

# Physicalism, Psychism, and Phenomenalism\*

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**[Abstract]** The dominant way to define physical entities is by appeal to ideal physics (as opposed to current physics). However, it has been worried that physicalism understood in terms of ideal physics would be too liberal to rule out *psychism*, which is the view that mentality exists at the fundamental metaphysical level. In this article, I argue that whereas physicalism is incompatible with some psychist cases, such as the case of *phenomenalism* in which ideal physics adopts *mental* concepts to denote fundamental entities, physicalism should accommodate a certain type of psychist case in which fundamental mental entities are denoted by *non-mental* concepts in ideal physics. In so doing, I propose a distinctive account of physical entities, which is based on two plausible theses: 1) physical entities are entities denoted by physical concepts; and 2) physical concepts are non-mental natural concepts in ideal physics. Physicalism thus understood is expected to be neither too liberal nor too demanding.

Physicalism is basically the doctrine that all entities (substances or properties)<sup>1</sup> are *nothing over and above* physical entities—in other words, every entity is either itself a physical entity or depends upon physical entities.<sup>2</sup> The idea of “nothing over and aboveness” is now typically cashed out in terms of supervenience.<sup>3</sup> Roughly speaking, a domain of properties, *X*-properties, supervene upon another domain of properties, *Y*-properties, in the sense that if

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<sup>1</sup> Here I use the word ‘entities’ in a broad way, referring to substances and properties.

<sup>2</sup> See Jessica Wilson, “Supervenience-based Formulations of Physicalism,” *Noûs*, XXXIX, 3 (September 2005): 426–59.

<sup>3</sup> See Brian McLaughlin and Karen Bennett, “Supervenience,” in Edward Zalta, ed., *The Stanford Encyclopedia of Philosophy* (Spring 2014), URL = <<http://plato.stanford.edu/archives/spr2014/entries/supervenience/>>; Wilson, “Supervenience-based Formulations of Physicalism,” *op. cit.* I would like to note that it has been debated over whether supervenience is a satisfactory expression of nothing over and aboveness for physicalist purposes. See Terence Horgan, “From Supervenience to Superdupervenience: Meeting the Demands of a Material World,” *Mind*, CII, 408 (October 1993): 555–85; Wilson, “How Superduper Does a Physicalist Supervenience Need to Be?” *Philosophical Quarterly*, XLIX, 194 (January 1999): 33–52.

two systems (or two worlds) are identical with respect to *Y*-properties, then necessarily they are identical with respect to *X*-properties.

Needless to say, what the doctrine of physicalism really is depends on how we understand the notion of physical. Although there could be other approaches to defining ‘physical’, the default approach in contemporary philosophy of mind is the appeal to physics.<sup>4</sup> The past century has witnessed the remarkable success of the physical sciences along with the unreliability of our folk conceptions of the physical. According to materialism, the predecessor of physicalism, physical objects occupy space, have mass, and so on. But contemporary physics tells us that “photons have no mass; point particles have no dimension”.<sup>5</sup> The appeal to physics is manifested by the transition from materialism to physicalism. Nowadays most physicalists believe that we should defer to physics in order to understand the nature of the physical.

But what physics—current or ideal—should we appeal to in a physics-based account of physical entities? The dominant way to define physical entities is by appeal to ideal physics (as opposed to current physics). However, many philosophers worry that physicalism understood in terms of ideal physics would be too “liberal” to rule out the view—call it *psychism*—that mentality exists at the fundamental metaphysical level.<sup>6</sup> A straightforward and influential response to this problem is to stipulate physical entities as *non-mental* entities acknowledged by ideal physics.<sup>7</sup>

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<sup>4</sup> See Daniel Stoljar, *Physicalism* (New York: Routledge Press, 2010).

<sup>5</sup> Sara Worley, “Physicalism and the Via Negativa,” *Philosophical Studies*, CXXXI, 1 (October 2006): 101–26, at p. 101.

<sup>6</sup> Fundamental mentality exists if there are either fundamental mental substances or fundamental mental properties.

<sup>7</sup> See David Papineau, “The Rise of Physicalism,” in Carl Gillett and Barry Loewer, eds., *Physicalism and Its Discontents* (Cambridge: Cambridge University Press, 2001), pp. 3–36; Wilson, “On Characterizing the Physical,” *Philosophical Studies*, CXXXI, 1 (October 2006): 61–99.

In this paper, I will argue that this account of physical entities is too demanding. Physicalism should be compatible with psychism *per se*, whereas it is inconsistent with a particular kind of psychism, *phenomenalism*, which asserts that ideal physics contains *mental* concepts that denote fundamental entities. I will propose an alternative formulation of the physical, which is based on two appealing theses: 1) physical entities are entities denoted by physical concepts; and 2) physical concepts are non-mental natural concepts in ideal physics. My account has the following interesting implication: it can explain why physicalism should accommodate some psychist cases, for example, the case of fundamental mental-physical identity, but is incompatible with other psychist cases, such as the case of phenomenalism. Physicalism thus understood is neither too liberal nor too demanding.

## I. HEMPEL'S DILEMMA

The physics-based approach to physicalism is faced by a notorious problem, "Hempel's Dilemma".<sup>8</sup> The dilemma is whether to understand physical entities in terms of either current or ideal physics. The first horn of the dilemma is that if physical entities are entities posited by current physics, physicalism thus formulated would most likely be false. Contemporary physics, no matter how successful, is incomplete and inaccurate; it will be modified or even abandoned in the future, just like other physical theories throughout history. The physicalist should not build her doctrine on this shaky base.

I agree with most philosophers that a current physics-based approach to physicalism is doomed from the start.<sup>9</sup> Here let us simply suppose that the first horn is intractable. This

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<sup>8</sup> Carl Hempel, "Comments on Goodman's *Ways of Worldmaking*," *Synthese*, XLV, 2 (October 1980): 193–99.

