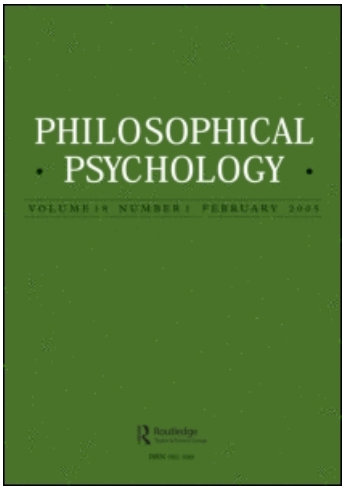

Philosophical Psychology
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713441835

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Online publication date: 11 October 2010

To cite this Article Francescotti, Robert(2010) 'Realization and Physicalism', Philosophical Psychology, 23: 5, 601 — 616
To link to this Article: DOI: 10.1080/09515089.2010.514546
URL: http://dx.doi.org/10.1080/09515089.2010.514546

Philosophical Psychology
Vol. 23, No. 5, October 2010, 601–616

Realization and Physicalism

Robert Francescotti

Melnyk provides a rigorous analysis of the notion of realization with the aim of defining Physicalism. It is argued here that contrary to Melnyk's Realization Physicalism, *the idea that mental phenomena are realized by physical phenomena fails to capture the physicalist belief that the former obtain in virtue of the latter. The conclusion is not that Physicalism is false, but that its truth is best explained with some notion other than realization in Melnyk's sense. I also argue that the problems with Melnyk's brand of Realization Physicalism generalize to other potential attempts to express Physicalism in terms of realization. The burden of proof is on the Realization Physicalist to show that physicalist intuitions can be adequately captured with the notion of realization.*

Keywords: Functional Types; Melnyk; Physical Properties; Physicalism; Realization

1. Introduction

The idea that mental properties are *multiply realizable* is still one of the major reasons in the philosophy of mind for believing that they are *not reducible* to physical properties. However, many who accept this popular non-reductionist view are also reluctant to give up *Physicalism*—the belief that all concrete objects and events are ultimately purely physical, and therefore that all concrete phenomena obtain solely in virtue of physical phenomena. At first glance, Physicalism and non-reductionism seem to conflict. If mental properties are not reducible to physical properties (at least in the sense of not being identical with them), then it would seem that individuals with mental properties are not purely physical, and if so, then mental phenomena do not obtain solely in virtue of physical phenomena. Given the apparent tension between the two views, the *Non-Reductive Physicalist* owes an explanation of how one can consistently accept both.[1]

While non-reductionists often show their commitment to Physicalism by claiming that mental properties *supervene* on physical properties, it is now widely agreed that supervenience claims are insufficient for the truth of Physicalism. As Kim (1993, pp. 165–169) notes, to say that physically indistinguishable items are mentally the

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ISSN 0951-5089 (print)/ISSN 1465-394X (online)/10/050601-16 © 2010 Taylor & Francis
DOI: 10.1080/09515089.2010.514546

same, i.e., that individuals differ mentally only by differing physically, does not explain *what makes it the case* that the mental relies on the physical in that way. For all that supervenience requires, mental properties might vary with physical properties in a way that is contrary to physicalist intuitions, e.g., by being instantiated in immaterial souls. To avoid substance dualism, one might endorse a *token-identity* claim. The idea that mental properties (state-*types*) are not identical with physical properties allows that *instances* of mental properties (state-*tokens*) are identical with instances of physical properties. However, a token-identity claim is not in itself enough to secure Physicalism, for since a mere token-identity claim says nothing about how mental properties covary with physical properties, it allows worlds that are physically indistinguishable from the actual world but completely devoid of mentality, which does not seem compatible with Physicalism.

It remains a matter of rigorous debate whether some combination of token-identity and supervenience claims can fully capture physicalist intuitions. However, what I wish to address here is the alternative approach to characterizing Physicalism chosen by Andrew Melnyk. Melnyk tries to avoid the limitations of supervenience and token-identity claims by relying on the *Principle of Physical Realization*—the view that mental and other higher-level items are *realized* by physical items. A doctrine of physicalism, he claims, ''can be formulated using only the notion of realization; neither claims of supervenience nor claims of token identity nor disjunctive definitions . . . play any part whatever'' (Melnyk, 1996, p. 390). In this paper, I focus on the case of mentality and argue that the brand of realization Melnyk describes fails to capture the physicalist belief that mental phenomena obtain in virtue of physical phenomena. I also question whether the notion of realization in general (as employed in the philosophy of mind) can be used to define Physicalism where mentality is concerned. The burden of proof, I argue, is on the Realization Physicalist to show that it can.

I focus on Melnyk's account since his is one of the most rigorous attempts to characterize Physicalism in terms of realization in the philosophical literature. Also, what I have to say about his account easily generalizes to other potential attempts to define Physicalism in terms of realization, as shown in sections 4 and 5.

