REALIZATION*

Giovanna Hendel

Department of Philosophy
University College London
G.Hendel@ucl.ac.uk

SUMMARY: So far no clear explication of the notion of realization has been offered, in spite of the frequent uses of the notion in the literature to discharge important jobs, such as that of accounting for the causal efficacy of the mental in a physical world, and that of providing a viable characterization of physicalism, and/or psychophysical reduction. I put forward an account of realization as an *identity-like relation*. I argue that such account has the following advantages: (a) it provides a picture under which it makes sense to use the same term, i.e. 'realization', to pick out relations that differ in their relata, as it happened in the original uses of the term 'realization'; (b) it helps to understand how well, if at all, some appeals to realization in the literature can discharge the jobs mentioned; (c) more generally, it makes clear what realization can do.

KEY WORDS: realization, identity-like, reduction, mental causation, physicalism

RESUMEN: Hasta el momento no se ha expuesto detalladamente ninguna explicación clara de la noción de realización, a pesar de que se usa con frecuencia en los textos filosóficos para desempeñar funciones importantes, como explicar la eficacia causal de lo mental en un mundo físico, y proporcionar una caracterización viable del fisicalismo, y/o de la reducción psicofísica. Presento una explicación de la realización como una *relación del tipo de la identidad*. Sostengo que tal explicación tiene las siguientes ventajas: (a) ofrece una caracterización dentro de cuyo marco resulta razonable usar el mismo término, *i.e.*, "realización", para distinguir relaciones que difieren en sus *relata*, como sucedió cuando se usó originalmente el término "realización"; (b) ayuda a comprender hasta qué punto la realización que se invoca en algunos textos filosóficos puede desempeñar correctamente las tareas mencionadas; (c) más en general, aclara qué puede hacer la realización.

PALABRAS CLAVE: realización, tipo de la identidad, reducción, causación mental, fisicalismo

The notion of realization has been around for quite a while in the philosophy of mind. Surprisingly, however, there are not many philosophers who offer a clear explication of this notion. I think that a lot could be gained by such an explication. This is because the rôles realization is made to play are crucial. Among such rôles (or jobs, hereafter referred to as 'the Jobs') features, for instance, that of accounting for the causal efficacy of the mental in a physical world; and/or that of providing a viable characterization of physicalism, and/or psychophysical reduction. It is, then, important to be given the opportunity of properly addressing the question of how well, if at all, the Jobs can be discharged, by being provided with a clear understanding of realization.

In this paper I want to put forward my own suggestion for how realization should be understood, trying to provide the best possible understanding with respect to the discharging of the Jobs. In a nutshell, my suggestion is to understand realization as, essentially, an *identity-like relation* in the sense to be explained.[1] The understanding of realization as an identity-like relation (henceforth 'RIL') has, in my opinion, the following advantages:

(a) It provides a picture under which it makes sense to use the same term, i.e. 'realization', to pick out relations that differ in their relata, as it happened in the original uses of the term 'realization'.

(b) It helps to understand how well, if at all, some appeals to realization in the literature can discharge the Jobs.

(c) More generally, it makes clear what realization can do.

Claim (a) is supported by section I, where I introduce RIL. Claims (b) and (c) are supported in sections II and III, where RIL is made more specific by considering the Jobs and some appeals to realization to discharge them.

---

[1] The first introduction of the term 'identity-like' is —as far as I know— to be credited to Stephen Yablo. (See Yablo 1987. Also, Sidelle 1992.) I am, however, responsible for the definition and use of the notion which follow in this paper.

I

The first uses of the notion of realization in the philosophy of mind are associated with classical papers such as Putnam (1960), Block & Fodor (1972), and Lewis (1972). Reading these papers, one is confronted with an interesting phenomenon. The ontological categories of the relata of the relation of realization are quite miscellaneous. In Putnam (1960), for example, we find, on the realized hand, conjunctions of properties by which Turing machines can be characterized,[2] and, on the realizing hand, those devices that, by possessing any of the conjunctions of properties in question, can be said to implement one of the machines. These are the relata also in Block & Fodor (1972). There, however, we find also types of states as relata on both hands. Finally, in Lewis (1972), realization is claimed to hold between, on the one hand, ways of picking out entities which go from individuals to "sets, attributes, species, states, functions, relations, magnitudes, or what have you",[3] and, on the other hand, the entities themselves.

Given this variety, one can wonder whether it is possible to provide a unifying picture under which it makes sense to use the same term, i.e. 'realization', to pick out relations that differ in their relata. We are now going to see that this is, indeed, (part of) what can be achieved by adopting the account I want to defend.

The core of my proposal is to understand realization as an *identity-like relation*. An identity-like relation is a relation that resembles identity in that its relata share, when considered in one world or in a set of possible worlds, all their non-modal properties, i.e. all their properties which are not to be understood by reference to worlds other than the one/s considered.

