

The Co-Instantiation Thesis

Abstract

The co-instantiation thesis is pivotal to a significant solution to the problem of causal exclusion. But this thesis has been subject to some powerful objections. In this paper, I argue that these difficulties arise because the thesis lacks the necessary metaphysical framework in which its claims should be interpreted and understood. Once this framework is in place, we see that the co-instantiation thesis can answer its critics. The result is a rehabilitated co-instantiation solution to the troubling problem of causal exclusion. But questions remain concerning the viability of certain of its applications.

Can properties be co-instantiated in a single instance? Could two properties share one property instance? Recently, these metaphysical questions have been subject to increasing philosophical scrutiny. Intrinsic interest aside, this attention has been generated by the claim that a solution to the problem of causal exclusion reveals itself if we accept the co-instantiation thesis: the claim that distinct properties can be co-instantiated in a single property instance.

This co-instantiation thesis, however, has been subject to some serious criticisms. Ehring and Gibb, for example, have argued that property dualism cannot be combined with property instance monism, so the co-instantiation solution to the problem of causal exclusion is a non-starter. In this paper, I intend to address this and other objections. My aim is modest. I shall argue that the co-instantiation thesis is defensible, so Gibb and others are wrong to say that the co-instantiation solution fails because of its commitment to that thesis. However, the defence I shall offer of the co-instantiation thesis fails to vindicate the co-instantiation solution, at least given certain important applications of it, since other significant issues emerge.

1. The Co-Instantiation Solution

The problem of causal exclusion is extremely familiar, so I'll be brief. It is generated by three claims that have struck many philosophers as independently plausible:

- (1) **Distinctness:** Properties of type N (be those mental, biological etc.) are not identical with properties of type P.
- (2) **Closure:** Every physical effect (or its chance) is determined by a purely physical history.
- (3) **Exclusion:** There is no systematic causal overdetermination.

From these premises, this worrying conclusion seems to follow:

- (4) **Epiphenomenalism:** No properties of type N (be those mental, biological etc.) can be causally efficacious for the occurrence of any physical effect.

Whilst this argument works equally well against the dualist's thesis that mental particulars are distinct from physical particulars, I have framed it in terms of properties because here I shall assume a broadly physicalist background in which mental and physical particulars aren't distinct. Distinctness is harder to deny for properties, however, due in large part to the phenomenon of multiple-realization. So the problem of causal exclusion is forcefully re-raised at this level.

The co-instantiation solution is proposed as an answer to this problem of property or type epiphenomenalism. What it offers is a way of consistently maintaining the distinctness of type-N properties with Closure, Exclusion and the denial of epiphenomenalism. But to achieve this feat, the co-instantiation solution requires two metaphysical theses and a distinction. First, the distinction: Properties or types are unifying entities that can be instantiated in different particulars at the same time. It is,

for instance, the property of redness or roundness that makes different particulars alike in certain respects. Property instances, in contrast, are single instantiations or instances of properties, such as *that* cable's weakness or *that* ball's redness.¹ As I am using them here, 'property' and 'property instance' do not presuppose a particular ontology. That will come later.

With this distinction in place, the co-instantiation thesis, the principal metaphysical thesis, may appear incredible. How could distinct properties be co-instantiated in a single property instance? So to illustrate and motivate the co-instantiation thesis, to some extent at least, consider a red, specifically a scarlet, post box. It seems counter-intuitive to say that we have two property instances here, an instance of scarlet and a separate instance of red, since being scarlet just seems to be a way of being red. But we cannot identify the property of being red with that of being scarlet, as they have different extensions. Many objects are red but not scarlet, for there are crimson, magenta, vermilion...objects that are all red. So why not say, of this case, that one property instance instantiates both the property of redness and the property of scarlet? In other words, why not allow that, sometimes, two properties can be instantiated in a single instance?

In addition to the co-instantiation thesis, the solution requires a further metaphysical claim: that property instances are the entities which are (directly) involved in the push and pull of causation. So when we say that the orange's being 250 grams caused the scale's pointer to move, it is not (primarily) the general property of being 250 grams that is causally effective, rather it is this orange's particular weight of 250 grams. The caveats 'directly' and 'primarily' are added since if it is thought that property instances are instantiations of universals at times, as Kim, Armstrong,

¹ I shall leave open the question of whether property instances should be relativized to times.

Macdonald (to name but a few) believe, then clearly properties or universals are involved in the causal process. The point is not to deny this. All that requires stressing is that in an instance of singular causation, what enables the particulars (be they objects or events) to bring about their effects, are particular instantiations of properties.²

Now we are in a position to state the co-instantiation solution. Its proponents begin by drawing our attention to the fact that the premises of the exclusion argument require disambiguating. When they mention properties, do they mean properties or their instances? Because the solution states that it is property instances, not properties, that are the causally efficacious entities, the principle of Closure and the conclusion should be taken to refer to property instances. However, the thesis of Distinctness could concern properties not their instances. For although non-reductive physicalists claim that the phenomenon of multiple-realization excludes the identification of physical properties with properties of type N, there is nothing to stop them saying that each property instance of type N is in fact an instance of a physical property. So the argument can be recast as follows:

- (1) **Distinctness:** *Properties* of type N (be those mental, biological etc.) are not identical with physical *properties*.
- (2) **Closure:** Every physical effect (or its chance) is determined by purely physical particulars and physical *property instances*.
- (3) **Exclusion:** There is no systematic causal overdetermination.
- (4) **Epiphenomenalism:** So *property instances* of type N (be those mental, biological etc.) are causally inefficacious in bringing about physical effects.

² This claim isn't particularly controversial (see, for instance, Kim [2003: 155] and Armstrong [1997 §14.3]), granted you accept the assumption, implicit in the causal exclusion argument outlined above, that properties play a role in causation. The co-instantiation solution is irrelevant to those who, following Davidson [1967], deny this. But the responses to Davidson's anomalous monism (see, for instance, Honderich [1982]) are testimony to how unpersuasive this sparse causal ontology is.

