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)

Traditional dualism holds that something singular happens in connection with brains of a certain complexity: irreducible conscious experiences of novel qualities (color qualia, olfactory qualia, pains) popped up by way of special contingent laws. Dualism is non-uniform and complex. Consciousness sticks out like a sore thumb. By contrast, the physicalist picture of reality is appealing. In both the sentient and insentient parts of nature, there are just different arrangements of the same fundamental physical elements.

Here I want to ask: what version of physicalism best achieves the physicalist dream? I will defend two claims.

First we 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. My first claim will be:

> **First claim:** Unlike dualism, identity physicalism is a maximally uniform and simple view of nature. There are strong reasons to prefer it to dualism. It achieves the physicalist dream.

However, many – including myself – think that identity physicalism is too austere. So we will look in detail at a more liberal and popular form of physicalism, *ground physicalism*. Jonathan Schaffer is a prominent advocate. Somewhat like dualists, ground physicalists might hold that your experiences are not identical with complex physical states or even functional states. But while dualists hold that they are linked by contingent

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nomic laws, ground physicalists hold that they are linked by metaphysically necessary "ground laws". My second claim will be:

> **Second claim:** Unlike identity physicalism, ground physicalism does not achieve the physicalist dream. It is not simpler or more uniform than a counterpart dualist view. There is no strong argument for preferring it to dualism (Pautz 2010, 2015).

So if you want to be a physicalist at all, I would suggest that you join Lewis, Sider and Dorr in accepting identity physicalism. Even if ground physicalism is more fashionable, identity physicalism is much better motivated. On the other hand, if, like me, you reject identity physicalism, then you should take a skeptical view of the dispute between ground physicalism and dualism.

1. The Dualist Nightmare

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

Dualists think that most of nature is pretty is 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)

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

First, 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).

Second, 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 still ideologically complex. And it requires a raft of special psychophysical laws, linking neural patterns with all the variety of experiences. Physicalists dream of a world whose fundamental laws are just the physical laws. Sometimes you see fans of science wearing T-shirts featuring some equations of physics (such as the Schrödinger equation). Dualists are going to need a bigger T-shirt. They will need a separate section for all the psychophysical laws. And these laws are difficult to precisely formulate and may resist systematic codification (Adams 1987).

Moreover, the psychophysical laws would be *anomalous* in several respects. They are not derivable from other basic laws in nature. Smart (1959: 143) notes that they also look very different from the other fundamental nomic laws in our world, the physical laws governing the evolution of the universe. They link experiences of "simple" qualities with neural patterns that are very complex and disjunctive when viewed through the lens of fundamental microphysics. So they cannot be compactly formulated in fundamental terms. Also, while the physical laws are diachronic and link subsequent states of the entire universe, these laws would be synchronic and local. Smart sums this up by saying that they have a "queer smell" to them.[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

Unlike dualism, identity physicalism offers an extremely appealing picture of nature. I begin by explaining it in some detail. Then I will explain how it avoids dualism's problems.

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).

[2] Smart (1959) regards the dualist's fundamental psychophysical laws as possible, but somewhat implausible because they happen to be unlike other fundamental laws, namely, the physical laws. Schaffer (MS) goes further, suggesting a constraint that would immediately rule out their very possibility: he says that "widely disjunctive" high level properties, such as neural-types, *cannot* figure in fundamental laws. (By contrast, he thinks they *can* figure in identical-looking psychophysical *ground* laws. This is one reason he favors ground physicalism over dualism.) But I think that, if by 'cannot' here Schaffer means that such laws are metaphysically impossible, his constraint is too strong. It is also vague. Just what degree of "disjunctiveness" is necessarily ruled out? Finally, I think that the constraint is not immediately *a priori* obvious; nor can be derived from any general theory of laws of nature. (….Best systems favors most simple, but most simple may not be all that simple……xx)

Eventually there evolved extremely complex and interesting arrangements of pixels at the macro-level (see Figure 1).

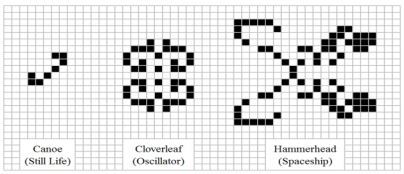

Figure 1

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, why not something similar 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 pixels and black and white, 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 (e. g. describing the evolution of the quantum state). 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]

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 ZCF set-theory, it includes "is a member of" and names for all the sets constructible from the basic physical items. If the identity physicalist like 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 argument 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 it *identity physicalism*. Others might choose to formulate identity physicalism using Sider's (2011) idea of "metaphysical semantics".

[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 "merely numerically distinct". A second 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.

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 in which there are objects). 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*'.

The third and final step formulates 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. And when we say that one of them 'is a tree', every "acceptable precisification" of this predicate picks out an extremely complex property of a sum of particles that 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'.[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, the hypothesis that 'is a hand' expresses (relative to one acceptable precisification) such a functional property is consistent with identity physicalism. The same goes for the hypothesis 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 might 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.

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[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*. Unlike the formulation of ground physicalism (§4), my formulation of identity physicalism doesn't at all invoke allegedly more basic notions of ground or essence. In fact, identity physicalists may entirely reject such notions (Dorr 2016: 79, 126n.75).

[5] Identity physicalists need a solution to the "problem of the many". A standard supervaluationist solution will imply 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). xx

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. 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.

In the same way, to wrap your head around identity physicalism, it may help to start small, rather than starting with big mountains 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. All instantiated properties were definable in terms of basic physics and topic neutral terms. But then it is plausible for the next moment too. It is not plausible that some irreducible properties *P*, *Q*, *R* . . . 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.

Therefore, when we say 'that is a tree', the demonstrative 'that' refers to a sum of fundamental particles (or perhaps something more exotic), and it's only such definable properties that are available to be the semantic value of 'is a tree'. And 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: in the interest of simplicity, why not say 'is a tree' expresses one of these definable properties (relative to a precisification), rather than positing a mysterious extra, irreducible property for it to pick out? The same goes for 'ought not be done' and 'sees red'.

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 it appeal 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* 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 maximally uniform. As David Lewis puts it:

> The very same fundamental properties and relations, governed by the very same laws, occur in the living and the dead parts of the world, and in the sentient and the insentient parts, and in the clever and the stupid parts. (Lewis 1994: 412-413)

True, on identity physicalism, interesting nonfundamental properties 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, some functional differences, and so on. 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).[6]

Second, identity physicalism is simple. It avoids dualism's anomalous psychophysical laws. 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 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

[6] Identity physicalism might be epistemically as well as metaphysically uniform. Proponents might hold that interlevel identifications (not only *pain is c-fiber stimulation* but also *water is H_20*) are generally deeply *a posteriori*, and not derivable *a priori* from a fundamental description of the world. At the other extreme, they might say that they are all in principle derivable *a priori* from such a description (Lewis 1994)

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.[7]

Third, identity physicalism can avoid dualism's problem about mental causation. Briefly, the standard solution is something like this. The event of your seeing a red stoplight 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 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 suggest that the arguments are weak in the case of the *insentient* parts of nature. Then, following tradition, I will suggest that we have stronger 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" about consciousness in the rest of this essay. It will also be important background to our later discussion of whether ground physicalism might achieve 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 the quality red. Campbell notes that it is part of commonsense that the quality red 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

[7] 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 other views when it comes to simplicity. *All* views accept such logical laws. But the dualist needs additional psychophysical laws. And the ground physicalist needs additional ground laws.

basis altogether lacks" (2020: 408). He concludes that 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 we see colors, so 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 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":

> [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".

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

> [L-law] Necessarily, if a disturbance in the air has so-and-so physical properties, then this "grounds" the fact it has distinct irreducible loudness level *L*.

> [S-law] Necessarily, if 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 our causally detecting them in the right way. The result is a uniform nonidentity physicalism about the insentient and sentient parts of nature.

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

Campbell's view of insentient nature is complex. To see this, imagine a philosopher who accepts Campbell's view, but with one difference: she replaces 'grounds' in [C-law], [L-law] and [S-law] with 'nomically determines'. This would be *objective dualism* about sensible qualities (Armstrong 1987). In that case, everyone would agree that [C-law], [L-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 follow Campbell in holding that they are ground laws?[9]

Is Campbell's appeal to commonsense about sensible qualities enough to support such a complex picture of insentient nature? My own view is that Campbell is right to think that sensible qualities are irreducible, but wrong to hold they emerged in insentient nature soon after the Big Bang. Instead, science supports a traditional "Galilean" view of sensible qualities sensible like colors, smells, pains, itches. The objective world is devoid of them. They depend on our neural responses. So they appeared in nature in 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 case of holes is a fun example. Take a hole in a piece of cheese. Casati and Varzi (1994) favor *immaterialism about holes*. Briefly, the argument is this. 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 identified with ordinary physical thing. 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 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

[9] Campbell's view is non-uniform and arbitrary as well complex. For Campbell's 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 (2020: 146, 225) and Cutter (2022: xx).

