

How to Achieve the Physicalist Dream: Identity or Grounding?*

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Imagine [a picture] with a million tiny pixels. The picture and the properties *reduce to* the arrangement of light and dark pixels. The supervenience of mind and all else upon the arrangement of atoms in the void — or whatever replaces atoms in the void in true physics — is another case of reduction.

David Lewis (1995)

The reader is welcome to label ground physicalism a form of “dualism” or “emergentism” (or perhaps a new position entirely), so long as she recognizes that ground physicalism is built around the thesis that the mental is not fundamental but rather grounded in the physical.

Jonathan Schaffer (2020)

Most of nature is pretty is boring: just different arrangements of atoms in the void. But consciousness seems special. When brains reached a certain complexity, a miracle happened. There appeared properties of a wholly novel type: *conscious experiences*. To explain this, we may have no choice but to posit special “psychophysical laws”. There are possible worlds where these laws don’t obtain, the miracle doesn’t happen, and we are all zombies. This is *property dualism*.

In “Sensations and Brain Processes”, J. C. Smart articulated just how unappealing property dualism is. It provides a complex and nonuniform picture of reality. And he put forward an alternative physicalist dream picture of reality. In sentient as well as insentient nature, “there is nothing in the world but increasingly complex arrangements of physical constituents” (1959: 142). *All* of nature is pretty boring. We no more need special laws to explain consciousness than we need special laws to explain digestion.

Smart apparently favored *identity physicalism*. Roughly, everything reduces to physical and topic-neutral elements. Other proponents include David Lewis, Cian Dorr and Ted Sider.

However, most physicalists today favor *nonidentity physicalism*. For example, Mark Johnston, John Campbell, and Jonathan Schaffer have defended versions of this view. Roughly, this view agrees with property dualism that conscious states are not identical with any physical-functional states. But, while dualists hold that conscious states and physical-functional states are connected by way of contingent nomic laws, nonidentity physicalists hold that they are connected by way of metaphysically necessary “grounding laws”. So they differ on the possibility of zombies.

In this essay, I will argue for three claims.¹

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¹ I have briefly argued for these three claims elsewhere (2004, 2010, 2015).

First, Smart was right that there is a strong argument for identity physicalism over dualism. It does achieve the physicalist dream of a maximally simple and uniform view of reality. However, there are also strong arguments against identity physicalism concerning the special nature of conscious experiences.

Second, although nonidentity physicalism is a possible fallback position, there is no reason to prefer to property dualism. It provides an equally complex and unattractive picture of nature.

Third, assuming identity physicalism fails, we also *should not much care* about which of these options is right. In fact, it becomes difficult to understand the difference.

In §1 I briefly go over the problems with dualism. In §2 I introduce identity physicalism and show it is better than dualism when it comes to simplicity, uniformity, and mental causation. In §3, I introduce the fallback position nonidentity of physicalism. In §§4-7, I argue that it is no better than dualism in these respects and in fact it is hard to understand the difference.

1. The Dualist Nightmare: A Complex and Non-Uniform Picture of Reality

1.1 Galilean dualism

I accept *Galilean intentionalism* about sensory consciousness (Pautz 2010). So, in order to illustrate dualism, I will work with this view.

To illustrate Galilean intentionalism, suppose you view a tomato on a table. Your experience is fully internally dependent. Even if you were an accidental, life-long brain in a void, you would have the same experience. But, as a matter of phenomenology, it is also essentially externally directed. In having the experience, you are *conscious of* a state of affairs in which there is a reddish and round item in space. So the brain has a mysterious capacity to enable you to be conscious of the quality red and the shape round, even if those properties don't occur *in* the brain or indeed anywhere at all (as in the brain-in-the-void case). Finally, this view holds with Galileo that "tastes, odors, colors, etc., only exist in consciousness". The physical world is just atoms in the void; it is radically different from the way it appears. For instance, the red quality you experience is not a reflectance property instantiated by the physical tomato. It is not in the physical world at all. It is also not a neural property instantiated in your brain (no more than the shape *round* is). And it is not a property instantiated by a round sense datum generated by your brain in a private mental space – there exists no such item, there merely seems to be one. The quality *red* only lives in the intentional content of your experience.

How did our brains manage to enable us to be conscious of Galilean qualities that occur nowhere in nature? On a dualist version of Galilean intentionalism, we must just accept with "natural piety" a slew of contingent, fundamental psychophysical laws linking our brain states with our being conscious of Galilean qualities and shapes. Here is how Jerry Fodor puts it:

Maybe the hard problem [of consciousness] shows that not all basic laws are laws of physics. Maybe it shows that some of them are laws of emergence. [Maybe] all the big things are made out of small things, and there are laws about the small things and there are laws about the big things, but some laws of the second kind don't derive from any laws of the first kind. In that world, it might

be a basic law that when you put the right sorts of neurons together in the right sorts of way, you get a subject of consciousness. (Fodor 2007: 10)

1.2 Problems for property dualism

In “Sensations and Brain Processes”, Smart brings out three problems with any such dualist theory.

First, Smart notes that dualism is *complex*. It requires novel macro-level natural kinds. It also “involves a large number of irreducible psychophysical laws”. So it goes against “Occam’s Razor” (1959: 142, 156). He also notes that they are *unlike other fundamental contingent laws* nature (the physical laws) as they relate very unnatural states of the brain to natural experiential properties. And there are worries about whether they could be systematized (Adams 1987).

Second, Smart notes that dualism requires *nonuniform* account of nature. In the beginning, there was a big bang. For eons, before brains of a certain complexity evolved, “there is nothing in the world but increasingly complex arrangements of physical constituents” (1959: 142). Dualists agree with this; they accept “identity physicalism” for all of insentient reality (or so I shall assume). But dualists hold that, when complex brains evolved, irreducible conscious properties started “popping up”. And they popped up nowhere else. Smart objected: “that everything should be explicable [reducible] in terms of physics except the occurrence of sensations seems to me to be frankly unbelievable” (1959: 142). It goes against our belief in the uniformity of nature, a belief that we may be *a priori* entitled to hold.

Third, Smart also notes that that, given causal closure (and setting aside systematic overdetermination), dualism requires epiphenomenalism, which is objectionable.

I want to add to the problem of nonuniformity. The problem is not only that, on dualism, properties pop up that are different from other macro properties (geological properties, biological properties) in being *irreducible*. They are different from other macro properties in other ways.

First, on many forms of dualism, there is a big difference in the metaphysical structure of conscious experiences and the physical-functional properties they depend on. For instance, on Galilean intentionalism, conscious experiences are relations to uninstantiated edenic qualities. But the brain states on which they depend do not have this structure. In fact, no other macro properties in nature are like this.

Second, normativity. Dualists will probably say that it is in the “constitutive essences” (Fine 1994) of conscious to ground normative and epistemic reasons. Pains essentially ground reasons to avoid, pleasures essentially ground reasons to seek. Experiences also ground reasons for beliefs. It is in the nature of having a tomato-like experience to give you a reason to believe you are having that experience and that a round thing is there. It also gives you knowledge of what red is like. Maybe simply being capable of consciousness in general has intrinsic value. Indeed, perhaps conscious experience is the *sole* source of value in the world.

This makes conscious properties very different from other macro properties in nature. Other macro properties in nature independent of conscious experience (chemical properties, geological properties, etc.) do not essentially ground normative reasons. Even the neural properties underlying our experiences, for instance *undergoing C-fiber stimulation*, do not essentially ground having reasons, according to dualists. They merely

cause experiences that essentially provide reasons. Likewise, other macro properties in nature do not have built in epistemic significance. For instance, having the physical property *weighing 180 lbs.* doesn't essentially give you a reason to self-attribute that property, in the way that having the experiential property *feeling searing pain* does.

Next, novel standout determinables. We have a concept of *qualitative resemblance*: quality x resembles quality y more than quality z . It has the following features. First, it is not resemblance "in a respect". For instance, smell qualities do not resemble in "respects". They simply resemble more or less closely. Second, it is simply in their essences that they stand in this relation; it is not grounded in anything more fundamental. Third, it is also a "standout" relation (perhaps a fundamental relation) like no other. When quality x resembles quality y more than z , there is never another, "equally good" sense in which x is more like z than y . We can stipulate that properties form a "standout determinable" just in case they stand in the special relation of qualitative resemblance to each other and to no other qualities. Properties belonging to *different* such tightknit families – for instance a color and a smell – are maximally different; they *incommensurable*.

Now imagine the world before sentient organism appeared. And *suppose that an austere physicalism applies to this pre-sentient reality* – what I call "identity physicalism". Reality is devoid of the qualities we experience, as Galileo taught us. As insentient nature evolves, "new" types of macro properties appear: chemical properties reflectance properties, geological, and so on. But they do *not* uniquely divide into nonoverlapping, incommensurable tightknit families, where the members of each family stand in the single, standout relation x *qualitatively resembles y more than z*. They are just different arrangements of the same fundamental ingredients that were in reality at the start; and their resemblances and differences can be measured in many different, equally good ways.

Dualists hold that, when brains evolved and created conscious experiences of *sensible colors, smells, tastes, pains*, and so on, something *radically different* happened. I think one way to put one's finger on what was so novel here is that, unlike macro properties in the rest of nature (molecular properties, reflectance properties, biological properties, and so on), these qualities (and, derivatively, our experiences of them) *do* form many wholly *novel, standout* determinables: color qualities, smell qualities, pain qualities, and so on. They uniquely divide into a handful of nonoverlapping, incommensurable tightknit families, where the members of the families stand in a single, standout relation x *qualitatively resembles y more than z*. In this way, they are *very* different from all other macro properties in nature (including the neural properties that underlie them).

Finally, radical macro-level discontinuities. Elsewhere in nature, where there are synchronous determination relations, similarities and differences at "higher" levels are matched by similarities at "lower" levels, at least if we measure the similarities right. (In fact, if identity physicalism is true, so that the "high level" is identical with the "low level", this *must* be the case, in some sense.) But, on dualism, the dependence of the experiential on the physical is not like this. For instance, one brain state results in the experience of *red*, and another brain state results in the smell of *citrus*. The two brain states are really quite similar; although they take place in different parts of the brain, they are after all just different patterns of firing in the same types of neurons. But, on dualism, they result in experiences that are *entirely incommensurable*. Or consider a pattern of neural firing that underlying a conscious experience and another one that doesn't

underlie any conscious experience at all (you could undergo it while sleepwalking). Again, they are fundamentally quite similar. But on dualism the first results in a *conscious experience with technicolor phenomenology* while the second grounds *nothing interesting at all*. So there is a *massive* difference in what they result in. Indeed, under dualism, the line between the conscious and the nonconscious is the *biggest line in all of reality*.

In sum, dualism faces three big problems: the complexity problem, the nonuniformity problem, and the causal problem. We have reason to think nature is not like this. At least, we don't *want* nature to be like this. It would be a real disappointment.

2. Identity Physicalism Achieves the Physicalist Dream

2.1 Identity physicalism explained

I will now introduce “identity physicalism” and then summarize the arguments for preferring it to dualism: the argument from simplicity, the argument from uniformity, and the causal argument.

David Lewis (1994) nicely captures the view I call “identity physicalism” in the following passage:

Imagine a grid of a million tiny spots — pixels — each of which can be made light or dark. When some are light and some are dark, they form a picture, replete with interesting intrinsic gestalt properties. The case evokes reductionist comments. Yes, the picture really does exist. Yes, it really does have those gestalt properties. However, the picture and the properties reduce to the arrangement of light and dark pixels. They are nothing over and above the pixels. They make nothing true that is not made true already by the pixels. They could go unmentioned in an inventory of what there is without thereby rendering that inventory incomplete. The [dependence] of mind and all else upon the arrangement of atoms in the void — or whatever replaces atoms in the void in true physics — is another case [of reduction].

