

How to Achieve the Physicalist Dream: Identity or Ground?¹

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Imagine [a picture] with a million tiny [black or white] pixels. The picture and its 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 (1994)

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)

If dualism is true, consciousness sticks out like a sore thumb. David Chalmers notes that “physicists seek a set of fundamental laws [governing the evolution of universe] simple enough that one might write them on the front of a T-shirt” (1996: 214). But if you accept dualism about consciousness, you are going to need a bigger T-shirt. In addition to the laws of physics governing the evolution of physical systems, you will need anomalous “psychophysical laws” linking certain physical systems – brains – with all the variety of conscious experiences. And there is reason to think that these psychophysical laws resist compact systematization (Adams 1987; Pautz 2010: 46-47). So dualism would ruin the dream of a world governed by a small handful of fundamental laws so simple that they might fit on an ordinary T-shirt. We might call this the *T-shirt problem for dualism*.

By contrast, physicalism about the mind promises a maximally simple and uniform picture of reality. In this essay, I want to look at two types of physicalism, and ask which one best achieves the physicalism dream.

First, I will look at *identity physicalism*, an especially austere form of physicalism that I associate with David Lewis, Ted Sider, and Cian Dorr. Roughly, everything reduces to physics plus some topic-neutral ingredients. I will argue for the following:

¹ This paper develops some points made in Pautz 2010, 2014, 2015. It has been long in the making (I first put it online in 2020), and I thank many people for help along the way. I am especially indebted to Jonathan Schaffer, Gabriel Rabin and an anonymous reviewer for generous comments that led to significant improvements. Thanks also to Brian Cutter, Louis DeRosett, Uriah Kriegel, Geoff Lee, Brian Saad, Ted Sider, Jonathan Simon, and Jessica Wilson. I presented this paper at the 2021 conference “Reductionism in meta-ethics and the philosophy of mind” and at the 2023 meeting of the Canadian Philosophical Association as part of a “keynote debate” with Jonathan Schaffer. I thank the audiences on those occasions for helpful discussions.

- Unlike dualism, identity physicalism avoids the T-shirt problem and achieves the dream of a maximally simple and uniform picture of nature.

However, many – including myself – think that identity physicalism is too austere. It fails for experiences and qualities. And maybe it even fails for more boring things, like the holes in a piece of cheese. So I want to examine the prospects of a more liberal kind of physicalism called “ground physicalism”.

Jonathan Schaffer is a prominent advocate. Like dualists, Schaffer (2021: 203) uses the “intuition of distinctness” to argue that identity physicalism fails for experiences. So your experiences are not identical with your neural states or even with any of your functional states. But while dualists hold that your experiences are linked to your neural/functional states by contingent *nomio* laws, Schaffer holds that they are linked to such states by metaphysically necessary *ground* laws.

The second claim of my essay will be negative:

- Unlike identity physicalism, nonidentity ground physicalism does not achieve the physicalist dream; in fact, it is just as complex and nonuniform as dualism. It faces an analogue of the T-shirt problem for dualism: the *T-shirt problem for ground physicalism* (Pautz 2010, 2014b).

The lesson will be that, if you want to be a physicalist at all, you should join Lewis, Sider and Dorr in accepting identity physicalism. Even though this austere form of physicalism is currently unpopular, it is the only good option for physicalists.

On the other hand, if you reject identity physicalism - as I am inclined to do - then you need to accept that we have no way of deciding whether things like experiences and the holes in a piece of cheese are linked to the fundamental physical level by *nomio laws* (dualism) or *ground laws* (physicalism). A number of philosophers have suggested an *abductive methodology* for grounding. But it cannot decide between these options because they are equally complex and nonuniform.

My plan is as follows. In §1, I will briefly review the problems with dualism. In §2, I will argue for my first claim: identity physicalism avoids the problems with dualism and achieves the physicalist dream. In §3, I consider some arguments for moving from the austere view of identity physicalism to the more liberal view of ground physicalism. In §§4-8, I will argue for my second claim: ground physicalism same problems as dualism.

1. The Dualist Nightmare

At a minimum, achieving the physicalist dream requires avoiding the problems with dualism. So I begin with dualism.

Dualists think that most of nature is pretty boring: just different arrangements of colorless atoms in the void (or whatever replaces atoms in the void in the true physics). But consciousness is special. When brains reached a certain complexity, a miracle happened. There appeared properties of a wholly novel type: *conscious experiences* with technicolor phenomenology. To explain this, we have no choice but to posit anomalous interlevel “psychophysical laws”. There are possible worlds where these laws don’t obtain, the miracle doesn’t happen, and we are all zombies.

David Chalmers is a prominent dualist:

Scientists introduced electromagnetic charge as a new fundamental entity and studied the associated fundamental laws. Similar reasoning should apply to consciousness. Thus, a complete theory will have two components: physical laws, telling us about the behavior of physical systems from the infinitesimal to the cosmological, and what we might call psychophysical laws, telling us how some of those systems are associated with conscious experience. (1995: 83)

There are three classic problems with dualism. Since they are familiar, I will be brief.

First, dualism is complex. Traditional *subject dualism* is ontologically complex. It holds that we are special immaterial subjects. *Property dualism* (or “predicate dualism”) avoids immaterial subjects. But it is still “ideologically” complex, requiring a slew of basic mental predicates.

Dualism is also complex in requiring all those psychophysical laws; it faces what in the introduction I called the “T-shirt problem”. Chalmers holds out hope that the basic psychophysical laws can at least be compactly formulated. For instance, one might hope that there is a systematic mapping from neural patterns in a “neural similarity space” onto smell qualities in a “quality space”. But, as Robert Adams (1987) argued in an unduly neglected essay, there is a real question about whether this is possible (for discussion, see Pautz 2010: 46-47, and Schaffer this volume). For instance, there may be no unique, objectively valid “quality space” for smell qualities. Also, high-level terms like “neural pattern” do not belong to the fundamental language. So if the fundamental laws must be formulated in a fundamental language, the fundamental psychophysical laws would require specifications of our neural states in the fundamental language of microphysics. Such specifications would be exceedingly long and complex, resulting in exceedingly long and complex fundamental psychophysical laws. There is no way you could put them on a T-shirt.

Second, dualism is non-uniform. As J. C. Smart put it, “that everything should be explicable [reducible] in terms of physics except the occurrence of sensations seems to me to be frankly unbelievable” (1959: 142). The dualist holds that special bridge laws link the activity of brains with irreducible experiences. But there are no such bridge laws elsewhere in nature. For instance, there are no such laws linking the activities of trees with some irreducible states. True, there are fundamental laws elsewhere in nature – the fundamental laws of physics. But psychophysical laws would be totally different from the laws of physics.²

A third well-known problem with dualism is that, given causal closure (and setting aside systematic overdetermination), it leads to epiphenomenalism about the mind (Loewer 2017).

2. Identity Physicalism Achieves the Physicalist Dream

So much for the problems with dualism. Let us now turn to identity physicalism. I begin by explaining it. Then I will show how it achieves the physicalist dream by avoiding the problems with dualism.

I will introduce identity physicalism by way of an analogy due to David Lewis (1994). Imagine a “pixel world” that starts off with a simple arrangement of black and white pixels (the “initial conditions”). Some “laws of nature” govern how the arrangement of black and white pixels at one time determines the arrangement at the next time. Perhaps they are like the laws of Conway’s famous *Game of Life* (see Gardner 1970 for details). Eventually there evolved extremely complex and interesting arrangements of pixels at the macro-level (see Figure 1).

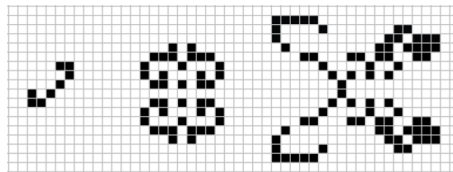


Figure 1: David Lewis’s pixel world.

² Schaffer (this volume) goes further than Smart (1959), suggesting a constraint that may immediately rule out the very possibility of basic psychophysical laws: he says that “high-level” properties such as neural/functional types *cannot* figure in basic nomic laws. But it is hard to believe that basic laws involving high-level properties are metaphysically impossible. For example, there are worlds where it’s a basic law that when a system reaches a certain complex organization (say, non-zero “integrated information”) it is annihilated. So the claim must be that, as a matter of fact, there are no such laws. But can we point to specific empirical evidence that there are no such laws? In my view, the only case against such laws is Smart’s (1959): there is an *a priori* presumption against them because they would be complex and require a non-uniform view of nature.

Now, as Lewis remarks, this world “evokes reductionist comments” (1994: 413). All objects are identical with pixels or sums of pixels, and all instantiated “macro” properties are identical with complex arrangements definable in terms of *black* and *white* and spatial relations. For instance, if the pixels happen to form a *smiley face*, that abstract type is identical with such an arrangement (perhaps a “disjunction” of specific arrangements). Call this *identity pixelism* about this world.

If identity pixelism can be true for the pixel world, maybe something similar is true for our world. Our world is more complex, but the basic idea is the same. Here is David Albert:

Ever since the scientific revolution of the 17th century, what physics has given us in the way of candidates for the fundamental laws of nature have as a general rule simply taken it for granted that there is, at the bottom of everything, some basic, elementary, eternally persisting, concrete, physical stuff. Newton, for example, took that elementary stuff to consist of material particles. And physicists at the end of the 19th century took that elementary stuff to consist of both material particles and electromagnetic fields. And so on. The fundamental laws of nature generally take the form rules connecting the arrangements of that elementary stuff at later times to its arrangement at earlier times. (Albert 2015)

Roughly, *identity physicalism* now says that, just as in the pixel world everything is identical with arrangements of black and white pixels, in our world everything is identical with arrangements in the “basic, elementary” objects and properties.

Let me try to formulate identity physicalism a bit more precisely. First, we start with the “fundamental language”. We assume that there is some set of fundamental global dynamic laws. Maybe they govern fundamental properties and relations that generally belong to very small things and that are widespread in nature (e.g. position, mass, charge, spin, particle number). To handle quantum entanglement, we may need to also include a new fundamental relation among particles, over and above spatiotemporal relations. 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 “fundamental language” includes predicates expressing all these properties and relations.³

³ Physics only tells us the *nomic roles* of microphysical properties like mass and charge. This leaves open different views of their natures. One view is that, aside from their nomic roles, they are “merely numerically distinct”. Another view is that they are not merely numerically distinct; they have “substantial natures” (e. g. qualitative or experiential natures) going beyond their nomic roles, even if we cannot know what they are (Chalmers 2012: 349-350). (Of course, it is very unlikely that they are anything like colors or any of the other qualities we are familiar with.) Identity physicalists can accept any of these views. Their view will still have the traditional virtues of physicalism.

The fundamental language also includes “topic-neutral” predicates. For instance, it includes predicates expressing all fundamental spatial and 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 also includes fundamental logical vocabulary, including that of modal logic and mereology. It includes lambda-abstraction, allowing for the formation of complex predicates.

If the identity physicalist accepts “necessitism” about properties (necessarily, all properties exist necessarily), then she will say that the fundamental language also includes all predicates for all possible *alien* fundamental properties. For they exist at our world even if they are not instantiated in our world.

The fundamental language also includes names of all fundamental physical objects. If the identity physicalist likes ZFC set-theory, it includes “is a member of” and names for all the sets constructible from the basic physical items. If the identity physicalist favors unrestricted mereological composition, it also includes “is a part of” and names for all the mereological sums composed from basic physical items. In the name of simplicity, such an identity physicalist will likely accept “uniqueness of composition”: for any objects, there is only one mereological sum with those objects as parts. (They can use counterpart theory or other moves to block Leibniz’s Law arguments for a more plenitudinous ontology of coincident objects.) Alternatively, the identity physicalist might entirely dispense with mereology, and try to get by with set-theory alone (Sider 2010: chap.13).

This is a rough characterization of “the fundamental language”. There are different versions of identity physicalism depending on exactly what is included in this language.

The next step is to introduce a notion for connecting high-level descriptions with lower-level descriptions in the fundamental language. Lewis (1994) speaks of “reductions”. Instead, I will use the idea of “identifications” recently discussed by Cian Dorr (2016). That is why I call the view *identity physicalism*. Others might choose to formulate identity physicalism using Sider’s (2011) idea of “metaphysical semantics”.

In ‘Hesperus is Phosphorus’, the expressions flanking ‘is’ are denoting phrases. Dorr (2016) notes we also have a good grip on identity claims in which the expressions flanking ‘is’ are predicates, such as ‘to be a vixen is to be a female fox’.⁴

Dorr holds that ‘to be *F* is to be *G*’ makes sense even if nominalism is true and there are no properties (in the sense of genuinely first-order quantification). However, I will assume realism about properties, so that ‘to be *F* is to be *G*’ generally goes with ‘the property of being *F* is identical with the property of being *G*’.

⁴ Rosen (2015) offers a very different interpretation of ‘to be *F* is to be *G*’ in terms of allegedly more basic notions of *ground* and *essence*. For criticism, see Pautz 2020a: 271, fn.8. In formulating identity physicalism, I’m instead using ‘to be *F* is to be *G*’ as understood by Dorr in terms of *identity*. So identity physicalists in my sense needn’t appeal at all to the notions of “ground” or “essence” – notions that many regard as dubious (Dorr 2016: 79, 126n.75).

The third and final step is to formulate identity physicalism as two claims. First, every object in our world is identical with something that you can name in the fundamental language: a fundamental physical thing, or a sum of them, or a set constructible from them. Second, every property instantiated in our world is identical with some or other property expressed by a predicate (perhaps an infinitely complex predicate) in the fundamental language.

For instance, maybe all concrete objects are sums of particles, or series of time-slices, or whatever. Suppose we say that one of them ‘is a tree’. Because “the array of definable properties and relations is extremely rich” (Sider 2011: 130, 294), *some* of them are bound to have extensions across worlds that pretty well fit our use of ‘is a tree’. Identity physicalists say that every “acceptable precisification” of this predicate picks out such an extremely complex property of a sum of particles definable in the fundamental language (a different one relative to different precisifications). The same is true when we say of a person that she ‘experiences red’ or ‘feels pain’ or ‘acts wrongly’.⁵ For, on this view, all the properties that there are in nature – and so all the properties available for our words to latch onto – are those definable in the fundamental language.

