup>39</sup> His reason may be that it is these properties whose exemplifyings bring about, or cause, other events. However, in the context of our discussion of causal relevance, this claim is extremely odd. For the constitutive properties are properties of the *subjects* of events, not of events themselves. And, as we have construed it, the problem of the causal relevance of the mental concerns the question of whether mental (= physical) events cause the effects they do in virtue of their mental properties, properties of those *events*, such as that of being a thinking of Vienna. And the answer to this depends on a number of issues, one of which concerns the conception of ‘property’ at work in the PEA, and another of which concerns the status of mental properties (of persons). We discuss these issues in turn.

The PEA construes properties as abstract, multiply-exemplifiable entities that can have, but are not identical with, their exemplifyings. According to it, to say that mental events are identical with physical events is to say that each event which is (= is identical with) an exemplifying of a mental property of a subject in that subject at a time is identical with an exemplifying of a physical property of that subject in that subject at that time. Crucially, this amounts to the claim that there is just *one exemplifying* of two properties, one mental, and one physical, by an object at a time.<sup>40</sup> That this is possible is

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<sup>39</sup> See Kim, “Causation, Nomic Subsumption, and the Concept of Event”, pp. 226-7. Kim’s early view of the relation between the mental and the physical is that identity between mental and physical events entails psychophysical laws, and he rejects the minimal physicalism assumed in this paper for that reason. But the PEA does not commit him to that view, and it is part of the purpose of this paper to correct the view that the PEA entails type identity between mental and physical properties whose exemplifyings are events. For more on the details of the PEA and its compatibility with non-reductive physicalism, see Macdonald (*Mind-Body Identity Theories*), especially chapters 4-6. (Note that Kim’s recent view on the mind-body relation differs substantially from the early one.)

<sup>40</sup> Kim claims on behalf of the PEA that both mental properties (of persons) and physical properties (of persons) are constitutive properties of events, and, in his early work (“Phenomenal Properties, Psychophysical Laws, and the Identity Theory”, *Monist* 56 (1972): 177-92), concludes that token identity

apparent from determinable/determinate examples, such as that of being colored and being red. The most natural understanding of the relation between these properties is that for an object to instance the latter (being red) just is for it to instance the former (being colored): nothing further is required, once the latter is instanced, for the former to be instanced. Unlike the determinable/determinate property relation, the relation between mental and physical properties is not both metaphysical and conceptual. However, if, as seems likely, non-reductive monism is committed to the view that mental properties supervene on physical ones (in a sense shortly to be specified), the result is that mental properties of persons are not themselves constitutive properties of the events that are (identical with) exemplifying of them, but rather, supervene on those events' physical, constitutive properties (see note 39). And our view is that although the supervenience relation is a weaker metaphysical relation than the determinable/determinate one, both are cases where there can be a single exemplifying of distinct properties.

Thus, appealing to the PEA in order to rescue causal *efficacy* for mental events requires simply recognizing that an event can be a single exemplifying of both a mental property and a physical property. In the case of mental and physical properties of events, we claim that this is just what happens, and hence, that the following 'Co-Instantiation Thesis' for events is true:

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theories of the mind-body relation are false, on the grounds that mental properties are not identical with physical ones, but the PEA is *not* committed to this conclusion, for two reasons. First, it requires that an event cannot have more than one constitutive property, and the PEA need not be committed to this (cf. our discussion of Lombard's version of the PEA, which rejects it, and note 34). Second, even if one does suppose it, one might claim – as we do – that mental properties of persons supervene on the constitutive properties of physical events, and so are not constitutive properties of those events (see subsequent pages of the text). We prefer this way of reconciling the PEA with token event identity because we think that a proper physicalism must be committed not just to an ontology of physical events, but must also provide an explanation of the relation between mental and physical *properties* which shows them to be, if not physical, not worryingly non-physical. The first way of reconciling the PEA with token event identity leaves the question of the relation between mental and physical properties completely open.

(CI) Two or more properties of an event can be co-instantiated in a single instance, i.e., there can be just one instance of distinct properties.<sup>41</sup>

By the extensionality of the causal relation, if the physical event is causally efficacious the mental one is.

This shows that the PEA has the resources with which to rescue the causal efficacy of instances of mental properties, which on any plausible account is necessary for the causal relevance of the properties themselves. How does the PEA account for the causal relevance of mental properties? We've seen that, according to it, events have (characterizing) properties, and so exemplify properties as well as being the exemplifyings of properties. Given this, and given the Universalist understanding of properties to which PEA subscribes, whereby an exemplification of a property just is (i.e., is identical with) the thing that has (exemplifies) it, exemplifications of mental properties of mental events are identical with exemplifications of physical properties of physical events (since each mental event is identical with a physical event). So, to say that a mental property of a physical event is causally relevant (i.e., that a mental event is causally efficacious *qua* mental) is to say *at least* that an exemplification of that property, i.e., that event, is causally efficacious in bringing about an effect of that event. This will require that (mental) instance to be a physical instance, i.e., will require one and the same event to be an instance of both a mental and a physical property.