We can now see that the conclusion, namely epiphenomenalism, doesn't follow from our three premises. But we still do not have our solution, for it is unclear how property instances of type N could be causally efficacious in bringing about some physical effect if, as Closure maintains, these physical effects have a complete physical history. The answer, of course, lies in the co-instantiation thesis. According to this, it is possible for two properties to be co-instantiated in a single property instance. So one and the same property instance could be both an instance of a physical property and an instance of a property of type N. As a result, non-physical property instances may be causally efficacious in bringing about physical effects, without contravening Closure. For the very same property instance could also be an instance of a physical property, so all physical effects would still be determined by a purely physical history.

There is, then, logical space for a position which combines Closure, Distinctness and Exclusion with the denial of Epiphenomenalism. Moreover, this solution is a general one; it could work for any non-physical properties. But, as it stands, the solution is schematic. It is claimed that property instances 'may' or 'could' be co-instantiated. But no reasons have been given to think that they ever actually are. To say the very least, the solution needs fleshing out more, and so it is to this, and other problems, that I now turn.

2. Problems for the Co-Instantiation Thesis

(a) *Ehring's Challenge*

The first challenge for the co-instantiation thesis is to explain why we should (or at least plausibly could) accept that certain property relations, other than identity, entail that the corresponding property instances are identical. Ehring [1996] forcefully raises this

challenge. It isn't enough simply to claim that two distinct properties could be co-instantiated in the same instance, for such a claim certainly goes against the grain. If properties x and y are identical, then of course one property instance will be an instance of both x and y . But why believe that this ever occurs when two properties are not identical? Surely, if the properties are not identical, then instances of these entities will have to differ also?

(b) *Ontological Troubles*

Another, related, question is this: what ontology could support the co-instantiation thesis? If we are going to claim that two distinct properties can be co-instantiated in a single instance, we need an ontology of properties and their instances which legitimises this claim. But it has been argued that the two main contenders, an ontology of universals and an ontology of tropes, cannot be combined with the co-instantiation thesis.

Ehring [1996, 1999] outlines the difficulty for an ontology of universals.

Proponents of this view state that property instances are instantiations of universals by objects at times, so we get the following criterion of identity for property instances:

Property instance x = property instance y iff x and y are instantiations of the same universal, by the same object, at the same time(s).

This creates a serious problem. If property instances are instantiations of universals, and property instances x and y are only identical when they are instantiations of the very same universal, then two universals could not be constituents of the same property instance. For, according to the criterion of identity, to be the same property instance is just to be an instantiation (in the same object, at the same time) of the same universal. So one property instance cannot share two universals, contra the co-instantiation thesis.

In light of this, proponents of the co-instantiation solution have tended to move towards an ontology of tropes. Recently, however, Gibb has challenged this approach, arguing that ‘one cannot combine a trope monism with a type dualism’ [2004: 464]. In other words, one trope cannot be an instance of two properties, as the co-instantiation solution demands. The basis of Gibb’s argument for this conclusion is the claim that only sets of exactly resembling tropes can be substituted for universals or properties. For only sets of exactly resembling tropes form equivalence sets, which divide their domain into mutually exclusive sets.

Consider a mental property M. Those moved by the phenomenon of multiple-realization claim that we cannot identify M with any physical property. For the property of being M may be ‘realized’ by one property in humans, another property in dogs, and so on. According to the co-instantiation solution, this ‘realization’ amounts to tropes of different properties being identical to each other. However, Gibb claims that only sets of exactly resembling tropes can be substituted for universals. So any instances of this universal M, such as M1 and M2, must exactly resemble each other. This thesis, once combined with multiple-realization (understood as the co-instantiation of different properties), has unwelcome consequences. Suppose that trope M1 is identical with a trope of physical property P, and trope M2 is identical with a trope of a different physical property, Q. These physical tropes, P1 and Q1, cannot exactly resemble each other, since they are instances of different physical universals. But the mental tropes these physical tropes are identical to are supposed to exactly resemble each other.

Now we have our problem. According to the co-instantiation solution, tropes M1 and P1 are identical, and so exactly resemble each other. The same is true of tropes M2 and Q1. But if we grant Gibb’s claim that all tropes of the same universal must exactly resemble each other, this means that trope M1 exactly resembles trope M2. This can’t

be right, as trope M2 also exactly resembles trope Q1 which, being an instance of a different property, cannot exactly resemble trope P1. So the co-instantiation thesis cannot be combined with an ontology of tropes. For, given the transitivity of the relation of exact resemblance, if P1 exactly resembles M1, M1 exactly resembles M2, and M2 exactly resembles Q1, then Q1 has to exactly resemble P1. But this could only be the case if P1 and Q1 were both instances of the same physical property. Consequently, Gibb concludes, 'Trope monism entails type monism' [2004: 472].

The combination of Ehring and Gibb's objections is extremely serious for the co-instantiation solution. A background assumption of the causal exclusion argument is that properties (or better, their instances) are entities in the world with genuine causal influence. But if we cannot combine the co-instantiation solution with either an ontology of universals or an ontology of tropes, then the two realist accounts of properties (or their instances) are out of the picture. Moreover, turning to a nominalist theory of properties isn't going to help us here, since this pushes us in the direction of Davidson's solution: simply denying that properties are the sorts of entities that can have causal efficacy at all. But such a move, of course, renders the co-instantiation solution defunct.

(c) *The Fine-Grainedness Objection*

The most frequently cited criticism of the co-instantiation thesis is what I shall call the fine-grainedness objection. A number of philosophers, including Pettit [1992], Block [1995] and Noordhof [1998], have argued that the co-instantiation thesis is unacceptable because it gives us the wrong results. It renders causally efficacious property instances that should be regarded as causally inefficacious.

Consider an example put forward by the Macdonalds [1995]. They ask us to suppose that there is a piece of putty resting on a metal mesh. Over time, there is a change in the putty's shape, due to a change in its microphysical parts, which causes the putty to fall through the mesh. During that same time, the microphysical parts are also responsible for the expansion in the volume of the putty. The Macdonalds write,

On the co-instantiation model, it looks as though the change in shape and the expansion in volume will be co-instantiated, so that if one is causally efficacious, then so is the other. But if this is so, then we are forced to the conclusion that the expansion of the putty must be held to be causally responsible for the putty's falling through the mesh [1995: 67].

This conclusion, as Pettit claims, seems 'outlandish' [1992: 258]. It looks as though we should say that the putty falls through the mesh *despite* its increase in volume, not because of it.

