

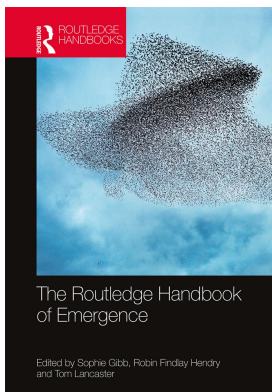
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EMERGENCE AND
NON-REDUCTIVE PHYSICALISM*Cynthia Macdonald and Graham Macdonald*

Non-reductive physicalism is the view that although all empirical entities and phenomena are physical, mental properties or kinds are irreducibly distinct from physical ones. Early contemporary versions of physicalism (such as those endorsed by brain state theorists J.J.C. Smart (1959) and Herbert Feigl (1958)) were committed to the identity of mental properties or kinds with physical ones. Such type–type identity was taken to be the earmark of reductive physicalism. The phenomenon of multiple realizability of mental properties or kinds by physical ones – the thesis, made famous by Hilary Putnam (1967), that one and the same mental property or kind may be realized in the same or in different organisms by not one but rather many distinct physical properties or kinds – was one of the early motivations for non-reductive physicalism (Putnam (1967); J. Fodor (1974)). Other proponents of physicalism were struck not only by the multiple realizability of mental properties or types but, importantly, also by the intentional nature of mental phenomena, which seemed to them to have no place in physical theory, but who, for this reason, were inclined to be eliminativist about the mental (cf. W.V.O. Quine (1960); P. Feyerabend (1963)). For present purposes this entry will focus on the version of non-reductive physicalism that has its source in the seminal work of Donald Davidson (1970) and Jerry Fodor (1974). Davidson focused attention on the phenomenon of intentionality, which he considered to be constitutive of the mental domain. He argued for a position he termed ‘anomalous monism’ – ‘anomalous’ because according to it mental events do not fall under universal, exceptionless psychophysical or psychological laws, and ‘monism’ because such events are nevertheless held to be identical with physical ones. The monism argued for is a physical monism because mental/physical events *do* fall under universal, exceptionless physical laws governing their causal interactions with physical events. Fodor’s emphasis was on the taxonomic divergence between upper-level sciences and physics: money, for example, has no corresponding physical kind, given that monetary tokens are constituted from diverse physical items (e.g., gold, silver, paper, etc.). Both variants of the view combine token physicalism (the view that each individual mental event or phenomenon is identical with a physical one) with type or kind distinctness. Subsequent discussions of the position typically formulate the type distinctness claim in terms of properties, although Davidson himself was never comfortable with property talk.

Because non-reductive physicalism (hereafter, NRP) is a nonreductive position in the philosophy of mind, questions have arisen as to how it can legitimately claim to be a form of physicalism and how it can preserve genuine causal efficacy of the mental in the light of several theses

to which physicalism seems committed. Specifically, physicalism is deemed to be committed to the theses that (1) if physical effects have causes, they have sufficient physical causes (sometimes referred to as the closure principle, or *Closure*) and (2) there is no systematic overdetermination of physical events by events distinct from and independent of them (sometimes known as *Exclusion*). Some have claimed that the irreducible distinctness of mental properties or kinds from physical ones is incompatible with a genuine physicalist monism, since the latter is committed to the thesis that everything – mental properties included – is, at root, physical. Others have claimed that NRP only awards physical causal powers to mental events, those that are sanctioned by the causal laws that govern the physical events with which mental events are identical, and that, as a result, the causal powers that make mental events *mental* can make no causal difference to the world. (This charge has taken two forms: one in the charge that mental events are causally inefficacious, and another, more challenging one in the charge that mental events are not causally potent *in virtue of* their mental properties – or *qua* mental – often referred to as the *qua* problem or the problem of the causal relevance of the mental.) Attempts to resolve the tension inherent in the position between its commitment to irreducibility, physicalism, and genuine causal efficacy of the mental has led to recent interest in doctrines of emergence in the philosophy of mind.

