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Physicalism

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Philosophers have long labored to articulate conceptions of physicalism adequate to their various dialectical purposes. As a result, *physicalism* denotes a rich and intricately related family of views, each with its own deep and dense philosophical literature. Painstaking work on supervenience has allowed the physicalist to attempt comparatively sophisticated formulations of the view. However, supervenience physicalism arguably faces serious unresolved challenges. A relatively new entry onto the metaphysical scene — *grounding* — enables an alternative conception of the key relation at the heart of some versions of physicalism. This chapter will consider the prospects for an account of physicalism with grounding at its core.

Before determining whether grounding may be fruitfully applied to physicalism, we will need some sense of what physicalism is supposed to be. To that end, Section 1 will lay out some key metaphysical physicalist theses. Section 2 will discuss supervenience and some central challenges to supervenience physicalism (see also Kovacs, this volume). Section 3 will introduce the notion of grounding and use it to formulate physicalism. Finally, Section 4 will consider the relative merits and demerits of grounding physicalism. We will see that while grounding physicalism arguably improves on supervenience physicalism in some respects, serious work remains if grounding is to enable a clearly viable formulation of physicalism.

1. Physicalism

Physicalism is, like many philosophical doctrines, notoriously difficult to define. We often encounter it in the context of the mind-body problem. There, in opposition to substance dualism, the physicalist denies that the mental and the physical are distinct basic kinds of substance and integrates both under a common category. Against idealist metaphysical monism, which claims mentality to be the one monolithic substance, the physicalist claims the common category to be physical substance. Several standard views of the mind-body relation are considered physicalist, including behaviorism (at least in its ontological form), token and type identity theory, reductionism, and eliminativism.

Physicalism is generally thought to say more than simply that the mind is physical. While one could endorse domain-specific versions of physicalism (see Yates 2009), physicalism is often meant to be an overarching philosophical doctrine — a *Weltanschauung*. The trouble is, the precise nature of the doctrine is subject to significant controversy. I will shortly turn to the task of surveying some of the controversy, by distinguishing a number of competing physicalist theses. Note, however, that some see physicalism not as a contentful view, but as a stance or attitude (Ney 2008b, van Fraassen 2002). Those who do see physicalism as a contentful view sometimes formulate it as a linguistic thesis, as in the case of its progenitors, Carnap (1959) and Neurath (1931). Others formulate it as a partly epistemic thesis about whether the necessitation of the mental by the physical is known *a priori* or *a posteriori* (Howell 2015, Jackson 2005, Levin 2019, and Witmer 2006). Since my interest here is in applications of grounding — a metaphysical relation — to physicalism, I will bracket such formulations and discuss some

standard metaphysical theses. I will not attempt to give an exhaustive survey (but for a more extensive one, see Stoljar 2010).

The first metaphysical thesis captures the anti-dualist sentiment mentioned above.

(1) *Negative thesis*: There are no non-physical things.

This thesis is meant to capture the physicalist's insistence that there are no non-physical minds, spirits, souls, gods, and so forth (Kim 1997; Poland 1994: 15). In its negative form, this thesis reflects a relatively focused dialectical motivation. The physicalist who avows it primarily aims to distinguish herself from those she regards as holding a spooky or otherwise suspect metaphysical view. The challenge she faces is that of delimiting the category of non-physical things in a non-*ad-hoc* manner. A natural move would be to define the category contrastively, as whatever falls outside the category of *physical* things. This naturally leads us to an alternative version of our first thesis — its logically equivalent, but positively stated obverse.

(1') *Positive thesis*: Everything is physical.

Some important features of this thesis need unpacking. First, we need to know what falls within the scope of the quantifier — that is, what is meant by the claim that every 'thing' is physical. 'Thing' should be construed broadly to include entities, properties, kinds, relations, events, processes, and facts. With 'thing' understood in this broad sense, this positive thesis is sometimes presented as the core idea of physicalism (Papineau 2001; Pettit 1993; Elpidorou 2018; Stoljar

2010: 28). Moreover, having understood ‘thing’ broadly, we can further discriminate between token and type things. On the *token physicalist* interpretation, every token thing is a physical token. On the *type physicalist* interpretation, every type of thing (for instance, every mental property or every kind of mental event) is a physical type. Since types are instantiated by tokens, type physicalism entails token physicalism.

Next, we need to know what it means to say that everything is ‘physical’. That is, which account of the physical does the physicalist assume or endorse? This is a thorny and controversial issue, and I can consider it only briefly (for suggested desiderata on conceptions of the physical, see Witmer 2018). On one major view, that which is physical is in some sense *countenanced* by science — or more specifically by natural science (Stoljar 2010: 26), physical science (Brown and Ladyman 2009: 34), physics (Elpidorou 2018, Kirk 1994), or fundamental physics (Loewer 2001, Wilson 2006). Call this the *scientific conception* of the physical.¹ Let ‘science’ be a placeholder for whatever the physicalist deems to be the appropriate science.

