

From Grounding Physicalism to Panpsychism

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Grounding physicalism is the view that phenomenal truths are grounded in, but not reducible to, physical truths. Panpsychism is the view that consciousness is much more widespread than is usually thought. This paper argues that if grounding physicalism is true, then panpsychism is true. The argument runs as follows: firstly, grounding physicalism requires compact physical-phenomenal laws, and secondly, the existence of such laws requires the truth of panpsychism. I see this as a powerful objection to grounding physicalism; others may see it as an invitation to develop and defend a panpsychist version of the view.

1. Introduction

According to physicalism, there is nothing ‘over and above’ the physical. The enormous success of physics made physicalism the dominant view in the second half of the twentieth century. It was typically presupposed that physicalism involves some way of identifying mental phenomena with broadly physical phenomena. Discussion focused on issues like whether the identities are ‘type’ or ‘token’ (Putnam 1967, Davidson 1970, Fodor 1974), and whether they are a priori (Lewis 1994, Block & Stalnaker 1999, Chalmers & Jackson 2001).

However, the elegance of the physicalist world-view attracts many who would reject identity physicalism, especially as it applies to consciousness. A common form of complaint is simply that the view is committed to ‘bare and incredible identity assertions’ (Schaffer 2021: 203), which are surrounded by ‘an air of mysticism’ (Nagel 1974:447), and even seem ‘unintelligible’ (Levine 2006:148). Intuitively, physical properties and phenomenal properties are distinct (and no plausible conceptual analysis could justify their identification). The idea that consciousness ‘is just physics’ seems to under-appreciate the supremely vivid and undeniable reality of our own subjective perspective on the world. Furthermore, identifying consciousness with some broadly physical property renders its special significance mysterious (Pautz 2017). Perhaps the most influential concern arguably generalizes to all high-level properties: identity physicalism allegedly

conflicts with multiple realizability (Putnam 1967, Fodor 1974, Kim 1998). According to this concern, consciousness cannot be identified with any physical property since it may be ‘realized’ by many different physical properties.¹

For these reasons, many seek a more moderate physicalism which reconciles the non-fundamentality of phenomenal properties with their apparent irreducibility. Following a wider trend in metaphysics, *grounding physicalism* has emerged as the leading candidate. On this view, consciousness is not itself a physical phenomenon, but physics nonetheless grounds (generates, gives rise to, or ‘metaphysically causes’) conscious experiences. Since this view attributes non-physical levels to reality itself (rather than our representation of it), there is a sense in which it is less austere than identity physicalism (and a sense in which, since these levels are ‘derivative’, it isn’t).²

Grounding physicalism consists of a positive thesis and a negative thesis. The positive thesis makes the view physicalism rather than dualism or idealism:

Consciousness is Physically Grounded: Phenomenal truths are grounded in physical truths.

The negative thesis makes the view grounding physicalism rather than identity physicalism:

Consciousness is Non-Physical: Phenomenal truths are not physical truths.

(If phenomenal truths are physical truths, they may be high-level physical truths which are grounded in other physical truths. Hence, identity physicalists might endorse the positive thesis.)

¹ Schaffer 2013 argues that functionalist identifications do not address the concern since functional properties are themselves multiply realizable. For discussion of challenges to identity physicalism, see Pautz forthcoming: §2.3.

² For discussion of grounding physicalism, see Dasgupta 2014 and Schaffer 2021. For recent comparison to identity physicalism, see Pautz forthcoming. The division approximates the more traditional distinction between ‘reductive’ and ‘non-reductive’ physicalism, though the latter is sometimes drawn in terms of the availability of a priori entailments, which (as I see it) is an orthogonal issue.

A ‘physical truth’ is a true sentence whose constituent terms are all broadly physical: paradigm cases are ‘All electrons are negatively charged’ and ‘Joe’s C-fibers are firing at 2pm’. Since my interest is in the case of consciousness, I will be expansive in my conception of which terms count as physical, to include, roughly, anything objective and non-phenomenal (including the vocabulary of higher-level sciences like chemistry and biology, logical/mathematical vocabulary, nomic/modal vocabulary, *etc.*). A ‘phenomenal truth’ is a true sentence which directly concerns the distribution of conscious experiences across subjects and times by involving some phenomenal predicate: paradigm cases are ‘Joe is in pain at 2pm’ and ‘Everyone is having a reddish experience’.

I assume that physical and phenomenal truths are delineated in such a way that there are no physical truths logically entail any phenomenal truths. By ‘logical entailment’, I mean entailment between sentences formalized in some suitable logic e.g. classical first-order predicate logic.³ (This is narrower than a priori entailment, or analytic entailment. Thus, there is a logical gap between physical and phenomenal truths even if ‘type-A’ physicalists are right that there is no a priori gap.)

Following Kit Fine (2012: §1.4), we can regiment the positive thesis using the connective ‘<’ (‘(fully) grounds’), which connects one or more sentences on the left to a sentence on the right, as in:

Joe has firing C-fibers at 2pm < Joe is in pain at 2pm.

