

Properties, Powers, and the Subset Account of Realization

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According to the *subset account of realization*, a property, F , is realized by another property, G , whenever F is individuated by a non-empty proper subset of the causal powers by which G is individuated (and F is not a conjunctive property of which G is a conjunct). This account is especially attractive because it seems both to explain the way in which realized properties are nothing over and above their realizers, and to provide for the causal efficacy of realized properties. It therefore seems to provide a way around the causal exclusion problem. There is reason to doubt, however, that the subset account can achieve both tasks. The problem arises when we look closely at the relation between properties and causal powers, specifically, at the idea that properties *confer* powers on the things that have them. If realizers are to be ontically prior to what they realize, then we must regard the *conferral* of powers by properties as a substantive relation of determination. This relation of conferral is at the heart of a kind of exclusion problem, analogous to the familiar causal exclusion problem. I argue that the subset account cannot adequately answer this new exclusion problem, and is for that reason ill-suited to be the backbone of a non-reductive physicalism.

1 Nonreductive Physicalism and Causal Exclusion

Nonreductive physicalism is roughly the view that while mental phenomena are nothing over and above physical phenomena, they are also not reducible to physical phenomena. To make this precise, we need to specify what the phenomena in question are, and what the relations of reducibility and nothing-over-and-above-ness amount to. Here, I am concerned with nonreductive physicalism specifically about mental properties. I will take reductive physicalism about properties to be the view that every mental property is identical with some physical property. In the strictest sense, then, any view on which even one mental property fails to be identical with any physical property counts as nonreductive physicalism. I, however, will restrict my attention to the view that *no* mental property is identical with a physical property. As for “nothing-over-and-above-ness”, it is the task of an account of *realization* to make that notion precise. Let us assume that realization is asymmetrical, so that F 's

realizing G entails that $F \neq G$. Then we can define nonreductive physicalism schematically as follows:

(NRP) Every mental property instance is realized by some physical property instance (and no mental property instance is actually realized by any non-physical property instance).

Now, realization generates a worry about the causal efficacy of realized properties. (Properties are not causally efficacious directly, by being causes and effects, but indirectly, by being responsible for the causal powers and liabilities of the particulars that are causes and effects.) Where we have realization, we have two properties: realizer and realizee. The question then arises whether both of them are causally efficacious. This, in turn, raises the threat of overdetermination. Avoiding it seems to require holding that only the realizer does any causal work.¹ After all, the realizer will be the narrowly physical property, i.e., the kind that is of interest to the physical sciences. So the realizer must do *some* work, and indeed, must do *enough*, since physicalism requires that (narrowly) physical events, properties, and so on be fully causally sufficient for everything that happens. (This is the *causal completeness* or *causal closure* principle.) Furthermore, since the realized property is supposed to be instantiated wholly in virtue of the instantiation of its realizer, it seems that its causal activities (whatever they are) ought just to be identical with those of its realizer. (This is a version of Jaegwon Kim's *Causal Inheritance Principle*.)² Realizers thereby threaten to preempt any causal activity on the part of what they realize. Even if the realizee is not identical with its realizer, it seems that it will not be causally efficacious in its own right.

2 The Subset Account of Realization

The subset account of realization seems to provide a way around the causal exclusion problem that both preserves the causal efficacy of realized properties and provides a sense in which they are nothing over and above their

¹ This is of course an incomplete statement of the causal exclusion problem. A full statement requires at least the addition of some exclusion principle (e.g., that any event with two causally sufficient antecedents is overdetermined). Cf. Kim 1998. I use 'antecedent' here because the category under discussion is property instances, while most parties to the debate hold that only events are literally causes.

² See Kim 1992.

realizers.³ This account presupposes the notion of a *causal power*, and the idea that, at least as a matter of contingent fact, properties are individuated by the causal powers with which they are associated. For instance, the power to attract iron filings is a causal power, and it is associated with the property of being magnetic. This association includes, at least, the fact that if something is magnetic, then there are certain other properties (not themselves sufficient for the power to attract iron filings) such that if the thing should have those properties, then it will have the power to attract iron filings.⁴ For present purposes, I will take the notion of a causal power for granted. (The precise nature of the association between properties and powers will receive further attention below.) We can use it to formulate the following analysis of realization:

(SAR) F realizes G just in case the powers associated with G are a (non-empty) proper subset of those associated with F , and F is not a conjunctive property of which G is a conjunct.⁵

Note that ' F ' and ' G ' here pick out types rather than tokens (that is, something like universals rather than property instances).⁶ Thus the core notion of realization is a relation between types. But we can define a relation of realization between property instances by appeal to the relation between properties themselves: An instance of G is realized by an instance of F just in case F and G

³ This account is most prominently defended in Shoemaker 2001 and 2007. It is also defended by Wilson 1999 and 2011, and Clapp 2001, and a kindred view is expressed in Pereboom 2002.

