**How Counterpart Theory Saves Nonreductive Physicalism**

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Nonreductive physicalism has its problems; in what follows, I solve them. Or, at least, I propose solutions to what I regard as three of the most serious challenges facing the view: those of causal exclusion, causal heterogeneity, and realization. The proposals set out depend crucially on embracing *modal counterpart theory*. Hence, my thesis: counterpart theory can be used to save nonreductive physicalism.

My inspiration is the view, defended now by several philosophers, that the relation between mental tokens and their physical realizers is that of *constitution*—that is, the very same relation that obtains between a statue and the lump of clay from which it is formed.[[1]](#footnote-1) However, I break from the other nonreductive physicalists who have pursued this line in that I hold that *constitution is identity*.[[2]](#footnote-2) On my account, the value of the comparison to statues and lumps is that it calls to mind the resources used to defend constitution-as-identity, most notably that of counterpart theory.

This way of pitching the idea threatens to understate its novelty though. Type-token distinctions play a central, organizing role within nonreductive physicalism in a way that has no direct analogue within discussions of material constitution. Because of this, when counterpart theory is applied to nonreductive physicalism, the result is not just a familiar kind of work in a new context—‘take everything counterpart theorists say about statues but now say it about pains’—but also a new kind of philosophical work, one that counterpart theory is not asked to do elsewhere. We will see this below.

The paper is structured around the three problems mentioned earlier. In §1, I review the causal exclusion problem, propose a constitution-as-identity-based solution to the problem, and then use counterpart theory to rebut a modal objection to my solution. In §2, I review the causal heterogeneity problem and use counterpart theory to defend a solution that says mental tokens have more causal powers than their physical realizers. In connection, I discuss the viability of conditional analyses of the causal powers of natural kinds. In §3, I review the problem of realization and then draw on results obtained earlier in the paper to defend a novel account of realization that in one respect is the opposite of the familiar subset account, and in another respect is a refinement of it. Finally, §4 wraps things up by noting that the claims advanced in the paper can be used to develop a novel, empirical defense of counterpart theory.

**1. Causal Exclusion**

*1.1 The Problem*

The causal exclusion problem can be understood as arising from a pair of theses to which nonreductive physicalists are committed, theses that go toward defining the view.[[3]](#footnote-3) As physicalists they accept,

**Causal Closure of the Physical Realm**: If a physical effect has a cause at time *t*, it has a sufficient physical cause at *t*.[[4]](#footnote-4)

While as nonreductionists they accept,

**Irreducibility**: There exist mental types that are irreducible to (and so not identical with) physical types.

An observation on **Irreducibility**. In what follows my focus will be on the mind-body relation but I take the issues involved to generalize widely. There are reasons to hold that various types posited by chemistry, biology, economics, geology, and other special sciences are multiply realized by rather than identical with the types posited by lower level sciences. These reasons are largely empirical. Psychology and the other special sciences come to us apparently positing irreducible types. Perhaps metaphysical considerations will show that we cannot take this appearance at face value, and that reductionism is forced upon us. But if so I claim this would be a revisionist result for our philosophy of the special sciences. I acknowledge that this assessment is not uncontroversial, but in what follows I will treat it as an unargued assumption.[[5]](#footnote-5) When I provide an empirical argument for counterpart theory in §4, the warrant I appeal to traces back to the empirical case for **Irreducibility**.

 To now illustrate the exclusion problem, consider an arbitrary physical effect *e*. **Causal Closure** entails that *e* has a fully sufficient physical cause whenever it has a cause at all. But then, given **Irreducibility**, it might seem to follow that there is no room for *e* to have in addition a mental cause. There is no remaining causal work to be done by such a mental cause, given the fully sufficient physical causes. Generalizing, it might seem that there is no room for any mental causation of physical effects.[[6]](#footnote-6)

 Some nonreductive physicalists respond at this point by positing causal overdetermination.[[7]](#footnote-7) Even if *e* has fully sufficient physical causes, they say, it can *also* have an overdetermining mental cause. On their view, all mental causation involves overdetermination. I take this overdeterminationist position seriously, but in what follows I will assume it is unattractive and to be rejected. Nobody comes to the mental causation debate with the pre-theoretic intuition that massive overdetermination is taking place; at best, this is something you try to convince yourself you can live with as a philosopher. Overdeterminationists are ultimately owed more of an argument than this, but I cannot provide one here without distracting from my central case. In what follows I will focus on developing a non-overdeterminationist alternative.[[8]](#footnote-8)

*1.2 The Solution*

In order to connect nonreductive physicalism to the view that constitution is identity—and in turn, counterpart theory—I need to embrace some sort of psychophysical token identity theory. I think the most attractive way to do this involves regarding properties not as universals but *tropes*, or abstract particulars, like the redness of a given tomato. Properties so conceived are tokens. Types can then be understood as classes of tropes, so that for example the type redness is the class of all red tropes.[[9]](#footnote-9)

A nonreductive physicalist working within this framework can hold that every mental token (trope) is identical with some physical token (trope), while denying that mental types (trope classes) are identical with physical types (trope classes).[[10]](#footnote-10) To illustrate, assume that functionalism is true and that pain is a functionally defined type that is realized by exactly two physical types, P1 and P2. Then even if a particular pain token is identical with a P1 trope, pain as a type will not be identical with the type P1, since the former (the class of all pain tropes) contains both P1 and P2 tropes while the latter contains just P1 tropes. If we follow David Lewis by taking classes to be mereological wholes whose subclasses are parts,[[11]](#footnote-11) then multiply realized mental types are wholes whose parts are their distinct realizing types. In our example, pain is a whole whose parts are the types P1 and P2. Following Douglas Ehring,[[12]](#footnote-12) I will call this view *part-whole physicalism*.[[13]](#footnote-13)

 Bringing this to bear on the exclusion problem, suppose that the relata of causal relations are not events (as on the standard view) but tropes.[[14]](#footnote-14) Part-whole physicalists can then hold that every instance of mental causation involves a physical effect being caused by a mental trope that is identical with some physical trope. For example, suppose my pain causes me to cry. Because my pain is identical with a physical trope, this instance of mental causation does not threaten to violate **Causal Closure**. There is also no overdetermination, given the token identity. And crucially, we have obtained these results while retaining the assumption that mental and physical types are distinct in accordance with **Irreducibility**.

 I claim that this provides a fully satisfying solution to the exclusion problem; that is, a solution that does not need to be supplemented in any way. Some nonreductive physicalists disagree, and combine the trope identity theory together with other theoretical elements meant to address causal exclusion.[[15]](#footnote-15) But I say this is a mistake: the trope identity theory is enough. Now, don’t get me wrong. There is further philosophical work to do at this point. But that work consists in showing that the present solution to the exclusion problem can be combined with satisfying solutions to the other problems that nonreductive physicalists face.

 Sadly, some critics think the preceding solution is entirely on the wrong track. Yes, part-whole physicalism entails that there are mental causes of physical effects, these benighted critics say, but it is unsatisfying in that it fails to establish that they are causes *by virtue of* falling under mental types, as opposed to being causes purely *by virtue of* falling under physical types.[[16]](#footnote-16) This sort of objection is familiar from critical discussions of Donald Davidson’s anomalous monism.[[17]](#footnote-17) Part-whole physicalism makes no philosophical progress on Davidson’s notoriously problematic view, the critics say.

 But I have a pair of arguments as to why the critics are wrong. The first says they lose track of what is distinctive about the trope-theoretic framework, and more specifically they lose track of the direction of the *metaphysical dependence relations* (marked by the ‘in virtue of’ talk) that obtain within the framework. Spelling this out, I concede to the objection that causes operate by virtue of having the *natures* they do. But what exactly is a cause’s nature? For standard trope theorists, a trope’s nature is *identical with its particularity*.[[18]](#footnote-18) Accordingly, it’s not that a given trope has the nature that it does, and thus operates as a cause, by virtue of falling under some type (i.e., by belonging to some class of tropes). Rather, the trope has its nature primitively, and then both (i) operates as a cause, and (ii) falls under the types it does, by virtue of having that nature. Consequently, no trope ever causes any effect by virtue of falling under some type—that’s getting things backwards.[[19]](#footnote-19) The critics’ demand that mental tokens should be causes by virtue of falling under mental types is thus confused.

 This marks a crucial difference with the alternative universals framework on which events rather than tropes are the causal relata. The nature of an event plausibly *is* determined by the universal(s) it exemplifies or instantiates, and so once it is conceded that causes operate by virtue of having the natures they do, it really does follow that events operate as causes by virtue of falling under certain types (universals). Because of this, I agree that it is a perfectly good question for Davidson whether on his view mental events operate as causes by virtue of falling under mental types or purely by virtue of falling under physical types.[[20]](#footnote-20) The mistake was to think this continues to be a good question on the trope-theoretic framework. It does not.

