

## SUBSET REALIZATION, PARTHOOD, AND CAUSAL OVERDETERMINATION

### 1. INTRODUCTION

If all physical effects have physical causes, then it seems that we can only endorse the causal efficacy of nonbasic (mental, biological) properties by supposing that every physical effect caused by the instantiation of a nonbasic property is also caused by the instantiation of a physical property.<sup>1</sup> *Prima facie* this isn't an attractive metaphysical picture, and such considerations have led some to endorse the reductionist conclusion that in fact putatively nonbasic properties are identical with physical properties, while others have opted for a form of eliminativism.<sup>2</sup>

According to one line of thought, the key to resolving this worry about the causal efficacy of, for instance, the mental, isn't to be found in reductionism or eliminativism, but rather in an account of what it is for one property to be realized by another. Thus Lenny Clapp, Sydney Shoemaker, and Jessica Wilson have maintained that the "subset view" of realization can provide a satisfying account both of how nonbasic properties fit into a physicalist worldview and how such properties can be causally efficacious without this implying a metaphysically objectionable form of causal overdetermination. Concerning the latter claim, which will here be of primary interest, they have maintained that any causal overdetermination implied by the subset view is no more problematic than the sense in which a *part* and a *whole* may both figure as causes of an effect.<sup>3</sup>

Contra this line of thought, I'll argue that the causal overdetermination implied by the subset view can't be legitimated by appealing to more ordinary, unproblematic part-whole causal

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<sup>1</sup> See, for instance, Kim 1998.

<sup>2</sup> For the reductionist conclusion, see Papineau 2004; for an eliminativist conclusion based on causal considerations, see Merricks 2001.

<sup>3</sup> See Clapp 2001, Shoemaker 2001 and 2007, and Wilson 1999. The *physicalist* aspect of subset realization is based on two ideas. Suppose that all properties are either physical properties or subset-realized by physical properties. First, this is enough to rule out emergentist views under which nonbasic properties bring with them novel causal powers: if all properties are at least subset-realized by physical properties, it follows that the causal powers of nonbasic properties are redundant vis-à-vis the causal powers of physical properties. Second, given that all properties are at least subset-realized, it seems to follow that once we've fixed the distribution of physical properties and the powers of physical properties, we've thereby fixed the distribution of nonbasic properties; and in this sense, subset realization seems to explain physical supervenience. This latter physicalist feature of subset realization is disputed in McLaughlin 2007 for reasons beyond the scope of this paper, though it may be noted that I don't believe McLaughlin's arguments here are successful.

overdetermination; more generally, I'll challenge the attempt to validate the causal efficacy of nonbasic properties by appealing to parthood considerations.

## 2. SUBSET REALIZATION AND PART-WHOLE CAUSAL OVERDETERMINATION

According to the subset view, property realization consists in the causal powers individuating one property having as a subset the causal powers individuating another, where the causal powers of a property consist in what the instantiation of that property brings about, given the instantiation of certain other properties in certain circumstances.<sup>4</sup> Thus Clapp offers the following definition of realization:

P realizes M if and only if, where  $C_P$  and  $C_M$  are the sets of powers constituting P and M, if  $C_M$ , then  $C_P$ .<sup>5</sup>

Similarly, Shoemaker contends that a property M has a property P as a realizer just in case the powers of M are a subset of those of P, and an instance of P realizes an instance of M on some occasion just in case M and P are instantiated in the same individual and P is a realizer of M.<sup>6</sup>

The subset view would seem to allow for nonbasic properties to be causally efficacious vis-à-vis the physical domain without implying any objectionable overdetermination as follows. Where

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<sup>4</sup> This corresponds to what Sydney Shoemaker calls “conditional causal powers” or “causal features”—powers conditional on other properties. For instance, the property *being knife-shaped* has the power to cut bread, conditional in part on the knife-shaped entity having the property *being made of steel*. See Shoemaker 1980. Clearly this account of property realization isn't going to be completely general if we deny the causal individuation of at least some properties but nonetheless maintain that such properties are physically realized.

<sup>5</sup> Clapp 2001, p. 129, with some minor changes to notation.