In order to formulate identity physicalism, we first need two ideas on the table.

First, the *austere fundamental base*. This includes everything that can be expressed in a fundamental language for describing our world. To begin with, we assume that there is some set of fundamental global dynamic laws (e. g. describing the evolution of the quantum state). They govern fundamental properties and relations that belong to very small things and that are widespread in nature (e. g. position, energy, spin, particle number).² To handle quantum entanglement, we may need to include a fundamental entanglement plural property holding among particles (Bohn 2012). The pattern of instantiation of these properties at a time, together with these laws, completely determines the probabilities of all possible future world-states. The “austere fundamental language” include predicates expressing all these properties and relations. It also includes predicates

² These fundamental physical properties could turn out be “quiddities” (Chalmers 2012). Identity physicalism is neutral here.

expressing all fundamental spatio-temporal relations. If there is an irreducible law-making relation (“nomic necessitation”) or sentential operator (“it is a law of nature that . . .”), it includes that too. It includes fundamental logical vocabulary, including that of modal logic and mereology. It includes lambda-abstraction, allowing for the formation of complex predicates. It includes names of all fundamental physical items. If the identity physicalist likes unrestricted mereological composition and ZCF set-theory, it includes the ideology of these theories and names for all the sums and sets constructible from the fundamental physical items. If the identity physicalist thinks that numbers are *sui generis*, it includes language for talking about them. If the identity physicalist accepts “necessitism” about properties (necessarily, all properties exist necessarily), it includes all predicates for all possible alien fundamental properties. For they exist at our world even if they are not instantiated in our world.

A second idea that will help us formulate Lewis’s vision of the world is that of *generalized identity*, recently discussed by Cian Dorr (2016). Lewis himself uses the dark word “reduction”. But I find the idea of generalized identity more clear. We are all familiar with identity statements like ‘Hesperus is Phosphorus’ in which the expressions flanking “is” are denoting phrases. We also have a grip on identity claims like “to be a vixen is to be a female fox” in which the expressions flanking “is” are not denoting phrases. Here “is” combines with two *predicates* to make a sentence, rather than two denoting phrases.

According to Dorr, the “is” in “to be vixen is to be a female fox” cannot be analyzed in more fundamental terms - no more than the “is” in “Hesperus is Phosphorus”. In particular, Dorr would reject the view of Gideon Rosen (2105) that it can be analyzed in terms of “metaphysical necessity”, “essence” and “grounding”. In fact, Dorr (2016: 69, 79) says that these are dark notions that we should avoid unless they can be explained in terms of identifications. For instance, he suggests that for something to be metaphysically necessary is for it to follow from identifications and logic.

If there are properties, then “to be a vixen to be a female fox” implies that the *property* of being a vixen is identical with the (conjunctive) *property* of being a fox and being female. But “to be a vixen is to be a female fox” should not be equated with such a property-identity. It could be accepted by nominalists who reject properties.

Now we can formulate identity physicalism as two claims. First, every *thing* in our world is identical with something that you can name in the austere fundamental language (a fundamental physical thing, or a sum of them, or a set constructible by them). Second, every *property* instantiated in our world is identical with a property expressed by a predicate (perhaps an infinitely complex predicate) in the austere fundamental language. For instance, for a sum of two atoms to be carbon monoxide is *for one part to be a carbon atom, the other part to be an oxygen atom, and for the parts to be bonded*. This goes for biological properties, and even conscious properties like *being conscious of the quality red*. They are all complex properties like this. Since “to be *F* is to be *G*” make sense even if there are not properties, we could formulate identity physicalism in a nominalistically-acceptable way. However, I will continue to talk about properties for ease of expression.³

³ Depending on how physics turns out, identity physicalism may imply that reality differs from how it appears – a kind of generalized Galilean view. For instance, David Albert (1996: 277) says that quantum mechanics implies that “the space we live in is configuration space” and “whatever

Besides David Lewis, Ted Sider defends identity physicalism.⁴ For instance, after describing his own view of the “austere fundamental language”, Sider writes:

What remains is to sketch a metaphysical semantics for ordinary and scientific language. This is a formidable task, since the worldview is so austere. What of predicates like ‘x is a table’ or ‘y is a person’? How can we say, in the language of physics, logic, and set theory, which sets of points of spacetime are tables and persons? Of course I have no clue. Nevertheless, I am confident that a metaphysical semantics could in principle be given. The reason is that the array of definable relations is extremely rich.

Notice that the austere language has the resources to form predicates expressing “functional properties”: having some property that necessitates property *P*. So identity physicalists can identify macro properties with functional properties. The austere language might also contain names for alien properties. So identity physicalists can identify macro properties with properties “disjunctive properties” with alien disjuncts. These points are relevant to the problem for “multiple realizability” for identity physicalism – a problem we will look at presently.

When it comes to conscious experiences, identity physicalists have a variety of options. For instance, if they accept intentionalism, they might identify sensible properties (color qualities, smell qualities, etc.) with external physical properties (reflectance properties, chemical properties, etc.), and they might identify the conscious-of relation with a complex “tracking” relation (Dretske 1995, Tye 2000). Or they might reject intentionalism, and identify experiences with brain states that don’t essentially represent anything (just as words don’t represent anything).

2.2 Identity physicalism: maximally simple and uniform

Identity physicalism holds that our world is like Lewis’s pixel world: maximally simple and uniform.

First, simplicity. In Lewis’s pixel world, there are “macro-level” properties like *making a pixel face* (a shape that looks like a human face), but they reduce to complex conditions definable in fundamental terms. So our theory of the pixel world is simple in terms of ideology and ontology. In addition, we don’t need any special non-logical principle to explain why, when the pixels are arranged a certain way, they *make a pixel face*. In the same way, unlike dualism, identity physicalism about world is simple. It does not require any special psychophysical laws to explain the emergence of conscious properties from the fundamental physical and topic-neutral description of reality. In fact, it needs no

impression we have to the contrary (whatever impression we have, say, of living in a three-dimensional space, or in a four-dimensional space-time) is *flatly illusory*”. For relevant discussion, see Chalmers (2012: 290-298).

⁴ Sider appeals to the idea of a “metaphysical analysis”, which I will not go into here. Cian Dorr is another proponent of identity physicalism (personal discussion). In print?

special extra-logical principles at all (including “grounding laws”).⁵ True, it asserts identity claims. But identity claims have a very special: *they do not add to the complexity of our theory of the world.* (Pace Chalmers (xx), this is true even if they are deeply *a posteriori*.) For instance, if you believe in Mark Twain (that is, Samuel Clemens), then “Mark Twain is Samuel Clemens” doesn’t add to the complexity of your theory of the world. The same is true of claims of the form “to be *F* is to be *G*”. So identity physicalism is maximally simple.⁶

Second, uniformity. We saw in §1 that dualists hold that something happens in connection with brains that is anomalous in many ways. Identity physicalists avoid the anomalism of the experiential.

First, pop-up. Identity physicalism avoids irreducible properties “popping” up when brains evolve. Identity physicalism was true in the first moments after the big bang. And if it was true at *t*, it is plausible that it is true at moment *t* + 1. And that is precisely what identity physicalist say: it is true at all times and places. True, new properties come to be instantiated. But they are always just arrangements of the fundamental physical and topic-neutral properties.

Next, big difference. As noted above, dualists often hold that experiences have a metaphysical structure (e. g. acquaintance with Galilean qualities) different from that of the physical-functional states they depend on. But, of course, identity physicalism rules this out this kind of big difference. For instance, if experiences are brain states, they cannot have a different metaphysical structure from those brain states.

Next, normativity. We saw that, among macro properties in nature, dualists will say that conscious properties (pains, pleasures, visual experiences) stand out in that it is part of their essences to ground normative and epistemic reasons. They glow with normative power. This makes them look very special. Identity physicalists will deny all this. For instance, they will say that pain is just C-fiber stimulation, and value and disvalue of a thing reduces to a response-dependent property involving whether the thing is apt to be desired or not desired, or something along these lines (Lewis). C-fiber stimulation only has disvalue because we happen not to *like* it (which itself reduces to something functional); and this is not part of the essence of C-fiber but a contingent, relational feature of it. Likewise, it is not the case that undergoing C-fiber (hence pain), just by virtue of his intrinsic nature, grounds a reason to believe that you are in that state. In general, take all the complex properties definable in terms of the fundamental base. *None* of them

⁵ In Pautz (2004) I argue that identity physicalism can be quite complex because it requires necessary connections between basic properties and countless complex properties – necessary connections that can look strange. But identity physicalists could be *nominalists* who don’t believe in any properties at all, whether “simple” or “complex” (Sider 2011). In addition, even if identity physicalists do believe in complex properties, they might have a quite simple and general “maximalist” theory of them (Zalta 1988).

⁶ Some (Papineau 1993, Dorr 2016) have said that identifications “don’t cry out for explanation”. I am not saying this because I am unsure what it means. Instead, I am saying that they don’t add to the complexity of our theory. In fact, identity physicalists can hold that the “book of the world” (Sider 2011) can be complete even if such identifications are not included in the book and it is entirely written exclusively in the austere fundamental language. This kind of identity physicalism may require illusionism about consciousness in the sense of Chalmers (2018).

glow with essential normative power. So, unlike dualism, identity physicalism avoids normative singularity.⁷ Once again, identity physicalism is more uniform.

Next, stand out determinables. Above we saw that another way in which dualism is non-uniform is that it holds that conscious properties are unlike all other macro properties in nature in that they form novel standout determinables, where this was explained in terms of a standout relation *x qualitatively resembles y more than z*. Identity physicalists will deny this too. They will say that it may seem to be the case, but we must give it up. For they will say that all macro properties, including experiences, are just different complexes of the austere fundamental properties. For instance, maybe experiences are *distributed neural patterns*, which in turn are identical with enormously complex properties definable in the austere fundamental base. Then they are all fundamentally similar to one another. They do not divide uniquely into non-overlapping families, where the members of the same families stand in the standout relation *x qualitatively resembles y more than z* and members of different families are incomparable. For instance, there are many different but equally good ways to group neural patterns into nonoverlapping families. Thus, our experiences are just such neural properties, they do not form novel stand out determinables, in the sense explained above.

Finally, and relatedly, dualism requires radical macro-level discontinuities, but identity physicalism avoids them. On identity physicalism, it is not the case that some neural patterns result in variety of wonderful color experiences, others result in a variety of incommensurable smell experiences, while still others result in no states of consciousness at all. On this view, neural patterns do not “result in” anything distinct from them all.

In short, dualism holds that conscious properties appear in connection with brains that are irreducible, metaphysically special, have built-in normative glow, belong to novel standout determinables, and make for radical discontinuities in nature. By contrast, identity physicalism achieves completely uniform picture of reality. Just as in the pixel-world, all macro level properties are different constructions of a fundamental set of properties and relations; they are all fundamentally the same. True, our “phenomenal concepts” of them might make some of the – the conscious properties – seem special. But in reality they are nothing special.

Finally, mental causation. As many have discussed, identity physicalists can accept that instantiations of the multiply realizable mental properties cause of our behaviors, in addition to instantiations of “realizer” properties. This is an unobjectionable form of overdetermination (Loewer 2015).

