

Physicalism

[Alternative headword: Materialism]

Physicalism is a view about the relationship between people's mental properties and their physical properties. It claims that people's mental properties are nothing over and above—nothing additional to—their physical properties. People's mental properties would certainly be nothing over and above their physical properties if their mental properties turned out to form a proper subset of their physical properties, so that every mental property turned out to be identical with—to be literally one and the same thing as—some physical property (e.g., the physical property of having one's brain be in such and such neurophysiological state).

People's mental properties might also be nothing over and above their physical properties if mental properties turned out to be identical with functional properties that were physically realized. A functional property is the property of having some or other physical property that plays a particular functional role (e.g., that has certain typical causes and typical effects). For example, suppose the mental property of being in pain turns out to be the property of being in some or other internal state that is typically caused by bodily damage and that typically causes wincing and groaning. In that case, if the internal state playing that functional role is always in fact some physical state of the brain, even if it is not always the same type of physical brain state, then being in pain is nothing over and above a physical property.

The claim that a particular mental property is identical with a particular physical or functional property is not advanced as any kind of a priori claim, e.g., as a conceptual or analytic truth. It must be supported with empirical evidence. For example, it is argued that the identification of mental property M with physical property P would provide the best explanation of an observed correlation between instances of M and instances of P. Physicalism is claimed to be analogous to such a posteriori scientific hypotheses as that genes are segments of DNA or that chemical elements are systems of physical particles.

The two features of mental states that are most often argued to present a problem for physicalism are the phenomenal character of sensations (e.g., the introspectible nature of a severe toothache) and the intentionality of beliefs and desires (e.g., the fact that believing that Bhutan is in India is about Bhutan and India). Physicalists have offered physicalism-friendly accounts of both features.

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1 *Physicalism as one solution to the mind-body problem*

People have mental properties. They have numerous beliefs and desires, such as the belief that it sometimes rains or the desire to win a Nobel prize. They have sensations; for example, they experience pains, tingles, episodes of nausea or dizziness, afterimages, and hallucinations; they smell the smell of gasoline, taste the taste of mustard, and feel the smoothness of glass. They have moods, such as depression or restlessness or mania. They feel emotions, such as jealousy or sorrow or dread. They undergo mental processes, sometimes reasoning to practical or theoretical conclusions, but at least as often just flitting from one daydream to another.

People also have physical properties, which we should take to be those properties that are attributed to them by the correct descriptions of them that the sciences provide. These sciences certainly include physics (in the strict sense of what you study if you earn a degree in physics), but they are not limited to physics. Especially relevant to the mind, of course, are such sciences as neurophysiology, cognitive neuroscience, and cognitive psychology. And these sciences describe people as having brains, activity in which is the proximate cause of all non-reflexive behaviour. Human brains, in turn, are described as immensely complex networks of sub-networks (of sub-sub-networks...) of neurons constantly inter-communicating via electro-chemical signals. Neurons themselves are described as elaborate structures of atoms and molecules that interact in accordance with general principles of chemistry.

The mind-body problem is that of characterizing the relationship between the mental properties that a person has at a certain time and the physical properties that the person has at that same time, especially the physical properties had in virtue of what is going on in his or her brain. A first pass at a statement of how physicalism characterizes this relationship might be this:

A person's mental properties at t are in some way nothing over and above—nothing additional to—the person's physical properties at t .

If physicalism is true, all God needed to do (so to speak) to endow people with mental properties was to endow them with the right physical properties.

How could a person's mental properties at a certain time be nothing over and above the person's physical properties at that time? One way would be if the mental properties formed a proper subset of the physical properties—if every mental property was identical with a physical property (see Mind, identity theory of). Every property is obviously nothing over and above itself. So if mental property M is identical with physical property P , then M is nothing over and above P ; there is, after all, just one property, to which the expressions 'M' and 'P' both refer.

It is not a physicalist view that a person's physical properties at time t simultaneously *cause* the person's physical properties at t . For if a thing's being F causes it to be G a moment

later, being G is obviously something over and above being F. The same is true if the cause is simultaneous with the effect.