We think that this requirement would need to be met anyway, since, on the Universalist conception of properties presumed by the PEA, things exemplify properties,

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<sup>41</sup> See Cynthia Macdonald and Graham Macdonald, "Mental Causes and Explanation of Action" and "How to be Psychologically Relevant", in which this thesis is defended in more detail by appeal to an analogy with biological properties.

and a thing just is (i.e., is identical with) an instance of each property that it has.<sup>42</sup> So, an event exemplifies *all* of its properties, and it is (i.e., is identical with) an instance of *every* property that it has.<sup>43</sup> Thus, our solution to the problem of causal efficacy makes *every* property exemplified by an event one whose instancing is causally efficacious in bringing about the associated effects. This result is, in essence, what previous critics of this solution have latched onto: too many properties become causally efficacious, or so it is said.

We claim that this is an inevitable consequence of the extensionality of the causal relation, and that what critics have conflated are requirements on causal relevance with those on causal efficacy. However, this reply will be unsatisfying unless we can provide an account of causal relevance that makes only some of the properties exemplified relevant to some effects. Since, on our view, mental properties are higher-level ones, the causal relevance of such properties cannot be purchased independently of relations that they bear to certain (i.e., physical) lower-level properties. CI, being blind to what more is required beyond causal efficacy for mental properties to be causally relevant, cannot help us to see how such properties can be brought within the domain of causally relevant properties along with lower-level, physical ones, in a way that does not entail that every property of an event is causally relevant to any of its effects. Fortunately, a further thesis

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<sup>42</sup> Alex Oliver (in “The Metaphysics of Properties” *Mind* 105 (1996): 1-80) speaks as though the Platonic view is the view that universals have instances that are in particulars and bear some kind of relation to their instances. But this cannot be right, since on the Universalist understanding of universals, an instance of a universal just is the thing that has it, i.e., a particular concrete object. Thus, for example, an instance of the property, red, just is the red bird. Supposing otherwise encourages the view that instances of universals are tropes, but this is not the Universalist understanding of ‘instance’. On the Platonic view, there are no ‘property instances’ that mediate between particular and form, or universal.

<sup>43</sup> In her account of ‘aspect causation’, one similar to ours in its use of property-instances, Laurie Paul suggests that she can develop it either as a trope-view or as in the PEA. What our development of the PEA suggests is that she will find it impossible to use this approach *and* to isolate the causal relata (property-instances) in the way she does, so as to protect the transitivity of the causal relation. See L. Paul, “Aspect Causation”, *Journal of Philosophy* 97 (2000): 223-34.

is available – one that has already been implicit in our discussion of causal efficacy of instances of mental properties - that applies specifically to higher-level and lower-level properties. Things – objects, events, and other particulars – exemplify properties, but some properties they exemplify *just* by exemplifying others. Consider a red, square box. It has the properties of being red and being square. It also has the property of being colored. It is (identical with) an instance of each property that it has. The box exemplifies the properties of being red, being square, and being colored. It does not exemplify the property of being square just by exemplifying the property of being red. But it does exemplify the property of being colored just by exemplifying the property of being red.<sup>44</sup> Similarly, in the case of mental and physical properties of events, a mental event can exemplify the property, being a thinking of Vienna, just by exemplifying the property, say, being neuro-chemical event  $\square$ . This view is reasonable independently of the issues surrounding mental causation. Where one property (or properties) of an event is said to realize another property (or properties) of that event, this is by far the most plausible way to construe the relation between the properties exemplified.

Call this thesis the Property-Dependence Thesis, to distinguish it from the weaker Co-instantiation Thesis. It states:

(PD) When properties of events are related as higher-level to lower-level and the lower-level properties realize the higher-level ones, an event exemplifies the higher-level one just by exemplifying the lower-level one.

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<sup>44</sup> But note that we do not think that the relation between mental and physical properties is a determinable/determinate relation, as standard cases of this relation involve conceptual entailment of the determinable from the determinate property.

CI is weaker than PD, since, on the Universalist conception, *all* properties of an event are co-instantiated in a single instance. However, the stronger thesis entails the weaker one: where  $P$  is the physical property realizing mental property  $M$ , there will be just one instance of both  $P$  and  $M$ ,  $P_i$ , i.e.,  $M_i$ .<sup>45</sup>

We are now nearly in a position to see how this understanding of the metaphysics of events can facilitate a reconciliation between MCR and PCR, EXCL, and CLOS, consistently with the view that mental properties are distinct from physical ones. A crucial further claim, noted above, is needed: mental properties whose exemplifyings are mental events are not constitutive properties of those events, but rather, supervene on physical properties constitutive of such events, and, consequently, mental properties of events supervene on physical properties of events. Given the identity condition on events imposed by the PEA, non-reductive monism requires rejection of the view that mental properties are constitutive properties of the events that have them. But, independently of this, the position is committed to some kind of supervenience thesis, since without such commitment it is difficult to fend off the charge that the position is irredeemably dualist because it acknowledges the presence in the natural world, if not of non-physical events, of free-floating non-physical properties. Many will think that such a position does not deserve the name ‘physicalist’.