Because of the explanatory gap, the physicalist idea that conscious experiences are necessitated by austere physical conditions certain lacks *a priori* support. How then could we ever justify such a strong modal claim? Identity physicalists can offer a two-step *justification by identification*.

1. The speculative hypothesis that conscious properties, and indeed all macro properties in nature, are identical with extremely complex properties (e. g. functional properties) defined in terms of fundamental base has the great theoretical virtues of simplicity and uniformity.

⁷ For more on this issue, see Lee (2019) and Pautz (2020).

2. This hypothesis entails the strong necessitation thesis required by physicalism.
3. So, by standard abductive methodology, that hypothesis is probably true.

2.3 *Against identity physicalism: the special nature of consciousness*

I would like to believe identity physicalism. But I think it cannot be right.

We can distinguish between two types of arguments against identity physicalism. There are *general arguments* to the effect that it fails for all macro-level properties. Then there are arguments from the *special nature* of conscious properties. I think that the general arguments fail but certain “special nature” arguments succeed.

One general argument against identity physicalism is an argument from failure. No one has given a counterexample-free biconditional analysis of the boring property *being a mountain* (Fodor xx). We certainly cannot keep on going until we reach the fundamental base. So *being a mountain* is an extra, irreducible property in sense that is not *identical with* any complex property (not even an infinitely complex property) definable in terms of the fundamental base. It is necessitated by a huge range of austere fundamental conditions; but it is not identical with any of them, their disjunction, or a “functional property” realized by them and definable in fundamental terms. So we need to believe in necessary “bridge laws” that aren’t derivable from identifications and logic.

But this argument against identity physicalism is unconvincing. Here is a quick way to see this. In pixel-world example mentioned earlier, we cannot define *being a pixel face* in terms of pixel states and relations, given all the varieties of pixel faces (sad, happy, etc.). But, clearly, in the pixel-world, all properties are just complex properties constructible from the fundamental base. Likewise, in the actual world, given the fundamental base, “the array of definable properties and relations is extremely rich” (Sider 2011: 130, 294). *Some* of them are bound to be such that their extensions, in this world and other worlds, match pretty well that of “is a mountain”. In the interest of simplicity, why not say “is a mountain” expresses one of these definable properties (relative to a precisification), rather than positing a mysterious extra irreducible property for it to pick out, requiring its own extra-logical bridge laws?

Another general argument against identity physicalism concerns multiple realizability (Schaffer 2013). I just said that there are bound to be definable properties or relations whose extensions across worlds match that of “is mountain”. But maybe this is not so. Intuitively, “is a mountain” can apply in possible worlds which the fundamental properties are not mass, charge and spin, but some “alien” properties. So, while in the actual world it is grounded in an open-ended range of possible fundamental configurations, it is not identical with any of them or their disjunction.

This argument, too, is unconvincing. First, if the multiple realizability were a good argument, then it would presumably equally show that in the pixel-world some high-level properties are not identical with complex properties built from the fundamental properties. But then something has gone wrong, because it is quite clear that in this world all high-level properties are identical with such complex properties. Second, turning back to our world, the fundamental language allows us to construct *functional* properties. This can help the identity physicalist accommodate multiple realizability (Sider

2013).⁸ Third, if the identity physicalist accepts “necessitism” about properties (all properties exist necessarily), the fundamental language includes all predicates for all possible alien fundamental properties, since they exist at our world even if they are not instantiated in our world. So, perhaps multiply realizable macro predicates like “is a mountain” express, relative to *some* acceptable precisifications, infinitary disjunctions, where some disjuncts are arrays of physical properties and others are arrays of alien properties but where the disjuncts are “similar” by some measure. Fourth and last, even if the fundamental base only contains the fundamental properties instantiated at our world, *counterpart theory* applied to properties might be used to accommodate “the property of being a mountain might be instantiated even if the world contained only alien properties”. For even if “being a mountain” here refers (relative to every precisification) to a complex property *C* built from (in part) physical properties instantiated at *our* world, this sentence might come out true, if in an alien world a suitable *counterpart* of *C* is instantiated by the mountain-like things in that world.

So general arguments against identity physicalism fall short. There are also arguments from special nature. For instance, John Campbell claims that “redness is not a microphysical property” because in the “special case” or colors “the nature of the property is transparent to us” (1993: 258). Mark Johnston suggests that *conscious acquaintance* is special: “Herein lies the deep inadequacy of reductive materialism: There is no reduction of a relation which essentially involves disclosure to any combination of relations which essentially do not” (2011: 215-216). And Schaffer relies on intuitions of distinctness, saying that experiential and physical-functional properties “look like clearly different properties” (2020).

Elsewhere I have developed my own arguments from the special nature of consciousness against identity physicalism. Briefly, they are as follows.

First, the argument from internal intentionality (Pautz 2010 and 2019; Mendelovici 2018). Suppose you see a tomato. A brain in a void might have the tomato experience in which it is *conscious of* the shape round and the quality red. But, the BIV is cut-off from the world and bears no interesting causal-informational physical relations to these properties – no relations constructible from the austere fundamental base. So the tomato experience involves standing in an *irreducible* mental relation to *red* and *round* (akin to Russellian acquaintance). Our usual externalist models for reducing intentionality (e. g. Neander 2017, Dretske 1995, Tye 2000) do not apply to conscious intentionality. Further, Galileo was right: the property *red* you are conscious of seeing a tomato isn’t instantiated in the physical world at all.

Second, the argument from significance (Pautz 2017). The conscious-of relation has a special normative and dissimilarity-making significance that no physical-functional relations possess. So, for this reason too, it must be taken to be distinct from any physical-functional relation.

Third, the argument from determinacy (Pautz 2017). The conscious-of relation is a source of determinate intentionality. When you are conscious of a quality, you are able to easily and determinately think about that quality. In these fundamental cases, radical

⁸ In responding to Schaffer (2013), Sider (2013) notes that the functionalist account of multiple realizability works smoothly for identity physicalists who are *realists* about properties. He does consider another problem arising out of multiple realizability, but it only arises for nominalists like himself.

Quinean indeterminacy worries just do not get a grip. I have argued that this requires that we give up identity physicalism for the conscious-of relation.

3. Nonidentity Physicalism for Consciousness

Arguments from the special nature of consciousness against identity physicalism will be controversial. But, for the sake of discussion, let us assume going forward that they indeed undermine identity physicalism for consciousness.

For the sake of concreteness, I will also assume that these arguments support the idea that consciousness have a *special nature* in at least some of the following respects:

1. Experience consist in standing in an irreducible conscious-of relation to ostensible states of affairs involve perceptible properties like red and round, and so are very different from the brain states they depend on.
2. It's in the constitutive essence of experiences (pains, pleasures, visual experiences), but not the underlying physical-functional states, that they ground reasons to believe and desire certain things.
3. Experiences belong to novel stand-out determinables, unlike other macro properties in nature.
4. Experience makes make for *radical discontinuities* or *radical breaks* in nature, as when one neural pattern grounds an experience but another neural pattern grounds nothing interesting at all.

Now 1-4 often go with dualism, but they are also consistent with a form of physicalism. Even if conscious experiences are very different from complex conditions definable in terms of the austere fundamental, they might yet be “metaphysically necessitated by” or “grounded in” such conditions. This is a form of *nonidentity physicalism*. Compare the way in which Mooreans hold that normative properties are distinct from natural properties because of their “special natures”, but then go on to say that they are “metaphysically necessitated” by natural properties.

In the present section, I will describe nonidentity physicalism and its different forms. In subsequent sections, I want to consider whether nonidentity physicalism might achieve the dream of a uniform and simple account of reality. I will suggest that it achieves that dream no better than dualism. There is *no reason to prefer it to dualism*. Since I think the best case against identity physicalism comes from arguments from the special nature of consciousness, I will typically assume nonidentity physicalists accept claims like 1-4 above, but I will also consider “tamer” forms of nonidentity physicalism.

To get a feel for nonidentity physicalism for consciousness, I will start with the form I would myself defend were to go in for this view: Galilean nonidentity physicalism.

3.1 An illustration: Galilean nonidentity physicalism for consciousness

As illustrated in Figure, Galilean nonidentity physicalism is just like Galilean dualism briefly introduced in §1.1, but it upgrades the psychophysical laws from contingent laws (thin arrow) to metaphysically necessary grounding laws (tick arrow).

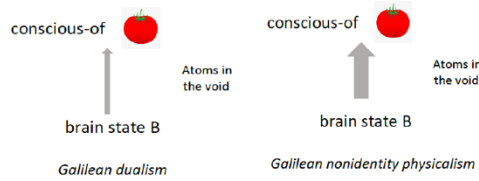


Figure 1

To understand, Galilean nonidentity physicalism, let's first say more about Galilean dualism than we did in §1.2. Galilean dualists will hope for psychophysical laws with the same simplicity and systematicity as the fundamental physical laws – laws that could be written on a t-shirt (Chalmers 1995). And there is indeed some evidence of systematic correlations.

For instance, several recent studies show that, in visual area 4 (V4), neural similarity space matches the similarity space of the colors we are conscious of (Bohon *et al.* 2016). So maybe one law looks like this:

Color Law: If the fundamental physical and topic-neural base properties are arranged so that a subject undergoes V4 brain state B , then they are in the distinct state of standing in the irreducible conscious-of relation to color $f(B)$, where f is a systematic function from V4 brain states onto Galilean colors.

In general, there is evidence *distributed neural patterns* vary along parameters corresponding experiential parameters. For instance, if you firing rates of pain-matrix neurons increases, then the intensity of the Galilean pain you are conscious of increases in proportion (Coghill *et al.* 1999). So dualists can hope that there are such laws for other ranges of Galilean properties.

For the sake of discussion, I will assume a brain-based (or “internalist”) account of the physical basis of experience. And I will assume that there such systematic correlations between neural states and experiential states.

Now we can explain Galilean *nonidentity physicalism* (Figure 1b). It is exactly like Galilean dualism as regards ontology. Just like Galilean dualists, nonidentity physicalists hold that, in connection with certain brain states (but not others), novel properties appear that are *very different* from other macro properties in nature in respects 1-4.

The only difference between Galilean dualism and Galilean nonidentity physicalism concerns the *status* of the Color Law and other psychophysical laws connecting brain states with distinct conscious states. While Galilean dualism holds that the Color Law is a contingent nomic law, Galilean nonidentity physicalism holds that it is a grounding law. Necessarily, being in in V4 brain state B always *grounds* standing in the irreducible conscious-of relation to color $f(B)$.

Grounding is supposed to be an undefinable relation among distinct facts that we can get grasp by considering examples (Fine 2012, Rosen 2012, Schaffer 2020). For instance, the natural fact that an action causes pain for fun grounds the distinct normative fact that you ought not to do it. The fact that there exists an immaterial hole in the cheese is grounded in the arrangement of the matter in the cheese. Galilean nonidentity

physicalism claims that the same connection holds between our brain states and our very different conscious experiences. For the sake of formulating nonidentity physicalism, I will assume that we do have a grip on this indefinable connection (but at the end of the essay, in §7, I will question this). In assuming that grounding is indefinable, I am not assuming that specific experience-physical grounding connections cannot be explained. In §3.3 we will see that some nonidentity physicalists may explain them in terms of the “essences” of experiences.