<sup>9</sup> For exceptions, see Andrew Melnyk, "How to Keep the 'Physical' in Physicalism," this JOURNAL, XCIV, 12 (December 1997): 622–37; Agustín Vicente, "Current Physics and 'the Physical,'" *British Journal for the Philosophy of Science*, LXII, 2 (June 2011): 393–416. They attempt to tackle the first horn and offer a current physics-based account of physical entities. But most philosophers, myself included, remain unconvinced.

paper is thus exclusively concerned with the second horn of the dilemma: what are the prospects for an ideal physics-based account of physical entities? Consider the following formulation of the physical:

[P1] Physical entities are entities posited by ideal physics.

In Hempel's original discussion of the dilemma, the second horn is that if physics is understood as ideal physics, physicalism is *indeterminate* in content.<sup>10</sup> But as Jessica Wilson argues, the charge of indeterminacy is off the mark. Physics is not the discipline of everything; physics is a *scientific* theory that studies *fundamental* entities of the world. Thus, physicalism defined in terms of ideal physics still has some determinate content.<sup>11</sup>

On another, more interesting reading of the second horn, an ideal physics-based approach to physical entities would make physicalism too *liberal*.<sup>12</sup> Wilson writes:

[T]he worry with a future physics-based account of the physical is not that such an account renders physicalism devoid of determinate content, but rather that what determinate content it does bestow is compatible with physical entities' being fundamentally mental.<sup>13</sup>

Agustín Vicente makes a similar point:

Construing physicalism in this second way runs the risk of rendering it trivial, since it is possible that the final theory of physics will turn out to include, for instance, irreducible mental properties in its basic repertoire.<sup>14</sup>

Let me coin the term 'psychism' for the view that there are mental entities at the fundamental metaphysical level. If, highly unlikely, all fundamental entities exhibit mentality,

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<sup>10</sup> Hempel, "Comments on Goodman's *Ways of Worldmaking*," *op. cit.* See also Geoffrey Hellman, "Determination and Logical Truth," this JOURNAL, LXXXII, 11 (November 1985): 607–16.

<sup>11</sup> Wilson, "On Characterizing the Physical," *op. cit.*

<sup>12</sup> See, for example, Noam Chomsky, *Language and Mind* (New York: Harcourt, Brace & World Press, 1968); Seth Crook and Carl Gillett, "Why Physics Alone Cannot Define the 'Physical': Materialism, Metaphysics, and the Formulation of Physicalism," *Canadian Journal of Philosophy*, XXXI, 3 (September 2001): 333–59; Barry Loewer, "From Physics to Physicalism," in Gillett and Loewer, eds., *Physicalism and Its Discontents*, *op. cit.*, pp. 37–56; Papineau, *Philosophical Naturalism* (Oxford: Blackwell Press, 1993); and Papineau, "The Rise of Physicalism," *op. cit.*; Vicente, "Current Physics and 'the Physical'," *op. cit.*; Wilson, "Supervenience-based Formulations of Physicalism," *op. cit.*; and Wilson, "On Characterizing the Physical," *op. cit.*

<sup>13</sup> Wilson, "On Characterizing the Physical," *op. cit.*, p. 69.

<sup>14</sup> Vicente, "Current Physics and 'the Physical'," *op. cit.*, p. 2.

it would be a case of *panpsychism*; if only some fundamental entities are mental, then psychism would be true in a *dualist* form. The possibility that ideal physics would endorse fundamental mental entities is remote but presently open. Even current physics does not rule out fundamental mentality. For example, some influential interpretations of quantum mechanics (say, the Consciousness interpretation and the Many-Minds interpretation) appeal to mental entities. Furthermore, we are not considering the epistemic question of how likely ideal physics might vindicate the truth of psychism. Instead we are deciding on an appropriate understanding of physicalism, by asking the hypothetical question: *if* some fundamental entities posited by ideal physics were mental entities, should we regard those entities as physical entities? **Would physicalism be true** in this scenario?

Many believe that physicalism should be incompatible with psychism—physicalism requires the absence of fundamental mentality.<sup>15</sup> Wilson puts it this way:

Reflecting the historical roots of physicalism in materialism, as foundationally committed to understanding mentality as nothing over and above complex material goings on, one feature has remained definitive of the term “physical” (as this term enters into formulating physicalism, at any rate); namely, that physical entities are not fundamentally mental: physical entities do not individually either possess or bestow mentality.<sup>16</sup>

But if physical entities were defined by [P1]—that is, if the physical were understood purely in terms of ideal physics—then physicalism would still be true in circumstances where some entities posited by ideal physics are fundamentally mental. Physicalism formulated in terms of [P1] thus seems overly liberal.

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<sup>15</sup> See, for example, Robin Brown and James Ladyman, “Physicalism, Supervenience and the Fundamental Level,” *Philosophical Quarterly*, LIX, 234 (January 2009): 20–38; David Chalmers, *The Conscious Mind* (Oxford: Oxford University Press, 1996); Jaegwon Kim, *Philosophy of Mind* (Boulder: Westview Press, 1996); Barbara Montero, “Post-Physicalism,” *Journal of Consciousness Studies*, VIII, 2 (January 2001): 61–80; Papineau, “The Rise of Physicalism,” *op. cit.*; Vicente, “Current Physics and ‘the Physical’,” *op. cit.*; Wilson, “Supervenience-based Formulations of Physicalism,” *op. cit.*; and Wilson, “On Characterizing the Physical,” *op. cit.*

<sup>16</sup> Wilson, “Supervenience-based Formulations of Physicalism,” *op. cit.*, p. 428.