⁴ I will use 'causal power' here broadly to include *powers simpliciter* and *conditional powers*, categories that Shoemaker distinguishes. A thing has a conditional power to ϕ iff it would have the power to ϕ simpliciter were it to have certain further properties. For example, the property of being knife-shaped confers the conditional power to cut wood if instantiated along with a certain size and material constitution (say, being 10" long and made of Damascus steel).

⁵ Note that this formulation does not entail that F and G are instantiated in the same individual. It is thus neutral between Shoemaker's same-subject realization—realization₁—and different-subject realization—realization₂. I will ignore this distinction in what follows since it appears irrelevant to my worries about the subset account.

⁶ I say 'something like' since the subset view is not committed to the existence of universals, that is, entities capable of being wholly present in different particulars at once. But it seems to me that one can distinguish between property types and property tokens without believing in true universals. If not, then the subset account is committed to universals.

are instantiated by the same thing, and F realizes G .⁷ According to the subset account, when one property type realizes another, each token of the realizer will (a) realize a token of the realizee such that (b) the realizee token is nothing over and above the realizer token.

The utility of this account is well illustrated by simple functional properties. Take, e.g., the property of being a toaster. Let's suppose that the property of being a toaster is defined (and hence individuated) by the power to heat sliced bread until its surface is crispy. The set of properties sufficient for being a typical spring-loaded 2-slice toaster with electric heating elements confers this causal power and hence counts as a realization of the property of being a toaster. But it confers various other powers in addition, such as the power to interfere with radio signals. That power is no part of the functional definition of a toaster, and so the powers associated with being a toaster are a proper subset of those associated with this particular realization.⁸

This understanding of realization does a great deal of work. Sydney Shoemaker has put it to work on almost every aspect of nonreductive physicalism.⁹

Irreducibility

If a realized property must confer a *proper* subset of the powers conferred by its realizer, it follows that they are not identical. It is not essential to the subset account that properties be individuated just by what causal powers they confer, since it will be true in any case that F and G are not the same property if they do not confer exactly the same powers. It follows just from Leibniz's Law that if F confers a power that G does not, then $F \neq G$. Thus, the subset account of realization explains why realized properties are not identical with their realizers, thereby securing a non-reductive account of mental properties.

⁷ See Shoemaker 2007, p. 12.

⁸ Note that the subset account depends on a particular account of how powers are individuated. On an alternative view of powers, there could be a single power here, manifesting itself differently with different reciprocal disposition partners (the toast and the radio signals). See, e.g., Heil 2004 and 2005. Defenders of the subset account seem committed to treating powers as individuated more finely than this in a number of cases.

⁹ Most recently in Shoemaker 2007.

Nothing-Over-And-Above-Ness

Non-reductive physicalism walks a razor's edge. On one side is the threat of reduction, on the other the threat of dualism. The subset account, as I showed, avoids reduction. But how does it simultaneously avoid dualism? While subsets are obviously not identical with their supersets, they are just as obviously included within them. The subset view need not regard properties as literally being *sets* of powers (though that view of properties is compatible with the subset account).¹⁰ It is enough that everything needed for the instantiation of the realized property be contained in each instance of a realizer of it. According to Shoemaker, "it does not seem inappropriate to use the part-whole relation to characterize the relationship between the instances of these pairs of properties."¹¹ If we think of realization in this mereological fashion, then given that a part is nothing over and above any whole to which it belongs, we can see how on the subset view a realized property instance is nothing over and above its realizer.

Multiple Realizability

A given set can be a proper subset of each of two different sets. This provides an elegant model of multiple realizability. A given property, F , is multiply realizable provided there is more than one property that confers all the powers associated with F . Suppose F is individuated by the set of powers {1, 2, 3}, G by the set of powers {1, 2, 3, 4}, and H by the set of powers {1, 2, 3, 5}. F 's individuating powers are a subset of those of G and of H , and so both G and H count as realizers of F . But G confers power 4 and H does not, H confers power 5 and G does not, and so $G \neq H$. Thus F is multiply realizable.

Causal Efficacy without Overdetermination

To secure the causal efficacy of realized properties, Shoemaker appeals to the inclusion of realized property instances by their realizing instances:

¹⁰ Shoemaker 1980 defended the view that properties were identical with *clusters* of powers. Melnyk 2006 argues that some such view is required by the subset account if it is to explain why the instantiation of a realizer *necessitates* the instantiation of what it realizes. I discuss this view below in section 6.

¹¹ Shoemaker 2001, p. 80.