This entry begins by setting out the main objections to NRP formulated in terms of the combination of a token identity and a type distinctness claim, and some attempts that have been made by proponents of the position to refute these objections by developing the metaphysics of the view. Dissatisfaction with two well-known attempts to develop the metaphysics in a way that satisfactorily addresses these objections has motivated weaker forms of NRP which do not commit to a token identity thesis but rely instead on a notion of physical realization. Although the weaker forms of NRP do not suffer from problems stemming from commitment to token identity, they are no less vulnerable than are the stronger versions of NRP to the charge that they either lead to reduction or to the causal impotence of the mental. Because all forms of NRP are committed to reconciling non-reducibility of the mental with a broadly physicalist world view, abandoning non-reducibility is not an option for its proponents. It is this refusal to abandon non-reducibility in the face of the ‘reduction or causal impotence’ charge that has shaped recent interest in emergentism.

1. NRP, token identity, and metaphysics

Davidson’s original position had two notable features: it presumed, first, that events are ‘unstructured particulars’, individuals with no essential intrinsic properties, whose identity conditions consist in their causal relations to other individuals of the same kind and nothing more, and second, that the position could be supplemented by a doctrine of supervenience, roughly specified as ‘there can be no mental difference without a physical difference’, or ‘sameness with respect to the physical guarantees sameness with respect to the mental’, as a way of attempting to capture a suitable relation between mental and physical types. Subsequent defences of NRP focussed on both of these features, attempting to resolve the tension inherent in the position by supplying a metaphysics of events and an appropriate doctrine of supervenience strong enough to ward off the charge that mental properties ‘float free’ from physical ones but weak enough to ensure non-reducibility. Development of a metaphysics of events was designed to help de-fuse the objection that the only causal powers that mental events could exercise in the physical world are the physical ones that they have by virtue of being identical with physical events governed by physical laws. And development of an appropriate doctrine of supervenience was designed to help de-fuse the objection that a world in which irreducible mental properties ‘float free’ from all physical ones is not a world in which physicalism could be true.

Two main metaphysical theories of events emerged as ones favoured for resolving the causal tension inherent in NRP: one was anchored in what is known as the Property Exemplification Account (or PEA), a position pioneered by Jaegwon Kim (1976), and the other was anchored in a trope view of events whose origins stem from the work of D.C. Williams (1966). According to the former, events are exemplifications of act-or event-properties at (or during intervals) of times in objects, where properties are understood as universals, entities capable of multiple exemplification in many entities at the same and at different times. They can be represented schematically in terms of structures of the form '[x, P, t]' (known as their canonical descriptions), where $x, P,$ and t are variables ranging over objects, properties, and times, respectively, and two conditions govern them, an existence condition and an identity condition, specified thus:

- Existence Condition: Event [x, P, t] exists if and only if the object x has property P at time t .
Identity Condition: Event [x, P, t] is identical with event [y, Q, t'] if and only if $x = y, P = Q,$ and $t = t'$.

According to Kim (1976), mental properties are constitutive properties of mental events. As a result, in Kim's view the property identity requirement on mental and physical events conflicts with the irreducibility thesis of NRP and so with NRP itself.¹

Those who have made use of the PEA developed it differently from Kim but consistently with the two noted conditions. Specifically, Kim made two important but contestable assumptions that are not part of the core commitments of the PEA. The first is that (monadic) events have just one constitutive property, and the second is that the mental properties of mental events are constitutive properties of them. The first is rejected by, for example, Lawrence Lombard's (1986) theory of events, which takes events to be the exemplifying of first one, than another, of a pair of incompatible properties in the same 'quality space' at or during intervals of times. And both the first and the second are rejected by Cynthia and Graham Macdonald (1989, 1995, 2006), who maintain that mental properties are not constitutive properties of mental events, but rather supervene on physical properties that are constitutive properties of those events and are co-instantiated with them (i.e., there is a single instancing or exemplifying of two properties, one lower level and the other – mental – one higher level). It is this departure, they maintain, that makes possible the combination of the PEA with a token identity thesis.