Indeed, more extreme forms of Galilean nonidentity physicalism are possible. Maybe, when your brain undergoes the right brain states, this grounds the fact that there exists an *immaterial soul* and a reddish and round *sense datum* that the soul is acquainted with (Lockean “representative realism”). On the view I have in mind, *there are* such immaterial subjects and objects in the same sense in which *there are* electrons. Only there are such items because (in the sense of metaphysical explanation) you undergo the right brain states. Compare: there are immaterial holes in the cheese only when its matter is arranged in a certain way.⁹

Dualists recognize possible worlds in which simple subjects (e. g. angels) have the same tomato experience you have but this not *caused by* or *grounded in* anything more basic. Some nonidentity physicalists might recognize such possible worlds. Even if in the actual world the experience is grounded in a brain state, perhaps in another world it might float free from any ground at all.

In general, *nonidentity physicalism* holds that the actual world is very different from Lewis’s pixel world. When brain states of a certain complexity evolved, very unique properties “popped up” that are distinct from all complex conditions definable in terms of the austere fundamental base. Nevertheless, they are “grounded in” such conditions, where grounding is a basic connection that we can get a grip on from examples.

You might think that Galilean nonidentity physicalism cannot be right. If experiences are very different from brain states in respects 1-4, how can they be grounded in such brain states? How can the Color Law be a grounding law?

But, in general, the grounded fact *must be* distinct from the facts that ground it, since the grounds *explain* the grounded fact, and nothing explains itself. Why then cannot the grounds (in this case, brain states) be *very* different from the grounded (in this case, experiences)?

⁹ A terminological note on “identifications”: In 2.1, I adopted Dorr’s account of identifications of the form “to be *F* is to be *G*” as generalized identities, so that (like identity among objects) it is not to be further analyzed. By contrast, Rosen (2015) explains “identifications” as metaphysically necessary biconditional grounding claims. On his view, if the ground physicalist were to accept the sense datum view and then to go on to accept the *biconditional* grounding claim *necessarily, anyone is acquainted with a red and round sense datum (quite different from a brain state) iff and because (grounding “because”) they are in brain state B*, then their view entails *to be acquainted with a nonphysical red and round sense datum just is to be in brain state B*. I think this shows that Rosen’s account of “to be *F* is to be *G*” is incorrect. If the experience involves a red and round sense datum but the brain state doesn’t, how can it be that to have the experience *just is* to be in the brain state? Rosen (in discussion) has offered replies. In any case, in this essay, I am simply stipulating that identifications of the form “to be *F* is to be *G*” are to be understood in Dorr’s way. And on this understanding physicalists who accept the sense datum view, or Galilean intentionalism, don’t accept identifications between the experiential and the physical-functional, even if they accept the relevant biconditional grounding claims.

You might think that the Color Law cannot be a grounding law because it is *a posteriori* and grounding connections must be *a priori*. But grounding is not analyzed in epistemic terms. Grounding connections are out in the world, just like nomic connections. Why then should they be knowable *a priori*? There is conceptual room for *a posteriori* grounding laws, just as there is conceptual room for *a posteriori* nomic laws.¹⁰

3.2 Other examples: Campbell, Johnston, and Schaffer

Many have defended something like nonidentity physicalism for consciousness.

In the previous section, I said science supports experiential internalism. John Campbell (1993, 2020) disagrees. He defends an externalist form of nonidentity physicalism. He agrees with we Galileans that, when you view a tomato, the quality red is a “primitive” property radically different from the reflectance property of the tomato. But whereas we Galileans sweep the quality red into the dustbin of the mind, Campbell keeps it where it seems to be: redness is a property of the *tomato* grounded in its reflectance property (1993: 259).¹¹ In general, something special happens in connection with the *reflectance properties* of objects: the reflectance properties of objects, but presumably not their other physical properties (charges, masses), ground a gamut of special qualities that are very different from those reflectance properties. Furthermore, according to Campbell, you stand in something like a primitive relation of Russellian acquaintance to the instantiation of redness by the tomato, grounded in (but not reducible to) the long causal process going from the tomato and ending with your brain state.

Mark Johnston (1997, ms) also defends nonidentity physicalism for consciousness: he holds that “[appearings of manifest qualities] are constituted by but not reducible to patterns of causation among things”, adding that “the appearing to subjects of manifest qualities can seem very special” and “one may say with some justice that the existence of appearings in a world of things is a mystery”.

Finally, Jonathan Schaffer (2017, 2020) has proposed “ground functionalism”. Schaffer holds that different brain states ground different experiences *by virtue of playing different functional roles* with respect to sensory inputs and behavioral outputs. However, he is neutral on the metaphysics of experiences (e. g. Galilean intentionalism, sense datum view, the “raw feel view”) and the precise input-output functional bases of different experiences. (I noted above that research instead suggests that variations in experiences most systematically depend on variations in *distributed neural patterns*.)

All of these philosophers defend *a posteriori* grounding physicalism because physical-experience connections are evidently not *a priori*. Indeed, Johnston (1997, ms) and

¹⁰ Chalmers (2010: 184–191) holds that metaphysical necessities (framed in transparent language) must always knowable *a priori*. Maybe then the same could true for grounding connections? But Chalmers *analyzes* metaphysical necessity in terms of *a priority* (so that, e. g., physicalism becomes an *epistemic* thesis). I am assuming that grounding is not analyzed in epistemic terms, so there remains conceptual room for deeply *a posteriori* grounding connections.

¹¹ Campbell holds that the color red is “primitive” or “fundamental” in the sense that there is no interesting *identification* of the form “to be red is to be . . .”. But, in another sense, he holds that the color red is not primitive. Whenever something is red, this is *grounded in* the thing having a certain reflectance. If grounding is a primitive notion independent of the notion of identification, nonidentity physicalism is a possible view.

Schaffer (2017) *generalize* the explanatory gap, holding that interlevel grounding connections in nature are generally *a posteriori*.

3.3 *A few questions for nonidentity physicalists*

Nonidentity physicalists differ very questions.

First, nonidentity physicalists can differ over the metaphysics of experience and the physical-functional grounds of different experiences. As already discussed, they might accept Galilean intentionalism or naïve realism. Other options include the sense datum view and the “raw feel” view. They might also differ on their physical-functional grounds of experiences.

Second, nonidentity physicalism can be restricted or general. For instance, I myself strongly favor the austere identity physicalism of Lewis and Sider applies to all consciousness-independent reality. Arguments from the special nature of consciousness show that identity physicalism fails only in the special case of conscious experiences. So if I were an identity physicalist, I would accept restricted nonidentity physicalism.

Other nonidentity physicalists might say that, despite my criticisms above, the arguments from failure and multiple realizability all show that identity physicalism fails even for macro properties that have nothing to do with consciousness, such as being a mountain (Schaffer 2013).

Third, there is a question about whether nonidentity physicalists can somehow explain grounding connections. For instance, Galilean nonidentity physicalism holds that the Color Law is a grounding law connecting distinct physical and experiential states. Can they explain this grounding law?

Some nonidentity physicalists would be content to take this grounding law as basic (Schaffer 2020). But others will wish to explain it. For instance, some recognize the concept of essence in addition to the concept of ground: “it is in the essence of X that p ” (Fine 1994). And they hold that in general grounding connections are explained by the essences of items involved in the grounded facts (Fine 2012, Rosen 2010). Such nonidentity physicalists will declare that, even if states of acquaintance with Galilean color aren’t *identical with* brain states, it is just “in their essences” that they are systematically *grounded in* brain states. This bedrock essentialist truth explains the Color Law understood as a grounding law. (It’s an explanation that easy to come by!) On this view, some things that are true by virtue of the essences of our experiences of Galilean colors are at the surface: they involve an irreducible acquaintance relation to color qualities with certain qualitative natures, they glow with intrinsic value, and so on. But another thing that is true by virtue of their essences is “hidden”, namely that they are systematically grounded in brain states.

As with the ideology of grounding, I will assume for the sake of discussion that we have a grip on the heavy-duty ideology of essence that is required to make sense of this claim (but see §7).

3.4 *Bling and zing: can nonidentity physicalists identify a big difference from dualism?*

Every version of nonidentity physicalism has a *dualist counterpart*. For instance, imagine a nonidentity physicalist who hold that experiences are nonrelational “raw feels” grounded in brain states, rather than mysterious intentional relations to uninstantiated

Galilean qualities. It has a dualist counterpart that downgrades the connection between brain states and distinct raw feels to a nomic one.

I think we need to ask whether nonidentity physicalists like Campbell, Johnston and Schaffer can identify a big difference between their view and the counterpart dualist view.

For instance, Chalmers is open to Galilean dualism. Suppose he accepts it. The Color Law is a basic nomic law. Chalmers is also a non-Humean who holds that “it is law that p” is a primitive sentential operator (2012: 337). In this essay, I will assume such a non-Humean “governing” conception of laws of nature. Now imagine that Schaffer accepts Galilean nonidentity physicalism. He holds that the Color Law is a basic grounding law, where “grounding” is another primitive notion.

Some philosophers may be inclined to complain in Humean fashion of the obscurity of “secret connexions” like grounding and lawfully determining that go beyond regularities. However, for the sake of argument, in this essay I will assume that we have a primitive grip on the difference between grounding and lawfully determining (but see §7). These assumptions are needed to sense of the difference between Schaffer (nonidentity physicalism) and Chalmers (dualism). My question is: is there a *big* difference between Schaffer and Chalmers?

This is relevant to the subsequent discussion. If there is no big difference between nonidentity physicalism and dualism, it is hard to see how we might have a big reason to prefer nonidentity physicalism to dualism.

In order to make the question vivid, let’s introduce some new terms. Let us say that *F blings G* when it is a nomic law that all *Fs* and *Gs*. And let say that *F zings G* when it is the case that, whenever it is a fact that an individual is *F*, this grounds the fact that the individual is *G*. So we have:

Chalmers: brain state *B* merely blings acquaintance with red.

Schaffer: no, brain state *B* zings acquaintance with red.

Now blinging (lawfully determining) comes in probabilistic forms, even if it is deterministic in the present case. By contrast, blinging (grounding) is always deterministic. But both Chalmers and Schaffer hold that, in the present case, the connection is deterministic. So this doesn’t identify a big difference between their views of the neural-experiential connection.

Chalmers holds that the connection is merely “nomically necessary” (zombies are possible), while Schaffer holds it is “metaphysically necessary” (zombies are impossible). Zinging is “modally stronger than” blinging. Isn’t that a big difference?

However, Schaffer holds (2020: sect. 2.2) that these notions are not primitive but are themselves to be understood in terms of blinging and zinging, so that this difference (roughly) amounts to this:

Chalmers: the connection between brain state *B* and acquaintance with red holds in all worlds with all the same blinging laws but fails in conceptually possible worlds outside this sphere.

Schaffer: the connection holds in all worlds with the same zinging laws but fails in conceptually possible worlds outside this sphere.

And now we are back to where we started: what is the big difference?

At this point, Schaffer might say his view and Chalmers' imply very different claims about how "far away" zombie worlds are, even both views imply zombie worlds are easy to conceive. For suppose Chalmers is right that our brain states merely bling our distinct color experiences. Since we count bling connections (laws) as pretty important, we will count a zombie world where the actual neural-experiential bling connections are removed as pretty far away. Now suppose Schaffer is right that our brain states *zing* our experiences. Then, since we count holding fixed zing (grounding) connections as *even more* important than holding fixed bling connections (natural laws) in reckoning across-world similarity, we will count zombie worlds where the actual neural-experiential zing connections are removed as *even farther* away.