Let me explain that by offering an example. Suppose that a statue (call it 'Statue') is constituted by a portion of clay (call it 'Clay') that came into existence at the very moment at which the

---

[2] The conjunctions in question are of the form: *Being disposed, when in state S_1, to go into state S_2, & being disposed, when in state S_2, to go into state S_3, &...*

[3] Lewis 1972, p. 210.

statue came into existence, and that is destroyed by destroying
the statue at some point.[4] (We may suppose that both Statue
and Clay came into existence by the putting together of two
smaller portions of clay, and that they go out of existence as
a result of an atomic explosion.) In the world w where Statue
is constituted by Clay, Statue and Clay share a good deal of
their properties: shape, colour, location, etc. In fact, the only
properties they don't share are properties such as that of *being
essentially a statue*, or that of *being essentially composed of a
determinate number of atoms N*. These are properties which are
to be understood by reference to worlds other than w. For an
object is essentially a statue iff it is a statue *in all* the possible
worlds where it exists; and an object is essentially composed of
a determinate number of atoms N iff it is composed of such a
number of atoms *in all possible worlds*. So, the constitution of
Statue by Clay can be taken as an example of an identity-like
relation.[5]

   Statue and Clay are particulars. How are we to understand
the notion of identity-like relation when the relata are prop-
erties? In such a case, I suggest, the relata share one crucial
property: the property P of *being instantiated by the particu-
lars* $x_1, x_2, \ldots, x_n$, where $x_1, x_2, \ldots, x_n$ stand for the particulars
instantiating the relata in one world, or in a world-portion, or in
a set of possible worlds,[6] where the two properties are, in fact,

---

   [4] Cf. Gibbard 1975. I am, however, following Thomson (1998) in speaking
of a *portion*, as opposed to a *piece*, of clay —taking a portion of clay to be
essentially identified by a determinate amount of clay, whereas one can have
the same piece of clay even if the amount of clay varies slightly. (See Gibbard
1975, p. 95. Also, cf. Baker 1999, note 20.)

   [5] I'm here adopting a way of presenting the situation close to some ways
as opposed to others of understanding constitution. (For some relevant under-
standings of constitution, see, e.g., Baker 1997; 1999; Melnyk 1995; or, indeed,
Yablo 1987, Sidelle 1992 —although all these understandings also differ from
each other in important respects.)

   [6] This disjunction corresponds —as we are going to see shortly— to vari-
ous specific ways of understanding an identity-like relation between properties.
The notion of *world-portion* is best understood by conceiving of possible worlds
as sets of maximally possible states of affairs (as in Plantinga 1976); a *world-
portion* can be thought of as a subset of a set of this kind.

co-extensive.[7] Arguably, the instantiation of P by two properties ensures their indiscernibility in all their properties which are non-modal in the sense above.[8] We can then understand an identity-like relation between properties as a relation where the relata share P.

That amounts to understanding an identity-like relation between properties as a relation of overlapping between the sets of the instances of the relevant properties. For, given our understanding of P, whenever two properties stand in an identity-like relation, some of their instances will coincide.

It now begins to be possible to see —I hope— how by understanding realization as an identity-like relation we can provide the kind of picture mentioned at the beginning of this section, that is a picture under which it makes sense to use the same term, i.e. 'realization', to pick out relations that differ in their relata, as it happened in the original uses of the term 'realization'. The idea is to regard the relevant relations differing in their relata as different ways of describing a single situation, i.e. the 'overlapping situation' which has just been brought out by our explication of the notion of identity-like relation between properties. This overlapping situation can be described as a case of realization between properties, taking the overlapping properties to be the realizing and the realized properties, and, also, as a case of realization between a property and some particulars, taking the realizing particulars to be the coincident instances. We can then choose to regard either of the relations, i.e. that between

___

[7] Example: Take the two properties standing in an identity-like relation to be A and B. And suppose that A and B are co-extensive only when considered in w, which is a world inhabited only by the particulars x_1, x_2, and x_3, and where x_1 and x_2 are both A and B, whereas x_3 is neither A nor B. The relevant property P in this case is that of *being instantiated by x_1 and x_2*, and both A and B possess this property.

[8] I can't argue for this claim here because the development of an argument for it would be a major undertaking on its own, requiring, to be fully supported, the defence of the rejection of certain views of properties. My failure to provide an argument, however, does not affect what's going to follow. For even if the claim in the main text could not be defended, the picture that I'll put forward would still hold good. What would have to change would be only my way of formulating the notion of identity-like relation for properties.

properties and that between a property and some particulars, as
primary. We can, for example, choose to regard realization as
primarily the relation that holds between properties in our over-
lapping scenario. The realized property can then be regarded as
realized, also, derivatively, by the coincident particulars. If we
do decide to look at things in this way (and, in fact, I think
that it would be a good idea to do so, in the light of the uses of
realization that we are going to consider in the next sections),
the understanding of realization put forward is that of realization
as (primarily) an identity-like relation between properties.[9]

What needs to be done now is some work to make this under-
standing more specific. In particular, it is necessary to distin-
guish between different forms that the overlapping under discus-
sion can take. Each form corresponds to a determinate scenario
which can, in turn, be paired up with a specific understanding,
as opposed to others, of the idea of realization as an identity-like
relation. Which understanding is the most suitable with respect
to the discharging of the Jobs is something that will be con-
sidered in the next sections. For the moment, let me begin by

---

[9] What about the case featuring in Lewis (1972) of realization between
ways of picking out individuals (e.g. 'the murderer of Jones') and individuals;
and between ways of picking out properties of properties (e.g. 'the property of
being a property characterized by a causal role of type R') and the properties
possessing the relevant property of properties?

In the first case, we can still regard the relevant way of picking out indi-
viduals as corresponding to a set: the set of the individuals picked out in all
possible worlds by such way of picking out individuals. We can then regard
these individuals as the relevant realizers insofar as they belong to the relevant
set. (And we would still have a case of identity-like relation between properties
if with each individual we associate a property, e.g. the conjunction of all the
essential properties of the individual in question.)