 I also have a second argument against the critics, but to set it up I want to consider and then reply to a distinct line of attack against my proposed solution to the exclusion problem.

*1.3 Objection & Reply*

The token identity theory was once a standard element of nonreductive physicalism,[[21]](#footnote-21) but in recent years several authors have rejected the view. One argument against the theory proceeds along modal lines. Suppose again that the physical types P1 and P2 are realizers of pain, and suppose that they both are found in human brains. Imagine that I suffer a pain realized by a P1-token. Then some argue that although my pain is in fact realized by this P1-token, it did not have to be. The very same pain could have instead been realized by a P2-token. And this supposedly shows the non-identity of my pain and its P1-realizer. Formalizing the modal argument,

(P1): My pain could have existed without me tokening P1.

(P2): My P1-token could not have existed without me tokening P1.

 (C): My pain ≠ my P1-token.[[22]](#footnote-22)

If this objection is sound then token physicalism in all its forms is false, and §1.2’s solution to the exclusion problem is lost. This cannot stand.

 Enter counterpart theory. Developing my account of de re modality along broadly Lewisian lines,[[23]](#footnote-23) I take tropes to be world-bound entities that exist at just one world but have counterparts at others. Counterpart relations are to be understood as similarity relations, where we allow that a single trope can enter into multiple distinct counterpart relations, corresponding to the distinct ways it can be similar to other tropes. Crucially, I hold that the *mental counterpart relation* a trope enters into is (generally) distinct from the *physical counterpart relation* it does. Thus, tropes *t* (at world *w*) and *t*\* (at world *w*\*) might qualify as mental counterparts because they are sufficiently mentally similar but not as physical counterparts because they are not sufficiently physically similar.

 With counterpart theory in place, I deny the validity of the modal objection. I grant that (P1) is true, analyzing its truth in terms of there being a world containing a mental counterpart of my pain (a.k.a., my P1-trope), where that counterpart is a pain trope identical with a P2-trope. I also grant that (P2) is true, analyzing its truth in terms of there being no world containing a physical counterpart of my P1-trope that is a P2-trope—any possible P2-trope is too physically dissimilar from my P1-trope to qualify as a physical counterpart (even if it qualifies as a mental counterpart). But then I deny that (C) follows from (P1) and (P2).[[24]](#footnote-24) My pain and my P1-trope are identical; what are distinct are the mental and physical counterpart relations this single trope enters into.

 Back in the introduction, I said that applying counterpart theory to nonreductive physicalism isn’t just a matter of using the theory to do a familiar kind of work in a new context. It isn’t *just* this… but it is *partly* this. My use of counterpart theory in the present subsection mirrors Lewis in ‘Counterparts of Persons and their Bodies’, where he uses the theory to defuse (neo-Lockean) modal objections to the identification of persons with their bodies.[[25]](#footnote-25) The only important difference is that Lewis’s counterpart theory is directed at objects (persons, bodies, etc.) while mine is directed at tropes.

 Lewis’s defense of the identification of persons with their bodies is of a piece with his more general view that constitution is identity. Across different writings Lewis offers different arguments for this position, but one especially germane to our discussion is hinted at in *On the Plurality of Worlds*. Using the example of a dishpan constituted by a piece of plastic, Lewis writes there,

It reeks of double counting to say that here we have a dishpan, and we also have a dishpan-shaped piece of plastic that is just where the dishpan is, weighs just as much as the dishpan weighs (*why don’t the two together weigh twice as much*?), and so on. (Lewis 1986, p. 252, emphasis added)

L. A. Paul develops the parenthetical rhetorical question into an argument. If the piece of plastic weighs two pounds, and the dishpan weighs two pound, and the dishpan ≠ the piece of plastic, then why doesn’t the scale register four pounds when we place ‘both’ the dishpan and the piece of plastic on it?[[26]](#footnote-26) Given that the piece of plastic by itself sufficiently causally explains what the scale registers, it seems there is no causal work for the dishpan to do—it is causally excluded. Generalizing, all constituted objects are in danger of being causally excluded by their constituting objects.

I am impressed by this argument, and would be happy to deploy it against those who deny that constitution is identity. For present purposes, however, I can hold my fire. Leaving it open whether there is a solution to this exclusion problem available to those who deny the thesis that constitution is identity, I note that it is uncontroversial that the problem is solved by Lewis and others who accept that constitution is identity. If the dishpan is identical with the piece of plastic, there is no puzzle at all as to why the scale registers two pounds rather than four: there is but a single two-pound object on it.

This feeds into my second argument against those critics who say that §1.2’s solution to the exclusion problem is on entirely the wrong track. As it goes with dishpans, it also goes with pains—or so I say. Mental tokens are constituted by physical tokens in the exact same way dishpans are constituted by pieces of plastic, and so given that the causal exclusion threat facing dishpans is averted if constitution is identity, I say the same is true of the causal exclusion threat facing nonreductive physicalism if §1.2’s proposal is embraced. If the critics disagree, their burden is to explain the disanalogy between the cases. Why does a token identity thesis solve one causal exclusion problem but not the other?

If there is an interesting difference between the cases, I suggest it’s this. The type, being a dishpan, is not plausibly a natural kind. There are no laws of nature about dishpans as such, no inductively confirmed generalizations, and perhaps (depending on your view of explanation) no genuine scientific explanations invoking the type. In contrast, a characteristic claim of nonreductive physicalists is that multiply realized mental types are natural kinds properly studied by psychology, that they enter into generalizations that are explanatory and inductively confirmed, generalizations that can qualify as natural laws. In light of this, if you feel some lingering doubts about my proposal at this point, I want to try to steer them for you. Don’t target §1.2’s proposed solution to the exclusion problem—for again, the solution is successful. Instead, direct your doubts at the separate question of whether on my account mental types are able to play the role nonreductive physicalists need them to play regarding explanation, inductive confirmation, laws, and so on. Whether they can is not something I have established at this point. So, on to the next section to begin this further work.

**2. The Causal Heterogeneity Problem**

*2.1 The Problem*

 Kim has posed a second serious problem for nonreductive physicalists, that of the supposed *causal heterogeneity of multiply realized types*.[[27]](#footnote-27) This problem too can be understood as arising from a pair of principles.

**Causal Inheritance**: If a mental type M is realized in a system at time *t* in virtue of the physical realizer P, then the causal powers of that M-token are identical with the causal powers of the P-token.[[28]](#footnote-28)

**Causal Individuation of Kinds:** Natural kinds are individuated by their causal profiles, that is, the set of causal powers their tokens possess.

Reconsider pain with its realizers P1 and P2. By the **Causal Individuation of Kinds** it follows that since P1 and P2 are distinct kinds, they will have distinct causal profiles. But then, by **Causal Inheritance** it follows that those pains realized by P1 will have one set of powers (namely, those belonging to the P1-profile) while those pains realized by P2 will have a different set of powers (namely, those belonging to the P2-profile). Pain as a type will thus be causally heterogeneous in that its various tokens are not all causally alike. By a second application of the **Causal Individuation of Kinds** it then follows that pain is no natural kind. As a result, Kim’s argument continues, pain as a type cannot enter into natural laws or figure in inductively confirmed generalizations; indeed, pain as a type is not as such a proper subject of scientific inquiry. This result generalizes so that no multiply realized types are natural kinds.

The analogy is to jade.[[29]](#footnote-29) Jade is no natural kind but instead comprises the two distinct mineral kinds, jadeite and nephrite, each with their own causal profile. There are inductively confirmed laws about jadeite, and there are (distinct) inductively confirmed laws about nephrite. But there are no overarching inductively confirmed laws about jade as such. As it goes with jade, it also goes with pain, according to Kim.

Unless they are able to solve this problem, philosophers who endorse §1.2’s proposal will be forced to say there are no natural kinds other than physical kinds, no natural laws other than physical laws. In that sense, they will need to concede, all genuine science will be reducible physics. ‘There is physics and there is stamp collecting’, as Ernest Rutherford famously put it, in a passage Kim is fond of citing.[[30]](#footnote-30) Thus, even if the exclusion problem is solved, such philosophers will be forced to accept this reductionist sentiment unless they also can solve the heterogeneity problem.