## II. THE VIA NEGATIVA APPROACH

A straightforward and influential solution to the liberalism charge is the “*via negativa* approach”, an approach that appeals to the non-mental to define the physical. Some advocate a *simple via negativa* approach, according to which physical entities are just *equivalent* to non-mental entities.<sup>17</sup> However, this approach makes physicalism liberal in a different respect. After all, non-mental entities may include supernatural, non-scientific entities. Suppose that there are no fundamental mental entities, but rather irreducible supernatural entities in the world. In this scenario, physicalism defined by the simple *via negativa* approach can still be true. But this is absurd. Vicente writes:

Physicalism must be, or at any rate I take it to be, a more robust thesis. A physicalist defends not only that there are no irreducible mental entities, but also that there are no irreducible spirits, astrological forces, acts of divine intervention, telekinetic principles, and so forth.<sup>18</sup>

Since physics can rule out non-scientific, supernatural entities, we need the notion of physics to account for the physical. So, most philosophers prefer a *hybrid via negativa* account, which incorporates a physics-based approach.<sup>19</sup> As Wilson suggests,

The guiding idea is to allow that some appeal to future (ideal) physics is needed (since current physics is at least in part inaccurate and incomplete), while recognizing that physicalists need not and should not hand over *all* authority to physics to determine what is physical... [P]hysicalists (and their rivals) have good reason to impose the NFM (no fundamental mentality) constraint on their operative account of the physical.<sup>20</sup>

Now let me introduce a hybrid *via negativa* formulation of the physical as follows:

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<sup>17</sup> See Montero, “The Body Problem,” *Noûs*, XXXIII, 2 (June 1999): 183–200; Montero and Papineau, “A Defence of the Via Negativa Argument for Physicalism,” *Analysis*, LXV, 3 (July 2005): 233–37.

<sup>18</sup> Vicente, “Current Physics and ‘the Physical,’” *op. cit.*, p. 5.

<sup>19</sup> See Crook and Gillett (2001) “Why Physics Alone Cannot Define the ‘Physical’: Materialism, Metaphysics, and the Formulation of Physicalism,” *op. cit.*; Papineau, “The Rise of Physicalism,” *op. cit.*; Wilson, “Supervenience-based Formulations of Physicalism,” *op. cit.*; and Wilson, “On Characterizing the Physical,” *op. cit.*

<sup>20</sup> Wilson, “On Characterizing the Physical,” *op. cit.*, pp. 69–70.

[P2] Physical entities are entities that 1) are posited by ideal physics, and 2) are not fundamentally mental.<sup>21</sup>

It is important to note that [P2] is compatible with reductionism in the philosophy of mind (such as behaviorism and the mind-brain identity theory). The so-called “mental-physical identities” (say, the identity between pain and C-fiber firing) are in fact *not* identities between mental properties and physical properties in the fundamental, narrow sense, but identities between mental properties and *higher-level* physical properties, such as chemical, physiological, neurological, and biological properties. Higher-level physical properties are the subjects of special sciences (excluding psychology for current purposes); they supervene upon fundamental physical properties. [P2] rules out cases in which a mental property could be a fundamental physical property, but it is neutral with respect to whether mental properties are in fact higher-level physical properties. Both reductive physicalism and non-reductive physicalism *could* accept that mental properties are not fundamental physical properties, whereas they disagree whether the mental is identical with the higher-level physical.

Some philosophers have the intuition that physicalism should not allow that mental entities are (fundamental) physical entities. But they may adopt two different approaches. On the first approach, they can still regard a fundamental mental entity posited by ideal physics as a physical entity, but stipulate physicalism in a way such that physicalism is conceptually incompatible with mental-physical identities. For example, they may define physicalism as the view that all entities are nothing over and above *non-mental* physical entities. On the second approach, they can deny that a fundamental mental entity is a *physical* entity in the first place (even if this entity is endorsed by ideal physics). In my view, the second approach is more natural and straightforward. Physicalism is commonly regarded as the view that every entity is either a physical entity or depends upon physical entities. It is thus incoherent

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<sup>21</sup> *Ibid.*, p. 70

to maintain both that a fundamental mental entity is a physical entity and that the existence of such a *physical* entity is incompatible with the truth of *physicalism*. This is why most adopt the second approach, which imposes the NFM (no fundamental mentality) condition on an account of physical entities. In this paper, I focus on the second approach and aim to argue against it.

At the end of this section, I want to make a distinction between a *via negativa* account of physical *entities* and a *via negativa* account of physical *concepts*. While the former appeals to non-mental entities to understand physical entities, the latter aims to account for physical concepts by appeal to non-mental concepts. Almost all proponents of the *via negativa* approach have in mind a *via negativa* account of physical entities like [P2], but I attempt to show that a *via negativa* account of physical concepts can shed some light, in an indirect way, on the formulation of physical entities. In the next section, I will propose a two-step approach to formulating physical entities: first, I suggest that physical entities be understood as entities denoted by physical concepts; second, I provide a *via negativa* account of physical concepts, according to which physical concepts are *non-mental* (natural) concepts in ideal physics. Then I will attempt to show that my account of physical entities is superior to the influential account [P2].

### III. PHYSICALISM AND PHENOMENALISM

Many philosophers contend that physicalism is incompatible with psychism. According to them, it would be terrible news for physicalism if we find that some fundamental entities endorsed by ideal physics are mental entities. However, we should distinguish between two different cases in which a fundamental mental entity figures in ideal physics. One is a case in which ideal physics posits a fundamental mental entity *qua* mental—that is, the mental entity

is denoted by a mental concept in ideal physics (call it *the case of phenomenalism*). The other is a case in which a fundamental entity, which is in fact identical with a mental entity, is denoted by a non-mental concept in ideal physics (call it *the case of identity-psychism*).<sup>22</sup> In the rest of the paper, I will argue that whereas physicalism is inconsistent with the case of phenomenalism, it is compatible with the case of identity-psychism. That is to say, the physicalist should not worry about psychism *per se*; they should only resist certain types of psychism.