This can be understood as saying that Joe’s C-fibers firing generates his pain, or that he is in pain in virtue of his C-fibers firing. We can capture **Consciousness is Physically Grounded** as follows:

³ Thus, ‘It is not the case that Joe is in pain and not in pain’ is not a phenomenal truth, and ‘Either Joe’s C-fibers are firing or he is in pain’ is neither physical nor phenomenal.

For any phenomenal truth q , there are some physical truths pp such that $\ulcorner pp < q \urcorner$ is true.⁴

I use ‘ground’ here broadly, to cover any relation which i) constitutes or backs metaphysical explanation (depending on whether one is a ‘unionist’ e.g. Dasgupta 2017 or a ‘separatist’ e.g. Schaffer 2012), and where ii) there is a worldly (as opposed to merely representational) difference between explanans and explanandum. This includes, for example, determination (Yablo 1992), constitution (Pereboom 2011), and realization (Shoemaker 2007, Wilson 2011). If the ‘fundamental’ is understood as grounding all else, then fundamentality physicalism (‘only the physical is fundamental’) also entails **Consciousness is Physically Grounded** (Rabin 2019).

Following Cian Dorr (2016: §3; cf. Rayo 2013), we can regiment the negative thesis using the connective ‘ \equiv ’ (pronounced ‘for it to be the case that... just is for it to be the case that ...’), as in:

Joe has firing C-fibers at 2pm \equiv Joe is in pain at 2pm.

This ‘identification’ can be understood as saying that Joe’s pain just is his C-fibers firing: there is a single phenomenon (which may be conceptualized in different ways). We can capture **Consciousness is Non-Physical** as follows:

For all physical truths p and phenomenal truths q , $\ulcorner p \equiv q \urcorner$ is false.

⁴ Here ‘ $\ulcorner pp < q \urcorner$ ’ stands for any sentence which results from concatenating each of the sentences in pp , separated by commas, followed by ‘<’, followed by the sentence q . The grammatical gymnastics might be avoided by quantifying over propositions (or whatever meanings sentences have in virtue of which the grounding claims we make using them are true). But we need to talk about the sentences themselves here since: i) the distinction between phenomenal and physical truths is in the first place a distinction between sentences, and ii) the relation of logical entailment between sentences plays a key role in the argument below. Making the issue meta-linguistic in this way does yield somewhat artificial expressive limitations, but this won’t matter for my purposes.

In sum: grounding physicalists agree with identity physicalists that consciousness is ‘nothing over and above’ physics, but they view the connection as a matter of grounding (determination/constitution/realization) rather than identity.

I will argue that grounding physicalism leads to panpsychism. ‘Panpsychism’ sometimes means the view that everything is conscious, or that some fundamental entities are conscious. Instead, I have in mind the weaker (and somewhat vague) thesis that consciousness is much more widespread than is usually thought.⁵ In particular, it extends well beyond the complex sensory systems which provide the paradigm cases of conscious subjects. Perhaps it extends to inanimate objects like rocks and thermostats, extremely simple systems like cells and molecules, or even fundamental entities like subatomic strings and spacetime points. Speaking for myself, I think there is excellent reason to doubt that consciousness is widespread in this way. Hence, I view my argument as a powerful objection to grounding physicalism. But I won’t try to defend this further claim here: those with keener imaginations may view my argument as an invitation to develop a panpsychist version of grounding physicalism.

2. The Argument

My argument runs as follows:

- i) If grounding physicalism is true, then there are physical-phenomenal laws.
- ii) If there are physical-phenomenal laws, then they are compact.
- iii) If there are compact physical-phenomenal laws, then panpsychism is true.

Therefore, if grounding physicalism is true, then panpsychism is true.

The rest of this section will explicate and justify each of these premises.

⁵ Recent defenses include Chalmers 2013, Strawson 2017 and Builes forthcoming.

2.1 From grounding to laws

The first premise of my argument is:

- i) If grounding physicalism is true, then there are physical-phenomenal laws.

By ‘laws’, I mean metaphysical laws, as opposed to laws of nature. Following Jonathan Schaffer (2017: 305), I have in mind a minimal conception of metaphysical laws as ‘counterfactual-supporting general principles’, which concern ‘the not-causal-but-constitutive generation of a dependent outcome’, and which correspond to functions from more fundamental inputs to less fundamental outputs. ‘Laws’ here needn’t be understood in any ‘heavyweight’ sense: we needn’t assume that these laws are ‘brute’ in the sense of having no metaphysical explanation, that they ‘govern’ their instances, or that they are somehow ‘sui generis’ entities.⁶

Some paradigm candidates to be metaphysical laws are:

The Fusion-Formation Law: For any things, there is a thing which is their mereological fusion.

The Truth-Making Law: For all p, if p, then the proposition that p is true.

The Disjunction Law: For all p and all q, if p, then p or q.

For example, The Fusion-Formation Law supports counterfactuals of the form ‘If xx didn’t exist, then the mereological fusion of xx wouldn’t exist’, concerns the not-causal-but-constitutive generation of fusions from their parts, and corresponds to a function from things (or the truths that they exist) to their fusion (or the truth that it exists).

