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## Type-R physicalism

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### ABSTRACT

In this paper, I argue for an often-neglected solution to the conceivability argument: *the reconciliatory response*. Its advocates state that, even if zombies are metaphysically possible, it does not follow that *all* versions of physicalism are false. To make the reconciliatory response, we must construct a theory that counts as a version of physicalism (because it makes higher-level facts count as physical) but also allows for the metaphysical possibility of zombies. Call any physicalist theory that can make the reconciliatory response *type-R physicalism*. In this paper, I discuss one version of type-R physicalism: *stochastic ground physicalism (SGP)*. First, I argue that type-R physicalism, construed as SGP, offers physicalists an attractive rationalist package that no other version of physicalism can provide. Second, I address two concerns that have been underexplored in the literature. First, the charge that SGP is incoherent because it fails to provide metaphysical explanations. Second, the charge that type-R physicalism is not a genuine form of physicalism because the supervenience of the phenomenal on the physical is a necessary condition for any formulation of physicalism. I argue that both concerns are ill-founded.

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## Introduction

### Ground physicalism

Physicalism is the view that everything is physical. I'll understand physicalism in terms of grounding<sup>1</sup>:

Ground Physicalism: All facts are either (i) fundamental physical facts, or (ii) fully grounded in fundamental physical facts.<sup>2</sup>

The grounding relation is often thought to satisfy<sup>3</sup>:

Physicality: If [X] fully grounds [Y], and [X] is physical, then [Y] is physical because its full ground is physical.

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So, if [F] is a fundamental physical fact, [G] is a higher-level fact, and [F] grounds [G], then [G] will *inherit* the physicality of [F].<sup>4</sup> If Physicality is true, then grounding is an attractive level connector for the physicalist.

Physicality is sometimes said to hold because grounding connects its relata *tightly*. [F] is typically taken to be sufficient for fixing both the existence and qualitative nature of [G]. Consider a paradigmatic case of grounding:

[The ball is scarlet] grounds [The ball is red]

[The ball is scarlet] and [The ball is red] stand in a particularly close relationship. First, the obtaining of [The ball is scarlet] guarantees the obtaining of [The ball is red]. Second, [The ball is red] has the qualitative features that it does *because* [The ball is scarlet] has the qualitative features that it does.

It's often assumed that if grounding satisfies Physicality, then it also satisfies:

Necessitation: If [X] grounds [Y], then [X] metaphysically necessitates. [Y]

That is, there are no metaphysically possible worlds where [X] obtains in the absence of [Y]. If the ball can be scarlet without being red, then the former was not metaphysically sufficient for the latter after all.

### **The conceivability argument**

The conceivability argument aims to establish the falsity of physicalism by showing that it is possible to duplicate a conscious creature's physical profile without duplicating its phenomenal profile. These physical duplicates are called zombies. Zombies are a counterexample to Necessitation and thus show that a creature's physical profile was not metaphysically sufficient for determining that creature's phenomenal profile. The argument runs as follows<sup>5</sup>:

(P1) Zombies are conceivable.

(P2) If zombies are conceivable, then zombies are metaphysically possible.

(P3) Zombies are metaphysically possible.

(P4) If zombies are metaphysically possible, then physicalism is false.

(C1) Physicalism is false.

Physicalists traditionally reject either (P1) or (P2).<sup>6</sup> To reject (P1) the physicalist typically argues that the physical facts *a priori* entail the phenomenal facts. Mary, in her black-and-white room, can know the phenomenal facts (such as what it's like to see red) just in virtue of knowing the physical facts. To reject (P2) the physicalist typically argues that the physical facts *a posteriori* entail the

phenomenal facts. Mary, in her black-and-white room, cannot know the phenomenal facts just in virtue of knowing the physical facts, despite the fact that the latter fully ground the former.

### **The reconciliatory response and type-R physicalism**

There is a third response to the conceivability argument that has only recently started to receive more attention:

Reconciliatory Response: The metaphysical possibility of zombies does not threaten physicalism.

The advocate of Reconciliatory Response rejects (P4).<sup>7</sup> If the response succeeds, then the conceivability argument can be successful in establishing the metaphysical possibility of zombies but unsuccessful in establishing the falsity of physicalism. Consequently, type-R physicalists need not accept either an *a priori* or *a posteriori* entailment thesis, despite the fact that the physical facts fully ground the phenomenal facts. The result is a novel form of physicalism that has been underexplored in the literature.

I'll define type-R physicalism by the solution it provides to the conceivability argument:

Type-R Physicalism: Any version of physicalism that is consistent with the metaphysical possibility of zombies.

To reconcile the metaphysical possibility of zombies with physicalism, we must make sense of:

Schema: (a) the grounding of phenomenal profiles in physical profiles makes phenomenal profiles physically acceptable, but (b) physical profiles that ground phenomenal profiles can nevertheless be modally separated from those phenomenal profiles.

Take some phenomenal fact, [M], and some physical fact, [P]. Suppose that, at the actual world, @, [M] is grounded by [P]. Assume Physicality. So, [M] will be physical at @. So, (a) is satisfied. The challenge is to keep this picture but also provide a way of satisfying (b). That is, although [M] is grounded in [P], there is a world, *w*, at which [P] obtains in the absence of [M]. This allows us to say that [M] isn't a threat to physicalism (because it counts as physical) but that a zombie ([P] in the absence of [M]) is metaphysically possible. What we need is a notion of grounding that gives this result.

### **Stochastic grounding**

#### **Stochastic and deterministic grounding**

We can distinguish between *deterministic grounding* and *stochastic grounding*. Deterministic grounding is the familiar kind of grounding, implicitly

taken to be at work in section 1.1. When a grounding relation is deterministic, fixing the explanans will fix the explanandum. Deterministic grounding can be compared to deterministic causation. When an event  $E_1$  causes an event  $E_2$ , the relation between  $E_1$  and  $E_2$  is deterministic when  $E_1$  necessitates  $E_2$ . Stochastic grounding, on the other hand, allows for a weaker connection between the explanans and the explanandum. When a grounding relation is stochastic, fixing the explanans is not enough to fix the explanandum. However, despite the explanandum not being fixed, there may still *be* an explanandum. The explanandum is settled by objective chance. Some examples are:

(e1) My physical profile doesn't fix the phenomenal character of my experience, so it's left to chance what the phenomenal character is. (B. Montero, 2013, pp. 106–107)

(e2) A collection of mereological atoms doesn't fix whether composition takes place, so it's left to chance whether it does.<sup>8</sup>

(e3) The physical profile of the world doesn't fix whether I am talking about addition or *quaddition* (Hattiangadi, 2024), so it's left to chance what I mean.