<sup>6</sup> Shoemaker 2001 and 2007. Shoemaker (2007, p.12) officially defines property realization not only in terms of causal powers, but also in terms of “backward-looking causal features”, where the backward-looking causal features of a property consist in what brings about the instantiation of that property. And in this case, the subset realization of a property M by a property P will consist in the powers of M being a subset of those of P and the backward-looking causal features of P being a subset of those of M. Backward-looking causal features are needed if we think that properties can be identical with respect to their causal powers but differ with respect to their causes. But while the notion of a backward-looking causal feature, and its relevance to an account of realization, raises a number of challenging questions (see McLaughlin 2007), I'll work with the simpler formulation in terms of powers simpliciter in what follows. For one, Shoemaker (2007, p. 12, fn.5) expresses doubts about the need for building the notion of a backward-looking causal feature into the definition of realization. Second, aside from the definition advanced in Shoemaker 2007, other definitions of subset realization have been formulated exclusively in terms of causal powers. It may be noted, however, that if we adopt the formulation in terms of backward causal powers, this will further call into question the analogy between subset-realization and ordinary part-whole relations: if the backward-looking causal features of a subset-realized property indeed go beyond those of its physical realizer on some occasion, we clearly won't be able to maintain that instances of subset-realized properties are parts of physical realizer. My reason for not pressing this line of thought is that it is far from clear that we *should* take the backward-looking causal features of an instance of a realized property to go beyond those of its realizer on some occasion.

the causal powers of a property M are a proper subset of those of its realizer P, there is a sense in which M-instances can be regarded as *parts* of P-instances, at least to the extent that the powers of M-instances will be included in those of P-instances. But in this case, to say that both a realized property and its physical realizer cause the same physical event is no more problematic than cases in which we may regard a whole as causally efficacious in virtue of one of its parts. Thus Clapp maintains that just as there is no causal competition between a whole and its parts, so there is no causal competition between instances of mental properties and instances of their physical realizers.<sup>7</sup>

Likewise, Shoemaker concedes that the subset view implies causal overdetermination,

This is not overdetermination of an objectionable sort; it can be compared with the case in which we can say both that Smith's death was caused by the salvo of shots fired by the firing squad *and* that it was caused by the shot fired by Jones, where Jones' shot was the only member of that salvo that hit Smith.<sup>8</sup>

That is, any overdetermination in this case is metaphysically benign—the death of Smith has two causes just in the sense that the particular shot is part of the salvo of shots. The present claim is that on the subset view, physical effects caused both by the instantiation of physical properties and by subset-realized properties are like this: these effects are overdetermined just in the sense that the realized property instance is part of the realizer property instance. So, if we endorse the subset view of realization, we can allow that nonbasic properties overdetermine their physical effects, but maintain that the overdetermination isn't especially objectionable. Indeed, Wilson goes so far as to suggest that the subset view provides a *solution* to the problem of causal overdetermination.<sup>9</sup>

### 3. PARTHOOD AND SUBSET REALIZATION

If we presume that parts and wholes typically don't compete for causal efficacy, the crucial question is then to what extent realized property instances may be regarded as *parts* of realizers. Now, there clearly is *a sense* in which the subset realization of a property M by a property P implies that M-

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<sup>7</sup> Ibid, p.133.

<sup>8</sup> Shoemaker 2007, p. 53; emphasis added.

<sup>9</sup> Wilson 1999, p.51; emphasis added.

instances are parts of P-instances; namely, just insofar as the powers of an M-instance are a proper subset of those of a P-instance. But the question is whether *this sense* in which M-instances are parts of P-instances is relevantly similar to cases in which we can unproblematically assign causal efficacy to both a whole and a part. On reflection, however, it is far from clear that this is the case.

It is typically thought that there is a significant sense in which a whole *depends for its existence* on its parts; we say, for instance, that a table is *constituted* by the molecules that compose it, suggesting that the table *depends* on its parts at least insofar as the table has the properties that it does *in virtue of* the properties of its parts. And in the case presented by Shoemaker, we can safely presume that the salvo is constituted by the particular shots, and generally that the properties of a salvo is determined by the properties of the shots that make up that salvo. The point here, which should be uncontroversial, is that in most part-whole relationships, including those that exhibit presumptively unproblematic part-whole causal overdetermination, how things are with a whole is determined by how things are with its parts.