⁶ Laws are general principles, but what are ‘principles’ exactly? I won’t take any stand on this here, but my discussion will presuppose that we can make sense of laws i) standing in logical entailment relations, ii) having a certain simplicity and strength, and iii) standing in relations of metaphysical explanation. For these purposes, it is useful to treat laws as being associated with certain interpreted sentences (even if this would be an overly linguistic view of what laws *are*).

By ‘physical-phenomenal laws’, I mean laws which bridge the logical gap between physical truths and phenomenal truths. That is, some laws LL are physical-phenomenal laws just in case there are some physical sentences pp and some phenomenal sentence q such that LL together with pp logically entail q. For example, the following would be a physical-phenomenal law:

The Human Pain Law: For any x, if x is a human being with firing C-fibers, then x is in pain.

We can argue for premise i) in two steps. Firstly, if physical truths ground phenomenal truths, then the logical gap must be bridged by laws and/or identifications. Secondly, if there are no physical-phenomenal identifications, then the logical gap must be bridged by laws alone. We can capture this line of argument using the notion of a ‘covering law’, as follows:

i) a. If **Consciousness is Physically Grounded**, then there are physical-phenomenal covering laws.

i) b. If there are physical-phenomenal covering laws and **Consciousness is Non-Physical**, then there are physical-phenomenal laws.

Therefore, if grounding physicalism (i.e. the conjunction of **Consciousness is Physically Grounded** and **Consciousness is Non-Physical**) is true, then there are physical-phenomenal laws.

Intuitively, some laws ‘cover’ a grounding relation just in case they allow the logical entailment of the grounded (under some guise) by the grounds (under some guise). More precisely, suppose that $\ulcorner pp \llcorner q \urcorner$ is true, and let p be the conjunction of the sentences pp. Some laws LL *cover* this grounding relation just in case there is some p* and some q* such that:

$\ulcorner p \equiv p^* \urcorner$ is true; $\ulcorner q \equiv q^* \urcorner$ is true; and LL together with p* logically entail q*.

Note that this is only a definition of covering; it presupposes an independent notion of lawhood.

To illustrate, suppose that:

Ann exists, Bob exists < There is a thing which the fusion of Ann and Bob.

This grounding relation is straightforwardly covered by The Fusion-Formation Law, since this law, together with ‘Ann exists and Bob exists’, logically entails ‘There is a thing which the fusion of Ann and Bob’. Now let Chris be the fusion of Ann and Bob, so that:

Ann exists, Bob exists < Chris exists.

Then this grounding relation (intuitively, the same relation as before, under a different guise) is also covered by The Fusion-Formation Law, on the assumption that:

Chris exists \equiv There is a thing which is the fusion of Ann and Bob.

Note that the identification is needed for covering here because this notion is defined in terms of sentential rather than propositional entailment.

Given this understanding of ‘covering’, premise i) a. can be thought of as the claim that **Consciousness is Physically Grounded** entails the following ‘scrutability thesis’:

Assisted Scrutability: All phenomenal truths are logically entailed by some physical truths together with some laws and/or identifications.⁷

If the grounding relations between physical and phenomenal truths are covered by laws, then by definition there are some laws which, together with the physical truths and some identifications, entail the phenomenal truths. This claim is significantly weaker than the constraints associated with standard ‘scrutability’-based objections to physicalism, since it allows that there are some connecting laws and/or identifications which are not themselves scrutable from the physical truths.

⁷ For discussion of various notions of ‘scrutability’, see Chalmers 2012. Chalmers focuses on a priori propositional entailment; I am employing logical sentential entailment.

Premise i) a. follows from a general principle, which might be called ‘The Nomological Character of Ground’:⁸

All grounding relations are covered by metaphysical laws.

This principle merely states a necessary condition for there to be a grounding relation; it does not amount to a ‘deductive-nomological account’ of grounding (or grounding-based explanation).⁹ It is consistent with many views about what explains grounding facts, such as the view that q’s being grounded by pp is itself grounded in pp (e.g. Bennett 2011), or the view that grounding facts derive from essence facts (e.g. Dasgupta 2014).¹⁰ Indeed, these views are themselves naturally cast in terms of metaphysical laws concerning grounding!

(Logical entailments are trivially ‘covered’ by any laws in the sense defined: for example, any law ‘covers’ the grounding of disjunctions in their disjuncts. This suggests that there is some stronger principle in the vicinity of The Nomological Character of Ground e.g. in which ‘covering’ is understood in terms of subsumption under the function corresponding to some law(s). I won’t attempt to develop this stronger principle, since the weaker principle suffices for my argument.)

The justification for The Nomological Character of Ground may be adapted from Schaffer’s (2017: §2) argument that metaphysical explanations require metaphysical laws.¹¹ Grounding relations — in the form of determination, constitution, realization, etc. — are explanatory in that they either constitute or back explanations. Hence, grounding relations must be covered by metaphysical laws since the explanations they either constitute or back must be covered by metaphysical laws. Let me briefly summarize Schaffer’s defense. (Schaffer does not explicitly argue that metaphysical explanations must be *covered* by metaphysical laws, but this, I believe, is implicit in his case.)