(e4) The descriptive facts don't fix the normative facts (Hattiangadi, 2018; Roberts, 2018, Rosen, [manuscript](#); Fine, 2002), so which normative facts obtain is left to chance.

(e5) The physical facts do not settle which person I become post-fission, so it's left up to chance which person I become (Bader, 2021, p. 1131).

Compare stochastic grounding to stochastic causation.  $E_1$  can stochastically cause  $E_2$ , but this is consistent with a counterfactual situation in which  $E_1$  caused some distinct event  $E_3$ . Crucially, in this counterfactual situation, the background conditions and causal laws are the same as in the actual world. Stochastic causation is more familiar to us than stochastic grounding. Very few philosophers take causation to be entirely deterministic. Contrastingly, the notion of stochastic grounding is rarely discussed. Many philosophers take the idea to be incoherent and claim that grounding is, of necessity, deterministic (e.g., Alter, 2021; Bennett, 2017; Bernstein, 2016; Rosen, 2010; Schaffer, 2017a).<sup>9</sup>

Can Schema be satisfied by either deterministic or stochastic grounding? Deterministic grounding entails Necessitation and so fails to satisfy (b). This leaves stochastic grounding. Stochastic grounding entails the falsity of Necessitation and so satisfies (b). Where stochastic grounding may run into trouble is with the satisfaction of (a). This is because the failure of Necessitation is typically thought to entail the failure of Physicality. However, unlike the failure of deterministic grounding to satisfy (b), the relationship between stochastic grounding and (a) is a lot more open-ended. The failure of Necessitation does not *entail* the failure of Physicality. For

now, I'll set the question of Physicality to one side. In section 4.2, I'll argue that stochastic ground does satisfy Physicality.

Stochastic ground physicalism can now be distinguished from deterministic ground physicalism:

Deterministic Ground Physicalism (DGP): All facts are (i) fundamental physical facts, or (ii) deterministically grounded in fundamental physical facts.

Stochastic Ground Physicalism (SGP): All facts are (i) fundamental physical facts, (ii) deterministically grounded in fundamental physical facts, or (iii) stochastically grounded in fundamental physical facts.<sup>10</sup>

According to SGP, the stochastic grounding relation is taken to be a *level connector* satisfying Physicality. Phenomenal facts need not stand in the deterministic grounding relation to physical facts to count as physical.

### *The metaphysics of stochastic ground*

In the rest of this paper, I'll make use of the following framework. Suppose that Socrates is looking at some flowers. Let [P] be the fact that this event obtains and has a particular physical profile. [P] is our physical ground. We then associate [P] with a sample space,  $\Omega$ , containing all the possible outcomes given [P]. In a deterministic setting,  $\Omega$  would have one member. Suppose that this member is [M], which is the phenomenal experience associated with Socrates looking at the flowers.

In the stochastic setting,  $\Omega$  has more than one member. For simplicity, I'll assume that  $\Omega = \{[M], [\text{not-M}]\}$ , though note that  $\Omega$  could have more members if there are any qualia inverts of [M]. [M] and [not-M] are clearly incompatible with one another, so only one can obtain. We then assign each member of the sample space a non-trivial probability. For convenience, I'll assume that the probability assigned to [M] is the probability that [P] grounds [M], while the probability assigned to [not-M] is simply the probability that [P] does not ground [M].<sup>11</sup> However, when there is more than one positive fact in  $\Omega$  (e.g., if  $\Omega$  contains some phenomenal fact that is non-trivially isomorphic to [M]), then more than one fact will be assigned a non-trivial probability of being grounded by [P]. For any positive fact, [X], in  $\Omega$ , when [X] obtains in the presence of [P], we say that [P] stochastically grounds [X].<sup>12</sup>

I'll make the following assumptions about the resultant notion of stochastic grounding. First, I'll assume that there are coherent notions of full stochastic grounding and partial stochastic grounding.<sup>13</sup> A partial stochastic ground by itself never has a chance of generating its output, whereas a full stochastic ground does. Stochastic partial ground stands to stochastic full ground as deterministic partial ground stands to deterministic full ground.

Second, I'll assume that the ground-theoretic probabilities are indexed to persons. This ensures that Socrates himself does not fluctuate between having phenomenal consciousness and being a zombie: Socrates is either a zombie or he isn't, but his physical profile is not enough to determine this.

Third, I'll assume that the probabilities assigned to [M] and [not-M] are non-trivial, but I won't offer specific probabilities. Perhaps the probabilities are symmetric, such that both [M] and [not-M] are assigned a probability of 50%, or perhaps the probability of [M] is much higher than the probability of [not-M], such that [not-M] is very unlikely.

Fourth, I want to remain neutral on the metaphysics of the chancy mechanism that settles which member of  $\Omega$  obtains. Following Lewis (1994), call the set of facts that ground the objective probabilities the *chancemakers*. I'll stay neutral on whether the ground-theoretic chancemakers are best characterized by frequentist/best systems, propensity, or symmetry accounts.<sup>14</sup>

The rest of this paper has two aims. First, I want to emphasize the uniqueness of type-R physicalism, which has not yet been properly appreciated. In §3, I show that type-R physicalists have access to a genuinely novel package that no other variant of physicalism can accept. Second, I want to discuss two worries about type-R physicalism that haven't been properly addressed in the literature. In section 4.1, I focus on the connection between metaphysical explanation and stochastic grounding, arguing that, despite initial appearances, stochastic grounds can provide full metaphysical explanations of their groundees. In section 4.2, I argue that stochastic grounding relations are acceptable to physicalists. Addressing these issues also helps to establish the coherence of stochastic grounding more generally.

### Type-R physicalism and the rationalist triad

Where does type-R physicalism sit in the current landscape? Chalmers (2003) distinguishes between type-A, type-B, and type-C physicalism – all defined against the backdrop of the conceivability argument. In this section, I'll assume that type-R physicalism is a genuine form of physicalism and show that it is a new variety of physicalism that can help itself to a novel triad of resources, the members of which are jointly unavailable to type-A, type-B, and type-C physicalists.<sup>15</sup>

By rejecting (P4) of the conceivability argument, the type-R physicalist can jointly accept:

- (i) A thick conception of consciousness.
- (ii) The transparency of our physical and phenomenal concepts.
- (iii) Modal rationalism.