*2.2 The Solution*

 My way out of the problem is to reject **Causal Inheritance** by taking mental tokens to have *more* causal powers than their physical realizers.[[31]](#footnote-31) Such a response might initially seem unavailable to token identity theorists: If mental and physical tokens are identical, how can they differ in their powers? But counterpart theory provides the way. I begin by saying what I want to say about causal powers; I then turn to how counterpart theory allows me to say it.

 Consider some causal power that belongs to the profile of the type P2 but not P1; for concreteness, suppose it is the power to cause sleep loss. I say that nonreductive physicalists should hold that all pains possess this power, but that it is *realization-sensitive*, meaning its exercise is dependent upon how a given pain is physically realized.[[32]](#footnote-32) That is, every pain possesses the power to cause sleep loss *if the pain is realized by a P2-token*. Pains realized by P1-tokens possess the power just as much as those realized by P2-tokens do. It’s just that P2-realized pains are *positioned* to exercise the power in a way P1-tokens are not—that is, positioned in the sense that part of the triggering condition for the power to be exercised is that a given pain must be realized by a P2-token, a condition that of course fails to obtain in the case of any P1-realized pain.[[33]](#footnote-33) If a particular pain presently realized by a P1-token *were* to be realized by a P2-token, then that particular pain could exercise its power to cause sleep loss.

 These realization-sensitive powers I am positing are meant to be a special case of what Sydney Shoemaker calls *conditional causal powers*—powers that can be exercised only when the right triggering conditions obtain.[[34]](#footnote-34) In Shoemaker’s favorite example, all knife-shaped objects possess the conditional causal power to cut wood *if the given object is made of steel.* Knives constituted by pieces of plastic possess this conditional power just as much as knives constituted by pieces of steel do; it’s just that steel knives are positioned to exercise the power in a way that plastic knives are not. As it goes with knives, it also goes with pains—or so I say.[[35]](#footnote-35)

 What matters to the naturalness of a type is not whether its tokens are alike with respect to the powers they exercise but whether they are alike with respect to the powers they possess. It does not count against the naturalness of electrons as a type that only some of its members exercise the power to annihilate positrons upon collision. What matters is that all electrons possess this power, even if only a few get the chance to exercise it.[[36]](#footnote-36) My suggestion is that pain’s conditional power to cause sleep loss if realized by a P2-token should be understood along the same lines.

 So I say that every pain, including those realized by a P1-token, possess this realization-sensitive power to cause sleep loss if realized by a P2-token. And I also say that no P1-token possess this power, since no P1-token could be realized by a P2-token. I thus reject **Causal Inheritance**: P1-realized pains have powers that their P1-realizers lack. By generalizing this position and taking mental tokens to have a range of realization-sensitive powers that their realizers lack, Kim’s argument can be blocked.

 This sort of response to the causal heterogeneity problem is available to token identity theorists if they accept counterpart theory together with some sort of counterfactual analysis of causal powers. To illustrate, consider the following de re modal sentence attributing a causal power to my pain (a.k.a., my P1-token).

(PAIN POWER): My pain possesses the conditional power to cause sleep loss if it were realized by a P2-token.

I propose that this sort of statement should be analyzed in terms of some counterfactual conditional broadly along the lines of,

(PAIN CF) If my pain were realized by a P2-token, and further conditions C1, C2, …, Cn obtained, my pain would cause sleep loss.

Note that conditions C1, C2, …, Cn are included in the counterfactual on the assumption that it’s not that P2-realized pains cause sleep loss come what may, but that they do so when the right further background conditions obtain.[[37]](#footnote-37) Now, I say that (PAIN CF) is true, and what makes it true is that at the closest worlds where there is a mental counterpart of my pain that is identical with a P2-trope, and where conditions C1, C2, …, Cn obtain, that counterpart causes sleep loss.[[38]](#footnote-38) From (PAIN CF)’s truth, I conclude that (PAIN POWER) is true.

 Next, consider an analogous sentence attributing the causal power to my P1-token (a.k.a., my pain).

(P1 POWER) My P1-token possesses the conditional power to cause sleep loss if it were realized by a P2-token.

Again, I propose that this should be analyzed in terms of some counterfactual conditional broadly along the lines of

(P1 CF) If my P1-token were realized by a P2-token, and further conditions C1, C2, …, Cn obtained, my P1-token would cause sleep loss.

I say that (P1 CF) fails to express a non-vacuous truth. The problem is that the physical counterpart relation is such that no possible P2-trope qualifies as a physical counterpart of my P1-trope, and so there is no possible world where (P1 CF)’s antecedent is true.[[39]](#footnote-39) From this, I conclude that (P1 POWER) is false.

 I frame the proposal in terms of ‘some counterfactual conditional broadly along the lines of’ (PAIN CF) or (P1 CF) because, while I mean to commit myself to there being some sort of counterfactual analysis of the possession of causal powers, I don’t want to commit myself to the particular analysis on offer here. Perhaps more complicated counterfactuals are needed for the analysis to be successful. I want to be open to this, and will say a bit more about it in the following subsection.

 The proposal assumes a counterfactual analysis of causal powers, but not a counterfactual analysis of causation itself.[[40]](#footnote-40) Maybe causation should instead be analyzed in terms of regularities, or structural equations, or physical processes, or maybe causation is primitive and so unanalyzable. The proposal is compatible with this and a wide range of other accounts of causation.

 Where the proposal does take a stand is on the metaphysics of powers. I regard powers as de re modal properties and so assume that like other such properties, their possession is to be analyzed using the machinery of counterpart theory. In connection, I assume the ascription of powers is a context-sensitive affair, with different ascriptions seizing on the different counterpart relations that tropes enter into. This sort of context-sensitivity is what we find with de re representation generally, as Lewis often notes.[[41]](#footnote-41)

 Within the counterpart-theoretic framework, then, I reject **Causal Inheritance** in that I take (PAIN POWER) to be true but (P1 POWER) to be false. Again, the idea is not that there is a single trope—alternatively described as my pain or as my P1-token—and this entity both has and lacks a certain causal power. That would be a contradiction. Rather, the idea is that talk of causal powers is ultimately to be analyzed in terms of counterfactuals broadly like (PAIN CF) and (P1 CF), and that when this is done we find that (PAIN POWER) is true but (P1 POWER) is false.

 In adopting this deflationary conception of powers, I beg no question against Kim, who intends for his argument to be neutral on just how causation and causal powers are to be understood. If a counterpart-theoretic treatment of causal powers allows nonreductive physicalists to escape Kim’s conclusion, this is a shortcoming of his argument.[[42]](#footnote-42)

*2.3 Objections & Replies*

 I want to consider two separate objections to the proposal. The first says the proposal absurdly entails that all sorts of obviously heterogeneous types are in fact causally homogeneous after all, and so qualify as natural kinds. Consider the disjunctive type of being either an alligator or an apple, which we will call being an ‘applegator’. The class of applegators is obviously causally heterogeneous: those members that are alligators possess the power to devour human beings, for instance, while those members that are apples do not. But imagine a philosopher co-opting §2.2’s proposal to argue, perversely, that the class is a causally homogeneous natural kind after all. Handed an apple, she says, ‘This applegator does in fact have the power to devour human beings. But it’s a realization-sensitive power that can be exercised only if this applegator were realized by an alligator rather than an apple. That it has this power follows from the truth of the following counterfactual,’

(Applegator CF) If this apple-realized applegator (i.e., this apple) were realized by an alligator, and further conditions C1, C2, …, Cn obtained, the applegator (i.e., the alligator) would devour a human being.

This would constitute a reductio of my proposal. What nonreductive physicalists need is a solution to the heterogeneity problem that distinguishes the class of pains from that of applegators, classifying only the former as a natural kind.

 In response, I want to begin by making explicit that I deny that natural kindhood can be analyzed in terms of causal homogeneity, understood in terms of the deflationary, context-sensitive conception of powers set out in §2.2.[[43]](#footnote-43) Instead, my view is that pain tropes simply do resemble one another enough for their class to qualify as a natural kind, where I have no illuminating, non-circular analysis to offer of what makes this the case. In contrast, applegators simply do not resemble one another enough. I think there are excellent empirical reasons to regard pain but not being an applegator as a natural kind: the success of psychology, which takes pain to be a kind, in contrast with there being no successful science that posits applegators as a kind, that devotes itself to discovering inductively confirmed laws about applegators as such. But this epistemological point provides us with no metaphysical analysis of kindhood.