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<sup>45</sup> So, in what follows, when we claim that  $P_i=M_i$  – that is, that there is one instance of both a mental property and a physical property where mental properties are not identical with, or reducible to, physical ones – we mean more than just that there is just one instance of both a mental property and a physical property (since on the Universalist conception of properties, an event is just one instance of *all* of its properties). We mean that a mental event exemplifies  $M$  *just by* exemplifying  $P$ .

What kind of supervenience thesis best captures the relation between mental and physical and physical properties is a thorny issue, as is well known.<sup>46</sup> Still, for present purposes we can say this much. Take supervenience between the mental and the physical to be that relation which holds between a mental property or set of properties, *M* and another, physical one, *P*, such that any two objects/events indiscernible with respect to *P* cannot diverge with respect to *M*. Further, following Kim, let us distinguish weak from strong supervenience.<sup>47</sup> Then we can define a relation of strong supervenience thus:

SS: *M*-properties strongly supervene on *P*-properties =df. For any possible worlds *w* and *w*<sup>\*</sup>, and any individuals *x* and *y*, if *x* in *w* is a *P*-twin of *y* in *w*<sup>\*</sup>, and the actual world's laws of physics hold in both, then *x* in *w* is an *M*-twin of *y* in *w*<sup>\*</sup>.<sup>48</sup>

where any *x* and *y* are *M* (*/P*) twins if and only if *x* and *y* are exactly alike with respect to their *M* (*/P*) properties.

Understood in this way, our claim is twofold: (1) mental properties of persons supervene on their physical properties, and so (2) mental properties of events supervene on their physical properties. This is consistent with the view that an individual event can

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<sup>46</sup> For some sceptical discussion of the value of appeal to psychophysical supervenience, see, for example, R. Miller ("Supervenience is a Two-Way-Street", *Journal of Philosophy* 87 (1990): 695-701) and A. Melnyk (*A Physicalist Manifesto: Thoroughly Modern Materialism* (Cambridge: Cambridge University Press, 2003)). For some examples of work on psychophysical supervenience that seeks to meet objections based on the claim that no satisfactory thesis can be found, see Terence Horgan, "From Supervenience to Superdupervenience: Meeting the Demands of a Material World", *Mind* 102 (1993): 554-586, and Thomas Grimes, "Supervenience, Determination, and Dependency", *Philosophical Studies* 62 (1991): 81-92.

<sup>47</sup> See "Supervenience and Nomological Incommensurables", *American Philosophical Quarterly* 15 (1978): 149-56 and "Concepts of Supervenience", *Philosophy and Phenomenological Research* 45 (1984): 153-76.

<sup>48</sup> This is an adaptation of the definition of strong supervenience given by Brian McLaughlin in "Varieties of Supervenience", in E. Savellos and U. Yalcin, eds., *Supervenience: New Essays* (Cambridge: Cambridge University Press, 1995), pp. 16-59.) By *M*-properties (*/P*-properties) we mean the non-empty set, *M* (*/P*), of properties. We choose this version over Kim's principally because it is weaker than his, though his entails it. Kim's implies that it is necessarily the case that if something has an *M* property, then it has some *P* property. But SS could be true if twins had no *P* property at all. It thus allows for the possibility that there might be purely mental worlds. We think this consequence desirable, given that we take physicalism to be true and contingent, and given the variable realizability of mental properties.

be an exemplifying of both a mental and a physical property (of a person), can be an instance of both a mental property and a physical property (of an event), and can be an instance of a mental property just by being an instance of a physical property (of an event).

### 5. Causal Relevance

What was at stake in the previous section was whether the PEA is consistent with the possibility of mental properties' being causally relevant, where causal efficacy is a necessary but not a sufficient condition on causal relevance, given PCR, EXCL, CLOS and minimal physicalism. It might be thought that although we have shown that PEA is consistent with PCR and CLOS, we have not shown that it is consistent also with EXCL, since we have not established that mental properties and physical properties of events are not in competition with one another. The question that might seem to have remained unanswered is this: given that mental properties are wholly distinct from physical ones, how can the mere fact, established by PD, that an event can exemplify a mental property just by exemplifying a physical property take the two properties out of competition with one another?

But this question misunderstands the dialectic of the argument of section 4. The argument was not that PD *alone* explains how mental properties do not compete for causal relevance with physical ones. PD was invoked in order to help explain how it is *possible*, given that mental properties are higher-level properties, for them to be causally relevant on the PEA in a way that does not make every property of an event causally relevant to any of its effects – a possibility that CI does not explain. How, then, is PEA made consistent with EXCL given the other principles? Well, look again at what EXCL

says. It says that if a property *P* of an event *c* is causally sufficient for an effect *e*, then no other property *Q*, of *c*, *distinct from and independent of P*, is causally relevant for *e*, where a property's being causally sufficient for an effect means that an instance of that property is causally sufficient for that effect, and where a property's being causally relevant for an effect requires that an instance of that property is causally effective in bringing about that effect. What PD tells us is that an event can exemplify – i.e., be an instance of – a mental property just by being an instance of a physical property. Given this and CI, PEA is consistent with the possibility that mental properties are causally relevant - instances of mental properties can be causally effective -because they just *are* instances of properties that are causally sufficient. Given supervenience, the mental property's causal relevance is compatible with its subvening physical property's causal sufficiency, and consistent with EXCL's requirements, since mental properties are *distinct from* but not *independent of* physical ones. ('Distinctness' satisfies the 'non-reductive' part of non-reductive monism, and we think that any viable physicalism will require dependence.) We do not see how anything more is, or should be, required to show that mental and physical properties need not compete with one another.