As Sider (2011: 130) notes, identity physicalists can accept “functional properties” of the form *having some property or other that plays role R*, because the fundamental language can allow quantification over properties. For instance, they can say that ‘is a hand’ expresses (relative to one acceptable precisification) such a functional property. And they can say that experiencing red is a functional property, as long as the functional property can ultimately be cashed out in fundamental physical and topic-neutral terms. So identity physicalism includes functionalism and can accommodate “multiple realizability” (more on this in §3).

No one can actually define ordinary predicates in the fundamental language. But that does not mean that those predicates don’t pick out (or have acceptable precisification on which they pick out) properties that are definable in this way.

Here is an analogy. Imagine that, as time goes on, Lewis’s pixel world evolves and the pixels start forming what look like faces: smiley-faces, sad-faces, and so on. We cannot define ‘pixel-face’ in the austere language of pixels – there are just too many possible arrangements of pixels that make a pixel-face. In fact, if you squint or have bad vision, you might see the pixel-faces, but be altogether unaware of the pixels. Nonetheless, every precisification of ‘is a pixel face’ refers to a property definable in such terms.

⁵ Identity physicalists need a solution to the “problem of the many”. A standard “supervaluationist” solution implies that whenever someone is in pain, they have countless states that are nearly identical to their pain in every way but are not pains and not even experiences. This is a cost of their view (Pautz 2017).

In the same way, to wrap your head around identity physicalism, it may help to start small, rather than starting with big things like trees and persons. Identity physicalists like Lewis, Sider and Dorr can point out that their view was very plausible in the very first moments after the Big Bang when the universe was small and relatively simple. All instantiated properties were definable using the terms of basic physics and some topic-neutral terms. But then it is plausible for the next moment too. For it is implausible that some irreducible properties $P, Q, R \dots$ started “popping up” in the next moment. (By calling a property ‘irreducible’, I just mean that identity physicalism fails for it.) Generalizing: if identity physicalism is true at t , it is plausible that it is true at $t + 1$. So identity physicalism is always true. New macro properties appeared, but they were definable in physical and topic-neutral terms.

What about mathematics? Identity physicalists might accept ZF-set theory, and hope that this is enough for mathematics. Or they might take a fictionalist approach to mathematical objects and other abstract objects. Even if they ultimately must add some primitive mathematical objects to their fundamental language, this needn’t conflict with the spirit of their view. It still may be the simplest and most austere view of reality (both concrete and abstract) *consistent with the facts*.

Notice that my formulation of identity physicalism doesn’t invoke any notion of ground. Nor does need Kit Fine’s locution ‘it is in the essence of X that so-and-so’ (2012). It doesn’t even appeal to “metaphysical necessity”. So identity physicalists could consistently avoid these notions in theorizing about the world, even if they are currently *de rigueur*. In fact, Lewis probably would have rejected the very idea of grounding (MacBride and Janssen-Laure 2022). Dorr is also skeptical about it, saying that it is one of “the most obscure ideas in all of philosophy” (2016: 79, 126n.75).

However, one identity physicalist, Ted Sider, is happy to say that fundamental facts “ground” more complex, higher-level (disjunctive, functional) facts, even if he thinks that such ground connections are not basic but can ultimately be “reduced” (Sider 2020a: 765-766). Nevertheless, I would not count Sider’s identity physicalism as a form of ground physicalism. In my terminology, ‘ground physicalism’ refers to a view that *rejects* identity physicalism for consciousness (and perhaps other elements of the manifest image) but that nevertheless holds that consciousness is linked to the fundamental physical base by way of basic ground connections (or basic Finean essentialist connections). So I use ‘ground physicalism’ and ‘identity physicalism’ exclusively.

Identity physicalism clearly avoids the dualist nightmare. It has the virtues traditionally associated with physicalism.

First, identity physicalism is simple. It appeals to the aesthetic sense of those of us who have a taste for desert landscapes. It only requires the laws of physics. It does not

require dualism's anomalous psychophysical laws. So it may achieve the physicalist dream of a short list of fundamental laws that could fit on a T-shirt.

For instance, there is a systematic correlation between increasing pain intensity and increasing firing rates of neurons in the "pain matrix" of the cortex. But, on identity physicalism, there are not two things here that are systematically connected by a special law of nature; there is just one thing - increasing firing rates of neurons. When you say 'my pain is increasing', this is what you are talking about, even if you do not know it.

Of course, on identity physicalism, firing rates depend on more fundamental physical facts. But here again no special laws are required. High-level descriptions are definable in fundamental terms, and they follow logically from the fundamental description (Dorr 2008). So, to account for the manifest image, no special principles or laws are required, other than logical principles that everyone accepts.⁶

Second, identity physicalism is maximally uniform. True, on identity physicalism, interesting new nonfundamental properties have appeared in the sentient and insentient parts of nature. But, as in the pixel world, all such properties are definable in terms of the austere fundamental language.

For instance, suppose you are in a dreamless sleep. Then you suddenly wake up and experience various qualities. If identity physicalism is true, there is a sense in which what is going on at the two times is *fundamentally alike*: just neurons firing in different patterns. Yes, this is hard to believe. Isn't there a *massive difference in kind* between what is going on – a massive discontinuity? At first, there is just activity in soggy grey matter, then there is *technicolor phenomenology*. But identity physicalists just deny this. What is going on at the two times *is* fundamentally alike (Lee 2019).⁷

Third, identity physicalism can avoid dualism's problem about mental causation. One standard solution is something like this. The event of your seeing a red stop-light is an occurrence of a neural/functional property. If it didn't occur, you would not have pressed on the brakes. So, given a counterfactual analysis of causation, it caused your pressing on the brakes (Loewer 2017).

I have said enough to establish the first thesis of this essay: identity physicalism achieves the physicalist dream. It is supported by abductive methodology in metaphysics. And it immediately justifies the strong physicalist claim that experiences

⁶ Ted Sider is a "Russellian realist" about logic who thinks of these logical connections as laws of a certain kind. But (as he pointed out to me in discussion) his identity physicalism still has an advantage over alternatives when it comes to simplicity. *All* views accept such logical laws. But dualists need additional, non-logical psychophysical laws. As we will see, nonidentity ground physicalists also need additional, non-logical "ground laws".

⁷ Identity physicalism might be epistemically as well as metaphysically uniform. Maybe all interlevel identifications (not only *pain is c-fiber stimulation* but also *water is H₂O*) are deeply *a posteriori*, and not derivable *a priori* from a fundamental description of the world. Or maybe they are all in principle derivable *a priori* from such a description (Lewis 1994).

are “metaphysically necessitated” by fundamental physical conditions. We might call this *justification by identification*.

3. From Identity Physicalism to Ground Physicalism

So identity physicalism achieves the physicalist dream. But many think that it is too good to be true. In fact, many think it fails uniformly across all of nature, both the sentient and insentient parts.

In this section, I will consider some arguments for this unfortunate conclusion. I will first look at reasons to think identity physicalism fails for the *insentient* parts of nature. Then, following tradition, I will suggest that we have especially strong reasons to think identity physicalism fails when it comes to *conscious subjects*, relatively recent additions to nature. This discussion will lead us to consider “nonidentity ground physicalism” (§§4-8). It will also be important background to our later discussion of whether ground physicalism might have the traditional physicalist virtues of simplicity and uniformity.

Let us begin with an argument due to John Campbell (2020) for the conclusion that identity fails even in the insentient parts of nature. Suppose you look at a humble tomato. You experience a red quality. Campbell notes that it is part of commonsense that the red quality is an intrinsic, mind-independent feature pervading the tomato’s surface. So that is the default view. Identity physicalists might accept this but then identify the quality with the “reflectance” of the tomato (its distinctive way of reflecting light). But Campbell notes that “the colour seems to have a certain unity and simplicity that the physical basis altogether lacks” (2020: 408). He concludes that the quality red is a *simple and irreducible* quality of the tomato’s surface: that is, there is no interesting identity of the form ‘for the tomato to be red is for the tomato to . . .’

Still, Campbell must say that there is a tight connection between the tomato’s red color and its reflectance. After all, changing its reflectance changes its color. And since we see colors, our visual systems must be able to detect them by detecting the reflectances of objects.

Here Campbell might turn to “ground physicalism” about colors.⁸ Roughly, “grounding” is an unanalyzable determinative connection in nature linking distinct facts. When the fact that *p* grounds the fact *q*, then *p* is necessarily sufficient for *q*. (I will say more about “grounding” when I explain ground physicalism about consciousness in §§4-5.) Armed with this notion, Campbell might put forward the following basic “ground law”:

⁸ Campbell (2020: 409) formulates his view in terms of “supervenience” rather than grounding, but this will not affect the points I will make.

[C-law] Necessarily, if an object has reflectance R , then this “grounds” the fact that it has distinct irreducible color *red*.

This is a form of *nonidentity physicalism* about colors. It rejects identity physicalism, but still may deserve the label “physicalism”. In one version, while a certain reflectance is sufficient for the simple quality red, it is not necessary. For example, perhaps in other possible worlds non-physical objects have the same simple red quality in a “fundamental way”, without having any underlying property as a ground. In another version, the relevant reflectance-type is necessary as well as sufficient for the simple red quality, but the simple red quality is still distinct from the reflectance (requiring an hyper-intensionalist theory of qualities).

Campbell would presumably extend his view to other sensible qualities, requiring even more basic ground laws:

[A-law] Necessarily, if a disturbance in the air has so-and-so physical properties, then this “grounds” the fact it has distinct irreducible audible quality A .

[S-law] Necessarily, if an odor cloud is made up of chemical-type T , then this “grounds” the fact it has distinct irreducible smell S .

On this view, irreducible qualia belong to insentient nature. Indeed, they first emerged long ago, soon after the Big Bang, when the relevant reflectance properties and chemical properties first appeared. They are themselves “simple”, but they are grounded in complex physical properties. Much later, sentient creatures became consciously acquainted with these pre-existing qualities, where conscious acquaintance is irreducible but grounded in the actual world by our brains’ causally detecting them in the right way.

Campbell’s view has an appealing feature. It makes conscious experience look less exceptional in nature. True, there is an explanatory gap between brain activity and conscious experience. However, on Campbell’s view, there are also explanatory gaps all over insentient nature: there are explanatory gaps between reflectances and distinct colors, between chemical types and distinct odor qualities, and so on. As Mark Johnston puts it, “generalizing the mind-body problem in this way makes me calmer about the whole issue” (Johnston 1997: 583; see also Schaffer 2017).

However, Campbell’s view of insentient nature is complex. It faces a problem analogous to T-shirt problem for dualism. To see this, imagine a philosopher who accepts Campbell’s view, but with one difference: she replaces ‘grounds’ in [C-law], [A-law] and [S-law] with ‘nominally determines’. This would be *objective dualism* about sensible qualities (Armstrong 1987). In that case, everyone would agree that [C-law],

[A-law] and [S-law] add to the complexity of our theory of insentient nature. So why wouldn't they still add to complexity if we upgrade them to ground laws?⁹

Is Campbell's appeal to commonsense about sensible qualities enough to support such a complex picture of insentient nature? I think that Campbell is right to hold that sensible qualities are irreducible, but wrong to hold that they emerged in insentient nature soon after the Big Bang. Instead, science supports a traditional "Galilean" view of sensible qualities like colors, smells, pains, and itches. The objective world is devoid of them. They depend on our neural responses. So they appeared in nature only when conscious individuals evolved. I will say more about the Galilean view later on in this section.

Others have argued that identity physicalism fails for certain *objects* within insentient nature. The holes in a piece of cheese are a fun and instructive example. Casati and Varzi (1994) as well as Schaffer (2009: 375) favor *immaterialism about holes*. Commonsense endorses realism: there exists a hole in the cheese, "in the one and only sense of existence" (Schaffer 2009: 357-360). Further, Casati and Varzi argue that the hole cannot be identified with anything made of physical stuff. For instance, it cannot be identified with the physical "hole-lining" within the cheese (contrary to Lewis & Lewis 1970). They conclude that the hole in the cheese is a ghostly immaterial object, wholly distinct from the cheese, filling the empty space. And it is linked to the cheese by a basic ground law:

[H-law] Necessarily, the fact that something is perforated grounds the fact that there exists a distinct immaterial hole within it.

This view is complex. The [H-law] is not trivial. The idea is *not* that 'there exists a distinct hole within the cheese' is just a different way of expressing *the same fact* as 'the cheese is perforated', so that here 'there exists' is being used in an ontologically unserious way. For it is generally supposed that grounding connections can only hold between *distinct* facts (a fact cannot ground itself). So the idea is that there are two distinct facts here. The cheese is perforated. And this grounds a distinct fact: the coming-into-existence of a further object, an immaterial hole. And when proponents of this view say that the immaterial hole exists, they are invoking "the one and only sense of existence".

To appreciate the complexity of nonidentity physicalism for holes, suppose a maverick philosopher accepts the self-same immaterial objects (they are invisible, fill

⁹ Campbell's view is arbitrary as well complex. For Campbell presumably doesn't think that *every* condition specifiable in physical terms (e.g. electric charge, mass) grounds a distinct primitive sensible quality (a bizarre "panqualityism"). Instead, he presumably thinks that only a somewhat arbitrary *subset* of physical properties (reflectances, chemical properties, other physical properties detected by perceivers) ground distinct primitive sensible qualities. See Pautz (2021: 146, 225) and Cutter (2022: 739-740).

the empty spaces in hole-hosts, etc.), except for one thing. Instead of the ground law [H-law], she accepts a nomic law [H-law*]: the fact that a piece of cheese is perforated merely *nominally determines* the fact that there is such a distinct immaterial object in it. Call this *dualism* about those immaterial objects. This law would add to complexity. So why wouldn't it still add to complexity once we upgrade it to a ground law?