I will discuss the case of identity-psychism in the next section. Here let us consider first the case of phenomenalism. I use the term ‘phenomenalism’ to refer to the view in the philosophy of science that ideal physics contains mental concepts. Phenomenalism is a subtype of psychism.<sup>23</sup> It may be the case that some, but not all, concepts in ideal physics are mental concepts—imagine that the Consciousness interpretation or the Many-Minds interpretation of quantum mechanics is correct. Or, much less likely, it may be the case that all fundamental entities are denoted by mental concepts in ideal physics—imagine that radical empiricism in the philosophy of science is right in the end: concepts of putative physical objects are reduced to concepts of experiences and sense-data.<sup>24</sup> We can grant that ideal physics could contain mental concepts—physics is not by definition a theory that contains no mental concepts. The phenomenalist is not making a *conceptual* mistake about physics (regardless of whether phenomenalism is a mistaken theory). Even if the Consciousness Interpretation of quantum mechanics is false, we do not want to say that

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<sup>22</sup> For the sake of simplicity, let us exclude cases in which there are both a mental concept and a non-mental concept in ideal physics that denote the same fundamental entity.

<sup>23</sup> Some other subtypes of psychism may also be inconsistent with physicalism. Consider, for example, the view that mental entities are neither dependent upon nor identical with entities posited by ideal physics. Here we can ignore this version of psychism, since an ideal physics-based approach to physical entities already ensures that this kind of psychism is incompatible with physicalism.

<sup>24</sup> See Rudolf Carnap, *The Logical Structure of the World* (Berkeley: University of California Press, 1967); Arthur Danto, *Connections to the World* (New York: Harper & Row Press, 1989); Ernst Mach, *The Analysis of Sensations and the Relation of the Physical to the Psychological* (La Salle: Open Court Press, 1984); John Stuart Mill, *An Examination of Sir William Hamilton’s Philosophy* (London: Forgotten Books Press, 2012).

quantum mechanics under this interpretation is no longer a theory of physics. But should we say that physicalism is still true in the phenomenalist case? Certainly not. It seems safe to suppose that physicalism should be incompatible with phenomenalism, if it is incompatible with anything.

But how to explain the incompatibility between physicalism and phenomenalism? [P2] offers an explanation. Since phenomenalism (or psychism in general) endorses fundamental mentality, physicalism formulated in terms of [P2] would be inconsistent with phenomenalism. Whereas [P1] makes physicalism true even in the phenomenalist case, physicalism in terms of [P2] would be false in that scenario. Thus, [P2] seems less liberal and hence preferable to [P1] for physicalist purposes. However, I will argue that [P2] gives the correct answer for the wrong reason. Although physicalism should be incompatible with phenomenalism, this is not because phenomenalism implies fundamental mentality.

I propose to offer a different explanation of why physicalism is incompatible with phenomenalism, by presenting a third account of physical entities as follows:

[P3] Physical entities are entities denoted by non-mental natural concepts in ideal physics.<sup>25</sup>

[P3] is based on two plausible theses:

- 1) Physical entities are entities denoted by physical concepts.
- 2) Physical concepts are non-mental natural concepts in ideal physics.

The first premise looks like a conceptual truth, especially considering that the physics-based formulation of physical entities we are assuming here is itself a theory-based or concept-based approach. It may be worth mentioning that thesis 1) does not say that physical entities are entities that can *only* be denoted by physical concepts; it is possible that an entity (either a

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<sup>25</sup> In this context, to say that something is natural is just to say that it is open to empirical investigation. Ideal physics will include logical and mathematical concepts. Since these concepts are, I think, non-natural concepts, they should not be regarded as physical concepts.

substance or a property) is denoted by both a mental concept and a physical concept. The thesis only requires that physical entities have physical modes of presentation.

Turn to thesis 2). Suppose that ideal physics includes mental concepts. Can we say that those mental concepts are physical concepts? My answer is no. I agree with Wilson that physics is not a sufficient condition for the formulation of the physical although it may be a necessary, indispensable component: “[P]hysicalists need not and should not hand over *all* authority to physics to determine what is physical”.<sup>26</sup> As the *via negativa* approach has suggested, *physical entities* are not the same as *entities posited by physics*. In the same vein, *physical concepts* are not equivalent to *concepts in physics*. What is physical should be determined in accordance with the spirit of physicalism. Physical concepts *from a physicalist point of view* are supposed to be objective or mind-independent. It is nearly a consensus in contemporary philosophy of mind that physical concepts are distinct from mental concepts (that is, phenomenal concepts and intentional concepts). Even behaviorists and analytic functionalists can probably agree with this. They only assert that mental concepts are behavioral/functional concepts; they do not go so far as to claim that mental concepts are identical with (fundamental) physical concepts. Therefore, it is more reasonable to say that physical concepts are non-mental (natural) concepts in ideal physics than to say that physical concepts are simply concepts in ideal physics.

According to [P3], if a fundamental entity is denoted by a mental concept in ideal physics, the entity is not a physical entity. Then there would be a non-physical fundamental entity in the world. Physicalism is thus false. [P3] explains why physicalism is incompatible with phenomenalism. In the next section, I will show that [P3] can also explain why physicalism should accommodate the case of identity-psychism, whereas physicalism

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<sup>26</sup> Wilson, “On Characterizing the Physical,” *op. cit.*, p. 69.

formulated in terms of [P2] would (mistakenly) rule out fundamental mental-physical identities.

#### IV. PHYSICALISM AND IDENTITY-PSYCHISM

Now let us consider the case of identity-psychism. Suppose that physics in its ideal form consists of only non-mental concepts. Ideal physics appeals to non-mental concepts in lawlike generalizations, explanations, and predictions. In this regard, ideal physics is the same as current and past physics, such as Newtonian mechanics, the theory of relativity, and (most versions of) quantum physics.