The falsity of substance dualism does not suffice for physicalism. Substance dualism holds (i) that minds are immaterial objects in that they are not made of cells or of any other physical components, and (ii) that mental properties are immaterial properties of immaterial minds (see Dualism). Substance dualism might be false, and yet physically-composed people have not only physical properties but also mental properties that are something over and above the physical properties. In that case, physicalism would be false (and property dualism true).

Because the first-pass formulation of physicalism is a view about how mental properties are related to physical properties, it assumes that mental properties exist. But so-called eliminative materialists deny that they exist, so that no one has ever believed or felt anything (see Eliminativism; Churchland 1981). So if the first-pass formulation formulates physicalism accurately, then eliminative materialism, far from being a kind of physicalism, is actually inconsistent with it. But this is not a substantive problem for the first-pass formulation. It aims to formulate physicalism about mental properties; an analogous (but much less controversial) view would be physicalism about biological properties. Eliminative materialism is indeed inconsistent with physicalism about mental properties, but clearly consistent with physicalism about the properties that people have.

The physical properties mentioned by the first-pass formulation are explicitly restricted to those had at t , the time at which the mental properties are had. But this restriction is needless and undesirable. It is needless because no violation of the spirit of physicalism results if physical properties had before t are permitted, or physical relations borne at or before t to the person's physical environment (present or past), or properties had at t entirely in virtue of physical properties or physical relations had before t . It is undesirable because beliefs and desires have intentional content (to believe is to believe that so-and-so, and to desire is to desire something; see Intentionality), and at least two views about the nature of intentional content exist that make it depend on facts about a subject's environment or history. According to semantic externalism, a mental state's intentional content is determined, at least in part, by relations that the bearer of the mental state stands in to the things that the mental state is about (e.g., to raining or to winning a Nobel prize), such things typically being features of the bearer's environment (see Content: wide and narrow). According to teleosemantics, a mental state's intentional content at t is determined, at least in part, by the history of the mental state's bearer, and even of the bearer's ancestors, and hence by properties that the mental state's bearer, or the bearer's ancestors, had before t . A significantly improved formulation of physicalism would therefore be this:

A person's mental properties at t are in some way nothing over and above—nothing additional to—the person's physical properties at or before t , and physical relations borne to his or her physical environment (present or past) at or before t .

2 Being nothing over and above

We have already seen one way in which mental properties could be nothing over and above physical properties: if every mental property was identical with a physical property (see Mind, identity theory of). But, it has been claimed, there are other ways.

A mental property could be nothing over and above physical properties by being identical with a functional property that is physically realized, i.e., realized by a physical property solely in virtue of physical laws and physical environmental or historical conditions (Melnyk 2003; Shoemaker 2007). To have a property F that is functional in the intended sense is to have some property or other that meets a certain condition C_F (where C_F is the particular condition in terms of which F is defined). A property realizes F if it meets condition C_F . If more than one property meets C_F , then F is said to be multiply realized. Because functional properties are usually multiply realized, this way of being nothing over and above physical properties does not require that mental properties be identical with physical properties. A non-mental illustration: being poisonous is plausibly regarded as the property of having some or other property that will sicken or kill any creature that ingests a substance that has it. Zyklon-B's being poisonous was realized by its containing cyanide; containing cyanide will sicken or kill any creature that ingests a substance that has it. But containing strychnine will also sicken or kill a creature that ingests a substance that has it; so being poisonous is multiply realizable.

What kind of functional property might a mental property be? There are as many kinds of functional property as there are kinds of condition that a realizing property might meet (see Functionalism). One kind of condition is playing a causal role specifiable in the language of daily life. For example, being in pain might be the property of having some or other property that is typically caused by actual or potential bodily damage and that typically causes wincing, moaning, and so on, and a desire for the pain to stop. A second kind of condition is playing a causal role only specifiable in scientific language, a computational role, perhaps. A third kind of condition is having a certain bio-function. For example, being in pain might be the property of containing some subsystem that (i) has the bio-function of detecting, and then generating behavioural responses to, imminent or actual tissue damage, and that (ii) has actually been activated.