2. Melnyk's Realization Physicalism

The notion of realization is intimately tied to the notion of a *functional* property or type. A functional type is one whose instantiation consists in performing a certain functional role. For any functional type, F, there is a functional role, R, such that anything, x, is an instance of F if and only if x plays role R. *Soda-machine*, for example, is a functional type since there is a certain function—the function of dispensing beverages when the right coins are inserted and tabs pressed—and being a soda machine consists in being a machine that performs (or was designed to perform) this beverage-dispensing function. Being a heart is a functional type since an object is an instance, a token, of this type if and only if it plays the right sort of

blood-pumping role. It is also commonplace, thanks to the popularity of Functionalism in the philosophy of mind, to think of mental properties as functional types. To be in pain, we are told, is to have some inner event that plays the right causal role with respect to sensory input (e.g., cuts, burns, and pressure), behavioral output (grimacing, wincing, groaning), and other mental states (beliefs about the source of the pain and the desire to avoid that source).

With the notion of a functional type comes the notion of a *realization* of that type. In general, for any functional type, F, what plays the functional role definitive of F is called a realization of F. Thus, the large object in the hallway is a realization of the type, soda-machine, in virtue of playing the role of dispensing soda, and the pumping thing in your chest realizes a heart in virtue of serving to pump blood.

One source of debate in discussions of realization is whether the realization relation is to be viewed as relating *types* or relating *tokens*. One might wish to talk about types being realized by other types—e.g., the type, *refrigerator*, realized by the type of physical structure, P, on one occasion and the physical structural type, P*, on some other occasion. Likewise, we might speak of the property of being in pain (the mental state-type) realized by neural type N_1 in one individual, a different neural type in another individual, and perhaps a hydraulic type in Lewis' (1980) Martian. We might, instead, view realization as relating *tokens* to *tokens*. We might speak of a particular refrigerator being realized by a particular physical structure, or we might talk about a certain instance of pain being realized by an instance of some neural type. This second way is how Melnyk thinks of realization—as relating tokens to tokens.[2]

His full characterization (Melnyk, 2006, p. 129) of the realization relation is:

> [R] token *x realizes* token *y* (or: token *y* is *realized by* token *x*) iff
> (i) *y* is a token of some *functional* type F (i.e., some type whose tokening just is the tokening of some or other type that meets a certain condition, C);
> (ii) *x* is a token of some type that in fact meets C; and
> (iii) the token of F whose existence is necessitated (in the strongest sense) by the holding of clause (ii) is numerically identical with *y*,[3]

where [R] abbreviates 'realization'.

Note that clause (iii) does not require that the realizer token, x, is itself identical with the realized token, y. The neural event, x, that realizes my current pain, y, must be of a type that plays the right functional role (i.e., that meets the right condition C), but x need not be identical with y, Melnyk thinks. The lack of a token-identity claim allows us to believe that mental events are realized by physical events and also that organisms with mental features are realized by physical bodies, while remaining neutral on the difficult issue of whether *constitution* counts as identity (e.g., whether the mental event is identical with the constituent neural event, or whether the person with mental properties is identical with the constituent body).[4]

Melnyk requires that the tokening of functional type F is necessitated *in the strongest sense* by the tokening of a type that meets condition C. In many cases, the connection between a functional type and the associated condition is *conceptual*.

It is arguably part of the very meaning of 'refrigerator' that a refrigerator is designed to keep its contents cool, and it seems that a tendon, by definition, is fibrous tissue designed to connect muscle to bone. Also, if analytic functionalists are correct, then it is a conceptual truth that mental properties are functional properties. Presumably, this is why Melnyk (2003, p. 21) requires that a token of a type meeting condition C *logically* guarantees a token of F (where 'logically' is understood broadly enough to include *conceptual* ties). However, he later decides to require only that "the tokening of some or other type that meets condition C *metaphysically* [italics added] necessitates a tokening of functional type F" (Melnyk, 2006, p. 129). With this weaker constraint, Melnyk wants to allow that the condition essential to a functional type is not discoverable a priori—i.e., that there are *synthetically necessary* truths about the functional character of various properties. So Melnyk's qualifier, "in the strongest sense," in definition [R] includes metaphysical as well as conceptual necessity.

With his account of realization Melnyk is able to define Physicalism as the view that:

> [RP] every causal or contingent token of any type—whether an object, property-instance, or event—is either (1) a token of a physical type or (2) a physically realized token of a functional type (2006, p. 131),

where [RP] abbreviates 'Realization Physicalism'. Note that the earlier definition of realization, [R], allows tokens of the same functional type to be realized by tokens of different physical types. An object of one physical type might realize a token of the type *heart* (or *tendon*, or *pain*, or *refrigerator*) on one occasion while an object of some other physical type might realize an instance of the same functional type on a different occasion. Thus, [R] does not entail a one-one correspondence between mental or other higher-level types and the physical types whose tokens do the realizing. So if Melnyk's account of Physicalism is accurate, then Physicalism is consistent with the popular claim that mental and other higher-level types are *not reducible to* physical types. In fact, if Melnyk is correct, not even *tokens* of higher-level functional types need to be identical with tokens of physical types; thanks to condition (iii) of [R], the realizer token necessitates but need not be identical with the token that is realized. So Melnyk's definition of Realization Physicalism, [RP], generously allows non-reductionists to be physicalists.