 Because I do not propose such an analysis, I can appeal to natural kinds within my account of causal powers to block the present objection. Specifically, I do this by adding the following to §2.2’s account of causal powers: types that are not natural kinds do not possess any causal powers (and so do not possess realization-sensitive powers). In adding this to the account, I am not saying that (Applegator CF) is false or that it is disanalogous to (Pain CF) in any respect except one: pain is a natural kind while being an applegator is not. In ‘Special Sciences’, Fodor writes, ‘There is no firm footing here. If we disagree about what a kind is, we will probably also disagree about what a law is, and for the same reasons. I don’t know how to break out of this circle, but I think there are interesting things to say about which circle we are in’ (Fodor 1974, p. 102). This is what we are running up against here, except that where Fodor says ‘law’ I say ‘causal power’.

 I say, roughly: ‘The type, applegator, enters into patterns of counterfactual dependence, I concede, but these patterns are not worthy of the name “causal powers”, because the type is not a natural kind’. This way of putting things makes my proposal seem overly stipulative, however, whereas the underlying idea is intuitive. A given P1-realized pain could come to be realized by a P2-token while remaining the exact same *kind* of thing it is—a pain. In connection, it could cause sleep loss (while realized by P2) while remaining the exact same *kind* of thing it is right now. Given that this particular pain could cause sleep loss without turning into an entirely different *kind* of thing, it seems correct to say that the pain already possesses the power to cause sleep loss if the right conditions obtained (including being realized by a P2-token). In contrast, a given apple could not become an alligator, or devour a human being, without becoming an entirely *different kind* of thing from what it presently is—an apple. Being an applegator is not a genuine (natural) kind of thing that anything is, and so we cannot say that the applegator realized by (identical with) the apple could devour a human being while remaining the same kind of thing it is presently.

 This response to the objection begs no question against Kim. Solving the causal heterogeneity problem cannot plausibly require coming up with an informative analysis of kindhood that entails multiply realized mental types are natural kinds while patently disjunctive types like being an applegator are not. It is enough to take as a starting point that multiply realized mental types are natural kinds while being an applegator is not, and then show that causal heterogeneity considerations do not force us to give up this starting point, pace Kim. This is what I have done.

 Now to the second objection. As noted, §2.2’s proposal requires that causal powers be susceptible to some sort of conditional analysis—again, perhaps not an analysis specifically in terms of (PAIN CF) or (P1 CF), but something. In recent years, however, a number of philosophers have grown skeptical of the prospects of such conditional analyses. This is largely the result of various counterexamples. Leading the way on this front was C. B. Martin.[[44]](#footnote-44) To pick just one of his cases, Martin considers a conditional analysis stating that a wire is live (a disposition) just in case the following conditional is true: if the wire were touched by a conductor, electrical current would flow from the wire to the conductor. To show that the analysis is inadequate, Martin imagines a dead-wire hooked up to an *electro-fink*, a device that registers when the wire is touched by a conductor and then simultaneously changes the wire from live to dead. The counterfactual is then true even though the wire is dead, contradicting the analysis.

 Given this skepticism of conditional analyses, is my proposal dead on arrival? Not at all. For one thing, many philosophers continue to explore and defend various conditional analyses. They remain a ‘live option’, so to speak (my apologies).[[45]](#footnote-45) For another, there is an important difference between the type of analysis I am committing myself to and that which figures in many of the familiar counterexamples. To see this, consider Martin’s take on the general lesson to be learned from his counterexamples:

Objects are capable of acquiring and losing (some) powers. A substance that is not malleable can become malleable, an object which is elastic can lose its elasticity, and so on… According to the conditional analysis, ‘The wire is live’ simply says that if the wire it touched then it gives off electricity. What ultimately defeats this analysis is the acknowledged possibility of objects gaining or losing powers. If it makes sense to say that the object *a* has the power *P* at one time and not at another… then it should make sense to say both that *a* has *P* when and only when the activating conditions for the manifestation of *P* obtain, and that *a* lacks *P* when and only when the activating conditions for the manifestation of *P* obtain. (Martin 1994, p. 4)

In short, the dispositions and causal powers of objects can ‘come and go’, as Lewis 1997, p. 143 puts it, and they can do so in ways that frustrate (at least certain) conditional analyses. I concede the point. However, I am not directly interested in the dispositions or causal powers of *objects*. Rather, §2.2’s proposal concerns the causal powers of *natural kinds*. And these cannot come and go. A token of a natural kind cannot gain or lose any causal power while remaining a token of that kind. Or at least this is what you will hold if you follow Kim by accepting the **Causal Individuation of Kinds**, as you must for the causal heterogeneity problem to get a grip in the first place.[[46]](#footnote-46) For, if the tokens of some type can gain or lose powers while continuing to fall under that type, then the tokens of that type will be causally heterogeneous, entailing that the type is not natural.

Because of this, my (tentatively) proposed analysis of (PAIN POWER) in terms of (PAIN CF) is not susceptible to a Martin-style counterexample. For (PAIN CF) says that my pain would cause sleep loss if the right conditions held (i.e., if it were realized by a P2-token and C1, C2,…, Cn all obtained), but this entails that my pain in those conditions would possess the power to cause sleep loss (since a trope cannot cause that which it has no power to cause), which in turn entails that my pain already possesses this power, *given the assumption that* pain as a type is a natural kind, for the causal powers of natural kinds (unlike those of objects) cannot come and go. That is, it entails (PAIN POWER). Importantly, the italicized assumption that pain is a natural kind begs no question against Kim, whose argument in effect is initially willing to grant such an assumption, for reductio, to show that unacceptable results follow. My reply, in effect, is that no such unacceptable results must follow if we accept counterpart theory.

I also say that my use of (P1 POWER) and (P1 CF) is insusceptible to Martin-style counterexamples. Again, I claim that the negation of (P1 POWER) follows from (P1 CF)’s failure to express a non-vacuous truth, which is a result of its antecedent being impossible—it is impossible for a P1-token to be realized by a P2-token. Do critics want to say that (P1 POWER) can be true even if (P1 CF) is vacuous, and so that tropes can possess causal powers whose exercise depends on an impossible condition obtaining? This seems like an unpromising line to pursue.

Don’t misunderstand me. Many different types of counterexamples have been posed to various proposed conditional analyses of dispositions and powers, and I do not claim that what I have said can be used to respond to them all. My goal is less ambitious. Without adopting any particular conditional analysis, my aim has been to resist a kind of kneejerk skepticism about §2.2’s proposal, a skepticism that takes for granted that devastating objections to my proposal are available via straightforward extensions of counterexamples that are already familiar. I say that this is not so.

**3. The Realization Problem**

*3.1 The Problem*

 The third problem facing nonreductive physicalism is that of providing an account of the mind-body relation that avoids treating the mental as something ‘over and above’ the physical in a way that violates physicalism, but without collapsing into reductionism. It was once common for nonreductionists to appeal to supervenience for this purpose, but several compelling objections have now been raised against supervenience-based formulations of physicalism.[[47]](#footnote-47) Plausibly, what physicalism requires is not just that mental types supervene on physical types, but that such supervenience be physicalistically explainable rather than brute.

 As a supervenience replacement, a number of nonreductive physicalists have turned to the notion of *realization* familiar from functionalism. If the mental is realized by the physical, the idea goes, this would explain why psychophysical supervenience obtains. Unfortunately, there is no universally accepted account of how realization should be understood. This is what I am calling the *problem of realization*.

 One leading proposal is the *subset account* defended in different forms by Shoemaker, Jessica Wilson, Leonard Clapp, and Michael Watkins.[[48]](#footnote-48) It says that realization can be analyzed in terms of the relation between the causal powers of a realizee and those of its realizer. I will focus on the version of the view Shoemaker defends in his book *Physical Realization*. It says that a type M has another type P as a realizer just in case the following two conditions obtain.

**Forward Subset:** The forward-looking causal powers of M are a proper subset of the forward-looking powers of P.

**Backward Superset:** The backward-looking causal powers of M have as a subset (i.e., are a *superset* of) the backward-looking powers of P.[[49]](#footnote-49)

To clarify terminology: a ‘forward-looking power’ is a power to cause effects of a given type, while a ‘backward-looking power’ is a power to be the effect of causes of a given type. **Forward** **Subset** entails that when a type is multiply realized, its forward-looking causal profile (i.e., the set of its forward-looking powers) will be the *intersection* of the causal profiles of its various realizers (or perhaps a proper subset thereof), while **Backward Superset** entails that the realizee’s backward-looking causal profile will be the *union* of the causal profiles of its realizers (or perhaps a proper superset thereof).