But this may invite the question, not of how the PEA is (metaphysically) *consistent* with the causal relevance of the mental – of how a certain metaphysical view of events does not exclude the possibility of the causal relevance of the mental, but of how mental properties can be plausibly seen to be causally relevant. In approaching this matter we issue a prior warning: our approach is deflationary in two ways. First, we take it that a philosophical solution to the problem of mental causal relevance (as well as causal efficacy) is one that demonstrates that such relevance (or efficacy) is

unproblematic. The shape of the debate, especially discernible in the writings of Kim, is one in which certain assumptions are meant to ensure a difficulty for *mental* causation. Showing that the difficulty is surmountable is sufficient to dispel the problem. What we have done so far is to take on board the appropriate assumptions and show that the metaphysics of events provided by the PEA can accommodate the causal efficacy of instances of mental properties without any troublesome overdetermination of effects, consistently with the possibility that such properties are causally relevant. The task we are now taking on is that of supporting the claim that a mental event, *qua* mental, can have causal influence, and so can be causally relevant.

Second, we do not aim to provide a general account of causation – though we do think that the metaphysics of events outlined above is important for any such general account. The aim, again, is to demonstrate that the *special* difficulties that some think attach to the possibility of mental causation are not difficulties unique to mental causation. They arise in the context of trying to provide a perfectly general account of the conditions under which it is correct to judge either that *c* caused *e*, or that *c* is causally relevant to *e*. It may well be that the attempt to provide such a general account is itself mistaken, but if that is so it won't be because of any problem specific to mental causation.<sup>49</sup>

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<sup>49</sup> Christopher Hitchcock, for example, thinks that it is futile to attempt to provide a unique characterization of the causal relation. See his “Of Humean Bondage” in *British Journal for the Philosophy of Science* 54 (2003): 1-25. We are sympathetic to this view as far as causal relevance is concerned. We are also inclined to the related view that reductionist accounts are bound to fail.

We have said that the causal efficacy of *instances* of properties is a necessary condition for the causal relevance of the properties instanced.<sup>50</sup> The issue of causal relevance is one that focuses on the properties, rather than their instances. To see what more is needed, it will be instructive to return to the original source of these debates, Davidson's anomalous monism. Central to Davidson's argument is the Principle of the Nomological Character of Causality, the PNCC. This Principle states that events are cause-effect related if and only if there is a law 'covering' the causing episode. Putting it in our preferred way, such a law will mention only some of the properties of the events involved in the particular causal affair, those properties of the cause that are 'relevant' to the exemplification of certain properties in the effect.<sup>51</sup> For Davidson, only physical predicates can be employed in such laws, leading to the suggestion that only physical properties could be causally efficacious, and hence causally relevant.

But it now becomes apparent that the problem of the causal relevance of properties is not one unique to the mental domain. Suppose that we adhere, for the present, to the PNCC requirement on causal interactions. As mentioned above, this privileges only some of the properties of the related events, so it is plausible that some of the *physical* properties of those events will be 'non-nomological', or will be specified in laws not germane to a particular cause-effect pair. The law will be applicable because of only certain of the properties exemplified in the cause and its effect. For this causal transaction, then, some *physical* properties will be not relevant – will not be salient. The effect will be deemed to have occurred *qua* only those properties specified in the

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<sup>50</sup> This is not uncontroversial; Philip Pettit denies it (see *The Common Mind*, pp. 32-42), but we think for no good reason. See our "Beyond Program Explanation", in G. Brennan, R. Goodin, and M. Smith, eds., *Common Minds: Essays in Honour of Philip Pettit* (Oxford: Oxford University Press, 2007): 1-27.

<sup>51</sup> Davidson talks only of predicates, not properties.

appropriate law. Or, more precisely, a property exemplified in the effect will be dependent on, or co-vary with, only some property or properties exemplified in the cause. So the problem of the causal relevance of mental properties dissolves into the more general problem of determining which of the properties in a specific interaction are causally significant and which not, no matter whether those properties are physical, chemical, mental, or anything else. Given the generality of this problem, it would be churlish to insist that it be solved for mental causation before a general solution appears.