However, as argued in the next section, Melnyk's account fails to capture the physicalist belief that mental phenomena obtain in virtue of physical phenomena. For it is shown that with his analysis of realization, not only are the former *realized by* the latter, but they also *realize* the latter.[5]

3. Mental Realizing Physical

According to [RP], every causal or contingent token of any type is either a token of a physical type or a physically realized token of a functional type. If Physicalism of this sort is to have any chance of being true, Melnyk had better be using the word 'functional' quite broadly, to include all non-physical types—otherwise, tokens of

these types will not satisfy [RP]. Fittingly, Melnyk does admit that "the account uses 'functional type' very liberally indeed, to refer to any type whose tokening just is the tokening of some or other type that meets a specific associated condition" (2006, p. 129).

Functional types are abundant in the realm of physics as well as the other sciences. For many if not most physical types, there is an associated condition C (a functional role) that must be met in order to have a token of that type. Associated with the physical type, *boson*, is the condition, *particle with integer spin obeying Bose–Einstein statistics*, and an item is a token of this type if and only if this condition is met. An item is an *electron* just in case it is of a type that meets the condition, *subatomic particle with negative electric charge*. Since physical types can qualify as functional types, tokens of physical types can be realized in the sense of [R] by tokens of other physical types. This alone is no threat to either Melynk's account of realization or the characterization of Physicalism that relies on it, for nothing in his formulations is meant to preclude tokens of physical types being realized by tokens of other physical types. However, at this point the question does arise: if some physical types are functional in character, and therefore have realizable tokens, can these physical tokens be realized by tokens of non-physical types? Can tokens of physical types be realized by tokens of mental types according to [R]?

The answer is 'yes'. Consider the very general physical type of *having a certain density*. This is a functional type, in Melnyk's sense of 'functional', since there is a condition, C, that must be met (a role to be played) for there to be a token of this type. In this case C is the condition, *instantiated in an item with a certain ratio of mass to volume*, and having density consists in having a property (being of a type) that meets this condition. Now let G be the mental type that includes all and only those *organisms that are sentient*. Although Cartesian egos, and immaterial souls generally, seem to be logically possible, it is not implausible to think, as Physicalism demands, that as a matter of fact all sentient organisms are material objects in physical space, and therefore have a certain density. So assuming that substance dualism is false, for any sentient organism, x, there is a physical token, y, where y is the physical body of x, and (i) body y is a token of type F, a bearer of density, plus (ii) x is a token of mental type G (sentient organism) that meets condition C—the condition of being instantiated in an item with a certain ratio of mass to volume. Also, (iii) the fact that x is of a type that meets C necessitates that there is a token of F (since a token of a type that meets the condition of being instantiated in something with a certain ratio of mass to volume necessitates that there is something with a certain density), and this necessitated token of F is identical with token y. Now, having density is a genuine property and a genuine property of physics,[6] and being sentient certainly qualifies as a mental property. So in the case we are considering, mental token x realizes physical token y on Melynk's account.

This is not an isolated case. In addition to having a certain density, there are a number of very general physical types whose tokens are realized, in the manner described by [R], by tokens of mental types. These physical types include: *being located in physical space*, *having weight*, *having potential energy*, and *containing*

fermions. Each of these is a general feature of physics. And each may be considered a functional type, in Melnyk's liberal sense of 'functional', since having these features consists in playing the right role, or as Melynk says, being of a type that meets a certain condition, C. For the four physical types just mentioned, there is the condition of being instantiated in an item that: occupies space, is subject to gravitational force, has stored energy, and contains elementary particles with ½ integer spin, respectively. Assuming that substance dualism is false, then for any thinking organism x, there is a physical token y, where y is the physical body of x, and the following are true. Token y is of functional type F, where F is one of the physical features mentioned above, x is a token of the mental type, *thinker*, and this mental type meets the condition C associated with F. Also, the fact that mental token x is of a type that meets C necessitates that there is a token y of F, since F consists in having a token of a type that meets condition C. So in each of these cases, mental token x realizes physical token y, according to [R].

The physical types mentioned so far are extremely general in character. However, mental realizing physical in the sense of [R] also occurs in the case of highly specific physical properties. Consider Crick and Koch's (1990) view that mental states are conscious when neurons fire in synchrony at around 40 Hz, or Gray's (1995) account of consciousness in terms of action-predication-assessment loops between the frontal and midbrain areas. Or suppose we decide that the human color center is to be located in the fusiform gyrus of human visual area V4, the ventral occipitotemporal cortex (McKeefry & Zeki, 1997). Or suppose that comprehension of complex grammatical structure is to be identified with a certain type of process in the pars opercularis of the inferior frontal gyrus. Take any one of these specific mind-brain identity claims. Of course, we want to say that the mental process is realized by the corresponding neural process. However, with [R], it seems the converse is also true. Take any token x of any one of those mental types, G, and any token y of the corresponding neural type, F. Mental type G meets whatever condition C is characteristic of F—e.g., the property of *sensing redly* meets the condition, *instantiated in such-and-such activity* (*call it 'V*'*) *in area V4*. Also, the fact that x is a token of a type that meets condition C necessitates that there is a token of neural type F, which is y itself; e.g., there being a token of a type that meets the condition, *instantiated in activity V**, necessitates that there is a token of V* activity. So in this case, a mental token realizes a neural token on Menlyk's account.