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" (Schaffer 2009: 357-360).

To appreciate the complexity of nonidentity physicalism for holes, suppose a maverick philosopher accepts everything this view says about holes (they are immaterial, fill 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 *nomically determines* the fact that there is a distinct immaterial hole in it. Call this *dualism about holes*. This law would add to complexity. So why wouldn't it still add to complexity once we upgrade it to a ground law?[10]

In my view, arguments from cases involving holes or other exotic objects are unlikely 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 hole understood as *sui generis* immaterial objects. For imagine that this view; you think that 'hole' 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* holes residing in its empty spaces. Then it would certainly be right 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 hole (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*.[11]

Let us look at one more argument that identity physicalism uniformly fails across all of nature: an argument from "multiple realizability". For example, Jonathan Schaffer has recently rejected identity physicalism partly on the strength of this argument, even though he acknowledges that identity physicalism is supported by his favored abductive methodology for metaphysics (2013: 750). To illustrate, consider mountains. Intuitively, 'is a mountain' might apply to things in "alien worlds" in which the fundamental

[10] Schaffer (in discussion) has acknowledged my main point here: that *[H-law]* adds to complexity. In general, he allows that *ground laws* add to complexity (more on this in §6). But he denies that immaterial holes themselves add to complexity. In general, he thinks that *grounded entities* are an ontological "free lunch" that don't add to complexity (Schaffer 2015; see also Bennett 2017). So, he has a very different attitude towards *grounded entities* and the *ground laws* that generate them. Against this, I think that grounded entities increase complexity as well as ground laws. (Compare how physical things and physical laws both add to complexity.) I will return to this issue in §6.

[11] In facts, identity physicalists' accounts of holes are superior the immaterialist account – and not just because they are simpler. Imagine we fill the holes in a piece of cheese with whip cream. The immaterialist 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 (it's just that now they coincident with some whip cream)? Is there 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.

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, 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.

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, that lack any biconditional definition in more fundamental terms. In that sense, they are *irreducible*. Just what are these properties? Schaffer does not say. Let us call them *P, Q, R*, and so on.[12]

Of course, Schaffer still holds that there are fundamental physical conditions that are *sufficient for* the instantiation of *P*, *Q*, . . . Because of multiple realizability, there will be many such conditions *A*, *B*, . . . So, Schaffer posits a complex raft of "ground laws", 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.

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

[12] If it turns out to be difficult to specify *P, Q, R,* this may be a reason to be skeptical of the view.

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.

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 Lewi'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-neural 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 are 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. In fact, 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.[13] 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) 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.[14]

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 claim that this undermines identity physicalism for *insentient* nature. That is because I disagree with his claim ("naïve realism") that such qualities belong to insentient nature. Instead, 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 at the outset. It just seems obvious that 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

[13] 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".

[14] The identity physicalist might offer yet another response to Schaffer's multiple realizability argument. First, she might argue on *a priori* grounds for *necessitism about properties:* necessarily all properties exist necessarily (for such an argument see van Inwagen 2004: 137-138). Then her fundamental language will have predicates expressing all alien properties as well as actually-instantiated properties. This increases ideological complexity but it is supported by argument. Second, she can then accommodate multiple realizability by saying that (at least relative to one pretty-good precisification) our predicate 'is a mountain' expresses a disjunction of all possible "realizers" of mountain-hood: physical-realizers, ectoplasm-realizers, and so on. In discussion Louis DeRosett objected that such disjunctive properties are not 'physical' because they have alien disjuncts, and so this is not a version of 'identity *physicalism*'. But the label is unimportant. The view retains the spirit of identity physicalism: it is the simplest view possible, consistent with scientific and *a priori* considerations.

properties in insentient nature, it is quite intuitive that they have some definition in some basic terms (even if it is hard to supply).

Similarly, Schaffer invokes an intuition of distinctness to argue against identity physicism in the case of qualities presented in experience. Such qualities are, as he puts it, "clearly different" from any underlying physical properties, and identities here would be "incredible" (2020: 203). We have no such immediate intuition of distinctness for *being a mountain*. So, when it comes to such qualities, Schaffer is especially motivated to move from identity physicalism to ground physicalism.

Let me briefly mention a second argument for the irreducibility of sensible qualities (Pautz 2021). At the same time, it is an argument for my Galilean view that sensible depend on our neural responses and so appeared in nature in 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, and 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* present in your experience are not neural properties instantiated in your own head! Why think the reddish quality is any different? There is nothing reddish in your brain when have an experience as of a reddish item. [15]

So 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. Not only is there a stubborn intuition of distinctness. In addition, there are no physical properties that are good candidates to be the sensible qualities. So such qualities are irreducible. Since conscious experiences involve irreducible qualities, they, too, are irreducible. They cannot be

[15] There are other, *a priori* reasons to think color qualities and other sensible qualities are not neural properties. Color qualities belong to a stand out determinable. They stand in a privileged, standout relation of similarity. And they satisfy the principle 'anything almost exactly like a color quality in every away is also a color quality'. Small steps cannot take you outside of color space – for instance they cannot take you to a smell (Pautz 2017). These claims are inconsistent with the idea that sensible qualities are neural properties. See Pautz 2021: 61 and Pautz (forthcoming).

identified with neural states. They cannot even be identified with higher-level functional states realized by neural states. Identity physicalism fails.[16]

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. One a traditional *sense datum version* (e.g. Boghossian and Velleman 1989), when you view the rose, the sensible quality red neither belongs to the rose nor your own brain. Rather, it belongs to a flower-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 rose. But it also does not belong to a flower-shaped region of your *visual field* – there is no such thing. In fact, it *belongs to nothing at all*. It only *seems* to be instantiated by a flower-shape region, thanks to your neural response. On these views, we can still say 'roses are red', but that is only because they normally cause in us experiences of this special quality. The colors of external tings co-evolved with color experiences.

4. Ground Physicalism about Conscious Experience

We just saw that there is an especially strong argument for giving up identity physicalism in the case of conscious experiences. In the rest of this essay, I will explore "nonidentity ground physicalism" for consciousness as a fallback. I being by explaining it in this section and the next. Then I will argue for the second claim of this essay: unlike identity physicalism, ground physicalism does not achieve the physicalist dream. Once we try to work out the details, we see that it cannot be developed in a simple and uniform way.

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).

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

Instead, philosophers 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" that 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 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 (see §12).

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". Recently, Jonathan Schaffer (2017, 2020) has developed and defended this view.

To illustrate, suppose you accept the arguments presented in §3. You think that sensible qualities are irreducible qualities that only appeared in the world when suitably complex brains evolved. Maybe you think that they reside in non-physical sensory fields, or maybe you think they only live in the intentional contents our experiences.

Such a view gives up identity physicalism. But it does not require moving to dualism. Given the notion of grounding, there is another option: ground physicalism. For instance, the quality red might be a "simple" feature of a non-physical visual field region, but still grounded in a complex physical state. Compare how the existence and character of immaterial holes is supposed by the 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).

As I understand ground physicalism for consciousness, it is neutral on whether basic psychophysical ground laws are merely *a posteriori* or ultimately *a priori.* I will return to this issue in the next section.

Others may label this kid of view 'emergentism' or even 'dualism' rather than 'physicalism'. Like Schaffer (2020: 201), I am uninterested 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'.