We can, however, say a bit more about why we think that mental properties are causally relevant, by looking at some examples of causings that are not covered by strict laws. Many recent accounts of causation attempt to extend the scope of causality to cover probabilistic connections between events, and do so by saying that causes ‘raise the probability’ of their effects. There seem to be counterexamples to this: a golfer intends to hit the golf-ball into the hole, but slices horribly, the ball ricocheting off a conveniently situated tree and ending up in the hole. The sequence of events seems to be one in which the slice *decreased* the probability of the ball’s ending up in the hole, but nevertheless the slice seems to have been a cause of that effect. The estimates of probability here, we claim, are estimates of the causal relevance of properties, relating the probabilities of sequential exemplifications of properties.<sup>52</sup> Note that no sensible person would want to say that the above example proves that nature is indeterministic. Under some specification of properties, one involving forces acting on a body, what happens when a body in motion impacts on another body at a certain speed and direction, and so on, the

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<sup>52</sup> Hitchcock, for example, takes the ‘factors’, such as smoking, that are involved in probabilistic accounts to be “event-types or a property that can be instantiated by the appropriate sort of individual; factors, unlike particular events, are repeatable and may be instantiated on multiple occasions.” “Causal Generalizations and Good Advice”, in Henry E. Kyburg, Jr. and Marian Thalos, eds., *Probability Is the Very Guide to Life* (Chicago: Open Court, 2003), 205-232, here p. 210.

probability of the ball's going into the hole *given that confluence of properties* may well be 1, or close to 1. And this combination of forces and resistances surely is involved when the golfer slices the ball. In general, what is 'accidental' is relative to a specification of properties. Given that different properties are exemplified in causally related events, the same effect can be accidental (or probability-decreasing) relative to one property-specification, and non-accidental (or probability-raising) relative to another.<sup>53</sup> This is exactly what one would expect if what is at stake in these discussions is causal relevance, and not causal efficacy.<sup>54</sup>

This is further illustrated in a recent discussion of probabilistic causation in which Christopher Hitchcock distinguishes between 'two effects', a net effect and a component effect.<sup>55</sup> Taking birth control pills containing estrogen has been said to raise the probability of thrombosis occurring while at the same time decreasing the risk of thrombosis by preventing pregnancy. In order to avoid the apparent contradiction, Hitchcock suggests that taking the pills is positive for thrombosis along one causal route (one effect of imbibing estrogen) and negative along another (a second effect, the prevention of pregnancy), where the notion of a 'causal route' to an effect is termed a 'component effect'. Combining the positive and negative component effects will, in this case (restricted to a specific population), yield a net negative effect: the chance of thrombosis (for the relevant population) is lowered.

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<sup>53</sup> This is hospitable to the account given by Hitchcock, which makes a causal claim equivocal unless the probability of the effect given one cause is contrasted with its probability given alternative causes. See C. Hitchcock, "The Mishap At Reichenbach Falls", *Philosophical Studies* 78 (1995): 237-291.

<sup>54</sup> So there is a lesson to be learnt from these debates about the causal relevance of mental properties, and that is that recent discussions of causation *simpliciter* need to pay more attention to these metaphysical foundations. Many of these discussions are careless about the distinction between causal efficacy and causal relevance.

<sup>55</sup> Christopher Hitchcock, "A Tale of Two Effects", *The Philosophical Review* 110 (2001): 361-396.

Hitchcock's 'component effect' is akin to our notion of causal relevance, although it needs to be noted that his distinction between net and component effects does not exactly match our causal efficacy/causal relevance distinction. As we understand his distinction, 'component effect' is similar to our 'causal relevance' insofar as certain properties are privileged as being components of a causal process or as being relevant to a certain effect. However, for us causally relevant properties do not compete with, or dilute the power of, other relevant properties to produce 'net effects'. Thus, for us causal relevance is always relative to a property *as exemplified* in the effect, whereas for Hitchcock a 'component' cause need not be successful in producing an effect. As he puts it, "I assume that at the type-level, the words *cause* and *prevent* are not success verbs, but rather describe causal tendencies."<sup>56</sup> Further, for him, when an assassin shoots a victim, the assassin's shot has a component effect on the victim's death, but no net effect in those cases where there is a backup who would have shot the victim in the absence of the assassin's shooting. However, for us, the event which is the assassin's shooting is causally efficacious, the property of being a shooting being a causally relevant property of the event.

Given that events exemplify diverse properties, it will be true that only some of the properties of the cause will be relevant to some of the properties of the effect. Which properties are relevant in any particular case will be discovered empirically, and, so far as we can see, there is nothing to prevent the discovery that mental properties are causally relevant. Of course, even when exemplified, they may not be relevant to some effect-properties, but they are not unique in this respect. Some properties exemplified in non-

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<sup>56</sup> Hitchcock, "A Tale of Two Effects", p. 375, fn. 9. Where Hitchcock talks of 'component effects' as 'causal tendencies' we would prefer to talk of the causal power of a property, the property's causal relevance being dependent both on having such a power and being instanced (exemplified).

mental causings are not relevant to some of their effect-properties either, this just being a consequence of *any* metaphysics of events that allows for an event to be an exemplification of many properties.