Illustrating the idea schematically, suppose P1’s forward-looking causal profile is {1F, 2F, 3F, 4F} while P2’s is {1F, 3F, 5F, 7F}—we use numerals to denote different causal powers and the letter ‘F’ to remind us they are forward-looking. Next, suppose P1’s backward-looking causal profile is {11B, 12B, 13B, 14B} while P2’s is {11B, 13B, 15B, 17B}; the ‘B’ is to remind us these powers are backward-looking. Finally, suppose pain’s forward-looking causal profile is {1F, 3F} while its backward-looking profile is {11B, 12B, 13B, 14B, 15B, 17B}. P1 and pain then jointly satisfy **Forward Subset** and **Backward Superset**, and so P1 qualifies as a realizer of pain. The same is true of P2 and pain.

I turn now to develop an objection to the account that draws on our earlier discussion. Shoemaker claims it is an advantage of his view that it provides a solution to the causal heterogeneity problem (§2). I concede that this is true for forward-looking powers. Shoemaker’s solution consists in rejecting **Causal Inheritance** by taking mental tokens to have fewer forward-looking powers than their realizers do. In our schematic example, P1-realized pains possess the powers 1F and 3F (but they do not inherit 2F or 4F from their P1-realizers), while P2-realized pains possess the same powers 1F and 3F (but they do not inherit 5F or 7F from their P2-realizers). The result is that all pains have the same forward-looking powers regardless of how they are realized.

But trouble arises for Shoemaker’s handling of backward-looking powers. To illustrate, focus on 12B, a power possessed by P1 but not P2. Here is a dilemma: Do pains realized by P2-tokens possess 12B? Taking the first horn, suppose the answer is Yes. The problem, first noted by Brian McLaughlin, is that this answer is inconsistent with a plausible general principle about realization that Shoemaker himself explicitly accepts:

**Token Entailment:** The tokening of a realizer type must entail the tokening of its realizee, and so must entail the tokening of a type possessing all of the realizee’s causal powers.[[50]](#footnote-50)

Since P2-tokens do not possess 12B, the tokening of P2 fails to entail the tokening of some type with all of pain’s backward-looking causal powers, and so fails to entail the tokening of pain. You can think of the problem this way: if P2-tokens lack 12B but the pains they realize possess this power, doesn’t this show that those pains are something ‘over and above’ their P2-realizers, in a way physicalists should find discomfiting?

 So turn to the second horn. Suppose the answer is No, P2-realized pains do not possess 12B. It then seems to follow pain is causally heterogeneous with respect to its backward-looking powers, for P1-realized pains will possess the power. To make the point concretely, think of 12B as the power to be caused by a P1-stimulator. You point such a stimulator at me, causing me to token P1. This P1-token realizes my pain. What caused my pain? The stimulator; therefore, my pain must possess the power to be caused by a P1-stimulator. If P2-realized pains don’t also possess this specific backward-looking power, pain is causally heterogeneous.

 But if pain is causally heterogeneous with respect to its backward-looking powers, there can be no inductively confirmed laws about the causes of pain, for just the reasons Kim notes (§2.1). Should nonreductive physicalists be satisfied with this as a solution to the causal heterogeneity problem—there can be laws about the effects of pain, but not about the causes? My view is that they should not. It is not as though medical researchers scientifically study only the effects of chronic pain, throwing their hands up to plead that there can be no unified science of the causes; it is not as though cognitive psychologists are confident they know inductively confirmed laws about the effects of working memory as a mental type, but not about how various causes (e.g., alcohol, chronic stress) affect it; and so on. At the very least, we would need an argument that this solution is good enough, but no such argument is provided by Shoemaker, who does not anticipate the problem.

*3.2 The Solution*

 In response to these difficulties I have an alternative account of realization to offer, an account that in one respect is the opposite of Shoemaker’s, and in another is a refinement of it. To begin, I accept Shoemaker’s **Backward Superset** as a *true description* of the relation between the causal profiles of realizer and realizee, but not as part of the *analysis* of realization. I also accept a symmetric principle applying to forward-looking powers, but again as a true description rather than an analysis:

**Forward Superset**: The forward-looking causal powers of M have as a subset (i.e., are a superset of) the forward-looking powers of P.

I accept **Backward Superset** and **Forward Superset** because they are consequences of §2.2’s proposed solution to the causal heterogeneity problem

 Recall that in §2.2, I suggested that mental tokens have *more* causal powers than their physical realizers, and specifically that they have realization-sensitive powers their realizers lack (where this claim is to be analyzed counterpart-theoretically). Representing my view schematically just as we did Shoemaker’s, suppose again that P1‘s backward-looking profile is {11B, 12B, 13B, 14B}, while P2‘s is {11B, 13B, 15B, 17B}. Then §2.2’s proposal entails that pain’s backward-looking causal profile is {11B, 12BP1, 13B, 14BP1, 15B P2, 17BP2}, where the subscripts are meant to indicate realization-sensitivity: the subscripted ‘P1’ indicates that a power’s exercise is dependent upon a given pain token being realized by P1, while the subscripted ‘P2’ indicates that a power’s exercise is dependent upon a given pain token being realized by P2. Modulo the point about realization-sensitivity, then, I accept **Backward Superset**.

 Turning to forward-looking powers, suppose once more that P1 has the forward-looking profile {1F, 2F, 3F, 4F} while P2 has {1F, 3F, 5F, 7F}. Then §2.2’s proposal entails that pain’s forward-looking causal profile is {1F, 2FP1, 3F, 4FP1, 5FP2, 7FP2}, again using subscripts to indicate realization-sensitivity. Recall the example from §2.2, in which every pain possesses the realization-sensitive power to cause sleep loss if the pain were realized by a P2-token.[[51]](#footnote-51) This corresponds to powers like 5FP2 or 7FP2 in our representation. The upshot is that I accept **Forward Superset**, again modulo realization-sensitivity.[[52]](#footnote-52)

 That I accept **Forward Superset** where Shoemaker instead accepts **Forward Subset** is the starkest point of difference between our views; it is here that what I am offering might be regarded as the opposite of his subset view. In short, I propose to treat forward-looking powers in just the way Shoemaker treats backward-looking ones, modulo realization-sensitivity.

 I say there is symmetry between forward-looking and backward-looking powers, while Shoemaker says there is asymmetry. I regard this symmetry as an advantage of my view. Shoemaker says very little to motivate the asymmetry he posits, and it’s not obvious what motivation it might receive.[[53]](#footnote-53) We don’t come to the mental causation debate pre-theoretically intuiting that mental tokens have lots of different sorts of causes but only a few different sorts of effects; we don’t expect our functional definitions of mental types to specify many causal inputs but just a few causal outputs; etc.

 Again, I accept **Backward Superset** and **Forward Superset** as true descriptions of the relation between the causal powers of realizer and realizee, but I deny that these principles should figure in the analysis of realization. How should realization be analyzed instead? In terms of just those causal powers that are specified in the mental type’s *functional definition*.[[54]](#footnote-54)

 To illustrate, suppose pain’s functional definition specifies that it is the type whose tokens possess the backward-looking powers to be caused by pinpricks and stubbed toes, and the forward-looking powers to cause winces and groans. Then my proposal says that any type realizer of pain will need to include these specific powers as a subset of its overall causal profile. This point is already reflected in our schematic representation. While some powers have subscripts indicating their realization-sensitivity, others have no subscript: 1F and 3F from the forward-looking powers, and 11B and 13B from the backward-looking ones. These powers are *realization-insensitive* in that their exercise is independent of how pains happen to be physically realized. On my proposal, those powers that figure in pain’s functional definition will be realization-insensitive in this way, because a given physical type would not qualify as a pain-realizer in the first place if it lacked these powers.

 I thus propose to analyze realization in terms of a modified version of Shoemaker’s **Forward Subset**, together with a symmetric principle applying to backward-looking powers. That is, I propose that a type M has another type P as a realizer just in case the following two conditions obtain.

**Forward Subset (Functional Definition):** Those forward-looking causal powers of M that are specified in M’s functional definition are a proper subset of the forward-looking powers of P.

**Backward Subset (Functional Definition):** Those backward-looking causal powers of M that are specified in M’s functional definition are a proper subset of the backward-looking powers of P.

Notice that pain and its realizers P1 and P2 satisfy these conditions if we assume pain’s functional definition specifies it as possessing 1F, 3F, 11B, and 13B. In this respect, what I am offering might be regarded as a refinement of Shoemaker’s account; perhaps I should be viewed as defending a special version of the subset account.

 On my view, Shoemaker’s two original principles, **Forward Subset** and **Backward Superset**, provide genuine insights about realization and causal powers. But Shoemaker misidentifies what those insights are, taking them to reflect an important distinction between forward-looking and backward-looking powers. Instead, I claim, the important distinction is between the total causal powers of a realizee and the more limited set of those powers that figure in the realizee’s functional definition, and in turn the analysis of realization.