I have said that on ground physicalism about consciousness there are some psychophysical ground laws. What might they look like? In the case of nomic laws, the most basic ones are general functional laws. Think of gravitation, for example. In Newtonian physics, connections between specific masses and forces are not basic; rather, they are derived from a more basic and more general functional law – Newton's law of gravitation. It is not clear why we could not have the same explanatory structure with ground laws. Neuroscience is beginning to uncover *systematic* regularities connection patterns of neural activity with different kinds of experiences. So, instead of a long list of basic ground laws connecting every experience with some neural-functional state, the ground physicalist can hope for some more general *functional ground laws*. Now, there is a very important issue – discussed by Robert Adams (1987) in a neglected essay – about whether they might be compactly systematized in a precise way, in the way the fundamentally physical laws can (Pautz 2010: 46-47; Schaffer MS). But here I will assume that they can be. So the "psychophysical ground laws" *might* look like this:

> *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 brain 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 brain 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.[17]

These ground laws may not be end of the explanatory story. Kit Fine (2012) recognizes a primitive concept of essence in addition to the concept of ground: "it is in the essence

[17] 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 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.

of *X* that *p*". And he puts forward a principle: general ground laws derive from the essences of items involved in the grounded facts. Ground physicalists about consciousness could easily accept the Finean idea. They just have to declare that *G1-G3* are explained by more basic essentialist truths: *it's in essence of pain experiences that they systematically depend on distinct neural states according to G1*, and *it's in the essence of olfactory experiences they systematically depend on distinct neural states according to G2*, etc. Call these *essentialist laws* between distinct experiential and neural/functional states. This implies that some essentialist truths about experiences unavailable to reflection on those experiences, namely, that they essentially depend on distinct neural-functional states in such-and-such systematic ways. But why couldn't there be such essentialist truths? On this Finean view, the most basic psychophysical laws are not *G1-G3* but rather these *essentialist psychophysical laws*. When I speak of the "basic psychophysical ground laws" in what follow, this should be understood broadly, so that they may be such essentialist laws.[18]

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. Ground physicalists have two options.

First, they might accept *restricted nonidentity physicalism*. On this view, identity physicalist is right for nearly all of nature and fails only in one place: consciousness. This view is suggested by our discussion in §3. We saw there that the best arguments against identity physicalism may concern the hard case of consciousness; arguments that identity physicalism fails in the rest of nature are quite weak. Another version of restricted nonidentity physicalism might add that identity physicalism also fails for moral properties like *ought-not-to-be-done*, because they are other hard cases for identity physicalism.

On "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*, . . . exist grounds the fact that their sum [*x*, *y*, z, . . .] 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

[18] In discussion, Chris Hill has asked me about a view on which experiences are identical with neural states, but identity physicalism fails for neural states (and for special science properties generally) because they cannot in turn be identified with properties definable in the austere fundamental language. This view doesn't require psychophysical ground laws linking neural-functional states with experiences. Against this view, I think that the arguments of §3 – Schaffer's intuition of distinctness, the argument from no good candidates, and the significance argument (note xx) – support the claim that experiences are *distinct* from neural-functional states. In that case, we do need some kind of laws linking the two. This is Schaffer's (2020) view. This kind of view has other prominent defenders – Campbell's (2020) has a similar view of colors, and many have a similar view of goodness. This is the form of nonidentity ground physicalism I will be interested in.

requires special, additional ground laws along the lines of *G1-G3*. We get to say "everything is grounded in the physical", but the case of consciousness is very singular.

Restricted nonidentity physicalism may seem nonuniform in much the same way as dualism. After all, it holds that identity physicalism is right for everything except consciousness (or maybe everything except for consciousness and morals). Like J. C. Smart (1959: 142), you might find this kind of view "frankly unbelievable", even if it counts as a form of physicalism rather than a form of dualism.

So if you accept nonidentity ground physicalism for consciousness and you wish to have a more uniform theory of the world, you will favor *generalized nonidentity physicalism*. You will say that 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 objective sensible qualities, immaterial holes, or multiply-realizable macro properties like *being a mountain*. There are ground laws for these elements of insentient nature, such as the H-law, the P-law, the Q-law. Then there are ground laws *G1-G3* for consciousness. Maybe the generalized ground physicalist could derive all these laws from more general and more basic "maximalist" or "plenitudinous" ground principles (an issue we will return to in §10).

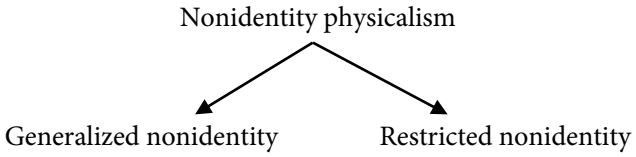

Figure 2

So much for what ground physicalism might look like. Let me address a worry about any form of ground physicalism. Some might think that ground physicalism about consciousness, 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 seems to hold that experiences are "over and above" neural-functional states. They 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.

To evaluate this objection, we need to know what "is nothing over and above" means. It cannot mean "is identical with", because then the constraint is false. Indeed, it is usually supposed that grounding *requires* non-identity, because nothing can ground itself. So if the fact that you are in a certain neural state grounds the fact that a region of

our visual field is red (or whatever), or if the fact that the cheese is perforated grounds the fact that it contains a hole, they those facts *must* be distinct.

Recently, Gideon Rosen (2017) has offered an interpretation of the "nothing over and above" constraint: roughly, for Rosen, the constraint comes to this: if *p* grounds *q*, then *q* must *always*, across all possible worlds, be grounded in something or other more basic. The fact that *q* can never "float free".

But, so understood, the "nothing over and above" constraint is unobvious. For instance, ground physicalists might wish to hold that in the actual world physicalism is true, so that experiences are grounded in neural/functional states, but that in *other* possible worlds ("dualist worlds") those very same experiences can occur without being grounded in anything more basic.

Even if Rosen's version of the "nothing over and above" constraint is true, ground physicalists about consciousness have nothing to fear from it. They might hold that, in the actual world, the experience of red is grounded in a neural-functional state that is distinct from it, and indeed that in some respects it is very different from the neural-functional state. Still, they can satisfy Rosen's interpretation of the "nothing over and above" constraint by adding that in all worlds it is grounded in something or other more basic. This is a coherent view. For Rosen, this would be enough for them to count as holding that the experience is "nothing over and above" the neural-functional state.

5. How Ground Physicalism Resembles Dualism: Bling and Zing

Before moving on to our central question of whether ground physicalism achieves the physicalist dream, I want to note some ways in which ground physicalism about consciousness 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 does not avoid the problems with dualism.

To illustrate how ground physicalism compares to dualism, let us focus on a single case: 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 become acquainted with an array of novel, uninstantiated sensible qualities entirely absent from pre-sentient nature. Schaffer could accept the same view. We could also imagine that they agree on the empirical evidence: they agree on how states of consciousness are systematically correlated with distinct neural or functional states.

In fact, we can imagine that Schaffer and Chalmers 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 *nomic* 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 brain 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 from neural similarity space onto the similarity space of olfactory qualities.
>
> *N3.* If an individual undergoes V4 brain 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 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 Schaffer in one respect only: 'grounding' is replaced throughout by 'nomically determining'. Thus, for Chalmers, the systematic relationship between brain states and conscious experiences is more like that between mass and gravitational pull, or between electric charge and magnetism (see Figure 3).

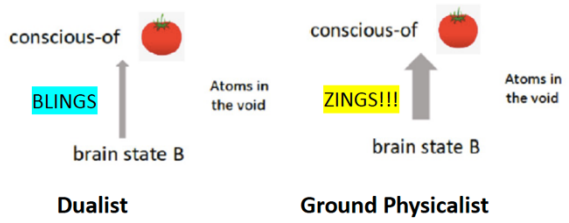

Figure 3

The point I am making here is general. In general, for *any* form of ground physicalism, you can convert it to a *counterpart dualist theory*: a theory that agrees with the form of ground physicalism about everything, except it replaces occurrences of "grounding" with "nomically determining". Ground physicalism come in different forms because there are different non-reductive theory of consciousness. So far, I have imagined that a ground physicalist like Schaffer follows Chalmers in accepting a kind of Galilean intentionalism. But he could instead accept a *sense datum view* on which immaterial subjects

experience immaterial brain-created sense data, provided that he adds that all these immaterial things are grounded in brain states. (Compare how immaterial holes are consistent with ground physicalism as long as they are grounded in hole-hosts.) Or he 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 he could hold that experiences are irreducible, non-relational states grounded in brain states. Whatever form of ground physicalism he accepts, we can always convert it into a counterpart form of dualism by simply replacing 'grounding' by 'nomically determining' throughout.