This and other examples pose a serious threat to the metaphysics presupposed by the co-instantiation solution. For if the solution commits us to the claim that property instances, such as the increase in volume in the putty case, are causally efficacious, this strongly suggests that it is peddling the wrong causal ontology. Property instances, when distinct properties are co-instantiated by them, are not fine-grained enough to capture the subtleties involved in questions concerning what causes what. For there are occasions, such as this, when we want to say that some particular aspect of the property instance, the property instance qua shape, was the cause of the effect in question. We are thus faced with this question: was it the property instance qua volume or qua shape that was causally efficacious in this case?

But once it has been admitted that it is only the property instance qua property X or qua property Y that has causal influence, we no longer have our co-instantiation solution. For now we have legitimised this question: was the property instance causally

efficacious in virtue of falling under the property of type N or the physical property? To opt for the former is to give up Closure, the latter, on the other hand, sacrifices Non-Epiphenomenalism. Either way, the prospects look bleak.

It is worth noting, however, that this fine-grainedness objection presupposes some answer to Ehring's challenge. For unless we know when two properties can be co-instantiated in a single instance, we will be unable to judge whether the co-instantiation solution really does give us the wrong results. This, in turn, requires a worked-out ontological analysis; one which will hopefully answer the ontological problems raised here and also show when and why co-instantiation can occur. All these objections, then, can be seen as stemming from the same source: the co-instantiation solution has to be situated within a metaphysical framework. For, without an answer to Ehring's challenge, the plausibility of the proposal cannot be adequately assessed. In the next section, therefore, I shall sketch a metaphysical analysis that meets Ehring's challenge.

3. A Metaphysical Framework

Earlier, the co-instantiation thesis was illustrated and, to some extent, motivated by properties which stood in the determinable-determinate relation. It seems plausible to claim that a property instance could be both an instance of red and an instance of scarlet, for being scarlet just seems to be a way of being red. So perhaps we should claim that co-instantiation occurs when properties are related via the determinable-determinate relation?

Unfortunately, this suggestion immediately encounters a stumbling block. For there is little consensus as to how the determinable-determinate relation should be

analysed. Indeed, whether or not there is such a unified relation is itself controversial.³

In order to bypass these difficulties, I shall simply outline a relation, which I shall call a ‘determination relation,’ that can obtain between properties. This relation resembles the traditional determinable-determinate relation in important respects, and so I shall continue to use scarlet and red for the sake of illustration. But the argument does not rely upon the claim that the relation of determination is the very same relation as that described by Johnson [1921].⁴

The analysis of determination takes, as its background, Shoemaker’s [1981] functionalist theory of properties. Key to this is the claim that the identity conditions for properties are given via their functional roles. In other words, by both the possible causes of a property’s instantiation and by the complex causal contribution it makes to the particular that instantiates it. Since this focuses upon what *instantiated* properties do, the criterion should be written as follows:

*Property instances or tropes x and y are instances of the same property iff they both occupy the same functional role.*⁵

On this view, property instances or tropes, and the complexes of conditional causal powers they bestow, are taken as a given. What we’re then offered is an analysis of what it is for a property instance to be an instance of a certain property, in terms of what causal powers that instance bestows. So property A is instantiated by a particular if and

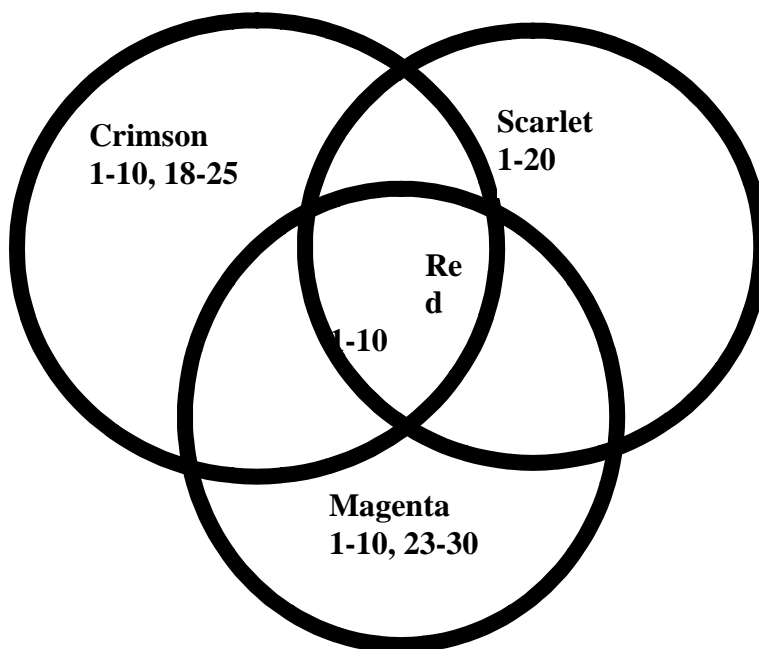
³ Worley [1997], for instance, denies that there is a single determinable-determinate relation.

⁴ The relation I shall describe differs in at least one important respect because, following Yablo [1992a: 253], I shall ‘discount the traditional doctrine’s conceptual component and reconceive determination in wholly metaphysical terms.’ However, unlike Yablo’s analysis, the relation I describe does not render conjunctive properties determinables and their conjuncts determinates, nor arbitrary disjunctive properties determinables of their disjunct properties.

⁵ The criterion of identity offered has the form of a two level criterion, since it does not tell us when x and y are identical. Rather, it states that the function f of x is identical to the function f of y iff there is an equivalence relation between the entities over which variables x and y range.

only if it has a property instance which bestows such-and-such a complex of conditional causal powers.

The analysis of determination I want to offer draws upon this account. It states that: *property A determines property B when the causal powers bestowed by B's instances are a proper subset of those bestowed by A's.*⁶ To illustrate, suppose that the determinate scarlet stands in this relation of determination to its determinable red, and suppose that scarlet is a determinable of no other property. If this is the case, then the property instances of scarlet will make exactly the same causal contribution to the particulars that instantiate it. But this isn't so for its determinable red. Instead, red instances must bestow the *intersection* of causal powers conferred by its determinates.