The second departure from Kim's way of developing the account is one that can be appealed to not only by those who rely on the PEA metaphysics of events but also, in a slightly different way, by those who subscribe to a trope metaphysics of events in order to resolve the causal tension inherent in NRP and, more specifically, to resolve the threat of epiphenomenalism. According to one well-known version of trope metaphysics, known as the Classic Account, tropes, or 'particularized' properties or qualities, such as this particular whiteness of this white cup, or this particular weight of this particular apple, are the foundations of all things – ordinary particular things and phenomena as well as properties understood as types that may be possessed by many different particulars. Individual objects such as the white cup sitting on my desk are bundles of compresent tropes. And events, in this account, are either tropes or bundles of compresent tropes. Property types are derivative entities whose natures are both dependent on and individuated as the types of properties they are by the tropes that fall under them. In this account, property types are classes of exactly resembling tropes. Physical ones are classes of exactly resembling physical tropes. Mental ones are higher-level properties: they are classes whose members are physical tropes that fall into them in virtue of falling into distinct, lower-level classes of exactly resembling physical tropes. Given that NRP is committed to the multiple realizability of mental types (in this context, the thesis that different members of a given class of mental tropes may fall into many wholly distinct

classes of exactly resembling physical tropes), the class of mental tropes has as members physical tropes that are not exactly resembling.

Two charges have repeatedly been voiced against both ways of developing the metaphysics of the version of NRP committed to token identity. One is that NRP leads to causal impotence of the mental. The other is that the position is inconsistent.

Consider the first charge. According to both metaphysical accounts, there is a distinction to be drawn between mental tokens and mental types or properties. And, according to both, mental tokens are the primary bearers of causal efficacy. One, weaker, version of the causal impotence charge is that mental events are not causally efficacious. This version of the charge can be addressed by both types of metaphysics. Epiphenomenalism is avoided by the adoption of an additional commitment, and this is to a version of what is known as the Co-instantiation Thesis (Macdonald and Macdonald 1986, 1995; Whittle 2007). The claim by the proponent of the PEA is that two properties, one mental and one physical, can be co-instantiated in a *single* instance, that is, that there can be just one instancing of two distinct properties. Examples where this seems most plausible are cases of determinates and their associated determinables. A scarlet cardinal bird is both an instance of the determinate colour scarlet and an instance of the determinable red, but it would be very implausible to suppose that these are distinct instances in the cardinal. In instancing scarlet, the cardinal just does instance red. On the version of the PEA developed by those such as the Macdonalds (1995, 2006), mental properties are higher-level properties whose instantings just are (i.e. are identical with) instantings of lower-level, physical properties that are constitutive of events. It is in virtue of the Co-instantiation Thesis that the token identity claim is true. In a similar vein, the proponent of the trope account will claim that the token identity claim just is the claim that mental tropes and physical tropes are identical (irrespective of whether events are tropes or whether events are bundles of tropes). Since tropes themselves are particularized properties, the Co-instantiation Thesis amounts to the claim that one and the same trope is both a mental trope and a physical trope (i.e., there is just one trope), and that one trope falls into two classes, a class of physical tropes, and a higher-level class, a class of mental tropes (cf. Whittle 2007).

This may satisfactorily address the causal efficacy charge at the level of events. However, a stronger version of the causal impotence objection remains, one which questions whether either metaphysics can award mental events causal efficacy *in virtue of* being mental (the *qua* problem). On both accounts, mental events are deemed capable of bringing about physical effects because they are identical with physical events that cause those effects. This is essential to the NRP position under discussion because it is a form of physicalism, and physicalism is deemed to be committed to (1) *Closure* and (2) *Exclusion*. The charge is that neither the PEA nor the trope view can account for a mental event's being causally effective in virtue of its mental properties. On the PEA, it is claimed that the identity of property instantings combined with (1) and (2) has the consequence that it is in virtue of being instantings of physical properties that mental events are causally effective. With the trope account as developed earlier, the claim is that it is only in virtue of falling into physical classes that mental tropes are causally effective given (1) and (2). If this criticism succeeds, it pushes the proponent of NRP toward one of two positions: either mental properties are, *qua* mental, causally impotent (risking sacrificing non-reduction), or the causal powers of mental properties are more independent of the causal powers of physical ones than supervenience allows (suggesting an emergentist position similar to that of C.D. Broad (1925) and J.S. Mill (1843)).