In my view, arguments from cases involving holes or other exotic objects are unlikely to bring down identity physicalism for insentient nature. Maybe it is common sense that 'there is a hole in the piece of cheese'. But we can know in advance that this doesn't *require* that there really is a distinct immaterial object. For imagine that you accept this view, and you think that 'holes' refers to immaterial objects. But now imagine the Oracle of Philosophy tells you that you are wrong, and that identity physicalism is right. That is, although the cheese is perforated, there are no ghostly *immaterial* things residing in its empty spaces. Then it would certainly be correct to continue to say 'there are holes in the cheese'. Maybe, in this case, 'hole' *would* refer to the physical hole-living as a fallback, rather than an immaterial thing (Lewis & Lewis 1970). Or maybe in this case 'there is a hole in the cheese' would be a case of ontologically unserious quantification, so that it can be true even if there are (seriously) no holes. This thought-experiment shows that identity physicalists' accounts of hole-talk are *good enough*.¹⁰

Let us look at one more argument that identity physicalism uniformly fails across all of nature: an argument from "multiple realizability". For example, Schaffer (2013) rejects identity physicalism partly on the strength of this argument, even though he acknowledges that it is a beautifully simple view supported by his preferred "abductive methodology" for metaphysics. To illustrate the argument, consider mountains. Intuitively, 'is a mountain' might apply to things in "alien worlds" in which the fundamental properties are totally different (e. g. ectoplasm). Schaffer considers various ways in which identity physicalists might accommodate this. For instance, he considers Sider's appeal to functional properties, which I mentioned in §2. He also considers the idea that 'is a mountain' expresses (relative to a precisification) a disjunction of all possible realizers across modal space. But Schaffer argues that these properties aren't good enough candidates to be the semantic value of 'is a mountain'. These candidates themselves face the multiple realizability challenge, or they are too disjunctive to be explanatory, or whatever. The argument is very general: it also works for 'is a tree', 'is a hand', and so on. Schaffer concludes that identity physicalism uniformly fails.

¹⁰ In fact, the identity physicalist's account of holes is superior to the nonidentity physicalist's account – and not just because it is simpler. Imagine we fill the holes in a piece of Swiss cheese with sour cream. The immaterialist about holes faces a substantive question here: in the "one true sense of existence" (Schaffer 2009: 357-360), did the immaterial holes go out of existence, or did they continue to exist within the cheese (and now they are coincident with some sour cream)? It is hard to believe in an arbitrary fact of the matter. By contrast, identity physicalists can use "quantifier variance" (Sider 2009) to say that there is no substantive question here. In one sense there still exist holes, in another sense there do not.

Schaffer's multiple realizability argument is consistent with there being biconditional definitions of *some* macro properties in more fundamental terms. For instance, *tree* might be defined in terms of *trunk* and *leaves*. But his view implies that we cannot keep providing definitions until we reach absolutely fundamental terms. For that would result in identity physicalism, which Schaffer thinks is ruled out by multiple realizability. So, eventually, we must reach properties P, Q, \dots that lack any biconditional real definitions in more fundamental terms. In that sense, they are *irreducible*. Just what are these properties? Schaffer does not say.

Of course, Schaffer still holds that there are fundamental physical conditions that are *sufficient for* the instantiation of P, Q, \dots . Because of multiple realizability, there will be many such conditions A, B, \dots . So, Schaffer faces a kind of T-shirt problem when it comes to the basic ground laws, akin to the T-shirt problem that dualists face when it comes to the basic psychophysical laws (§1). He may need to posit a complex raft of "ground laws" – so many that they could not fit on a T-shirt. For instance:

[P-Law] Necessarily, if the fundamental particles instantiate fundamental micro-physical and other properties A or B , then this grounds the fact that they instantiate irreducible macro property P .

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

Schaffer apparently cannot explain such ground laws and must take them as basic. For instance, he cannot say that the P -law obtains because (i) P is identical with a disjunctive property with A and B as disjuncts, and (ii) in general, a disjunction is grounded in its disjunctions. For that would be a form of identity physicalism.

So, like parallel views of colors and holes, Schaffer's nonidentity physicalism for multiply realizable properties is complex and somewhat nonuniform. Two types of properties are instantiated in insentient nature: there are the properties recognized by identity physicalists definable in terms of the fundamental physical base; and, in addition, there are properties like P and Q that cannot be so defined, but that are tied to the fundamental physical base by special ground laws like the P -law and the Q -law. Such irreducible properties "popped up" sometime after the Big Bang. If you agree with me that ground laws about colors and holes add to complexity, you should agree that such ground laws would add to complexity as well (more on this "generalized T-shirt problem" in §7).

Is Schaffer's multiple realizability argument enough to support such a complex view of insentient nature? I do not think it is.

Here is an initial reason to be skeptical. Return to David Lewis's pixel world. Could Schaffer mount a strong argument against "identity pixelism" for this world based on multiple realizability? Could he use multiple realizability to show that we must posit specific properties instantiated in this world that cannot be fully defined in fundamental terms (black, white, spatial relations, topic-neutral and logical terms, etc.)? It is hard to think of convincing examples. But then it is hard to see how multiple realizability might be enough to bring down identity physicalism for the insentient parts of our world. After all, the only difference is one of complexity.

Here is another initial reason to be skeptical of Schaffer's multiple realizability argument against identity physicalism. We can make the same point we made against the argument from holes. Suppose that the Oracle of Philosophy told Schaffer that identity physicalism is actually true, so that, although there are atoms arranged mountain-wise, there are no such extra irreducible properties as *P* and *Q*, contrary to the [*P*-law] and [*Q*-law]. If the Oracle of Philosophy told him this, he presumably wouldn't say that 'there are mountains' is false – just look at Mount Everest. Instead, in that case, he would say 'is a mountain' *does* pick out (relative to a precisification) a property definable in the fundamental language. Those are the only properties there are, if identity physicalism is true. So, contrary to the conclusion of his multiple realizability argument, he must allow that such properties are after all *good enough* to be the semantic values of our terms, and they are *good enough* to explain what needs to be explained.

This is not yet to respond to Schaffer's multiple realizability argument. I think identity physicalists have several responses. Let me mention two.

First, in his response to Schaffer's criticism, Sider (2011, 2013) holds on to the idea of appealing to functional properties not at all tied to actual-world physics. He does acknowledge that his opposition to "Platonism" creates a technical problem here, which I will not go into here. Suffice it to say that he also notes that "if one instead adopted a more Platonist approach—employing universals, say, at the fundamental level—then the problem would immediately be solved" (2013: 765). If so, then the functional response is still very much on the table.

Suppose the functional response fails. Then I would suggest another response. Identity physicalists might accommodate multiple realizability by invoking counterpart theory applied to properties.¹¹ Take our multiple realizability intuition: 'the property of being a mountain might be instantiated even if the world contained only alien properties'. The idea is that, even if the identity physicalist says that 'being a mountain' here refers (relative to every precisification) to a complex property *C* built from (in part)

¹¹ One might immediately worry that counterpart theory is ontologically profligate, requiring the existence of other worlds and counterparts, so that it is at odds with the motivation behind identity physicalism. But as Sider (2009: 3) notes "modal realism is not obligatory for counterpart theorists".

physical properties instantiated at *our* world, this modal intuition might come out true, because in an alien world a suitable *counterpart* of *C* is instantiated by the mountain-like things in that world.¹²

This has only been a brief survey of a few arguments against identity physicalism for insentient nature. Suffice it to say that, when it comes to *insentient nature*, it may be difficult to motivate giving up identity physicalism and moving to ground physicalism.

Following tradition, I suggest that we have stronger reasons to think identity physicalism fails when it comes to conscious subjects, relatively recent additions to the universe. Our conscious experiences are bound up with our awareness of sensible qualities: colors, smells, pains, itches. And, as I mentioned earlier, I agree with John Campbell that the sensible qualities are irreducible. But I disagree with his naïve realist view that such qualities belong to insentient nature. Instead, I favor the Galilean view that they somehow depend on the neural responses of conscious subjects. So their irreducibility only undermines identity physicalism for conscious subjects.

Let me start with the irreducibility of sensible qualities. One argument is Campbell's argument discussed earlier. It just seems obvious that when you look at a tomato the quality red is "simple". That is, it seems obvious that there is no interesting identification of the form: "to have this red quality is to be *F*", where *F* is a logically complex predicate. This seems just about as obvious as anything. So sensible colors cannot be identified with complex reflectance properties of external things in insentient nature. Nor can they be identified with complex neural patterns in our own brains (even if they are grounded in such neural patterns). Even the staunch identity physicalist David Armstrong conceded that the sensible qualities are by far the hardest case for his view (1987). By contrast, when it comes to macro-properties in insentient nature, it is quite intuitive that they have some definition in more basic terms (even if it is hard to supply).

Similarly, Schaffer invokes an intuition of distinctness to argue against identity physicalism in the case of the qualities presented in experience: such qualities are, as he puts it, "clearly different" from any underlying physical properties, and identities here would be "incredible" (2021: 203). We have no such immediate intuition of distinctness

¹² The identity physicalist might offer yet another response to Schaffer's multiple realizability argument. She might argue on *a priori* grounds for *necessitism about properties*: necessarily all properties exist necessarily (for an argument see van Inwagen 2004: 137-138). Then her fundamental language will have predicates expressing all alien fundamental properties as well as actually-instantiated fundamental properties. This increases ideological complexity but it is supported by argument. In that case, the property of being a mountain is bound to be necessarily coextensive with some complex property definable in this rich fundamental language: say, a disjunction of all possible "realizers" of mountainhood, including physical-realizers, ectoplasm-realizers, and so on. In that case, it is natural to hold in the interest of simplicity that the property of being a mountain is simply identical some such property. (Maybe such properties are not 'physical' because they have alien, non-physical disjuncts, but the view retains the spirit of identity physicalism.) Maybe Schaffer (2013: 747-748) would even reject this identity on the basis of the constraint he calls "Explanation". But this would require some hyperintensional, plenitudinous theory of properties (see §7).

for *being a mountain*. So, when it comes to such qualities, Schaffer is especially motivated to move from identity physicalism to ground physicalism.

Here is another *a priori* argument against identity physicalism for sensible qualities. Intuitively, color qualities are radically different from non-colors; for instance, they are radically different from audible qualities. Here is a way to articulate this thought: if you start with a color quality in color space, and you move away from it in minimal resemblance-steps, you will always stay within the space of color qualities, and you will never reach a non-color quality. This amounts to a certain kind of *closure principle* for color qualities: anything nearly exactly like a given color quality in every way is also a color quality.

The closure principle rules out identity physicalism for sensible colors. While color qualities have the closure property, complex physical properties lack the closure property. To see this, consider an analogy: in David Lewis's pixel world (Figure 1 in §2), every type of complex macro property can be converted into another type by a series of small steps (e.g. a pixel-face can be converted into a non-pixel-face). The same is true of complex physical properties in our world.

For instance, while color qualities have the closure property, neural patterns in the brain lack the closure property: you can start with one neural pattern (say, the basis of the experience of the quality red) and reach another neural pattern (say, the basis of the experience of an audible quality) by a large enough series of small modifications. So color qualities cannot be identical with neural patterns in the head. They also cannot be identical with reflectance properties of surfaces out in the world. While color qualities have the closure property, the property of reflecting photons lacks it: it is possible to start with the property of reflecting photons and, by gradually changing the laws of nature, reach the property of reflecting a hypothetical particle distinct from photons (say, particles that behave classically and with a speed less than photons). In general, even though our experiences of sensible qualities *depend on* complex physical properties, sensible qualities cannot be *identified with* complex physical properties.

Let me briefly describe a final argument for the irreducibility of sensible qualities (Pautz 2021). At the same time, it is an argument for my Galilean view that sensible qualities depend on our neural responses and so appeared in nature only when conscious experience evolved. We might call it the *argument from no good candidates*. Briefly, there are just no complex physical properties in the external world or in the brain that are even *remotely* good candidates to be identified with the sensible qualities.

Start with physical properties in the external world. They are very poor candidates to be the sensible qualities. There is "bad external correlation". Reflectances in the external world do not have anything like the resemblance structure of colors, chemical properties do not have anything like the resemblance structure of smells, and so on.

By contrast, there is “good internal correlation”. The resemblance structure of sensible qualities *is* mirrored by the resemblance structure of neural patterns in the brain. There is a systematic mapping here. So identity physicalists might identify sensible qualities with neural properties in the head.

But this candidate can also be ruled out. Imagine having an experience of a tomato moving to the right. Clearly, the spatial features *round* and *moving to the right* presented in your experience are not neural properties instantiated in your own head! Why think that the reddish quality is any different? There is nothing reddish in your brain when you have an experience of a red thing.

For all these reasons, identity physicalism is especially implausible for sensible qualities. As Jaegwon Kim (2005: 170) puts it, they are a “mental residue” that cannot be reductively explained in physical terms, even if everything else in nature can be. Since conscious experiences involve irreducible qualities, they, too, are irreducible. They cannot be identified with neural states. They cannot even be identified with higher-level functional states realized by neural states. Identity physicalism fails.¹³

The findings of bad external correlation and good internal correlation also support a Galilean view of sensible qualities. On a Galilean view, before sentient creatures evolved, the external world was devoid of sensible qualities. Reflectances, chemical types, were not objectively associated with particular sensible qualities (“qualia”). Sensible qualities somehow depend on neural responses, and only appeared in the world when sentient creatures evolved. (See Pautz 2021 and Cutter 2022; for criticism see Epstein 2022.)