The phrase ‘countenanced by science’ is unclear. It could mean *mentioned, explicitly posited, or described* in the language of science (Hellman and Thompson 1975). We might characterize this roughly in Quinean fashion, in terms of the things (or kinds of things) quantified over by our scientific theories. Alternatively, ‘countenanced’ by science could mean *investigated* by it. In that case, the things countenanced by science are the targets of scientific inquiry, which we sometimes successfully intervene on and manipulate, posit for the purposes of explanation and prediction, mathematically describe, or speculate about. Where the physicalist means ‘science’ to denote the natural sciences, this latter interpretation would make physicalism

equivalent to the view Papineau calls *ontological naturalism*, according to which “reality involves nothing more than the entities studied in the natural sciences” (2014: 166).

Regardless of how we cash out ‘to countenance’, the scientific conception faces what is known as *Hempel’s Dilemma* (Hempel 1969, 1980). The dilemma emerges when, in response to the proposal that science guide ontology, we ask *which science, from when* (see Crane and Mellor 1990; Dowell 2006a; Melnyk 1997; Montero 1999; Ney 2008a; Stoljar 2010; and Wilson 2005, 2006)? If we index our conception of the physical to *past science*, we grant physicality to things whose existence we now deny. That route is a non-starter. The dilemma, then, is as follows. On the first horn, if we index our conception of the physical to *current science* (Loewer 2001, Melnyk 1997), we face a few related difficulties, including that current science is incomplete, likely to change, and false. On the second horn, if we index our conception of the physical to ideal or complete *future theories* (Poland 1994), arguably we render physicalism vague, lacking determinate content, or trivial (Chomsky 1968, Crook and Gillett 2001). At the very least, we leave ourselves epistemically in the dark about which things count as physical. Those who endorse the scientific conception of the physical must choose a horn and resolve it.

However, an alternative conception of the physical has emerged in an attempt to avoid Hempel’s Dilemma. On the *via negativa* conception, that which is physical is non-mental. There is some debate as to whether the *via negativa* conception in fact avoids Hempel’s dilemma (see Gillett and Witmer 2001 and Montero and Papineau 2005). Moreover, while I characterize the *via negativa* as a conception of the physical (following Montero and Papineau 2005, Crook and Gillett 2001, Stoljar 2010, Tiehen forthcoming, and Worley 2006), some characterize it as a way of altogether *avoiding* the substantive difficulty of defining the physical (Levine and Trogdon

2009; Montero 1999, 2001; Spurrett and Papineau 1999). Indeed, the *via negativa* appeals most to those who see dim prospects for an adequately worked-out conception of the physical (Crane and Mellor 1990; Montero 1999, 2001; Stoljar 2010).

It is not clear which of the discussed conceptions, if either, is adequate or best relative to physicalist purposes. On the one hand, the scientific conception uncontroversially faces Hempel's Dilemma. On the other hand, the *via negativa* must be relativized to dialectical context — after all, it is only apt to characterize the physical as *non-mental* if we are concerned with minds in the first place — and such relativization might strike one as *ad hoc*. What's more, the *via negativa* clearly leaves something to be desired for those who think a satisfying or complete physicalist story requires a positive account of the physical. Of course, whether these are bugs or features is among the bones of contention. Ultimately there is no easy answer to the question of what the 'physical' in 'physicalist' means.

Setting aside conceptions of the physical, let us return to the positive thesis we were attempting to cash out — the thesis that everything is physical. It might be thought that this thesis, however interpreted, will lead to an overly restrictive ontology. That is because we can identify entities, properties, and phenomena that seem not quite physical in the senses above. For instance, if we adopt a brand of physicalism that assumes physical things are mentioned in the language of physics, we must contend with the fact that physics tends not to mention lots of the things we believe in, such as “mothers, baseballs, nations, or even rocks” (Ney 2008a: 1036).

In response, the defender of the positive thesis can either eliminate or reduce such things. The eliminativist move is revisionary in the extreme. As for the reductionist move, setting aside conceptual, theoretical, and explanatory reductions, we may distinguish two kinds of

metaphysically reductionist views: *narrowly reductive* and *broadly reductive*. For the narrow reductionist, to reduce something is to establish its (token or type) identity with something at a lower level of organization. The narrow reductionist move requires a promissory note, which we may regard with some dubiousness, to the effect that all the ontological items we are interested in saving will be shown to be identical with fundamental physical phenomena. Identity theory has been so closely associated with reduction that it is common to deem brands of physicalism that reject it *non-reductionist* (as in List and Menzies 2009 and Wilson 2010). However, Lewis identified a broader sense in which physicalist theories can be reductionist, in which to reduce something is to show it to be *nothing over and above* something at a lower level of organization (1983: 358). This broad-sense reductionism can figure into physicalism in the following way.

(2) *Free lunch thesis*: There is nothing over and above the physical.