 To complete the proposal, I note that I do not regard realization as its own sui generis metaphysical relation. Rather, when it comes to types I say that *realization is mereological composition*, or more specifically that a realizer is a mereological part of its realizee (recall this element of part-whole physicalism from §1.2). That is, I say that we call those instances of mereological composition that obtain between types (trope classes) “realization” iff **Forward Subset (Functional Definition)** and **Backward Subset (Functional Definition)** are satisfied.[[55]](#footnote-55)

And when it comes to tokens, I say that *realization is identity*, where this is of a piece with my view that constitution is identity. On my account, then, ‘realization’ is ambiguous in that it denotes different relations depending on whether you are talking about types or tokens. Permitting this ambiguity eases discussion with fellow nonreductive physicalists. For example, I can follow their lead by shifting between talking about pain’s various realizers and the token realizer of a specific pain.

*3.3 Objection & Reply*

 To make explicit something implied by the preceding proposal: my response to §3.1’s dilemma is to take the first horn. As a consequence of my rejection of **Causal Inheritance**, I reject **Token Entailment**. On my view, mental tokens have more causal powers than their physical realizers, and so the tokening of a realizer does not by itself entail the tokening of a type with all the causal powers the realizee possesses.[[56]](#footnote-56)

 While sharpening the first horn above, I suggested that the rejection of **Token Entailment** appears inconsistent with physicalism, for it seems to treat mental tokens as something ‘over and above’ their realizers. If this is indeed correct, §3.2’s proposed solution to the realization problem is a failure. It fails to deliver a physicalistically acceptable account of the mind-body relation.

 To begin responding to this concern, it is helpful to draw a connection to the *grounding problem* familiar from discussions of material constitution.[[57]](#footnote-57) Consider a constituting object and its constituted object that are spatiotemporally coincident throughout their existence; following the classic presentation, think of a statue and a lump of clay that are created and destroyed at the same times.[[58]](#footnote-58) The statue and the lump share all the same material parts, all the same physical properties and relations. And yet there is an apparent modal difference between them: the lump could survive being squashed into a ball while the statue could not. What explains or grounds this modal difference? Given that the statue and the lump seem to share all their non-modal properties, there is no obviously promising answer. That is the grounding problem.

 If mental tokens are constituted by physical tokens in exactly the same way statues are constituted by lumps of clay, as I and other philosophers hold, a version of the grounding problem figures to arise in the mind-body case as well. You can raise the problem in connection with causal powers: if a mental token differs in its powers from the physical token that constitutes it, what explains or grounds this difference? But you can also raise the problem using modal properties that aren’t powers. Consider a pain constituted by a P1-token. The pain has the (non-power) modal property of being such that it could be constituted by a P2-token; the P1-token lacks this modal property. In that case, the P1-tokening fails to entail the tokening of a type with all of pain’s (non-power) modal properties. It is not obvious that this result is any less threatening to physicalism than the rejection of **Token Entailment** is.

 The version of the grounding problem that arises in the mind-body case is perhaps even more daunting than the version discussed in connection with material constitution, because it comes with a further constraint on acceptable conclusions. To see this, consider the view entertained by Karen Bennett, that it is simply a brute, unexplained fact that the statue and the lump differ in their modal properties.[[59]](#footnote-59) Whatever the merits of such a view for statues and lumps, it seems to be unavailable to physicalists to regard it as a brute, unexplained fact that mental tokens have causal powers or other modal properties that their physical realizers lack. For, physicalism should rule out such brute mental facts, it should require that such facts be physicalistically explainable. Recall the objection to supervenience-based formulations of supervenience (§3.1): they are inadequate because they are compatible with brute, physicalistically unexplained psychophysical supervenience relations.

 The grounding problem poses a very serious challenge for those who deny that constitution is identity, perhaps an insuperable one. But for those who accept that constitution is identity, together with counterpart theory, a response is readily available. The statue just is the lump, but this single object enters into multiple distinct counterpart relations, corresponding to the distinct ways it is similar to other possible objects. In particular, an otherworldly squashed ball of clay is in one respect similar to the statue/lump we have here, and so qualifies as a *lump-counterpart* of the object, while in another respect it is dissimilar to our statue/lump, and so fails to qualify as a *statue-counterpart*. This is what explains the modal difference.

 A similar line is available in the mind-body case. Mental tokens are identical with physical tokens, but mental counterpart relations are distinct from physical counterpart relations, and it is this that explains the modal distinctions in question. In connection, I am not sure there is a promising, physicalistically acceptable way to reject **Token Entailment** for those philosophers who hold that mental tokens are constituted by but not identical with physical tokens. But thanks to counterpart theory, I have a way of doing so. If my pain can be truthfully said to possess a certain causal power (or other modal property) that its P1-realizer lacks, this is explained by or grounded in the fact that my pain stands in the mental counterpart relation to a possible P2-token possessing that power (or other modal property), but not in the physical counterpart relation to that P2-token; that is, it is explained by or grounded in the fact that in one respect my pain is similar to the possible P2-trope while in another respect it is dissimilar. This explanation is entirely physicalistically acceptable, and so nonreductive physicalists are free to reject **Token Entailment** on this basis with a clear conscience.[[60]](#footnote-60)

**4. Conclusion**

 Nonreductive physicalism has thus been saved. The view once had its problems, but now those problems are gone. Or so I hope to have persuaded you. Central to the solutions offered has been the acceptance of counterpart theory. This sort of solution should perhaps seem unsurprising. Causal powers and other modal properties play a prominent role in critical discussions of nonreductive physicalism, and so it makes sense to investigate whether certain conceptions of such properties lend themselves to solutions to the view’s challenges that are unavailable on alternative conceptions.

 Throughout the paper, my acceptance of counterpart theory has been uncritical. There are serious objections to the view, but I have done nothing to counter those objections directly. For present purposes, I simply concede that counterpart theory comes with certain philosophical costs. But in this closing section, I note that insofar as the arguments advanced in this paper are successful, they add up to a novel line of support for counterpart theory. They reveal a philosophical benefit of the view.

 Again, I say that nonreductive physicalism has substantial empirical credentials: it captures the way science seems to present itself to us, in contrast with revisionist reductionist views. Supposing this is right, if counterpart theory is indeed part of the best response to the objections facing nonreductive physicalism, as I have argued, then we thereby have *empirical reasons to accept counterpart theory*.

In his response to Kim’s causal heterogeneity problem, Jerry Fodor writes,

only God gets to decide whether there are laws about pains; or whether, if there are, the pains that the laws are about are [multiply realized]. Kim’s picture seems to be of the philosopher impartially weighing the rival claims of empirical generality and ontological transparency, and serenely deciding in favor of the latter. *But that picture won’t do*. Here, for once, metaphysics actually matters, so philosophers don’t get to choose.[[61]](#footnote-61)

Here, for once, metaphysics actually matters, given the empirical stakes involved. And so when it comes time for carrying out the cost-benefit philosophical analysis of counterpart theory, saving nonreductive physicalism should count as an important philosophical benefit.