This Galilean view comes in different versions. On a traditional *sense datum version* (e.g. Boghossian and Velleman 1989), when you see a tomato, the sensible quality red belongs neither to the tomato nor your own brain. Rather, it belongs to a tomato-shaped region of a nonphysical visual field (a “sense datum”), where the visual field is distinct from but dependent on neural activity. On a contemporary *intentionalist version* of the Galilean view (Pautz 2021, Chalmers 2010), the sensible quality red does not objectively belong to the tomato. But it also does not belong to a tomato-shaped region of your *visual field* – there is no such thing. In fact, it *belongs to nothing at all*. It only *seems* to pervade a tomato-shaped region, thanks to your neural response. On these views, we can still say ‘tomatoes are red’, but that is only because they normally cause in us experiences of this special quality. The colors of external things co-evolved with color experiences. In what follows, I will assume a Galilean view of sensible qualities in discussing “ground physicalism”, but my arguments will not depend on it.

¹³ In Pautz 2017 I develop yet another argument against identity physicalism for consciousness, which I call “the argument from significance”. See Dorr, Hawthorne and Yli-Vakkuri (2021: 324-326) for considerations in the same general vicinity.

4. Formulating Ground Physicalism

In the rest of the essay, I will assume:

Nonidentity. Experiences of qualities are not identical with neural states, and they are not even identical with functional states realized by neural states. Identity physicalism may also fail for certain other elements of nature, such as holes and multiply-realizable properties (although here the arguments are weaker).

Schaffer (2020) agrees with me that experiences are not identical with neural states or functional states. As noted in the previous section, he supports nonidentity with an “intuition of distinctness”. This kind of intuition is typically associated with dualism. But Schaffer also holds that experiences are “grounded by” neural/functional states even if they are distinct from them. So he avoids dualism. Instead, he accepts “nonidentity ground physicalism”.

I will explore this kind of view in the rest of this essay. In the present section, I will explain it in greater detail. In §5, I will compare and contrast it with dualism. Then §§6-8, I will argue for the second claim of this essay: unlike identity physicalism, ground physicalism does not achieve the physicalist dream because it shares the problems with dualism.

Let me begin by saying a bit more about the notion of grounding. Typically, philosophers do not introduce this notion by defining it in more familiar terms. For instance, they do not define it as modal necessitation, or *a priori* modal necessitation. In fact, they think that no definition of grounding is possible – not even a complex and unobvious definition. In that sense, it is a fundamental concept (Fine 2001: 21; Schaffer 2009: 376; Rosen 2010: 113). They introduce “grounding” by giving examples and hoping you catch on. For instance, Schaffer (2009: 375) gives the following example: the fact that something is perforated “grounds” the fact that there exists an immaterial hole within it. Grounding is that salient connection between these facts.

When the fact that p grounds the fact that q , it is “metaphysically necessary” that if p then q . But in addition to the modal connection, grounding involves a determinative connection. Grounding is metaphysical causation, or metaphysical superglue. Many are skeptical about grounding (Wilson 2014, Fritz 2022). I’m actually unsure about it. However, for the sake of discussion, I will grant such a notion of grounding.

If you don’t like grounding, then you might instead formulate the kind of nonidentity physicalism about consciousness that I am exploring in terms of old-fashioned “metaphysical necessity”. My arguments that nonidentity physicalism cannot achieve the physicalist dream would apply to any version of this view.

Armed with this notion of grounding, we can make sense of views that reject identity physicalism about consciousness but that may still deserve the label of “physicalism”. To illustrate, suppose you agree with the arguments in §3. You think that sensible qualities are irreducible qualities that only appeared in the world when suitably complex brains evolved. Maybe the quality red is a “simple” feature of a non-physical visual field region. Even so, you might say that it is grounded in a complex neural/functional state. Compare how immaterial holes are fully grounded in the arrangement of matter. On this view, consciousness is irreducible, but that is no cause for alarm because consciousness, like everything else, might still be grounded in the physical.

In general, here is how I understand ground physicalism:

Ground physicalism about X (holes, consciousness): (i) identity physicalism fails for X , but (ii) X is connected to the physical ground floor by some basic ground connections (or basic “essentialist connections”; more on this below). In particular, I am interested in a form of ground physicalism that holds that experiences are not identical with neural states or even functional states of persons.

Others may label this kind of view ‘emergentism’ or even ‘dualism’ rather than ‘physicalism’. Like Schaffer (2020: 201), I am not interested in what to call this view. I am more interested in how well it might achieve the physicalist dream. I will continue to call it a form of ‘physicalism’.

On ground physicalism, there are some ground connections between neural/functional states and distinct experiences. For instance, one neural/functional state grounds the sensation of red, and another grounds the sensation of pain. Such psychophysical ground connections cannot be derived from general ground principles operating within insentient nature. For instance, they cannot be derived from a mereological ground principle: the fact that exists x, y, z, \dots grounds the fact that there exists a sum with x, y, z, \dots as parts. So the ground physicalist must say that there are special psychophysical ground connections that are unique to the case of experiences.

What are the most *basic* psychophysical ground connections? It is implausible that, for every experience, there is a basic psychophysical ground connection linking it to a specific neural/functional state. That would be very complex. Also, neuroscience is beginning to uncover *systematic* correlations between patterns of neural activity and different kinds of experiences. So, instead of a long list of basic ground laws (one for each experience), the ground physicalist has some reason to hope for more general and systematic basic psychophysical ground laws:

G1. If an individual undergoes overall firing rate R in her “primary somatosensory cortex”, then this grounds the fact that she is conscious of irreducible pain quality of intensity $f(R)$, where f is a linear mapping.

G2. If an individual undergoes neural state B in her olfactory cortex, then this grounds the fact that she is in the distinct state of being conscious of irreducible olfactory quality $f(B)$, where f is a systematic from neural similarity space onto the similarity space of olfactory qualities.

G3. If an individual undergoes V4 neural state B , then this grounds the fact they are in the distinct state of being conscious of irreducible sensible color $g(B)$, where g is a systematic from neural similarity space onto the similarity space of sensible colors.¹⁴

Here is an analogy. Connections between specific masses and forces are not basic; rather, what is basic is a more general functional law – Newton’s law of gravitation.

When I discussed the T-shirt problem for dualism in §1, I mentioned a neglected paper by Robert Adams (1987) in which he argues that psychophysical laws could not be compactly systematized. He was discussing the psychophysical nomic laws posited by dualists, but Adams’ worry equally arises for the psychophysical ground laws posited by ground physicalists (Pautz 2014b, Schaffer this volume). But here I will assume that the basic psychophysical ground laws can be somewhat compactly systematized along the lines of *G1-G3*. I think that this is the best that can be hoped for. Nonidentity ground physicalists will need a separate chapter in their book of the world with a list of the basic psychophysical laws.

Nonidentity ground physicalism is neutral about the epistemic status of the basic psychophysical ground laws *G1-G3*. Schaffer (2017) holds that they are only knowable *a posteriori*, just like the dualist’s psychophysical nomic laws *N1-N3*. But nonidentity ground physicalists could also say that they are in principle knowable *a priori*. I will return to the issue in the next section.

Following Kit Fine (2012), many friends of ground also recognize a primitive concept of essence: “it is in the essence of X that p ”. And they think that general ground laws must derive from the essences of the items involved in the grounded facts.

¹⁴ As Schaffer (2020: 194-195) notes, just as identity physicalists disagree about whether experiences are *identical with* neural states or with more abstract functional states, so nonidentity ground physicalists might disagree about whether they are *grounded by* neural states or more abstract functional states. Schaffer himself favors functionalist ground physicalism. My skepticism about ground physicalism will apply to both versions. However, I think that neuroscience favors neurobiological ground physicalism (see Pautz 2021: chap.4). Accordingly, below I formulate the psychophysical ground laws *G1-G3* in neurobiological terms.

Nonidentity ground physicalists about consciousness could easily accept the Finean idea. They could reformulate *G1-G3* in terms of essence:

G1. pain experiences are *essentially* grounded by distinct neural/functional states according to functional law *f*.

G2. Olfactory experiences are *essentially* grounded by distinct neural/functional states according to functional law *g*.

G3. Color experiences are *essentially* grounded by distinct neural/functional states according to functional law *h*.

When I speak of the “basic psychophysical ground laws” in what follows, this should be understood broadly, so that they may be such basic essentialist laws.

The essentialist claims *G1-G3* are apparently not knowable *a priori*. But maybe this is not a problem. Maybe some “essentialist laws” are only knowable *a posteriori* (just as on Schaffer’s view some ground laws are only knowable *a posteriori*). Maybe some of them have the same epistemic status as laws of nature. We can only know them (if we can know them at all) by abductive methodology. After all, they are supposed to be out there in nature, just like the laws of nature. Why should they always be knowable *a priori*?

Gideon Rosen (2010: 133) would object to essentialist claims *G1-G3*. For instance, you could know “what pain is”, without knowing that it depends on a certain distinct neural/functional state. Doesn’t this show that this is not part of the *essence* of pain?

But the nonidentity ground physicalist who proposes essentialist laws *G1-G3* has a reasonable reply. In an everyday sense, you can know what water is without knowing that it depends on H₂O. This does *not* show that this is not part of the essence of water – this *is* part of the “essence” of water. And you can know what mountains are, without knowing that they are grounded in so-and-so microphysical facts. Still, a follower of Fine must say it is part of the consequential essence of the property of being a mountain that it is ultimately grounded in so-and-so microphysical distributions. Likewise, even if in some everyday sense you can know what pain is without knowing it depends on distinct neural/functional states, this may be part of the essence of pain.

I have just explained nonidentity ground physicalism about consciousness. But what about the rest of nature? Our discussion in section §3 can help us answer this question. Nonidentity ground physicalists have two options.

First, nonidentity physicalists might accept *restricted nonidentity physicalism*. In §3, we saw that the best arguments against identity physicalism may concern the hard case of consciousness; arguments against identity physicalism in the rest of nature are

quite weak. So maybe identity physicalism is right for nearly all of nature and fails only in one place: consciousness. Or maybe identity physicalism also fails for moral properties like *ought-not-to-be-done*, because they are another hard case for identity physicalism.

On this kind of “restricted nonidentity” ground physicalism, identity physicalism was right for presentient nature. All things were sums of fundamental things and all properties were definable in terms of the austere fundamental base. In pre-sentient nature, there were just a handful of very general and boring “ground” connections. For instance, the fact that particles x, y, z, \dots exist grounds the fact that their sum $[x, y, z, \dots]$ exists; the fact that x instantiates F grounds the fact that it instantiates F or G ; and so on. Then conscious experience evolved. It is a very different case: identity physicalism fails for it. So it requires additional ground laws along the lines of *G1-G3* that are unique to experiences. We get to say “everything is grounded in the physical”, but the case of consciousness is very singular. Similarly, special ground laws would be required for irreducible normative properties, if such there be.

Alternatively, nonidentity physicalists might accept *generalized nonidentity physicalism*. On this view, identity physicalism does not just fail for consciousness; it fails all over the place. We already looked some examples in §3. For instance, you might think identity physicalism also fails for immaterial holes, or multiply-realizable macro properties like *being a mountain*. There are psychophysical ground laws *G1-G3* for conscious experiences. Then there are ground laws for holes and multiply-realizable properties in insentient nature: the [H-law], the [P-law], the [Q-law], and so on (§3). Maybe the generalized ground physicalist could derive some of these laws from more general and more basic “maximalist” or “plenitudinous” ground principles (more on this in §7).

So much for what ground physicalism might look like. Let me address a worry about any form of nonidentity ground physicalism. Let’s go back to conscious experience. Some might think that ground physicalism about conscious experience, at least as I have described it, is a nonstarter because violates a “nothing over and above” constraint on grounding: if p grounds q , then the fact that q is “nothing over and above” the fact that p . That is because it holds that neural-functional states ground experiences, but it also appears to hold that experiences are “genuinely over and above” neural-functional states. For, on this view, experiences involve certain qualities that are not involved in the underlying neural-functional states. And maybe it’s in their constitutive essence to ground certain normative properties (e.g. pain grounds badness), while this is not true of the underlying neural/functional states. If so, then ground physicalism flouts the “nothing over and above” constraint on grounding.

I find this objection hard to assess for the simple reason that I find “nothing over and above” obscure. It is usually supposed that grounding requires non-identity, because

nothing can ground itself. So if a physical/functional fact grounds an experiential fact, the experiential fact must *distinct from* the physical-functional fact. Yet now we are being told it must be somehow “nothing over and above” the neural/functional fact. What could this mean?

Recently, Gideon Rosen (2017) has offered an interpretation of “nothing over and above”. Roughly, Rosen says that the fact that p is “nothing over and above” the fact that q just in case the fact that p is grounded in q , *and*, across all possible worlds, the fact that p is grounded in something or other more basic.

But if this is all “nothing over and above” means, the objection fails, because the ground physicalist can easily accept that experiences are nothing over and above neural/functional states in this sense. They already say that experiences are grounded in neural/functional states. Now they just have to add that in all worlds they are grounded in something or other more basic; it is contrary to their nature to occur in an ungrounded way.¹⁵

If we understand “nothing over and above” along Rosen’s lines, ground physicalists might favor a different, less conciliatory response to “nothing over and above” worry. They might entirely reject the “nothing over and above” constraint on grounding. For even if in the actual world experiences are grounded in neural/functional states, it is quite plausible that in *other* possible worlds (“dualist worlds”) those very same experiences can occur without being grounded in anything more basic.

5. How Ground Physicalism Resembles Dualism: Bling and Zing

Before moving on to our central question of whether ground physicalism about consciousness achieves the physicalist dream, I want to note some ways in which it resembles dualism. I will also note some ways in which they differ. This will help me warm you up to the second claim of this essay: unlike identity physicalism, ground physicalism does not achieve the physicalist dream, because it shares the problems with dualism.