But how does *grounding* differ from *nomically determining?* In what ways do the ground laws *G1-G3* differ from the nomic laws *N1-N2?*

To make the question vivid, imagine using new technical terms: "zinging" for grounding and "blinging" for nomically determining (Figure 3). If Chalmers and Schaffer 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, nomic determination cannot be explained in other terms. In fact, Schaffer (LEANS) and Chalmers (2012: 338-339) both accept primitivism about nomic connections. So the dualist Chalmers says that one primitive determinative connection holds between brain 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?[19]

[19] Nomically determining (blinging) comes in probabilistic forms. By contrast, grounding (zinging) is essentially deterministic. However, both the dualist and the ground physicalist hold that the experiential-neural connection is

One answer is that ground laws are always *a priori* or "intelligible", while nomic laws are *a posteriori*. In that case, the views differ epistemically. The dualist Chalmers holds that his nomic psychophysical laws *N1-N3* are *a posteriori*. By contrast, the ground physicalist must hold that *G1-G3* report systematic connections between brain states and distinct conscious states that are somehow knowable *a priori*. True, they not *a priori* for us now: we discover them by doing neuroscience. But the ground physicalist might speculate that somehow *a priori* in principle – they are *a priori* for God, so to speak. (Those who like "Russellian monism" might speculate they would become *a priori* if we only knew the hidden quiddities of the microphysical properties instantiated in the brain.) Call this view *a priori ground physicalism*.

Schaffer himself does not take this line. He has noted that many putative grounding laws are not *a priori*. Indeed, this is true of many of the examples used to introduce the concept of grounding. For instance, it is certainly not *a priori* (or at least not conclusively *a priori*) that, if a piece of cheese is perforated, then it thereby contains an immaterial hole – after all, identity physicalists deny this. (I don't even find it *a priori* plausible.) There is a bit of an "explanatory gap" here. So Schaffer thinks that his psychophysical ground laws *G1-G3* might also fail to be *a priori*. Instead, they might be totally *a posteriori*, just like Chalmers's dualistic psychophysical nomic laws *N1-N3*. Call this *a posteriori ground physicalism* about consciousness. Mark Johnston (1997: 582-583) has also proposed a form of nonidentity physicalism on which explanatory gaps are to found all over nature, but he frames it in terms "constitution" rather than "grounding".

I would add another reason to be skeptical of any *a priority* constraint on ground connections besides Schaffer's appeal to examples. The constraint *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 (2021: 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. So, like nomically 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?[20]

deterministic. So this doesn't identify a difference between their theories of this connection that would help us to decide between them.

[20] 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 must be knowable *a priori* - they could be deeply *a posteriori*. So *if* we have a grip on such a notion of grounding, then *a posteriori* ground physicalism is a natural view: Schaffer's ground laws *G1-G2* might be just as *a posteriori* as Chalmer's nomic laws *N1-N2*. 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). He only recognizes what he calls "conceptual ground connections" that are trivially knowable *a priori* (2021: 452).

For the sake of discussion, suppose that Schaffer is right that the ground physicalist's psychophysical ground (or essentialist) laws *G1-G3* would be just as *a posteriori* as the dualist's psychophysical nomic laws *N1-N3*. Then there is no *epistemic* difference between the ground physicalists views of Schaffer and Chalmers. Do they otherwise differ?

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. So the dualist Chalmers and the ground physicalist 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?

For the dualist Chalmers to say that his nomic laws *N1-N3* are merely nomically necessary is just for him to say that they hold in all worlds where the nomic laws are the same. Similarly, as Schaffer explains "metaphysical necessity", for him to say that his *a posteriori* ground laws *G1-G3* are "metaphysically necessary" is just for him to say 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*.

Maybe this can be explained along the following lines. Imagine a "zombie scenario". The *a posteriori* ground physicalist Schaffer agrees with the dualist Chalmers that the zombie scenario 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 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 (or essentialist) laws connecting neural states and our distinct experiences, and that is a bigger difference.

However, in this essay, I am just assuming for the sake of discussion that Fine (2001: 21), Schaffer (2009: 376) and Rosen (2010: 113) are correct in holding that we do have a grip on a kind of grounding that is not defined in epistemic terms. And that is the notion I'm using in my formulation of ground physicalism, making *a posteriori* ground physicalism a natural view.

However, I think that the ground physicist must say that this is merely due a *conventional* fact: it is a conventional fact that we *count* holding fixed *a posteriori* ground or essentialist laws ("zing laws") as more important than holding fixed *a posteriori* nomic laws ("bling laws") in reckoning across-world similarity. For, contrary to the depiction in Figure 3, it is not as if grounding is an objectively "big" glowing relation, while the nomically determining is a "small" one, 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 (blinging). So it may be impossible to say how they differ in other terms.[21]

By the way, ground physicalists face the questions I have asked even if they accept Kit Fine's idea that grounding connections derive from essences. In that case, they hold that psychophysical laws *G1-G3* are explained by more basic "essentialist laws" *E1-E3*. These laws say that experiences are essentially liked to distinct brains states in certain systematic ways. Proponents of this view face the question: how do their essentialist laws *E1, E2, E3* differ from the similar-looking nomic laws *G1, G2, G3* posited by the dualist? There is no obvious reason why they must differ epistemically from the dualist's nomic laws. Why couldn't they be just as *a posteriori* as the dualist's nomic laws? And, for the reasons I have given, it is not possible to specify an objective sense in which they are objectively modally stronger than the dualist's nomic laws.

Now that we understand ground physicalism, I can turn to arguing for the second claim of my essay: unlike identity physicalism, ground physicalism fails to achieve the physicalist dream. Indeed, it suffers from the traditional problems with dualism summarized in §1. It is just as complex as dualism (§6). It is not supported by considerations of mental causation (§7). And, once we try to work out the details, we see that even the "generalized" version is unavoidably unsystematic and nonuniform (§10).

[21] Rabin (2019: 198-199) raises the worry that "Schaffer is actually a dualist in physicalist clothing" and says it is hard to resolve the issue because "I have no idea how to gauge what will count as a metaphysical law versus a natural law on Schaffer's system". I found Rabin's remarks congenial but my point here is different (as he himself pointed out in his extremely helpful written comments). I am assuming that Schaffer is right there are two different unanalyzable connections in nature: nomically determining and grounding. So I think Schaffer answer Rabin's worry: there is a real difference in nature between "metaphysical/ground laws" and "nomic laws". Accordingly, once he rejects identity physicalism, he can say that there is a real difference between his ground physicalism and dualism. (This contrasts with Sider's (2009: 12.5) entirely Humean/conventionalist account of which generalizations count as "laws of nature" and which count as "laws of metaphysics".) My point is just that the views are very similar. And there is no clear sense in which psychophysical connections are objectively "modally stronger" on Schaffer's view than they are on a dualist view.

6. Ground Physicalism v Dualism: Simplicity

We just saw that, for any form of ground physicalism about consciousness, there is a counterpart dualist view. They accept same theory of sensory consciousness: Galilean intentionalism, or the sense datum view, or whatever. They agree on the empirical evidence: systematic correlations between our neural-functional states and our distinct experiences of sensible qualities. They only disagree about one thing. The dualist speculates that these correlations are explained by psychophysical *nomic* laws *N1-N3*. The ground physicalist speculates that they are explained by identical-looking psychophysical ground laws *G1-G3*.

How might ground physicalists support their speculation that experiences and neural-functional states are linked by ground laws G1-G3 over the dualist's speculation that they are linked by nomic laws N1-N3? Schaffer proposes an abductive methodology:

> Just as we accept an abductive methodology for inquiry into the laws of nature, so we should accept an abductive methodology for inquiry into the grounding principles (or "laws of metaphysics"). The metaphysician should seek the simplest grounding principles. (2020: 18)

In this passage Schaffer acknowledges *that ground laws – nomic laws - add to the complexity of our theory of the world*. According to his abductive methodology, when we know we must accept some ground laws, we should minimize complexity by accepting the fewest and simplest such ground laws.

But my question here is: how do we know that experiences and brain states are linked by ground laws *G1-G3* in the first place? Why not think instead that they are nomic laws *N1-N3*? Schaffer's abductive methodology cannot help us answer this initial question. The reason is that the ground laws *G1-G3* and the nomic laws *N1-N3* would *equally* add to complexity. So we have no simplicity-based reason to prefer one hypothesis to the other.

Here is a simple *parity argument* for this (Pautz 2010, 2015). Everyone admits that the dualist's nomic laws *N1-N3* add to complexity. The counterpart ground physicalist view requires identical-looking basic psychophysical ground laws *G1-G3.* They are in all relevant respects just like the nomic laws *N1-N3* proposed by the dualist. They also link our neural-functional properties with distinct experiential properties. Therefore, they *equally add to complexity*. In the passage above, Schaffer already acknowledges that ground laws add to complexity just as nomic laws do. The point here goes only a little further: ground laws and counterpart nomic laws add *equally* to complexity.