⁸ Davidson (1970) proposed a parallel principle concerning causation, in arguing for a kind of identity physicalism.

⁹ For defense of such an account, see Wilsch 2016.

¹⁰ Although, I consider an essence-based objection to premise i) below.

¹¹ See also Glazier 2016 and Wilsch 2016.

First, since grounding relations are explanatory, they ought to be subsumed under general patterns: ‘Laws are the stable patterns which unify the phenomena, provide recipes for manipulation, and guide understanding.’ (Schaffer 2017:307). For example, without a general principle to cover the grounding of some composite object’s existence, there would be no prospect of unifying it with the existences of other composite objects, knowing how to intervene on its existence by intervening on its parts, or grasping the explanatory connection between its existence and its parts. In short: for the grounding relation between parts and whole to have the expected explanatory payoff, it must be covered by some metaphysical law.¹²

Second, the need for covering laws is suggested by the analogy between grounding-based explanation and causal explanation: just as the latter needs causal laws to connect explanans to explanandum, so the former needs metaphysical laws to play this connecting role.¹³ For example, the causal explanation of a pattern of iron filings in terms of the presence of a magnet is incomplete without some causal law connecting the pattern to its cause.¹⁴ Similarly, the metaphysical explanation of some subject’s experience in terms of some brain events is incomplete without some metaphysical law connecting the experience to its grounds.

Finally, paradigm cases of grounding relations are covered by laws. For example, the grounding of composite objects is covered by The Fusion-Formation Law, and the grounding of propositional truth is covered by The Truth-Making Law.

¹² Markosian (1998) has defended the view that composition does not fit any general pattern. My claim is not that this view is false but that it suggests that composite objects are not grounded in their parts.

¹³ Again, this does not assume a deductive-nomological account of causation/causal explanation!

¹⁴ Some proponents of ‘causal powers’ might hold that they ‘directly’ provide explanatory connections with no need for causal laws (e.g. Mumford 2004). However, it is hard to see how powers could play this explanatory role without yielding some general principles. Hence, it is natural to view powers as giving rise to (rather than replacing) causal laws (as Bird 2007 suggests).

For these reasons, anyone who embraces the idea of grounding (in the broad sense at issue) should accept that it exhibits stable general patterns of the sort that are captured by laws (in the lightweight sense at issue).¹⁵ This justifies:

i) a. If **Consciousness is Physically Grounded**, then there are physical-phenomenal covering laws.

Recall the second premise in my argument for premise i):

i) b. If there are physical-phenomenal covering laws and **Consciousness is Non-Physical**, then there are physical-phenomenal laws.

The idea here is that if the logical gap between physical truths and phenomenal truths is bridged by laws and/or identifications, but there are no physical-phenomenal identifications, then it must be bridged by laws alone.

A little more carefully, suppose that some laws LL cover some physical-phenomenal grounding relation. Then, by definition, there are some physical truths pp such that LL together with pp and some identifications logically entail some phenomenal truth q. Suppose that LL together with pp alone do not logically entail q. There are two (non-exclusive) ways this could happen: there could be some auxiliary identification on the side of the physical truths and/or some auxiliary identification on the side of the phenomenal truth. Strictly speaking, in neither case must there be a physical-phenomenal identification. It could instead be that there is some intermediary kind of truth, X, such that there is some physical-X identification, yielding an X-phenomenal grounding relation, and/or some X-phenomenal identification, yielding a physical-X grounding relation. However, it is hard to see what third realm X could belong to: what could phenomenal truths be identified with and/or grounded in, if not (broadly) physical truths or further phenomenal truths?

Some may be tempted to speculate that the required intermediary truths are representational, proto-phenomenal, or even ‘informational’. However, these truths are best understood as belonging to

¹⁵ Of course, grounding skeptics might reject metaphysical laws, but this is not relevant to my argument.

either the phenomenal or the (broadly) physical realm. Either way, we are left with physical-phenomenal grounding relations, and the need for physical-phenomenal laws. (As discussed below, grounding physicalists might use proto-phenomenal truths (§2.3) or representational truths (§3.3) to *compactify* physical-phenomenal laws, but not to sidestep them altogether.)

2.2. From laws to compactness

The second premise of my argument is:

- ii) If there are physical-phenomenal laws, then they are compact.