To illustrate how ground physicalism compares to dualism, let us focus on the dualism of David Chalmers versus the ground physicalism of Jonathan Schaffer. Chalmers and Schaffer could agree on many things. For instance, Chalmers accepts a kind of Galilean intentionalism about sensory consciousness: the brain enables us to

¹⁵ Wilson (2018: 503) says that “the stipulated formal features of Grounding do not rule out anti-physicalist ‘over and above’ relations”, and she notes that a strong emergentist can say physical states “Schmound” experiences (where this is a relation formally akin to Grounding). But, as I note here, nonidentity ground physicalists can at least accept Rosen’s version of the “nothing over and above” claim. My discussion will be independent of this issue. Even if nonidentity ground physicalists accept Rosen’s version of the “nothing over and above” claim and in this respect their view differs from dualism, their view resembles dualism in other respects (§5) and is susceptible to my main objections about complexity (§6) and nonuniformity (§7).

become acquainted with an array of novel, uninstantiated sensible qualities entirely absent from pre-sentient nature. Schaffer could accept the same view. They could also agree on the empirical evidence: correlations between experiences and distinct neural/functional states.

In fact, Schaffer and Chalmers might only disagree about one thing: what lies behind and explains these empirically-discovered correlations. As we saw in §4, a ground physicalist like Schaffer speculates that they are explained by systematic basic *ground laws*, such as *G1-G3* listed above. By contrast, as a dualist, Chalmers speculates that they are explained by identical-looking basic *nomically laws*:

N1. If an individual undergoes overall firing rate R in her “pain matrix”, then this *nomically* determines that she is conscious of irreducible pain quality of intensity $f(R)$, where f is a linear mapping.

N2. If an individual undergoes neural state B in her olfactory cortex, then this *nomically* determines she is in the distinct state of being conscious of irreducible olfactory quality $f(B)$, where f is a systematic function from neural similarity space onto the similarity space of olfactory qualities.

N3. If an individual undergoes V4 neural state B , then this *nomically* determines that they are in the distinct state of being conscious of irreducible sensible color $g(B)$, where g is a systematic function from neural similarity space onto the similarity space of sensible colors.

The nomic laws *N1-N3* proposed by Chalmers differ from the ground laws *G1-G3* proposed by Schaffer in one respect only: ‘grounding’ is replaced throughout by ‘nomically determining’. Thus, for Chalmers, the systematic relationship between neural/functional states and distinct conscious experiences is more like that between mass and gravitational attraction, or between electric charge and magnetism (see Figure 2).

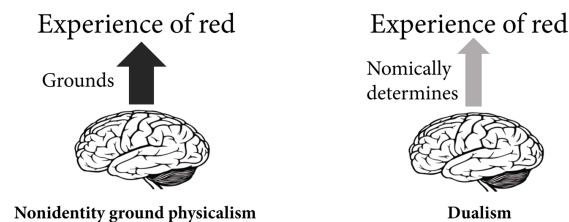


Figure 2: Nonidentity ground physicalism resembles dualism.

The point I am making here is general. Ground physicalism comes in different forms because there are different non-reductive theories of consciousness. In general, for *any* form of ground physicalism, you can convert it to a *counterpart dualist theory*: a theory that agrees with that form of ground physicalism about everything, except it replaces occurrences of “grounding” with “nomicallly determining”.

For instance, ground physicalists could accept a *sense datum view* on which immaterial subjects experience immaterial brain-created sense data, provided that they add that all these immaterial things are grounded in neural/functional states. (Compare how immaterial holes are consistent with ground physicalism as long as they are grounded in hole-hosts.) Or they could accept *naïve realism*: contrary to the Galilean view, sensible qualities are out in the world, and we stand in an irreducible acquaintance relation to them. Acquaintance is grounded in the long causal chain going from external objects to the brain. Or ground physicalists could hold that experiences are irreducible, non-relational states grounded in brain states. For each of these forms of ground physicalism, we can always convert it into a counterpart form of dualism by simply replacing ‘grounding’ by ‘nomicallly determining’ throughout.

But how does *grounding* differ from *nomicallly determining*? In what ways do ground laws like *G1-G3* differ from the nomic laws like *N1-N3*?

To make the question vivid, imagine using new technical terms: “zinging” for grounding and “blinging” for nomicallly determining (Figure 2). And let’s go back to the disagreement between Chalmers and Schaffer. If they were to state their disagreement using these technical terms, it would no longer seem very profound:

Chalmers: “Neural or functional states merely *bling* distinct states distinct states of being conscious of irreducible sensible qualities, by way of bling laws like *N1-N3*. Once we give up identity, bling connections are the best explanation of the empirically-discovered correlation between them.”

Schaffer: “Wrong! Neural states *zing* those distinct states of being conscious of irreducible sensible qualities, by way of zing laws like *G1-G3*. Once we give up identity, zing connections are a much better explanation of the empirically-discovered correlation between them.”

The resemblance between these views is especially close if we assume a “primitivist” theory of nomic determination, such as the Armstrong-Tooley-Dretske primitive necessitation theory, or the theory that ‘it is a law that . . .’ is a primitive operator. On this view, just like grounding cannot be explained in other terms, so nomic determination cannot be explained in other terms. In fact, Chalmers (2012: 338-339) accepts primitivism about nomic connections and Schaffer leans towards it (personal

communication). So the dualist Chalmers says that one primitive determinative connection holds between neural/functional states and distinct states of consciousness. And the ground physicalist Schaffer says that another primitive determinative connection holds between these same states. How do these connections differ? What's the difference between zinging and blinging?

One answer is that there is an epistemic difference between the ground physicalist's psychophysical ground laws *G1-G3* and the dualist's psychophysical nomic laws *N1-N3*. The dualist Chalmers holds that his nomic psychophysical laws *N1-N3* are empirical generalizations. It is conceivable that there should not have been such bridge laws or that they should have taken a different form.

By contrast, it may be thought that ground laws or "laws of metaphysics" are always *a priori* or at least "intelligible" (Rabin, this volume). Call this *rationalism about grounding*. Now the nonidentity ground physicalist who accepts rationalism about grounding must concede that, at present, there is a massive explanatory gap between experience and the brain, so that we do not *now* "see" that that neural/functional states must be linked with certain distinct experiences according to *G1-G3*. But she might speculate that, if we only knew more about the brain (say, the hidden "quiddities" of the fundamental physical properties), then these grounding links would become "intelligible" (Chalmers 2015).

However, Schaffer (2017) rejects rationalism about grounding. He says that grounding connections within concrete nature are generally not *a priori*. For instance, as we discussed in §3, Schaffer is inclined to accept [H-law]: necessarily, the fact that something is perforated grounds the fact that there exists a distinct *immaterial* thing within it. But this is not *a priori* obvious. True, it is *a priori* that a piece of Swiss cheese "contains holes" in *some sense*. But it is not *a priori* that it contains holes understood as invisible, immaterial objects. It is conceivable that a perforated piece of cheese does not contain such objects. After all, identity physicalists hold that it does not contain such immaterial objects: rather, holes are material hole-surrounds, or "there are holes" is a case of ontologically unserious quantification. They deny [H-law].

I think that there is an additional reason to be skeptical of rationalism about grounding. Rationalism about grounding would be guaranteed, if the initial way of introducing the concept of "grounding" (or "zinging") were to *stipulatively define* it in terms of the *a priori*. For instance, Chalmers (2012: 452) introduces a concept of "conceptual grounding" in this way. But, as already noted, this is not how grounding enthusiasts typically introduce their notion of grounding ("zinging"). They consider it primitive, and introduce it through examples. Like nomic determining, it is out there in the world and conceptually independent of the *a priori*, rational domain. When the grounding is explained in this way, it becomes very hard to argue that ground laws must

be *a priori*. Indeed, it becomes implausible. Why *must* they all be knowable *a priori* by us, any more than nomic laws?¹⁶

If Schaffer is right, then there is no epistemic difference between his psychophysical ground laws *G1-G3* and Chalmers's psychophysical nomic laws *N1-N3*. His psychophysical ground laws *G1-G3* are also empirical generalizations. It is conceivable that there should have been no such ground laws, or that they should have taken a different form.

Might Schaffer's ground laws differ from Chalmers's nomic laws in some other way? A common idea is that ground laws are always *modally stronger* than mere nomic laws. Grounding (zinging) is a kind of metaphysical superglue, while nomically determining (blinging) is a weaker glue.¹⁷ So Chalmers and Schaffer might continue their conversation in this way:

Chalmers: The psychophysical laws are *nomic* laws along the lines of *N1-N3*, and these are merely *contingent*. So I think zombie scenarios (where all the physical facts are the same but conscious experiences are absent) are metaphysically possible.

Schaffer: I disagree. The true psychophysical laws are the *ground* laws *G1-G3*. And, even if they are just as *a posteriori* as your dualist laws *N1-N3*, they are modally stronger: they "metaphysically necessary". So in my view zombies are metaphysically impossible.

That sounds like a big difference. But what does it mean?

When Chalmers says that his nomic laws *N1-N3* are merely nomically necessary, he means that they hold in all worlds where the nomic laws are the same. Similarly, as Schaffer explains "metaphysical necessity", when he says that his *a posteriori* ground laws *G1-G3* are "metaphysically necessary", he means that they hold in all worlds where the ground laws are the same (2020: sect. 2.2). But this doesn't yet tell us in what sense *G1-G3* are modally *stronger* than *N1-N3*.

¹⁶ Chalmers (2010: 189-191) makes the same point. He says that, *if* we have a grip on a kind of grounding that is not defined in epistemic terms, then there is no good reason to think that ground connections (like *G1-G3*) must be knowable *a priori*. They could be deeply *a posteriori*, like laws of nature. Although Chalmers accepts this conditional, he rejects its antecedent: he is a "modal rationalist" who says that "there is no reason to believe in metaphysical grounding" that is not defined in epistemic terms (2010: 191). But here I am assuming a kind of metaphysical grounding not defined in epistemic terms.

¹⁷ Relatedly, nomically determining (blinging) comes in probabilistic forms. By contrast, grounding (zinging) is supposed to be essentially deterministic (we can allegedly just "see" this *a priori*). So if we had evidence that the link between neural/functional states and experiences is probabilistic, this would favor probabilistic psychophysical nomic laws over psychophysical ground laws. But at present we have no such evidence.

Maybe this can be explained along the following lines. Imagine a “zombie scenario”. The ground physicalist Schaffer agrees with the dualist Chalmers that the zombie scenario is easily conceivable and cannot be ruled out *a priori*. Still, they differ about how “far away” this scenario is from actuality. Chalmers holds that the zombie scenario is “not very far away” from the actual world, because in his view it merely requires removing the nomic laws connecting our neural/functional states with our distinct experiences, and that is not such a big difference. By contrast, Schaffer holds that the zombie scenario “much farther away”, because in his view it requires removing the ground laws connecting neural/functional states and our distinct experiences, and that is a bigger difference.

However, I think that the ground physicalist must say that this is merely due to a *conventional* fact: it is a conventional fact that we *count* holding fixed *a posteriori* ground laws (“zing laws”) as more important than holding fixed *a posteriori* nomic laws (“bling laws”) in reckoning similarity across worlds. For, it is not as if grounding is an objectively “big” relation, while the nomically determining is a “small” one (even though that is how I depicted them in Figure 2), so that removing ground connections between distinct physical and experiential states would *objectively* make for greater across-world dissimilarity than removing nomic connections between them.

In sum: ground physicalism about consciousness resembles dualism. Both hold that states of consciousness are linked to distinct neural/functional states by basic psychophysical laws. These laws may not differ epistemically. And if they differ modally, it is only a consequence of the difference between the primitive notions of grounding (zinging) and nomically determining (blinking).¹⁸

By the way, nonidentity ground physicalism resembles dualism, even if ground physicalists accept Kit Fine’s idea that grounding connections derive from essences. As discussed in the previous section, in that case, they hold that the most basic psychophysical laws *G1-G3* should be re-formulated so that they are about the essences of experiences: experiences are *essentially* grounded by distinct neural/functional states in certain systematic ways (see §4). Such “essentialist laws” *G1-G3* resemble the dualist’s nomic laws *N1-N3* in being systematic connections between neural/functional states and distinct experiences. Further, such essentialist laws *G1-G3* look just as a

¹⁸ Rabin (2019: 199-200) raises the initial worry that “Schaffer is a dualist in sheep’s clothing”, but then says it is hard to say because we “have no idea how to gauge what will count as a metaphysical law versus a natural law on Schaffer’s system” and maybe “there is no fact of the matter”. I found Rabin’s discussion congenial, but just to be clear, I think Schaffer is definitely not a dualist. I am assuming two different unanalyzable connections in nature: grounding and nomically determining. This settles what is a metaphysical law versus a natural law. So there is a substantive difference between Schaffer’s view that neural-functional states and experiences are linked by *ground* laws and the dualist view that they are linked by *nomic* laws. (This contrasts with Sider’s (2009: 12.5) entirely Humean, conventionalist view: according to Sider, there are simply regularities, and whether we label them “laws of metaphysics” or “natural laws” is not substantive.) My point in the present section (and in Pautz 2014a,b and 2015) is merely that nonidentity ground physicalism *resembles* dualism in some respects – and on this point Rabin and I agree. More importantly, I will go on to argue that it is just as complex (§6) and nonuniform (§7) as dualism.

posteriori as the dualist's nomic laws. And why shouldn't they be *a posteriori*? If essences are out in nature, why must we be able to know them *a priori*? Finally, it is unclear in what sense essentialist laws like *G1-G3* might be objectively "stronger" than the dualist's nomic laws *N1-N3*. Zombie worlds where they fail to hold (where the arrow of "being essentially grounded by" is removed) would not be *objectively* farther away from worlds where the dualist's nomic laws fail to hold (where the arrow of "nomically determining" is removed). It is just a matter of convention that we count them as farther away.

Now that we understand ground physicalism, we can turn to the question of whether it achieves the physicalist dream. In §§1-2, I argued for the first claim of this essay: identity physicalism achieves the physicalist dream because unlike dualism it is simple, uniform, and nicely handles mental causation. In the rest of the essay, I will argue for the second claim: nonidentity ground physicalism does not achieve the physicalism dream. It is just as complex as dualism, facing a version of the T-shirt problem (§6). It is also equally nonuniform (§7). And it doesn't better handle mental causation (§8).