Consider, for example, a window that shatters when a rock of 5 lbs or more impacts on it at 10 mph or more, and so shatters because it is struck by a 7 lb rock thrown at 10mph. It is causally relevant that the rock weighs over 5 lbs, even though this instance of weighing over 5 lbs is also an instance of weighing over 2 lbs. The throwing of a rock weighing over 2 lbs won't explain the window's shattering, though *in this case* the instance of the property, weighing over 2 lbs, just is the instance of weighing over 5 lbs (= the instance of weighing 7 lbs), and so was causally implicated in the shattering. This property, weighing over 2 lbs, does not help explain the shattering because other instances of it in rock-throwings won't be ones in which the window will shatter. But this truth about other instances is irrelevant to the causal efficacy of this instance, it being pertinent only to the matter of causal relevance. So objections to our account that protest that it makes *too many* properties causally relevant simply confuse causal efficacy with causal relevance.

There remains, however, a potentially serious objection, one stemming from the role played by the PNCC. Critics may agree that mental properties won't be unique in sometimes being causally irrelevant, but insist that, given the PNCC *and* the anomalousness of the mental (i.e. that mental properties do not figure in causal laws), they are unique in *never* being causally relevant. That they might, on particular occasions, join other, physical, properties in being causally irrelevant will be of little comfort if they are, by their nature, *never* relevant.

But this will be so only if we concede two claims. The first is that the mental is anomalous, and the second is that causal relevance can be secured only by nomologicality. Both claims can be and have been contested. Some have modified the first claim by distinguishing between ‘strict’ and ‘loose’ laws, making much of the use of ‘*ceteris paribus*’ laws in the special sciences. It would be open to a proponent of the PNCC to loosen one’s understanding of ‘law’ so as to include these less-strict laws in the ‘N’ part of the PNCC, thus still allowing that Principle the role of sole bestower of causal relevance. As long as mental properties were to figure in these loose laws, that would permit their causal relevance.

There may well be ways of pursuing this strategy so as to allow for mental causal relevance, in the process diminishing the tension between the PCR and MCR. But with this tension in mind, we prefer to challenge the second claim, that the PNCC is the sole guarantor of the causal relevance of properties. First, it is worth noting that the principle doesn’t serve this function in Davidson’s original argument; it serves as a guarantor of causal efficacy, not of relevance. More interestingly, one might view the PNCC as providing *a* criterion for one kind of causal relevance, *physical property* causal relevance. This makes the role of the PNCC more extensive, in ensuring the causal efficacy of mental events in a way that secures the causal relevance of the physical properties exemplified by those events.<sup>57</sup>

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<sup>57</sup> This extended role serves to integrate mental causation more thoroughly with physical causation. For further remarks on this integration (on how harmony of diverse causal relevances can be achieved), see Graham Macdonald, “Reduction and Evolutionary Biology”, in *Reduction, Explanation and Realism*, ed. K. Lennon and D. Charles (Oxford: Oxford University Press), pp. 69-96. One further feature of such integration is the avoidance of troublesome ‘downward’ causation. On how we avoid that trouble, see “Beyond Program Explanation”.

Second, and relatedly, the PNCC doesn't serve the function of being the *sole* guarantor of causal relevance in contemporary controversies about causation, as the briefest of summaries of some of this literature will show. It has been suggested that many theories of causation have the following form:

(CF) *C* has an effect on *E* iff *E* depends upon *C* – that is, iff *E* varies as *C* is varied while holding fixed other appropriate factors.<sup>58</sup>

This can be filled out in various ways. One account follows David Lewis and interprets causal dependence in terms of counterfactual dependence.<sup>59</sup> Given the difficulties of making this work satisfactorily<sup>60</sup>, Lewis has recently suggested a requirement of 'counterfactual co-variation'.<sup>61</sup> This requires, minimally, that variations in the manner of *c*'s occurring co-vary with changes in the manner that *e* occurs. Thus, for example, the atmospheric pressure causes the barometer pointer's position to be what it is because variations in atmospheric pressure co-vary with changes in the position of the pointer.<sup>62</sup>

It is important that the notion of 'variation' here only makes sense once properties enter the picture, since what is seen as crucial is the existence of *some* patterned variation between a property (or properties) exemplified in the cause and a property (or properties)

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<sup>58</sup> This is Christopher Hitchcock's formulation, in "A Tale of Two Effects", p. 369.

<sup>59</sup> See the papers on causation in David Lewis, *Philosophical Papers*, Volume II (New York: Oxford University Press, 1986). Lewis's more recent elaboration of his theory is in "Causation as Influence", *Journal of Philosophy*, 97 (2000):182-97.

<sup>60</sup> For some of the discussion see the papers collected in J. Collins, J. Hall, and L. Paul, *Causation and Counterfactuals* (Cambridge, MA: MIT Press, forthcoming).

<sup>61</sup> See Lewis, "Causation as Influence". See also Christopher Hitchcock "The Intransitivity of Causation Revealed in Equations and Graphs", *Journal of Philosophy* 98 (2001): 273-299.