By ‘compact’, I mean that they comprise a system which is both strong and can be axiomatized in some reasonably simple way. I do not have fully worked-out accounts of simplicity and strength to hand, but the intuitive ideas suffice for my purposes. Roughly, simplicity is a matter of being concisely expressed in (reasonably) joint-carving terms. For example, assuming that ‘electron’ and ‘negatively-charged’ are joint-carving, ‘All electrons are negatively charged’ counts as simple. By contrast, ‘Everything which is either an electron and observed before 3000 or a proton and not observed before 3000 is negatively charged’ is much less simple, even in the superficially concise form ‘All schmelectrons are negatively-charged’. Roughly, strength is a matter of how informative a sentence is. For example, ‘All electrons carry -1.602×10^{-19} coulombs’ is more informative than ‘All electrons are negatively-charged’ and ‘This electron carries -1.602×10^{-19} coulombs’. If one sentence logically entails another, then it is at least as strong as it (but it is notoriously difficult to say anything general about sentences which do not stand in any entailment relation).¹⁶

Note that a compact system may consist of very many and varied sentences, many of which are themselves very complex. Compactness requires only that the system be founded on some simple collection of axioms — not too many, and not too complex — from which the rest can be derived. This is appropriate since I am assuming that laws are closed under logical entailment (so that the entire system of laws will be varied and complex). We could instead assume a more restricted

¹⁶ Given that metaphysical laws are metaphysically necessary, the notion cannot be understood in terms of metaphysically possible worlds. (Perhaps it can be understood in terms of epistemically possible worlds.)

notion of laws as ‘axioms’ or basic principles: the demand would then be that the collection of laws is itself reasonably simple.

The idea behind ii) is that compactness is what guides us in our search for the general principles by which the world works. This is the ‘T-shirt conception’ of laws — as David Chalmers (1996:214) articulates it:

Physicists seek a set of basic laws simple enough that one might write them on the front of a T-shirt; in a theory of consciousness, we should expect the same thing. In both cases, we are questing for the basic structure of the universe, and we have good reason to believe that the basic structure has a remarkable simplicity.

This compactness constraint is epistemic or methodological: the claim is that a non-compact system should be regarded as implausible in practice, not that it is impossible in principle. (The constraint does not require a Humean account of laws, on which their comprising a sufficiently compact system is what makes them laws.) Arguably, compactness makes for ‘explanatory power’, and so we should expect compact laws insofar as we should expect laws to support powerful explanations.

Crucially, this methodology applies whether our theory of consciousness posits bridging laws of nature or bridging laws of metaphysics.¹⁷ To be sure, metaphysical laws differ from laws of nature in important ways: they are ‘tighter’ connections, which hold across levels of reality, and with maximal modal strength. But these differences seem irrelevant to the compactness constraint. First, as with laws of nature, it is hard to see how we could have any epistemic access to metaphysical laws without a compactness constraint: any inter-level correlations we discover will be consistent with a multitude of candidate laws. Second, like laws of nature, metaphysical laws are part of the universe’s ‘basic structure’ in the relevant sense: both kinds of principle describe the ‘inner workings’ by which certain worldly phenomena generate others. The upshot is that grounding

¹⁷ Cf. Pautz 2017:352; forthcoming: §4.

physicalism is committed to there being some suitably compact system of physical-phenomenal laws. Without some such system, grounding physicalism is untenable.

2.3 From compactness to panpsychism

My third premise is:

- iii) If there are compact physical-phenomenal laws, then panpsychism is true.

As described by Chalmers (1996:214) and Schaffer (forthcoming: §5.1), naturalistic dualism faces the ‘T-shirt problem’: it requires psychophysical laws, and yet the psychophysical correlations we discover don’t seem to lend themselves to compactification.¹⁸ I am applying this familiar problem to grounding physicalism.¹⁹

The idea behind (iii) is that the most promising way of compactifying psychophysical correlations entails panpsychism. As I see it, there are two main obstacles to compactification. Firstly, there is the apparently incompressible space of phenomenal properties: there seems to be a huge range of possible conscious experiences, differing along many incommensurable dimensions (Adams 1987: 256-8). Visual, auditory, tactile and olfactory experiences each seem to have their own sets of basic parameters, belonging to distinct similarity spaces. Consider, moreover, the (potentially vast) array of alien experience-types which are inaccessible to humans: bat experiences, for example, may not fit into any phenomenal similarity space that we are familiar with (Nagel 1974). The basic phenomenal parameters seem to vastly outnumber the fundamental physical properties that we expect to feature in a final theory.

¹⁸ See also Collins (2011: §III) and Bennett (forthcoming).

¹⁹ This can be viewed as a successor to Sider’s (2011: §8.2.1) well-known objection that grounding connections must themselves be explained because they involve non-fundamental constituents (see Dasgupta 2014 and Glazier 2016 for responses). The problem here does not require that metaphysical laws stand in need of explanation (nor that they cannot be explained). Instead, it only relies on the claim that, since they constitute worldly explanatory structure, they ought to be compact.

Secondly, on the other side of psychophysical connection, the physical correlates of consciousness are not simply expressible in joint-carving terms (Latham 2000: 78–80).²⁰ For example, notwithstanding the philosophers’ legend of C-fibers, the human correlate of pain appears to be a holistic pattern of activation which is complex when stated in neural terms (let alone in terms of fundamental physics). Famously, moreover, the human story fails to extend to Martians or sentient AI. Furthermore, there can be little hope for simple functional correlates: try listing the stimuli and behavioral dispositions corresponding to pain (together with the background conditions under which these correspondences obtain). Not only is the list long, but its entries are unlikely to be simply expressible in joint-carving terms.