Similarly, in the second case, we can still regard the way of picking out
properties of properties as a set: the set of the properties possessing the rele-
vant property of properties. And we can then regard the properties belonging
to this set as the relevant realizers in virtue of their being members of the
set in question. (We would still have a case of identity-like relation between
properties. The realized property would, this time, be the property picked out
by the relevant way of picking out a property of properties; the realizing prop-
erties would be properties corresponding to sets whose members are properties
of properties which can, at least in some possible worlds, be picked out using
the way of picking out properties under discussion.)

laying out, in the remaining of this section, the various possible scenarios corresponding to various possible ways of couching the idea that realization, and, in particular, the realization of a mental property M by some physical property, can be understood as an identity-like relation.[10]

Scenario 1: The set of all the actual and possible M instances coincides with a set identical to the set of the instances of some physical property. If one takes a property to be the set of its actual and possible instances,[11] the present Scenario becomes a case of identity between a mental property and a physical property; and if the present Scenario is taken as a case of psychophysical realization, and, indeed, of an identity-like relation, psychophysical identity becomes a special case of the latter.

Scenario 2: The set of all the actual and possible M instances (or at least of the M instances in a determinate set of possible worlds; or in a single possible world; or in a portion of possible world) can be exhaustively divided into subsets each of which is a set identical to the set of the instances of some physical property (or at least of the instances of some physical property in the set of possible worlds under consideration; or in the single possible world under consideration; or in the portion of possible world under consideration). In what follows, I'll speak of 'Scenario 2a', 'Scenario 2b', etc., to refer, respectively, to: (a) the case where what we are considering is the set of all the actual and possible M instances; (b) the case where what we are considering is the set of the M instances in a determinate set of possible worlds; (c) the case where what we are considering is the set of the M instances in a single possible world; (d) the case where what we are con-

---

[10] If psychophysical realization is conceived of as a one-many relation between a mental property and some physical properties, the relevant idea will be that the realization of a mental property M by some physical properties P_1, P_2, P_3, etc. can be understood in terms of a *group* of identity-like relations, holding between M and P_1, M and P_2, M and P_3, etc.

[11] See, e.g., Lewis 1983; 1986.

sidering is the set of the M instances in a portion of possible world.

Scenario 3: The set of all the actual and possible M instances is a subset of a set identical with a set of instances of some physical property.

Scenario 4: The set of all the actual and possible M instances (or at least of the M instances in a determinate set of possible worlds; or in a single possible world; or in a portion of possible world) can be exhaustively divided into subsets each of which is a set identical to a *subset* of the set of the instances of some physical property. I will use the letters a, b, c, d as above.

Scenario 5: *Some* subsets of the actual and possible M instances are sets each of which is identical to the set, or a subset of the set, of the instances of some physical property. (Cf. Scenario 2 and Scenario 4.) Some other subsets of the actual and possible instances of M, however, are not sets of this kind. They are, rather, sets each of which is identical to the set, or a subset of the set, of the instances of some non-physical property.

Some would be unhappy with taking Scenarios 1 and 3 as even special cases of realization. For many take realization to be necessarily a one-many, asymmetric relation; for them realization is to be understood as, at least potentially, *multiple* realization. Let me then point out that for these people Scenarios 1 and 3 can be ruled out as inadequate for realization right from the start, i.e. even before considering how they fare with respect to the Jobs.

It can then be objected that even the remaining Scenarios are inadequate as accounts of realization. For —the objection goes— there can be instances of such Scenarios that we want to regard as cases of causation rather than realization. So, for example, we may have a law to the effect that all (or some) instances of a physical property P cause the instantiation of a mental property M, and the same holds for some other properties P' and P''. In all the nomologically possible worlds by reference to our world, the relevant instances of P, P', and P'' will thus be accompanied by the instantiation of M, as in Scenarios 2b, 4b, or 5b. Still,

ex hypothesi, M is *caused* by P, P', P''; we don't want to say that it is *realized* by P, P', P''.[12]

My reply to that is to deny that cases of the kind considered are, in fact, instances of our Scenarios, thus having to be counted as cases of realization, under the assumption that our Scenarios are adequate as accounts of realization. Property overlapping is, necessarily, *simultaneous* co-instantiation of the relevant properties, whereas causation involves (at least typically) a time gap between the cause and the effect. So, to revert to our example, although we can say that the relevant instantiations of P, P', P'' are 'accompanied' by the instantiation of M, this is not the right kind of 'accompaniment' to have a case of our Scenarios.

If not causation, there are, however, cases of another kind that could, problematically, count as instances of our Scenarios if we didn't add some further constraint on how the latter should be understood.[13]

Consider, for example, the often cited coincidence, in our world, of creatures having kidney with creatures having heart. We can further suppose that similar coincidences, but with organs other than kidney, hold in all the other possible worlds. In this way, we would have a Scenario of type 2a, 4a, or 5a. Still, we don't want to say that the property of *having a kidney realizes* the property of *having a heart*.

What is the missing feature, in the relation between *having a kidney* and *having a heart*, that prevents us from saying that *having a kidney* realizes *having a heart*?

To find that out, consider a case where we would, by contrast, say that realization holds: This is the classical case of the relation between a second-order property M of *having a property*

---

[12] I owe this objection to an anonymous referee for *Crítica*. In the example given by the referee, the causal property is actually accompanied by two properties, one of which is then assumed to be causally inert. However, this doesn't seem to me to add any bite to the objection. So, I have simplified the example in this respect. On the other hand, I've introduced the idea of multiple causal properties to make the case as close as possible to the Scenarios under discussion.

[13] This point has been brought out, once again, by the mentioned referee for *Crítica*.

that occupies a determinate causal rôle R and a property *P*
that occupies such causal rôle. What is crucially missing in the
heart/kidney case that is not missing in this latter case?