I will now work through (i) – (iii) in more detail. The aim is not to show that (i) – (iii) are universally desirable but simply to establish the uniqueness of type-R physicalism.

### Thick consciousness

The type-A physicalist rejects (P1) of the conceivability argument. While zombies may be *prima facie* conceivable, further analysis reveals that they are not *ideally* conceivable.<sup>16</sup> Type-A physicalists traditionally rely on a metaphysically *thin* account of phenomenal properties. According to the likes of Dennett (1991) and Lewis (1980, 1990), specifying the causal role of consciousness is sufficient to explain consciousness. Thus, phenomenal properties are no more than higher-level functional properties, which can be grounded in lower-level functional properties.

Type-R physicalism is not type-A physicalism. Type-R physicalism is under no pressure to accept a metaphysically thin account of consciousness. The fact that [M] is stochastically grounded in [P] does not require a functional account of consciousness. In fact, quite the opposite: if [M] were some higher-level functional property of [P], we should say that [P] deterministically grounds [M] – since [M] would be *a priori* entailed by the functional properties of [P].

### Transparency

Type-C physicalists also reject (P1) but claim that, although there is a current explanatory gap between the physical and the phenomenal, it is in principle closable by *a priori* reasoning alone. Such a position must claim that either physical or phenomenal properties fail to be conceived under transparent concepts. The type-C physicalist therefore rejects:

Transparency: The essential nature of phenomenal properties is revealed to us *a priori* by our phenomenal concepts.<sup>17</sup>

Type-R physicalism is not type-C physicalism. Type-R physicalism can hold that both physical and phenomenal properties are conceived under transparent concepts. Since there is no entailment relation between the physical and phenomenal facts, type-R physicalists don't need to claim that we're missing something about the psychophysical relationship. According to the stochastic ground physicalist, Mary, in her black-and-white room, will not be able to arrive at phenomenal concepts from physical concepts, but this is because the connection between those concepts is stochastic, not because phenomenal and physical concepts are opaque.



### Modal rationalism

The type-B physicalist rejects (P2) of the conceivability argument and claims that, while zombies may be conceivable, it does not follow that zombies are possible. That is, conceivability does not entail possibility. So, there is an epistemic gap between the physical and the phenomenal that is not (even in principle) closable by *a priori* reasoning alone. A popular way of establishing this conclusion is to argue for the existence of *strong necessities*: necessities that have an opaque primary and secondary intension, and which are only knowable *a posteriori* (Goff & Papineau, 2014). If we accept strong necessities, then the spaces of logical and metaphysical modalities are pulled apart, resulting in modal dualism (Chalmers, 2009, pp. 326–327). Zombies will be logically possible (in virtue of being *a priori* conceivable) but metaphysically impossible.

Contrastingly, type-R physicalism need not make use of strong necessities, and so need not accept modal dualism.<sup>18</sup> Type-R physicalism rejects (P4) of the conceivability argument and can therefore accept that there is an *a priori* accessible primary intension for consciousness and that the primary and secondary intensions of consciousness coincide. Consider the fact [[P] stochastically grounds [M]]. This fact is consistent with the primary and secondary intensions of [[P] and not-[M]] being contingent. The contingency is explained by appealing to a world where [P] fails to stochastically ground [M], which is permitted by our theory of stochastic ground. Thus, the *prima facie* contingency of [[P] and [M]] corresponds to a genuine metaphysical possibility.<sup>19</sup>

### Two problems for type-R physicalism

I'll now discuss the viability of type-R physicalism (conceived as SGP). I want to answer two questions:

(Q1) Is stochastic grounding compatible with metaphysical explanation?

(Q2) Is stochastic grounding physically acceptable?

Both questions are linked to SGP's failure to entail Necessitation. While there has been some discussion of these issues in the literature, they have not taken center stage and consequently have not been adequately addressed.

### Stochastic ground and metaphysical explanation

When we do metaphysics, we're often trying to offer metaphysical explanations for one set of things in terms of another set of more fundamental things. A coherent notion of metaphysical grounding should respect this.<sup>20</sup>

Grounding relations are typically taken either to *be* or to *support* metaphysical explanations:<sup>21</sup>

Unionist: Grounding relations *are* metaphysical explanations.

Separatist: Grounding relations *support* metaphysical explanations.

Both unionists and separatists typically assume symmetry between the modal profile of a dependence relation and the associated explanation:

Symmetry: A dependence relation,  $Rab$ , has modal profile  $M$  iff the explanation,  $Eab$ , associated with  $Rab$  has  $M$ .<sup>22</sup>

So, if  $[F]$  stochastically grounds  $[G]$  and the stochastic grounding relation has modal profile  $M_1$ , then the explanation of  $[G]$  in terms of  $[F]$  should also have modal profile  $M_1$ . But metaphysical explanations are supposed to hold with metaphysical necessity. Here's Fine:

It is perhaps hard to say in general what constitutes a constitutive explanation, but it is at least required, in any case of a constitutive explanation, that there should be a metaphysically necessary connection between explanandum and explanans. (Fine, 2015, p. 296)

If  $[F]$  stochastically grounds  $[G]$ , then  $[F]$  does not necessitate  $[G]$ . By Symmetry, the explanation of  $[G]$  in terms of  $[F]$  will also fail to be necessitating. To hold on to the idea that metaphysical explanations hold with metaphysical necessity, it seems that we must reject Symmetry. But, if stochastic grounding comes apart from metaphysical explanation in this way, is stochastic grounding even coherent? How might the advocate of stochastic grounding respond to this problem? Here are some options.

- (1) *Grounding and explanation come apart.* Reject Symmetry and argue that, while metaphysical *explanations* require Necessitation, stochastic grounding does not.<sup>23</sup>

The idea is to separate grounding from metaphysical explanation, such that grounding relations (worldly things) can flout certain epistemic rules that govern grounding explanations. Cameron (2022, pp. 109–120) argues for this approach when discussing grounding chains and infinite regresses. Applied to our target case, when  $[F]$  stochastically grounds  $[G]$ ,  $[F]$  would fail to fully explain  $[G]$ . While  $[F]$  may be *part* of the explanation for  $[G]$ , nothing in the world fully accounts for  $[G]$ . This would give us a form of physicalism that prioritized metaphysical dependence over metaphysical explanation. Such a physicalist could argue that all facts need a full ground (either deterministic or stochastic) but not all facts need a full explanation.