I call this the ‘free lunch’ thesis (borrowing Armstrong’s well-known 1997 phrase) because it suggests that things like mental events and properties add nothing to the furniture of the world. As it were, they come for free with our physical commitments. So this version of physicalism is suitably ontologically conservative from the perspective of those who wish to save mothers, baseballs, nations and rocks, while at the same time minimizing their ontological status.

The pressing question for the free lunch physicalist is, naturally, what does it mean for something to be *over and above* the physical (or not)? Rather than grappling with that particular question, I wish to consider the more general issue of what sort of relation the physicalist needs at the heart of her view. The final thesis I will discuss prompts us in that direction. It shares the

spirit of the free lunch thesis, but is slightly more informative or contentful in virtue of its disjunctive form.

(3) *Disjunctive thesis*: Everything is either physical or appropriately related to the physical.

In cashing out this disjunctive thesis, the crucial question now becomes: what does it mean to be *appropriately related* to the physical? Since this 'appropriate relation' is highly sought-after and physicalists have put such effort into identifying it, I will call it the *million-dollar relation*. A number of candidates for the million-dollar relation have been suggested. Here I again bracket non-metaphysical relations, such as entailment. The following list is not exhaustive and there may be some overlap among its items, depending on how one cashes out the terms. Candidates include constitution (Baker 2000, Johnston 1992), composition (Boyd 1980), determination (Hellman and Thompson 1975, MacDonald and MacDonald 1986, Yablo 1992), fixing (Elpidorou 2018), necessitation (Stoljar 2010), truthmaking (Morris 2016), and realization (Melnyk 2003, 2006, 2018; Shoemaker 2007).

Importantly, the disjunctive thesis provides the clearest entry-point for grounding, since grounding may be thought to be a comparatively attractive candidate for the physicalist's million-dollar relation. I will explore this thought in Sections 3 and 4 below. Since supervenience has had the most attention devoted to it, in the following section I will treat supervenience physicalism as the benchmark against which to compare the prospects for a grounding-based formulation of physicalism. This is not to suggest that the other candidates are not interesting or promising in their own right.

2. Supervenience Physicalism

On the standard conception of supervenience, *A* supervenes on *B* when there cannot be an *A*-difference without a *B*-difference. The relata of the supervenience relation are generally thought to be properties or facts (Leuenberger 2008). So for instance, to say the mental supervenes on the physical is to say there cannot be a difference in mental properties or facts without a difference in physical ones. Moreover, the formal properties of the supervenience relation include reflexivity (there can be no A-difference without an A-difference) and transitivity (one thing may supervene on another via intermediate supervenience relations). Supervenience is also non-symmetric (Kim 1984).

That it is impossible to have an A-difference without a B-difference is a modal claim, the force of which can be characterized in different ways. For instance, with *natural supervenience*, an A-difference without a B-difference would involve a violation of physical law. With *metaphysical supervenience*, the B-facts metaphysically necessitate the A-facts. With *logical supervenience*, an A-difference without a B-difference would involve a contradiction.²

Importantly, supervenience is a mere covariation relation. It builds in no substantive metaphysical commitment as regards the reason for the covariation. For instance, there is no assumption that the supervenience-base somehow *produces* supervenient things, nor that the supervenient things *metaphysically depend* on the supervenience-base. Because the supervenience relation is metaphysically minimal, reflexive and non-symmetric, it also lacks explanatory import (Blackburn 1984, Kim 1993).

It is worth noting at this juncture that Horgan (1993) advances the notion of *superdupervenience* — supervenience that is amenable to physicalistically-acceptable explanation (i.e. supervenient properties or facts can be explained in terms of a physical supervenience base). While *prima facie* superdupervenience may be thought to overcome the explanatory limitations of supervenience, Horgan admits that explaining supervenience relations in a physicalistically-acceptable way is a “daunting task” (1993: 581). Lynch and Glasgow argue that, worse, it is impossible (2003). Even if it were possible, Jessica Wilson (1999) argues that the explanatory constraint Horgan places on supervenience “is neither sufficient nor necessary to ensure that properties supervening on presumed physicalistically acceptable base properties are themselves physicalistically acceptable” (1999: 34).

Returning to garden-variety supervenience, the supervenience of mental properties on fundamental physical properties is typically thought to be at least a necessary condition for physicalism (though against this see Montero 2013 and Montero and Brown 2018). If we plug supervenience into the disjunctive thesis, we get the following formulation of physicalism.

Supervenience physicalism: Everything either is physical or supervenes on the physical.

‘Thing’ may still be construed broadly, though assuming the standard view of supervenience, anything satisfying the right disjunct will be a property or fact. Nevertheless, some things — like concrete particulars — will satisfy the left disjunct and not the right, since they are not the sorts of things that can be related in supervenience relations (characterizing them as such would be a category mistake). Moreover, there is some question as to which modal profile the physicalist

intends to assign to supervenience in this context — but the physicalist often takes the type of supervenience at issue to involve metaphysical necessity (Wilson 2005: 436).