The above diagram represents the causal powers bestowed by the determinates of red. If we endorse Shoemaker's theory of properties, and offer identity conditions for a property in terms of the causal contribution its instances make, then the criterion of

⁶ This relation is also invoked, for different purposes, by Shoemaker [2000] and Clapp [2001]. But here I intend to use it to defend the co-instantiation thesis – a thesis that Shoemaker criticises.

identity for the determinable red is given by the set of intersecting causal powers. In other words, property instances x and y are members of the same determinable set of red iff x and y bestow the same subset of causal powers, i.e. in this case causal powers 1-10.

On the view I am proposing then, two properties stand in this determination relation to each other when the causal powers bestowed by one property's instances are a subset of those bestowed by the others. My claim is that when this relation of determination obtains between two properties, co-instantiation occurs.

4. Defending the Co-Instantiation Thesis

(a) Ehring's Challenge

The first challenge to the co-instantiation thesis is to explain why we should accept that certain property relations, other than identity, entail that the corresponding property instances are identical. Now that the metaphysical framework is in place, we can see how this can be answered.

According to the analysis above, co-instantiation occurs in cases where the causal powers bestowed by the determined property are a proper subset of those bestowed by the determining property. Why? If the causal powers bestowed by R are a proper subset of those bestowed by S, one property instance can occupy both the functional role of R and that of S. According to the functionalist theory of properties, all it is for a property instance to be an instance of property S (or R), is for that property instance to occupy the functional role definitive of S (or R). So property instance x is an instance of both property S and property R, just in case it occupies both their functional roles.

When this occurs, the property instance is a member of more than one set. So property instance *x* belongs to the set that is (or stands for) property *S* and the set that is (or stands for) property *R*. But properties *S* and *R* are not identical since they have different extensions. For instance, while property instance *x* is a member of both the determinate set of scarlet (as it confers causal powers 1-20), and a member of the determinable set of red (as it confers causal powers 1-10), property instance *z* is a member of the set of red not that of scarlet, as it confers causal powers 1-10, but not causal powers 11-20.

(b) *Ontological Troubles*

Could an ontology of universals support the co-instantiation thesis? Ehring suggests not, as property instances are individuated by their constituent universals, so one and the same property instance could not instantiate two different universals. Is there any way round this? It is difficult to see how we could plausibly reject this individuation condition for property instances, since, granted an ontology of universals, a property instance just is an instantiation of a universal.⁷ Consequently, if we grant that there are such entities as determinable universals, we are going to have to deny that the co-instantiation thesis applies to them and their determinates. For when, for instance, red and scarlet are instanced, there is both an instantiation of the determinate universal scarlet and an instantiation of the distinct determinable universal of redness.

Unlike Ehring [1996], Robb [1997] and Gibb [2004], however, I doubt that this automatically excludes an ontology of universals. If we held a very sparse view of

⁷ I am not claiming that this is the only position in logical space. One might, for instance, opt for both an ontology of Platonic universals and an ontology of tropes. But if one just endorses an ontology of universals, it is very difficult to envisage what a property instance could be other than an instantiation of a universal – where this is understood either as a universal immanent in a particular (Aristotelian), or where the particular participates in a universal (Platonic).

universals, such as that offered by Armstrong [1997], we could claim that determinable properties like redness, while not themselves universals, are nevertheless properties constituted by sets of property instances. Ehring argues that this move is unacceptable, since it commits us to an eliminative view of determinables (which, of course, is worrying indeed if we are trying to make out that mental properties are like determinables). But this objection seems a little overstated. If a sparse theory of universals is combined with physicalism, as in the case of Armstrong, then it is extremely unlikely that mental properties or determinables are going to count among these universals. But this doesn't necessarily commit us to an eliminative view of these entities. We could claim that sets of instantiations of universals form (less than perfectly sparse) properties; so mental properties and determinables are complex properties constructed out of sparse universals. The functionalist analysis can then be employed to say which sets of instantiations of universals form (less than perfectly sparse) properties: sets of disjunctive instantiations of universals that are unified by a shared subset of causal powers. So co-instantiation of distinct properties can be said to occur when an instantiation of a universal is both an instance of some universal F-ness, and a member of a set that is a (less than perfectly sparse) property. I don't want to stick my neck out for this proposal, as I think that a reductive ontology of tropes is more conducive to the functionalist theory of properties outlined. But it's worth noting that Ehring's point fails to establish that the co-instantiation solution, when combined with an ontology of universals, either doesn't work or leads to eliminativism.

What of Gibb's claim that trope monism cannot be combined with type dualism? Central to her case is the initial claim that 'only those sets of tropes with the greatest possible degree of unity, that is, sets of exactly resembling tropes...can be substituted for universals' [2004: 471]. In defence Gibb writes,

This can be seen by the formal properties of the relation of resemblance. Whilst all resemblance relations are reflexive and symmetrical, it is only in the case of exact resemblance that the relation of resemblance is transitive. This means that classes of exactly resembling tropes are equivalence classes and thus can be divided into mutually exclusive classes, each providing a substitute for a universal [2004: 471].

No doubt it is plausible to claim that only those tropes that exactly resemble each other in every respect (which, on the functionalist theory, amounts to those tropes occupying exactly the same functional roles) provide substitutes for Armstrong's [1997] sparse universals. But why should a trope theorist claim that these are the only properties there are? Trope theorists can maintain the plausible thesis that there are only the tropes that are required to 'comprise a minimal basis for characterising the world completely' [Lewis 1983: 12]. But this restriction doesn't appear to exclude the existence of less than perfectly sparse properties which are sets of less than perfectly resembling tropes. So we need to know what's wrong with saying that there are properties, such as determinables like mass, redness etc, that have inexactly resembling instances?

Gibb, at this point, simply refers us to Armstrong [1989]. But Armstrong is an eliminativist about determinables, so it is hardly surprising that he claims that only tropes forming mutually exclusive sets can be substituted for his sparse universals. On the alternative view I have sketched, the fact that determinate tropes form mutually exclusive equivalence sets, doesn't exclude there being determinable properties that are formed out of these determinates. These determinables can still plausibly be thought of as properties, since every instance of a determinable exactly resembles each other in some, if not in every, respect. For instance, two tropes of redness exactly resemble each other in some respect, as they each bestow causal powers 1-10 onto their particulars.⁸

⁸ So every particular that instantiates redness, exemplifies causal powers 1-10, and every particular that can be correctly ascribed the property of redness, exemplifies every causal power in this set [see Clapp 2001: 127-129]. Unfortunately, these conditions do not suffice to exclude the possibility of

So Gibb needs to show why only sets of tropes that resemble each other in every respect offer substitutes for universals.