But ideal physics may be different from current physics in two respects. According to current physics, 1) fundamental entities posited by physics are microscopic entities; and 2) microscopic entities have no mental features—only macroscopic entities can exhibit mentality. Now imagine two possible situations of ideal physics in which either of these two claims is false. First, suppose that there is a non-mental concept in ideal physics, [S-neutrino fluctuation]. The concept picks out the *microscopic*, fundamental property *S-neutrino fluctuation*. The property has a non-mental mode of presentation in ideal physics. Suppose that *S-neutrino fluctuation* is in fact identical with *consciousness* (suppose further that the concept [consciousness] is not a concept in ideal physics).<sup>27</sup> That is, the same property is denoted by both a physical concept [S-neutrino fluctuation] and a mental, non-physical concept [consciousness].<sup>28</sup> Then there would be at least one mental entity at the fundamental microscopic level, which is a case of psychism. This is a possibility that both the proponents

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<sup>27</sup> Physical concepts/knowledge are not the only kind of concepts/knowledge of fundamental entities. Even if the concept [consciousness] picks out a fundamental entity, it is possible that the concept is not a concept in ideal physics.

<sup>28</sup> Some may worry that dual concepts would tacitly introduce dual properties. But as many reductive physicalists suggest, it remains a viable option that the same property can be denoted by both a physical concept and a mental concept without assuming two distinct (mental and physical) properties. A formulation of physicalism should allow this possibility. I will discuss this issue in more details in Section V.

of [P2] and I can grant. Once again, we are not concerned with the question of how likely it is that microscopic entities have mental features, but rather the conceptual question of whether physicalism would still be true in the possible scenario.

According to [P2], S-neutrino fluctuation (as well as consciousness) is not a physical property. Moreover, consciousness does not *depend* upon any physical properties (because it is a *fundamental* property). It follows that consciousness is over and above the physical. So, if we grant [P2] as the definition of the physical, then physicalism—the view that all entities are nothing over and above physical entities—would be false.

This strikes me as odd, however. Whether S-neutrino fluctuation is identical with some mental property seems irrelevant to the question of whether it is a physical property. Let us imagine a possible scenario in which S-neutrino fluctuation is also a fundamental property posited by ideal physics. But suppose that physical laws in that scenario are somehow different from physical laws in the actual world. As a result, a system that undergoes S-neutrino fluctuation does not exhibit consciousness. Of course, we should say S-neutrino fluctuation is a physical property in that possible scenario. But why is S-neutrino fluctuation not a physical property in our *actual* world? That an entity *X* manifests mentality in some world seems to be an extrinsic feature of *X* and is independent of whether it is a physical entity.

Second, even if microscopic physical entities do not exhibit mentality, the *fundamental* physical is not equivalent to the *micro*-physical. Some physicalists have argued against micro-physicalism.<sup>29</sup> It is possible that there are irreducible macroscopic entities posited in ideal physics (a possibility that seems to me more likely than the possibility that microscopic

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<sup>29</sup> See, for example, Papineau, “Must a Physicalist Be a Microphysicalist?” in Jakob Hohwy and Jesper Kallestrup, eds., *Being Reduced: New Essays on Causation and Explanation in the Special Sciences* (Oxford: Oxford University Press, 2008), pp. 126–48.

entities have mental features). For the sake of convenience, let me adopt a conventional stipulation according to which microscopic entities are entities the length scales of which are smaller than 1 mm. On this stipulation, quarks, atoms, protons, and so on are microscopic entities, whereas fiber, cells, legs, arms are not.

Take C-fiber firing again as an example. Suppose that ideal physics tells us that C-fibers are fundamental, irreducible entities. And suppose further that pain is identical with C-fiber firing. According to [P2], C-fiber firing is not a physical property. But this seems arbitrary. Everyone agrees that C-fiber firing could be a higher-level physical property, regardless of whether it is identical with a mental property. Now we assume that C-fiber firing is a property posited by ideal physics rather than a higher-level property posited by special sciences. Then it makes a lot of sense to say that C-fiber firing turns out to be a fundamental physical property; it makes *much less* sense to say that C-fiber firing now should be regarded as a non-physical property (neither a fundamental physical property nor a higher-level physical property).

In the two examples of identity-psychism, we seem to have the intuition that S-neutrino fluctuation and C-fiber firing are physical properties, even if they are identical with mental properties. In contrast, it seems clear that in the case of phenomenalism, the entities posited by ideal physics are not physical entities. How to explain the asymmetry (although psychism is true in both cases)? [P3] offers an explanation. In the case of identity-psychism, the entities are denoted by both mental concepts and physical concepts. Since entities denoted by physical concepts are physical entities, it follows that S-neutrino fluctuation, say, is a physical entity. But in the case of phenomenalism, it is incorrect to regard the relevant fundamental entities as physical entities, because they are *not* denoted by physical concepts.

[P3] explains why physicalism is compatible with psychism *per se*, whereas physicalism is inconsistent with phenomenalism.

Thus, my account of physical entities raises a challenge to the **formulation** of physicalism that requires the non-existence of fundamental mentality. Here I wish to emphasize the methodology of reflective equilibrium implicit in my discussion. It is worth pointing out a dialectical relationship between an account of physical entities and of physicalism. We first start with a tentative formulation of physicalism (for example, an account of physicalism that imposes the NFM condition). Then we seek for an appropriate definition of physical entities in coherence with our initial understanding of physicalism. After mutual adjustments, we may eventually achieve a state of reflective equilibrium. Sometimes we adjust the account of physical entities based on our preliminary understanding of physicalism, but sometimes we should adjust the doctrine of physicalism in accordance with a plausible account of physical entities. As I have argued in Section III, [P3] is a very promising account of physical entities. It is reasonable to say that physical entities are entities denoted by physical concepts and that physical concepts are non-mental (natural) concepts in ideal physics. If we are convinced that a property P is a physical property as long as it is denoted by a non-mental (natural) concept in ideal physics, we should formulate physicalism in a way that it can accommodate entities like P (regardless of whether P is identical with some mental property). That is to say, the account of physical entities [P3] pushes us to drop our initial understanding of physicalism that imposes the NFM condition.