Moreover, this makes sense of *why* we can maintain that a whole is causally efficacious in virtue of the efficacy of its part. For instance, we can make sense of the salvo killing Smith in virtue of the particular shot killing Smith by noting that in general the properties of a salvo are a function of the properties of the shots that make up that salvo. In other words, the causal efficacy of a whole vis-à-vis an event in virtue of the causal efficacy of its part vis-à-vis that same event is no more or less mysterious than the general phenomenon of a whole having the properties it does in virtue of the properties of its parts. In terms of causal powers, we can thus say that in cases of ordinary part-whole overdetermination, the whole has the power relevant to bringing about the event in question in virtue of the powers of the part causally responsible for that event.

It is also notable that in these cases, while how things are with the whole depends on how things are with its parts, the causally efficacious part has at the relevant powers largely independently of the whole of which it is a part. For instance, the particular shot that kills Smith has the power to

kill Smith quite independently of the other shots in the salvo. This makes sense of why we can assign causal efficacy to the part vis-à-vis an event, and then again assign causal efficacy to the whole vis-à-vis *that same event*, since if the part *couldn't* be assigned such independence, we *wouldn't* be able to take it to be causally efficacious vis-à-vis the same event as the whole. This would be the case, for example, if the part could at best be regarded as a partial cause of the event, in which case we wouldn't really have a case in which a single event has two causes, and so a case of causal overdetermination.

It is far from clear, however, that these properties can be assigned to the sort of part-whole relation that obtains between subset-realized property instances and realizer property instances. For one, it should be noted that the subset view is supposed to be a physicalist view, roughly in the sense that if all properties are either physical properties or subset-realized by physical properties, this is good enough for physicalism to be true.<sup>10</sup> And in this case, the presumption has to be that where an instance of physical property P realizes an instance of a nonbasic property M, the M-instance depends for *its* existence on the P-instance, given that physicalism requires that how things are with nonbasic properties *depends on* how things are with physical properties.<sup>11</sup> But this observation immediately calls into question the extent to which the part-whole analogy can secure the causal efficacy of realized properties, since insofar as subset realization is supposed to support a form of physicalism, we can't maintain that *physical property instances depend on realized property instances*.

While this line of thought appeals to the role of subset realization in the formulation of physicalism, this is inessential. Rather, we only need to suppose that an account of realization should deliver a sense in which one property (the “realized” one) depends on another (the “realizer”) for its

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<sup>10</sup> See especially Wilson 1999.

<sup>11</sup> Indeed, a prominent worry about attempts to formulate physicalism in terms of supervenience is that supervenience isn't sufficient for us to capture the requisite dependence of how things are on how things are physically. See, for instance, Horgan 1993 Kim 1998, and Melnyk 2003. See also Heil 2005 for the worry that supervenience isn't enough to spell out the dependence of certain properties on others in the context of a metaphysical picture that takes reality to be divided into distinct “levels”.

instantiation. As Shoemaker notes, to say that one property realizes another is to say that there is a sense in which the former “makes real” the latter.<sup>12</sup> But a view of realization clearly cannot meet this desideratum if it ends up maintaining that in fact realizer properties depend for *their* existence on realized properties. And given this, while there may be a sense in which realized property instances are parts of realizer property instances, we can’t maintain that this relationship accommodates the sense in which wholes depend for their existence on their parts. Insofar as this feature is crucial to making sense of why ordinary part-whole overdetermination is unproblematic, the same story can’t be invoked to explain why the overdetermination implied by the subset view is unproblematic.

It may also be noted here that the suggestion that instances of realized properties are parts of realizer property instances directly conflicts with the suggestion that if physicalism is true, then all instances of nonbasic properties are *constituted* by instances of physical realizer properties in the sense that they have instances of physical properties as parts.<sup>13</sup> If we take seriously the idea that subset-realized property instances are *parts* of physical property instances, the subset view gets the dependence we expect from a view of realization *precisely backwards*. My suggestion, in effect, is that insofar as the subset view is supposed to be a physicalist view of realization, we *shouldn’t* take the sense of parthood at work in the subset view very literally. But in this case, we can’t legitimate the overdetermination that the subset view implies by appealing to the legitimacy of more straightforward cases in which an event is overdetermined by a part and a whole.