Two other proposed ways in which mental properties might be nothing over and above physical properties should be mentioned. According to the first, mental properties are nothing over and above physical properties if, and only if, mental properties supervene on physical properties (see Supervenience of the mental; Post 1987). For mental properties to supervene on physical properties is for no difference in mental properties (within or across subjects) to be possible without some difference in physical properties. But the supervenience of mental properties on physical properties has been charged with not being sufficient for physicalism, even if it is necessary. According to the second proposed way, mental properties are nothing over and above physical properties if, and only if, every mental event (or instance of a mental property) is identical with some or other physical event (or instance of a physical property), even though mental properties are not identical with physical properties (Davidson 1980; see

Anomalous Monism; Fodor 1974; see Mind, identity theory of). But it has been thought obscure how an instance of mental property M could be the same thing as an instance of physical property P if M is distinct from P (Kim 1993).

3 Physicalism and reductionism

Physicalism and reductionism are often spoken of in the same breath, but how they are related depends on how reductionism is conceived. When the context is the mind, reductionism is the thesis that the mental is reducible to the physical (see Reductionism in the philosophy of mind). But what is reducibility? In some non-philosophical circles, to say that the mental is reducible to the physical is simply to say that the mental is nothing over and above the physical. If reductionism is understood in this way, non-reductionist physicalism is impossible.

In philosophical circles, however, a distinction is standardly drawn between reductive physicalism (which entails the reducibility of the mental to the physical) and non-reductive physicalism (which does not). Here, evidently, reducibility is not being understood as nothing-over-and-above-ness. In fact, it is being understood by reference to a different (and controversial) account of reducibility. On this account, the mental is reducible to the physical if, and only if, every law-like generalization about mental states framed in everyday mental language can be deduced from (and hence explained by) law-like generalizations framed in the proprietary vocabulary of the physical sciences, via so-called bridge principles that assert the identity of each mental property (or type of mental state) with a particular physical property (or type of physical state). Reductive physicalism therefore entails, whereas non-reductive physicalism does not entail, that every mental property is identical with a physical property. Whether non-reductive physicalism, understood in this standard way, is even coherent turns on whether physicalism can be formulated without appeal to mental-to-physical type-identity statements (see §2).

Not all philosophers of mind, however, conceive of reducibility in a way that requires every mental property to be identical with a physical property. According to an alternative view, the reducibility of the mental to the physical is still conceived as requiring that the physical be capable of (non-causally) explaining the mental. But the physical is held to be capable of explaining the physical if (i) mental properties are identical with functional (rather than with physical) properties, e.g., with properties defined in terms of some causal or computational role; and (ii) it is always a physical property, in accordance with physical laws under physical conditions, that plays the defining role when someone has a mental property. For if some physical property is instantiated that, in accordance with physical laws under physical conditions, plays a certain functional role, then how things are physically necessitates (and hence explains) an instance of the mental property defined in terms of that functional role. But it need not be the same physical property on every occasion that plays the defining role for a given mental property—which makes this alternative conception of reducibility consistent with the multiple realizability of mental properties, not requiring every mental property to be identical with a physical property (Kim 2005).

4 *The epistemic status of physicalism*

Because physicalism claims that mental properties are nothing over and above physical properties, it is a broad-scope hypothesis concerning the character of a kind of entity. In this regard, it resembles the once-controversial hypothesis that every atom of a chemical element is nothing over and above a certain system of physical particles. And just as purely a priori reasoning could not provide reason to believe the chemical hypothesis—only empirical evidence could do so—purely a priori reasoning could not provide reason to believe physicalism.

That physicalism is an a posteriori hypothesis is also suggested by a different line of reasoning. Physicalists emphasize the role of property-identity claims in physicalism. On one view, physicalism requires that every mental property be identical either with a physical property or with a functional property that is physically realized (Melnyk 2003). But these identity claims are not supposed to be knowable a priori in virtue of one's logical or conceptual or linguistic competence. They are supposed to be analogous to such scientific identity claims as that salt is NaCl, or that genes are segments of the DNA molecule, or that having consumption (the disease) is being infected with *Mycobacterium tuberculosis*. Like these scientific analogues, they are supposed to be supported by empirical evidence or not at all.