Finally let me diagnose why some people mistakenly regard NFM as a necessary condition on physicality and physicalism. They might have two reasons. First, the NFM condition may be partially influenced by current physics. According to current physics, there are no mental entities at the fundamental physical level; only when a system is complex

enough can mental phenomena occur. This *empirical* view motivates some philosophers to adopt an NFM-based *conceptual* claim about what the physical is or is not. Although those philosophers accept the possibility that ideal physics may endorse fundamental mental entities, they still believe that those entities would be non-physical entities in that possible situation. Consider an analogy regarding causation. In the 19<sup>th</sup> century, physics was dominated by Newtonian mechanics, which understands physical laws as deterministic. A Newtonian physical world is a world in which every event follows deterministically from the previous facts and laws of nature. Suppose that a philosopher in the 19<sup>th</sup> century is convinced by Newtonian mechanics, and then makes a determinism-based conceptual claim about what causation is—according to her, the exactly same cause cannot lead to two different effects. This philosopher can also accept the possibility that in ideal physics, the fundamental physical laws are indeterministic. But she still thinks that in that possible situation, there would be no causation at all (rather than that there would be indeterministic causation). Just as the 19<sup>th</sup> century philosopher’s understanding of causation is limited by Newtonian mechanics, so the proponents of NFM are also misled by contemporary physics in attempting to capture the spirit of physicalism.

Consider the second possible reason. The NFM condition may be based on the idea that a physicalist world is a world in which the physical should take precedence over the mental. But if there were fundamental mental entities, then the mental would not *depend* upon the physical—the physical is no more fundamental than the mental. However, this motivation is misplaced. The primacy of the physical does not require that the mental depends upon the physical. Supervenience (or nothing over and aboveness) only rules out that the mental can float freely from, or be independent of, the physical. It is worth noticing that supervenience is not equivalent to dependence: while dependence implies non-identity,

supervenience makes room for identity. That a domain of entities  $X$  supervenes upon a domain of entities  $Y$  is compatible with the possibility that  $X$ -entities are identical with some of the  $Y$ -entities.

That being said, the physical is still prior to the mental in two senses. First, whereas the mental supervenes upon the physical, the physical **does not** supervene upon the mental. Two systems (or two worlds) can be indistinguishable with respect to mental features but different with respect to physical features (regardless of whether mental entities are identical with some physical entities). For example, it could be the case that two worlds are mentally identical, but one world contains additional physical entities that the other world lacks. Second, there is another way that the physical is prior to the mental. An entity is physicalistically acceptable if and only if it is either itself a physical entity or depends upon the physical; where the entity in question is a *fundamental* mental entity, it must be *identical* with a physical entity in order to be allowed into the physicalist worldview. **But a physicalistically acceptable entity could be over and above—i.e., neither identical with nor dependent upon—mental entities.** These are thus two kinds of priority that a physicalist should be satisfied with.

## V. IDENTITY AND EXPLANATION

In the preceding section, I have argued that a proper formulation of physical entities (and physicalism) should accommodate fundamental mental-physical identities. It is worth mentioning that the mental-physical identities I am considering are not just identities between mental and physical *events* or *processes*, but identities between mental and physical

*properties*.<sup>30</sup> If mental properties are identical with physical properties, then it seems to follow that mental and physical events (as property exemplifications) should also be identical. But not *vice versa*: there could be event identity without property identity. Since event identity is not adequate for reductionist purposes, the contemporary debate between reductive and non-reductive physicalism is primarily concerned with property identity. Moreover, it is important to note that the case of identity-psychism (say, consciousness = S-neutrino fluctuation) is a case of *synthetic identity* in the sense that the same property is denoted by two distinct concepts, the mental concept [consciousness] and the physical concept [S-neutrino fluctuation].

However, an immediate question arises: How could mental-physical concept distinction be reconciled with mental-physical property identity all the way down? Consider an example of synthetic identity: the morning star is identical with the evening star. It seems that the two different concepts, [the morning star] and [the evening star], denote the same entity Venus by referring to two distinct properties of the object: the property of appearing in the morning sky and the property of appearing in the evening sky. By the same token, if a mental concept [M] and a physical concept [P] are distinct concepts but refer to the same property, it should be the case that they express two distinct features of the same property: a mental feature M\* and a physical feature P\*. Given that [M] and [P] are two different concepts, it seems reasonable to say that M\* is non-identical with P\* (although M = P). That is, mental-physical property distinction arises in another way.<sup>31</sup>

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<sup>30</sup> Early physicalists were eliminativists about properties; they speak of *descriptions* instead of properties. See Donald Davidson, "Mental Events," in Davidson, *Essays on Actions and Events* (Oxford: Clarendon Press, 1980), pp. 207–25. But as with most contemporary physicalists, I assume the existence of properties, although this article leaves it open whether properties should be understood as universals or as tropes. See Keith Campbell, *Abstract Particulars* (Oxford: Blackwell Press, 1990); John Heil and David Robb (2003) "Mental Properties," *American Philosophical Quarterly*, XL, 3 (July 2003): 175–96.

<sup>31</sup> I want to thank the anonymous reviewer for suggesting me to address this worry.

Reductive physicalists have adopted several strategies to solve this problem. Here I want to present two dominant approaches: the *functionalist* strategy and the *direct reference* strategy. Let me introduce the functionalist approach first.<sup>32</sup> Consider, for example, the functional reduction of gene:

Step 1 (Conceptual Analysis): [gene] = [the entity that plays such and such functional role (for example, transmitting inheritable features)];

Step 2 (Empirical Discovery): DNA is the entity that plays such and such functional role;

Step 3 (Identification): Therefore, gene = DNA.