There are different ways of cashing out supervenience physicalism. First, it can be cashed out in terms of individuals (Kim 1987) or regions (Horgan 1982). For instance, one might hold that there cannot be a mental difference in an individual or region without some physical difference in that individual or region. Call this *local* supervenience physicalism. Alternatively, supervenience physicalism can be cashed out in terms of possible worlds. For instance, one might hold that there cannot be a mental difference at a world without some physical difference at that world. Call this *global* supervenience physicalism. Since physicalism is meant to be an overarching metaphysical doctrine, it is often formulated as a global thesis. Jackson and Lewis articulate some classic global formulations:

Any world which is a *minimal* physical duplicate of our world is a duplicate *simpliciter* of our world. (Jackson 1998: 12)

Among worlds where no natural properties alien to our world are instantiated, no two differ without differing physically; any two such worlds that are exactly alike physically are duplicates. (Lewis 1983: 364)

For further discussion of the global thesis, see Bennett (2004); McLaughlin (1995), (1997); Paull and Sider (1992); Shagrir (2002); and Sider (1999); and Stalnaker (1996).

While supervenience physicalism faces many challenges (see Leuenberger 2008 for a survey), I will highlight two main problems. First, it is usually thought that the physicalist's million-dollar relation should be a metaphysical dependence relation of one form or another. However, as I have already noted, supervenience is not a metaphysical dependence relation, but a mere covariation relation. As such, supervenience formulations of physicalism fail to capture or illuminate the common physicalist contention that the mental metaphysically depends on the physical. Since supervenience is not a metaphysically or explanatorily robust dependence relation, we might think that it somewhat impoverishes physicalism. As Koslicki puts it, supervenience is a “purely modal relation... too explanatorily coarse-grained to capture and illuminate the nature of the connections at issue” (2015: 308). So the first problem is that supervenience seems to be rather less metaphysically and explanatorily robust than the physicalist wants her million-dollar relation to be.

The most serious problem facing supervenience physicalism is that supervenience fails to be sufficient for physicalism (Heil 1992; Horgan 1993; Kim 1990, 1993; Schiffer 1987). The problem is that “any necessary facts globally supervene on any facts” (Leuenberger 2008: 755). In other words, with necessary facts, we get supervenience on the cheap. That is because no matter what kind of fact B is, if A is a necessary fact, there cannot be an A-difference. So, trivially, we satisfy the supervenience dictum that there cannot be an A-difference without a B-difference. Switching from facts to entities, Montero and Brown explain the problem in the following way: “any necessarily existing thing supervenes on the physical since any world that duplicates the nitty-gritty of our world will also contain this necessarily existing thing; even God, if she goes in for necessary existence, supervenes on the physical” (2018: 524).

Alternatively, Wilson imagines a god that sets things up so that emergent mental states covary, in a metaphysically necessary fashion, with physical states (2014: 543). Since non-physical gods and emergent mental phenomena can fit into the supervenience mould, supervenience formulations of physicalism fail to meet a minimal condition of physicalism — namely, that it rule out the existence of things like non-physical gods and emergent mental states.

We have seen in my survey of the available conceptions of physicalism that the physicalist who wishes to avoid an overly restrictive ontology will characterize her view using the disjunctive thesis, according to which everything is either physical or appropriately related to the physical. However, we have seen that the standard candidate for the million-dollar relation — supervenience — is both metaphysically and explanatorily impoverished, as well as insufficient for physicalism. This suggests that we should consider alternatives. This is the natural entry point for the discussion of grounding. Several philosophers have suggested the possibility of a grounding-based formulation of physicalism (Bennett 2011a, Fine 2001, Kroedel and Schulz 2016, Schaffer 2009, Rosen 2010). After introducing the notion of ground, the remainder of the chapter will sketch grounding physicalism and assess its prospects.

3. Grounding Physicalism

Grounding is a metaphysical dependence relation that tracks the ‘in virtue of’ locution (Fine 2012), so that whenever we say that x exists or obtains in virtue of y , we may also say that y grounds x .³ The relation is generally thought to involve necessitation (though against this, see Skiles 2015). The nature of the dependence is also sometimes thought to be productive in some sense. For example, Bennett characterizes grounding as a *building relation* — a directed relation,

the relata of which differ in how fundamental they are and share a connection, where ‘connection’ is left as a primitive (2011b: 90-92; see also her 2017). At any rate, the thing doing the grounding is thought to be more fundamental ontologically than the thing being grounded. Since some prominent grounding theorists (Schaffer 2009, Rosen 2010) take *grounding* to be a primitive term, examples often play a key role in its elucidation. Putative examples of grounding claims include:

Categorical facts ground dispositional facts. (Audi 2012)

Non-aesthetic facts ground aesthetic facts. (Audi 2012)

Social and psychological facts ground semantic facts. (Audi 2012)

The fact that A and the fact the B ground the fact that A&B. (Fine 2012)

Socrates’ existence grounds the existence of singleton Socrates. (Fine 2015)

Natural features ground moral features. (Schaffer 2009)

Sparse properties ground abundant properties. (Schaffer 2009)

Truthmakers ground truths. (Schaffer 2009)

Some grounding theorists take the relata of the grounding relation to be facts (Audi 2012, Fine 2012, Rosen 2010); some take them to be propositions (Cameron 2015, Rosen 2010); others take them to be objects (Schaffer 2009).