A distinction is drawn between so-called a priori physicalism and a posteriori physicalism (see, e.g., McLaughlin 2007). This terminology, however, is misleading. 'A priori physicalism' does not refer to physicalism that is a priori. Indeed, a priori physicalism does not even entail physicalism! Some a priori physicalists are not physicalists (e.g., Chalmers 2010). Likewise, *mutatis mutandis*, for 'a posteriori physicalism'. The actual usage of 'a priori physicalism' and 'a posteriori physicalism' requires a little machinery to explain.

5 *A priori and a posteriori physicalism*

Let 'P' abbreviate a complete description of the world in the language of the physical sciences, including statements of physical law. The description is complete in the sense that it says everything true that can be said in the language of the physical sciences (not in the sense that it describes everything in the world). Let 'Q' abbreviate a vast list of true claims, framed in everyday non-scientific language, each of which ascribes a mental property to some creature; the list includes every such claim that is true. Now, if physicalism is true, then, no matter how it is formulated, the following conditional is necessarily true (i.e., true in all possible worlds): $P \rightarrow Q$. Intuitively, if physicalism is true, then any possible world that contains everything physical that the actual world contains, governed by the same physical laws, must contain everything mental that the actual world contains; if it did not contain everything mental that the actual world contains, then anything mental that it fails to contain cannot have been, in the actual world, wholly constituted by the physical. A priori physicalism can now be formulated as the claim that the conditional ' $P \rightarrow Q$ ', to which physicalism is committed, can in principle be known to be true a priori by anyone who possesses all the concepts needed to understand the

conditional (i.e., all physical concepts and everyday mental concepts). A posteriori physicalism is the claim that this conditional cannot be known a priori, even in principle; it can only be known a posteriori, via the empirical discovery of a posteriori mental-physical or mental-functional identity claims (see, e.g., McLaughlin 2007).

How could a priori physicalism—the claim that $P \rightarrow Q$ is a priori for anyone who understands it—be consistent with the claim that physicalism is an a posteriori thesis? Physicalism says that how the actual world is mentally is nothing over and above how the actual world is physically. To know whether this is true, one must know how the actual world is mentally and how the actual world is physically; otherwise one could not tell whether the former outruns the latter. But how the actual world is mentally (especially with regard to other people) and how the actual world is physically are clearly things that can only be known a posteriori. So whether physicalism is true has to be an a posteriori question. But once it has been discovered a posteriori how the actual world is mentally and how the actual world is physically—that is, once it has been discovered a posteriori that P expresses how the actual world is physically, and that Q expresses how the actual world is mentally—the claim that the truth of P necessitates the truth of Q might still be something knowable a priori for anyone who understands $P \rightarrow Q$.

Relatedly, how could $P \rightarrow Q$ possibly be a priori for anyone who understands it if the reason why the truth of P necessitates the truth of Q is the holding of necessary mental-physical or mental-functional property-identity claims that are a posteriori? Why does moving in thought from P to Q not require knowing identity claims that can only be known empirically? Consider, first, how a priori physicalism seeks to explain how $P \rightarrow \text{Water exists}$ can be known a priori, even though $\text{Water} = \text{H}_2\text{O}$ is a posteriori. (Assume that the word 'water' does not appear in the physical description of the world that P abbreviates.) It will then be easy to see how, if analogous conditions are met, $P \rightarrow Q$ could be a priori, even though mental-physical or mental-functional property-identity claims are a posteriori.

According to a priori physicalism, the everyday word 'water' (or the everyday concept of water associated with the word) does not have a definition in the vocabulary of the physical sciences which (i) anyone who understands 'water' thereby knows, and which (ii) a priori entails that $\text{water} = \text{H}_2\text{O}$. For example, 'water' does not have a definition of this kind *as* H_2O . That is why $\text{Water} = \text{H}_2\text{O}$ is a posteriori, and hence why, if the only thing one knows about how the world is physically is that H_2O exists, one has no way to move a priori to the conclusion that water exists. But the concession that $\text{Water} = \text{H}_2\text{O}$ is a posteriori does not entail that $P \rightarrow \text{Water exists}$ is a posteriori. Even if 'water' does not have a definition of the requisite kind as H_2O , it may still have some other definition, in the vocabulary of the physical sciences, which (i) anyone who understands 'water' thereby knows, and which (ii) entails that water exists when conjoined with P , which, of course, says a great deal more than that H_2O exists. To illustrate this possibility: suppose that everyone who understands the word 'water' thereby knows that water is the transparent, potable stuff that falls from the sky as rain and fills the lakes and rivers. ('Definition' is here used broadly enough that a reference-fixing definite description associated with a term counts as a definition of the term.) Suppose, too, that P entails not just