Furthermore, each mental item also realizes a process of physics itself. Take any type of color sensation, G, and any instance x of G. Call the way in which G is instantiated at the level of physics, F. F is a functional type with the associated condition, C, of being *instantiated in manner F*. In this case, x is a token of mental type G that meets condition C—i.e., the color sensation is instantiated in manner F—and this fact clearly necessitates that there is a token y of type F. Color sensations are genuine mental properties. Also, we are supposing that F is the way some visual color process is instantiated at the physical level (and it is instantiated physically if Physicalism is true), which implies that F counts as a genuine physical type. So here we have a highly specific physical process being realized mentally according to [R].

One might worry that the cases described in this section are not genuine cases of realization for in these cases condition C is specified by a simple rewording of the description of the corresponding functional property F—e.g., 'has density' is replaced with 'instantiated in an item with a certain ratio of mass to volume' and 'visual activity V*' is replaced with 'instantiated in visual activity V*'. In response to this concern it should be noted, first, that for some of the examples offered in this section it seems that the connection between F and C is not just a matter of wording. While having weight may be a function of the gravitational force exerted on an object, it is doubtful that this is true as a matter of logical or conceptual necessity. If it is a necessary truth, it would seem to be a *synthetically* necessary truth. Secondly, and more importantly, in many cases the connection between a functional property and the associated condition is a conceptual tie, for many concepts are genuinely *functional concepts*. As noted earlier, it is arguably part of the very meaning of 'refrigerator' that a refrigerator is designed to keep its contents cool, and analytic functionalists claim that it is a conceptual truth that a mental state is a state that plays the right functional role with respect to input, output, and other mental states. We do not want to deny that these are genuine cases of realization even if it is true that in these cases F is conceptually tied to C—i.e., that F goes with C solely due to the meaning of the words used to describe F and C. So while it may be that in (some of) the cases of mental realizing physical described in this section, F is conceptually tied to C, this fact should not preclude them from being genuine cases of realization.

The fact that there are cases in which the phenomena of physics are realized by mental phenomena would seem to undermine the prospect of characterizing Physicalism in terms of realization. Physicalists believe that all phenomena occur solely in virtue of physical phenomena. But if a mental token can realize a physical token, then it seems whatever makes it the case that mentality obtains in virtue of physical phenomena, it is not simply that the former is realized by the latter.[7]

Perhaps we can find some other analysis of 'realization', one that plausibly captures the meaning of the term while also avoiding the result that physical phenomena have mental realizers. In the next section, I give reasons to be suspicious.

4. The Functional Model of Realization: The Core Idea

Talk of realization became popular in the philosophy of mind with the rise of *Functionalism*. It became standard practice to think of mental properties as functional properties and also to suppose that the functional role definitive of any one mental property can be played by different physical types. So rather than identifying mental properties with physical properties, functionalists speak of mental properties being *realized by* physical properties—in virtue of the latter playing the functional roles characteristic of the former. In the philosophy of mind, this *Core Functional Model* (as I shall call it) is the standard conception of realization. For instance, Van Gulick says that a mental property is realized when one has "some

set of lower order structural states that . . . play the functional role associated with that mental property'' (1992, p. 162). Papineau writes, ''in order for a mental or other special type M to be realized by an instance of some physical type P, M needs to be a *second-order property*, the property of having some property which satisfies certain requirements R'' (1993, p. 25). Likewise, Heil notes that the pumping thing in your chest ''realizes the functional property of being a heart . . . because it endows the object possessing it with the right sort of causal role'' (1998, p. 97), and Kim explains that DNA molecules realize the property of being a gene in virtue of performing the causal function of transmitting phenotypic characteristics from parent to offspring (1999, pp. 10–11).

The main idea behind this functional view of realization is that

> property G realizes property F (or token x of G realizes token y of F) for individual z at time $t =_{df}$ there is a functional role, R, characteristic of F, and G (or token x of G) plays role R for z at t.

This formulation accommodates different views on the relata of the realization relation, including Melnyk's idea that they are tokens of properties/types as well as the view that the relata are the properties themselves. (Although, there is reason *not* to think, as Melnyk does, that *both* relata are tokens. While Melnyk's account does not require that the realizer is identical with the token that is realized, it does not and should not prevent it either. However, if token x is identical with token y, then thanks to the Indiscernability of Identicals, it is inevitable that if x realizes y, then y realizes x, which seems unacceptable. Also, Polger & Shapiro [2008, p. 214] argue that property-instances, tokens, are not the things realized, for if they were, then *multiple* realizability would be impossible.)