But I think that Schaffer cannot say that this identifies a big *objective* difference between zinging and blinging. For (contrary to the depiction in Figure 1) it is not as if the zinging relation is a "big" glowing relation, while the blinging relation is a "small" one, so that if zombie worlds require removing the actual neural-experiential zinging relations that will make them "objectively" more dissimilar from actuality than if zombie worlds merely require removing the actual neural-experiential blinging connections. Therefore, Schaffer must say that this difference results from the *conventional* fact that we would "count" *removing the actual neural-experiential zinging connections* as a bigger difference from actuality than *removing the actual neural-experiential blinging connections*.¹²

I conclude that Schaffer theory of the neural-experiential connection is barely different from Chalmers' theory. But set that aside. Is there is any reason to prefer it to Chalmers' theory? Does it better achieve the dream picture of reality that physicalists are after?

4. Is Nonidentity Physicalism Simpler than Dualism?

We will assume going forward that arguments from the special nature of consciousness show that experiences are distinct brain states and indeed all complex properties definable from the fundamental based. Given this assumption, I will raise a skeptical challenge for the fallback position of nonidentity physicalism.

In way, the skeptical challenge goes back to David Hume. Our evidence consists of neural-experiential regularities, like the regularity following from the Color Law. If there are "secret connexions" going beyond such regularities, how do we know about them? Given our present assumptions, the problem is even *worse*. We are assuming that there are *two* secret connections in reality: lawfully determining (blinging) and grounding (zinging). If our evidence is limited to the Color Law regularity, what reason is there

¹² This shows that, even if you accept an "inflationary", anti-Humeanism account of metaphysical necessity (in the sense of Sider 2011: chap. 12) who understands metaphysically necessity in terms of the scenarios consistent with some primitive "grounding (zinging) laws", there remains a significant degree of convention in your view.

to think brain states *ground* distinct states of acquaintance with Galilean colors (non-identity physicalism) *rather than* merely *lawfully determining* them (dualism)? Both hypotheses are explanatorily fruitful, in that they explain the regularity rather than taking it to be a “cosmic coincidence”.

Here it is natural for nonidentity physicalists to appeal to abductive methodology, or “inference to the best explanation” (Schaffer 2020: sect. 1.3). A big part of that methodology concerns *simplicity*. We saw that identity physicalists can justify their view by appealing to this methodology (§2.2). But I will now argue that the hypothesis that the Color Law is a grounding law connecting distinct neural and experiential states *cannot* be justified on the grounds that it is simpler than the hypothesis that it is a nomic law. To illustrate, I will continue to focus on Galilean nonidentity physicalism.

4.1 Galilean nonidentity physicalism is as complex as Galilean dualism

Here is a plausible principle:

Parity principle: If two theories assert the same laws connecting distinct states, and *only* differ on the modal (or epistemic status) of those laws, they are equally complex.

To illustrate, suppose we know the fundamental laws of physics. And suppose that they turn out to be deterministic. Now imagine two philosophers who disagree about their status. Philosopher A says that they are primitive and contingent nomic laws. Philosopher B says that they are metaphysically necessary grounding laws, even if they appear contingent to us. The initial state of the universe *grounds* every future state of the universe (more on this maverick view in §7)! Do we have a simplicity-based reason to prefer the second maverick hypothesis over the first? Clearly, we do not.

Likewise, imagine again that Chalmers accepts Galilean dualism and Schaffer accepts a counterpart Galilean nonidentity physicalist view. They agree about the Color Law connecting brain states with distinct states of acquaintance with Galilean colors; both include it in their book of the world. They both agree that it cannot be derived from identifications and logic. They only disagree about the status of the Color Law. Chalmers says that it is a contingent nomic law. Schaffer says that it is a metaphysically necessary grounding law, even if it appears contingent to us. In the terminology of §3.4, Chalmers holds that it is a “bling” law while Schaffer holds that it is a “zing” law. Just as we have no *simplicity-based* reason to prefer the hypothesis of philosopher B over that of philosopher A, we have no *simplicity-based* reason to prefer Schaffer’s hypothesis to Chalmers’. Galilean nonidentity physicalism is just as complex as Galilean dualism.¹³

¹³ Schaffer (in discussion) agrees that the *Color Law* adds to the complexity of our theory of the world whether it is a grounding law or a nomic law. But he holds that grounded *entities* don’t add to complexity (Schaffer 2015). However, even if this is true, it doesn’t show that Galilean dualism is simpler than Galilean nonidentity physicalism, since both are forms of “property dualism” that agree on the fundamental entities and only differ on the status of the Color Law. In addition, I don’t think it is true. For instance, take the nonidentity physicalist view (mentioned in §3.1) that there are immaterial sense data grounded in (zinged in) brain states and the counterpart dualist view that there are immaterial sense data nomically determined by (blinged by) brain states. Both views hold that “there are” sense data in the same sense in which “there are” electrons (there aren’t different modes of existence here). Contrary to Schaffer, I think that it’s obvious that both views

To appreciate the complexity of nonidentity physicalism, compare it with identity physicalism. As we saw in §2.2, for identity physicalists, experience properties, like all other properties, *just are* complex properties definable in terms of fundamental properties and relations. So for them the connection between the fundamental properties and all other properties is just a matter of logic (e. g. if something is *F* then it is *F* or *G*). By contrast, nonidentity physicalists deny that experience properties *just are* complex properties definable in terms of fundamental properties and relations. So it is inevitable that they need *some* additional, extra-logical “laws” connecting them to fundamental properties and relations, such as the Color Law. And it’s inevitable *some of them will be basic*. On their view, these basic inter-level laws are metaphysically necessary. On a counterpart dualist view, they are contingent. By the parity principle, they add equally to the complexity of their theory of the world.

I have been assuming that there is a relatively simple Color Law connecting brain states with experiences of Galilean colors. In a wonderful but neglected paper, “Flavors, Colors and God”, Robert M. Adams argued that this is not so. I am more optimistic than Adams.¹⁴ But suppose Adams is right. This doesn’t affect the parity point. Suppose that the Galilean dualist and the Galilean nonidentity physicalist accept the same raft of unsystematizable laws (in the worst case, one for every possible experience), but just differ on their status. Their theories are equally complex (Pautz 2010 and 2015: footnote 31; Schaffer this volume????).

In short, nonidentity physicalism cannot achieve Smart’s simple dream picture any better than dualism. The nonidentity physicalist and dualist may have to share the same convoluted nightmare.

4.2 *An objection to equal complexity relying on general nonidentity physicalism*

I myself accept identity physicalism for all reality with the exception of conscious experience. But, for the sake of argument, suppose that the arguments from failure and from multiple realizability show that it also fails for consciousness-independent reality (Schaffer 2013).

In that case, in our world (unlike Lewis’s pixel world), there are various properties macro property *P*, *Q*, and so on that are distinct from any complex properties definable in terms of the fundamental base. Maybe they are *being a mountain*, *being a city*, *being a hand*, and so on. Or, maybe there are biconditional analyses of these properties in more fundamental terms (e. g. *city* in terms of *building*, *hand* in terms of *finger*), even if we cannot keep on going until we reach the fundamental base. In that case, *P*, *Q*, and so on are such more basic properties, but still at a “higher level” than the fundamental level.

In any case, besides psychophysical laws like the Color Law, the general nonidentity view requires countless extra-logical bridge laws operative in insentient reality, for instance:

are ontologically complex because both views hold that there are immaterial sense data very different from the brain states they depend on.

¹⁴ See also Chalmers 2012: 341. For discussion of the kinds of problems that Adams brings up, see Pautz 2010 and 2019. Geoff Lee (in discussion and in his book MS) has pointed out to me that the Adams’ “arbitrariness” worry applies equally to physical laws. So psychophysical laws may not be worse off than physical laws.

[P-Law] Necessarily, if the fundamental particles instantiate fundamental micro-physical and other properties A or B , then they instantiate macro property P (where P is not definable in terms of the fundamental base).

[Q-Law] if the fundamental particles instantiate distribution of micro-physical properties C or D , then they instantiate macro property Q .

Since nonidentity physicalists deny that macro property P is identical with the disjunction of A and B , the P -law isn't an instance of the general claim "disjuncts ground disjuncts". In general, the P -law cannot be derived from identifications and logic. It is a further, extra-logical law that is unique P . The same is true of the Q -law. For the sake of discussion, suppose that each is basic (but see footnote 21).

Now here is an objection someone might make to my parity principle. The objection first asserts that grounding laws like the P -Law and the Q -law *don't add to the complexity of our theory*, because, even if P and Q are not identical with the microphysical distributions or functional properties definable in fundamental terms, they are in some obscure sense "nothing over and above" the fundamental microphysical distributions. This suggests that *in general* grounding laws don't add to complexity. In that case, the hypothesis that the Color Law connecting brains states with states of acquaintance with Galilean colors is a grounding law *is* simpler than the hypothesis that it is a nomic law, giving us a reason to prefer it.¹⁵

My reply is that the basic P -law and the basic Q -law would add to the complexity of our theory of the world. To see this, note that identity physicalists like Lewis and Sider do not have to accept them. In their view, our world is like the pixel world. There simply *don't exist* such properties like P and Q that are not complex properties definable in terms of the fundamental base. Rather, all properties instantiated in our world are identical with such complex properties (including the ones expressed by "is a mountain", "is hand"). Therefore, as we saw in §2.2, for identity physicalists the connection between the pattern of instantiation of the fundamental physical and topic-neutral properties and the pattern of the instantiation of all other properties is (broadly speaking) logical. By contrast, since nonidentity physicalists believe in properties like P and Q that aren't definable in terms of the fundamental base, general nonidentity physicalists need to accept *additional, extra-logical* "laws" which connect the pattern of instantiation of the fundamental physical and topic-neutral properties and the pattern of the instantiation of P and Q . How could this fail to add to the complexity of their theory?¹⁶

¹⁵ Here I am indebted to Gabriel Rabin and Andrew Lee.

¹⁶ As mentioned in §3.3, some nonidentity physicalists will say that the P -law is explained by the fact that it's just in the "essence" of P to be grounded in microphysical distributions A or B . But this doesn't enable them to avoid the charge of complexity. Since they are nonidentity physicalists who *deny* that P is simply identical with the disjunctive property A or B (they hold P is "irreducible"), their claim that it's in the essence of P to be grounded in A or B is not an instance of the general claim that it is in the essence of a disjunctive property to be grounded in its disjuncts. They must take the P -law to be an *additional* essentialist truth that is special to P . And, as we shall see in 4.3, such additional "essentialist laws" would add to the complexity of their theory.

At this point the general nonidentity physicalist might agree that there is no *simplicity-based* reason to think that Color Law is a grounding law rather than a nomic law, but suggest that, if in the rest of nature the *grounding* laws explain why macro properties like *P* and *Q* start to pop up when fundamental reality is arranged in complex ways, then considerations of uniformity suggest that the Color Law, too, is a *grounding* law”. But this is different argument, and one I will return to in §5.

4.3 Three additional objections to equal complexity

The *first objection* additional objection I want to consider is based on *essentialist* nonidentity physicalism mentioned in §3.3. In particular, suppose that the Galilean nonidentity physicalist continues to hold that acquaintance with Galilean colors is very different from the underlying V4 brain states in the respects 1-4 listed at the start of §3. But suppose that she just invents an essentialist truth that is very different from standard essentialist truths (e. g. “it is in the essence of a disjunctive property that it is grounded in its disjuncts”). In particular, suppose that she declares that it simply flows from the (hidden) “constitutive essence” of acquaintance with Galilean colors that such acquaintance is grounded in underlying V4 brain states in the systematic way specified by the Color Law. In that case, she might say, the Color Law “comes for free” and doesn’t add to the complexity of our theory. So perhaps we have a simplicity-based reason to prefer the speculative hypothesis that the Color Law has the status of an “essentialist law” (Figure 1b) over the dualist hypothesis that it is merely a contingent nomic law (Figure 1a).