- (2) *Grounding supports metaphysical explanations, but metaphysical explanations are not necessitating.* Alternatively, we might preserve Symmetry by resisting the claim that metaphysical explanations are metaphysically necessary.

There are a few options here. First, we could criticize the widespread idea that metaphysical explanations are essence-based.<sup>24</sup> Perhaps, when [F] grounds [G], [G] does not obtain simply in virtue of the essence of [F]. The strategy is to locate the source of metaphysical explanation in something other than essence-based facts and show that this alternative source of metaphysical explanation does not entail Necessitation. For instance, we could adopt a model of grounding similar to that of causation. Grounding, just like causation, provides non-necessitating explanations. Just as causation is often taken to be mediated by contingent laws of nature, perhaps grounding is mediated by contingent laws of metaphysics – see Schaffer (2017b), Giannotti (2022), and Zhong (2021). Here the source of metaphysical explanation is the set of laws of metaphysics.

Second, we could seek to preserve the connection between stochastic grounding and metaphysical explanation by thinking carefully about the *location* of the chancemakers in the grounding hierarchy. Consider an analogous problem in the free will literature:

The central thesis of the problem of luck is that indeterminism is incompatible with the degree of control necessary for free will and moral responsibility. The thought here is that indeterminism injects a kind of randomness or chanciness into the agent's action that precludes the necessary degree of control required for freedom and responsibility. (Franklin, 2018, section 1.3)

Libertarian accounts of free will solve the problem of luck by thinking carefully about where ontic chance should be placed within the world. In the same way, the location of ontic chance in the grounding hierarchy may have implications for the compatibility of stochastic grounding and metaphysical explanation. For instance, Bader (2021) sets out an *opposing grounds model* of stochastic grounding:

Opposing grounds model: Suppose that [F<sub>1</sub>] grounds [G<sub>1</sub>] and [F<sub>2</sub>] grounds [G<sub>2</sub>]. Assume that [G<sub>1</sub>] and [G<sub>2</sub>] are inconsistent, such that it is not the case that [F<sub>1</sub>] and [F<sub>2</sub>] can both do their grounding work. Which ground gets to do its grounding work? In Bader's framework, which of [F<sub>1</sub>] or [F<sub>2</sub>] wins out is left up to chance.

According to the opposing grounds model, ontic chance is brought in to settle standoffs between opposing grounds. But once a ground has “won” its standoff, it proceeds to do its grounding work in a manner reminiscent of deterministic grounding. Bader's proposal is a promising account of stochasticity and metaphysical explanation. However, Bader's approach is not applicable to the conceivability argument and is thus of little use to the type-

R physicalist. This is because Bader's model requires that we have at least two opposing grounds. But in the cases the type-R physicalist is interested in, we have just one ground, [P]. Even if Bader's strategy is not applicable, the general strategy may be useful to the type-R physicalist.

Third, we might argue that metaphysical explanations are essence-based but that essence itself is not always necessitating. Here we might draw on the contingent identity literature. Consider the case of the statue and the lump of clay (Gibbard, 1975). The statue and the clay have the same microphysical structure, they are spatiotemporally coincident. However, they differ with regard to their modal properties. This suggests that there are two objects that share the same location but are not identical. One controversial solution to this puzzle is to say that the statue and the clay *are* identical but only contingently so. In other words, the identity relation does not entail the strong modal covariation of its relata. But both numerical identity and essence are often understood as entailing strict theses of modal covariation. If this condition can be relaxed for numerical identity, perhaps it can also be relaxed for essence. Importantly, relaxing the condition in the case of essence may prove easier than in the case of numerical identity. Sandstad (2016, pp. 64), for instance, argues that there are countless counterexamples to the essence-necessity link.

In the remainder of this section, I want to consider a specific variant of the essence-based strategy and show that it allows us to retain the physicalist triad that I set out in section 3. Fine (2012, pp. 74–76) suggests that we understand essence as follows. When the existence of Socrates grounds the existence of {Socrates}, it lies in the essence of {Socrates} to be grounded by Socrates, but it doesn't lie in the essence of Socrates to ground {Socrates}. Socrates "knows nothing" of {Socrates}:

It is the fact to be grounded that "points" to its grounds and not the grounds that point to what they may ground. (Fine, 2012, p. 76)

This picture allows us to make sense of worlds where Socrates obtains and yet fails to ground {Socrates}: since it's not in the essence of Socrates to ground {Socrates}, Socrates need not necessitate {Socrates}. So, despite it being in the essence of {Socrates} to be grounded by Socrates, {Socrates} doesn't have to exist just because Socrates does.

For the physicalist committed to Necessitation, the Finean model is inadequate: such a physicalist also needs to explain why the existence of Socrates *necessitates* the existence of {Socrates}. If she fails to do this, then she has no justification for the *a priori* or *a posteriori* entailment thesis that is characteristic of her view. She must therefore claim that Socrates *knows something* of set-theoretic concepts, which will result in either (i) the set-theoretic concepts being eliminated (or at least construed very thinly), or (ii) the physical or set-theoretic concepts being

treated as opaque. In contrast, the type-R physicalist does not encounter this problem since she is not committed to an entailment relation between first-order facts. If the type-R physicalist thinks that [Socrates exists] stochastically grounds [{Socrates} exists], then she does not need to claim that it lies in the nature of physical properties to generate set-theoretic constructs. She can appeal to Finean essentialist explanation *when* {Socrates} exists, but need not worry when Socrates obtains in the absence of {Socrates}.

Consider how this works for physical and phenomenal properties. According to the Finean model, it lies in the nature of phenomenal properties to be grounded by physical properties. Phenomenal properties have structural and dynamical features, and so aren't ignorant of their physical grounds in the way that physical properties are ignorant of phenomenal properties. But traditional physicalists won't be happy with this: they need the physical to entail the phenomenal. Unfortunately, there seems to be nothing in the nature of the physical to suggest that this entailment thesis is plausible. In contrast, in the stochastic setting, there is no such entailment relation, and so the Finean insight proves more instructive. The stochastic ground physicalist *acknowledges* that there is no reason why this particular physical fact should always accompany this particular phenomenal fact and builds this observation into her metaphysics. But she can also say that any P-world that is also an M-world is a world at which [M] is explained in terms of [P] (in virtue of it lying in [M]'s essence to be grounded by [P]). There is nothing in this set up that forces the type-R physicalist to reject either (P1) or (P2) of the conceivability argument. So, type-R physicalists can accept a connection between stochastic ground and essentialist metaphysical explanation while holding on to their rationalist triad.