Melnyk's account is a detailed version of the *Core Functional Model* (hereafter, CFM) formulated above. So one might wonder whether the particulars of his version are what give the implausible result that mental phenomena realize physical phenomena, in which case, one might suspect that CFM itself does not yield this result. However, recall the very general physical types mentioned in section 3: *having density*, *located in physical space*, *having weight*, *having potential energy*, and *containing fermions*. For each of these properties, there is a characteristic functional role: having a certain ratio of mass to volume, occupying space, being subject to gravitational force, having stored energy, and containing elementary particles with ½ integer spin, respectively. Barring substance dualism, i.e., assuming that objects with mentality are objects confined to physical space, then for any mental property and anything, x, with that mental property, x exemplifies (at least some of) those general physical properties mentioned in virtue of playing the associated functional roles. Any sentient organism, for example, has density in virtue of having a certain ratio of mass to volume. Being sentient certainly is a mental property, and having density is a genuine, albeit general, physical feature. So, according to CFM, the physical is realized by the mental in this case.

CFM gives the same result even in the case of highly specific physical properties. Suppose that mental type M is the property of sensing redly and that x is some

instance of M. Call the way in which x instantiates M at the level of physics, P. In this case, x instantiates the complex physical property P in virtue of M's playing the functional role, *instantiated in manner P*. Assuming that M is a genuine mental property, and also given the physicalist belief that mental properties depend on physical properties, P is a genuine physical property. Of course, M could be any mental property, where P is the way in which M is instantiated on some occassion at the physical level. So if Physicalism is true (which requires that for each instance of M there is some such P), then whenever a mental property is instantiated, the mental property realizes a highly specific physical property according to CFM.

We have seen that worries about mental realizing physical arise for CFM (the standard approach to understanding realization in the philosophy of mind) as well as for Melnyk's particular version of it. Before drawing any general conclusions about the prospects of Realization Physicalism, we should consider two noteworthy accounts of realization that do not obviously fit CFM.

5. Yablo and Shoemaker on Realization

Consider Yablo's (1992) account of realization in terms of determinates of determinables. On his view, a realized property stands to a realizing property as the determinable color *red* stands to its more determinate color *scarlet* or as the determinable *rectangularity* stands to the determinate *squareness*. Or suppose Shoemaker is right that "property X realizes property Y just in case the conditional powers bestowed by Y are a subset of the conditional powers bestowed by X" (2001, p. 78).[8] The conditional powers conferred by the *belief that it's raining* "include, among countless others, one that can be roughly characterized as *being such that if one wants to keep dry and believes that umbrellas keep off rain, this will result in one's taking an umbrella if one goes out*" (Shoemaker, 2001, p. 82). Suppose that this conditional power, along with all of the other conditional powers conferred at that time by the belief that it is raining, are a subset of those conferred to the individual by her having some physical property P. Then on Shoemaker's subset account, P realizes the belief that it is raining.[9,10]

Neither of these accounts makes explicit reference to a property being exemplified in virtue of a functional role being played (or a certain condition C being met). However, both accounts can easily be rephrased in terms of CFM. Any property G that is a determinate of some determinable F is also a realizer of F according to CFM, since for any determinate G of F, there is a condition that G satisfies in virtue of which it also falls within category F. Scarlet is a determinate of red because any scarlet object satisfies the condition, *reflecting light in the range 650 nm–700 nm*, which is characteristic of redness, and squareness is a determinate of rectangularity because every square satisfies the condition, *having four right angles*, which defines rectangularity. Any case of realization that satisfies Shoemaker's subset account fits CFM as well. For if the conditional powers bestowed by F are a proper subset of the

conditional powers bestowed by G, then G fulfills the role of *including all the conditional powers of F*, in which case, G realizes F according to CFM.[11]

Since cases that fit Yablo's account and Shoemaker's also fit CFM, it should be no surprise that worries about mental properties realizing physical properties arise for both of their accounts as well. Assuming that substance dualism is false, all individuals with emotions occupy physical space, though not all things that occupy space have emotions. It seems to follow that *having emotions* is a determinate of the more determinable, *having spatial location*. This case does satisfy Yablo's description, ''*P* determines *Q* iff: for a thing to be *P* is for it to be *Q*, not *simpliciter*, but in a specific way'' (1992, p. 252), for barring substance dualism, having emotions guarantees having spatial location, and not *simpliciter*, but in a specific way. It seems, then, that in this case the mental property realizes the physical property on Yablo's account. Of course, the same point can be made with any mental property. If Physicalism is true, then for any mental property, there will be certain very general properties of physics (e.g., *having density* and *containing electrons*), such that the mental property is a determinate of the physical property, i.e., a specific way in which the physical property is exemplified. Regarding Shoemaker's account: the conditional powers (e.g., the potential behavioral consequences) of *perceiving an approaching lion* or *believing that one is being stalked by a killer* seem to be at least as numerous as the conditional powers of *occupying space* or *having density* or various other general physical properties—especially if having the mental property guarantees having those general physical properties. So it is arguable that in these cases a mental property realizes a physical property on Shoemaker's account.