...the instantiations of P [realizee] and Q [realizer] are different, but...the latter includes the former. We can say that while the Q instance causes E, it does so because it includes the P instance that causes E. We might compare this with the case in which Smith dies as the result of a salvo of shots fired by a firing squad, but in which the only shot in that salvo that hit Smith was the one fired by Jones—the salvo killed Smith, but it did so because it included a particular shot, Jones’...This is obviously not a case of overdetermination.¹²

In this analogy, the salvo stands for the realizer, the individual shot for the realizee. So notice that if one feels the usual impulse to deny that *both* were causes, and to treat as the genuine cause only the smaller, mereologically more basic event (or property instance, as Shoemaker would have it), in this case that will be the realizee rather than the realizer. Here, a typical exclusionist intuition has been turned on its head. By zooming in on the intuitively relevant causal factors, we find ourselves focusing on the realizee as the true causal agent.

Of course, sometimes causal powers conferred only by the realizer will be relevant and so there will be no chance of regarding the realizee alone as cause of the effect in question. Here Shoemaker adopts a version of Stephen Yablo’s notion of *proportionality*, to wit, that causes must be proportionate to their effects.¹³ According to Shoemaker, the realizer will be more proportionate to some effect if some causal power conferred by the realizer but not by the realizee played a role in bringing about that effect, and the realizee will be more proportionate otherwise.¹⁴ In the salvo case, then, since no shot but Jones’ contributed to bringing about Smith’s death, Jones’s shot (a *proper part* of the salvo) is more proportional to Smith’s death than is the salvo, and so is the cause. In an alternative case in which each shot hits Smith but, given his fortitude and the small-caliber rifles of the firing squad, he’d have survived even one less shot (let’s say), it appears that the salvo is the cause rather than any individual constituent shot in it.

It should be clear by now that the subset account of realization is a formidable view, and that it makes way for a particularly powerful version of nonreductive physicalism. Even so, it does not succeed in delivering all that it promises. In particular, a conflict arises between the account of how realized

¹² Shoemaker 2007, p. 13.

¹³ See Yablo 1992.

¹⁴ See Shoemaker 2001, p. 81 and 2007, p. 14.

properties manage to be causally efficacious and the account of why realized property instances are nothing over and above their realizers.

3 The Relation between Properties and Powers

An essential component of the subset account is the idea that properties are associated with certain causal powers. Up to now, we have taken this association for granted. But a consideration of the precise nature of this association will reveal some serious problems for the subset account of realization. I will argue that the association is best understood as a matter of properties' *conferring* causal powers on the things that have them. Conferral is a relation of determination, so that to say a property confers a power on something is to implicate the property as at least part of what *makes it the case* that the thing has the power. Given that conferral is a case of determination, when a property confers a certain causal power, then the fact that something has that property *explains* why it has the power. As with causation and causal explanation, conferral gives rise to an exclusion problem (as I will show in the next section).

The exclusion problem for conferral can be avoided by denying that properties truly *confer* powers on their possessors, but that denial brings other costs. If properties are associated with certain powers not by conferring them but by having them as something like parts, then no exclusion problem will arise for the subset account. I am thinking now of the view that properties are clusters of powers. I will argue against this conception of properties (and the corresponding version of the subset account) in section 6. In a nutshell, the cluster view robs the category of property of any real metaphysical significance. Properties, on this view, are merely ways powers may be grouped together. The properties a thing has, however, do not properly speaking explain why it has the powers it does. Nor does anything about the nature of a property account for why certain powers are invariably found together, while certain others are mutually exclusive.

The subset account therefore seems to require not only that properties be associated with certain causal powers, but that at least some properties be *responsible* for the fact that things have the powers with which those properties are associated. This is to say that the word 'confer' carries some real metaphysical weight. Conferral, whatever else is true of it, essentially involves a kind of ontic priority. Given that a property confers a certain power, anything that has the property will have the power *in virtue of* having the property. The relation expressed by 'in virtue of', here, is an asymmetrical relation of determination (a noncausal one). It enables the fact that the property is

instantiated by a thing to explain the fact that the thing has the power in question, and it prohibits a similar explanation in the other direction.

Lest anyone be skeptical about this relation, let me show why we must recognize it. It is never a brute fact that one thing explains another; explanations are correct only when they advert to some underlying relation of determination.¹⁵ More specifically, one thing explains another only if the one plays a role in determining the other. This should be familiar in the case of causal explanation, where the correctness of an explanation depends on underlying causal relations.¹⁶ But not every correct explanation will be a causal explanation. Now, the subset account works with a notion of properties and powers according to which a thing's properties explain its having the causal powers it does. It is, on this view, not a brute fact that a thing has the powers it does, but rather it has those powers in virtue of having the properties it has. So we have an explanation that cannot be a causal explanation. Properties do not *cause* things to have causal powers. (If it is not obvious that the relation here is non-causal, note that holding causal powers to be explained causally threatens to set off a vicious regress.) Now we have the ingredients for an argument for non-causal determination. (1) Every correct explanation must be undergirded by a relation of determination. (2) Not every correct explanation can be undergirded by a causal relation. Therefore, (3) There must be a non-causal relation of determination.¹⁷ We can express this relation in a variety of ways, e.g., in terms of 'conferral', 'grounding', or the phrase 'in virtue of'. For the most part, I will follow Shoemaker in speaking of conferral.¹⁸

I have now shown what is involved in taking the notion of conferral seriously. When we revisit the account in light of this, we will find reason to question whether it can deliver all that it promises. In the next section, I will pose a dilemma for the subset account and argue that each horn presents a

¹⁵ This idea is defended, e.g., by Kim 1993 (see p. xii) and Ruben 1990.