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1. See for instance Pereboom and Kornblith (1991), Pereboom (2002 and 2011), Melnyk (2003: 20, note 15), Paul (2007), and Shoemaker (2007: 49). For critical discussion of the appeal to constitution, see Ney (2007), Francescotti (2014: Chapter 3), and Melnyk (2014). [↑](#footnote-ref-1)
2. On the view that constitution is identity, see Lewis (1971 and 1986), Gibbard (1975), Robinson (1982), Noonan (1993), and Wasserman (2002 and 2004). [↑](#footnote-ref-2)
3. See Kim (1998, 2005, and 2007). [↑](#footnote-ref-3)
4. This version of the thesis is taken from Kim (2005: 15), but with two amendments. First, I follow Loewer (2007: 251) by adding that the physical cause is *sufficient*; in connection, to simplify the discussion I will assume determinism, and so whenever an effect has a cause it has a sufficient cause. Second, Kim formulates his thesis in terms of events while I adopt more neutral language to allow the causal relata to be other sorts of entities, including tropes (see below). [↑](#footnote-ref-4)
5. Here I especially follow Fodor (1974, 1989, and 1997), who uses examples from economics and geology in addition to psychology. For discussion of arguments for the irreducibility of chemical types, see for instance Scerri (1994), Bishop (2005), and Hendry and Needham (2007). For arguments for the irreducibility of biological types, see for instance Kitcher (1984) and Kincaid (1990). For those philosophers driven to reductionism on largely empirical grounds, I can offer a compromise. What I most want to rebut in what follows are a priori philosophical arguments against nonreductive physicalism, arguments purporting to show that the view is incoherent or could not possibly be true. Empirically driven reductionists could agree that I win this fight while insisting that the empirical case for their view remains compelling. [↑](#footnote-ref-5)
6. Kim (1998: Ch. 2) goes on to show that the exclusion problem also arises for the *mental* effects of mental causes, but I will leave this aside and assume in what follows that if my proposed solution to the exclusion problem for physical effects is adequate, it can be extended to cover mental effects. [↑](#footnote-ref-6)
7. See for example Pereboom (2002), Bennett (2003), Schaffer (2003), Sider (2003), Loewer (2007), Carey (2010), and Roche (2014). [↑](#footnote-ref-7)
8. Kim (2005: 46-52) provides one argument against overdeterminationism. More recently, see Aimar (2011), Moore (2013), Won (2014) and Bernstein (2016). [↑](#footnote-ref-8)
9. Classic defenses of trope theory include Williams (1953), Campbell (1990), Bacon (1995), and Maurin (2002). I take a trope ontology to have several advantages over the universals alternative, but in this paper my defense of the view is indirect: insofar as the nonreductive physicalist position I set out is attractive, we have reason to embrace tropes in light of their role within the position. [↑](#footnote-ref-9)
10. Views along these lines have been defended by Robb (1997, 2001, and 2013), Heil (2003 and 2012), Heil and Robb (2003), and Ehring (1999), (2003), and (2011). [↑](#footnote-ref-10)
11. Lewis (1991: 4-5). [↑](#footnote-ref-11)
12. Ehring (2003 and 2011). [↑](#footnote-ref-12)
13. An implication of the view is that mental types are identical with disjunctions of physical types—for example, pain is identical with the disjunctive type (P1 or P2). *Objection*: Part-whole physicalism is then not a nonreductive view after all, but a version of the psychophysical type identity theory, one that identifies mental types with disjunctive physical types. *Reply*: Families of types are not closed under disjunction. A disjunction of fundamental types need not itself be fundamental—the disjunctive type (being an electron *or* a neutrino) is not fundamental although its disjuncts are. Similarly, a disjunction of physical types like (P1 or P2) need not itself be a physical type. Compare Yablo (1992: 255-256, n. 28). [↑](#footnote-ref-13)
14. For defenses of the view that causal relata are tropes, see for instance Ehring (1997, 1999, 2009, and 2011) and Garcia-Encinas (2009). [↑](#footnote-ref-14)
15. See Ehring (2011: Ch. 5), who regards the trope token identity thesis as just part of what is needed for an adequate solution to the exclusion problem. [↑](#footnote-ref-15)
16. See for instance Noordhof (1998), Shoemaker (2001), MacDonald and MacDonald (2006). [↑](#footnote-ref-16)
17. Davidson (1970). Classic criticisms of Davidson’s account of mental causation include Stoutland (1980), Honderich (1982), Sosa (1984), and Antony (1989). [↑](#footnote-ref-17)
18. See especially Campbell (1990) on this. [↑](#footnote-ref-18)
19. It bears emphasis that this claim is restricted to *standard* trope theory, like that defended by Campbell (1990). According to the (non-standard) *natural class trope nominalism* defended by Ehring (2011), the natures of tropes are determined by their memberships in natural classes of tropes, and so by the types they fall under. In that case, the argument I am presenting in the text could not be advanced. I regard this as a disadvantage of natural class trope nominalism. [↑](#footnote-ref-19)
20. In addition, part of Davidson’s problem was that he held that causal relations must always be backed by strict laws, while mental types could not figure in such laws. But the version of nonreductive physicalism I am defending is not committed to either of these claims. And so, while I address the causal exclusion problem in the text (a problem I use Davidson to illustrate, but that faces all nonreductive physicalists), I will just ignore any problem alleged to arise from Davidson’s somewhat idiosyncratic views about strict laws, except for noting that the account I am developing is consistent with Fodor’s (1974, 1989, 1991a, 1997) influential view of ceteris paribus laws. [↑](#footnote-ref-20)
21. See for instance Davidson (1970) and Fodor (1974), the classic works first articulating the view. [↑](#footnote-ref-21)
22. Modal arguments along these lines are advanced by Pereboom (2002), Paul (2007), and Shoemaker (2007). [↑](#footnote-ref-22)
23. See Lewis (1968, 1971, 1973, 1976a, and 1986). A familiar point worth explicitly noting is that you can accept Lewis’s counterpart theory while rejecting his view of possible worlds as concrete universes—perhaps worlds are maximally consistent sets of sentences, for instance. Ehring (2011) argues that trope theorists have several reasons to embrace counterpart theory, but does not touch on the considerations raised in what follows. [↑](#footnote-ref-23)
24. This marks a break from Robb (2013: 218-219), who responds to the modal objection by rejecting (P1). [↑](#footnote-ref-24)
25. Lewis (1971). [↑](#footnote-ref-25)
26. Paul (2007 and 2010). [↑](#footnote-ref-26)
27. Kim (1992). [↑](#footnote-ref-27)
28. Kim (1992: 326). Kim (1998: 54) formulates the principle somewhat differently, allowing that the causal powers of the M-token may instead be a *proper subset* of the powers of the P-token. This alternative formulation matters to defenders of the subset account of realization (§3), but does not affect my argument. [↑](#footnote-ref-28)
29. Kim (1992: 319-325). [↑](#footnote-ref-29)
30. See for example Kim (2010). [↑](#footnote-ref-30)
31. Clarke (1999) similarly suggests mental tokens have more causal powers than their realizers, but without the counterpart theoretic framework central to my approach. [↑](#footnote-ref-31)
32. I introduce the notion of realization-sensitive powers in Tiehen (2014). [↑](#footnote-ref-32)
33. I assume that there are multiple distinct conditions that each must obtain for a typical power to be exercised—so for instance, if a match is to light it must be struck, dry, in the presence of oxygen, and so on. A token might be positioned to exercise a given power in one respect, in that one such condition obtains, but not positioned in another respect, in that another such condition fails to obtain. Connecting this to our example, suppose a P2-realized pain occurs in a person who has just taken heavy sedatives, where *not* taking such sedatives is one of the triggering conditions that must obtain for a pain to exercise its power to cause sleep loss. Then in this respect, a P1-realized pain might be positioned to exercise its power to cause sleep loss (supposing the person with the P1-realized pain hasn’t taken sedatives) while the given P2-realized pain is not so positioned; while in another respect the P1-realized pain is not positioned to exercise the power (since it is realized by P2) while a P2-realized pain is so positioned. The upshot is that I do not take there to be an important metaphysical distinction between those causal powers a token merely possesses and those that it possesses *and is positioned to exercise*. Instead, talk of a token being positioned (or not) to exercise a power is just a way of indicating whether a given triggering condition obtains. [↑](#footnote-ref-33)
34. See Shoemaker (1980, 2001, and 2007). [↑](#footnote-ref-34)
35. There is one notable difference between my realization-sensitive powers and Shoemaker’s conditional powers. Shoemaker (1980: 232-233) builds it into his definition of conditional powers that their triggering conditions are not themselves causally sufficient for the given effect, while in our example I say that being realized by a P2-token is part of the triggering condition for pain to exercise its power to cause sleep loss, even while acknowledging that the P2-token is itself causally sufficient for this effect. But so be it. I am offering what I regard as a justified extension of Shoemaker’s treatment of conditional powers. That is, I say that a pain realized by a P1-token could instead be realized by a P2-token, and that if it were so realized it would cause sleep loss (without overdetermination). On this basis, I further say, we should attribute the pain with the conditional, realization-sensitive causal power in question. The remainder of this section fills out the argument for this conclusion. [↑](#footnote-ref-35)