The overall upshot seems to be that we need many physical-phenomenal laws (one for each basic phenomenal parameter), each of which is complex (at least as complex as the physical correlate involved). To avoid these obstacles, we need some reasonably small list of basic phenomenal parameters, or ‘proto-phenomenal properties’, each of which has some reasonably simple connection to fundamental physical properties. This requires that each familiar phenomenal property of our conscious experience somehow reduces to the overall distribution of these proto-phenomenal properties, so that the richness of the phenomenal realm is built from a few basic phenomenal ingredients.²¹ These proto-phenomenal properties then serve as the ‘gates’ of the phenomenal realm, through which all nomic roads from the physical realm pass.

This solution to the T-shirt problem plausibly entails panpsychism. There is no simple physical property which is shared by all and only those objects which are usually thought to be conscious. Hence, if proto-phenomenal properties bear some simple connection to physics, they cannot be confined to those objects which are usually thought to be conscious (or their constituents). Indeed, the most natural picture is one on which some reasonably fundamental physical entities — such as particles or even spacetime points — themselves bear proto-phenomenal properties. On this

²⁰ Schaffer (forthcoming) focuses on the closely related issue that these correlates are either high-level or disunified, rendering them unsuitable to feature in basic laws of nature. This particular problem does not obviously extend to grounding physicalism, since we might expect high-level properties to feature in the level-connecting metaphysical laws.

²¹ For discussion of this idea, see Chalmers 1996: §8, Collins 2011: §IV, Builes forthcoming: §4.

picture, consciousness is at least as widespread as the fundamental entities in question, and may even be ubiquitous.

The appeal to proto-phenomenal properties is perhaps the most popular response to the T-shirt problem on behalf of naturalistic dualists. I am saying that grounding physicalists should join the panpsychist ranks, by reinterpreting the simple psychophysical laws as laws of metaphysics. On the resulting ‘physicalist panpsychism’, proto-phenomenal truths are grounded (via a compact system of fundamental bridging laws) in physical truths, and combine to yield ordinary phenomenal truths.²²

It might be thought that the T-shirt problem simply reappears in the second stage: what laws govern phenomenal combination? But at this stage, grounding physicalists can make use of identifications (without violating **Consciousness is Non-Physical**).²³ For example, perhaps to experience red is to have parts with proto-phenomenal properties satisfying some logically complex distributional profile. The higher-level phenomenal truth that x is experiencing red can then be grounded in the proto-phenomenal truths about x’s parts via some general laws concerning mereological/logical complexity. In this way, physicalist panpsychism avoids both physical-phenomenal identifications and the T-shirt problem.

²² Perhaps the most popular brand of panpsychism is ‘Russellian panpsychism’: the view that proto-phenomenal properties are the quiddities which play the nomic/dispositional roles described by fundamental physics. Strawson 2017 defends a version of this view, calling it ‘physicalist panpsychism’. As Chalmers 2013 notes, it is unclear whether this view counts as ‘physicalist’, since it is unclear whether the fillers of physical roles themselves count as ‘physical’. The important feature of the view for my purposes is that the physical roles are connected to their phenomenal fillers via laws of nature: it is because the latter are involved in certain laws that play the roles they do.

This is quite different from the view which results from combining grounding physicalism with panpsychism. On the view I have in mind, the fundamental properties are physical and non-phenomenal (whether dispositional or categorical), and give rise to proto-phenomenal properties (whether dispositional or categorical) via some compact metaphysical laws. (This might be thought of as reversing the direction of explanation in Russellian panpsychism, insofar as the latter is a view on which certain phenomenal quiddities give rise to physical dispositions via some compact laws of nature.)

²³ This constitutes a dialectical advantage over dualist panpsychism: if the required identifications are inscrutable, embracing them undermines an important argument against physicalism (Goff 2009).

The case for (iii) is not demonstrative. I have argued that the most natural route to compactification entails panpsychism, but this may not be the only viable route. I argue against one alternative below. The challenge for grounding physicalists who wish to avoid panpsychism is to come up with something else.

3. Objections

3.1 Essences

Objection: The case for premise i) relied on The Nomological Character of Ground:

All grounding relations are covered by metaphysical laws.

But grounding relations derive from essences (e.g. Fine 2012: §1.11, Dasgupta 2014). For example, the grounding relation between a thing's scarletness and its redness derives from the essence of redness: in particular, the truth that it is essential to redness that anything which is scarlet is also red. Thus, The Nomological Character of Ground must be replaced by The Essential-Nomological Character of Ground:

All grounding relations are covered by metaphysical laws and/or essentialist truths.

Thus, essentialist truths — such as its being essential to pain that anyone with firing C-fibers is in pain — may play a crucial role in bridging the logical gap between physical and phenomenal truths.