One possible answer is to point out that the instantiation of
M, when *P* occupies the causal rôle definitive of *M*, is entailed
by (a) what '*M*' and '*P*' mean and refer to, and (b) the fact
that *P* is instantiated, and (c) the fact that, in the context under
discussion, whatever instantiates *P* satisfies conditions sufficient
for identifying *M* with *P* on those occasions on which *P* satisfies
the conditions in question. In the heart/kidney case the relevant
condition of type (c) is not satisfied. I then propose to add the
following constraint to our candidate accounts of realization: Our
Scenarios are to be understood in terms of identity-like relations
where the instantiations of the *M* type properties are entailed
by (a) the meaning and reference of the predicates used to pick
out the *M* type properties and the subsets into which the sets
of instances of the *M* type properties are exhaustively divided;
and (b) the fact that one of the properties corresponding to such
subsets is instantiated; and (c) the fact that, in the context un-
der discussion, whatever instantiates such property ('our subset
property') satisfies conditions sufficient for identifying a relevant
M type property with our subset property on those occasions on
which the subset property satisfies the conditions in question.[14]

Let me now consider which, among the candidate Scenarios,
is the most suitable to discharge the Jobs. By addressing this
question, it will be possible to bring out what realization can do.

I'll first consider how realization fares with respect to the Jobs
of providing a viable characterization of psychophysical reduc-
tion, and of accounting for the causal efficacy of the mental
in a physical world. I'll do that by focusing, in particular, on
Kim's appeal to realization to discharge these Jobs. I'll com-
pare Kim's way of conceiving of realization with the various
conceptions corresponding to the Scenarios. This will help to

---

[14] As we shall see, my candidate accounts of realization have thus now
become very close to Kim's account (to be considered in section II). As I
intend to show in the following sections, it is, however, still worthwhile putting
things in my terms to make clear what realization can do.

understand what are the strengths and weaknesses of realization, under each of these specific understandings, with respect to the discharging of the relevant Jobs. As a result of that, it will be possible to make out, and carve the details of, the best understanding. In section III, I'll carry out the same kind of job by focusing on Melnyk's appeal to realization to provide a viable characterization of physicalism.

II

What Kim dubs *Physical Realizationism* is put forward —in Kim 1998—[15] as a viable characterization of psychophysical reduction, and as a good way of accounting for the causal efficacy of the mental in a physical world.

By *Physical Realizationism*, Kim means *"[. . .] the view that the mental must be physically realized —that is, there can be no non-physical realizations of mental properties"* (p. 12). Realization is understood as the relation that holds between a second-order property and the first order property/ies satisfying the condition used to define the second-order property, taking the notion of second-order property to be defined as follows:

F is a *second-order property* over set of base (or first-order) properties iff F is the property of having some property P in such that $D(P)$, where D specifies a condition on members of (p. 20).

As examples of second-order properties, Kim cites: (1) the property of *having a primary colour*, thought of as the property of having a property P, in a set of properties comprising colours, such that $P =$ red or $P =$ blue or $P =$ green; (2) the property of *being jade*, thought of as the property of being a mineral that is pale green or white in colour and fit for use as gemstones or for carving; (3) the property of *being water-soluble*, thought of as the property of having some property P such that when what has such property is immersed in water P causes it to dissolve.

---

[15] This is Kim's piece of work that I'll focus on; it's where Kim's appeal to realization to discharge the Jobs discussed is most fully developed. (All page references will be to Kim (1998) unless otherwise stated.)

The claim that Physical Realizationism provides a viable characterization of psychophysical reduction is supported by first individuating a set of necessary, and, taken together (presumably)[16] sufficient conditions for reduction; and then by arguing that if Physical Realizationism holds, these conditions are satisfied in the psychophysical case.

Here are the conditions:

(a) *Reduction must achieve some ontological simplification.* When reduction holds, our picture of the world can be simplified from an ontological point of view, insofar as we can countenance less kinds of entities than the ones that there would be if reduction did not hold. And when this does not result from the elimination of some kinds of entities, the ontological simplification is achieved rather in virtue of identity relations: What an identity statement tells us is that instead of there being two entities corresponding to the two relata, there is in fact just one.[17]

(b) *The reduced must not "bring into the world" new causal powers, in addition to the ones brought in by the reducer.* This follows from (a). For if an entity x brings into the world new causal powers, in addition to the ones brought in by an entity y, x cannot be identified with y, nor can it be eliminated from a satisfactory account of the world.

(c) *The reduced must be explainable by the reducer.* This is actually a condition already present in Nagel (1961). And, as Kim points out, explanation is, in Nagel, understood in terms of the D-N model. In accordance with it, if our explananda are the mental facts, we have an explanation if, for every mental fact, or instantiation of mental property,

---

[16] There is actually no point in the text where Kim says explicitly that the conditions discussed are supposed to be sufficient for reduction. I think, however, that it is safe to take him to believe so, for the conditions under discussion are the only ones he appeals to in arguing for Physical Realizationism as reduction.

[17] That this is what Kim has in mind when he speaks of 'ontological simplification' can —I think— be gathered especially from what he says on p. 97.