that H₂O exists but also that it is the transparent, potable stuff that falls from the sky as rain and fills the lakes and rivers. On these suppositions, 'P → Water exists' can be known a priori. It is a priori that P → H₂O exists and is the transparent, potable stuff that falls from the sky as rain and fills the lakes and rivers; it is also a priori that water is the transparent, potable stuff that falls from the sky as rain and fills the lakes and rivers; and from these two a priori truths it follows a priori (by the transitivity and symmetry of identity), via the claim that P → Water = H₂O, that P → Water exists.

6 Considerations against physicalism

Two general features of mental states have been regarded as especially problematic for physicalism: the phenomenal character of mental states (= their phenomenal properties, or, in one usage of the word, their qualia) and their intentionality (see Qualia and Intentionality).

The phenomenal character of a mental state is what it is like to be in the mental state, for the person in the mental state: it is the totality of those features of the mental state that the person in the mental state can become aware of through introspection. All philosophers agree that sensations have phenomenal character; a few philosophers think that propositional attitudes also have it (so-called cognitive phenomenology). Of the many anti-physicalist arguments that appeal to the phenomenal character of sensations the four most extensively-discussed are these:

- (1) Saul Kripke's argument (Kripke 1980),
- (2) Frank Jackson's Knowledge Argument (Ludlow, Nagasawa, and Stoljar 2004),
- (3) Joseph Levine's concern about the so-called explanatory gap (Levine 2001), and
- (4) David Chalmers' Zombie (or Two Dimensional) Argument (Chalmers 2010).

According to Kripke's argument, it seems possible to be (say) in pain while not being in any neural state alleged by physicalism to be identical with pain (and vice versa). Because any state that strikes us introspectively as pain is pain (and any state that does not strike us introspectively as pain is not pain), this seeming possibility cannot be explained away as an error in the same way in which the seeming possibility of heat without molecular motion can be explained away as an error (what really seems possible, without molecular motion, is not heat but something else that causes the same sensations of warmth in us that heat causes). So the seeming possibility must therefore be a genuine (metaphysical) possibility. But such a possibility is inconsistent with the (metaphysically necessary) identity of pain with the neural state, and so pain is not in fact identical with the neural state. Jackson's Knowledge Argument starts with the premise that an idealized cognitive scientist (Mary, in his story) could know absolutely all the physical facts about colour vision, and yet not know the phenomenal character of a blue sensation. The argument infers that the phenomenal character of a blue sensation is not a physical fact, and hence that physicalism is false. Levine's closely-related 'explanatory gap' is the fact that no amount of neuroscientific information about the brain-state of someone enjoying a sensation seems to explain why the sensation has the phenomenal character that it does, a fact that is puzzling if physicalism is true. Chalmers' argument starts

with the premise that zombies—in the philosophical sense of physical replicas of sensation-feeling people, in identical physical circumstances, for whom there is nothing that it is like—are at least conceivable. The argument's next premise is a priori physicalism (see §5), the claim that, if physicalism is true, then ' $P \rightarrow Q$ ' is a priori (where ' P ' is a complete physical description of the world, and ' Q ' attributes sensations to all people who actually have them). But from the premise that zombies are conceivable, the argument concludes that ' $P \ \& \ \sim Q$ ' is conceivable, and hence that ' $P \rightarrow Q$ ' is not a priori, and hence, from a priori physicalism, that physicalism is false. To all four of these arguments, of course, physicalists present extensive objections (e.g., Hill 1991, Papineau 2002).