6. Ground Physicalism v Dualism: The T-shirt Problem

In §1, I noted that dualists face the "T-shirt problem". We might hope that there is a handful of fundamental nomic laws simple enough that they might fit on a T-shirt. But dualism ruins this dream. Even in the best case, the dualist will need a separate, basic psychophysical nomic law for each *type* of experience. They might look like *N1-N3* (listed in §5). Such psychophysical nomic laws add to the complexity of the dualist's theory of the world (assuming an anti-Humean view on laws on which they are more than mere regularities).

I think that nonidentity ground physicalists about experience face an analogous T-shirt problem: the *T-shirt problem for ground physicalism* (Pautz 2010, 2014). In explaining the vast array of derivative facts about holes, mountains and experiences, they should prefer a small number of systematic ground principles that could fit on a T-shirt. But the case of experience ruins that dream. As I argued in §4, wherever the dualist requires psychophysical nomic laws linking experiences with distinct neural/functional states, the ground physicalist needs parallel psychophysical *ground* laws. Just as the dualist's psychophysical nomic laws cannot be derived from other nomic laws in nature (the laws of physics), the psychophysical ground laws cannot be derived from other ground laws in nature (e. g. mereological ground laws). For instance, if the dualist

requires basic psychophysical nomic laws *NI-N3*, the ground physicalist requires identical-looking basic psychophysical ground laws *G1-G3*.¹⁹

Now the ground physicalist's psychophysical ground laws *G1-G3* are in all relevant respects analogous to the dualist's psychophysical nomic laws *NI-N3*. They are basic necessary connections between distinct neural/functional and experiential states. So if we accept that the dualist's psychophysical nomic laws *NI-N3* add to the complexity of their theory of the world, then we must also accept that the nonidentity ground physicalist's psychophysical ground laws *G1-G3* *equally* add to the complexity of their theory of the world. These theories are *equally complex in their stock of basic principles*. Call this the *parity point*.

The parity point means that we have no simplicity-based reason to prefer nonidentity ground physicalism to dualism. Schaffer proposes an abductive methodology for grounding (2021: 183). But Schaffer's abductive methodology apparently cannot help us answer the question: *why favor his hypothesis that experiences and distinct neural/functional are linked by ground laws G1-G3 to the dualist's hypothesis that they are linked by nomic laws NI-N3?* After all, our only evidence is the systematic correlations between experiences and distinct neural/functional states. And these two hypotheses provide equally complex explanations of these correlations. So we have no simplicity-based reason to prefer the first to the second (Pautz 2010: 66).

I have been focusing on Schaffer. As we saw in §4, other nonidentity ground physicalists will have different views on the psychophysical ground laws *G1-G3* linking experiences to distinct neural/functional states. For instance, rationalists about grounding may speculate that they are in principle knowable *a priori*. Others will say that they follow from the essences of experiences. But the parity point I am making here is neutral between these views.

Start with a rationalist form nonidentity ground physicalism (Chalmers 2015). The rationalist must accept nonidentity for experiences, because there are conceivable dualist worlds where simple subjects have experiences without being grounded in anything more fundamental (Pautz 2015). To explain the empirically discovered correlations between experiences and distinct neural/functional states, the rationalist speculates that they are linked by some metaphysically basic ground laws *G1-G3* (basic in the sense that they cannot be derived from still more basic principles). True, he also speculates that *G1-G3* are knowable *a priori*. Maybe he speculates that the subatomic particles making up the brain have little alien experiences or qualities ("panpsychism", "Russellian monism") and that, if we only knew what they are like, we would see that

¹⁹ Elsewhere (2015: note 47) I raised a similar potential problem for Schaffer's "priority monism": it may require a big unsystematic list of "big-to-small" ground principles that could not fit on a T-shirt. Sider (2020: 82) makes the same point.

these basic linking principles must hold. But that speculation does not make the theory any less complex. The complexity of a theory is only a function of what it says about the world; the issue of how we could know what it says about the world is just not relevant to its complexity. So if we accept nonidentity for experiences, we have absolutely no simplicity-based reason to accept the trendy speculation of Russellian monists and panpsychists that experiences and distinct neural-functional states are linked by *a priori* linking principles. This is no simpler than a counterpart dualist view that accepts the same linking principles, but says that they are *a posteriori* and contingent (Pautz 2015).²⁰

Next consider the Finean idea that *G1-G3* should be formulated in terms of the “essences” of experiences. Like the rest of us, the Finean starts with empirically-discovered correlations between experiences and distinct neural/functional states. She leaps to the hypothesis that they are explained by essentialist laws:

G1. Pain experiences are *essentially* grounded by distinct neural/functional states according to functional law *f*.

G2. Olfactory experiences are *essentially* grounded by distinct neural/functional states according to functional law *g*.

G3. Color experiences are *essentially* grounded by distinct neural/functional states according to functional law *h*.

But my parity point applies to this Finean speculation too. The dualist instead speculates that the empirically discovered correlations are explained by nomic laws:

N1. Pain experiences *nomically* depend on distinct neural/functional states according to functional law *f*.

N2. Olfactory experiences *nomically* depend on distinct neural/functional states according to functional law *g*.

²⁰ David Chalmers has objected (in correspondence) that *a priori* principles never add to complexity, citing the example of “everything that is scarlet is red”. If so, *G1-G3* do not add to complexity under the assumption that they are *a priori*. Against this, I think that the reason we feel “everything that is scarlet is red” doesn’t add to complexity is that determinables are identical with disjunctions of their determinates, so that it amounts to the general logical truth *everything that is F is F or G*. So it does not go beyond general logical truths that everyone accepts. By contrast, the ground physicalist’s *G1-G3* certainly do go beyond general logical truths that everyone accepts, as they link experiences with distinct neural-functional states. Analogy: if we are non-naturalists about normativity, then “if an act is a case of causing pain for fun, then this grounds the distinct fact that it has the irreducible property *ought-not-be-done*” adds to complexity, even if it is *a priori*. Naturalists about normativity who can entirely do without such principles have a simpler theory.

N3. Color experiences *nominally* depend on distinct neural/functional states according to functional law *h*.

The proposed essentialist laws *G1-G3* are just as complex as the identical-looking nomic laws *N1-N3*. They both assert systematic connections between the same experiential and neural/functional states. A long list of such basic psychophysical essentialist laws would be just as complex and objectionable as a long list of basic psychophysical nomic laws. Appealing to “essences” does not avoid the T-shirt problem. Therefore, there is no *simplicity-based* reason to accept *G1-G3* over *N1-N3*, even if they are understood as essentialist laws.²¹

If you are still not convinced, here is an analogy in support of my claim of parity (Pautz 2015: 36). Consider the status of the fundamental dynamical physical laws linking the initial state of the universe to subsequent states. Let’s suppose that there are exactly three such dynamical laws, and let’s suppose that determinism is true.

The standard view is that these dynamic laws are contingent nomic (“bling”) laws – call them *A1, A2, A3*. But we can imagine a maverick philosopher who instead says that they are metaphysically necessary *ground* (“zing”) laws *B1, B2, B3*. On this view, the initial state of the universe *grounds* every subsequent state! Our imaginary maverick could add some bells and whistles. She could have rationalist tendencies, and so speculate that the hypothesized dynamical ground laws *B1, B2, B3* are knowable *a priori*, even if at present we only know the *a posteriori*. (A “Russellian monist” might speculate that they would become *a priori* if we only understand the hidden “quiddities” of the fundamental physical properties.) And she might speculate that *B1, B2, B3* are “essentialist laws” that flow from the essences of the fundamental physical properties.

Now it is obvious that, in any of these versions, the maverick hypothesis about the dynamical physical laws is not simpler than the standard hypothesis. The standard hypothesis requires three basic dynamical laws: *A1, A2, A3*. In any version, the maverick hypothesis also requires three basic dynamical laws: *B1, B2, B3*. This is not changed if the maverick philosopher speculates that they are *a priori*, or that they are essentialist laws. So we have no simplicity-based reason to prefer the maverick “grounding” hypothesis over the standard “contingent” hypothesis about the dynamical physical laws

²¹ Gideon Rosen (in correspondence) suggested to me that, just as stipulative definitions don’t count towards the complexity of a theory, so essentialist truths don’t count towards complexity. If he is right, then *G1-G3* do not add the complexity, while *N1-N3* do. I disagree. Suppose we stipulate that to be a vixen is to be a female fox. I agree that this doesn’t add to complexity. But this is because it is an identity, and identities don’t add to the complexity of a theory (in fact we can entirely leave them out of our final theory). By contrast, *G1-G3* are not identities. They are necessary connections between distinct existences. So they add to complexity just as much as *N1-N3* do.

linking adjacent states of the universe. Otherwise, we would all have to prefer the maverick hypothesis!²²

If you agree with me about this, then you should also agree with my parallel point about the psychophysical laws. Suppose we give up identity physicalism, and hold that experiences are distinct from neural/functional states (just as subsequent states of the world are distinct). Then we have no simplicity-based reason to think that they are linked by psychophysical ground laws *G1-G3* rather than contingent psychophysical nomic laws *N1-N3*. And this is true even if we speculate that *G1-G3* are *a priori*, or that they are Finean essentialist laws.

So far, I have argued that ground physicalism is just as complex as a counterpart dualist view in its *stock of basic principles or laws*. But maybe it is simpler *in its ontology*.

For example, take a ground physicalist view and a counterpart *property* dualist view. Both hold that there are experience properties are distinct from neural/functional properties. But the dualist holds that they are linked to neural/functional properties by psychophysical nomic laws *N1-N3*. By contrast, the nonidentity ground physicalist holds that those same properties are linked to neural/functional properties by psychophysical ground laws *G1-G3*. In this sense, while the dualist holds that experience properties are “fundamental”, the nonidentity ground physicalist holds that they are “non-fundamental”. As a general principle, Schaffer (2015) holds that grounded items are an ontological free lunch that don’t add to complexity. If so, then although both the nonidentity ground physicalist and dualist say that there are experience properties distinct from neural/functional properties, this only adds to complexity when the dualist says it. In that case, abductive methodology favors *G1-G3* to *N1-N3* after all.

I disagree with Schaffer’s free lunch principle. Here is one reason to doubt it. Consider a proponent of a more extreme form of dualism that recognizes non-physical individuals as well as non-physical properties. In particular, when you hallucinate a tomato, there exists a non-physical red and round sense datum that you are acquainted with. Now imagine an imaginary ground physicalist who agrees that, in the “one and only sense of existence” (Schaffer 2009: 357-360), there exists such a sense datum

²² If we recognize a basic grounding connection, I think we must have a skeptical view about whether the initial state of the universe *grounds* or *nominally determines* subsequent states, just as I think we must have a skeptical view about whether neural/functional states *ground* or *nominally determine* distinct experiences. After all, whatever features you think are essential to grounding (e.g. being deterministic and well-founded), we may build them into the hypothesis that the initial state grounds subsequent states (Pautz 2015: note 5). In response to Rabin’s (2019: 197) different maverick hypothesis that everything is grounded in the state of a single peanut, Schaffer (2021: 186, note 15) objects that it is not “explanatorily fruitful”. However, Schaffer cannot likewise object to my maverick ground hypothesis about the evolution of the universe, because it *is* explanatorily fruitful: like the standard nomic hypothesis, it explains the regular evolution of the universe. In comments on an earlier version of this essay, Schaffer said that it posits implausible diachronic grounding-at-a-distance patterns. But even if *some* actual alleged examples of grounding are not at-a-distance, that doesn’t strongly support the idea that *none* are at-a-distance, still less that grounding-at-a-distance is *impossible*.

distinct from your brain state. The only difference is that, while the dualist holds that the nonphysical sense datum is nomically dependent on (“blinged by”) your brain state, the ground physicalist holds that it is grounded by (“zinged by”) your brain state. As we saw in §5, zinging is rather like blinging, especially on Schaffer’s view. So it is implausible that the red and round nonphysical sense datum adds to complexity if it is blinged by your brain state, but suddenly cease to add to complexity if it is zinged by your brain state.

Here is a second reason to reject the free lunch principle. Imagine two scenarios. In both scenarios, there exist *F*s (nonphysical sense data, immaterial holes), in the “one and only sense of existence”. The scenarios only differ in *what else* is true. In the first scenario, they are *nomically determined* by other facts. In the second scenario, they are *grounded by* other facts. Now here is a plausible principle: if the fact that *p* adds to complexity, it does so no matter what *else* may be the case. So if the fact that there are *F*s adds to complexity in the first scenario, that same fact must add to complexity in the second scenario, contrary to the free lunch principle.²³

But, for the sake argument, suppose that Schaffer’s free lunch principle is right. Given certain theories of properties, the free lunch principle will not imply that property dualism is ontologically more complex than a counterpart ground physicalist view.

First, suppose that nominalism is right and there do not exist properties at all. In that case, “property dualism” should rather be called “predicate dualism”. And ground physicalism and predicate dualism have exactly the same ontology. They recognize the same (fundamental and nonfundamental) physical particulars. So, even granting Schaffer’s free lunch principle, they do not differ in *ontological* complexity.

It might be said that predicate dualism will still be more *ideologically* complex than ground physicalism in Quine’s (1951) sense. After all, its ideology includes experiential predicates that cannot be defined in more basic terms. For instance, it includes ‘*x* feels pain’ as a basic predicate, because it rejects any identification of the form ‘for *x* to feel pain is for *x* to so-and-so’. But the ideology of ground physicalism includes the very same experiential predicates, because it also rejects identity physicalism. So predicate dualism and ground physicalism are equally ideologically complex, as well as being equally ontologically complex.

Next, suppose a “deflationary” theory of properties is correct (Schiffer 2003). On such a theory, the fact that the property *being F* exists is always immediately grounded in the fact that there are *F*s. In that case, the ground physicalist and the dualist agree that there exists the property *feeling pain*, and that it is distinct from the properties recognized

²³ Another problem with the “free lunch” principle is that it implies – wrongly – that we should *prefer* the maverick hypothesis discussed above that the initial state of the universe grounds every subsequent state. For, given this principle, the maverick hypothesis implies that only the initial state counts towards complexity and all the new types of particles that emerge afterwards don’t add to complexity (Pautz 2015: note 5).

by identity physicalists. And both hold that its existence is immediately grounded in something more basic, namely the fact that some people feel pain. So, if Schaffer’s free lunch principle is correct, then *both* can regard experiential properties as an “ontological free lunch” that do not add to complexity.