¹⁶ As argued by Lewis 1986a.

¹⁷ Elsewhere, I defend in detail this argument and the notion of grounding.

¹⁸ Shoemaker, for example, speaks of things having powers *in virtue of* their properties in his 1980, and of properties *conferring* and *bestowing* causal powers in his 2001, and in his 2007 (p. 12) of how a property "contributes to producing various sorts of effects (and contributes to bestowing causal powers on its possessors)..." I take all these locutions to be adverting to the same phenomenon; the non-causal determination relation that obtains between the fact that a thing has a certain property and the fact that it has a certain causal power. For all we have seen, a causal power may itself be a kind of property. So this could be interpreted as a version of the view that properties of one kind (categorical properties or qualities) account for those of another (dispositional properties or powers).

problem for nonreductive physicalism. In the following two sections, I will argue against two ways of attempting to steer between the horns.

4 An Exclusion Problem for Conferral

If properties are understood to confer powers, a crucial question arises for the subset account:

Do realized properties confer causal powers?

The different answers to this question correspond to significant differences between versions of the subset account.

Suppose one holds that realized properties confer the relevant powers on their own, independently of their realizers. Then, assuming that the realizers also confer those powers, the powers are conferred twice over. We thus have a certain kind of overdetermination, and what is more, no ontic priority of realizer of realizee. Now, this would not be causal overdetermination, since the kind of determination involved in conferral is not causation. But noncausal overdetermination is overdetermination nonetheless. On this view, the (alleged) realized property is not dependent on the realizer. Since it is capable of conferring associated powers by itself, there is no reason in principle why it should not be instantiated in the absence of any realizer. For that reason, the “realized” property seems not to be realized at all, but rather entirely self-sufficient.

Suppose, on the other hand, one holds that realized properties do not themselves confer the relevant powers. Then it will be clear that realizers are ontically prior to what they realize. But since the realized property plays no role in explaining why its host particular has the causal powers it does, it seems that it cannot share in the responsibility for any causal activities of that particular.

In either case, the subset account is unsuccessful.

This was a very brief statement of the problem. To show in more detail what the problem is, let me present an exclusion-style argument against the view that realized properties confer the powers with which they are associated.

- (1) Realizing properties confer any powers with which they are associated.
- (2) Realized properties are not identical with the properties that realize them.
- (3) Realized properties confer any powers with which they are associated.
- (4) Any power conferred by two properties of the same thing is overdetermined.

The subset account entails that:

- (5) Any power associated with a realized property is associated with any property that realizes it.

(1)-(5) jointly entail that:

- (6) Any power associated with the realized property is overdetermined.

As in the case of the causal exclusion problem, one can deny that realized properties do the work that, it seems, they can do only redundantly. But this denial just trades redundancy for sheer inertia. In this case, the inertia is not the failure to be a cause, but the failure to play any (non-causal) role in determining what causal powers things have. But, since it appears that properties are in any case not causes or effects, this kind of role (i.e., in conferring causal powers on the things that have them) is the only causal role properties are candidates to play. So denying premise (3) leads to the view that realized properties fail to play any causal role whatsoever.

Now, one might think that overdetermination in the domain of conferral is benign. I will not attempt to show that such overdetermination is incoherent, and indeed, I think it is perfectly possible. (An example of it, quite independent of the subset account, is a thing's having the power to burn skin both in virtue of being alkaline and in virtue of being very hot.) Rather, the problem is that if (allegedly) realized properties overdetermine the powers with which they are associated, there seems little reason to treat them as *realized* properties, as opposed to autonomous properties.

So whether one takes the view that realized properties confer their associated powers or the view that they do not, the subset account faces serious difficulties. Let us look at each view in more detail by placing it in a broader metaphysical account of properties.

The first account simply accepts the conclusion of the argument, that is, that realized properties overdetermine their associated powers. This approach is motivated by some attractive ideas about the natures of properties. Part of what it is to be a property, it seems, is to confer causal powers. Perhaps properties are even individuated by the powers they confer, so that they confer these powers essentially. In any case, part of what a property does to earn its keep is to contribute in this way to the causal powers of things. So then if there are realized properties, they had better follow suit; they had better confer the causal powers with which they are associated. Since the same reasoning applies

to realizer properties, the powers in the subset are all conferred twice over, once by the realizer and then again by the realizee.