To this point I’ve focused on the existential dependence of realized properties on realizer properties—the idea that instances of the former should depend for their existence on instances of the latter. But it goes along with this that insofar as an M-instance is realized by a P-instance, the properties of that M-instance are determined by those of the P-instance. More specifically, realized property instances should be causally efficacious in virtue of the causal powers of physical realizers:

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<sup>12</sup> Shoemaker 2007, p. 2.

<sup>13</sup> See Melnyk 2003, p. 60 – 61.

a realized property instance can bring about some event in virtue of the causal powers of its realizer on that occasion.

But this is directly opposed to the dependence between the powers of parts and those of wholes that we find, for example, in the firing squad case sketched above. Whereas in the more ordinary case we can make sense of part-whole overdetermination by contending that the whole brings about the event in question in virtue of its part bringing about that event, it seems that in the present case we should say that the realized property instance (*the “part”*) bring about an event in virtue of the realizer property instance (*the “whole”*) bringing about that event.

Shoemaker suggests that where a power shared by a realized property M and its realizer P is manifested, the right thing to say is that while the P-instance may have caused the event in question, it did so only in virtue of having the M-instance as a part—that is, we should say that while the P-instance causes the event, it does so *because* it has the M-instance as a part.<sup>14</sup> This is unobjectionable if it *just* amounts to the claim that the manifestation of a causal power shared by M and P is relevant to the event in question. But if it amounts to anything more than this, it is far from clear that it is true, since it will conflict with the very plausible idea that the powers of an instance of a nonbasic property turns on the powers of its physical realizer. Moreover, if such a claim *is* true, it is hard to see on what grounds we can endorse physicalism: the claim that the powers of physical property instances *depends on* the powers of the nonbasic properties they realize doesn't sound like something a physicalist can say.<sup>15</sup> But, crucially, this is what we *should* say if we are going to contend that the overdetermination implied by subset realization is unproblematic by appealing to the sense in which ordinary part-whole overdetermination is unproblematic.

While to this point I've focused specifically to the attempt to legitimate the overdetermination implied by the subset view of realization, the considerations I've advanced can be

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<sup>14</sup> Shoemaker 2007, p. 13.

<sup>15</sup> Again, assuming that the suggestion under consideration amounts to something more than the unobjectionable claim that the realized property is defined, in part, by a causal power shared by a physical property, the manifestation of which is relevant to the event in question.

seen to tell against any attempt to legitimate the sense in which nonbasic properties overdetermine their physical effects on the basis of ordinary part-whole causal overdetermination. For insofar as such an attempt is advanced in the context of a physicalist framework, it is very plausible that we *aren't* going to be able to regard nonbasic properties as *parts* of physical properties in the same sense in which, say, a particular shot is part of an entire salvo of shots: in the latter case, there is a robust sense in which the whole depends on its parts for its existence, which is precisely why we can assign causally efficacy to the whole on the basis of the causal efficacy of the part; but insofar as we are working within a physicalist framework, this is precisely what we *can't* say about the relationship between nonbasic properties and physical properties.

The considerations I've advanced call into question a related line of thought advanced by defenders of the subset view. In particular, following Stephen Yablo, they have maintained that the overdetermination implied by the subset view is no more or less problematic than the sense in which an instance of *determinate* and an instance of a *determinable* may be both regarded as causes of an event.<sup>16</sup> That is, for instance, insofar as a subset-realized mental property and its physical realizer cause the same physical behavior, this is no more problematic than the sense in which an instance of red and an instance of scarlet may both be regarded as causes of the same event.

But, for one, it just isn't clear that determinates and determinables don't "compete" for causal efficacy. Indeed, the observation that determinables are causally redundant vis-à-vis determinates has led some to question the very existence of determinables.<sup>17</sup> And even if determinates and determinables *aren't* in "causal competition", it *doesn't* follow from this that in general subset-realized properties and realizer properties aren't in such competition. For the subset-realization relation coincides with the determinate-determinable relation, if at all, *just to the extent that both involve one property having as a subset the powers of another*. But it surely doesn't follow from its

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<sup>16</sup>See, for instance, Shoemaker 2001, p. 436 and Wilson 1999, p. 47.