I conclude that, while identity physicalism is certainly simpler than dualism, nonidentity ground physicalism about consciousness is just as complex as its dualist counterpart. This is in line with the second claim of this essay: unlike identity physicalism, ground physicalism does not achieve the physicalist dream, because it shares the problems of dualism.²⁴

7. Ground Physicalism v Dualism: Uniformity

I will now argue that, while identity physicalism is more uniform than dualism, nonidentity ground physicalism is bound to be just as nonuniform as dualism.

Let me begin by elaborating on how dualism requires a nonuniform view of nature. Following Smart (1959), Schaffer (2021: 201-202) notes that the dualist’s psychophysical nomic laws *NI-N3* would be very singular – very different from other fundamental nomic laws in nature. Elsewhere in nature, the fundamental nomic laws are the laws of physics. And the laws of physics are *dynamic* and *global*: they link subsequent states of the universe, and they take into account the state of the entire universe. By contrast, the dualist’s psychophysical nomic laws *NI-N3* would be *synchronic* and *regional*: they link the neural/functional states in your little brain at a time to your distinct experiences at that time. Therefore, dualism requires a very *bifurcated view of nature*, with anomalous laws that only operate in connection with brains of a certain complexity (see Figure 3). Schaffer presumably allows that there *could be* such synchronic and regional psychophysical nomic laws; his point is just that they are improbable because they go against the presumption that nature is uniform.

<i>Nomic laws in insentient nature</i>	<i>Psychophysical nomic laws</i>
<ul style="list-style-type: none"> • Global, concern whole states of the cosmos • Dynamic 	<ul style="list-style-type: none"> • Regional, concern brains only • Synchronic

Figure 3: Dualism requires a bifurcated view of nature with anomalous psychophysical nomic laws.

²⁴ I think nonidentity ground physicalism shares another problem with dualism about psychophysical laws, which I call the “normative harmony problem” (Pautz 2020b). For discussion, see Cutter and Crummett 2022.

Schaffer suggests that nonidentity ground physicalism can provide a more uniform view of nature than dualism. He accepts what I called *generalized nonidentity* in §4. On this view, identity physicalism does not just fail for consciousness and qualities. It fails across insentient nature as well. For instance, as I mentioned in §3, Schaffer (2009: 375) expresses sympathy for Casati and Varzi's (1994) view that the holes in a piece of cheese are immaterial objects that cannot be identified with sums or sets of fundamental particles. And he uses "multiple realizability" to argue that it fails for boring properties like *being a mountain*. So, even in insentient nature, interesting stuff is popping up all over the place for which identity physicalism fails. Further, it is all connected to the physical ground floor by way of the connection of *grounding* rather than the distinct connection of *nomically determining*. So even if identity physicalism fails for conscious experiences, we get the most uniform view of nature if we suppose that they are likewise linked to distinct neural-functional states by *ground laws G1-G3* rather than *nomic laws N1-N3*. So that is a pretty reasonable bet.²⁵

In the previous section, I noted that, once we accept nonidentity for experience, our evidence consists of mere correlations between neural/functional states and distinct experiences. And I argued that Schaffer's hypothesis that they are linked by psychophysical ground laws *G1-G3* is just as complex as the dualist's hypothesis that they are linked by psychophysical nomic laws *N1-N3*. So *simplicity* considerations do not at all favor *G1-G3* over *N1-N3*. The T-shirt problem afflicts both hypotheses. Schaffer might agree with all of this. His point, as I understand it, is that *uniformity* considerations slightly favor *G1-G3* over *N1-N3*.

Now, I agree with Schaffer that dualism provides a non-uniform view of nature, requiring psychophysical laws with somewhat anomalous features (e.g. they would be regional and synchronic). But I think that, once we try to work out the details, we will see that his generalized nonidentity physicalism is not much more uniform. When it comes to insentient nature, it only requires a small handful of very general principles. By contrast, when it comes to experiences, it requires a separate set of special psychophysical ground laws with very different features (Pautz 2014a).

Let's start with what generalized nonidentity physicalists should say about insentient nature. *Identity* physicalists will only need a couple of general principles for all of nature. For instance, if they recognize mereological sums, they might accept the following: for any things whatever, there exists a sum they compose. For properties, they

²⁵ This line of thought crucially depends on *generalized nonidentity*; for if we instead hold that identity physicalism is correct for everything in insentient nature and only fails for the experiences of sentient creatures (I lean towards this view), then ground physicalism would be just as non-uniform as dualism (see "restricted nonidentity physicalism" in §4). In §3, I criticized Schaffer's multiple realizability argument for generalized nonidentity, but here I will assume generalized nonidentity for the sake of discussion.

might accept some comprehension principle along the following rough lines: necessarily, for any predicate F (simple or complex) formulated in fundamental terms, there exists a property P such that for something to be P is for it to be F .²⁶ However, generalized nonidentity physicalists like Schaffer recognize all kinds of objects and properties in addition to those recognized by identity physicalists. For example, Schaffer thinks that the property of being a mountain is distinct from any property recognized by identity physicalists, and that there are immaterial holes distinct from any object recognized by identity physicalists. So he faces the *generalized T-shirt problem*. To generate all these additional objects and properties, he needs additional principles. Nonidentity physicalists should prefer a short list of general, systematic ground principles that could fit on a T-shirt (just like theoretical physicists want a short list of nomic laws). But how could any short list of principles generate all these further objects and properties? I think that the solution to the generalized T-shirt problem is a small handful of general *principles of plenitude*. They might look something like this:

Object Plenitude. For any property F , there is an object x , such that it is metaphysically necessary that for any spacetime point y , x is located at y if and only if, and because, y is F (Dorr *et al.* 2021).

Plenitude for Grounded Properties. For every property P definable in fundamental terms (however complex or disjunctive), there is a distinct property Q that is immediately grounded in P and only P .

Such principles solve the generalized T-shirt problem. For instance, Object Plenitude generates things in empty spaces that are good candidates to be *immaterial holes*. True, it also generates all kinds of objects not recognized by commonsense, such as “table-shaped objects located in the intergalactic void” (Dorr *et al.* 2021: 268). But it would be arbitrary to recognize immaterial holes while rejecting other objects located in empty space.

Likewise, a principle along the lines of Plenitude for Grounded Properties will generate all kinds of properties $Q1, Q2, Q3, \dots$ at every level of nature in addition to those recognized by identity physicalists. The property *being a mountain* can be identified with one of those. (This view may sound like a form of identity physicalism, but it is not because identity physicalism fails for $Q1, Q2, Q3, \dots$. So it handles Schaffer’s (2013) multiple realizability concerns discussed in §3.) True, such principles will also generate all kinds properties *not* recognized by commonsense. For instance,

²⁶ Identity physicalists might adopt a higher-order logic to avoid the paradoxes associated with such comprehension principles.

Plentitude for Grounded Properties implies that there is a rather odd property Q^* that is grounded by the disjunctive property *having mass or charge*, but that is *distinct from* this disjunctive property (in fact, for all this principle says, Q^* could be instantiated by things that *lack* both mass and charge). But if there are *any* properties distinct from those recognized by identity physicalists, it is natural to suppose that there is a *plenitude* of such properties. Any other view would be arbitrary – where to draw the line?²⁷

So if generalized nonidentity physicalism is correct, a few principles of plenitude are enough for all of insentient nature. Now turn to the sentient parts of nature. Some of your neural/functional states (like those in a dreamless sleep, or sleepwalking) ground no experiences at all. But, given nonidentity for experiences, something special happens in connection with other neural/functional states: they ground states of experiencing specific qualities, which are special in that we have an “intuition of distinctness” concerning them (Schaffer 2021: 203).

Now all these specific physical-experiential ground connections certainly cannot be derived from any general principles of plenitude like those above which make no mention of experiences. So in the special case of experience Schaffer will need a huge list of *separate* psychophysical ground connections that operate only in connection with brains of a certain complexity. As I explained in §4, in the best case they can be compactly formulated along the following lines:

G1. Neural-functional states ground distinct pain experiences according to functional law *f*.

G2. Neural-functional states ground distinct smell experiences according to functional law *g*.

G3. Neural-functional states ground distinct smell experiences according to functional law *h*.

And so on and so forth for every possible type of experience.

²⁷ I think that Plentitude for Grounded Properties is too simple. I think that generalized nonidentity physicalists need to replace it with different principles strong enough to generate *two* types of properties for which identity physicalism fails. (i) They should recognize properties that have *sufficient* conditions characterized in fundamental terms, but no *necessary* conditions whatever. For instance, they should say that there is a property Q^* such that *having mass or charge* is sufficient to ground Q^* but such that there are no *necessary* conditions on the instantiation of Q^* . So even though mass or charge grounds Q^* , it is also compatible the nature of Q^* that it be instantiated by objects lacking mass and charge in an ungrounded way. Why couldn't there be such a property? (ii) Nonidentity physicalists like Schaffer must recognize another type of properties for which identity physicalism fails. For instance, Schaffer holds that identity physicalism fails for the property *being a mountain*. This is a different type of property because it *cannot* be instantiated in an ungrounded way. Maybe Schaffer would say that, necessarily, whenever it occurs, it is grounded in something more fundamental, but it is still *distinct from* any property definable in fundamental terms (see note 12).

So, when it comes to all of *insentient* nature, generalized nonidentity physicalism only requires a small handful of very general principles of plenitude. They have the following features: they *operate all over nature*, they are *general and topic-neutral* (concern “objects” and “properties”, not “mountains” or “experiences”), and they are *few in number*. By contrast, when it comes to brains of a certain complexity, it requires a separate very long list psychophysical ground laws that are special to the case of experiences. And they have very different features: they *operate only in connection with brains*, they *only concern experiences* (they are “impure” in the sense of Sider 2020: 765), and they are *extremely numerous* (see Figure 4).

<i>Ground laws in insentient nature</i>	<i>Psychophysical ground laws</i>
<ul style="list-style-type: none"> • Operate all over nature • General, topic-neutral • Few in number 	<ul style="list-style-type: none"> • Operate only in connection with brains • Only concern <i>experiences</i> • Extremely numerous

Figure 4: Nonidentity ground physicalism requires a bifurcated view of nature with anomalous psychophysical ground laws.

In sum: it is true that dualism is non-uniform; the psychophysical nomic laws posited by the dualist would be very singular – unlike other nomic laws in nature some respects (Figure 3). But, once we work out the details, we see that Schaffer’s generalized nonidentity ground physicalism is bound to be equally non-uniform (Figure 4). *Like dualism, it requires bifurcated view of nature, with a handful of general ground laws for insentient nature and a large number of additional, anomalous psychophysical ground laws that operate only in connection with brains.*

The point applies to any form of generalized nonidentity physicalism. For example, suppose that generalized nonidentity ground physicalists follow Kit Fine in holding that all ground connections derive from essences (ruling out what Rosen 2010 calls “Moorean connections”). They will still wind up with the same nonuniform of nature represented in Figure 4. Abductive methodology dictates a handful of general principles of plenitude for insentient nature. For instance, for every property *P* definable in fundamental terms (however complex or disjunctive), there is a distinct property *G* such that *P* is *essentially* immediately grounded in *P* and only *P*. But, when it comes to experiences, they will require a separate, long list of essentialist laws special to the case of experiences, linking all the varieties of experiences to distinct neural/functional states.

For all of these specific physical-experiential links certainly cannot be derived from any general principles of plenitude.²⁸

I have been assuming that our experiences are distinct from our neural/functional states. Our only evidence consists of correlations between the two. They might be linked by nomic laws, ground laws, or essentialist laws. In the previous section, we saw that these hypotheses are equally complex. In the present section, we saw that they are equally non-uniform. So how can we decide between them?

8. Ground Physicalism v Dualism: The Causal Role of Consciousness

Let's consider one last-ditch effort. You might think that nonidentity ground physicalism at least achieves one element of the physicalist dream. It can accommodate the "causal efficacy" of conscious states. By contrast, given causal closure, dualism leads to epiphenomenalism.

I agree that nonidentity ground physicalists can accommodate mental causation given a counterfactual analysis of causation. (See Hall 2005: 518 for a persuasive argument that some such reductive theory of causation must be right.) To illustrate, suppose you come up to a stoplight, experience red, and then press on the brakes. This is mediated by visual neural state *N*. Now, what would have happened, had you not had this experience of red? That is, what happens in the "nearest possible world" in which you do not have this experience? Well, on nonidentity ground physicalism, your experience of red is distinct from your neural state *N*, but it is linked to *N* by way of a ground law (look back at Figure 2 in §5). In evaluating similarity across worlds, we use a rather baroque system of weights for different respects of comparison (Lewis 1979: 46; Kment 2014: 219). According to that system of weights, it is of the first importance to hold fixed such ground laws. (It is of second importance to avoid big, widespread, diverse violations of the nomic laws.) Given this system of weights, in the nearest possible world where you don't experience red, we hold fixed the ground law linking the experience of red with neural state *N*. So in this world you also don't have the neural state *N*. Consequently, you don't press on the breaks. That is, if you had not had an experience of red, you would not have pressed on the brakes. In sum, according to this

²⁸ I accept the Galilean view that sensible qualities like the quality *red* only appeared in the world when suitably complex brains evolved. Nonidentity physicalists might instead accept Campbell's naïve realist view (§3). The result would be an even more non-uniform view of nature. For example, in addition to special ground/essentialist laws linking experiences to neural/functional states, the naïve realist requires special ground/essentialist laws linking certain reflectances in the external world to certain irreducible color qualities. For those links are specific to colors and cannot be derived from any general principle of plenitude for properties. For the same reason, nonidentity physicalists who are "non-naturalists" about normativity need special additional ground/essentialist laws linking specific irreducible "normative properties" with certain natural properties.

system of weights, your behavior *counterfactual depends* on your experience; so it is *caused by* your experience.