This is not an incoherent view, but it does not afford the economy that initially made the subset account so attractive. For the subset view sets out to treat realized properties roughly as proper parts of their realizers. The sense in which realized properties would be proper parts of their realizers is that realizers confer all the powers sufficient for the realized property, and that's all it takes for the realizee to be instantiated. In particular, it is not also required that the realizee account for the powers on its own. The present view, however, does not preserve that aspect of the subset account. But it was that aspect that made the realized properties nothing over and above their realizers. So the view on which realized properties confer their associated powers, hence overdetermining them, fails to make realized properties nothing over and above their realizers.

The second account, then, begins by securing the nothing-over-and-above-ness of realized properties. On this picture, the realizer properties do all the work of conferring the causal powers with which they are associated. It is sufficient for a realizee to be instantiated in a thing that the thing have the powers associated with the realizee. But premise (3) is false; the realizee does not itself contribute to conferring those powers. (Its association with those causal powers must be explained in some other way.) Now there is a clear metaphysical difference between realizer properties and realizee properties, and one that makes realizers ontically more basic. Realizers account for the powers of things, and realizees do not. Realized properties, on this picture, appear to be merely ways of reclassifying causal powers into clusters, classifying them, that is, alternatively to the classification in terms of the properties that actually explain why things have their powers.¹⁹

¹⁹ One could claim that realized properties are not *merely* clusters of powers, since not any old cluster of powers will count as property-constitutive. Shoemaker 1980 holds, e.g., that property-constitutive clusters of powers must be closed under nomic and metaphysical entailment. But this restriction does not answer the question of how a realizee could bear any causal responsibility for any effects without being responsible for a thing's having the power to bring about those effects. (Furthermore, it seems that the best account of why certain powers cluster together, so that there is a property corresponding to that cluster, is that it lies in the nature of that property to *confer* all and only those powers. For example, it lies in the nature of sphericity to confer both the power to roll and the power to make round impressions in wet sand, and that is why those powers are invariably found together. This account is unavailable if we deny that realized properties confer their associated powers.)

On this picture, realized properties are surely nothing over and above their realizers. But now they do not seem to be very important properties, because they do not seem to play a role in explaining why things have the causal powers that they do. Their passivity in that domain, moreover, extends to the issue of causal efficacy. Since realized properties are not responsible for things' having the causal powers with which they are associated, there seems no hope of holding them to be causally responsible for the effects those powers are powers to produce. This picture, then, sacrifices efficacy to parsimony.

To illustrate, let's imagine that some brain state of mine realizes my thirst, which is distinguished, among other things, by the power to cause me to drink. On the present view, it is the brain state that confers on me the power to drink under certain circumstances. We can call anything with that power thirsty, but the fact that it is thirsty does not explain its having that power. And since responsibility for actually causing drinking seems bound to trace back through the power, which thirst plays no role in explaining, my thirst will be causally inefficacious as far as my drinking is concerned.

So it seems that however we answer the question of whether realized properties confer the powers with which they are associated, the subset view will prove inadequate. If realized properties do confer their associated powers, we lose the sense in which realizer is ontically prior to realizee, and realizee nothing over and above realizer. And if realized properties do not confer their associated powers, they are causally inert.

5 Why Not Token Distinctness of Power Types?

Now, one strategy for avoiding the dilemma would be to allow that the realizer and realizee confer different tokens of their shared powers. This idea derives from the work of Derk Pereboom.²⁰ Suppose the realizer confers powers of type 1 and 2, while the realizee confers a power only of type 1. A thing that instantiates these properties will then have two tokens of power type 1. Looking back at the conferral-centered exclusion argument, as formulated it does not specify whether it is about power types or power tokens. Suppose, now, that the subset account is understood as the view that realizers confer a power of every type conferred by realizees, though different tokens of those power types. Premise (1) can in this case be accepted, provided it is read as a claim about types. Premise (4), that any power conferred by two different properties is overdetermined, is plausible only as a claim about token powers. So either the

²⁰ See Pereboom 2002.

argument is invalid—equivocating between power types and power tokens—or premise (4) is false.

Let us assess, then, this new version of the subset account according to which realizer and realizee overlap in the types of powers they confer, though not in what tokens of those powers they confer. Given that this strategy involves doubling up on power tokens, this view might appear to be a non-starter for purposes of securing parsimony, but Pereboom has suggested that the two tokens of a given power type might stand in a constitution relation, so that the token conferred by the realizee is nothing over and above the token conferred by the realizer, even though it is numerically different from it.

Now we are working with the following metaphysical picture. Realization is still understood along the lines of the subset strategy, but what stands in the superset-subset relation are sets of power *types*. The set of power tokens conferred by the realized property is disjoint from the set of power tokens conferred by its realizer. But the realizer still counts as ontically prior to what it realizes because every power token associated with the realizee is wholly constituted by some power token associated with the realizer.