<sup>17</sup>See, for instance, Gillett and Rives 2005.

being the case that the overdetermination generated by *some cases* of this relationship is unproblematic (namely, those traditionally regarded as determinate-determinable relations) that *all* cases of this relationship are unproblematic. We *could* endorse this inference *if* we could maintain that the reason why, for example, an instance of red and an instance of scarlet may both be regarded as causing the same event is precisely *because* the instance of red is *part* of the instance of scarlet, at least in the sense that the powers of scarlet include as a subset the powers of red. But crucially, we just saw that such considerations *don't* work, and thus what is needed is some reason for thinking that cases *not* traditionally regarded as determinate-determinable relationships are enough like traditional cases for us to conclude that subset-realization generally implies only benign causal overdetermination. And we *can't* do this simply by appealing to the sense in which subset-realized properties, like determinables vis-à-vis determinates, are *parts* of physical realizers.

#### 4. CONCLUSION

To this point I've focused on the significance of the dependence of wholes on parts in making sense of why ordinary part-whole overdetermination may be metaphysically unproblematic. The second relevant property of unproblematic part-whole causation, recall, is the sense in which the part may be assigned a certain independence from the whole, which allows us to maintain that the part and the whole cause the *same* event.

Now, on one hand this line of thought *isn't* going to be available in the case of interest, since in whatever sense a realized property instance may be regarded as a part of a realizer, it can't be insofar as the former is *independent* from the latter: to say that one property realizes another is to say that instances of the former *aren't* independent from instances of the latter. Yet a defender of the subset view doesn't have to appeal to the independence of realized properties vis-à-vis realizers here, since we can easily make sense of how both a subset-realized property instance (the "part") and the realizer instance (the "whole") can cause of the same event: namely, just insofar as they have a common causal power, the manifestation of which is relevant to the event in question.

The more significant question, however, is why this overdetermination should be regarded as benign, and the considerations advanced above suggest that this can't be established by appealing to the sense in which a part and a whole may unproblematically overdetermine an effect. Of course it is compatible with this that there is some story that can legitimate the causal overdetermination that we get from subset realization.<sup>18</sup> But it won't be the same story that makes sense of why ordinary part-whole overdetermination is unproblematic.

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<sup>18</sup>Additionally, defenders of the subset view have tentatively appealed to Yablo's proportionality view of causation to legitimate the causal efficacy of subset-realized properties (Shoemaker 2001, p. 436 and Clapp 2001). On this picture, suppose a property M is realized by P on some occasion and we are interested in whether the instantiation of P or of M should be regarded as a cause of some event E. According to the proportionality view, we need to ask: If M had been realized otherwise than by P, would E still have come about? If *not*, then P is *required* for E. Thus P is said to be *proportional* to E, and so P, rather than M, is a *cause* of E. On the other hand, if M had been realized otherwise than by P, E would still have come about, then P is *not* required for E and so M is *enough* for E. In this case M is thus said to be *proportional* to E, and so M, rather than P, is a *cause* of E. This view seems to imply that realized properties will have causal powers *beyond* those of realizers. For instance, take a pigeon, Sophie, trained to peck at patches of red quite generally, regardless of the particular shade of red that they happen to be. The proportionality view dictates that what causes Sophie to peck at a scarlet patch on some occasion is the instantiation of *being red* rather than the instantiation of *being scarlet*, since if red had been realized by crimson, Sophie still would have pecked at the patch.

But while this gets us a sense in which realized properties are causally nonredundant, it seems to preclude taking the red to be subset-realized by the scarlet, since the powers of the instance of red *aren't* a subset of the powers of the instance of scarlet. Indeed, given a proportionality view of causation, the subset view would seem to be a nonstarter, since it would seem to imply that the causal powers of nonbasic properties typically are *not* a subset of those of physical properties. While there are ways in which the subset view can be formulated to avoid this worry (for instance, by distinguishing between causation, causal relevance, and causal sufficiency), it is not clear that these formulations allow for the subset view to explain why instances of subset-realized properties are necessitated by physical realizer properties without taking this necessitation as a premise in making sense of the realization relation (see McLaughlin 2007 for further discussion). More generally, to the extent that the proportionality view succeeds at all, and so provides for a sense in which nonbasic properties can be causally efficacious without this implying a bizarre sort of causal overdetermination, this would seem to have little if anything to do with the subset view of realization; and in this case, the key to securing the causal efficacy of nonbasic properties would be found in the proportionality view of causation, not (as defenders of the subset view have suggested) in adopting a particular account of realization.

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