In vindicating metaphysical explanation, the type-R physicalist can also say something about the other dimensions of the hard problem of consciousness. Consider the knowledge argument. According to the type-R physicalist it's not surprising that Mary, in her black-and-white-room, cannot derive the phenomenal facts from the physical facts: the physical facts do not entail the phenomenal facts, and it is phenomenal properties that point toward their grounds, not *vice versa*. But this result appears consistent with physicalism:<sup>25</sup> whenever a phenomenal fact obtains, it has a full metaphysical ground.<sup>26</sup>

However, it's important to note that the type-R physicalist doesn't gain a *complete* solution to the hard problem of consciousness simply by recovering metaphysical explanation. Consider the following *revenge* problems:

Ghosts: Are phenomenal properties without physical grounds metaphysically possible? (Goff, 2010)

Mary's Revenge: Mary knows all the phenomenal facts and none of the physical facts. Can Mary come to know that she has a body?

Deep Explanatory Opacity: Do phenomenal properties reveal the essences of their physical grounds? (Aleksiev, 2022)

These revenge problems can grant that the physical fails to necessitate the phenomenal, but still find something mysterious about psychophysical grounding. Thus, even after dealing with the traditional hard problem of consciousness, there is work for the type-R physicalist to do. It's beyond the scope of this paper to fully engage with the revenge problems, but the type-R physicalist should be optimistic. The type-R physicalist might tackle the revenge problems along the following two dimensions:

Revelations of Phenomenal Properties: What do phenomenal properties tell us about their physical grounds?

Revelations of Groundees: What must a property reveal to demonstrate that it has a full physical ground?

Ideally, what the type-R physicalist wants is something like:

Strong Phenomenal Revelation: Phenomenal properties reveal a lot about their full physical grounds.<sup>27</sup>

Weak Groundee Revelation: Phenomenal properties need not reveal much in order to demonstrate that they have a full physical ground.<sup>28</sup>

The combination of Strong Phenomenal Revelation and Weak Groundee Revelation would give the type-R physicalist the best chance of preserving her rationalist triad in the face of the revenge problems.<sup>29</sup> I leave this as further important work for the type-R physicalist. In this paper, I will settle for having shown that the type-R physicalist can help herself to an attractive *partial* solution to the hard problem of consciousness.

### ***Is type-R physicalism just dualism?***

Assume that deterministic ground satisfies Physicality. Can the same be said for stochastic ground? Despite not being a sufficient condition for physicalism, most philosophers take Necessitation to be a *necessary* condition for physicalism. Here's Stoljar:

However, in light of the fact that any view about what physicalism is must distinguish it from standard versions of dualism, it would appear that [...] any thesis that has a chance of deserving the name 'physicalism' will *at least* have to entail (something like) the thesis that every property is metaphysically necessitated by a physical property. (Stoljar, 2010, p. 129, my italics)

While the physicalist may need to say more about why she counts as a physicalist, failure to commit to *some* thesis of necessitation will put her straight in the anti-physicalist camp.<sup>30</sup> We might worry that, if SGP fails to give us Necessitation, then it isn't physicalism.

There seem to be four ways that the stochastic ground physicalist could respond to this problem:

- (1) The traditional distinctions between physicalism, emergentism, and dualism collapse.
- (2) Although the traditional distinctions can be retained, the status of some (especially borderline) theories should be revised.
- (3) Preserve the traditional distinctions by locating an alternative necessary condition for physicalism.
- (4) Preserve the traditional distinctions but don't provide a necessary condition for physicalism.

(1) says that the classical distinctions don't make sense anymore and that we should stop asking whether a theory counts as a formulation of physicalism or anti-physicalism. A possible example of (1) is Strawson's (2006) claim that panpsychism is really a form of "realistic physicalism". Although the term "physicalism" is retained, Strawson's realistic physicalism is far removed from traditional physicalism.

(2) is less revisionary than (1). There is still some sense in retaining the traditional terminology, but the distinctions behave slightly differently. For instance, some cases of emergentism that are typically classed as anti-physicalism are classified as physical instead.<sup>31</sup> Frameworks that count Russellian monism as a version of physicalism are also arguably an instance of (2). It's less of a stretch to count unspecified *non-structural* properties as fundamentally physical than to count phenomenal properties as fundamentally physical. However, there may be no strict line between (1) and (2).

(3) specifies a new necessary condition for physicalism. Drawing on the discussion in section 4.1, perhaps physicalism requires that everything be *grounded* in the physical, even if grounding fails to entail supervenience. Alternatively, perhaps the physical must *explain* everything, but full stochastic explanations satisfy this requirement. Ney (2008) suggests construing physicalism as an *attitude*, in which case a theory is a formulation of physicalism if it *privileges* the physical in some appropriate epistemic manner.<sup>32</sup> Each of these suggestions can plausibly work without the claim that the phenomenal supervenes on the physical.

Finally, (4) refuses to provide a new necessary condition on physicalism, but still insists that the traditional boundaries can be retained. For instance,

Schaffer (2017a) sets out some *core physicalist intuitions* but doesn't commit himself to a specific necessary condition. According to Schaffer, *physicalism* is more like a cluster concept. A theory can be more or less physical depending on how many of the core intuitions it meets. In the remainder of this section, I'll focus on (4). Specifically, I'll take Schaffer's core physicalist intuitions and show that they can be met by SGP.

Schaffer (2017a, pp. 19–20) suggests that there are five “core” physicalist intuitions that a theory needs to meet to count as a formulation of physicalism. I present these as six intuitions rather than five:

Supervenience Base: The physical is a supervenience base for the rest of our ontology.

Metaphysical Connection: Ontological levels are metaphysically connected.

Ultimate Grounding: Everything is ultimately grounded in the physical.

Explanation: The physical explains everything else.

Equal Footing: The phenomenal domain isn't special.

Free Lunch/God Reflex: Once the physical facts are fixed, everything else comes for free.

Meeting these intuitions strongly suggests that stochastic grounding is physically acceptable.