The argument purporting to show that trope monism cannot be combined with type dualism fails to offer this, since it rests upon the assumption that only sets of exactly resembling tropes are properties. So proponents of the functionalist analysis can give this response to Gibb's argument against co-instantiation: although tropes M1 and M2 must resemble each other in some respect to be instances of the same property M, they need not resemble each other in every respect. Thus, we get no violation of transitivity: P1 can exactly resemble M1 with respect to functional role F (i.e. they both bestow causal powers 50-59), M1 can exactly resemble M2 with respect to functional role F, M2 can exactly resemble Q1 with respect to functional role F, but P1 and Q1 can nevertheless be instances of different physical properties, since P1's complete functional role bestows causal powers 45-59, whereas Q1's complete functional role bestows causal powers 50-75.

Gibb, however, has more ammunition. She concedes that her argument is surmounted if we maintain that tropes are alike in certain respects, but claims that the response relies upon an ontology of trope aspects. This, Gibb argues, is equally fatal to the co-instantiation solution, for 'The problem of mental causation is re-invited at the level of property aspects' [2004: 475]. The objection Gibb has in mind here is the one raised earlier in response to the fine-grainedness objection: If we claim that the trope is

proliferations of properties. Suppose, for instance, that the set of {crimson, scarlet} shares a slightly larger subset of causal powers than {crimson, scarlet, magenta}. In this case, given what has been said, these sets form two distinct properties. In response, two points can be made. First, the functionalist analysis enables us to make sensible distinctions between more or less sparse properties. For sparseness can be viewed as a trade-off between the number of shared causal powers bestowed by the set's members and the number of determinates included in the determinable set. Second, although we may have some rather gruesomely gerrymandered looking properties on our hands, there are limits on this. The tropes impose restrictions upon the properties that can be formed, since the properties are sets whose members must all confer a subset of the causal powers bestowed by the (sparse) tropes.

a cause in virtue of its mental aspects, we violate Closure. But if it is a cause in virtue of its physical aspects, we violate Non-Epiphenomenalism.

Gibb and other critics of the co-instantiation solution who raise this objection, are unclear about what exactly these trope aspects are. So we need to hear more details before we can determine whether, given the analysis offered here, tropes have aspects. What is crucial for these purposes, however, is not what aspects are, but whether it is these aspects, rather than the tropes themselves, that are doing the causal work. Gibb claims that talk of tropes being alike in certain respects commits us to causally efficacious aspects, but this doesn't follow on the functionalist analysis. Whether or not two tropes are alike in a certain respect depends upon what causal powers these tropes bestow. For instance, although the causal powers definitive of redness are said to be a subset of those bestowed by its determinates, the causal powers are parts or aspects of the particulars, not of the tropes themselves. So saying that tropes are alike in certain respects does not commit us to an ontology in which trope aspects do the causal work, since it is tropes in their entirety that are claimed to bestow such-and-such powers onto particulars.⁹

Still, it might be objected, doesn't the functionalist analysis invite this, equally troublesome, question: in this instance of mental causation, was the trope causally efficacious qua the functional role definitive of its being an instance of mental property M (i.e. in the example above, qua bestowing causal powers 50-59)? Doesn't this pose a

⁹ Whilst I wish to remain as neutral as possible regarding the nature of tropes, this makes it clear that I think that causal powers should be attributed to objects, not tropes. Saying this does not commit me to endorsing a Husserlian view of tropes as 'moments,' which are wholly dependent upon their objects. Objects could equally be regarded as tropes bounded by a special relation of compresence, in the tradition of Williams [1953]. But what I am assuming here, is that although tropes are partly characterized in terms of what they do, it is a mistake to think that they are simply causal powers. There are at least two reasons for thinking this: first, it is objects, not tropes, that have causal powers. Second, it is obscure to say that tropes are causal powers unless we know what causal powers are. On the view I am presupposing, tropes bestow causal powers onto objects and thus can be seen as the (or a) source of power in the world. But they cannot be eliminated in favour of powers, since tropes are *sui generis* entities in their own right.

problem similar to that created by trope aspects? For if the trope is causally efficacious qua the functional role of a mental property, doesn't this violate Closure? And if the trope is only causally efficacious qua the functional role of some physical property, doesn't epiphenomenalism raise its ugly head?

The co-instantiation solution, however, when it is combined with the functionalist framework, offers an escape from this predicament. Consider, for instance, the causal statement 'my desire for wine caused me to go the shop'. Presuming that this is an instance of genuine mental causation, my desire for wine, call that trope M1, is causally efficacious qua the functional role definitive of its being an instance of mental property M, desire for wine. But, given the functionalist analysis, the causal efficacy of M1 will not violate Closure. For this states that the co-instantiation of properties can only occur when the causal powers bestowed by one property instance (in this case, my desiring the wine) are a subset of those bestowed by its 'determinate' instances (which, we are supposing, are physical). So whenever a trope is causally efficacious in virtue of falling under some mental property, this trope is also an instance of some physical property, whose causal powers are necessary and sufficient for an instance of the mental property in question. As a result, if mental properties stand in the relation of determination to physical properties, the causal efficacy of mental properties is ensured without jeopardising Closure. So the functionalist analysis shows us how trope monism can be combined with property dualism, without reintroducing the problem of causal exclusion at the level of trope aspects.

(c) *The Fine-Grainedness Objection*

The fine-grainedness objection is, potentially, the most damaging of all those considered. It seems, as Pettit claims, 'outlandish' to say that the putty falls through the

mesh because of its increase in volume, so how should proponents of the co-instantiation solution respond?

The Macdonalds bite the bullet and accept this ‘outlandish’ conclusion. But they attempt to combat its counter-intuitiveness by invoking Davidson’s distinction between citing a cause and offering a good explanation. They write,

We accept all the apparently counter-intuitive conclusions which pertain to instances, but deny that this tells against our model. The reason is that all of these examples equivocate between concerns about causation and concerns about explanation [1995: 68].