Mx, a conditional of the form $\Box\,(\forall x)(Px \to Mx)$ holds, where P stands for some physical property. By contrast, Kim insists that this is not sufficient for (the relevant) reduction; for the mental facts to be reducible to the physical facts, it is necessary that the mentioned conditionals themselves be explainable by physical facts (and identities involving physical properties).[18] Although agreeing with Nagel in the core idea of the explainability of the reduced by the reducer, Kim's version of this idea sets a more stringent requirement on reduction than Nagel's.[19]

The claim that if Physical Realizationism holds, conditions (a)–(c) are satisfied in the psychophysical case is supported by the following considerations: If Physical Realizationism holds, mental properties are second-order properties whose defining condition is satisfied by physical properties. When, on some occasion, it is a particular physical property P that satisfies the defining condition for a mental property M, we can say that *being P* on that occasion *is being M* on that occasion. For, given that M is a second-order property, it is definable as *the property of having some property X such that D(X)*, where D specifies some determinate condition. And, given that on the occasion under discussion it is P that satisfies D, M will be the property of *having P*. That provides us with appropriate identity relations to achieve ontological simplification, thus satisfying (a).[20] Moreover, given the mentioned relationship between (a) and (b), also (b) will be satisfied. Finally, concerning (c), the identities above provide an explanation for conditionals of the form $\Box\,(\forall x)(Px \to Mx)$, where the *xs* are those individuals

---

[18] To make that clearer, consider this example of a case of satisfaction of the requirement under discussion: If M is the second-order property of *having a property that occupies the causal rôle R*, and P is a physical property that occupies R, then the fact that $(\forall x)(Px \to Mx)$ is explainable by reference to the physical features of P and the physical laws that make it the case that P occupies R, and by the consequent fact that, on the occasions on which it is P that occupies R, M is identifiable with P. (More on that below.)

[19] For discussion in the text relevant to (c), see p. 95 ff.

[20] See esp. pp. 98–99.

which instantiate P on the occasion/s on which P satisfies the defining condition for M. For, as Kim says, "identity takes away the logical space in which explanatory questions can be formulated". To questions of the form 'Why is it that whenever X, Y?', there is no better, or conclusive answer than 'X *is* Y' (p. 98.)[21]

So far so good, I think, but only if the reducer and the reduced of the reductive relation that is claimed to hold in virtue of the relata being identical are not P and M in general, but, rather, *P-on-occasion/s-o/s and M-on-occasion/s-o/s*, where occasion/s o/s stand/s for the occasion/s on which P satisfies the condition definitive of M. For, once we allow —as Kim does— for the possibility of multiple realization, M in general (as opposed to M on some occasion/s) can't be identical to any one in particular of the physical properties that satisfy the relevant condition.

Kim can avoid being worried about that insofar as, with respect to M-in-general, he goes eliminativist. According to him, and for reasons which I'm not going to consider here, the predicate M does not pick out a property. If so, the ontological simplification of condition (a) can be achieved by the elimination of the reduced, and condition (b) will, *a fortiori*, be satisfied too.[22] As for (c), it can be argued that the satisfaction of the condition of full physical explainability of the mental facts is ensured by Physical Realizationism in virtue of the fact that, for every instantiation of a mental property, an identity relation of the kind above holds —i.e. every instantiation of M on some occasion o is identical to the instantiation of some P on occasion o.

---

[21] This is not to say that Kim's claim that "identity takes away the logical space in which explanatory questions can be formulated" holds good in any context. Whether it does depends, of course, on the explanandum. I think, however, that at least in this specific case (of a conditional of the form $\Box\,(\forall x)(Px \to Mx)$) Kim is right in taking identity (of P and M) to be explanatory.

[22] Actually, this is a bit putting things in the wrong order. For M's alleged failure to pick out some distinguishing causal powers features rather among the reasons for eliminating the 'property' M —or, in other words, for refusing to countenance a property M in our ontology. Whatever comes first, anyway, between conditions (a) and (b), one will follow from the other.

For that, however, to be the case, Physical Realizationism must be understood, contrary to what Kim does,[23] as essentially characterized by a strong modality. This comes out with particular clarity if we understand Physical Realizationism by reference to our Scenarios. I am, then, now going to show how this can be done.

First, it should be clear that, by requiring all the mental properties to be realized by physical properties, and by understanding realization in terms of the notion of second-order property as above, Physical Realizationism can be understood in terms of some kind of overlapping between mental and physical properties. For, if the conditions definitive of mental properties are satisfied by physical properties, there will be groups of individuals which are instances of mental properties and instances of physical properties. What remains to be established is what kind of overlapping in particular is the one captured by Physical Realizationism —or, in other words, which, among our Scenarios, is the one corresponding to Physical Realizationism.

Given that Physical Realizationism is meant to be compatible with Multiple Realization, Scenarios 1 and 3 are no good. What about Scenario 5? Well, if we want Physical Realizationism to ensure the satisfaction of (c) by way of the kind of identities mentioned, Scenario 5 is no good either, as a proper match for Physical Realizationism. For, under Scenario 5, there will be some instances of M which are not instances of a physical property. So there will be some mental facts which are not explainable by physical facts by way of the kind of identities mentioned (or 'by way of identity', for short). If we want Physical Realizationism to ensure the satisfaction of (c) by way of identity, the Scenario corresponding to Physical Realizationism must then be one under which all the instances of mental properties are instances of physical properties —which is another way of saying that Physical Realizationism must be characterized by a strong modality.

That leaves us with Scenarios 2 and 4. Following Kim's characterization of Physical Realizationism, we should rule out Sce-

nario 2a. For, under Kim's characterization of Physical Real-
izationism, the situation captured by this latter is meant to be
one where physical properties can share their instances with M
on some, but not necessarily all occasions. (See pp. 22–23.) On
the other hand, if some physical property P is instantiated in
two systems which are physically indiscernible, and where the
same laws of nature hold, it won't be possible for one of these
P instances to be an instance of M without the other too being
so (p. 23). The picture we end up with is thus a case of Scenario
4a where the set of the M instances can be divided into subsets,
each of which has as members instances of M embedded in phys-
ically indiscernible systems and in the same nomological context,
and stands to sets of instances of physical properties, embedded
in physically indiscernible systems and in the same nomological
context, as M stands to physical properties in Scenario 2.