### *Supervenience base*

Following Carl Craver (2017), we can distinguish between deterministic supervenience and stochastic supervenience. While the phenomenal doesn't deterministically supervene on the physical, it does stochastically supervene on the physical. Schaffer doesn't distinguish between deterministic and stochastic supervenience, but is there any reason to think that it's deterministic supervenience that's important for physicalism? Here are three ways in which stochastic supervenience might prevent a theory from counting as a version of physicalism. First, stochastic supervenience might fail to appropriately connect with metaphysical explanation. Our discussion in section 4.1 has already given the stochastic ground physicalist the resources to answer this worry. Second, the chancemakers that give rise to stochastic supervenience might be anti-physical. For instance, perhaps it's God's practice to toss an anti-physical die in heaven to determine whether [P] will be accompanied by [M] or [not-M]. This shows that we need to be careful when selecting our chancemakers. But so long as we insist that the chancemakers are either (i) fundamental physical facts, (ii) grounded in (/reducible to) fundamental physical facts, or (iii) outside the grounding hierarchy but still physical, then we won't



get into trouble. Third, stochastic supervenience might present problems for some of Schaffer's other criteria, diminishing its physicalist credentials. It is to these that I now turn. I'll show that Schaffer's other core physicalist intuitions can also be met by the stochastic ground physicalist, which strongly suggests that SGP is a genuine form of physicalism. This is especially important since it's tempting to assume that the failure of deterministic supervenience will bring about the failure of other core physicalist intuitions.

### *Metaphysical connection*

For any higher-level fact that obtains at a metaphysically possible world, that fact will be connected (by stochastic grounding) to a fact(/s) at some lower level.

### *Ultimate ground*

Suppose that [P] stochastically grounds [M]. When [M] obtains, [M] is grounded in [P]. But consider:

[[M] obtained instead of [not-M]]

This meta-grounding fact does not have a full ground: it is a brute fact that [M] obtained instead of [not-M]. When we ask for an explanation for this difference, we reach explanatory rock bottom: whether [P] grounded [M] was left to chance. So, we might object that SGP is an *emergentist* theory because it is committed to brute facts that involve higher-level concepts.

However, even *prima facie*, the stochastic ground physicalist is not an emergentist. While both parties accept some higher-level bruteness, the kind of higher-level bruteness accepted is very different. The emergentist claims that higher-level facts are ontologically novel with respect to the physical facts, while the stochastic ground physicalist commits to brute contrastive facts that can be *anticipated* given the physical facts. If SGP's chancemakers are physically acceptable, then the physical facts tell us to expect brute contrastive facts of this very form. So, these contrastive facts cannot be considered novel in the emergentist's sense. Moreover, it's not clear that meta-grounding facts like this even need full grounds. They can plausibly be said to stand outside the grounding hierarchy. What seems important to Ultimate Ground is that all first-order higher-level facts are fully grounded in the fundamental physical facts, and this SGP achieves.

### *Explanation*

Does the physical explain everything else? This depends on how we set out the connection between explanation and stochastic grounding. If the stochastic ground physicalist adopts a theory according to which stochastic grounding provides us with metaphysical explanations, then she can also

accept that the physical facts explain all first-order facts. As in the case of *Ultimate ground*, there is no obligation to provide explanations of the brute contrastive facts generated by the chancemakers.

### Equal footing

There is nothing in the theory of SGP that we have so far discussed that privileges the phenomenal domain. However, we might worry that, regardless of any neutrality in the discussion so far, the phenomenal domain really is the only viable candidate for being stochastically grounded. To allow for stochastic grounding, there cannot be an entailment relation between a ground and a groundee. The worry is that the physical and phenomenal domains present the only case where there might fail to be such an entailment relation. For most philosophers, there is a one-to-one correspondence between physical and normative facts – such as aesthetic, moral, logical, epistemic, mathematical, and semantic facts. The idea that a proof is sound a third of the time and unsound the rest (when all the physical conditions are kept fixed) looks *prima facie* absurd. The same is true for the connection between the physical facts and most other descriptive domains, such as mereological composites, mechanisms, organisms, social ontology, and chemical composites. For instance, under fixed physical conditions and excluding the presence of anti-physical influences, the components of mechanisms do not realize an activity one-third of the time and fail to do so the rest of the time. If this is right, then SGP will fail to satisfy Equal Footing. To resist this argument, we need to show that the phenomenal domain is not the only domain in which stochastic grounding is coherent.

First, consider the normative domains. Is it really the case that no normative fact can be stochastically grounded? I take it that incredulous stares are poor guides to metaphysical truth, so I'll ignore these kinds of worries. One genuine argument against normative stochastic grounding comes from Craver (2017). Craver suggests that the connections between the physical and normative domains lack “the nomological or conceptual slack” required for stochastic grounding (Craver, 2017, p. 167), whereas (due to the presence of ontological gaps) the psychophysical connection is appropriately slack. But this doesn't seem right. Whether there is a tight connection between the physical and the normative domains will depend on one's commitments. A normative non-naturalist will certainly not endorse a tight *conceptual* relationship between the physical and the normative – and neither will many reductive and non-reductive normative naturalists, especially those who accept that such connections are *a posteriori*. What about *nomological* slack? Must a non-naturalist at the very least posit *a posteriori* identities or deterministic bridging laws to link the physical and normative domains? It seems that any good reason for constraining the normative domains in this manner will apply equally

well to the phenomenal case. Moreover, some philosophers have recently discussed cases that violate Craver's claim. Hattiangadi (2024) has argued that semantic facts fail to supervene on physical facts. Rosen ([manuscript](#)) has discussed (but not endorsed) the possibility of moral facts being indeterministically grounded by descriptive facts. Bergman (2023) has argued that the teleosemanticist should accept a view according to which representational content can be metaphysically vague. In these cases, the connection between the relevant descriptive and normative domains is granted far more slack than Craver would allow. So, it's hard to see how the phenomenal domain is granted any special privileges when it comes to stochastic grounding.