Response: Firstly, bridging essences seem to undermine the non-reductive motivation for grounding physicalism: grounding phenomenal truths in physics allows them to be genuinely non-physical in nature. Why replace bare and incredible assertions of physical identity with equally bare and incredible assertions of physical essence? (Indeed, many non-reductionists seem motivated by the intuition that the essences of phenomenal properties are exhausted by the way

they feel.)²⁴ Moreover, surprising physical essences would be naturally explained by identifications: a natural explanation for its being essential to pain that anyone with firing C-fibers is in pain is that to be in pain just is to have firing C-fibers (or just is to be in some disjunctive state with firing C-fibers as a disjunct).²⁵

Secondly, why aren't these essentialist truths metaphysical laws? No objection has been given to the argument that metaphysical explanation requires stable general principles. Besides, regardless of whether we call the connections 'laws', the crucial question for the downstream argument is whether the compactness constraint applies. If these essentialist truths are not simply disguised physical-phenomenal identifications, or explained in terms of such identifications, then how are they to be systematically explained? And if unexplained, what exempts them from compactness?

Dasgupta (2014) has argued that essentialist truths are 'autonomous' i.e. not apt to be explained. Perhaps — but this does not enable grounding physicalists to escape the compactness constraint. If essentialist truths are tied to identifications, then I can see how they might be both non-compact and unexplained — identities 'do not cry out for explanation in their own right' (Dorr 2016: 41). But, given **Consciousness is Non-Physical**, phenomenal essences cannot be understood this way. They must instead constitute worldly explanatory structure. If autonomous — hence, unexplained — they add to the world's brute complexity. We have the same reason to expect them to fit on a T-shirt as we do for laws.

Effectively, the proposal that essences provide physical-phenomenal connections inherits the mess of physical-phenomenal laws and merely adds that they are essential to the phenomenal properties in question. Analogously, nomic essentialism — the view that laws of nature are essential to the properties they involve — does not exempt physicists from searching for a compact system of fundamental laws. New branding; same epistemology.

²⁴ In this vein, Rosen (2010: §13) observes that physical-phenomenal bridging laws are plausibly viewed as 'Moorean connections': exceptions to the generalization that metaphysical laws derive from essences.

²⁵ See Correia & Skiles (2017) for a related proposal connecting both essence and ground to identification.

3.2 Derivative laws

Objection: Grounding relations may be covered by derivative metaphysical laws. Consider:²⁶

For any x , if x is scarlet, then x is red.

For any region R , if there are some atoms arranged table-wise in R , then there is a table in R .

For any action a , if a involves stealing sweets from a baby, then a is wrong.

These principles do not belong in the ultimate roots of the universe's explanatory tree —they operate somewhere higher up, within their own specialized branches. Nonetheless, they seem well-suited to cover grounding relations. Indeed, the arguments adapted from Schaffer (2017), which appealed to the explanatory nature of ground, seem only to require some type of robust general connections, and do not exclude covering by derivative metaphysical laws.

These derivative laws do not constitute 'basic structure', so we should not expect them to fit on a T-shirt. Indeed, the incompressible complexity of psychophysical correlations is exactly what we find in other specialized branches, such as those concerning colours, ordinary objects, or normative status. Overall: physical-phenomenal laws may be derivative, hence not compact. Premise ii) fails.

Response: These derivative laws must themselves be metaphysically explained. (If they are simply brute posits, they ought to be compact.) So the issue is only pushed a step back: the gap across to phenomenal truths has been bridged at the expense of creating a new gap across to the derivative bridging laws.

²⁶ This parallels the objection to Davidson 1970 that causal relations may be covered by higher-level laws which are neither strict nor deterministic.

How might this gap be bridged? On one picture, we invoke some further derivative laws to cover the grounding of the derivative laws, some further derivative laws to cover the grounding of those, and so on. This is not exactly an infinite regress of grounds, but it is an infinite regress of explanatory involvement: each law in the sequence is involved in explaining the previous law (by covering its grounding). I agree with Schaffer (2017:316) that ‘there cannot be limitlessly descending chains of ever deeper laws’ — or at least that, if there were, they wouldn’t support satisfactory explanation.²⁷ On this picture, the physical-phenomenal gap remains forever unbridged.

Instead, we should expect that the complete explanatory story for each derivative law bottoms out in some ultimate foundation: the basic laws on which the whole scaffolding rests. But then, if physical-phenomenal grounding relations are covered by derivative laws, all phenomenal truths are entailed by the physical truths together with basic laws and/or identifications. Suppose that some phenomenal truth *q* is grounded in some physical truths *pp* via some derivative laws *LL*, so that *q* is entailed by *pp* together with *LL* and (perhaps) some identifications. To avoid regress, the derivative laws *LL* are themselves metaphysically explained via basic laws and/or identifications together (perhaps) with some physical truths *pp**. Hence, the basic laws and/or identifications together with some physical truths, *pp* and *pp**, entail *q*. Given **Consciousness is Non-Physical**, we are back to basic — hence compact — physical-phenomenal laws.

3.3 Two-factor physicalism

Objection: The case for premise iii) relied on the idea that compactifying the physical-phenomenal laws involves proto-phenomenal properties as the ‘gates’ of the phenomenal realm. But there is another route to compactification.