Similarly, one can propose a functional reduction of the mental:

Step 1 (Conceptual Analysis): [pain] = [the state that plays such and such functional role (for example, being caused by injuries and inducing aversive behavior and negative attitudes)];

Step 2 (Empirical Discovery): C-fiber firing is the state that plays such and such functional role;

Step 3 (Identification): Therefore, pain = C-fiber firing.<sup>33</sup>

On the functionalist account, although the mental concept [pain] is still distinct from the physical concept [C-fiber firing], the mental concept is translated to be a topic-neutral, functional concept. So, whereas [pain] refers to C-fiber firing by pointing out a functional property (being a state that plays such and such functional role), it does not do so by expressing any further mental property. Thus, the functional reduction of mental properties seems to ensure that there is no mental-physical property distinction at another level.<sup>34</sup>

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<sup>32</sup> See Kim, *Mind in a Physical World* (Cambridge: MIT Press, 1998); and Kim, *Physicalism, or Something Near Enough* (Princeton: Princeton University Press, 2005); David Lewis, "Psychophysical and Theoretical Identifications," *Australasian Journal of Philosophy*, L, 3 (December 1972): 249–58.

<sup>33</sup> See Kim, *Physicalism, or Something Near Enough*, *op. cit.*

<sup>34</sup> Some philosophers maintain that phenomenal states resist functionalization. See Chalmers, *The Conscious Mind*, *op. cit.*; Kim, *Mind in a Physical World*, *op. cit.*; and Kim, *Physicalism, or Something Near Enough*, *op. cit.* But it **is** worth noting that the representational theory of phenomenal states, according to which phenomenal states can be reducible to intentional states, is increasingly popular. See Fred Dretske, *Naturalizing the Mind* (Cambridge: MIT Press, 1995); Michael Tye, "Visual Qualia and Visual Content Revisited," in Chalmers, ed., *Philosophy of*

Now let us turn to the direct reference strategy, according to which mental concepts (especially phenomenal concepts) pick out their referents without introducing any *contingent* modes of presentation.<sup>35</sup> There are different direct reference approaches. Some argue that a mental concept has as its mode of presentation the very property that it picks out.<sup>36</sup> Others argue that a mental concept denotes its referent in a purely direct or “empty” way, without appealing to any mode of presentation.<sup>37</sup> Despite their differences, these approaches hold in common that although the mental concept [M] is distinct from the physical concept [P], [M] and [P] can refer to the same property without introducing any further mental property M\*. As with the functionalist approach, the direct reference approach aims to establish, though in a different way, that mental-physical synthetic identities will not incur further mental-physical property distinction.

Certainly, whether the two reductionist approaches are successful is still an open question in the philosophy of mind. But, for our purposes, it suffices to note that both the functionalist approach and the direct reference approach can equally apply to fundamental mental-physical identities as well as identities between the mental and the higher-level physical. A formulation of physical entities (and physicalism) should be neutral with respect to the debate between reductive and non-reductive physicalism. An account of physical

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*Mind: Classical and Contemporary Readings* (New York: Oxford University Press, 2002), pp. 447–56. If the representationalist is right, then a functionalist reduction of phenomenal states will be no less plausible than a functionalist reduction of intentional states.

<sup>35</sup> I owe the term ‘the direct reference approach’ to John Hawthorne, “Direct Reference and Dancing Qualia,” in Torin Alter and Sven Walter, eds., *Phenomenal Concepts and Phenomenal Knowledge* (New York: Oxford University Press, 2007), pp. 195–209. A direct reference account of phenomenal concepts is famously labeled as the ‘Phenomenal Concept Strategy’. Here I would like to leave it open whether the direct reference approach can only apply to phenomenal concepts.

<sup>36</sup> See Brian Loar, “Phenomenal States (Second Version),” in Chalmers, ed., *Philosophy of Mind: Classical and Contemporary Readings*, *op. cit.*, pp. 296–311.

<sup>37</sup> See Janet Levin, “What Is a Phenomenal Concept?” in Alter and Walter, eds., *Phenomenal Concepts and Phenomenal Knowledge*, *op. cit.*, pp. 87–111.

entities would be problematic if it *conceptually* rules out mental-physical identities (or non-identities).

In the rest of this section, let me turn to a related question: Can we explain fundamental mental-physical identities in a physicalistically acceptable way? If not, some may argue, this would be a problem for physicalism.<sup>38</sup> A possible worry is that the absence of relevant explanations would make fundamental mental-physical identities pure surds or danglers, which are incoherent with the framework of physicalism.<sup>39</sup> *Analytic* identities (say, bachelors = unmarried men) require no explanation, but that is not true in the case of identity-psychism, in which, for example, consciousness is *synthetically* identical with S-neutrino fluctuation.

I have two responses: (1) It is still open whether fundamental mental-physical identities can be explained in a physicalistically acceptable way. The reductionist can appeal to the functionalist approach I mentioned earlier to explain fundamental mental-physical identities. First, we can give a functional analysis of a mental property M—that is, translate the mental concept [M] to be a functional concept that characterizes a certain functional role F. Second, we may find out that a fundamental physical property P actually plays the relevant

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<sup>38</sup> Thanks to the reviewer for pressing me to deal with this problem.