There are reasons to doubt that this version of the subset view presents an adequate account of the relation between realized properties and their associated power tokens. First, notice that this view would make no headway if realized properties were not responsible for their associated powers, since they would then be causally inefficacious. Second, notice that it would make no headway if tokens associated with the realizee were not wholly constituted by tokens associated with the realizer, since otherwise there would be no reason to regard the realizer as ontically prior to the realizee. But now we have the ingredients for another exclusion problem, one regarding the power tokens associated with the realized property. Of any token associated with the realizee, we can ask why a thing has it, and there are two answers. First, that it is conferred by the realized property. Second, that it is wholly constituted by a power token associated with the realizer. If these are two genuinely different explanations, then the presence of the power token is overdetermined, and the “realized” property proves too independent from its realizer. If, on the other hand, the conferral of the power token by the realizee amounts to nothing other than the fact that the realizer confers a power token that wholly constitutes the realizee’s power token, then it is clear that the realizer is doing all the work.

Up to this point, I have been conceding that sense can be made of the notion of one power token’s wholly constituting another. But there are at least two reasons to doubt this. First, it is not clear that a single particular can possess two tokens of a single type of power. Power types, it seems, are individuated by

what they are powers to do. If cutting isn't burning, then the power to cut is not the power to burn. Now, realized properties do not confer any types of powers not conferred by their realizers, hence the need for token differences. But how are power tokens individuated? It seems to me that two power tokens of the same type are different only if they are possessed by different particulars. Given that realized properties are instantiated by the same particulars that instantiate their realizers, this condition will never be satisfied in the case of realized properties. Now, of course, the advocate of the token distinct powers approach will deny that this is how powers are individuated. But anyone who denies this faces troubling questions. What would it mean to say that, e.g., someone had *two* powers to bring the glass to his lips—one conferred by his neurology, the other by his thirst? How would he differ from something that had only one such power token? I doubt there are any sensible answers to these questions, and that gives us reason to reject the assumption from which they arise, namely, that something can have two power tokens of the same type.

The second reason to reject the view that the realizer and realizee confer different tokens of their associated powers is that powers really do not seem to be candidates to stand in relations of constitution. There can be no constitution without *constituency*.²¹ If something is a candidate to be constituted by something else, it needs to be made up of something, either parts or matter of some kind. The subset account of realization gets off the ground because there is some promise in the view that properties have constituents—causal powers—so that realization can be cashed out as a constitution-like relation. But causal powers themselves do not appear to have constituency of any kind. They are not made up of parts, nor are they made up of non-particulate matter. So it does not seem possible to extend this kind of constitution account to causal powers.

Now, it might be charged that these observations miss the point, since the crucial claim was that one power token constitutes another, not that powers are constituted by some other kind of entity—some power part or power-constituting gunk. But my point is that it is not appropriate to appeal to constitution in the first place. There is certainly not constitution of any ordinary kind here. No ordinary constitution relation involves things of exactly the same kind standing in a constitution relation. Nor do we fare better in appealing to

²¹ I am glossing over the distinction between composition—making up out of parts—and constitution—making up out of non-particulate matter. The distinction is not important here since what I want to say applies equally to composition and constitution. I use 'constitution' as generic, covering any kind of making-up relation.

coincidence; items are coincident only if they share exactly the same parts or are made of exactly the same matter.

If the claim is just that it is coherent to believe in power tokens that are numerically different but nothing over and above one another, then perhaps that is true. But even granting this possibility, without any further account of the relationship between coincident power tokens, there is no reason to take one (the one associated with the realizer) to be ontically prior to, or in any way to account for the existence of, the other. There is, in other words, no independent reason—no reason apart from the stipulation that it is to be such a case—to view this situation as one in which the power token conferred by the realizee is nothing over and above that conferred by the realizer. But nothing-over-and-above-ness is essential to the realization relation. In this instance, it makes the difference between physicalism and emergentism. Kim has defined emergent properties as those that confer novel causal powers.²² Now, he had in mind power types, but his ideas apply equally to power tokens. Suppose a mental property confers a power token whose presence is in no way explained by any physical property. What reason is there to deny that the mental property is emergent? The mere fact that the power is of the same type as one conferred by some physical property does not explain how the power got there. Unless the power is somehow constituted or explained by the physical property, we should regard the mental property as a property in its own right. It, like the physical property, confers causal powers on the things that have it. The two properties are ontological equals; there is no priority of physical over mental. Since the token distinct powers approach cannot rule this out (since it provides no understanding of how some powers constitute others), we do not as yet have an adequate nonreductive account of realization.

6 Why Not Clusters of Powers?

Now, a proponent of the subset account of realization could also avoid the dilemma by upholding the view, once defended by Shoemaker, that properties do not properly speaking *confer* or *ground* their associated powers. Properties, on this view, are nothing other than clusters of powers.²³ So it would be inappropriate to speak of them determining or explaining the associated powers, just as it would be a mistake to treat a mereological sum as ontically or explanatorily prior to its parts. On this view of properties, the crucial question

²² Kim 1999.