The major theories of consciousness divide into two parts. One part targets state-consciousness: that is, truths of the form ‘mental state *S* is conscious’. This might appeal to broadcasting in the ‘global workspace’ (e.g. Baars 1988), higher-order states (e.g. Rosenthal 1993), or local recurrent

²⁷ Cameron 2022: ch.3 argues that some infinite regresses are possible but unexplanatory.

processing within the sensory cortex (e.g. Block 2007). Another part determines — given a conscious state S — its particular phenomenal character. For example, representationalist theories draw on S 's content (e.g. Dretske 1995) or that of a corresponding higher-order state (e.g. Carruthers 2000).

This suggests the following proposal. The only physical-phenomenal law is a consciousness-generating law of the form: for any state S , if S has physical property X then S is conscious. Truths about phenomenal character are derivable from this law together with identifications of the following form:

$$S \text{ has } Q \equiv S \text{ is conscious and has } Y$$

where Q is a phenomenal property and Y is a physical property. To illustrate, the complete explanation for why some state feels painful might proceed as follows: first, its consciousness is grounded in its being globally broadcast; second, its painfulness is identified with its being conscious and representing tissue damage.

This proposal reduces phenomenal truths via identifications to phenomenally homogenous truths involving the single phenomenal notion of state-consciousness. By ‘factorizing out’ state-consciousness from phenomenal character, all the rich variation may be quarantined in the remaining physical factor, thus avoiding the ‘many phenomenal parameters’ aspect of the T-shirt problem. The phenomenally homogenous truths may then be targeted by a single physical-phenomenal law. If the functional/neural correlate of state-consciousness turns out to be reasonably simple, then the physical-phenomenal laws will be suitably compact.²⁸

²⁸ Another version of this strategy factorizes phenomenal truths into an irreducible phenomenal relation and richly varying physical relata, employing identifications of the form:

$$S \text{ has } Q \equiv S \text{ is conscious-of } Y$$

where again Q is phenomenal and Y is physical. In addition to the problems raised below, this version inherits the difficulties of representationalism: for discussion, see e.g. Chalmers 2010: ch.11. (Pautz (2017:§5) advocates a non-physicalist version of this approach on which the relata are non-physical ‘sensible properties’.)

Response: It is far from clear that there is any simple physical correlate of state-consciousness — unless, that is, consciousness turns out to be far more widespread than usually thought. By relying on simplicity, this strategy risks collapsing into panpsychism.

But set this aside: grant that some suitably concise law is available. Do the non-reductive motivations for treating it as a law rather than an identification really justify the cost of complicating the overall lawbook? Two-factor physicalism makes state-consciousness irreducible, yet it reduces each phenomenal character to state-consciousness together with some corresponding physical property. This reductive component seriously undermines its non-reductive motivations.

First, multiple realizability: high-level properties are realized by many different physical properties, and so cannot be identified with them. However this argument is supposed to go, it cannot motivate two-factor physicalism. If multiple realizability precludes identification, two-factor physicalists must hold — implausibly — that there is only one way of making the physical difference between state-consciousness and any specific phenomenal character.

Second, by making all phenomenal variation physical variation, two-factor physicalism seems to retain much of what is mysterious and counter-intuitive about assimilating phenomenal truths to physical truths. (If anything, making phenomenal variation a physical matter but not consciousness itself piles mystery upon mystery!)

Finally, Pautz 2017 has argued that identity physicalism neglects the special significance of consciousness. Roughly, the idea is that no physical correlate ‘stands out’ in the right way from the many intrinsically similar candidates in its vicinity. For two-factor physicalists, this issue re-arises for phenomenal characters, such as pleasure and pain. Their identification involves some presumably complex and arbitrary-looking physical property — but if consciousness itself must be significant, why not also these specific ways of being conscious?

4. Conclusion

The major positions on the metaphysics of consciousness are traditionally divided in modal terms: are physical-phenomenal connections metaphysically necessary or merely nomically necessary? My argument suggests that the important division is ‘post-modal’: are physical-phenomenal connections laws (and hence, worldly) or identifications (and hence, representational)?

Grounding physicalism’s commitment to physical-phenomenal laws places it alongside naturalistic dualism in the search for compact consciousness-generating worldly structure. Taking consciousness ‘seriously’ as an irreducible feature of reality pushes both views into the strange and perhaps wonderful territory of panpsychism. By contrast, identity physicalism collapses worldly structure: it posits a single ‘portion of reality’ where there seemed to be two. As Pautz (2017:355) remarks: ‘identifications have a unique feature: unlike certain kinds of brute “grounding laws”, *they don’t add to the complexity of our theory.*’ This leaves identity physicalists with a different set of concerns: their task is not to find a compact ‘fundamental theory’, but to accommodate — or explain away — multiple realizability and the other apparent motivations for **Consciousness is Non-Physical.**

The ‘nothing over and above’ metaphor which unifies physicalism hides an important distinction. The real question is whether consciousness is anything *other* than physics — ‘over and above’ or not.

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