So I agree that nonidentity physicalists can accommodate mental causation by holding that experiences are linked to distinct neural/functional states by ground laws like *G1-G3*. But I don't think that this is a strong reason to prefer their view over the dualist's view that they are instead linked by nomic laws *N1-N3*.

To see why, first observe that dualists can "define up" a new notion of counterfactual dependence, *counterfactual dependence**; and a new correlative notion of *causation**. As with counterfactual dependence and causation, we define *counterfactual dependence** and *causation** in terms of what happens in the closest possible world. The only difference is that we now define 'the closest possible world' using a slightly different baroque system of weights. In particular, we treat *psychophysical* nomic laws *N1-N3* as having a special status among nomic laws; we treat them as just as important as ground laws. That is to say, it is of the first importance to hold fixed the ground laws *and* the psychophysical nomic laws *N1-N3*. At the end of §5, I noted that nonidentity ground physicalists must hold that the weightings here are somewhat conventional; this is just a different convention.

Using this system of weights, it straightforwardly follows from dualism that your pressing on the brakes counterfactually depends* on, and is caused by*, your experience of red. That is because, according to this system of weights, it is of first importance to hold fixed the nomic link between your experience of red and your neural state *N*. So in the closest world where you don't have that experience, you also don't have *N*, and so you don't press on the brakes.²⁹

Now I can say why mental causation does not provide a reason to speculate that experiences and distinct neural/functional states are linked by ground laws *G1-G3* rather than nomic laws *N1-N3*.

These hypotheses are quite similar (look back again at Figure 2 in §5). As we have just seen, the first hypothesis implies that your experience of red *causes* your pressing on the brakes, while the second implies that your experience of red *causes** your pressing on the brakes. This supports the ground physicalist hypothesis over the dualist hypothesis only if we have some reason to believe that your experience causes rather than *causes** your behavior.

But where could this reason come from? Introspection? That is not credible. Causation and *causation** are nearly identical relations; they are both defined in terms of counterfactuals, only using slightly different systems of weights for measuring across-

²⁹ By contrast, by the standard system of weights, in the nearest world where you do not experience red, the dualist's psychophysical nomic law is broken (a "local miracle"), and your neural state *N* and your behavior of pressing on the breaks are held fixed. That is because, according to the standard system of weights, holding nomic laws fixed is not so important. See Loewer 2017: 61.

world similarity. So it is implausible that you can “just tell” introspectively that your experiences causes rather than causes* your pressing on the brakes.

Here is an analogy that supports my point. Mereological realists believe in things with parts, while mereological nihilists reject them. Given mereological realism, we can say that *there is a table in the room*, where “there is” is used in a joint-carving way. Given nihilism, we cannot say this; but we can say that *there is* a table in the room*, where that means *there are atoms arranged table-wise*. The nihilists often point out that it is implausible that perception is so discerning that it can discriminate between these hypotheses. My point is similar: it is implausible that introspection is so discerning that it can tell us that there is mental causation rather than mental causation*.³⁰

9. Conclusion

I have argued for two claims:

- Unlike dualism, identity physicalism (Lewis, Sider, Dorr) avoids the T-shirt problem and achieves the dream of a maximally simple and uniform picture of nature.
- Unlike identity physicalism, nonidentity ground physicalism (e.g. Schaffer) does not achieve the physicalist dream; in fact, it is just as complex and nonuniform as dualism. It faces an analogue of the T-shirt problem for dualism: the *T-shirt problem for ground physicalism*.

So the only good way to be a physicalist is to be an identity physicalist.

I wish I could accept identity physicalism. But, for reasons I explained in §3, I cannot accept it. I think that experiences are distinct from neural/functional states. So I think our choice is between dualism and nonidentity physicalism. But I also think that we have no way of deciding between them. Our only evidence consists of correlations between experiences and neural/functional states. They might be linked by nomic laws, as dualists think. Or they might be linked by some kind of allegedly “stronger” connection (supervenience laws, ground laws, or essentialist laws), as nonidentity

³⁰ As I interpret him, Kroedel (2020) holds that dualists might say that ‘causation’ in ordinary language refers to causation*, so that they can agree that ‘there is mental causation’. (Thanks to Brian Cutter for bringing Kroedel’s work to my attention.) My point here is different and does not require this. My point is epistemological: the ground physicalist’s mental causation and the dualist’s mental causation* are introspectively indistinguishable. It follows considerations about mental causation do not support rejecting dualism in favor of ground physicalism, whether or not the dualist says that ‘causation’ in ordinary language refers to causation*. (Also, for the reasons presented in §5, I do not think we can make sense of Kroedel’s idea (2020: 88) that the dualist’s psychophysical laws are *objectively* “stronger” than ordinary nomic laws, but still “not as strong as” the ground physicalist’s ground laws.)

physicalists think. But I have argued that these hypotheses are bound to be equally complex and nonuniform. And I have argued that we also cannot decide between them on the basis of considerations about mental causation.³¹

The conclusion I draw is that we may never know the modal status psychophysical laws linking our experiences with our distinct neural/functional states. Nature just has not left us enough clues. We may never even be able to systematically and compactly formulate the psychophysical laws – we lack a solution to the T-shirt problem (Adams 1987). This bothers me but it is not enough for me to turn back to identity physicalism. I very much agree with something Frank Jackson once said (1982: 135): “It is to be expected that there should be matters which fall quite outside our comprehension . . . the wonder is that we understand as much as we do.”

References

- Adams, R. 1987. Flavors, Colors, and God. In his *The Virtue of Faith and Other Essays in Philosophical Theology*. Oxford: Oxford University Press, 243-262.
- Albert, D. 2015. Is Lawrence Krauss a Physicist, or Just a Bad Philosopher? <https://blogs.scientificamerican.com/cross-check/is-lawrence-krauss-a-physicist-or-just-a-bad-philosopher/>
- Armstrong, D. M. 1987. Smart and the Secondary Qualities. In Philip Pettit, Richard Sylvan & J. Norman (eds.), *Metaphysics And Morality*. Blackwell.
- Boghossian, P. & D. Velleman. 1989. Colour as a secondary quality. *Mind* 98: 81–103.
- Campbell, K. 2020. Does That Which Makes a Sensation of Blue a Mental Fact Escape Us? In Derek Brown and Fiona MacPherson (eds.) *The Routledge Handbook of Philosophy of Colour*. Routledge.
- Casati, R & A. Varzi 1994. *Holes and Other Superficialities*. MIT Press.
- Chalmers, D. 1995. The Puzzle of Conscious Experience. *Scientific American* 273: 80-6.
- Chalmers, D. 2010. *The Character of Consciousness*. Oxford: Oxford University Press.
- Chalmers, D. 2012. *Constructing the World*. Oxford: Oxford University Press.
- Chalmers, D. 2015. Panpsychism and Panprotopsychism. In T. Alter & Y. Nagasawa (eds.) *Consciousness in the Physical World*, pp. 246–276.
- Cutter, B. 2022. The mind-body problem and the color-body problem. *Philosophical Studies* 180 (3):725-744.
- Cutter, B. & D. Crummett 2022. Psychophysical Harmony: A New Argument for Theism. *Oxford Studies in Philosophy of Religion*.
- Dorr, C. 2008. There Are No Abstract Objects, in T. Sider, J. Hawthorne and D. W. Zimmerman (eds), *Contemporary Debates in Metaphysics* (Oxford: Blackwell Publishing, 2008), pp 32–63.
- Dorr, C. 2016. To Be F Is to Be G. *Philosophical Perspectives* 30: 39–134.
- Epstein, P. 2022. In Defense of the Armchair. *Noûs*.
- Fine, K. 2001. The Question of Realism. *Philosophers Imprint* 1: 1-30.
- Fine, K. 2012. Guide to Ground. In Fabrice Correia & Benjamin Schnieder (eds.), *Metaphysical Grounding*. Cambridge University Press. pp. 37-80.
- Fritz, P. 2022. Ground and Grain. *Philosophy and Phenomenological Research* 105: 299-330.
- Gardner, M. 1970. The fantastic combinations of John Conway's new solitaire game of life. *Scientific American* 223: 120-123.

³¹ My skeptical conclusion generalizes. Suppose that identity physicalism fails for things other than experiences. For instance, maybe a multiply-perforated piece of Swiss cheese is filled with multiple wholly distinct invisible objects. Or maybe all wrong actions share an irreducible property. I think we cannot use considerations about simplicity, uniformity or mental causation to rule out an unorthodox *generalized dualism* on which *all* these things are linked to the physical ground floor by way of nomic laws rather than ground laws.

- Hall, N. 2005. Causation. In Frank Jackson & Michael Smith (eds.), *The Oxford Handbook of Contemporary Philosophy*, Oxford University Press, 505-533.
- Jackson, F. 1982. Epiphenomenal Qualia. *Philosophical Quarterly* 32: 127–136.
- Johnston, M. 1997. Manifest Kinds. *Journal of Philosophy* 94: 564-583.
- Kim, J. 2005. *Physicalism, or Something Near Enough*. Princeton, NJ: Princeton University Press.
- Kment, B. 2014. *Modality and Explanatory Reasoning*. Oxford: Oxford University Press.
- Kroedel, T. 2020. *Mental Causation: A Counterfactual Theory*, Cambridge University Press.
- Lee, G. (2019) Alien subjectivity and the importance of consciousness, in Pautz, A. & Stoljar, D. (eds.) *Blockheads! Essays on Ned Block's Philosophy of Mind and Consciousness*, Cambridge, MA: MIT Press.
- Lewis, D. & S. Lewis. 1970. Holes. *Australasian Journal of Philosophy* 48: 206-212.
- Lewis, D. 1979. Counterfactual Dependence and Time's Arrow. *Noûs* 13: 455-476.
- Lewis, D. 1994. Reduction of Mind. In S. Guttenplan (ed.) *A Companion to the Philosophy of Mind*. Oxford: Blackwell, 412-431.
- Loewer, B. 2017. Mental Causation: The Free Lunch. In *Qualia and Mental Causation in a Physical World*. Horgan, T., Sabates, M. & Sosa, D. (Eds). Cambridge: Cambridge University Press, p. 40-63.
- MacBride, F. & F. Janssen-Lauret. 2022. Why Lewis Would Have Rejected Grounding. In *Perspectives on the Philosophy of D. K. Lewis*. Oxford University Press, 66-91.
- Pautz, A. 2010. A Simple View of Consciousness. In R. Koons and G. Bealer (eds.) *The Waning of Materialism: New Essays*. Oxford: Oxford University Press, 25–66.
- Pautz, A. 2014a. The Real Trouble for Armchair Arguments Against Phenomenal Externalism. In M. Sprevak & J. Kallestrup (eds.) *New Waves in Philosophy of Mind*. Palgrave Macmillan, 153-181.
- Pautz, A. 2014b. Review of Langsam's *The Wonder of Consciousness*. *Notre Dame Philosophical Reviews*.
- Pautz, A. 2015. A dilemma for Russellian monists about consciousness, [Online], <https://philpapers.org/archive/PAUCRM.pdf>.
- Pautz, A. 2017. The Significance Argument for the Irreducibility of Consciousness. *Philosophical Perspectives*.
- Pautz, A. 2020a. The puzzle of the laws of appearance. *Philosophical Issues* 30: 257-272.
- Pautz, A. 2020b. Consciousness and Coincidence: Comments on Chalmers. *Journal of Consciousness Studies*: 143-155.
- Pautz, A. 2021. *Perception*. London: Routledge.
- Quine, W. 1951. Ontology and Ideology. *Philosophical Studies* 2: 11–15.
- Rabin, G. 2019. Grounding the Gaps or Bumping the Rug? *Journal of Consciousness Studies* 26: 191-203.
- Rosen, G. 2010. Metaphysical Dependence: Grounding and Reduction. In R. Hale and A. Hoffman, eds. *Modality: Metaphysics, Logic, and Epistemology*. Oxford University Press. 109–136.
- Rosen, G. 2015. Real definition. *Analytic Philosophy* 56: 189–209.
- Rosen, G. 2017. Ground by Law. *Philosophical Issues* 27: 279-301.
- Schaffer, J. 2009. On What Grounds What. In *Metametaphysics*, eds. David Chalmers, David Manley, and Ryan Wasserman. Oxford: Oxford University Press, 347–83.
- Schaffer, J. 2013. Metaphysical semantics meets multiple realizability. *Analysis* 73: 736–751.
- Schaffer, J. 2015. What not to multiply without necessity. *Australasian Journal of Philosophy* 93: 644-664.
- Schaffer, J. 2017. The Ground Between the Gaps. *Philosopher's Imprint* 17: 1-26.
- Schaffer, J. 2021. Ground Functionalism. *Oxford Studies in the Philosophy of Mind*.
- Schiffer, S. 2003. *The Things We Mean*. Oxford: Oxford University Press.
- Sider, T. 2009. Beyond the Humphrey Objection. http://www.tedsider.org/papers/counterpart_theory.pdf (unpublished).
- Sider, T. 2011. *Writing the Book of the World*. Oxford: Oxford University Press.
- Sider, T. 2013. Reply to Jonathan Schaffer. *Analysis*, 73, 760–770.
- Sider, T. 2020. *The Tools of Metaphysics and the Metaphysics of Science*. Oxford: Oxford University Press.
- Smart, J.J.C., 1959. Sensations and Brain Processes. *Philosophical Review* 68: 141–156.
- van Inwagen, P. 2004. A Theory of Properties. *Oxford Studies in Metaphysics* 1: 107–138.
- Wilson, J. 2014. No work for a theory of grounding. *Inquiry* 57: 535–579.

Forthcoming in Rabin, *Grounding and Consciousness*

Wilson, J. 2018. Grounding-Based Formulations of Physicalism. *Topoi* 37: 495–512.