Functionalist intuitions entail that *events of different physical types can instantiate the same mental property* since the same functional role can be played by events of different physical types. However, these same functionalist intuitions also entail that *events of the same physical type might instantiate different mental properties*. According to functionalists, it is not the intrinsic character of a physical event that matters to its mental status but its causal connections to other internal events, sensory input, and behavioral output. If so, then by being situated differently in the causal framework, events of the same physical type might instantiate different mental properties. Let us suppose, then, that an event of physical type P can (depending on how it is causally situated) instantiate any of the following mental properties: $M_1, M_2, \ldots$ or M_n. These are different mental ways of being P, just as scarlet, burgundy, and crimson are different ways of being red. So it would seem that $M_1, M_2, \ldots$ or M_n count as determinates of the determinable P.[12] (Of course, since mental properties are multiply realizable at the physical level, any one of $M_1, M_2, \ldots$ or M_n will also be a determinable of the various physical properties that might realize it. Again, we get realization in both directions.)

The core functional model (CFM) is the standard conception of realization in the philosophy of mind. But we have seen that with CFM, and with the accounts of Melynk, Shoemaker, and Yablo in particular, we get the result that mental realizes physical. It remains to be seen whether there is some other acceptable version of CFM that avoids this consequence. Although, one might wonder whether we can actually

accept the result and still successfully define Physicalism in terms of realization. One might wonder whether there is some crucial difference between (i) physical realizing mental and (ii) mental realizing physical, a difference that entails the ontological primacy of physical phenomena. If so, then one can allow (ii) while still being a realization physicalist. Let us consider a few suggestions about what this crucial asymmetry might be.

6. Potential Asymmetries in Realization

Whenever a mental property is exemplified, mentality is realized physically. However, this is not a difference between (i) and (ii). As we have seen, with CFM (and the particular versions of CFM we've considered), it also happens that whenever a mental property is exemplified, the physical is realized by the mental.

One might think that a crucial asymmetry between (i) and (ii) is the *multiple* realizability of mental properties. Since a variety of different physical processes might play the functional role characteristic of any one mental property, each mental property can be realized in different physical ways. One might think that this is what makes physical phenomena ontologically fundamental. But multiple realizability is not a difference between (i) and (ii) either. Just as mental properties are multiply realizable at the physical level, so, too, are physical properties multiply realizable (on CFM) at the mental level. As noted at the end of section 5, the functionalist intuitions that support the idea that events of different physical types can instantiate the same mental property also imply that *events of the same physical type might instantiate different mental properties*. For if it is not the intrinsic character of a physical event that matters to its mental status but how it causally relates to other internal events, sensory input, and behavioral output, then it is possible for events of the same physical type to instantiate different mental properties with a change in their causal relations to other events. And when events of the same physical type instantiate different mental properties, the physical is multiply realized at the level of mentality according to CFM (since in that case each of the mental properties plays the role of being instantiated in manner P, where P is the corresponding physical property).

There is one obvious asymmetry between (i) physical realizing mental and (ii) mental realizing physical. Physical realization occurs not just in the case of mentality. Given Physicalism, it occurs with all concrete phenomena. So the class of physical realizers is far more extensive than the class of mental realizers. In particular, *whenever a mental property is instantiated there is a physical realizer, but not every instance of a physical property has a mental realizer*. This certainly is a difference between (i) and (ii), but is it a crucial difference? Is it an asymmetry that entails that the physical realm is ontologically more fundamental? It is not clear that it is. Suppose that mental properties were *identical* with physical properties. The italicized asymmetry would still obtain. However, if mental properties were identical with physical properties, then it would be misleading at best to say that mental properties are ontologically less basic than physical properties, since in that case, the mental

properties themselves would be physical properties. Moreover, even when F properties are not identical with G properties, the class of G properties being more extensive than the class of F properties does not in itself entail that G properties are more fundamental. For it could be that while Gs often occur in the absence of Fs, in just those cases where Gs are Fs, the G properties are reducible to F properties. So while the class of physical realizers is more extensive than the class of mental realizers, that fact is not what makes the former ontologically more fundamental. It seems, then, that the italicized asymmetry above fails to capture the sense in which mentality is dependent on physical phenomena.

Assuming Physicalism is true, it is arguable that the physical realm is more fundamental in the following sense: *every mental item is at some level of structure comprised of physical items none of which are mental, but physical items are not at any level of structure comprised of mental items that are non-physical*. This *compositional* asymmetry is one clear sense in which physical phenomena are ontologically more basic than mental phenomena. This asymmetry, however, is not a consequence of realization itself. For one can consistently believe that mentality is realized physically (as depicted by CFM or some specific version of it) without accepting the italicized compositional claim. One can consistently believe, for example, that while physical properties realize mental properties, some mental properties are identical with certain fundamental properties of physics, which entails that instances of mental properties are not always comprised of any simpler non-mental items. Why one would want to accept such an idea is beside the point. The point is that since one can consistently hold that mental properties are realized by physical properties while rejecting the compositional claim, the latter is not a consequence of the former. So while the compositional claim expresses a sense in which mentality obtains in virtue of physical phenomena, this is not a consequence of the fact that the former is realized by the latter. So the compositional asymmetry is not one that is captured by talk of realization itself.