Grounding is also similar to causation in a number of interesting ways (Schaffer 2016b, Wang this volume, A. Wilson 2018). Like causation, grounding is thought to be closely connected with explanation — it is indispensable to explanation (Audi 2012: 104), or itself explanatory (Dasgupta 2014: 558; Fine 2001: 15; Rosen 2010: 117), or at least backs explanation (Schaffer 2016b: 50). On the connection between grounding and explanation, see also Glazier

(this volume) and Raven (2015); see J. Wilson (2018) on the conflation of metaphysical dependence with explanation. Moreover, just as we can distinguish causal relevance from sufficiency, we can distinguish partial from full grounds, where partial grounds might contribute to grounding some fact or entity, without being alone sufficient. For instance, *the fact that A* and *the fact that B* are each partial grounds of the fact that A&B (Fine 2012). Finally, like the causal relation, the formal properties of grounding are typically thought to be asymmetry (no two things mutually ground one another), transitivity (one thing may ground another via intermediate grounding relations), and irreflexivity (nothing grounds itself). Note, however, that there is some disagreement about these formal properties (see Bliss 2014; Jenkins 2011; Tahko 2013; Thompson 2016, this volume; and Wilson 2014).

Some key differences between grounding and supervenience have emerged. First, the relations may have different relata — if the grounding relata are objects or propositions and if the supervenience relata are properties (though it is also possible that the relata of both are facts). In terms of formal properties, grounding is standardly thought to be irreflexive and asymmetric, while supervenience is reflexive and non-symmetric. Moreover, grounding is a metaphysical dependence relation, while supervenience is not. In particular, grounding is arguably what Bennett calls a building relation; supervenience is not. Finally, grounding is in some important sense connected to explanation, while supervenience is not. See Kovacs (this volume) for further discussion of grounding in relation to supervenience.

Having spelled out the notion of ground and its differences from supervenience, we are now in a position to consider its application to physicalism. Recall that the disjunctive physicalist thesis declares everything to be physical or appropriately related to the physical. A grounding-

based formulation of physicalism will plug grounding into the thesis as the million-dollar relation.

Grounding physicalism: Everything is either physical or grounded in the physical.

Here, the domain of quantification should again be understood broadly, though (trivially) only those sorts of things that can be grounding relata can satisfy the right disjunct. This formulation of grounding physicalism accords with Loewer's characterization of physicalism as the view that "the fundamental properties and facts are physical and everything else obtains *in virtue* of them" (2001: 31). On this view, the mental metaphysically derives from a more ontologically fundamental physical basis, in the sense that the one exists or obtains in virtue of the other.

One might wonder how grounding physicalism compares with physicalism cashed out in terms of supervenience. Supervenience physicalism would claim that everything is either physical or supervenient on the physical (that is, covaries with and is explainable in terms of it). *Prima facie*, the two are similar in that both involve an explanatorily-loaded necessitation relation, and both build in a physical base. However, supervenience still differs from grounding in the ways that supervenience does: supervenience is not directional, nor is it productive. In virtue of this key difference between the two relations, grounding physicalism importantly differs from supervenience physicalism.

What might grounding physicalism end up looking like as an overarching metaphysical view? It may come as a surprise to learn that grounding physicalism could (*though need not*) be combined with ontological permissivism. For instance, Schaffer argues that the answer to most

existence questions (at least the controversial ones) is a trivial affirmation. In his view, numbers, properties, mereological composites, and fictional characters exist, and trivially so (2009: 357). Schaffer even claims, notwithstanding his atheism, that the existence of God is a trivial truth (2009: 359). It is just that God exists derivatively rather than fundamentally, just as Sherlock Holmes, the numbers, and all the rest of the ontological misfits (2009: 357). If we import this permissive attitude into grounding physicalism, *permissive grounding physicalism* might say that, trivially, there are abundantly many non-physical things, but those things are grounded in a relatively more sparse physical base.

It is important to note, however, that this kind of permissivism is incidental to grounding physicalism, not a consequence of it. One could equally well adopt an ontologically austere grounding physicalism. I consider the possibility of permissive grounding physicalism simply because it is an interestingly weird kind of view — weird because the spirit of physicalism seems anti-permissive, and interesting because it raises the question of whether such permissivism could actually square with the physicalist's broadly reductive tendencies. For his part, Schaffer takes derivative posits to be harmless. In his view, norms prescribing simplicity should apply at the level of fundamentality or grounds (2009: 361). Whether one sees this as a significant departure from the ontologically austere intentions of the physicalists depends on whether one agrees with Schaffer that it is harmless to posit abundantly many derivative entities (see Audi 2012 for an opposing view).