The parity argument is quite general. It applies even if the ground physicalist speculates that *G1-G3* are *a priori* (as "Russellian monists" might suggest). And it applies

even if the ground physicalist holds that they are Finean *essentialist laws* (an option mentioned in §4). Even on these views, *G1-G3* are basic, systematic connections between distinct neural-functional and experiential states. The ground physicalist still must include them in her "book of the world", adding to its complexity. They add to complexity no less than the corresponding psychophysical nomic laws *N1-N3* proposed by the dualist. Once we give up on identity physicalism, there is no *simplicity-based* reason to accept any of these physicalist speculations over the dualist hypothesis.

In case you are unconvinced, here is an analogy in support of the parity argument (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 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 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.[22]

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 linking

[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 *nomically determines* subsequent states, just as I think we must have a skeptical view about whether neural-functional states *ground* or *nomically 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 (I put forward this maverick hypothesis in 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 (2020: 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 something that needs to be explained, namely, 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*.

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

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. Then we have no simplicity-based reason to think that they are linked by psychophysical ground laws *G1-G3* (however understood) rather than contingent psychophysical nomic laws *N1-N3*.

In §4, I mentioned a neglected essay by Robert Adams (1987) which develops the *problem of compact systematization* (Pautz 2010; Schaffer MS). Adams argues that dualists cannot compactly systematize their psychophysical laws along the lines of *N1-N3*. In that case, a dualist would need a separate, basic nomic law *for each and every experience*, linking it with a certain neural-functional state. I think Adams is wrong about this. But even if Adams is right, it does not undermine my present "parity point". For if he is right, this is equally a problem for the ground physicalist (Pautz 2014, Schaffer MS). It would mean that the ground physicalist would also need a separate, basic *ground* law *for each and every experience*, linking it with a certain neural-functional state – a big list. So the dualist view and the counterpart ground physicalist view would still be on a par when it comes to their stock of basic principles or laws. Of course, identity physicalists avoid Adams' problem because they don't need psychophysical laws at all.[23]

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*. In discussion, Jonathan Schaffer agreed with this point, but asked whether it might be simpler *in its ontology*.

For example, take a ground physicalist view and a counterpart property dualist view. As a general principle, Schaffer holds that grounded items are an ontological free lunch that don't add to complexity. So even though the ground physicalist and the dualist agree that there are properties of persons distinct from the properties recognized by identity physicalists, this only adds to complexity when the dualist says it but not when the ground physicalist says it. For the ground physicalist, these extra properties are a "free lunch". Therefore, ground physicalism has a simpler ontology.

I disagree with Schaffer's free lunch principle. Suppose that two theories agree that that there are *X*s (irreducible mental properties, immaterial holes, or whatever). But they disagree about how this fact is related to other facts. The "dualist theory" holds that the fact that there are *X*s is merely nomically determined ("blinged") by other facts. The "ground theory" holds that it is grounded ("zinged") by those other facts.

Now Schaffer holds that there is "one and only sense of existence" (Schaffer 2009: 357-360). Therefore, the ground theory holds that there are *X*s in the very same sense in

[23] Elsewhere (2015: note 47) I raise a similar potential problem for Schaffer's "priority monism": it may require a big unsystematic list of "big-to-small" ground principles. See also Sider (2020: 82).

which the dualist theory holds that there are *X*s. True, it says something further about this fact, namely that it is grounded by ("zinged by") other facts. But it still includes the fact that there are *X*s no less than the dualist theory. So if this fact adds to the complexity of the dualist theory, it must add to the complexity of the ground theory as well. If the fact that *p* adds to complexity, it does so no matter what else may be the case.[24]

Suppose I am wrong about this. Suppose that Schaffer's free lunch principle is right. Even if his free lunch principle is true, it does not follow that property dualism is ontologically more complex than the counterpart ground physicalist view. If certain views about properties are right, it will not be more ontologically complex.

First, suppose that nominalism is right. In that case, property dualism should rather be called "predicate dualism". And ground physicalism and predicate dualism have exactly the same ontology. They both only recognize (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 the 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', because it rejects any identification of the form 'for x to feel pain is for x to so-and-so'.

But the basic ideology of ground physicalism includes the very same experiential predicates, because it also rejects identity physicalism. So predicate dualism and ground physicalism are on a par in ideological complexity as well.

Second, 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 *Fs*. 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 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.

The conclusion I draw is that, while *identity* physicalism is certainly simpler than dualism, *ground* physicalism about consciousness is no simpler than its dualist

[24] Another problem with the "free lunch" principle is that it has counterintuitive consequences. Consider again the maverick hypothesis that the initial state of the universe grounds every subsequent state. If the free lunch principle is correct, then the maverick hypothesis must be reckoned vastly simpler than the standard hypothesis that the initial state nomically determines every subsequent state. For, in that case, on the maverick hypothesis, 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). So if the free lunch principle is correct, we should all prefer the maverick hypothesis. I find this very implausible.

counterpart. This is in line with the second claim of this essay: unlike identity physicalism, ground physicalism does not achieve the physicalist dream.[25]

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

So far, we have seen that nonidentity ground physicalism (with ground laws *G1-G3*) is just as complex as a counterpart form of dualism (with nomic laws *N1-N3*). However, you might think the ground physicalist has an advantage over dualism when it comes to mental causation. It can accommodate the "causal efficacy" of conscious states. So it achieves one element of the physicalist dream. By contrast, dualism leads to epiphenomenalism.

I agree that the ground physicalist can accommodate mental causation if we assume some kind of 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 view a stoplight, experience a 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? That is, what happens in the "nearest possible world" in which you do not have this experience? Well, on ground physicalism, your experience of red is distinct from your neural state *N*, but it is linked to *N* by way of ground (or "zing") law *G3* (Figure 3). 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 the ground (zing) 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 G3 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 system of weights, your behavior *counterfactual depends* on your experience; so it is *caused by* your experience.

So, I agree that ground physicalism about consciousness might accommodate mental causation. But I don't think it is a reason to prefer the ground physicalist's ground (zing) laws *G1-G3* to the dualist's identical-looking nomic (bling) 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**.

[25] I have just argued that nonidentity ground physicalism and dualism about consciousness are equally complex because they both require psychophysical laws. I think they also both face another problem about psychophysical laws, which I call the "normative harmony problem" (Pautz 2020b). For discussion, see Cutter and Crummett 2022.

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 (bling) laws *N1-N3* as having a special status among nomic laws; we treat them as just as important as ground (zing) laws. That is to say, it is of the first importance to hold fixed the ground laws *and* the psychophysical nomic laws *N1-N3* (the thin arrow in Figure 3). At the end of §5, I noted that nonidentity ground physicalists most 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.[26]

Now I can say why mental causation does not provide a reason to accept the ground physicalist's ground ("zing") laws *G1-G3* linking our experiences and our brain states, rather than the dualist's identical-looking nomic ("bling") laws *N1-N3*. What we have seen is that 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 would support the ground physicalist hypothesis over the dualist hypothesis only if we had 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-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 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

[26] 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" - so that your neural state *N* and your behavior of pressing on the breaks are the same. That is because, according to the standard system of weights, holding fixed is not so important. See Loewer 2017: 61.

is mental causation rather than mental causation*. This is in line with my second claim in this essay: ground physicalism is no better than a counterpart dualist view.[27]

8. Ground Physicalism v Dualism: Uniformity

My first claim in this essay was that identity physicalism achieves the physicalist dream. It is extremely simple. And it is very uniform - certainly more uniform than dualism. As David Lewis puts it, on identity physicalism, nature is the same "in the sentient and the insentient parts, and in the clever and the stupid parts". They have a systematic answer to the question of what there is. Roughly, all objects are fundamental objects or mereological sums of them. And the ideology of the theory simply consists in fundamental predicates and complex predicates formed from the fundamental predicates using Lamba abstraction. [28]

Nonidentity ground physicalists hold that identity physicalism fails for certain objects and properties; there are "irreducible" objects and properties distinct from those recognized by identity physicalists. But they might still hope that that their account of these objects and properties can also be developed in a systematic and uniform way. And they might hope that that they can use this point in a last-ditch argument for preferring ground physicalism to dualism.

In the rest of this essay, we will examine a two-premise uniformity argument:

1. Identity physicalism fails things in insentient nature (e. g. holes, sensible qualities, multiply-realizable properties) as well as experiences in sentient nature.
2. The most uniform and therefore best view is that all these irreducible things are linked to the physical ground floor by way of interlevel *ground* laws ("generalized ground physicalism"); this view is certainly superior to the dualist that experiences are exceptional in being linked to the physical by way of interval nomic laws.