It is possible to simply add to our account of realization some additional constraint that does entail that physical phenomena are ontologically fundamental. For example, after giving his analysis of realization (definition [R]), Menlyk adds an account of what it is for a functional property to be *physically* realized. He claims that a "token *y* of a functional type, F, is *physically realized*" if and only if (1) "*y* is realized . . . by a token of some physical type, T" and (2) "T meets the special associated condition for F solely as a logical consequence of (a) the distribution in the world of physical tokens and (b) the holding of physical laws" (Melnyk, 2006, pp. 130–131). Satisfying (1), i.e., being realized by a token of a *physical* type, would seem to be enough to say that the token is *physically* realized. However, Melynk recognizes that a physical token might realize in a way that is unacceptable by physicalist standards. That is why he includes conjunct (2). This *truth-making* condition, as Melnyk calls it, precludes cases where the playing of the functional role "is *miraculous*, in the sense that" the physical token "behaves in ways not required by, or even contrary to, the laws of physics" (2003, p. 22), and cases in which a

functional type is tokened only when certain non-physical conditions obtain—e.g., "the presence in Australia of five angels" (2003, p. 23).

Condition (2) does seem to describe a way in which mentality obtains in virtue of physical phenomena. For while we might accept (2), we certainly would not accept its mental counterpart—i.e., while it is arguable that the totality of physical facts fixes all the mental facts, the totality of mental facts certainly does not fix all the physical facts. However, it seems that condition (2) is not part of the concept of realization itself. One can hold that mentality is realized at the physical level (in the sense of CFM or Menlyk's [R]) without believing that the physical facts alone determine the mental facts, for one might think that P realizes M in virtue of playing the functional role R definitive of M without believing that playing role R is entirely a function of physical facts (perhaps thinking there's an irreducible element of subjectivity to playing R). Regardless of whether one should accept such a view, the view is compatible with the idea that mentality is realized at the physical level. So while (2), the truth-making condition, expresses a way in which mentality is ontologically dependent on physical phenomena, (2) is not part of the notion of realization itself. Rather than being part of the notion of realization, (2) expresses a kind of *supervenience* claim, for saying that the physical facts necessitate the mental facts is equivalent to saying that physically indistinguishable individuals/worlds are mentally indistinguishable. (Although, see how Melnyk [2003, chapter 2] contrasts the truth-making condition provided by (2) with standard versions of supervenience.)

7. Conclusion

Melynk claims that Physicalism "can be formulated using only the notion of realisation; neither claims of supervenience nor claims of token identity nor disjunctive definitions . . . play any part whatever" (1996, p. 390). In section 3, it was shown that on his account, [R], not only do physical phenomena realize mental phenomena but that the latter realize the former as well. So it would seem that whatever makes it the case that mental phenomena obtain in virtue of physical phenomena, it is not that the former are realized by the latter—at least on Melnyk's account of realization.

Melnyk's account is an instance of what I called the Core Functional Model (CFM) of realization, which is the standard view of realization in the philosophy of mind. In section 4, it was shown that CFM itself (and not just Melnyk's particular version of it) yields the result that mental realizes physical. Shoemaker's account and Yablo's, both of which can be viewed as instances of CFM, also have this consequence.

If we can isolate a crucial difference between cases of (i) physical realizing mental and (ii) mental realizing physical, then there may be reason to think that a realization-based account of Physicalism can succeed. We considered some suggestions regarding crucial differences in section 6—i.e., (a) there being a physical realizer in every instance of mentality, (b) the multiple realizability of mental properties, (c) the class of physical realizers being more extensive, (d) the

asymmetrical composition of mental items by physical items, and (e) the physical facts fixing the mental facts. It was shown that in cases (a) and (b), the putative difference is not a difference at all; in case (c) the difference does not entail the primacy of the physical realm; and in cases (d) and (e), the difference is not one that follows from the concept of realization itself.

It has not been proven here that Realization Physicalism can never succeed. However, some serious concerns have been raised, concerns that need to be addressed by those who think Physicalism is adequately captured with the notion of realization.

Notes

[1] In this paper, I speak of *mental* rather than *psychological* properties simply because I wish to include the features of "folk psychology," assuming these exist, while remaining neutral on the issue of whether folk psychological concepts should figure in the science of psychology.

[2] In section 2, two reasons are noted for *not* viewing both the realizer and the realized as tokens; one of these reasons is given by Polger and Shapiro (2008).

[3] What follows '[R]' are Melynk's exact words, although he uses the label '[RP-R],' where 'RP' abbreviates 'Realization Physicalism'.