Both charges have been responded to by proponents of these accounts. Those who favour the PEA argue that causal potency of mental properties is secured by virtue of a combination of Co-instantiation and two further theses concerning property relations: one a supervenience thesis

that relates higher-level mental properties to the physical properties that they supervene on and with which mental property instances are co-instantiated, and a dependency thesis according to which a higher-level property can be instanced just by instancing a lower-level property on which it supervenes and which realizes it (this is the intuition underlying the determinate–determinable relation, but in more general form) (Macdonald and Macdonald 2006). Given that supervenience is not a reductive relation between properties but permits multiple realizability of the higher-level by lower-level subvening ones, mental explanations are distinctive causal explanations because they invoke distinctive causal patterns of relations between mental properties that mis-match the patterns of relations of physical properties on which they supervene and depend. As a result, although it is true that mental events are causally effective in virtue of their physical properties, they are not causally effective *only* in virtue of their physical properties. This is not to say that mental properties contribute causal powers to the events that have them that no physical property has, for that would be a breach of *Closure*. It is to say that mental/physical events fall into at least *two* patterns of causal relations, one of which does not reduce to the other, because the causal powers of mental properties do not match the causal powers of any lower-level, physical property (some, e.g., Macdonald and Macdonald (2010), claim that this is a form of ‘weak’ emergence).

Those who favour the trope account argue that mental and physical tropes are causally effective in virtue of being the tropes they are, not in virtue of falling into the classes they do. Because classes are dependent on tropes, no trope is causally effective in virtue of falling into any class. However, even if this is correct, it doesn’t follow that there isn’t a *qua* problem that arises at the level of tropes. For any given mental/physical trope, we can ask, in virtue of what does that trope have the effects it does? Suppose that mental event trope M1, which is identical with physical event trope P1, causes physical effect trope B1. We can ask, is it in virtue of event M1/P1’s being an M1-ing that it causes B1, or is it in virtue of event M1/P1’s being a P1-ing that it causes B1? And that just is the *qua* problem analogue for tropes. If, in order to respect *Closure* and *Exclusion*, we must answer that it is in virtue of M1/P1’s being a P1-ing, then it seems we must conclude that that trope is not causally effective *qua* mental.

Some trope theorists (e.g., Robb 2013; Heil and Robb 2003) respond by saying that tropes are not entities that *have* causal powers; a fortiori they are not entities that cause in virtue of being entities that have mental powers or physical powers. So it is a mistake to think that being an M1-ing (/being a P1-ing) is a property in virtue of which event trope M1/P1 causes effect trope B1. Rather, tropes *are* (identical with) powers: event trope M1/P1 just is an M1/P1 power, and it causes what it does in virtue of being *that* power. *Qua* questions are illegitimate here because powers do not have higher-level properties. However, if this resolves any residual *qua* problem, it seems to do so by identifying mental with physical powers and ruling out as illegitimate any features or respects in virtue of which they are capable of discharging their powers, thereby eliminating whatever difference mental powers can make to the world that physical ones do not.

The second primary objection that has been voiced against the two main ways of developing the metaphysics of NRP committed to token identity is that they are inconsistent. Specifically, it has been claimed that the commitment to a version of the Co-instantiation Thesis that lies at the heart of both the PEA and the trope metaphysics is incompatible with the non-reductive commitment of NRP. If this objection succeeds, non-reductive physicalists of this kind are faced with a dilemma; in order to be consistent, they must either abandon irreducible distinctness of mental and physical types, or they must abandon token identity. Either spells the death of the position.

Consider first the PEA. Given that NRP’s need to avoid the consequence that mental properties ‘float free’ from physical ones and so to at least some kind of supervenience thesis relating the physical, realizing, properties to the mental, realized ones, commitment to token identity seems to carry with it commitment to something like the Causal Inheritance Principle (Kim 1993a),

according to which each instance of a mental property that supervenes on and is realized by some physical property or properties has the same causal powers as the physical instance with which that mental instance is identical. That is to say, instances of realized mental properties inherit all of the causal powers of instances of physical properties that realize them and with which they are identical. Kim's version of this principle originally understood it as stating that instances of mental properties inherit all of the causal powers of *all* of the physical instances that might realize them (call this 'full causal inheritance'). And he took this to lead to a problematic kind of overdetermination of causal powers by mental properties that threatens and undermines the non-reductive part of NRP.