<sup>39</sup> There is another sense in which mental-physical identities seem to demand a physicalistically acceptable explanation: the fact that there is no such explanation of mental-physical identities is *evidence* that mental properties are non-identical with physical properties. See Loar, “Phenomenal States (Second Version),” *op. cit.* But this is not right. Many arguments for reductive physicalism neither presuppose nor imply physicalistically acceptable explanations of mental-physical identities. For example, some appeal to the *Inference to the Best Explanation Argument*: to assume that the mental is identical with the physical is the best explanation of mental-physical correlations. See Ned Block and Robert Stalnaker, “Conceptual Analysis, Dualism, and the Explanatory Gap,” *Philosophical Review*, CVIII, 1 (January 1999): 1–46; Christopher Hill and Brian McLaughlin, “There Are Fewer Things in Reality Than Are Dreamt of in Chalmers’s Philosophy,” *Philosophy and Phenomenological Research*, LIX, 2 (June 1999): 445–54. Others appeal to the *Causal Exclusion Argument*: only mental-physical identities can accommodate the causal efficacy of the mind. See Kim, *Mind in a Physical World*, *op. cit.*; and Kim, *Physicalism, or Something Near Enough*, *op. cit.* If either of the two arguments works, we should be justified in postulating mental-physical identity. The plausibility of these two arguments does not rely on the availability of physicalistically acceptable explanations of mental-physical identity. And it is important to note that these two arguments remain silent about whether mental properties are identical with fundamental physical properties or higher-level physical properties.

functional role F. Finally, we establish the identity between M and P. This is similar to a functionalist approach to theoretical identities in other domains (for example, gene = DNA; temperature = mean kinetic molecular energy). The first step appeals to a conceptual truth and the second step resorts to physical truths. The functionalist explanation is thus physicalistically acceptable. As Wilson says, “Since physicalistically acceptable facts, when combined with definitional facts, remain physicalistically acceptable, the explanation as a whole is physicalistically acceptable”.<sup>40</sup>

There have been hot debates over the plausibility of functional reductions of mental properties. But there is no reason to suggest that a functionalist approach to fundamental mental-physical identities is *less* plausible than such an approach to higher-level mental-physical identities. Whether the relevant functional role F is filled by a fundamental physical property or by a higher-level physical property is a question that is open to further empirical investigation. A formulation of physical entities and of physicalism should leave that open.

(2) Regardless of whether we can offer physicalistically acceptable explanations of fundamental mental-physical identities, it is unclear whether the absence of such explanations would be a problem for physicalism. The standard version of the “Explanatory Gap” is concerned with explanations of mental-physical correlation or dependence rather than explanations of mental-physical identity. Whereas mental-physical dependence may require a physicalistically acceptable explanation for physicalist purposes, the absence of such an explanation of mental-physical identity is, I will argue, coherent with physicalism.<sup>41</sup>

According to some philosophers, we should give a physicalistically acceptable explanation for mental-physical supervenience; otherwise we would fail to distinguish

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<sup>40</sup> Wilson, “How Superduper Does a Physicalist Supervenience Need to Be?” *op. cit.*, p. 37.

<sup>41</sup> This point is inspired by the reviewer.

physicalism from some versions of anti-physicalism, such as emergentism.<sup>42</sup> The emergentist can also accept mental-physical supervenience (at least nomological supervenience), but maintain that we cannot explain, in a physicalistically acceptable manner, why the mental supervenes upon the physical. If we cannot physicalistically explain mental-physical supervenience, mental phenomena must be explained by physical facts *plus* supervenience-based generalizations that are *sui generis* non-physical laws. Hence the mental is not *wholly* explained or grounded by the physical—the mental is over and above the physical in some sense.

But the case of fundamental mental-physical identity is different. In our case, mental properties are themselves physical properties. Mental-physical identity ensures that the mental is nothing over and above the physical—identity is the most robust form of nothing over and aboveness. The explanatory gap for mental-physical dependence may run afoul of physicalism, supposing that the absence of such explanations leans toward some type of anti-physicalism. In contrast, the explanatory gap for mental-physical identity raises no challenge to physicalism, because mental-physical identity suffices to rule out emergentism and other versions of anti-physicalism, no matter whether explanations of mental-physical identities are available.

Furthermore, there must be fundamental, brute facts that resist any explanation whatsoever; fundamental mental-physical identities might be among those facts. The existence of those brute facts *per se* should be no problem for physicalism. The reason why some physicalists take issue with fundamental mental-physical identity is not that physicalism is incompatible with *fundamental identity* that seems to be physicalistically unexplainable, but

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<sup>42</sup> See Horgan, “From Supervenience to Superdupervenience: Meeting the Demands of a Material World,” *op. cit.* For criticisms, see Robert Howell, “Emergentism and Supervenience Physicalism,” *Australasian Journal of Philosophy*, LXXXVII, 1 (March 2009): 83–98.

that, according to them, physicalism is inconsistent with *fundamental mentality*. They thus place the NFM constraint upon an account of physical entities to make sure that a mental property can never be a fundamental physical property. But, as I have argued in Section IV, a plausible account of physical entities and of physicalism should accommodate certain cases of fundamental mentality, such as the case of identity-psychism.

## VI. CONCLUSION

I have thus considered three accounts of physical entities. While [P1] is overly liberal, [P2] is too demanding. The formulation [P3] I am proposing seems more able than [P1] and [P2] to account for physicality and physicalism. See the below table:

	Phenomenalism	Identity-Psychism
Physicalism / [P1]	<i>Compatible</i>	<i>Compatible</i>
Physicalism / [P2]	<i>Incompatible</i>	<i>Incompatible</i>
Physicalism / [P3]	<i>Incompatible</i>	<i>Compatible</i>

On the one hand, whereas physicalism under [P1] incorrectly accommodates the phenomenalist case, [P3] can keep physicalism away from phenomenalism. On the other hand, while physicalism under [P2] mistakenly rules out the case of identity-psychism, [P3] can help physicalism to make room for fundamental mental-physical identities. Therefore, I hope I have shown that physicalism in terms of [P3] is neither too demanding nor too liberal. Hempel's dilemma has bothered physicalists for quite a while. Perhaps it is time to worry less about it.