Is Scenario 4a, then, the best possible way of understanding
psychophysical realization with respect to the Job of providing
a viable characterization of psychophysical reduction? 'Reduc-
tion' is one of those terms for which there is no universally
agreed upon meaning. Kim's conditions, however, seem to me
to go at least some way towards capturing a common core. If
so, Scenario 4a does well in providing a viable characterization
of psychophysical reduction to the extent that it ensures the
satisfaction of conditions (a)–(c).

Now, condition (a) is satisfied in that the groups of individuals
picked out by mental predicates of the form *M-on-occasion/s-
o/s* are the same as groups of individuals picked out by physical
predicates of the form *P-on-occasion/s-o/s*: Instead of having two
kinds of entities (i.e. two types of groups corresponding to the
mental and physical predicates), we have just one. Moreover, also
M-in-general is reduced to the physical to the extent that the
group of individuals picked out by the predicate *M-in-general* is
composed of groups of individuals picked out by physical predi-
cates of the form *P-on-occasion/s-o/s*, and, hence, it is definable
in physical terms.

Condition (c) is satisfied too: Under Scenario 4a we can ex-
plain every instance of M by its identity with an instance of

some physical property. (The relevant instance of M occurs because of the occurrence of some physical instance identical to the relevant instance of M.)

Finally, as far as (b) is concerned, it can be argued that the causal powers of M on some occasion/s o/s are no addition to the causal powers of some physical property P on o/s insofar as the causal powers of a property are derivative on the causal powers of its instances, and *M-on-o/s* is co-extensive with *P-on-o/s*. (b) can thus be satisfied for what is picked out by predicates of the form *M-on-occasions-o/s*. It can then further be argued that M in general does not bring into the world new causal powers in addition to the ones brought in by its various *P-on-o/s* realizers. To this extent, one might want to take (b) to be satisfied for M in general too.

This relates to the issue of the relationship between psychophysical realization and the causal efficacy of the mental, which is in fact what I want to turn to now. As before, I'll approach matters by considering Kim's claim that the relevant Job can be discharged by Physical Realizationism.

Kim's claim that Physical Realizationism provides a good way of accounting for the causal efficacy of the mental can be supported as follows:[24] As we have seen, if Physicalism Realizationism holds, there will be, for every mental property M, relations of identity of the form *M-on-occasion/s-o/s = P-on-occasion/s-o/s*, where P stands for the realizer of M on o/s. From that it follows, by Leibniz's Law, that, for every mental property M, the causal powers of M on some occasion/s o/s are identical to the causal powers of its physical realizers on o/s. Mental properties can thus be causally efficacious (without overdetermining physical effects which, by the Principle of Causal Closure —see p. 37— must be physically caused), by "inheriting" the causal powers of their physical realizers on o/s. (Cf. esp. pp. 115–116.)

---

[24] I am here going to put things in a slightly different way from Kim's. I'm doing that mainly to make it easier to be clear about what the argument can do, but, also, to back up Kim's *Causal Inheritance Principle* (see p. 54) by drawing on Kim's own resources, instead of letting it rest, as Kim surprisingly does, on a mere claim of "intuitive plausibility". (See, again, p. 54.)

Putting things in terms of Scenario 4a, we can view the identities of the form *M-on-occasion/s-o/s = P-on-occasion/s-o/s* as the cases of overlapping between *M* and its physical realizers. *M* can then be causally efficacious by "inheriting" the causal powers of its physical realizers by way of co-instantiation. (*M* can thus be causally efficacious without having, as we have seen above, causal powers which are something over and above the causal powers of its physical realizers.)

One thing to note (highlighted, I think, by putting things in terms of Scenario 4a): the causal powers inherited by *M* are the causal powers of what can be picked out by predicates of the form *P-on-o/s*, as opposed to predicates such as *P*. (This is because, as I said, the causal powers of properties are taken to be derivative on the causal powers of their instances, and, as we have seen, in the case captured by Scenario 4a the subsets into which the set of the *M* instances can be exhaustively divided are not the sets (picked out by predicates such as *P*) of *all* the instances of some physical properties, but only subsets of such sets, i.e. the subsets (picked out by predicates of the form *P-on-o/s*) corresponding to the instances of the relevant physical properties on those occasions on which the relevant physical properties realize, or are co-extensive with, *M*.) To this extent, psychophysical realization provides an account of the causal efficacy of the mental in terms of physical causal powers, without, for this reason, failing to leave room for physical causal powers which are not mental causal powers. (These will be the physical causal powers corresponding to those instances of physical properties which are not instances of *M*s.)

To sum up, we have thus made clear, by shaping (via consideration of Kim's claim) a specific understanding of realization as one of our Scenarios, what psychophysical realization can do with respect to the Jobs of providing a viable characterization of psychophysical reduction, and of accounting for the causal efficacy of the mental in a physical world. I am now going to carry on, as promised, the same kind of job by considering Melnyk's appeal to realization to provide a viable characterization of physicalism.

III

The "crude version" (as Melnyk puts it) of the realization thesis presented in Melnyk (1996) as able to capture physicalism is the following:

(R) Every property exemplified in the actual world is either (i) physical or (ii) physically realised.[25]

Melnyk then explains the notion of realization by first defining a *functional property* as "any type of property conceptually capable of being realised", and then considering the necessary and sufficient conditions for realization for some functional properties (p. 390 ff).