Proponents of the version of NRP who commit to the PEA and Co-instantiation Thesis might attempt to rescue the position from the threat of reduction by insisting that mental properties are multiply realizable, mis-matching with all of their actual and possible physical realizers precisely because mental properties themselves bear distinctive causal potentialities to one another – ones that are not and cannot be echoed in the patterns of causal potentialities their physical realizers bear to one another. One such pattern of causal potentialities is what one might call the 'rational' one; events that are instantiations of mental properties such as intentional ones (e.g., believes that *p*, desires that *q*, for some propositional contents *p*, *q*) do not just cause other instantiations of mental properties and intentional behaviour. They make their effects intelligible in ways other than in terms of mere instances of regular, causal-cum-statistical nomological patterns. But if this is correct, mental and physical properties are irreducible not simply because they are *different* types of properties; they are irreducible because they are *incompatible* properties. And now the threat to the position is that if such properties are indeed incompatible with one another, the Co-instantiation Thesis cannot be true; mental and physical properties could not be co-instantiated in a *single* instance (Schneider 2012). (A different but related objection argues that although the Causal Inheritance Principle is true, it can be respected by what is known as the powers-based subset account of the relation between mental properties and their physical realizers, a view to which we return in Section 2). According to this, mental properties do indeed have causal powers that are different and distinctive, since each mental property has causal powers that are a proper subset of the causal powers of each and every one of the physical properties that might realize it. So mental properties are irreducible to their physical realizers. But precisely because of this, co-instantiation is ruled out; mental properties and their physical realizers cannot be co-instantiated in a single instance because the physical realizers have more causal powers than any mental realized property, powers which the mental instance would also need to have if it were to be co-instantiated with its physical realizer (Shoemaker 2001; Wilson 2011).

The trope account, inasmuch as it is a version of NRP, suffers from a similar charge, since according to it mental and physical types are held to be irreducibly distinct compatibly with trope identity and so with a version of the Co-instantiation Thesis. According to the Classic account, types are classes of exactly resembling tropes. So a given mental type, say, excitement, if it is to be a genuine type, must be a class of exactly resembling physical tropes (for recall that mental types are higher-level classes whose members fall into them in virtue of falling into lower-level classes of physical tropes). But then, the argument goes, given that mental types are classes of exactly resembling physical tropes, mental types must be physical types (Gibb 2004). The only way to avoid this consequence would be to insist that because of multiple realizability, the physical tropes that fall into a given mental class are not exactly resembling. However, this now looks incompatible with trope identity. For it seems to have the consequence that one and the same trope, in being both fully mental and fully physical, both *does* exactly resemble certain other physical tropes and *does not* exactly resemble those same physical tropes.

2. From realization physicalism to emergence

Many proponents of a weaker form of NRP focus on the realization relation between mental and physical properties and their instances. Sydney Shoemaker tells us that to be realized is to be made real 'in a sense that is constitutive rather than causal' (2007: 10). Realization physicalism is the view that every property either is a physical property or is realized by a physical property; in the case of NRP the claim is that mental properties are realized by physical properties. Proponents of the position are motivated by a desire to formulate a version of NRP that (1) respects multiple realizability, (2) ensures non-reducibility of mental to physical properties, and (3) awards genuine causal potency to mental (and more generally, to higher-level) properties. Although there are a number of versions of realization physicalism (Poland 1994; Kim 1998;² Levine 2001; Melnyk 2006), our focus will be on a very influential and well-known one: the powers-based subset view of the relation between higher-level properties and their lower-level realizers.

In a number of seminal works, Shoemaker (2001, 2007) and Jessica Wilson (1999, 2011) (see also Clapp 2001; Watkins 2002) have argued that the most effective way for NRP to view the relation between mental and physical properties is to view mental properties as realized by physical ones and to understand realization in terms of an inclusion relation between sets of causal powers of the properties that have them. Mental properties are thus construed as having causal powers that are proper subsets of the sets of causal powers of the physical properties that realize them. Both Shoemaker and Wilson treat the determinable/determinate relation as a case of realization more generally. If, they argue, the conditional causal powers (hereafter, simply causal powers) of any determinable property are a proper subset of the causal powers of any of its determinates, the determinable will bestow *different* causal powers from those bestowed by any such determinate, and this distinctive causal profile is thought to be sufficient to ward off threats of overdetermination.