At any rate, we now have a flavor of what grounding physicalism amounts to and how it differs from nearby views. We have seen that grounding physicalism takes the disjunctive physicalist thesis and offers up grounding to fill the formidable role of the physicalist's million-

dollar relation. I will now turn to my final task of the chapter, which will be to consider whether grounding can really make good on the demands of the role.

4. Grounding Physicalism Assessed

4.1 Relative Improvement

The first thing to consider is whether any of grounding's characteristic features make grounding physicalism an improvement over supervenience physicalism. In response to general skeptical worries regarding grounding, its defenders have argued that grounding has distinctive merits. We may look to those suggested merits for a sense of how grounding might enrich the physicalist story.

First off, Cameron (2016) argues that the distinctive merit of grounding is its directionality. He claims that grounding, in being inherently directional, illuminates more of the world's structure than other relations. He argues that it helps us describe ontic priority (2016: 386), including priority differences among non-fundamental things (2016: 389). He also claims it to be essential for accounting for the dependence of determinable properties on determinate properties (206: 390-91). Likewise, Raven (2017) argues that fixing the direction of priority is part of the crucial work that grounding accomplishes.

Importantly, Cameron and Raven are responding to Jessica Wilson (2014), who argues that we don't need grounding to fix the direction of priority. So whether or not grounding has a unique or indispensable role in fixing the direction of priority is a matter of debate. However, we can safely set this debate aside. Our current task is to see whether and how grounding physicalism improves on supervenience physicalism — and to that end, the relevant question

here is just whether the grounding relation can be useful to the physicalist in a way that the supervenience relation can't. Regardless of whether grounding is *required* to fix the direction of priority, the fact remains that grounding *can* do it and supervenience can't. As we saw in the comparison of grounding to supervenience, supervenience is a non-symmetric modal relation, while grounding is indeed directional and productive. It is therefore plausible that compared with supervenience, grounding would increase the physicalist's descriptive capacity with regard to the hierarchical relation between the physical and non-physical. This may be considered a comparative merit.

Raven (2017) also argues that grounding's work includes helping us to analyze what he calls *ineliminable* fundamentality. Something is ineliminably fundamental when a fundamental account of reality must refer to it (2017: 649). Grounding enters the analysis of this notion in the following way: "an entity is ineliminable just in case not all facts about it are grounded in facts about other entities" (2017: 650). The relevance of this for my purposes here is that the physicalist will likely claim the physical to be ineliminable in Raven's sense. If so, then grounding may be crucial for analyzing the ultimate metaphysical status of the physical. So grounding's directionality and its ability to account for the ineliminable status of the physical arguably make it an improvement over supervenience.

4.2 Grounding the Grounding Facts

At the same time, grounding faces a difficulty of its own. The difficulty concerns the status of the grounding facts themselves. Following Sider (2011), Dasgupta (2014) identifies a problem for the articulation of grounding physicalism, stemming from the question of what

grounds the grounding facts (see also Litland, this volume). Suppose that grounding physicalism claims that all non-physical facts are grounded in physical ones (Dasgupta 2014: 581). Take an example of a token grounding claim: *conscious state x is grounded in brain state y*. The problem arises when we ask about the status of that token grounding claim. Dasgupta points out that such grounding facts are not themselves physical facts (2014: 560; see also Melnyk 2016). If they are not physical facts, then grounding physicalism seems to require that they be grounded in physical facts. This doesn't seem to be the case. If so, then grounding facts seem to present a counterexample to grounding physicalism.

A number of possible resolutions have been explored. Dasgupta resolves the problem by arguing that grounding facts belong to a category of *autonomous* facts — facts which are not apt for being grounded. Just as pure arithmetical facts are not apt for causal explanation, grounding facts are not apt for grounding explanation. The question of what grounds them “does not legitimately arise in the first place” (2014: 563). Rather, it rests on a category mistake.

Alternatively, in her treatment of the problem, Bennett argues that the grounding fact $\langle A$ grounds $B \rangle$ is grounded in A (2011a; see also her 2017). Then we have a further fact, which itself requires grounding: the fact $\langle A$ grounds $\langle A$ grounds $B \rangle \rangle$. On her view, A likewise grounds this further fact, and so on to infinity. The regress is, she argues, benign, since for each fact in the chain, there is an answer to the question of what grounds it. Similarly, DeRosset (2013) argues that facts stated by grounding explanations are grounded in their explanans, and that this does not generate vicious regress because each fact in the series is grounded. So the problem of what grounds the grounding facts may be resolved by looking to the grounding relata themselves.