The case for premise one comes from the kinds of arguments we already examined in §3, "From Identity Physicalism to Ground Physicalism". For instance, John Campbell

[27] 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 discussion 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. (Also, for the reasons presented in §5, I would not accept Kroedel's idea (2020: 88) that dualists could say that psychophysical laws are *objectively* "stronger" than ordinary nomic laws, but still not as strong as the ground physicalist's ground laws.)

[28] If the identity physicalist is a "realist" about properties, they might develop their theory of properties within the framework of a higher-order logic. As Williamson (2022: xx) notes, "standard higher-order logics have explicit, unrestricted comprehension theorems for all types of predicate". And they avoid Russell's paradox for properties.

(2020) has argued that, contrary to identity physicalism, irreducible colors and other sensible qualities were all over insentient nature even before sentient creatures evolved. Casati and Varzi (1994) have argued that there are immaterial holes in pieces of cheese. And Schaffer has used multiple realizability to argue that identity physicalism fails for nearly all interesting macro properties.

The case for premise two has two steps. To illustrate, consider holes. To begin with, ground physicalists might argue that, once we hold that holes are immaterial (the premise one), we should still hold that they are linked to arrangements of matter by way of *ground* ("zing") laws, rather than nomic ("bling") laws. After all, no one accepts the maverick dualist view that immaterial holes are linked to arrangements of matter by way of nomic ("bling") laws! Second, now that the ground physicalist has her foot in the door, she can "bootstrap" her way to ground physicalism for the more controversial case of experience. She can argue that the most uniform view is now that irreducible experiences, too, are linked to neural-functional states by way of ground ("zing") laws *G1-G3*, rather than by way of the dualist's nomic ("bling") laws *N1-N3*. This is more uniform than a rival dualist view on which immaterial holes (and so on) are linked to the physical by ground laws, while experiences are linked to the physical by nomic laws. The result is generalized nonidentity ground physicalism

This view is appealing. It would be nice to believe that there is nothing exceptional about experiences. Irreducible stuff is popping up all over nature. And it is all grounded in the physical (Fodor 1989, Johnston 1997, Schaffer 2020).

Ground physicalists who use the uniformity argument can agree with me that their psychophysical ground laws *G1-G3* are just as complex as the dualist's psychophysical nomic laws *N1-N3*. So if we look at these options in isolation, then there is no way to decide between them. But they hope that we can make progress if we look *across nature*. Since there are interlevel ground laws elsewhere in nature, considerations of uniformity provide *indirect* reason to think that there are interlevel ground laws *G1-G3* for experiences too.

Earlier (§2) I said that the motto of identity physicalists might be "justification by identification". They use simplicity considerations to support psychophysical identifications, which immediately entail the strong modal thesis of physicalism. This argumentative route is of course unavailable to nonidentity ground physicalists about experiences. The only argument available to them is the uniformity argument. So their argument might be "justification by generalization".

What should we think of the uniformity argument for ground physicalism? It looks promising. But I will argue that it fails. The first premise is hard to support (§9). And, even if the first premise is granted, there are a couple of reasons to reject the second premise (§§10-11).

9. Against Premise One of the Uniformity Argument

The first premise of the uniformity argument is "generalized nonidentity". But, in §3, we saw that there is no good reason to accept this. While there may be strong arguments to accept the irreducibility of experiences, there are no good reasons to think irreducible stuff is popping up *all over* nature. And we should only reject identity physicalism only where we actually have good reasons to do so.

For instance, in §3 we saw that we shouldn't accept John Campbell's argument that irreducible colors and other sensible qualities were all over insentient nature even before sentient creatures evolved. Instead, science supports the Galilean view that they depend on our neural responses. And we should be skeptical of Casati and Varzi's argument about immaterial holes and Schaffer's argument about multiple-realizability. Those arguments are just not very strong.

This means that the uniformity argument cannot get off the ground. It starts with certain "base cases" and then makes a generalization. In particular, it starts with the claim that there are irreducible things (immaterial holes, multiple realizability properties) popping up all over *insentient* nature, and moreover they are all connected to the fundamental physical ground floor by way of *ground laws* rather than *nomic laws*. From there, it uses considerations of uniformity to support the same view for the controversial case of irreducible experiences of sentient creatures. But we cannot get to square one here. We have no good reason to accept all these alleged "base cases". So we cannot begin to use considerations of uniformity to support ground physicalism over dualism for experiences.

Here is another way to put my first criticism. For the sake of discussion, suppose that we accept *restricted* nonidentity instead of generalized nonidentity. Identity physicalism only fails in certain hard cases, like consciousness and value. Irreducible stuff is only popping up only *here and there*. Everywhere else identity physicalism is right. (In fact, I am inclined to accept restricted nonidentity; after all, we should reject identity physicalism only where we actually have good reasons to do so.) If this is right, whether we say the occasional irreducible stuff is connected to the physical ground floor by way of ground laws or nomic laws, we get a nonuniform view of nature. So if we accept restricted nonidentity, we clearly cannot use considerations of uniformity to support accepting ground physicalism over dualism. This shows that the uniformity argument really requires *generalized* nonidentity. It requires that identity physicalism fails for things all over insentient nature. My point is that, since we have no good reason to accept this first step of the argument, the uniformity argument for ground physicalism cannot get started.

My first criticism of the uniformity argument, then, is that it cannot get off the ground because we have no good reason to accept its first premise of generalized

nonidentity. This is not to say the first premise is definitely false – just that we have no good reason to accept it.

I think that this criticism is decisive. However, for the sake of discussion, let us grant premise one ("generalized nonidentity"): identity physicalism doesn't just fail for experiences; it also fails for holes, multiply-realizable properties, and so on. In the next sections, I will show that, even if we grant the first premise, the argument would fail, because its second premise is false. I will give two for thinking that generalized nonidentity physicalism is *not* necessarily more uniform than dualism.

10. Against Premise Two: Generalized Nonidentity Physicalism is Nonuniform

In §1, we saw that traditional dualism needs anomalous interlevel *nomic* laws to explain the emergence of experience from the brain. There no such interlevel nomic laws in the rest of nature. In this section, I will argue that *generalized ground physicalism* needs special, anomalous *ground* laws to explain the emergence of experience from the brain, where these ground laws are very different from the ground laws operating in insentient nature. This goes against premise two of the uniformity argument, which says that generalized nonidentity ground physicalism is much more uniform than dualism.

Let us begin with insentient nature. Identity physicalists have a simple and systematic answer to the question of what there is. But generalized nonidentity physicalists like Schaffer hold that all over insentient nature there are objects and properties *distinct from* those recognized by identity physicalists. For instance, there are immaterial holes and multiply-realizable properties. But they have not addressed some important questions. For instance, once they accept *some* such distinct objects and properties, they face the question: exactly what such objects and properties are there? And what are the most basic additional ground principles that generate them?

In my view, generalized nonidentity physicalists have a strong reason to accept just a small handful of *basic principles of plenitude* here. They should go in for *plenitudinous nonidentity physicalism*. This is most in line with Schaffer's "abductive methodology" for metaphysics.

For instance, in the case of *properties*, generalized nonidentity physicalists will want a single principle of plenitude that generates all the properties they recognize distinct from those recognized by the identity physicalist definable in fundamental term. Such a principle might look like something like this:

> [#] For *every* condition *C* definable in fundamental terms (however complex or disjunctive), there is a property *P* that is immediately grounded in *C* and only *C*.

For instance, [#] implies that there is a property *P1* that is immediately grounded by the disjunction of all fundamental distributions where we would say "there is a mountain". Because grounding is irreflexive, *P1* is not identical with this disjunction. So *P1* is an "irreducible" property in the sense that it is not identical with any property recognized by identity physicalists. Maybe the nonidentity ground physicalist could say that 'is a mountain' expresses *P1* (relative to one precisification).

[#] also implies the existence of properties unrecognized by common sense. For instance, let *N* be the microphysical description of my nose, and let *E* be the microphysical description of the Eiffel Tower. [#] implies the existence of property *P2* that is immediately grounded in the disjunction, *E or N*, and only that disjunction. *P2* is not simply the disjunctive property *E or N,* since grounding is irreflexive. In fact, since [#] is only about sufficient conditions and not necessary conditions, it is consistent with [#] that *P2* should be instantiated by things that are *neither N* nor *E* (see note xx).

Now [#] is too simple. For instance, it does not allow for many-one grounding.[29] And it is too simple in other ways.[30] But here the details don't matter. I will work with [#] for the purposes of discussion.