In reply, I stand by the parity principle. Consider again the story above about philosopher A and philosopher B who know what the fundamental physical laws are governing our world, but disagree about their status. But now suppose that, while philosopher A holds that the laws are primitive and contingent, philosopher B is a nomic essentialist who holds that that it’s just a basic fact that they flow from the essences of the fundamental physical properties, even if this is not at all evident to us. They completely agree on what the laws are, but disagree about their status. We don’t have a simplicity-based reason to prefer the philosopher B’s speculation about their status to philosopher A’s view about their status. Equally, don’t have a simplicity-based reason to prefer the speculative hypothesis that the Color Law has the status of an “essentialist law” (Figure 1b) over the dualist hypothesis that it is merely a contingent nomic law (Figure 1a).

Here is a *second objection* to my claim that any form of nonidentity physicalism is equally complex as its dualist counterpart due to David Chalmers (personal discussion). Chalmers (2010: chapter 12) is a Galilean intentionalist: our brains enable us to be conscious of uninstantiated Galilean colors and other sensible properties. Although he is sympathetic to Galilean dualism, he has also suggested (2015) a speculative *a priori* version of Galilean nonidentity physicalism (“Russellian monism”). In one version of this view, if knew the “special quiddities” of the fundamental physical properties (position, energy, spin, particle number), we would see *a priori* that it’s metaphysically necessary that, if they are arranged so that someone undergoes V4 state *B*, then this grounds their being in the very different state of standing in the irreducible conscious-of relation to Galilean color $f(B)$.¹⁷ The Color Law connecting distinct physical and experiential states

¹⁷ This claim of *a priori* nonidentity physicalism that a physical-functional state *a priori* necessitates the very different state of being conscious of Galilean red is a bit like the claim that the state of

is not *a priori* for us now – it seems *a posteriori* and contingent. But, he suggests, the speculative hypothesis is that it is *a priori* is justified on the grounds that if such principles are *a priori* then they do not add to the complexity of our theory, no more than “if something is scarlet it is red”, “if x exists then the unit set $[x]$ exists”, or “if X s exist they compose something”. Thus *a priori* Galilean nonidentity physicalism is “more economical” than its dualist counterpart (2015: 269).

In reply, I stand by the parity principle. Consider yet another twist on the debate between philosopher A and B on the status of the fundamental physical laws that govern the evolution of the universe. As before, philosopher A says the laws are contingent and *a posteriori*. But now suppose philosopher B is a rationalist who puts forward the speculative claim that, if we only knew what the fundamental physical properties are like, then we would see *a priori* that the laws hold with metaphysical necessity (like the laws of “rational mechanics”). They agree on the laws, and just disagree on their status. I take it as obvious that their theories are equally complex. Complexity is matter of metaphysics (what a theory says about the world), not epistemology (how we know it). So there is no *simplicity-based* reason to accept the *a priori* claim.

In the same way, there is no simplicity-based reason to accept Chalmers’s speculative hypothesis that the Color Law connecting brain states and distinct states of acquaintance with Galilean colors (or some set of more basic underlying principles) is knowable *a priori* over the counterpart dualist hypothesis that the same Color Law (or the same set of more basic underlying principles) is only knowable *a posteriori*.¹⁸ And, even if principles like “if x exists then the unit set $[x]$ exists” and “if X s exist they compose something” enjoy some (nonconclusive) *a priori* support, they still add to complexity of our theory of the world (a theory that rejected sets and sums would be simpler).

The *third objection* is that Galilean nonidentity physicalism looks just as complex as Galilean dualism only because it is so weird. What about a tamer version of nonidentity physicalism which holds that experiences are nonrelational “raw feel” states grounded in brain states, rather than mysterious intentional relations to uninstantiated Galilean properties? Won’t that seem simpler than dualism?

My reply is that even such a tamer form of nonidentity physicalism must accept special systematic grounding laws (similar to the Color Law) that connect brain states

action having the natural property of causing pain for the fun *a priori* necessitates the state of the action having the very different normative property *ought-not-to-do-it-ness*. I note in passing that *a priori* nonidentity physicalism is problematic. Whatever they may be, the microphysical “quiddities” presumably don’t include the Galilean quality *red* or the conscious-of relation (electrons aren’t red or conscious of one another). So how do their arrangements *a priori* entail that you are *conscious-of* the wholly novel Galilean quality *red*, which is not instantiated anywhere in reality? In any case, if I am right, once we reject identity physicalism, we have no simplicity-based reason to accept such wildly speculative theories (“Russellian monism”, “pansychism”) over dualism.

¹⁸ Philip Goff has suggested to me (in discussion) that, even if we have no *simplicity-based* reason to accept speculative hypothesis that the Color Law is an *a priori* necessity connecting distinct neural and experiential states rather than the dualist hypothesis that it is contingent and *a posteriori*, we do have a reason to accept this speculative hypothesis stemming from a “basic commitment to the world’s being intelligible”. But, as Fodor says in the quote from §1.1, since the fundamental laws of physics are brute and *a posteriori*, why can’t the Color Law have the same status? We may *want* everything to be *a priori* intelligible, but maybe the world just isn’t that way.

with distinct experiential properties. So it is just as just a complex as its dualist counterpart which holds that those same laws are contingent nomic laws.

5. Is Nonidentity Physicalism More Uniform than Dualism?

We are assuming that arguments from special nature show that, in connection with some (but not all) brain states, distinct conscious experiences emerge with the unique features 1-4 listed at the start of §3. Our evidence only consists of regularities relating brain states and such distinct experiences. Given this limited evidence, how could we tell whether our brain states ground (zing) or merely lawfully determined (bling) our distinct experiences?

In the previous section, we saw that simplicity considerations don't help. In the present section, I will look at another, more indirect argument. Maybe looking at the rest of nature will provide a clue. In particular, if we look at the rest of nature, we can perhaps argue on the basis of *uniformity considerations* for the hypothesis of nonidentity physicalism that our brain states *ground* our experiences over the hypothesis of dualism that they merely *lawfully determine* our experiences. Maybe the first hypothesis comes closer than the second to realizing the dream of a *uniform* account of reality.

In §3.3, I distinguished between restricted and general nonidentity physicalism. We must consider them separately.

5.1 Is Restricted Nonidentity Physicalism More Uniform Than Dualism?

I myself am strongly committed to the identity physicalism of Lewis and Sider for all consciousness-independent reality. The insentient world resembles Lewis's pixel world. Identity physicalism only fails in the special case of conscious experiences, and the only question is what to say about this case.

Let me first briefly say why I think identity physicalism is superior to nonidentity physicalism for the all of insentient reality. Then I will consider whether, given this view, uniformity considerations might help with our question.

When it comes to insentient reality, the main argument for nonidentity physicalism over identity physicalism concerns multiple realizability (Schaffer 2013). But in §2.3 we saw that this argument is weak. There are, on the other hand, arguments for identity physicalism over nonidentity physicalism about insentient reality.

First, the identity physicalism of Lewis and Sider was true at the moment of the big bang when the universe was very simple. And if identity physicalism was true for insentient reality at time t , it is plausible that it is true for insentient reality at time $t + 1$. So it's true for insentient reality at all later times as well, even when complex high-level properties (e. g. *being a mountain*) emerged that are hard to define in terms of the fundamental base. Analogy: if Lewis's pixel world evolves according to laws in Conway's famous *Game of Life*, then "identity pixelism" was true at every stage. Nonidentity physicalists have to deny this. They must say that, even if identity physicalism was true at

start, at a certain point novel properties (P , Q , etc.) started “popping up” that aren’t definable in terms of the fundamental base – an odd view.¹⁹

Second, as we saw in §4.2, nonidentity physicalism for insentient reality requires special, extra-logical “grounding laws”, like the P -law and the Q -law, that govern the emergence of the properties that aren’t definable in terms of the fundamental base. They add to the complexity of our theory. (And if they are declared to hold in virtue of the “essences” of the grounded properties, these special essentialist principles add to complexity.) They also raise difficult questions. Schaffer (2020: sect. 1.3) says that he is after the simplest and most systematic basic grounding laws. But it’s very hard to believe that there is a systematic theory here. For instance, one grounding law is that, if the fundamental microphysical level is a certain way, then the property *being a game* is instantiated. Is there a *unique* set of more most basic grounding laws, starting from the microphysical base and moving up to higher and higher “levels”, that “chain together” to entail this law, so that it comes out as “derived” grounding law? It’s hard to believe that there is a systematic theory here, or even a fact of the matter as to what the “basic” grounding laws are. Another question is whether *every* miscellaneous disjunction of microphysical conditions grounds a property that is not a disjunction of those disjunctions or a functional property constructible from the fundamental base that is realized by those disjunctions?²⁰ Identity physicalism for insentient nature entirely avoids special “grounding laws” here, and so avoids all these problems (§4.2).²¹

Let us, then, assume that identity physicalism is right for all of consciousness independent reality, as I think it is. Arguments from special nature show that it is it fails only

¹⁹ Maybe nonidentity physicalists will respond that, even during the first moments after the big bang, nonidentity physicalism was false, because properties like *being beautiful* were instantiated that cannot be identified with complex properties defined in terms of the austere base, owing to their multiple realizability. But I think that *being beautiful* is a dispositional property defined in terms of the responses of sentient creatures. So we might revise the argument: all *mind-independent* properties instantiated in the universe in the initial moments were either properties in the austere base or complex properties definable in terms of them, and it is plausible that if this is true at time t then it is also true at time $t + 1$. The result is identity physicalism for consciousness-independent reality.

²⁰ David Lewis (as reported by Frank Jackson 1998: 127) has raised a similar question in connection with Moorean non-naturalism about normativity.

²¹ General nonidentity physicalists might try to formulate a general, super maximalist theory of properties on which the distribution of fundamental properties and relations grounds a *huge plenitude* of properties, over and above the complex properties recognize by identity physicalists built from those fundamental properties and relations. For instance, such a theory might be strong enough to entail that, if something has the microphysical distribution of the Eiffel Tower or that of my nose, it thereby has property F , where F is *not* identical with the disjunction of these microphysical distributions, so that, in other worlds, F might be instantiated by virtue of alien properties or perhaps in a fundamental way. Thus F has microphysical sufficient conditions but no microphysical *necessary* conditions. But it’s not clear how such a super maximalist theory of properties could be formulated. One idea is that, for every *logically consistent* grounding profile, there is a property with that grounding profile. But this allow too much. It would entail that there is a property F that is grounded in the microphysical distribution of my nose and that in turn grounds the property of being one-hundred meters away from something with the microphysical distribution of the Eiffel Tower. And I can verify that there is no such property.

in one case: conscious experience. For instance, in color experience, we bear an irreducible conscious-of relation to Galilean colors.

Given this, can we now appeal to uniformity considerations to argue that, in this special case, our distinct experiences are *grounded in*, rather than being *lawfully determined by*, more the fundamental facts? That is, can we use uniformity considerations to argue for *restricted nonidentity physicalism* over dualism. I think that the answer is no.

To see this, imagine the analogous situation in Lewis's pixel world. Suppose as above that it evolves according to the rules of Conway's *Game of Life*. And suppose that we are told that when certain special shapes occur (but not others) novel properties occur – *E*-properties – that are not definable in terms of pixels and their relations, and moreover their occurrence seems to be governed by certain systematic bridge laws. The only thing we are in the dark about is whether they are extra-logical *grounding laws* (restricted nonidentity pixelism) or *mere nomic laws* (dualism).