So far we have seen that grounding physicalism has some relative merits compared with supervenience physicalism, and while the grounding framework brings with it the problem of what grounds the grounding facts, there are some potential resolutions available. However, in assessing the relative attractiveness of grounding physicalism, a crucial step remains. If grounding physicalism is to be a viable form of physicalism, it must overcome the problems that arguably prove fatal to supervenience physicalism. I now return to those problems.

4.3 Coarse-Grainedness

The first problem was that supervenience is a purely modal relation, not a metaphysically or explanatorily robust dependence relation. Grounding one-ups supervenience in this regard, since it is explicitly a metaphysical dependence relation that its proponents believe to be importantly connected to explanation. However, Koslicki argues that, like supervenience, grounding “fails to be sufficiently fine-grained to do its intended explanatory work” (2015: 309; see also her contribution to this volume). In her view, to learn that something physical grounds something mental is only to learn that “this entity functions as a minimal element in a domain over which a certain well-founded partial order is defined” (2015: 315). But this is not illuminating, especially since such a relation is “formally indistinguishable from other well-founded partial orderings which are presumably not numerically identical with the grounding relation” (2015: 315; see also J. Wilson 2018).

Jessica Wilson also argues that “Grounding, like supervenience, is too coarse-grained to do the work of appropriately characterizing metaphysical dependence on its own” (2014: 540). She argues that it is severely underdetermined with respect to importantly different theoretical

options. Grounding claims say nothing, for example, about “whether the dependent goings-on exist, are reducible or rather distinct from the base goings-on, are efficacious, and so on” (2014: 540). In that regard, they wash over significant distinctions between eliminativist, reductionist, and non-reductionist accounts of dependence. As a result, compared with our rich array of pre-existing theoretical options, we might think that grounding physicalism is relatively contentless. Wilson puts the point this way:

[S]uppose someone claims that the mental is Grounded in the physical. Am I in position to know whether I should agree with them? Not at all... the bare assertion of Grounding is compatible with both reductive and non-reductive versions of physicalism — indeed, perhaps even with anti-realist eliminativism about the mental... Absent further information... I am stuck: I am not in position to assess, much less endorse, the claim that the mental is Grounded in... the physical. (2014: 549)

Wilson concludes that grounding claims leave open a number of critical questions, the answers to which are required for even basic understanding and assessment of dependence claims (2014: 545).⁴ Koslicki’s and Wilson’s arguments may be taken to raise serious doubts as to whether grounding fares better than supervenience with respect to its metaphysical and explanatory import.

Grounding’s arguable coarse-grainedness problem is one of several general skeptical worries about grounding. DeRosset (this volume) responds to some of these worries. In particular, he considers the worry that grounding’s coarse-grained logical features make it

theoretically unhelpful or uninformative relative to other metaphysical dependence relations. He replies that even if grounding claims are uninformative, that does not make them false — and neither does it motivate global skepticism with respect to grounding. Rather, it motivates the grounding theorist to move beyond the logic of ground to develop a more positive substantive theory of ground.⁵ With regard to the present concern that grounding is too coarse-grained to improve on supervenience in the formulation of physicalism, a response of this kind gives us only a promissory note for a harder-working conception of ground.

Since the coarse-grainedness worry is a general skeptical worry, my discussion of it may have had a kind of preaching-to-the-choir effect — those who were already convinced by the skeptical challenges will not have been optimistic about grounding's prospects in the domain of physicalism anyway. As we turn to the sufficiency problem, we will see a distinctive difficulty that doesn't similarly arise from general skeptical worries, but that arises *specifically* for grounding's application to physicalism and in response to physicalism's unique demands.

4.4 Insufficiency

The second problem facing supervenience physicalism was the insufficiency of supervenience for physicalism. How does grounding fare in this regard? Melnyk (2016) argues that grounding physicalism allows for a failure of broad reduction. That is, like supervenience, the grounding relation permits entities over and above the physical. However, as we saw above, physicalism is sometimes thought to require nothing over and above the physical. If so, then grounding physicalism violates a minimal condition of physicalism.

You may recall that I earlier shifted away from the language of over-and-aboveness. So we don't yet have any sense of what 'nothing over and above' means. Melnyk uses a placeholder phrase, "nothing over and above *in the intuitive sense required for physicalism*" (my emphasis, 2016: 251). Can the phrase be made more contentful? Sider (2015) devotes significant effort to precisifying the phrase. Without going down that particular rabbit hole, my very rough intuitive gloss of 'nothing over and above' is 'not ontologically additional to'. We may cash this out in terms of numerical distinctness. For instance, for a grounded entity to be nothing over and above its grounding entity (or entities) would be for it to be *not* numerically distinct from it (or them). Holding this gloss fixed, is Melnyk right that grounding physicalism permits entities over and above the physical? Clearly so. For the grounding theorist, the relata of the grounding relation are indeed distinct. Even Fine, for whom the grounding relation is in some important sense *constitutive*, denies that the grounded fact *just is* the grounding fact(s) (2012: 39). Indeed, the grounding relation seems to guarantee that grounded things are over and above their grounds in my sense.