Ground physicalists will also hope that there is a single principle of plentitude that can generate all the *objects* they recognize. For instance, identity physicalists only accept mereological sums or sets of fundamental things. But nonidentity ground physicalists recognize additional objects, like immaterial holes in a piece of cheese. Following Dorr, Hawthorne and Yli-Vakkuri (2021: 267) they might propose something like this:

> [&] For any property *F*, there really exists 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*.

[29] Ted Sider's more complex suggestion (in correspondence).

[30] Here is one reason why a generalized cannot have [#] as their only principle regarding what "irreducible" properties there are (distinct from the ones recognized by the identity physicalist). If they favor a plenitudinous theory of such properties, they will want to say that every physical condition grounds *two* types of properties. First, every physical condition grounds a property *P* that *needs* to be grounded in a more fundamental condition. For instance, the predicate 'is a mountain' expresses such a property (mountainhood is not only actually grounded in something more fundamental but must be). Second, they should also say that every physical condition grounds a property that *actually* is grounded but that *need not* be grounded in a more fundamental condition. For instance, the *condition being arranged mountain-wise* grounds a property P* that in other worlds can be instantiated by other things *in an ungrounded way*. Such a property *P** has only sufficient conditions but no necessary conditions. This may seem to be a somewhat odd category of properties, but a plenitudinous theory should recognize them - why couldn't there be such properties? Now [#] is *consistent with* every physical condition grounding properties of both of these kinds. But it does not *guarantee* that every physical condition grounds properties of both these kinds. So the nonidentity physicalist who wants a plenitudinous theory of "irreducible" properties may want stronger principles that are sufficient to guarantee properties of both kinds.

Such a will principle not only generate the holes in the piece of cheese but also all kinds of objects not recognized by commonsense, such as "table-shaped objects located in the intergalactic void" (Dorr *et al.* 2021: 268). The idea is not that "there exist" all these objects only in some second-rate sense. The idea is that they exist in the "one true sense of existence". They exist in the same sense in which electrons exist; it's just that their existence is grounded.

Instead of striving for systematic principles, nonidentity ground physicalists could take a more "particularist" approach. They hold that all over insentient nature there are objects and properties distinct from those recognized by identity physicalists: immaterial holes, multiply-realizable properties like *being a mountain*, and so on. But they might reject plenitudinous principles like [#] and [&], and instead take case-by-case approach that only recognizes some *subset* of the properties and objects generated by such principles. For instance, they might posit such objects and properties only where they think this is required by parochial "common sense".

But this is extremely arbitrary. It goes against Schaffer's abductive methodology for metaphysics. It would require just a huge unsystematic list of objects and properties (in addition to those accepted by identity physicalists) and basic ground laws for those objects and properties. Against this, 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: see §1). Such principles will be principles of plenitude along the lines of [#] and [&].

Now let us turn to the sentient parts of nature. If nonidentity ground physicalists could explain the sentient and insentient parts of nature with the same principle of plenitude along the lines of [#] and [&], then their view would indeed by very uniform. But they cannot do this. To handle experiences, they need separate ground laws. So their view is nonuniform in the same way as traditional dualism.

Let me explain. Imagine that Sally has a bunch of different types of experiences (visual, olfactory, bodily). Nonidentity ground physicalists hold that all her experiences are distinct from her neural-functional states, but they are linked to those neural-functional states by "ground connections". They also think that there is more to their nature than what neural-functional states they depend on; they have certain qualitative characters. This is a crucial part of their argument for preferring their view to identity physicalism in the first place. It is why they think experiences cannot simply be identified with those neural-functional states, as identity physicalists think.

But these neural-experiential ground connections are just not derivable from any general principle of plenitude along the lines of [#]. They link a specific subset of neural-functional states with experiences with specific qualitative characters. By contrast, the general principle of plenitude [#] says nothing at all about experiences. True, it implies that a gazillion irreducible properties (*P1, P2, P3, . . .*) are instantiated all of nature. But,

for all [#] says, there is no more to the difference between these properties than that they are numerical distinct and they are grounded in so-and-so more basic physical conditions.[31] So the general principle [#] is too weak to imply all these ground connections linking neural-functional states with experiences with specific qualitative characters.

Therefore, here is the best generalized nonidentity ground physicalist can do: in their book of the world, there are a couple of general principles of plenitude for objects and properties, along the lines of [#] and [&]. They may be enough to handle insentient nature. But, for the special case of experience, they need a totally separate chapter in their book of the world. They need a long list special psychophysical ground laws linking neural-functional states with specific experiences. Ideally, they will take the form of *functional ground laws* for the different types of experiences along the lines of *G1-G3*. However, given the great variety of experiences across the animal kingdom, generalized ground physicalists will still need a very long list of separate psychophysical ground laws. So they will have a very bifurcated picture of nature.[32]

Generalized ground physicalists have only one way of avoiding this unwelcome result. They could accept a truly eccentric form of panpsychism. They could say that there is only *one* principle of plentitude across all of nature: [#*] For *every* condition *C* definable in fundamental terms (however complex or disjunctive), and every *possible experience-type E*, *C* immediately grounds *E.* Of course, this would be strong enough to explain the experiences we actually have. And it would be very uniform: it would imply that every physical object has every possible experience! But it is a crazy option.

If we set aside panpsychism, and assume that only a certain *subset* of physical states (viz. certain neural-functional states of the brain) ground distinct experiences, I see no way for generalized nonidentity physicalists to avoid special, anomalous ground laws

[31] For instance, as discussed above, [#] implies that there is a macro property *P1* that is grounded in the condition: being atoms arranged mountain-wise. But it is compatible with [#] that all we can say about *P1* is that it has this ground-profile; it doesn't have any specific "qualitative character" or anything along those lines. Compare how some say that there is a difference between a fundamental physical property and the nomic role it plays, but a fundamental physical property doesn't have any further "substantial nature" or "thick quiddity". So, for instance, all there is to the difference between charge and spin is their numerical difference and their different nomic roles. (See Chalmers 2012: 350ff.) What I am saying is that [#] is consistent with a similar view of the nonfundamental properties *P1, P2, P3*, according to which all there is to the difference between these properties is their numerical difference and their different ground profiles. That is why it is too weak to entail that specific neural-functional states ground experiences with specific qualitative characters.

[32] If the generalized nonidentity physicalist follows Campbell holding that irreducible sensible qualities emerge in the external world, then their view of nature will be even more non-uniform and complex. In addition to special "internal" ground laws linking a subset of neural states with sensations like pain, they will need special "external" ground laws liking some arbitrary subset of *external* physical properties (reflectance properties, chemical properties and other properties detected by our sensory systems) with *specific irreducible qualities* (see §3 and note xx). However, as I explained in §3, I think science supports a *Galilean view* of sensible qualities on which they somehow depend on neural responses (Pautz 2021, Cutter 2022). If so, a generalized nonidentity physicalist will only need special "internal" ground laws linking neural states with experiences of sensible qualities, in addition to [#] and [&].

here, where the special ground laws for experiences are not derivable from any of the other ground laws operating in the rest of nature.[33]

This counts against premise two of the uniformity argument. That premise says that, given "generalized nonidentity", generalized ground physicalism is the most uniform view. But we have just seen that, once we actually try to develop the view, we see that it is non-uniform in much the same way as traditional dualism, requiring special ground laws for experiences. If so, considerations of uniformity do not provide much of a reason to prefer it to traditional dualism.

11. Against Premise Two: Generalized Dualism

I have a second, more decisive objection to premise two of the uniformity argument.

To illustrate, consider the holes in a piece of cheese, and the experiences of some person, Sally. Premise one of the uniformity argument says that identity physicalism fails for both. The holes in the cheese are immaterial objects distinct from the cheese, and Sally's experiences are distinct from her neural-functional states. Premise two says that the most uniform view is now generalized nonidentity physicalism: both the immaterial holes and irreducible experiences are linked to the physical by way of *ground laws*. But this misses an option: generalized dualism. The generalized dualist says that both are instead linked to the physical by *nomic laws*. So the generalized dualist endorses dualism both for Sally's experiences and for the holes in the piece of cheese. (And perhaps also for irreducible normative properties, if she thinks there are any.) Clearly, generalized dualism is just as uniform as generalized nonidentity physicalism. This view may seem bizarre, but I think that those who accept generalized nonidentity must take it seriously.