Wilson and Shoemaker hold that the subset view is incompatible with the Co-instantiation Thesis and so with token identity, remarking that where properties have different causal powers, so, too, do their instances. The subset relation thus holds not just between the causal powers of higher-level properties and those of the lower-level ones that realize them, but it also holds between the causal powers of instances of higher-level properties and the causal powers of instances of their lower-level realizers. This is one way in which subset realization is viewed as differing from the stronger version of NRP. Shoemaker suggests that instances of mental properties are parts of instances of physical ones, which is a kind of mereological view of the relation between them (see also Gillett 2006; Pettit 1993, 2007). Wilson prefers instead to view the relation between the mental and physical instances as non-mereological; mental property instances are realized by physical property instances.³

Because the subset strategy takes the causal powers of mental properties to be proper subsets of the causal powers of physical ones, proponents do not subscribe to Kim's version of the causal inheritance principle (noted in Section 1), according to which instances of mental properties inherit *all* of the causal powers of the instances of physical properties that realize them and with which they are identical. This we earlier called 'full causal inheritance'. They do, however, subscribe to a weaker version of that principle which we might call 'partial causal inheritance'. According to this, instances of mental properties inherit some, but not all, of the causal powers of the instances of physical properties that realize them.

Subset realization physicalism is intended to meet all of (1)–(3) above in the following way. (1) Since the causal powers of any higher-level property form a proper subset of the powers of properties that realize them, all realizers have those powers. But they also have additional powers, and each such realizer has powers that individuate it from other realizers sharing the same subset

of powers that individuate the higher-level, realized property. For example, every determinate of the colour property red has the causal powers of red. But scarlet has further, additional powers, ones that distinguish it from red and from other determinates of red, such as burgundy. Multiple realizability is a matter of lower-level properties having all the causal powers of their higher-level realized one plus additional ones not possessed by the higher-level, realized property. (2) Since the causal powers of realized properties form proper *subsets* of the sets of causal powers individuating any realizer property, no realized property (mental properties included) can be identified with any realizer property, and so, it is argued, the threat of reducibility is avoided. (3) Genuine causal potency is awarded to higher-level, realized mental properties, since the causal profile of such a property is distinct from that of any of its realizing properties. Moreover, proponents argue that there are cases where we can see that the higher-level property is implicated as cause of a given effect where no lower-level realizing property is sufficient. This can be illustrated with the following, well-worn example.

Consider two pigeons, Sophie and Alice, trained to peck at certain coloured patches. Sophie is trained to peck at red patches but not at patches of any colour other than red. Alice, on the other hand, is trained to peck at scarlet patches, but not at patches of any other shade of red. Suppose now, on a particular occasion, Sophie is presented with a scarlet patch and she pecks. Which of the two properties, red or scarlet, is the causally relevant one, the one whose instancing is causally responsible for Sophie's pecking? Shoemaker and other proponents of the subset view argue that it is the determinable, red, that is the causally relevant one in this case. Indeed, Shoemaker (2001: 31) takes difference-making considerations to show not only that red is the causally relevant property but that the *instance* of red, *rather than* the *instance* of scarlet, is the cause of Sophie's pecking:

Red is the difference-maker here because, had Sophie been presented with patch of any other shade of red, say, burgundy, she still would have pecked. Alice, on the other hand, who pecks at the scarlet patch, would not have pecked at any patch presented to her of any other shade of red, so in her case scarlet, not red, is the difference-maker.⁴

The view that instances of realized properties are distinct from, but are realized by or are parts of, instances of realizing ones is difficult to sustain even in the relatively benign case of determinables and their determinates: having *distinct* instances of scarlet and red when scarlet is instantiated is metaphysically puzzling. More to the point, to attribute causal potency to the higher-level (determinable) property instance and not to the lower-level realizer instance (as Shoemaker and Yablo do), while looking plausible in the case of Sophie's pecking at all and only red instances, proves to be problematic in the context of NRP (cf. Wilson 2011). As we have noted, the proponents of the subset view share with other proponents of NRP a commitment to both the non-reducibility and the causal potency (autonomy) of mental properties. But recall that there are two further conditions imposed by physicalism: *Closure* and *Exclusion*. And these cause trouble for the subset view in the case of mental realization.

The problem can be put in the form of a dilemma. If the mental part (in Shoemaker's terms) of a physical instance is, by virtue of being an instance of a mental property, a *non-physical* part of the physical instance that realizes it, denying co-instantiation in order to rescue distinctive causal relevance of the mental properties has the consequence that it is the non-physical part of the physical property instance that is causally effective in bringing about the effect it does. Where that effect is physical (where there is 'downward causation'), there is a breach of *Closure*, given no systematic overdetermination (*Exclusion*). And this is a breach of the physicalist commitments of NRP. With *Exclusion* and *Closure* in place, the non-physical part of the physical property instance

cannot be the causally effective one. The mental property instance is thus causally inefficacious. There is also the additional problem of seeing how an instance of a physical property can be physical if it has a non-physical part, and correspondingly, how a physical property can have causal powers that include as subsets the causal powers of a non-physical one without compromising its physicality.