However, one might think that 'not additional to' misses an important connotation of 'nothing over and above'. The aboveness metaphor may suggest that the physicalist means to rule out are things additional to the physical *in some more metaphysically weighty or significant sense*. Recall from the above discussion of permissivism that Schaffer claims derivative entities have little import relative to the ontological roster — they are, he says, an ontological free lunch (2009: 361). Perhaps that could be the sense of nothing-over-and-aboveness the physicalist is getting at. Applied to grounding physicalism, to say grounded items are nothing over and above their physical grounds would be to say they constitute nothing *metaphysically significant* in

addition to their physical grounds. If Schaffer is right that grounded entities are an ontological free lunch, then *contra* Melnyk, grounding physicalism does not permit entities over and above the physical. However, with regard to whether Schaffer *is* right, it is extremely unclear how we would go about settling the matter (especially for those with naturalist inclinations).

Further regarding the insufficiency of grounding in the formulation of physicalism, Jessica Wilson (2018) argues that grounding physicalism cannot distinguish itself from strong emergence. Strongly emergent properties or phenomena are (in some sense) over and above their underlying physical properties or phenomena and are not deducible from statements describing them. Wilson argues that nothing prevents strong emergence from being, like grounding, a strict partial order, and so grounding's status as a nothing-over-and-above relation is "just a matter of brute stipulation" (2018: 506).

Previously, we saw doubts raised regarding the metaphysical and epistemic import of grounding. Now, on the question of whether grounding fares better than supervenience with respect to its sufficiency for physicalism, we see further doubt. If these doubts are well-founded, then while grounding physicalism may be thought to improve upon its standard supervenience rival in certain respects, it doesn't overcome the problems that seem to defeat supervenience physicalism — and so is not yet a viable formulation of physicalism.

Supposing grounding physicalism does indeed fail to resolve the problems that are fatal to supervenience physicalism, by failing to illuminate the nature of the metaphysical dependence between the non-physical and the physical and by failing to rule out things over-and-above the physical, what shall the physicalist do? The issue regarding the contentless character of grounding, as well as its alleged insufficiency for physicalism, may stem from the fact that in

practice grounding is typically left a “thinly described primitive” (J. Wilson 2018: 506), even by those who claim it to be primitive only provisionally. Perhaps some of the challenges to grounding may be resolved if, as deRosset (this volume) also suggests, we develop the more positive substantive account. Alternatively, Ney (2016, this volume) suggests that grounding need not be adopted *to the exclusion* of other relations — so perhaps a hybrid view is possible. A final possibility would be to turn our attention elsewhere, to a range of alternate dependence relations, which some regard as more promising candidates for the physicalist’s million-dollar relation.

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Notes

1. If the scientific conception is a bonafide account of the meaning of ‘physical’, then it should give us necessary and sufficient conditions for physicality. If so, then with suitable refinement it should be amenable to biconditional formulation. However, I do not claim that it succeeds in providing necessary and sufficient conditions on any of its interpretations.
2. There are many important and sophisticated further refinements of supervenience, which I must bracket for reasons of length. For instance, on weak and strong supervenience, see Kim (1984) and (1987). On multiple domain supervenience, see Kim (1998).

3. While I characterize grounding as a dependence relation, McLaughlin and Bennett (2018) note that in cases of ‘grounding overdetermination’, you can have grounding without ontological dependence. See also Schnieder’s contribution to this volume.
4. In response, Ney (2016) argues that Wilson’s concerns don’t apply to Fine’s grounding framework.
5. Compare Schaffer’s (2016a) claim that *more* formalism is the answer. He argues that structural equation models resolve the problem of un informativeness.

Further Reading

1. Dasgupta, S. (2014) ‘The Possibility of Physicalism’, *Journal of Philosophy*, 111(9–10), pp. 557–92. (A treatment of the problem of whether token grounding facts are themselves grounded in physical facts.)
2. Melnyk, A. (2016) ‘Grounding and the Formulation of Physicalism’, in Aizawa, K. and Gillett, C. (eds) *Scientific Composition and Metaphysical Ground*. London: Palgrave Macmillan, pp. 249–69. (An articulation of problems for grounding formulations of physicalism, as compared with realization formulations.)
3. Ney, A. (2016) ‘Grounding in the Philosophy of Mind: A Defense’, in *Scientific Composition and Metaphysical Ground*. London: Palgrave Macmillan. (A defence of the usefulness of grounding in articulating key views in philosophy of mind.)
4. O’Conaill, D. (2018) ‘Grounding, Physicalism, and Necessity’, *Inquiry*, 61(7), pp. 713–30. (A defence of grounding physicalism against difficulties arising from metaphysical necessitation.)

5. Wilson, J. (2018) ‘Grounding-Based Formulations of Physicalism’, *Topoi*, 37, pp. 495–512.

(An articulation of problems for grounding formulations of physicalism.)

Related Topics

Mind, Modality

Biographical Note

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