<sup>62</sup> Another account along similar lines is James Woodward's interventionist account: "as a rough approximation, a necessary and sufficient condition for X to cause Y or to figure in a causal explanation of Y is that the value of Y would change under some intervention on X in some background circumstances..." (*Making Things Happen* (New York: Oxford University Press, 2003), p. 15). The qualifications concerning *some* intervention in *some* background circumstances signal the distance we have come from strict (or even loose-ish) laws. Woodward's account is significant in being non-reductionist.

exemplified in the effect.<sup>63</sup> The proponent of the possibility of the causal relevance of mental properties will insist, justifiably, that this is satisfied in the paradigmatic cases of mental causation. Thus, suppose that an officer shouts an order, and the soldier obeys it by standing to attention. Had the shouting not occurred, the standing to attention would not have occurred. Had a different order occurred, a different action would have followed.

Now, it might be objected that the systematic co-variation displayed in the above examples is the result of what may be called the ‘rational connectedness’ of the events (what used to be called ‘conceptual connections’ between the events), rather than simple (strict or loose) nomological dependence.<sup>64</sup> Suppose that it is true that the connections displayed are ‘rational’; does it matter? It does if one’s aim is to argue for the *a priori* irreducibility of the mental to the physical, as one may then wish to stress the difference between the patterns displayed in virtue of rational connections and those displayed in virtue of ‘mere’ causal connections. But however important the difference is for those purposes, it is not important in the context of establishing the possibility of mental properties’ being causally relevant. The ‘monist’ part of anomalous monism ensures that the rational connections are also causal connections, so, short of denying this possibility (that reasons are causes), there is no good reason to affirm the impossibility of the causal relevance of mental properties.

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<sup>63</sup> This is apparent in the literature on causal models, where a causal model consists of an ordered pair  $\langle V, E \rangle$  where  $V$  is a set of variables and  $E$  is a system of equations relating those variables. The values of the variable are best seen as properties of an event, ones that can vary in different ways: “For example, the values of a variable could represent the mass of some object, or they could represent various alterations of a particular event.” C. Hitchcock, “The Intransitivity of Causation Revealed in Equations and Graphs”, p. 280.

<sup>64</sup> In “How To Be Psychologically Relevant” we defended the view that causal relevance is dependent on *patterns* in nature, rational connections displaying one such pattern.

It may also be worth pointing out here that recent disputes about causation, particularly those concerning the transitivity of the causal relation, make unapologetic use of examples that involve rational connections. Here is an example, one of many. *Dog Bite* is a little narrative in which we have a Terrorist (T) wanting to explode a bomb, needing to push a detonator-button (P) at noon in order for the bomb to explode.<sup>65</sup> Being right-handed, T would have pushed the button with his right forefinger (Pr), but a dog bites that finger off (D), so event P is a left-forefinger pushing (Pl), which results in the explosion (E) occurring as planned. This seems to be a situation in which D causes Pl, and Pl causes E. Does D cause E, as transitivity would have it? It appears counter-intuitive to say that the dog-bite caused the explosion. The reason is that, given T's wishes, and given the means at T's disposal (left forefinger, feet, elbows, etc.), it is just plausible (reasonable) to assume that T will be intelligent enough, and determined enough, to carry the plan through regardless of the dog-bite.<sup>66</sup> The 'rational cause' of the explosion is undisturbed by the dog-bite.

Whether these cases support intransitivity or not is not our concern. What is to the point is that these examples are ones where the issue is one of causal relevance, of whether the property (-ies) instantiated in the cause are causally relevant to the property (-ies) instantiated in the effect. And the kind of systematic dependence between (exemplifications of) these properties that legitimizes causal relevance is not restricted to non-rational dependencies, as *Dog Bite* shows.

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<sup>65</sup> The example is raised in Michael Mcdermott, "Redundant Causation", *British Journal for Philosophy of Science* 46 (1995): 523-44.

<sup>66</sup> An argument for transitivity is given by Ned Hall, "Causation and the Price of Transitivity", *Journal of Philosophy* 97 (2000): 198-222. An argument against is given by Chris Hitchcock, "The Intransitivity of Causation Revealed in Equations and Graphs". At one point Hitchcock goes explicitly rational: "Given that he did not push the button with his right hand, why should the dog bite make any difference to whether he pushes it with the left? He wanted the bomb to explode, would he not push the button with his left hand regardless of whether the dog bit his right?", p. 292.

So far, so good: the examples above establish that putative cases of mental causation satisfy the test for causal relevance thought appropriate by contemporary theorists, that of systematic property dependence or co-variation. But the lingering doubt will be that we have not done what we promised, which is to show that there need not be any tension between physical and mental causal relevance, between the MCR and the PCR. It should be clear, however, how the supposed tension dissipates. Even if nomologicality were the only guarantor of causal relevance it would remain possible that two causally related events would fall under two (or more) laws, the property (properties) cited in the antecedent of law 1 being relevant to the exemplification of the property (properties) cited in its consequent, and the same for law 2. In this case we would have two relevance relations, and there is simply no reason to see them as competing, so no reason to say that one must preclude the other. Overdetermination has to do with causal instances - efficacy, not relevance.