Here uniformity considerations cannot help us decide. True, the nomic law option requires that there are special nomic laws relating shapes and *E*-properties, quite different from Conway's nomic laws that govern the evolution of the pixel world through time (nomological danglers). But the grounding option requires that there are special *grounding laws* that kick in only when the right shapes occur in the pixel-world (grounding danglers). There are no other grounding laws like that – in fact, if identity physicalism is true for insentient reality, there are no interesting, extra-logical grounding laws *at all* in the rest of nature (except perhaps boring ones like parts ground wholes). These options provide equally non-uniform accounts of reality.

Likewise, if assume that identity physicalism applies to all of consciousness-independent reality, but that there are laws like the Color Law whereby some brain states (but not others) result in novel experiential properties, we cannot use uniformity considerations to argue that those laws are grounding laws (restricted non-identity physicalism) rather than mere nomic laws (dualism). These options provide equally nonuniform accounts of reality. Both options imply the *anomalism of the experiential*.

5.1 Is General Nonidentity Physicalism More Uniform Than Dualism?

For the sake of argument, let us now assume, contrary to what I argued the previous section, that nonidentity physicalism *is* true for all of insentient reality, as Schaffer (2013, 2017) has argued. That is, there are macro properties like *P*, *Q*, *R* . . . that are identical with complex properties definable in terms of the austere fundamental base. And there are special, extra-logical grounding laws like the following:

[P-Law] Necessarily, if the fundamental particles instantiate distribution of micro-physical properties *A* or *B*, then they instantiate macro property *P*.

[Q-Law] if the fundamental particles instantiate distribution of micro-physical properties *C* or *D*, then they instantiate macro property *Q*.

In addition, let us assume that Galilean intentionalism is correct for sensory consciousness. The only question is whether we should accept *Galilean nonidentity physicalism* or *Galilean dualism*.

As we saw above, Galilean nonidentity physicalism and Galilean dualism only differ on the status of the following principle:

Color Law: If the fundamental physical and topic-neural base properties are arranged so that a subject undergoes V4 brain state B , then they are in the distinct state of standing in the irreducible *conscious-of relation* to color $f(B)$, where f is a systematic function from V4 brain states onto Galilean colors.

Galilean nonidentity physicalism holds that this law is a grounding law (Figure 1b) and Galilean dualism holds that it is a mere nomic law (Figure 1a).

In the previous subsection, we saw that, if we accept *identity physicalism* for insentient reality, it is impossible to use uniformity considerations to argue that the Color Law is a grounding law rather than a synchronic nomic law.

But you might think that, if we accept *nonidentity physicalism* for insentient reality, and so accept grounding laws like the P-law and the Q-law operative in the rest of nature, we can use uniformity considerations to argue, in line with general nonidentity physicalism, that the Color Law should be *just another grounding law* (a point I alluded to at the end of §4.2).

In addition, if the Color Law were a nomic law, it would be very different from other nomic laws in nature: Newton's synchronic law of gravitation, Schrodinger's diachronic law governing the evolution of the wavefunction, and so on. Smart expressed this by saying that such special nomic laws, operative only in connection with brains of a certain complexity, would be "nomological danglers", dangling from the rest of the body of nomic laws.²²

In more detail, the following points suggest that the Color Law is a grounding law (nonidentity physicalism) rather than a nomic law (dualism):

1. The Color Law looks like the grounding laws that operate in insentient reality, such as P-law or the Q-law, in that it connects extremely complex, unnatural microphysical conditions with the instantiation of macro properties.
2. At the same time, the Color Law doesn't look like standard nomic laws (e. g. Newton's synchronic law of gravitation, Schrodinger's law governing the evolution of the wavefunction), because standard nomic laws instead connect *natural* properties with other *natural* properties.
3. The Color Law doesn't look like a nomic law in another way. It connects a *local state* of the brain to distinct experiential states. By contrast, nomic laws connect the *global state* of the world to subsequent states.²³

²² Feigl (1958) coined the term "nomological danglers". I follow Feigl in using "nomological danglers" to refer the relevant *laws* of emergence, rather than to emergent experiential *states*.

²³ To clarify, Smart's argument is *not* the following: nomic laws *necessarily* relate *natural properties* and *global states*, but the Color Law doesn't have these features, so it *cannot* be a nomic law. The argument is rather: *in the actual world* (not all worlds), nomic laws happen to have these characteristics; since the Color Law doesn't have these characteristics, it *probably* isn't a nomic law.

Schaffer (2020) develops Smart’s “nomological danglers” objection to dualism. As we have seen, he instead favors a form of nonidentity physicalism on which the Color Law is a *grounding* law.

However, the matter is not so clear-cut (as I have argued in Pautz 2004, 2010, 2015). The danglers objection cut both ways. It counts equally against the hypothesis that the Color Law is a grounding law. For even if general nonidentity physicalism is true and there are grounding laws (mereological laws, the P-law, the Q-law, etc.) operating in insentient reality, the Color Law cannot be derived from them and indeed is very different from them.²⁴ So *if* it is a grounding law, it would be a strange “grounding dangler” that only kicks in when it comes to certain brain states. This weakens Schaffer’s inference to the conclusion “it’s just another grounding law”. In fact, in addition to looking very different from the grounding laws operative in the rest of nature, the Color Law in *some* ways resembles nomic laws.

In more detail, the following points suggest that the Color Law is a nomic law (dualism) rather than a grounding law (nonidentity physicalism).

1. The Color Law just doesn’t look like many grounding laws. Many grounding laws (e. g. mereological grounding laws) operate in nature generally. By contrast, the Color Law, and other psychophysical laws, only kick in in one place, namely brains of a certain complexity.
2. The Color Law doesn’t look like grounding laws. By grounding laws, fundamental physical conditions ground boring properties (being a mountain, being a hand, being a game) that don’t turn ground anything else of interest (“grounding epiphenomena”).²⁵ By contrast, by psychophysical laws like the Color Law, brain states result in *conscious experiences* that are radically different (they have qualitative character, belong to novel standard out determinables, etc.) and that in turn ground much else (indeed, they are the source of all reasons for action and belief and perhaps all value).
3. In some ways, the Color Law and other psychophysical laws look more like *nomic* laws (e. g. Maxwell’s laws connecting electricity and magnetism) than the grounding laws that operate in the rest of nature. They are like nomic laws in that they *systematic* and *relate very different states* (brain states and acquaintance with Galilean colors,

²⁴ Nonidentity physicalists also could not derive the Color Law, and other psychophysical laws, from a general “super maximalist” theory of properties on which every condition specifiable in fundamental terms grounds a *whole plenitude* of properties that *aren’t definable* in fundamental terms (footnote 21). For we are assuming that the case for nonidentity physicalism in the first place is that conscious properties occur in connection with brains, but not *other* macro-level physical objects in nature (rocks and plants), that have *special natures* (e. g. features 1-4 listed at the start of §3). In fact, by the psychophysical laws, one brain state *B* might result in the distinct state of being acquainted with Galilean red, while another (unconscious) brain state *B** results in *nothing like this* (assuming you don’t have a plenitude of experiences you aren’t aware of). Such *discontinuous* psychophysical laws that *only kick in for certain brain states* (but not others) could not be derived from any *general* theory of properties.

²⁵ It is true that the fact that something is a mountain *entails* the fact that it is massive. But it doesn’t *ground* that fact. The fact that something is a mountain doesn’t *ground* anything of interest. In this sense, *being a mountain* is a *ground epiphenomenon*.

firing rates with pain intensities). In these respects, they are unlike interlevel grounding laws. For interlevel grounding laws are generally uncodifiable and messy (the “failure of conceptual analysis”), and the states that they result don’t radically differ in their natures from the underlying states (e. g. there being a mountain isn’t radically different from there being atoms arranged mountain-wise).²⁶

4. The psychophysical laws are discontinuous. They might map two broadly similar neural patterns onto *incommensurable* conscious experiences (acquaintance with Galilean red and acquaintance with Galilean pain), and a third onto *no conscious experience* at all. No grounding laws are like that. The fact that psychophysical laws are discontinuous makes them look more like contingent *causal laws*, because there is no problem with the idea that similar causes can have radically different effects.
5. The distinction between nomic laws and grounding laws lines up with the distinction between the *a posteriori* and the *a priori* in the following sense: all nomic laws are *a posteriori* while all grounding laws (“if a and b exist, then the sum [a + b] exists”, “if particles are arranged mountain-wise there is a mountain”, and “if something is scarlet it is red”) at least enjoy *some* (nonconclusive) *a priori* support. Psychophysical laws like the grounding law fall on the *a posteriori* side of this line, suggesting that they are nomic laws rather than grounding laws.²⁷

In sum, general nonidentity physicalism and dualism are equally nonuniform. Both agree that something very special happens in connection with some brain states that is radically different from what happens elsewhere in nature. True, dualism implies that psychophysical laws are *nomological danglers* (special nomic laws different from other contingent nomic laws), but general nonidentity physicalism implies that they are *grounding danglers* (special grounding laws totally different from other grounding laws, such as mereological grounding laws). In some ways, psychophysical laws resemble grounding laws. But they also have some earmarks of nomic laws.

I conclude that nature just hasn’t left us with enough clues to determine whether psychophysical laws like the Color Law are grounding laws or nomic laws. Nonidentity physicalists like Johnston (1997, ms) and Schaffer (2020) think that they are grounding laws. Dualists think that they are nomic laws. I think that, once you look at the totality of evidence, it is just too close to call.

²⁶ It might be replied that sometimes grounding laws *are* systematic. For instance, there is a grounding law whereby variations in the mean molecular kinetic energy of a gas systematically ground variations in the temperature of the gas. So maybe the Color Law is just another systematic grounding law, rather than a nomic law. My reply is that there is no such grounding law, because variations in the mean molecular kinetic energy of the gas *just are* variations in the temperature of that gas.

²⁷ Schaffer (2017) argues for a radical empiricist view on which grounding laws for concrete items are generally not *a priori*. But I think that he might have distinguished between *conclusive* and *nonconclusive a priori* (Pautz 2105: note 5). I think the lesson of Schaffer’s discussion is that grounding laws (e. g. “if there are atoms arranged mountain-wise there exists a mountain rather than a pink elephant”) are generally not *conclusive a priori*. But in my view grounding laws (when framed in transparent language) are generally *nonconclusive a priori* (i. e. *a priori plausible*). By contrast, the Color Law (e. g. brain state *B* results in an experience as of a *red and round thing* rather than a *pink and elephant-shaped thing*) is deeply *a posteriori*, making it look more like a nomic law.

6. Nonidentity Physicalism and Dualism on Mental Causation

A big part of the physicalist dream is an account of mental causation compatible with causal closure. Is non-identity grounding physicalism better placed than dualism to accommodate mental causation? I think that the answer is no. To illustrate, I will continue to work with Galilean dualism and Galilean nonidentity physicalism (Figure 1).

Start with Galilean nonidentity physicalism. Galilean nonidentity physicalists can accommodate mental causation by accepting a counterfactual analysis of causation.²⁸ You experience a red stop light, and press on the brakes. Had your brain state been different, your behavior would have been different. So your brain state causes your behavior. Your brain state also grounds your acquaintance with the Galilean red, in line with the Color Law. In evaluating similarity across worlds, we use a rather baroque system of weights for different respects of comparison (Lewis 1979: 46 and Kment 2014: 219). According to that system of weights, it is of the first importance to hold fixed the grounding (zinging) laws (such as the Color Law, on Galilean nonidentity physicalism) and of the second importance to avoid big, widespread, diverse violations of the nomic laws. So it is also true that, had your experience been different, your brain state would have been different, so that behavior would have been different. Thus, on a counterfactual analysis of causation, your experience *as well as your brain state* counts as a cause of your behavior. There is systematic overdetermination, but it is not troubling because it explained by the grounding laws.