²³ Shoemaker 1980.

does not arise (and correspondingly, the exclusion argument does not get off the ground). Things have various powers, and corresponding to certain sets of these powers are properties. But the powers are ontically prior; they are not grounded in the relevant properties. I indicated above why this view ill befits the subset account, but it is worth saying more. I will not attempt to refute the claim that properties are simply clusters of causal powers. I will argue rather that this view cannot subserve an ontologically robust nonreductive treatment of realized properties, or indeed, any account of realization as a relation between properties (or their instances).

The view that properties are clusters of powers is compatible with the basic skeleton of the subset account. But on this view there is no reason to regard the more encompassing property as *realizing* the less encompassing one. The reason is that, if properties are just clusters of powers, what accounts for the instantiation of the less encompassing property is just the possession by a thing of certain powers, not its possession of the more encompassing property. Thus, since *F*'s realizing *G* requires that *F* (or its instances) account for *G* (or its instances), the cluster of powers view does not provide an understanding of how more encompassing properties realize less encompassing ones. Rather, the account of why each property is instantiated will be in terms of powers, rather than properties.²⁴ Indeed the explanations of why a thing instantiates the two properties will overlap. It might even be appropriate to say that the explanation of why the realized property is instantiated is part of the explanation of why the realizer is. But this common explanatory heritage does not have the form of a chain, and so does not assign the alleged realizer any role in explaining why the alleged realizee is instantiated.

One might worry that I have missed the point here. The subset account, it might be argued, treats realized properties as proper parts of the properties that realize them. Proper parts are nothing over and above that of which they are parts, and so the criticism that the more encompassing property would not on this view realize the less encompassing property is misplaced. But while it is true that nothing-over-and-above-ness is secured by the part-whole relation, that is not enough for realization. In general, it is not plausible to regard wholes as realizing their proper parts, or in any other way as ontically prior to them.²⁵ The

²⁴ The resulting view might still count as physicalist, provided all the powers in question are physical. But this is a radical form of physicalism, one that treats the category of power as prior to that of property. The subset account is not supposed to depend on such a controversial view.

²⁵ For an argument against this, see Schaffer 2010.

fact that the chair exists, e.g., does not account for the fact that the legs, seat, and back exist. It is the other way around. Realizer properties, on the present view, are the wholes, and hence not ontically prior to what they realize. So this view fails to accommodate a basic feature of realization. (I will explain why ontic priority is necessary for realization in the next section.)

More generally, it is not clear why the category of property is an ontologically significant category on this view. On this view, properties do not explain why things have the causal powers they do. Properties are simply classifications of powers. It would not make any difference to what powers a thing has if we reclassified the powers so that different powers were associated with different properties. One might think it would make a big difference, e.g., if it were being rubber rather than being copper that makes things capable of conducting electricity. That would indeed be a difference, but take note of the little word 'makes', which smuggles in the idea that the nature of copper explains conductivity. That is precisely what cannot be said on the present view, according to which powers like conductivity are prior to any properties that might be thought to confer them.

Now, it is worth noting that this view can deny that there is a property corresponding to every set of powers. Shoemaker claims, e.g., that there is a property corresponding to a set of powers only if that set is closed under nomic and metaphysical entailment.²⁶ But on the view that properties are just clusters of powers, it seems to be a brute fact that only such sets correspond to properties. In particular, we cannot explain why property-constitutive sets are closed in this way by appeal to the fact that it lies in the nature of some property to confer exactly that set of powers (or at least to do so under a certain set of laws). For that requires properties to confer powers, and once conferral is back in the picture, the above dilemma resurfaces. Either realizer and realizee each, separately, confer all associated powers, so that their common powers are overdetermined, or the realizee confers no powers and as a result can bear no responsibility for effects owed to those powers.

7 Why Realization Requires Ontic Priority

²⁶ What it means for a set to be closed under nomic and metaphysical entailment is that for any pair of powers such that it is nomically and metaphysically impossible for anything to have the first and not the second, the set contains the first only if it contains the second.

Now, one might wonder why the proponent of the subset account cannot dodge my criticisms simply by denying that realization requires the ontic priority of realizers over realizees. If ontic priority is not required, won't the cluster view turn out to yield a plausible version of the subset account of realization? In this section, I will argue that ontic priority is required, even though it is not necessary for nothing-over-and-above-ness. These points are best explained in relation to the issue of physicalism. Realization, surely, must be such that it is sufficient for physicalism that every mental property be realized by physical properties and only by physical properties. Nothing-over-and-above-ness, however, is not by itself enough for physicalism. Nothing-over-and-above-ness plus ontic priority, on the other hand, is sufficient for physicalism.