And again, there is no reason to see these different co-variation relationships as excluding one another. At least they do not compete *simply in virtue of being different properties*. They can co-exist harmoniously. In the mental case, this is guaranteed by the Property Dependence thesis (PD) and the other principles at play that together ensure that the physical properties of an event that realize a mental property won't conflict with the causal power of the mental property.

Any remaining doubt may take this dependency to be the problem rather than part of the solution. It may be thought that PD ensures that the physical property/ies will eclipse the relevance of the dependent mental property. But this is not true: it is because PD is weaker than reduction – variable realization is accepted – that mental causal

relevance remains. The systematic co-variation between exemplified mental properties is not a simple ‘upward reflection’ of what happens at the level of the realizing physical properties. For it to be such an ‘upward reflection’ would require the identity of mental and physical properties, and it would need an independent argument to support any such identity-claim. We maintain that the identity-claim cannot be supported by arguments using the causal irrelevance of the mental as an essential premise; not without begging the question.<sup>67</sup>

Causal relevance, then, is ubiquitous, and would remain so even if the world were shorn of higher-level properties. The causal relevance of a property, *P*, requires at least that instances of *P* are causally efficacious and that there are objective patterns, possible systematic co-variations among properties, in which *P* participates. Mental properties can satisfy these conditions, and that the pattern exemplified between, say, an intention and an action is one of rationality, or intelligibility, does not preclude the causal relevance of the intention to the performance of that action. So it turns out that the causal relevance of mental properties is no more mysterious than is causal relevance in general.

## 6. Conclusion

The problem of mental causation divides into the problem of the causal efficacy of mental events and the problem of the causal relevance of mental properties. We have argued that the former problem can be satisfactorily settled by adopting either a metaphysics of tropes or a version of the Property Exemplification Account (PEA) of events, but only the PEA can provide the foundations for an account of mental causal

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<sup>67</sup> Kim employs an argument using a ‘causal inheritance principle’; we address that argument in “Beyond Program Explanation”. Some of what Karen Bennett argues for in “Why the Exclusion Problem Seems Intractable, and How, Just Maybe, to Tract it” (*Nous*, 38 (2003): 471- 497) is relevant here, especially sections 7-10, but our approach differs crucially from hers in that we accept psychophysical event-identity whereas she rejects it.

relevance. Regarding the latter we have claimed that a property,  $P$ , is never causally relevant without there being another property relative to which it is causally relevant, so the question of which properties of events are the causally relevant ones is not one that can be answered *tout court* and independently of the types of effects that they bring about. This is a general difficulty of determining which properties of a cause are relevant to which properties of an effect, not one specific to mental causal relevance.

This suggests that concerns arising from Exclusion (EXCL) are overstated. For EXCL states that if there is a property,  $P$ , whose instance in an event  $c$  is causally sufficient for an effect  $e$ , then there can be no other distinct and independent property,  $Q$ , that is causally relevant for  $e$ . And CLOS states that if any physical event has a cause, it has a sufficient physical cause, whose physical properties are causally sufficient for its effect. However, appeal to the physical properties of physical events does not, given this, thereby rob mental properties of physical events of either their causal efficacy or their causal relevance, and so their causal-explanatory power remains intact. Causal efficacy is retained because the Co-instantiation Thesis (CI) permits the co-instantiation of the physical and mental properties, and supervenience and the Property-Dependence Thesis (PD) provide compelling reasons for assuming that they are so co-instantiated.

PD also provides a way of defusing the threat to causal relevance arising from EXCL, since it provides a way of seeing how it is that the mental properties are not independent of the physical properties of such events. It has been thought that such a dependence would lead to causal irrelevance, or that the dependent higher-order properties are not doing the ‘real’ causal work.<sup>68</sup> What our solution does is show how

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<sup>68</sup> David Braddon-Mitchell provides an expression of this common view: “...supervenient causation is best taxonomised as explanation, and causation is best reserved for whatever basal transactions actually perform

mental properties can be irreducible (and hence independent in one way) whilst still being causally efficacious and causally relevant. The causal relevance of mental properties requires the causal efficacy of their instances plus participation in a pattern (a system of potentially co-varying properties), and participation in the rationalistic pattern, along with the Co-instantiation Thesis (CI) and PD, purchases this consistently with CLOS. So PD, combined with the PEA, seems to be a viable way of resolving the putative conflict between MCR, PCR, EXCL, and CLOS, given minimal physicalism.

Cynthia Macdonald

Queen's University, Belfast.

Graham Macdonald

University of Canterbury, Christchurch.

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the work in the universe." "The Microstructural Causation Hypothesis" in *Erkenntnis* Vol. 39, No. 2, 1993: 257-83, p. 279. The popular "Program Model" of how higher-order causes relate to their lower-order counterparts suggests the same position: "The general idea in the program model ... is that a higher-order property is causally relevant to something when its instantiation ensures or at least probabilifies, in a non-causal way, that there are lower-order properties present which produce it." Philip Pettit, *The Common Mind* (Oxford: Oxford University Press, 1993), p. 37.