In particular, he considers what he calls *causal-functional properties*: properties "defined in terms of [their] causal role[s], i.e. (very roughly) in terms of the typical causes and effects, both actual and counterfactual, of [their] instances" (p. 391). A causal-functional property F, he claims, is "realised on some particular occasion iff on that occasion there exists some object which plays a certain causal role, viz. the causal role specified in the definition of F". (Ibid.) It is then *physically* realized on some particular occasion iff "on that occasion there exists some *physical* object which plays the causal role specified in the definition of F". (Ibid.) And it is physically realized *simpliciter* iff "on *all* actual occasions on which it is realised it is realised by some physical object or other". (Ibid.)

Another type of functional property considered is then the *computational-functional*. This type of functional property, Melnyk tells us, is defined "by reference to a *program*, i.e. a set of rules, such as a Turing machine table, which details the permitted and obligatory relations between schematically-specified input, output, and internal states. The simplest example of such a property might be that of *running program*

---

[25] Melnyk 1996, p. 390. (From now on page references will be to Melnyk (1996) unless otherwise stated.) I'm considering the crude version, as opposed to the more sophisticated one, for simplicity sake. I think that the points I'm going to make hold, *mutatis mutandis*, also for the more sophisticated version.

P, where P is some particular program." (Ibid.) This proper-
ty is realized on some particular occasion iff "on that occasion
there exists some object capable of being in *n* distinct states,
where there is a one-one mapping between the *n* states of the
object and the *n* program-states (distinct states mentioned in a
statement of program P), and the distinct states of the object
are related to one another, both actually and counterfactually, in
exactly the way that those states' corresponding program-states
are related to one another by the rules of the program". (Ibid.)
The property of running program P is then *physically* realized
on some particular occasion iff "on that occasion it is realised,
and the realising object is physical". (Ibid.) And it is physically
realized *simpliciter* iff "on *all* actual occasions on which it is re-
alised it is realised by some physical object or other". (Ibid.)

I think that all these necessary and sufficient conditions for
being a realizer of the relevant property are necessary and suf-
ficient conditions for being instances of the relevant properties.
In accordance with what Melnyk says, for example, an object *x*
is a realizer of a causal-functional property *F* iff *x* plays a certain
causal rôle, viz. the causal rôle specified in the definition of *F*.
But to play the causal rôle specified in the definition of *F* is a
necessary and sufficient condition for being an instance of *F*. If
this is right, Melnyk's realization amounts to instantiation.

That allows us to understand Melnyk's realization in terms of
our Scenarios.[26] When a mental property *M* is physically real-
ized, *M* will overlap, in respect of one or more instances, with
the physical property/ies of its realizing objects. What remains to
be established is the specific Scenario corresponding to Melnyk's
realization, and whether it is the most suitable to carry out the
Job of providing a viable characterization of physicalism (with
respect to mental properties). Before doing that, however, I want
to consider a possible objection to understanding Melnyk's real-
ization in terms of our Scenarios. The picture that will emerge
from this objection will be of some interest, when considering

---

[26] The case considered is, of course, that of the realization of the mental
by the physical.

the Job of capturing physicalism, even independently of whether or not it is in fact Melnyk's.

The objection to understanding Melnyk's realization in terms of our Scenarios can be put as follows. If psychophysical realization is understood in terms of our Scenarios, the M instances will be identical to physical instances of realizing properties. This is incompatible with Melnyk's insistence that realization physicalism can avoid claims of "event or token identities of any kind",[27] and, indeed, even more apparently, with the claim, in Melnyk (1995), that "realisation physicalism imposes no requirement that the physical realiser of an instance of a functional property be *identical* with that instance."[28] So, Melnyk's realization can't, after all, be understood in terms of our Scenarios.

My reply is that the understanding of Melnyk's realization in terms of our Scenarios can't be avoided: Such understanding *follows*, for the reasons given above, from Melnyk's definitions. What we can do, then, to somehow ease up the tension with the denial of token identities of any kind, is rather to leave as much room as possible for the failure of token identities compatibly with the kind of picture provided by our Scenarios.[29]

In order to see how that can be done, note, first, that those who deny psychophysical token identities typically replace the latter with the *constitution* of mental particulars by physical par-

---

[27] Note 21, p. 403.

[28] Melnyk 1995, note 21, p. 235.

[29] The tension would thus be eased up, but not completely removed. The most charitable interpretation of Melnyk could then rather be that of taking his denial of psychophysical token identities to be meant to hold only under a strict notion of physicality according to which a particular is physical iff it is an instance of a physical property understood as a property mentioned in the laws and theories of fundamental physics. The idea is that psychophysical token identities would no longer be denied under a more liberal understanding of physicality, according to which a particular can count as physical even if, although it doesn't satisfy a positive predicate on the list drawn from physics, it is entirely composed of things that do. (Cf. Melnyk 1995, p. 231.)

The reason why in the main text I've decided to pursue a different idea, even if, maybe, it is less charitable to Melnyk, is that the picture of realization that emerges from it is, I think, of some interest with respect to the issue of capturing physicalism, independently of whether or not it can, in the end, be ascribed to Melnyk.

ticulars.[30] But constitution is, as we have seen (§ I), an identity-like relation: the relata of constitution share, when considered in one world or in a set of possible worlds, all their non-modal properties (i.e. all their properties which are not to be understood by reference to worlds other than the one/s considered), although they do not necessarily share also their modal properties. That suggests the following way of leaving as much room as possible for the failure of psychophysical token identities compatibly with the kind of picture provided by our Scenarios: We can regard mental instances as constituted by physical instances. In this way mental instances (understood as entities which can exist in more than one possible world) will not be identical with physical instances. When considered on some occasions, however, they'll share all their actual properties with some physical instances. To this extent, the non-modal, world-bound mental entities picked out by descriptions of the form the *instance of M-on-occasion-o* will be identical to non-modal, world-bound physical entities picked out by descriptions of the form *the instance of P-on-occasion-o*. And that allows for the picture to be compatible with our Scenarios insofar as it allows for a relevant kind of overlapping between mental and physical properties.[31]

That's good news if we want it to be possible for our Scenarios to capture a notion of physicalism that makes of constitution, as opposed to identity, the crucial relation between mental and

[30] See Boyd 1980, and, indeed, Melnyk 1995.