Second, consider the descriptive domains. Is it only phenomenal facts that can be stochastically grounded? Do all other descriptive domains lack the required slack? Again, this seems to depend on one's commitments for some descriptive domain. Schaffer (2017a) has argued that all descriptive domains feature explanatory gaps, and while this isn't enough to get us nomological slack, it does rule out a tight conceptual connection between the physical and descriptive domains. A move from Schaffer's explanatory gaps to full-blown ontological gaps should then apply to *any* descriptive domain. We also find cases in the literature that provide evidence for nomological slack. Cameron (2007) argues that composition is a contingent relation. Bader (2021) has applied his own theory of stochastic grounding to fission cases in the personal identity literature. Norton domes provide another interesting case study. Norton domes are indeterministic systems that are allegedly consistent with Newtonian mechanics (Norton, 2008). If Norton domes are understood as mechanisms, which constitute certain activities, then fixing the components of the mechanism will not be enough to determine which activity is constituted (the particle will either remain stationary or begin to slide down the dome at some arbitrary time). This runs directly counter to Craver's claim that mechanistic explanations cannot be stochastic. So, once again, the phenomenal domain does not look special.<sup>33</sup>

### *Free lunch/god reflex*

There are ontological gaps in our story about the mental, so how can the physical fix all the higher-level facts? Interestingly, there's a *sense* in which this condition is easily met. Once the physical facts (including the chance-makers) have been fixed, God doesn't have to add any further anti-physical facts to fix the phenomenal facts: *which* phenomenal facts are fixed will vary from world to world, but it still looks as though the phenomenal facts have been *fixed*, in some important sense of the term. This might motivate us to distinguish two senses in which an ontological story can be *complete*:

- (1) completeness: An ontological story is 1-complete iff it contains *no* ontological gaps.
- (2) completeness: An ontological story is 2-complete iff the story gets to the end (i.e., its *ending* – or explanans – is reached).

1-completeness judges the story as a whole, labeling any story that contains ontological gaps as incomplete. 2-completeness judges a story by where it gets to, allowing that stories may contain ontological gaps, provided that their ending is reached. So, the stochastic ground physicalist can say that the phenomenal facts come along for free but only in the sense of 2-completeness. Thus, while there are ontological gaps in the grounding hierarchy, the phenomenal facts still arise without the aid of anti-physical facts.

We have now moved through all of Schaffer's core physicalist intuitions. Overall, SGP does very well on meeting these, and this is especially interesting given that many philosophers think that the failure of Necessitation constitutes a one-way ticket to the anti-physicalist camp.

I will now briefly consider an objection. Even if we're convinced that type-R physicalism is a genuine physicalist theory, we might worry that it comes at a heavy price: if phenomenal properties can vary independently of the physical properties, then the phenomenal properties appear to make no difference to the causal order of the world, and are thus epiphenomenal. If that's right, then type-R physicalists solve the conceivability argument at the expense of solving the exclusion problem. Thus, type-R physicalism does as well as dualism when it comes to zombies, but no better than dualism when it comes to causal exclusion.

It is beyond the scope of this paper to present a fully worked out type-R physicalist response to the exclusion problem. However, there is good reason for being skeptical about the *prima facie* comparison to dualism. First, type-R physicalism does not have the same modal consequences as dualism. As we have seen, the type-R physicalist accepts stochastic supervenience, which holds with metaphysical modal scope. The type-R physicalist will therefore reject the claim that physical and phenomenal properties are modally independent. Second, even the non-reductive physicalist who accepts Necessitation will face similar worries about epiphenomenalism, since she must still explain how the phenomenal properties come to play a causal role in the world when all of the causal work is done by the physical properties. Kim (1993) always intended the true beneficiary of the exclusion problem to be the *reductive* physicalist. It's therefore not clear what the non-reductive physicalist gains by accepting Necessitation without reduction. Third, the type-R physicalist's rejection of Necessitation does not prevent her from accepting the majority of post-modal physicalist solutions to the exclusion problem. Consider two such proposals:

Causal Inheritance: Causal overdetermination is only problematic when the phenomenal properties fail to inherit a subset of the causal powers of the physical properties (Sharpe, 2015).

Grounding: Causal overdetermination is only problematic when the phenomenal and physical properties do not share a fundamental ground (Stenwall, 2020).<sup>34</sup>

It's hard to see how the type-R physicalist's rejection of Necessitation rules out solutions like this. The type-R physicalist can say that, whenever the phenomenal properties obtain, they either inherit the causal powers of the physical properties or are grounded in the physical properties. Such responses ensure that the effects of phenomenal properties are not problematically overdetermined while also ensuring the causal efficacy of the phenomenal. We can already help ourselves to responses like this given our vindication of metaphysical explanation in section 4.1. So, despite initial appearances, type-R physicalism does not seem to come at the cost of an answer to the exclusion problem.<sup>35</sup>

## Conclusion

I have argued that type-R physicalism is a genuine and unique form of physicalism. The idea that a physicalism modeled using the resources of stochastic ground can give us access to a strong rationalist package (usually thought to be the remit of the dualist) is surprising. I have also tried to defend the view against two serious objections. I have argued that type-R physicalism is compatible with metaphysical explanation and that type-R physicalism is a genuine version of physicalism. Going forward, this novel variety of physicalism deserves more attention.<sup>36</sup>

## Notes

1. Grounding is a relation of non-causal metaphysical dependence. It can be thought of as a worldly level connector that backs a distinctly metaphysical kind of explanation. For an introduction to grounding see Bliss and Trogdon (2024) and Raven (2020).
2. For examples of ground physicalism, see Dasgupta (2014), Schaffer (2017a) and Zhong (2021). For criticisms of ground physicalism, see Wilson (2016) and Melnyk (2016).
3. In conversation, if not in print, Physicality is often taken to be an implicit assumption.
4. From now on, I'll just speak of "grounding", but I will mean "full grounding" unless I specify otherwise.
5. My setup follows Chalmers (2009).
6. See Kirk (2023) for an overview.
7. Discussion of the reconciliatory response has been limited (though see Alter, 2021; Eva, 2022; B. Montero, 2013; Montero & Brown, 2018; Zhong, 2021).
8. If one adopts a non-classical mereology, it could also be left to chance what kind of composite is composed by the atoms.