Of course, nothing in the subset view prohibits construing the proper subsets of the causal powers of physical properties as themselves physical (likewise for causal powers of instances), leaving it open to the proponent of the subset view to maintain that instances of realized mental properties are themselves physical parts of instances of their realizers. But – and this is the other horn of the dilemma – it is hard to see how treating the causal powers of mental properties as themselves physical – and correspondingly treating instances of mental properties as physical parts of physical property instances – can offer any solution to the problem of mental causation for subset theorists. To do is simply to retreat to reductionism of a different form than that originally envisaged by type–type identity theorists.

Further consideration signals a deeper alignment with traditional type–type physicalist theories. On the subset view the causal powers of the higher-level, multiply realized property are included in of every one of its realizing properties' causal powers. On the present assumption we are treating these subsets of the causal powers of realizer properties as physical, which means that amongst the diverse realizers there are some causal powers of realized and realizer that are numerically identical with each other – those realizing the causal powers of the higher-level property. Given this identity, it is difficult to see why what the realized and realizer properties have in common is not itself physical. On the subset view, the mental property cannot be identical with any of the realizing physical properties, but that does not show that it cannot be identical to some other, non-realizing, physical property. The identity of (some of the) causal powers shared by the realizers with all of those of the realized property suggests that there is such a physical property, having just those causal powers, with which to identify the mental property. (See Morris (2011) for an in-depth discussion of this difficulty for subset theory.) This undermines the point of appealing to NRP as a metaphysics of mind that reconciles the causal autonomy of the mental and with it psychology as a special science with a unified, naturalistic view of mental causation in a physical world (see Kim (2010) for similar remarks). Effectively, it sacrifices non-reduction.

The difficulties encountered in formulating and defending a coherent version of NRP has prompted some to opt for different strategies, either choosing reduction (cf. Kim 1998) or sacrificing one or more of the commitments that have been the source of NRP's problems. The major tensions in both of the versions of NRP discussed in this entry are induced by the desire to maintain causal autonomy for the mental while respecting key elements of physicalism, especially the commitment to *Closure* and *Exclusion*, and with this the commitment to the causal inheritance principle. Proponents of NRP have claimed that their position is a form of weak emergence, so called because it is committed to either partial or full causal inheritance while still permitting a higher-level (e.g. mental) property to have a distinctive causal profile (Macdonald and Macdonald (2010); Wilson (2015)). The higher-level property inherits its causal powers from those of its realizing (physical) properties while having a distinctive causal profile (i.e., not having exactly the same powers as any particular physical property). Those who think this to be an unstable position and who are averse to reduction opt for a stronger form of emergence of the sort favoured by Broad (1925) and Mill (1843), one which rejects any form of causal inheritance and which gives to the higher-level property causal powers not possessed by any physical property. This rejection of causal inheritance also leads to the rejection of *Closure*.⁵

Notes

- 1 Note that Kim subsequently abandoned this commitment (1993b, 1998).
- 2 Note that Kim's version does not reject token identity.
- 3 Although Yablo (1992) does not explicitly endorse the subset view, he takes the realization relation to be the same as the determination relation, and he also maintains that where properties related as determinable to determinate are instantiated, their instances are not identical (hence that the Co-instantiation Thesis is false). Since he takes mental and physical properties to be related as determinables to determinates, he rejects token identity for mental and physical events. For someone who rejects the view that determination is the same relation as that of realization and who endorses co-instantiation for determination but not for realization, see Funkhouser (2014). Effectively, he sides with Yablo, Shoemaker, and Wilson on whether the Co-instantiation Thesis is true in the psychophysical case.
- 4 The main idea in a difference-making account of causation is that if we manipulate the values of the one variable and find that this is accompanied by systematic changes in the values of the second variable, then we can take it that there is a causal relation between the values of the variables. See List and Menzies (2009) for further details.
- 5 See Jessica Wilson (2015) for a thorough survey of the various options.

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