They argue that while it is right to claim that *that* particular instance of increased volume is causally efficacious in the putty case, as instances of this property are not generally causally efficacious for effects of that type, describing the cause as an instance of this property provides a very unhelpful explanation of the effect.

This response, however, does nothing to answer the critic’s claim that the co-instantiation solution gives us the wrong results. If we allow that counterfactuals and laws are at least symptomatic of causal relations, there is nothing to suggest that such a relation does pertain between the increased volume of the putty and its falling through the mesh. So we seem to have a forceful counterexample here. Even if we could somehow convince ourselves, for theoretical reasons, that the putty’s increase in volume was a cause of the putty’s falling through the mesh, still, the co-instantiation solution would be left very vulnerable. For it would be wide open to the complaint that, for all that has been shown, mental (or other N-type) properties are only efficacious in the way that the expansion of volume is in the putty case. In other words, in a way which does not accord at all with our common-sense notions of causal efficacy.

The difficulty that co-instantiators find themselves with is exactly analogous to the one that faces Davidson's anomalous monism. In order to avoid the charge of epiphenomenalism, Davidsonians and co-instantiators could adopt a coarse-grained causal ontology (i.e. either Davidsonian events or property instances that are instances of many different properties). But then we seem to be left with an outlandish causal ontology. Alternatively, Davidsonians could retreat to the claim that properties of events are causally efficacious and co-instantiators could move to the view that property instances qua properties are causally efficacious. But then, as we saw earlier, the exclusion argument can be re-raised for them.

In order to avoid these unappealing horns, co-instantiators should steer clear of the bullet and instead deny that, in the putty case, its expansion is a cause of its falling through the mesh. Given the functionalist framework, two properties can only be co-instantiated if the relation of determination obtains between them. But in the putty case, whilst there may be some intersection between the causal powers bestowed by shape *S* (*S* being the shape of the putty at time *t*) and those bestowed by volume *V* (*V* being the volume of the putty at time *t*), it is implausible to claim that either ones' causal powers are a subset of the others. If we grant that laws and counterfactuals are at least symptomatic of causal relations, *V*'s causal powers are not a subset of *S*'s, because the former has causal powers not possessed by the latter, for example, the power to displace *X* amount of water. Similarly, *S*'s causal powers are not a subset of *V*'s because the volume of the putty, unlike its shape, is not causally efficacious for its falling through the mesh. So there isn't a single trope of the putty that is both a member of the property *S* set and a member of the property *V* set, since two tropes are required to bestow these diverse sets of causal powers onto the putty.

By combining the co-instantiation solution with the metaphysical framework given here, we can stave off the criticism that the solution is committed to an outlandish causal ontology. But the fine-grainedness objection has yet to be buried, as Yablo [1992a] has offered another version, which creates problems for the current proposal. He argues that two properties cannot be co-instantiated in a single instance, even in cases involving determinables and their determinates. For, sometimes, we need to distinguish between cases in which determinables are the causes and cases in which their determinates are the causes. Consequently, if instances of determinables are identified with their determinates, we get a proliferation of unsuitable causes.

To illustrate, consider Yablo's pigeon Sophie. Sophie has been taught to peck at all and only red things, so when a scarlet triangle is presented, Sophie begins to peck. According to Yablo, it is a mistake to think that the triangle's being scarlet is the cause of Sophie's pecking, since this is not proportionate to the effect. Sophie would have pecked if the triangle had been red but not scarlet (if it had been, say, crimson). So it was the redness of the triangle, not its being scarlet, which 'made the difference' and thus was the cause of Sophie's pecking.

This stirs up problems for the proposed analysis. If we stick to our guns and claim that both scarlet and redness cause Sophie's pecking, then we are accused of being committed to a too coarse-grained ontology. But if we concede Yablo's point, and say that Sophie's pecking was caused by the triangle's being red but not by the triangle's being scarlet, it looks like red bestows a causal power that scarlet doesn't, namely, the power to make Sophie peck. So what should be a paradigmatic instance of the determination relation turns out not to be, as redness does not bestow a subset of the causal powers bestowed by its determinates.

This fine-grainedness objection, however, isn't as persuasive as the putty case. While it clearly seems wrong to say that the putty's increased volume is a cause of its falling through the mesh, it doesn't seem so implausible to cite the triangle's being scarlet as a cause of Sophie's pecking. After all, if the triangle's redness is causally efficacious for the pecking, so is its being scarlet, since scarlet is just a way of being red. Yablo doesn't deny this, as he allows that the triangle's being scarlet is causally sufficient for the effect, it's just denied the title of cause [1992a: 273]. So this isn't a forceful counterexample to the co-instantiation thesis.

Can Yablo's case be strengthened by employing his proportionality principle?

He writes,

Nothing causes an effect that leaves out too many relevant factors, or brings in too many irrelevant ones. True causes are...commensurate with their effects [1992b: 404].

Nobody, I suspect, would deny that this is a sound heuristic principle. But it cannot be used to support Yablo's claim that it was only the redness of the triangle that caused Sophie's pecking. If we have an ontology that differentiates between instantiations of scarlet and red, then the latter will be more proportionate to the effect. But this won't be the case if our ontology doesn't recognise such a distinction. This suffices to undermine any appeal to the proportionality principle. For in order to be able to say that the triangle's redness is more proportionate to the effect than its being scarlet, we have to suppose that instantiations of scarlet are distinct from instantiations of redness. But this, of course, is the point at issue.