A whole is nothing-over-and-above its parts, but any given part is also nothing-over-and-above the whole. This generates a problem. The subset account seeks to cash out realization as at least akin to the part-whole relation, and perhaps as a special case of it on the view that properties are clusters of powers. But physicalism cannot allow that mental properties be parts of physical properties *unless* there is some way to do so while ruling out what would ordinarily be a consequence of this, namely, that in this case the part is not ontically prior to the whole. I do not mean anything especially *recherché* by 'ontic priority' here. My point is only that the physicalist must rule out that physical properties are somehow built, even in part, out of mental properties.

Suppose pain is a part of some physical property, *P*, and for that reason nothing-over-and-above *P*. One way to understand this situation is that *P* is not *purely* physical, since it contains a mental part. Physicalists, of course, must insist that *P* is purely physical, and indeed, that pain is ultimately physical as well. But the mere fact that pain is *nothing-over-and-above P* does not guarantee that this is so. For all we have said, pain could be among the fundamental properties. In that case, how does its being a part of a physical property do anything to insure that it is ultimately physical? Why should we not instead conclude that pain is the ontically prior property, so that *P* is ultimately mental? For example, this view might as well be a version of panpsychism, according to which the apparently physical things we can observe with the naked eye have microscopic constituents with mental properties. This is obviously a form of antiphysicalism. Even though the relevant mental properties are nothing-over-and-above the physical properties, they are ontically prior to them. That is why realization must insure not only the nothing-over-and-above-ness of realized properties, but also the ontic priority of realizers.

Now, the cluster view discussed in section 6 gives us a way to treat mental properties as parts of brain states without violating physicalism, but only

by sacrificing the view that mental properties are realized by physical ones. On this view, powers are the basic ontological building blocks of properties, and all powers are physical.²⁷ Now, making some common mereological assumptions, we can say that the pain is part of the brain state, simply because it is composed of a proper subset of the set of powers that compose the brain state. But there is no reason to call the brain state the *realizer* of the pain on this view. Rather, certain powers realize the pain (and, for that matter, the brain state as well). Whether or not this view is plausible, it is not a version of the subset strategy. And this is not merely because the realizers turn out not to be the kind of properties (such as relatively ordinary properties like brain states) we'd expected to be realizers. On this view, realization is no longer a property-property relation; it is a power-property relation. Powers, taken individually, realize the various properties that are clusters of them.

Whatever view of these matters is correct, it is clear that questions of determination and ontic priority make a great difference in metaphysics. For one thing, they make a difference to whether or not a view counts as physicalist. So in working out an adequate understanding of realization, these issues cannot be left concealed in a word like 'confer'. They must be brought to light and carefully considered.

8 Conclusion

I have argued that the subset account is inadequate. In particular, I think it fails to insure that realizers be ontically prior to what they realize. It is worth noting that even if, despite my arguments to the contrary, realization does not require ontic priority, I will have shown that the subset account is not compatible with a notion of realization that involves ontic priority. In particular, the subset account cannot take the notion of conferral seriously (cannot, that is, treat it as a genuine relation of determination), lest it face an exclusion problem at the level of conferral. Even if the subset account is defensible, then, it is incompatible with the view of properties as properly speaking determining what powers their possessors have.

The exclusion problem is insidious. It is not unique to the domain of cause and effect; wheresoever there are determinative or explanatory relations, an exclusion problem can arise. It will typically take the form of a dilemma; there is either too much distinctness between two explanatory factors or too little.

²⁷ What it takes for a power to be physical is for the proponent of this view to decide. Here, I want only to show that this view is not consistent with the subset account.

Here, I have discussed this problem as it arises for the notion of conferral. Both realized properties and their realizers might be taken to confer (and hence to explain) a power that they share. If both independently confer it, it is overdetermined, and its being so is owed to the independence of the realizee from its realizer. If only the realizer confers it, then the realizee is powerless; it contributes nothing to the powers of its possessors to produce their characteristic effects. The choice is between a realized property's doing no non-redundant work, and its doing no work at all. Since the work in question—that of conferring powers—lies at the very core of the conception of properties presupposed by the subset account, neither alternative can be accepted. Allowing either amounts to the claim that realized properties are not properties at all (or at least, so ontologically attenuated as not to merit defense). Since I do not think the subset account can avoid this dilemma, I think it must be abandoned as a defense of nonreductive physicalism.²⁸

²⁸ For discussion of these topics, I thank Joey Baltimore, Karen Bennett, John Heil, Paul Kelleher, Keith McPartland, Andrew Melnyk, and an anonymous referee for *Philosophy and Phenomenological Research*. I also learned a lot about this topic from attending an invited symposium on Mind and Metaphysics at the 2009 meeting of the Pacific Division of the APA. The speakers were Derk Pereboom and Jessica Wilson, and Alyssa Ney was the commentator, and I benefitted greatly from their session. Thanks also to the National Endowment for the Humanities; much of this paper was conceived while I was a participant in the NEH seminar in Mind and Metaphysics, held summer 2009, and led by John Heil at Washington University in St. Louis.

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