This objection to the second premise of the uniformity argument is independent of my objection in the previous section. There I argue that generalized nonidentity physicalism is bound to be quite nonuniform. Suppose that I am wrong about this. Maybe, for instance, the generalized nonidentity physicalist can get by with a couple of principles of plentitude along the lines of [#] and [&] for insentient *and* sentient nature. My present objection to premise two still applies. We can always convert the relevant version of generalized nonidentity physicalism into a form of generalized dualism, by replacing all occurrences of "grounding" with "nomically determining". So if the generalized nonidentity physicalists accepts a few principles of plenitude, the generalized dualist will accept those same principle of plentitude, but claim that they are merely *nomically* necessary.

[33] Likewise, if generalized nonidentity physicalists hold that special normative properties grounded in certain complex physical properties and not others (e. g. certain beautiful parts of nature *ought to be admired*), this will be derivable from the principle of plentitude [#]. They will need separate normative ground laws.

This point totally undermines the uniformity argument. Even if its first premise ("generalized nonidentity") is true, its second premise is false. It is just not true that generalized nonidentity physicalism is necessarily more uniform than dualism. Generalized dualism will be equally uniform. So uniformity considerations cannot be used to support generalized nonidentity physicalism over generalized dualism.

At this point, a proponent of generalized nonidentity ground physicalism might use other considerations to support generalized nonidentity physicalism over generalized dualism. They may argue that generalized dualism is a bizarre view not to be taken seriously.

I disagree. I don't myself accept "generalized nonidentity" – the first premise of the uniformity argument. But if I did, I think we would be forced to take generalized dualism seriously as an alternative to generalized nonidentity physicalism, even if it is a view that has not really been discussed.

For example, for the same reasons I gave in §6, we cannot use simplicity considerations to discriminate between generalized dualism and generalized nonidentity physicalism. Nomic laws for immaterial holes and irreducible experiences are no more complex than ground laws. And for the same reasons I given in §7, we cannot use considerations about causal relevance to discriminate between these options.

Maybe a generalized nonidentity physicalist would argue on *a priori* grounds that we should not take generalized dualism seriously as an alternative to their view. To illustrate, consider again the immaterial holes in a piece of cheese and Sally's irreducible experiences. They might insist that, while dualism about Sally's experiences must be taken seriously, dualism about the *holes* makes no sense. Instead, *a priori* reflection supports ground physicalism about immaterial holes. And then considerations of uniformity support generalizing this view to Sally's irreducible experiences.

I disagree. If we think identity physicalism fails for holes, so that there really exist such things distinct from the cheese (§3), then dualism about holes is just as coherent as dualism about Sally's experiences.

To begin with, dualism about immaterial holes does not violate the *a priori* truth that the perforated piece of cheese contains holes *in some sense*. True, the dualist about holes says that, while in the actual world the perforated cheese contains some invisible immaterial things ('holes'), in *other* coherent possible worlds the perforated cheese does not contain these invisible things (just as the dualist about experiences holds there are possible "zombie" worlds where the physical facts are the same but experiences are absent). But the dualist about immaterial holes can plausibly can say that 'the perforated cheese contains holes' has a tolerant metaphysical semantics, so that it can be true with respect to these worlds (see the discussion of the Oracle in §3).

Here is a positive reason for thinking that dualism about holes is coherent. We are assuming that identity physicalism fails, and the cheese contains these little invisible

objects distinct from the cheese. David Hume argued that "anything can cause anything". So why can't the fact that the cheese is perforated nomically determine the fact that it contains these little invisible objects? It is not very credible to think that there is *no* possible world where there should be a law of nature like this. Why can't our world be such a world?

As we noted back in §5, there is also reason to doubt alternative view that we can just "see" *a priori* that the fact that the cheese is perforated *grounds* ("zings") the fact that it contains these little distinct immaterial objects, rather than nomically determining ("blinging") that fact. Against this view, it seems perfectly coherent to accept that the cheese is perforated but deny that it contains any immaterial objects – in fact, that is the view of identity physicalists like David Lewis. Indeed, I myself don't even find it *a priori plausible* that, if the cheese is perforated, it *must* contain distinct immaterial objects.

I have used the case of holes to support the idea that generalized dualism is a viable alternative to generalized nonidentity physicalism. But similar points apply to properties. As we saw in §3, Jonathan Schaffer accepts "generalized nonidentity" for properties. He uses multiple realizability to argue that identity physicalism fails for nearly all macro properties, and he uses additional considerations (e.g. an intuition of distinctness) to argue that it fails for experiences. Suppose he is right. Then we have no (*a priori* or other) reason to prefer his generalized ground physicalism for these properties over generalized dualism.

In fact, I would go further. If we formulate generalized dualism and generalized nonidentity physicalism using my device of "zinging and "blinging" (§5), we may find that there is no big difference between them. For example, on generalized ground physicalism, the dependence of immaterial holes on the perforated cheese is "necessary" in the sense that it holds in all worlds with the same zing laws. On dualism, it is "necessary" in the sense that it holds in all worlds with the same bling laws. As we saw in §5, it is difficult to identify a sense in which sense the first kind of necessity is objectively "stronger" than the second kind.

Let me sum up my discussion of the uniformity argument for generalized nonidentity physicalism. I myself think that the argument cannot get off the ground because there are no good reasons to accept its first premise of "generalized nonidentity" (§9). But even if I were to accept generalized nonidentity, I would think the argument fails because its second premise is false. Against its second premise, generalized nonidentity ground physicalism is bound to be nearly as nonuniform as traditional dualism (§10). Even if I am wrong about this, it is certainly not more uniform than a counterpart form of *generalized* dualism (§11). So even if we accept generalized nonidentity, we must distribute our credences among all these options more or less equally. Nature has not left us enough clues to decide between them.

12. Conclusion

I have argued for two claims:

> **First claim:** Unlike dualism, identity physicalism (Lewis, Sider, Dorr) is a maximally uniform and simple view of nature. There are strong reasons to prefer it to dualism. It achieves the physicalist dream.
>
> **Second claim:** Unlike identity physicalism, nonidentity "ground" physicalism does not achieve the physicalist dream. It is not simpler or more uniform than a counterpart dualist view. There is no strong argument for preferring it to dualism.

My second claim generalizes to other forms of "nonidentity physicalism" that do not appeal to currently *de rigueur* pre-modal notions of "ground" or "essence". Suppose, for instance, you reject identity physicalism for experiences and perhaps other elements of the manifest image. Still, you could say that they are "metaphysically necessitated" by physical conditions (where metaphysical necessity is perhaps a basic notion). Or (following Johnston 1997) you might say that they stand in a "constitution" or "realization" relation to physical conditions (whatever that may mean). My second claim applies to this form of nonidentity physicalism as well. It will be just as complex as dualism, inevitably requiring a slew of extra-logical "bridge principles" (§6). Once we try to work out the details, we will see that it is nonuniform (§10). In any case, it will not be more uniform than a counterpart generalized dualist view (§11).

The upshot is that, if you want to be a physicalist at all, you follow Lewis, Sider and Dorr in accepting identity physicalism. My impression is that most physicalists today would reject this kind of physicalism as too "reductive". They have turned to more liberal alternatives, such as what I have called "nonidentity ground physicalism". But if I am right, they have made a big wrong turn.

On the other hand, if you reject identity physicalism (as I am inclined to do), then you should have a skeptical view of the dispute between dualism and "nonidentity physicalism" (assuming a substantive difference here). You may just have to accept that the nature of the mind-body connection is forever beyond us.

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.
Bennett, K. 2017. *Making Things Up.* Oxford: Oxford University Press.
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.
Cutter, B. 2022. The Mind-Body Problem and the Color-Body Problem. *Philos Stud* (2022). https://doi.org/10.1007/s11098-022-01875-6
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.
Fodor, J. 1989. Review Essay: *Remnants of Meaning* by Stephen Schiffer. *Philosophy and Phenomenological Research* 50: 409-423.
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.
Hall, N. 2005. Causation. In Frank Jackson & Michael Smith (eds.), The Oxford Handbook of Contemporary Philosophy, Oxford University Press, 505-533.
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. *Mental Causation: A Counterfactual Theory*, Cambridge University Press, 2020
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. 2014. 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.
Pautz, A. MS. A skeptical challenge for ground-enthusiasts.
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. 2020. Ground Functionalism. *Oxford Studies in the Philosophy of Mind*.
Schaffer, J. MS. The Problem of the Physical Correlate.
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.
Williamson, T. 2022. Higher-Order Metaphysics and Small Differences. *Analysis Reviews*.
Wilson, J. 2014. No work for a theory of grounding. *Inquiry* 57: 535–579.