[4] One might think that a mental event is not identical with the constituent neural event for the same reason one might believe that a statue is not identical with the constituent lump of clay—namely, the mental episode (statue) has *different persistence conditions* than the neural event (lump of clay). For example, an item can continue to be the same neural event (lump of clay) while ceasing to be a mental episode (statue).

[5] For an earlier and underdeveloped attempt to show that the mental can realize the physical, see Francescotti's (2002), prior to Melnyk's (2003, 2006) elaborate account of Realization Physicalism.

[6] According to Melnyk, a type is *physical* "iff *either* it is expressed by some positive predicate (e.g., 'is an electron', 'has charge') used in the formulation of the theories of current physics *or* it is expressed by some predicate constructable out of the positive predicates of current physics via the use of such predicate-forming machinery as the language of physics already contains, as well as of (possibly infinitary) conjunction and disjunction, and negation, so long as (i) the constructed predicate does not express a necessary property (e.g., that of either being a quark or not being a quark) and (ii) the constructed predicate is not entirely negative" (2003, p. 18).

[7] The non-physical realizing the physical is not only found in the case of mentality. If mental phenomena can realize the stuff of physics, then it should be no surprise that chemical and biological phenomena can do so as well. Consider, for example, a token x of the biological type, *tendon*, and suppose that x instantiates in manner P at the level of physics. In this case, x is of a biological type that meets the condition, C, of being instantiated in manner P, and meeting this condition necessitates that there is a token of P. So according to [R], biological tendon-token x realizes a token of a physical type. However, showing problems for Realization Physicalism with respect to all properties outside the domain of physics is too ambitious a project for a single paper. So the goal here is only to show problems for Realization Physicalism where mental properties are concerned.

[8] Shoemaker also requires that "X is not a conjunctive property having Y as a conjunct" (2001, p. 78). Without this constraint, realization would be too easy to come by. For any property F and any other property G, the conjunction F & G would realize both F and

G. However, Shoemaker later comes to realize that a *total* ban on conjunctive properties as realizers is too strict (see his 2007, pp. 26–28).

[9] Shoemaker also expresses his subset view of realization with the notion of a *forward-looking* and a *backward-looking* causal feature: ''one property realizes another if the set of its forward-looking causal features contains as a subset the forward-looking causal features of the other, and the set of its backward-looking causal features is a subset of the backward-looking causal features of the other'' (2003, p. 3).

[10] A major goal of Yablo and Shoemaker in presenting their accounts of realization is to solve the exclusion problem introduced by Kim (e.g., 1989, section V), the worry that if mental properties are not reducible to physical properties, then any mental property is excluded from being a cause by the underlying physical property. ''The subset account,'' Shoemaker notes, ''obviously avoids the threat that the causal role of the realized property will be preempted by its realizers'' (2007, p. 13). For on this account, we do not have to view mental property M as vying with physical property P as the cause of, say, behavior B; rather the causal powers bestowed by M are included among those bestowed by P. And regarding Yablo's account: ''determinates do not contend with their determinables for causal influence'' (1992, p. 259) since the determinable simply abstracts away causally irrelevant detail and therefore contains just that part of the determinate that is sufficient for the effect.

[11] Endicott (2006) cites Yablo's account and Shoemaker's as examples of what he calls the ''metaphysical'' tradition to understanding realization. Endicott mentions two other traditions. What he labels the ''logic-semantic'' tradition views realization as an interpretation of symbolic objects. Applied to mental properties, the position is that ''a set of mental properties that constitutes a system's cognitive program is realized by a set of engineering properties possessed by that system if and only if (a) the system's behavior supports an interpretation according to which instances of the computational properties are internal symbols involved in the operations of the system, and (b) it is rational for the system to possess those symbols and operations under the stated interpretation'' (Endicott, 2006, p. 428). Here, too, we have a version of the core functional approach, where the functional role is matter of satisfying some interpretation. What Endicott calls the ''mathematical'' tradition equates realization with a form of mapping between objects. In general, x realizes y because elements of y map onto the elements of x. However, the mere existence of a mapping, Endicott notes, does not distinguish between simulated and genuine realization. To guarantee genuine realization, Endicott suggests that one cite facts about causal structure, which gives the view that ''a set of mental properties that constitute the cognitive program of a system is realized by a set of engineering properties possessed by that system if and only if (a) there is a one-to-one mapping between instances of the two sets of properties, and (b) the engineering included has the causal structure to satisfy the computational state transitions required by the program'' (2006, p. 428). With the addition of (b), the mathematical approach also fits CFM.

[12] On another formulation, ''*P* determines *Q* . . . only if (i) necessarily, for all *x*, if *x* has *P* then *x* has *Q*; and (ii) possibly, for some *x*, *x* has *Q* but lacks *P*'' (Yablo, 1992, p. 252). For the example to fit this description, we can think of the properties *P instantiated in* M_1, *P instantiated in* M_2, . . . and *P instantiated in* M_n, each of which is sufficient for being P.

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