36. In connection, consider the debate over content externalism and mental causation. You might think that my water belief has the same causal powers as my Twin Earth twin’s twater belief, but differs in that it has actually exercised its power to interact with water (H2O) while my twin’s belief has not. In response, I endorse the following disjunction. EITHER my water belief and my twin’s twater belief have the exact same set of causal powers, in which case they fall under the same psychological kind regardless of the difference in the powers they have exercised. This is Fodor’s (1991b) view, in advancing a modal argument for narrow content. OR my water belief and my twin’s twater belief do in fact differ in the causal powers they possess and not just the powers they exercise, in which case they fall under different psychological kinds. So for instance, perhaps my belief has the power to cause water-directed (not twater-directed) behavior. Following Burge (1989), perhaps one could bolster this line of thought by holding that causal powers are identified relative to a normal environment. In endorsing the disjunction, I remain neutral on the debate over externalism and mental causation. Thanks for comments from an anonymous referee here. [↑](#footnote-ref-36)
37. So for instance, perhaps C1 specifies that the subject of the pain has not recently taken sedatives, to return to the example from n. 32. On my view, the pain’s being realized by a P2-token should be regarded as just another one of the conditions that must obtain for the given power to be exercised, and so should be regarded as just like conditions C1, C2,…,Cn. [↑](#footnote-ref-37)
38. Here I assume the standard Stalnaker (1968)/Lewis (1973) analysis of counterfactuals. [↑](#footnote-ref-38)
39. In accordance with the standard view, I assume (P1 CF) is vacuously true because of the impossibility of its antecedent. [↑](#footnote-ref-39)
40. Notice that ‘cause’ occurs as an unanalyzed term in (PAIN CF) and (P1 CF). [↑](#footnote-ref-40)
41. See especially Lewis (1986: 248-259). [↑](#footnote-ref-41)
42. This section marks a break from Tiehen (2013), where I defend **Causal Inheritance**. [↑](#footnote-ref-42)
43. Such an analysis presumably would entail a deflationary, context-sensitive account of natural kinds, something I have no interest in defending. [↑](#footnote-ref-43)
44. Martin (1994). For further discussion of alleged counterexamples to conditional analyses, see Johnson (1992), Lewis (1997), Bird (1998), Mumford (1998), Fara (2005), Choi (2008), Manley and Wasserman (2008 and 2011), and Bonevac, Dever, and Sosa (2006 and 2011). [↑](#footnote-ref-44)
45. See for example Lewis (1997), Mellor (2000), Malzkorn (2000), Gundersen (2002), and Choi (2008). [↑](#footnote-ref-45)
46. A referee suggests that we might want to relax Kim’s principle anyway, in response to examples like this: a human being can lose the causal power to reproduce while still belonging to the natural kind, human being. In the text, I mean to show that Kim’s causal heterogeneity problem can be solved *even if* we grant him the strict version of the **Causal Individuation of Kinds**, the principle he uses to motivate the problem. If we were to adopt a looser version of the principle, one that allowed for some variation in the causal powers of the tokens of a natural kind (or variation in the powers possessed by a single such token over time), that would make the task of responding to Kim easier, since it would relax the requirements that a type must possess to qualify as natural. I assume that the core of my proposal could be reconciled with such a relaxed version of the principle, but won’t attempt to show this here, since discussion of exactly how to formulate such a relaxed version would distract from the present argument. [↑](#footnote-ref-46)
47. See Horgan (1993), Kim (1998), Wilson (1999 and 2005), Melnyk (2003), and Shoemaker (2007). [↑](#footnote-ref-47)
48. Wilson (1999, 2009, 2010, 2011), Shoemaker (2001, 2003, 2007, 2011, 2013), Clapp (2001), and Watkins (2002). [↑](#footnote-ref-48)
49. Adopted from Shoemaker (2007: p. 12). More recently, Shoemaker (2011 and 2013) has revised his account in response an objection by Brian McLaughlin that we will discuss presently. In what follows, I ignore the revision and focus on the 2007 account because it best sets up my own view. [↑](#footnote-ref-49)
50. McLaughlin (2007: pp. 159-161) and (2009: §3). Shoemaker (2007: 6) endorses a version of the principle. [↑](#footnote-ref-50)
51. On my view, even a P2-realized pain’s power to cause sleep loss should be regarded as realization-sensitive, since that pain would no longer be positioned to exercise the power if it were to come to be realized by P1 instead. In accordance with §2.2’s proposal, I hold that a P2-realized pain’s possession of such a power follows from the truth of a counterfactual along the lines of: if the given pain were (to continue to be) realized by a P2-token, and further conditions C1, C2, …, Cn obtained, then the pain would cause sleep loss. [↑](#footnote-ref-51)
52. *Objection*: A realization-sensitive power like 2FP1, possessed by M, is distinct from the corresponding non-realization-sensitive power 2F, possessed by P1. But in that case, the forward-looking causal powers of M do not include as a subset the forward-looking powers of P1, in violation of **Forward Superset**. *Reply*: My preferred response is to *identify* M’s 2FP1 power with P1’s 2F power. After all, on my account causal powers are to be analyzed in terms of counterfactuals, and arguably the truthmaker of (PAIN CF) is the same as that for the following analogous counterfactual: If a given P1-token were realized by a P1-token, and further conditions C1, C2, …, Cn obtained, the P1-token would cause sleep loss. This new counterfactual requires a conception of realization on which a P1-token can realize itself, but perhaps this is unobjectionable—it is a familiar point that types (trivially) supervene on themselves, and there are conceptions of grounding on which truths ground themselves (see for example Fine (2012) on weak ground). At any rate, if the identification goes through there is no objection to **Forward Superset**. But suppose you don’t like this first response. I have a backup. Instead of accepting **Forward Superset** as formulated, I could accept a modified version stating that if P realizes M, then for every forward-looking causal power of P, M either possesses that very power or a realization-sensitive analogue of it, where for example 2FP1 counts as such an analogue of 2F. And similarly, I could accept a modified version of **Backward Superset**. In that case, I would contend that even though M possesses powers not (exactly) possessed by its physical realizers (like 2FP1), these powers are related to those of its realizers in a way that poses no threat to physicalism. In taking this line, I would draw on the argument presented in §3.3. Thanks to an anonymous referee for raising the issue. [↑](#footnote-ref-52)
53. Shoemaker (2007: 14) defends **Forward Subset** by appealing to Yablo’s (1992) *proportionality constraint* on mental causes (which states that a mental token must be more proportional to a given effect than the token’s physical realizer is if that mental token rather than the realizer is to qualify as causing that effect, where such proportionality is analyzed using counterfactuals). Presumably he rejects an analogous proportionality constraint on mental *effects* (stating that mental effects must be proportional to their causes), but he does not explain why or discuss the point at all. Anyway, he could attempt to ground the asymmetry his theory posits in some putative asymmetry of proportionality. I am not sure how such an argument would go, and at any rate, I think there are compelling reasons to reject Yablo-style proportionality constraints on mental causation—see Tiehen (2011) and Shapiro and Sober (2012). [↑](#footnote-ref-53)
54. See Lewis (1970 and 1972) on functional definition. [↑](#footnote-ref-54)
55. In her (2011) paper on metaphysical “building relations” (which include realization, grounding, etc.), Bennett imagines ‘some overzealous student of David Lewis championing mereological composition as the One True Building Relation,’ meaning that there would be no need to posit any distinct building relation. Overzealous Lewisianism is consistent with my view but not required by it. [↑](#footnote-ref-55)
56. To further illustrate this, consider a pain here in the actual world realized by P1 and possessing the realization-sensitive power 5FP2. Now consider a world *w* that shares the same physical laws that we have governing P1 (and so P1 qualifies as a pain-realizer at *w* just as it does here) but with different laws governing P2, so that at *w* P2 either fails to occupy the pain-role, or it occupies it while P2-tokens lack the power 5F. Then a pain-token at *w* that is realized by P1 will fail to possess the realization-sensitive power 5FP2, unlike a pain-token that is realized by P1 here in the actual world. This shows that here in the actual world, the tokening of P1 does not, *taken by itself*, entail the tokening of a pain possessing 5FP2. See n. 60 for further discussion. [↑](#footnote-ref-56)
57. For discussion of the problem (sometimes under different names), see for example Zimmerman (1995), Wasserman (2002), Bennett (2004), Sider (2008), deRosset (2011), Sutton (2012), and Saenz (2015). [↑](#footnote-ref-57)
58. Gibbard (1975). [↑](#footnote-ref-58)
59. Bennett (2004). [↑](#footnote-ref-59)
60. To return to the example from n. 56, here in the actual world, the tokening of P1, *when taken together with the physical laws governing P2*, entails the tokening of a pain with the realization-sensitive power 5FP2, since those laws entail P2 both qualifies as a pain-realizer and possesses 5F. So, it’s not as though the pain token has causal powers (or other modal properties) that are entirely physically ungrounded; it’s that what grounds the power in question is a physical truth about P2 rather than a truth about the P1 realizer. In Tiehen (2014), I use this point to respond to McLaughlin (2007), and to reject Shoemaker’s (2011) own response to McLaughlin. [↑](#footnote-ref-60)
61. Fodor (1997: 161). [↑](#footnote-ref-61)