9. Exceptions are Bader (2021), Craver (2017), Werner (2021), Zhong (2021), and Eva (2022).
10. Notice that stochastic grounding is not intended to replace deterministic grounding. There's an interesting question regarding how stochastic and deterministic grounding relate to one another. Craver (2017) suggests that deterministic grounding can be thought of as a special case of stochastic grounding.
11. For simplicity, I assume that [P] does not ground absence facts.
12. In saying this, I am assuming that there is more to the connection between [P] and [X] than mere stochastic modal covariation: when [P] stochastically grounds [X], [X] fully depends on (and is fully explained by) [P] in some metaphysically significant sense. I discuss this in more detail in section 4.1.
13. See Fine (2012) for the distinction between full and partial ground.
14. Usually, chancemakers concern *causal* stochasticity, but with minor modifications we can develop ground-theoretic versions. Just as there can be long-run frequencies for events (e.g., many tosses of a coin), there can be long-run frequencies for facts/properties (e.g., many possible worlds at which a physical property is instantiated). Just as there are causal propensities, there can be grounding propensities (i.e., the propensity to ground a property, as opposed to the propensity to cause an event). Just as symmetries can be broken at a point in time, so symmetries can be broken at a higher level in the grounding hierarchy (see Bader 2021).
15. In section 4, I'll argue that type-R physicalism is not a disguised form of anti-physicalism.
16. For a discussion of ideal conceivability, see Chalmers (2009, pp. 315–319).
17. This formulation of transparency is found in Goff (2017, p. 91).
18. A consequence is that the type-R physicalist has access to some powerful rationalist frameworks. For instance, Chalmers' 2D semantics (which arguably requires a commitment to modal monism) grants us a rationalist connection between meaning, reason, and modality (Chalmers, 2004; Vaidya, 2008).
19. Is the modal rationalism implied here compatible with ontic bruteness in the grounding hierarchy? Rabin (2020) argues that modal rationalism entails that "from a description of a world's fundamental level, a priori reflection will reveal all truths" (Rabin, 2020, p. 137). This would rule out the compatibility of modal rationalism and stochastic ground physicalism. Fortunately, the assumption Rabin needs to get from modal rationalism to his "Fundamental Scrutability" is Necessitation! (Rabin, 2020, p. 138) Rabin suggests that Necessitation is "nearly analytic, or perhaps constitutive of, the notion of fundamentality" (Rabin, 2020, p. 138). I reject this.
20. Importantly, we're talking about *metaphysical* ground. While *physical* ground doesn't need to have any connection to metaphysical explanation, metaphysical ground does.
21. See Raven (20125) for this distinction.
22. Though the separatist has more scope for resisting Symmetry.
23. This strategy only looks plausible for Separatists.
24. See Fine (1994) and Hale (2018).
25. See Fine (1994) and Hale (2018).
26. The physicality of type-R physicalism will be addressed more fully section 4.2.
27. Similar considerations apply to the explanatory gap: the physical facts do not entail the phenomenal facts, and thus there is no need (*pace* Levine, 1983) to explain why the physical story of what it is for me to see red is accompanied by the phenomenal experience of red, and not the phenomenal experience of green. So long as both phenomenal experiences are included in the sample space, such an explanatory gap is consistent with physicalism.

28. There are many ways in which phenomenal properties might reveal their full physical grounds. First, Farkas (2022) argues for what she calls *phenomenal functionalism*, according to which irreducible phenomenal properties are inseparable from their causal powers – see also Gray (2019). Second, Janzen (2012) argues that close attention to the nature of phenomenal properties reveals that ghosts are impossible. In virtue of their perspectival nature, phenomenal properties reveal the need for physical embodiment. Third, a view sometimes attributed to Kant is that only physical grounds can account for phenomenal properties being determined in time. Finally, consider the symmetry between phenomenal quality spaces and their physical counterparts (Macpherson, 2021): attention to the phenomenal similarity relations between the phenomenal properties reveals many things about the structural connections that hold between the physical facts.
29. Weak Groundee Revelation is somewhat of an open question. Aleksiev (2022) claims that properties conceived under fully transparent concepts should reveal the essence of their full grounds. But is he right? It's one thing for a groundee to tell us that it *has* a full physical ground, and another for a groundee to tell us about the essence of that full ground. Plausibly, the type-R physicalist only needs the former. Moreover, even if Aleksiev *is* right, the type-R physicalist's answer to Strong Phenomenal Revelation might already be enough to resist the revenge problems.
30. As a reviewer helpfully points out, even if type-R physicalism failed to fully deal with the revenge problems, it is not clear that the unique rationalist triad will have been entirely lost. For instance, the type-R physicalist might weaken Transparency and accept *translucency*: the claim that our phenomenal concepts *partially* reveal the essential nature of phenomenal properties.
31. Importantly, the physicalist must commit to a *metaphysical* necessitation thesis, since even the dualist can accept a natural necessitation claim – see McLaughlin and Bennett (2023).
32. e.g., the emergentism of Broad (1925), which invokes psychophysical laws.
33. For some further suggestions see B. Montero (2013, pp. 105–108).
34. However, even if, say, mereological atoms stochastically ground composites, Equal Footing might still be resisted on the grounds that revenge problems (as set out in section 4.1) only arise for psychophysical grounding. For instance, we should clearly reject the mereological analogue of Ghosts: that mereological composites can obtain without mereological atoms. Thus, the type-R physicalist has not fully dealt with Equal Footing until something has been said about the revenge problems. The type-R physicalist should aim to mitigate (or eliminate) the asymmetry between the mereological and psychophysical examples – for instance, by showing that the idea of phenomenal properties without physical properties is also objectionable. As mentioned in section 4.1, this is important further work for the type-R physicalist.
35. Stenwall (2020, p. 11790) even notes that his grounding solution is compatible with grounding contingentism.
36. A reviewer argues that the possibility of zombie or inverted qualia worlds is enough to show that phenomenal properties cannot be causes *qua* phenomenal character. But the type-R physicalist should resist this. Consider a classic case of qualia inversion: we perform a rotation of a simple color wheel (so that, e.g., greens become reds and *vice versa*). If such an inversion is possible, then there are worlds at which a phenomenal experience of green plays the causal role that is currently played by a phenomenal experience of red. But this isn't enough to show that the causal contributions of the phenomenal properties, in both worlds, aren't made *qua* phenomenal character. The

inversion scenario described is consistent with there being two phenomenal properties (that differ with respect to phenomenal character) that are both up to playing the relevant causal role *qua* phenomenal character. An especially vivid way to make the point would be to assume that phenomenal character grounds the causal powers of a phenomenal property (e.g., perhaps physical properties ground phenomenal characters, and phenomenal characters ground phenomenal causal powers). The different phenomenal characters of the red and green phenomenal experiences both ground qualitatively identical causal powers.

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