The second general feature of mental states deemed especially problematic for physicalism is intentionality, which is widely agreed to be a feature of propositional attitudes and emotions; it is a feature of sensations also if representationalist theories of phenomenal character are true (e.g., Tye 1995; see Representationalism about experience). There are no standard arguments for the falsity of physicalism that appeal to the intentionality of mental states. It is rather that, if physicalism requires that every mental property be identical either with a physical property or with a physically-realized functional property, intentionality must be either a physical or a functional property. Since intentionality is a multiply-realized property if anything is, it cannot be a physical property, and so it must be a functional property; but it has proved very difficult to specify in a plausible way what functional property it is. Well-known theories of the (broadly-speaking) functional nature of intentionality have been offered by Jerry Fodor (1990) and Ruth Millikan (1984). Though Millikan's theory far exceeds Fodor's in scope and detail, neither commands widespread endorsement.

7 Evidence for physicalism

In support of physicalism, two main lines of argument have been developed, the first of which starts with a claim to the effect that mental properties, or some sub-class of mental properties, have been found to be correlated with physical properties, where the correlation of Xs with Ys is understood to leave open the possibility that $X = Y$ (Hill 1991; Kim 2005; McLaughlin 2010). The strongest such claim would be that every mental property is perfectly correlated with a certain physical property—that people think about lunch when, but only when, they are in one kind of brain state, that people feel a shooting pain in their left leg when, but only when, they are in a second kind of brain state, that they feel on edge when, but only when, they are in a third kind of brain state, and so forth. But weaker correlational claims can also serve as premises, e.g., the claim that, in experimental subjects, there is no introspectible variation, or change, in sensations' phenomenal character without some simultaneous variation, or change, in neural state. The physicalist argument takes the correlational premise to constitute evidence that the mental properties in question are identical with physical or with physically-realized functional properties—perhaps on the grounds that physicalist identity hypotheses would, if true, provide better explanations of the empirical premise than would rival dualist hypotheses. Now, every physicalist identity hypothesis has an empirically-equivalent rival dualist hypothesis that explains the correlational premise by taking every mental property to be linked by a fundamental law of nature to the physical property with

which it is correlated. So the physicalist argument must include the claim that a physicalist identity hypothesis would be a better explanation than any empirically-equivalent dualist rival because it enjoys greater parsimony (ontological simplicity, theoretical economy) than the dualist rival: it posits fewer kinds of properties, and fewer fundamental laws of nature. The appeal to parsimony is itself defended by noting that practicing scientists discriminate between empirically-equivalent hypotheses by appeal to such so-called super-empirical theoretical virtues as parsimony.

The second line of argument in support of physicalism starts by noting that our behaviour is often caused by our mental states—our decisions or intentions (Papineau 2002). It continues with a so-called closure thesis to the effect (roughly) that any bit of human behaviour apparently caused by a mental state lies at the end of a chain of neurophysiological causes that runs, via motor neurons, backwards into the brain until causes are reached that occurred before the mental state; no neuronal state in this chain lacks a neurophysiological cause. These causes do not have to be sufficient for their effects; but they are enough to explain each neuronal state to the extent that it can be explained at all. Such a closure thesis is supported by the fact that current neurophysiology textbooks mention no neuronal activity that lacks a neurophysiological cause, and no neuronal activity to explain which neurophysiologists have found it theoretically necessary or advantageous to look outside the domain of physical causes. From the closure thesis it follows that any behaviour that has a mental state as a cause also has a simultaneous neurophysiological state as a cause. But how are these two causes related to one another? Are they entirely distinct, so that the mental cause duplicates the work of the neurophysiological cause? The argument concludes that the most parsimonious (hence best) answer to give is the physicalist answer that the mental cause is either identical with or realized by the simultaneous neurophysiological cause. And, as with the first line of argument, the role of parsimony is merely to discriminate between a physicalist hypothesis and an empirically-equivalent dualist rival.

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See also

Anomalous Monism

Behaviourism, analytic

Content: wide and narrow

Dualism

Eliminativism

Epiphenomenalism

Functionalism

Intentionality

Mental causation

Mind, identity theory of

Neutral monism

Qualia

Reductionism in the philosophy of mind

Representationalism about experience
Supervenience of the mental

Bibliography and further reading

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the functional account of reduction mentioned in §3; ch. 5 objects in principle to the argument for physicalism, mentioned in §7, that appeals to observed correlations between mental and physical properties.)

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Keywords:

Physicalism; closure; dualism; functionalism; identity theory; intentionality; materialism; naturalism; non-reductive; phenomenal properties; qualia; realization; reductionism; supervenience.