Yablo may object: the proportionality principle is an argument for an ontology of distinct property instances since, with it, we get causes that are more proportionate to their effects. But it is important to see that this deployment of the proportionality principle is inadmissible. Whilst it is a useful maxim for seeking the cause among a

number of possible alternatives, this is only the case when these possible alternatives are conceived of as *distinct existences*. If we do not think that the entities in question are distinct existences, as in the case of co-instantiated properties, the principle cannot be used to show that one and the same thing isn't the cause. For, ex hypothesi, both are the same, so both are equally proportionate to their effects. So the proportionality principle cannot be used to argue for a particular causal ontology.¹⁰

This leaves us at a standoff. Yablo does not have a strong argument against the claim that properties can be co-instantiated in this case. Moreover, although there are some intuitions on his side, these can be dealt with by appealing to the old Davidsonian move. We can say that although the triangle's being scarlet *is* causally efficacious for Sophie's pecking, this doesn't provide a good *explanation* of the effect. For when we say that 'the triangle's being scarlet caused Sophie's pecking' we imply that the trope was causally efficacious qua its being an instance of scarlet (i.e. qua bestowing one of the causal powers that is unique to scarlet). But, in actual fact, the trope was causally efficacious qua its being an instance of red (i.e. qua bestowing causal powers 1-10).

Saying this does not, as we saw earlier, re-raise the problem of causal exclusion. It does legitimise the question: in this instance of causation, was the trope causally efficacious qua the functional role definitive of its being an instance of the non-physical property N? But we've seen that we can answer yes to this, and so avoid epiphenomenalism, without thereby violating Closure. Consequently, so long as we are careful not to misinterpret this statement, and wrongly say that it is aspects of tropes rather than the tropes themselves that are causally efficacious, we can deal with the intuitions motivating Yablo's objection whilst maintaining the co-instantiation thesis.

¹⁰ This conclusion is a general one. So it is equally inadmissible to use the proportionality principle to argue, for instance, against Davidson's causal ontology.

5. Applications

So far, I have argued that the co-instantiation thesis can be defended against Gibb, Yablo and others. If we adopt a certain metaphysical framework, it is plausible to claim that properties can share instances. So the co-instantiation solution shouldn't be rejected just because it invokes the co-instantiation thesis. But this modest conclusion fails to vindicate the co-instantiation solution. To do this, we would need to show that the relation of determination actually does obtain between the excluding and excluded properties in question.

That this relation obtains in paradigmatic cases of the determinable-determinate relation, such as red and scarlet, seems likely. So here, at least, we have a principled reason for claiming that determinates do not causally exclude their determinables. But such cases, although discussed, have hardly engendered the same interest as that of mental causation, and proponents of the co-instantiation solution have been concerned to solve the problem of property exclusion in this domain. So is there reason to think that mental properties stand in this relation of determination to physical ones?

Unfortunately not. In fact, an argument has been put forward to show that the contrary is true – that mental properties have genuinely novel causal powers not had by their physical realizers.¹¹ To illustrate, suppose that C-fibres firing realizes pain in me, but sleepiness in my dog, whereas D-fibres firing realizes pain in my dog. One evening, I accidentally touch a hot hob and the pain/C-fibres firing causes me to cry out. Concurrently, my dog is also experiencing C-fibres firing, and yawning as a result. But

¹¹ The argument appears in a number of places, for instance, see Noordhof [1997] and Clarke [1999]. Another objection might be that the determination relation could not hold between the mental and the physical since mental properties are functional and physical properties are not. Given that I have been assuming Shoemaker's theory of properties, however, this problem doesn't arise.

if he had been in pain, he would have howled, so pain, unlike C-fibres firing, does cause him to cry out. This case is problematic not because C-fibres firing bestows causal powers not associated with pain, i.e. in this case, the causal power to make dogs sleepy; but because pain seems to have a causal power that C-fibres firing doesn't, namely, the power to make my dog howl. If this is right, then the causal powers bestowed by pain are not a subset of those bestowed by its physical realizers. So these properties are not co-instantiated, contra the co-instantiation solution.

One possible way of dealing with this problem is to avail ourselves of Shoemaker's [1981] distinction between core and total realizers. In our example, the core realizer of pain in me is the property of having C-fibres firing. But this differs from the total realizer – the property of being physically constituted in such a way that C-fibres firing plays the causal role definitive of pain. Perhaps, then, if we say that the relevant physical properties are the total realizers instead of the core, we can hang onto the claim that pain bestows a subset of causal powers bestowed by a set of physical properties. For we can say that if the total realizer had been instantiated by a dog, then this property would have caused him to howl, since had he instantiated the total realizer, he would have been physically constituted in such a way that C-fibres firing would have caused his howling. So the physical total realizer does have the causal power to make my dog howl.

This response, however, seems both unpersuasive and ad hoc. Whilst it is no doubt true to say that, in the right circumstances, if the total realizer had been instantiated by my dog, then he would have howled, this does not establish that, in the actual world, the total realizer has the causal power to make my dog howl. It may, for instance, be nomologically impossible for the properties of C-fibres firing to realize the

pain role in dogs. So, granted such a scenario, claiming that this total realizer has the power to make my dog howl in this world, smacks of desperation.

It is perhaps better, then, to simply concede the point. The relation between mental and physical properties isn't like that which pertains between determinables and their determinates because, unlike red, mental properties do bestow genuinely novel causal powers.¹² I am sympathetic to this view, and think that the success of the co-instantiation solution to the problem of causal exclusion needs to be judged on a case-by-case basis. But if this argument succeeds, it looks like it might also cut against cases where, *prima facie* at least, it seems reasonable to say that co-instantiation occurs. Consider the property of being poisonous. This can be realized by the property of being arsenic, which causes severe damage to the nervous systems of humans. But the property of being arsenic, we can suppose, has no damaging effects at all on Martians. So, once again, it looks like the property of being poisonous bestows a causal power that arsenic doesn't, namely, the power to do harm to Martians.

What seems striking about this case, however, isn't that being poisonous has novel causal powers not bestowed by a number of other properties, such as being arsenic, being cyanide, etc. But rather that the causal powers definitive of being poisonous are broader and less specific than those associated with arsenic, cyanide etc. For instance, while a poisonous substance has the causal power to injure or kill a living organism when absorbed by them, being arsenic has the power to cause damage to the

¹² An alternative would be to endorse Kim's move and argue that pain is C-fibres firing in humans and D-fibres firing in dogs. This would be to abandon the idea that there is a mental property of pain. What we would have instead is the property of pain-in-humans and the property of pain-in-dogs. This solution might be acceptable – perhaps pain-in-humans has a very different quality than pain-in-dogs and thus warrants the ascription of different mental properties. If this is the case, we needn't accept the claim that, in the example above, the property of pain-in-humans has different causal powers than that had by its specific realizers, and so the co-instantiation solution could still go through. My aim here isn't to decide the matter either way, but rather to flag up the sorts of issues that would need to be addressed if this solution to the problem of mental causation is to be successful.

nervous systems of mammals, being cyanide has the power to damage the heart and lungs of mammals, etc. In response to the argument in the case of being poisonous then, we can say that an instance of being poisonous does bestow a subset of causal powers associated with a number of other properties. But for these other properties to overlap upon a common set of causal powers, these causal powers have to be construed broadly. So, for instance, although arsenic damages the nervous system of mammals and cyanide harms their heart and lungs, they can still be thought of as sharing a causal power, namely, that of being able to injure or kill mammals.