Next, Galilean dualism. It is just like dualism except that it holds that the color law is a nomic law. Now let us “define up” a new notion of counterfactual dependence, *counterfactual dependence**; and a new correlative notion of causation, *causation**. As with counterfactual dependence, we define counterfactual dependence* in terms of similarity of worlds. But we define it using a slightly different baroque system of weights. In fact, we treat *psychophysical* nomic (bling) laws, such as the Color Law, in the same way we treat grounding (zing) laws. That is to say, it is of the first importance to hold fixed the grounding laws *and* the psychophysical laws. (In §3.4, we noted that nonidentity physicalist most hold that the weightings are somewhat conventional; this is just a different convention.) Using system of weights, it follows analytically from dualism that your behavior counterfactually depends* on your acquaintance with red as well counterfactually depending* on your brain state. (By contrast, by the standard system of weights, your behavior doesn’t counterfactually depend on your acquaintance with red: see Loewer 61.) So both are causes* of your behavior.²⁹ There is systematic overdetermination*, but it is not troubling because it explained by the nomic laws.

²⁸ See Loewer 2017 for how nonidentity physicalists can accommodate mental causation. Hall (2005: 518) argues persuasively that nonidentity physicalists cannot take causation to be primitive on the grounds that this would make it “a complete mystery why there should be any relations whatsoever of metaphysical dependence between the patterns of instantiation of causation at different levels”.

²⁹ In saying that your experience is a *cause** of your behavior, I’m not assuming that causation* falls under our concept “causation”. In fact, as I am about to point out, this issue is not at all important.

Now you cannot directly tell by introspection that your experience of red causes rather than causes* your behavior. After all, causation and causation* do not significantly differ. Compare: you cannot tell by perception whether *there is a table there* or *there is* a table there*, where the former requires a composite object while the latter only requires atoms arranged table-wise. So there is no *direct* argument, based on considerations of mental causation, for Galilean nonidentity physicalism over Galilean dualism. Of course, we do have a different reason to reject a Galilean dualist view on which our experiences of Galilean colors cause* our behaviors: it is complicated. But in §4 we saw that the Galilean nonidentity physicalism is equally complicated.³⁰

7. A General Skeptical Challenge for Ground Enthusiasts?

We have assumed that the identity physicalism of Lewis and Sider fails, and we have been looking at whether the fallback position of nonidentity physicalism might achieve the physicalist dream. On this view, the following law is a “grounding” law rather than a nomic law:

Color Law: If a subject undergoes V4 brain state B , then they are in the distinct state of standing in the irreducible *conscious-of-relation* to color $f(B)$

I have argued for the skeptical view that, once we give up identity physicalism, we have no good reason to think that our brain states *ground* (zing) distinct experiences, rather than merely *nomically determining* (blinging) them. It doesn’t achieve the physicalist dream. The grounding option is not simpler than the nomic option. Abductive methodology cannot help us decide between them.

I now want to argue that, *if* we recognize an indefinable “grounding” connection in addition to nomic determination, the skeptical problem can be generalized. I will illustrate the general problem with two examples (Pautz 2015).

The first example is this:

Newton’s laws: if bodies have masses m and m^* and are separated by distance d then, they stand in force relation $f(m, m^*, d)$, where f is given by the inverse square law.

Now imagine a dispute between philosopher A and philosopher B. Philosopher A takes the standard view that Newton’s law is a nomic law. Philosopher B is a maverick who takes it to be a grounding law: the masses of bodies together with their distances systematically *ground* the force relations holding between them.

You might think that the view of philosopher B is absurd because Newton’s law is *a posteriori* while grounding connections are generally *a priori*. But nonidentity physicalists like Schaffer cannot so quickly dismiss the maverick hypothesis. After all, Schaffer

³⁰ In my view, then, despite the enormous popularity of the causal argument against dualism, it contributes nothing beyond the simplicity argument. This seems to have been Smart’s view as well (1959: 156). I do think that dualism is open to a different problem about *luck* but I think that nonidentity physicalism faces the same problem (Pautz 2020).

holds that the *Color Law* is a grounding law between distinct states, even though he also thinks it is deeply *a posteriori*. So he cannot dismiss out of hand the hypothesis that the same is true of Newton's Law. I think Schaffer may be right to hold that, *if* grounding is an indefinable worldly connection alongside nomic determination, there is no reason why grounding connections cannot be *a posteriori* in this way (§3.1).³¹

Nor can we decide the dispute between philosophers A and B by using abductive methodology. Both hypotheses are equally explanatorily virtuous. They both avoid the idea that the regularity is a cosmic coincidence. There is also no difference between them on the score of simplicity.

Here is another example. Suppose that in the limit of theorizing we all agree to:

Dynamic law: if the state of the world at time t is s , then the state of the world at time $t + n$ is $f(s)$.

Philosopher A holds that this is a nomic law. Philosopher B is a maverick who holds that this is a grounding law. Only the initial state of the universe is fundamental. Every future state is grounded. Whatever features you think are essential to grounding, philosopher B says that they are present in this case. So if you think grounding must be deterministic and well-founded, philosopher B says that the relation between the state of the world at different times is deterministic and that the universe must have a beginning!³²

I think that this new skeptical challenge cannot be answered. If you recognize *two* worldly secret connections out there in the world, nomically determining and grounding, it would be absurd to say that we have *non-inferential a priori* reason to think that Newton's law and the dynamic law are nomic laws rather than grounding laws - that this is just an "intrinsically plausible" starting point. So if we have a reason, it must be *inferential*. In that case, there must be some completion of the following.

³¹ By the way, because he is an empiricist about *all* grounding connections (with the exception of those of logic and mathematics), Schaffer (2017) also faces the reverse question: what reason have we to think standard "grounding" connections in nature are indeed grounding connections rather than mere nomic connections (Pautz 2015: footnote 5)? For instance, maybe the fact that the matter of the cheese is arranged a certain way only *lawfully determines* (rather than *grounds*) the fact that there exist many immaterial holes in it. On this view, in some metaphysically possible worlds the cheese is the same but holes (understood as irreducible immaterial objects) don't exist. Abductive methodology (e. g. the appeal to simplicity) doesn't discriminate between these options.

³² I use the dynamic law example to illustrate my skeptical challenge in Pautz (2015: footnote 5). Rabin (2019: 197) poses a related but different challenge philosophers like Schaffer who think that grounding connections can be *a posteriori*. How can they rule out the maverick claim that everything is *a posteriori* grounded in the state of a single peanut? Schaffer (2020: footnote 15) replies that this explanatory claim is not fruitful, so that no one would accept it. My challenge is different. I focus on cases, such as Newton's Law and the fundamental dynamic laws, where *everyone already agrees* that it is explanatorily fruitful to think that there is some kind of explanatory connection in nature. And my skeptical challenge is: why believe that the explanation connection is one of *nomic determination* rather than one of *grounding*? Here both hypotheses are equally explanatory fruitful in that they both explain the agreed upon regularities rather than taking them to cosmic coincidences.

Our inferential reason to believe that Newton's law and the dynamic law are nomic rather than grounding laws is _____.

But I don't see what could fill the blank here.³³

Now, at this point, I face a *tu quoque*. After all, for the purposes of making sense of the difference between dualism and nonidentity physicalism, I recognized a notion of nomic determination and a "stronger" indefinable connection of grounding (Figure 1). So I also face the question: why believe that Newton's law and the dynamic law are nomic rather than grounding laws?

My answer is that, although I assumed for the sake of formulating nonidentity physicalism that there is an indefinable worldly connection of grounding in addition to nomic determination, I do not think that there is such a thing. I recognize connections flowing from identifications (Dorr 2016). And I recognize conceptual connections (Chalmers 2010: 184ff and 2012: 453). But I do not recognize an indefinable connection of grounding detached from these things. So I can rule out the maverick hypothesis that Newton's law and the dynamic law are "grounding" (or "zinging") laws by saying that I don't understand it. My case against indefinable grounding is that it opens up bizarre skeptical possibilities (e. g. that Newton's law and the dynamic law are "grounding laws") that we don't have a grip on. In addition, we can achieve a more parsimonious account of the world without it (compare Sider 2011: sect. 12.1).³⁴

This means that, even though I have played along for the sake of argument, I also not grip on nonidentity physicalism when it is formulated in terms of such an indefinable connection of grounding.

I'm also skeptical about the indefinable locution "it is in the essence of *X* that *p*" (Fine 1994) as well as a primitive notion of metaphysical necessity or possibility (a notion criticized by Chalmers 2010: 189). So in the end I think it is hard to make sense of the difference between nonidentity physicalism and a counterpart dualist view.

Therefore, I would put the moral of my discussion of nonidentity physicalism in this way: *if* we can somehow understand the view that experiences are distinct from (and perhaps very different from) underlying physical-functional states but there are "metaphysically necessary" interlevel laws connecting them, then there is no reason to prefer this view to a counterpart dualist view on which those interlevel laws are merely "nominally necessary".³⁵

³³ Schaffer (in discussion) mentioned appealing to paradigm cases or reflective equilibrium.

³⁴ For other reasons to be skeptical about an indefinable grounding connection (e. g. involving whether there is a unified concept here), see Wilson 2014.

³⁵ In this essay, I have been assuming an "inflationary", anti-Humean account of metaphysical necessity in the sense of Sider 2011: chap. 12. Sider himself defends a "deflationary", Humean account of metaphysical necessity. The metaphysical necessities are what follow from the "modal axioms". The "modal axioms" are given by a mere list and have nothing interesting in common; there is a sense in which the list is up to us and not the world. If this view is right, then it is even more obvious that there is no reason to prefer nonidentity physicalism to a counterpart dualist view. It's just a matter of whether the inter-level "laws" (which on this view are just summaries of inter-level regularities) connecting the physical and the experiential are on "the list". The issue is totally non-substantive and may be indeterminate.

8. Conclusion

Physicalists claim that conscious experiences are “metaphysically necessitated by” the distribution of fundamental physical and topic-neutral properties and relations. Why believe this incredible modal claim?³⁶ I have argued for three claims.

First, the *only* route to establishing physicalism is *justification by identification*. Identity physicalism (Lewis, Sider, Dorr) holds that conscious experiences are identical with hugely complex properties defined in terms of the austere fundamental base. It can be justified by an inference to the best explanation because it achieves the physicalist dream of a maximally simple and uniform view of reality. And it entails the incredible modal claim.

Second, once we reject identity physicalism because of arguments from the special nature of consciousness, we might fall back to nonidentity physicalism (Campbell, Johnston and Shaffer). On this view, even though experiences are distinct from (and indeed very different from) all complex properties definable in terms of the austere fundamental case, there are “metaphysically necessary”, extra-logical bridge laws connecting them with such complex properties. But there is no strong argument for preferring nonidentity physicalism to a counterpart dualist view on which those bridge laws are merely contingent. It provides an equally complex and unattractive picture of nature. It doesn’t achieve the physicalist dream.

Third, since these views are so similar, we also *should not much care* about the debate between nonidentity physicalism and its dualist counterpart.

The upshot is that, when it comes to the metaphysics of consciousness, the “big divide” is between identity physicalism and all the rest. This is where the debate should focus.

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³⁶ Even those who are open to the view that the fundamental physical properties are little “quiddities” or “feelings” face this question.

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