The idea, then, is that in cases such as being poisonous, we can abstract away from the more detailed descriptions we could give of the causal powers definitive of its realizers, to reveal a set of causal powers which is genuinely shared by all its determining properties. Given a property which is far from perfectly sparse, the shared subset of causal powers may be very general and non-specific indeed. But this is what we should expect if we are going to maintain that two particulars which instantiate the same property, such as being poisonous, exactly resemble each other in some respect. For not all the substances which instantiate this property have the power to damage nervous systems or hearts, so these causal powers are not definitive of being poisonous. But whilst the criterion of identity for this property, a unifying entity, abstracts away from differences across objects, times and places, the same is not true of its instances. For an instance of being poisonous is always instantiated in some, very particular, way. So the causal powers that property bestows also become manifested in specific ways.

The claim that properties such as being poisonous and being arsenic are co-instantiated, therefore, is defensible, since the argument fails to show that the causal powers definitive of being poisonous are not a subset of arsenic's. But whether this claim could be established for the more interesting case of mental properties seems

more doubtful. For we would need to show that all the core realizers of pain overlap upon a set of causal powers that is both necessary and sufficient for an instance of pain (although these causal powers, as in the case of being poisonous, could be broadly construed).

Despite failing to vindicate the co-instantiation solution to the problem of mental causation, however, some progress has nevertheless been made. Given the right metaphysical framework, the co-instantiation thesis is defensible. So at least the way is cleared for some applications of the co-instantiation solution to the problems of causal exclusion. What we are left with then, is this, admittedly rather modest, conditional conclusion: if non-physical properties of type N (be those mental, geographical, biological, etc.) stand in the relation of determination to physical properties, then their non-physical tropes are straightforwardly causally efficacious entities, in the most robust sense.¹³

References

- Armstrong, D. M. 1989. *Universals: An Opinionated Introduction*, Colorado: Westview Press.
- Armstrong, D. M. 1997. *A World of States of Affairs*, Cambridge: Cambridge University Press.
- Block, Ned 1995. Reply: Causation and Two Kinds of Laws, in *Philosophy of Psychology: Debates on Psychological Explanation*, ed. C. Macdonald and D. Macdonald, Oxford: Blackwell: 78-83.
- Clapp, Lenny 2001. Disjunctive Properties: Multiple Realizations, *The Journal of Philosophy*, 98: 111-136.

¹³ Many thanks to Mike Martin, Paul Noordhof, Keith Allen, Joel Smith and the anonymous referees for *The Australasian Journal of Philosophy*. I wrote this paper during my Jacobsen Fellowship at the University of London. I am deeply indebted for all the help and support offered by members of that institution.

- Clarke, Randolph 1999. Nonreductive Physicalism and the Causal Powers of the Mental, *Erkenntnis*, 51: 259-322.
- Davidson, Donald 1980 (1967). Causal Relations, in his *Essays on Actions and Events*, Oxford: Clarendon Press: 149-162.
- Ehring, Douglas 1996. Mental Causation, Determinables and Property Instances, *Nous*, 30: 461-480.
- Ehring, Douglas 1999. Tropeless in Seattle: The cure for insomnia, *Analysis*, 59: 19-24.
- Gibb, S. 2004. The Problem of Mental Causation and the Nature of Properties, *Australasian Journal of Philosophy*, 82: 464-476.
- Honderich, Ted 1982. The Argument for Anomalous Monism, *Analysis*, 16: 59-64.
- Johnson, W. E. 1921. *Logic: Part I*, Cambridge: Cambridge University Press.
- Kim, Jaegwon 2003. Blocking Causal Drainage and Other Maintenance Chores with Mental Causation, *Philosophy and Phenomenological Research*, 67: 151-176.
- Lewis, David 1999 (1983). New Work for a Theory of Universals, in his *Papers in Metaphysics and Epistemology*, Cambridge: Cambridge University Press: 8-55.
- Macdonald, Cynthia and Macdonald, Graham 1995. How To Be Psychologically Relevant, in *Philosophy of Psychology: Debates on Psychological Explanation*, ed. C. Macdonald and D. Macdonald, Oxford: Blackwell: 60-77.
- Noordhof, Paul 1997. Making Change the Functionalist's Way, *British Journal of the Philosophy of Science*, 48: 233-250.
- Noordhof, Paul 1998. Do Tropes Resolve the Problem of Mental Causation? *The Philosophical Quarterly*, 48: 221-226.
- Pettit, Phillip 1992. The Nature of Naturalism, *Proceedings of the Aristotelian Society*, 66: 245- 266.
- Robb, David 1997. The Properties of Mental Causation, *The Philosophical Quarterly*, 47: 178-194.
- Shoemaker, Sydney 1984 (1981). Some Varieties of Functionalism, in his *Identity, Cause and Mind*, Cambridge: Cambridge University Press: 261-286.
- Shoemaker, Sydney 2001 (2000). Realization and Mental Causation, in *Physicalism and its Discontents*, ed. C. Gillett and B. Loewer, Cambridge: Cambridge University Press: 74-98.
- Williams, Donald C. 1997 (1953). On the Elements of Being, in *Properties*, ed. D. Mellor and A. Oliver, Oxford: Oxford University Press: 112-124.
- Worley, Sara 1997. Determination and Mental Causation, *Erkenntnis*, 46: 281-304.
- Yablo, Stephen 1992a. Mental Causation, *Philosophical Review*, 101: 245-280.
- Yablo, Stephen 1992b. Cause and Essence, *Synthese*, 93: 403-449.