[31] Example: Take Pain to be the particular picked out by the property *being a pain* on occasion o. And take C-Fibre (firing) to be the particular picked out by the property *being a C-fibre that is firing* on occasion o. C-Fibre constitutes Pain, but it is not identical with it, if both Pain and C-Fibre are understood as entities capable of existing in worlds other than the one/s where they share all their properties. (We can, for example, take Pain to exist in a world where there are no C-fibres, and hence, under the assumption that *being a C-fibre* is an essential property of C-Fibre, in a world where it does not, a fortiori, share all its actual properties with C-Fibre.) On the other hand, the particulars picked out by the descriptions *the instance of being a pain on occasion o* and *the instance of being a C-fibre that is firing on occasion o* are non-modal, world-bound particulars as they can exist only on occasion o. They are thus identical insofar as, *ex hypothesi*, they share all their properties on occasion o.

physical particulars. I now want to consider how well our Scenarios fare with respect to capturing other aspects of physicalist theses, reverting to the questions of which, in particular, among our Scenarios, corresponds to Melnyk's realization, and whether it is the best suited to carry out the Job of providing a viable characterization of physicalism.

The realization thesis that Melnyk uses to formulate physicalism is restricted to instances of mental properties in the actual world. (See p. 390.) To this extent, Melnyk's realization corresponds to the kind of claim of our Scenarios of type c. Moreover, Melnyk's insistence on Multiple Realizability (see pp. 385; 390) rules out Scenario 1 and 3. That leaves us with Scenarios 2c and 4c (which are, in their turn, special cases of Scenario 5). And, given that Melnyk's realization thesis does not imply any kind of local supervenience,[32] I think that in the end the relevant Scenario is Scenario 4c.

Is that strong enough to capture physicalism? That depends, of course, on the desiderata we choose to associate with physicalism. The ones mentioned in Melnyk are that (i) "physics, and physical reality, [be] fundamental and occup[y] a privileged position in the grand scheme of things" (p. 393), and that (ii) ontological undesirables, such as ectoplasmatic souls and vital forces, be ruled out. (Ibid.) Considering (i), we can say that Scenario 4c ensures that physics, and physical reality, is fundamental (with respect to the mental),[33] to the extent that, under Scenario 4c, physical properties are the ones that overlap with sets of actual instances of mental properties. Obviously, the physical would be even more fundamental if we had a Scenario of type a. And to

---

[32] Melnyk's realization thesis does not imply any kind of local supervenience to the extent that for A to be physically realized by Bs amounts, as we have seen and in accordance with what Melnyk says, to A being instantiated exclusively by B instances; from that it does not follow that we can't have instances of a property in B which are M and instances of such a property in B which are not M.

[33] For other kinds of properties the relevant Scenario will not be Scenario 4c, as this latter has been characterized by considering mental properties. It will, however, be a Scenario of the same kind as Scenario 4c, the only difference being that instead of mental properties what will be considered is the kind of property for which the relevant realization claim is made.

this extent, one could argue, Scenarios of type a are better suited than Scenario 4c to capture physicalism, at least when considering (i). But I think that many would say that the 'fundamentality' provided by Scenario 4c (as opposed to some stronger sense) is all we need for at least some minimal form of physicalism. And at this point it is hard to see how the issue could be adjudicated. Once we go beyond some more or less universally agreed-upon constraints, it seems to me that the issue becomes a matter of what we *choose* to regard as physicalism.

Condition (ii), on the other hand, does seem to be one of such universally agreed-upon constraints. The question then becomes rather that of whether it can be satisfied if we understand —as we have seen that it is possible to do— Scenario 4c to be compatible with the mere constitution, as opposed to identity, of the relevant mental instances by physical instances. The answer is —I suggest— positive if we take entities such as ectoplasmatic souls and vital forces to be, possibly, spatio-temporally coincident with some physical particulars, but then to fail to share all the actual properties of these latter. (As an instance of a property of a spatio-temporal coincident of an entity such as an ectoplasmatic soul or a vital force that this latter could not possess, think of *having a determinate shape s*.) For, if ectoplasmatic souls and vital forces can fail to share all the actual properties of their spatio-temporal physical coincidents, then ectoplasmatic souls and vital forces cannot be constituted by their spatio-temporal coincidents.

The situation is slightly trickier when we consider other possible physicalist requirements. So, for example, some conceive of physicalism as essentially a reductionist thesis.[34] If reduction is then understood as in section II, it is not clear, for the reasons below, that mere constitution (of mental instances by physical instances) as opposed to identity can satisfy the relevant conditions.

Considering (a), for example, the problem is that the constitution of mental instances by physical instances still leaves

---

[34] See, e.g., Smart 1963; 1976; Snowdon 1989; Lewis 1983; 1994; Chalmers 1996; Jackson 1998.

us with two kinds of entities. We would not —one could thus argue— have achieved any kind of ontological simplification: We started with two kinds of entities, and, after saying that the one is constituted by the other, we are still left with two.

True, also when considering how (a) can be satisfied by our Scenarios, we faced a similar situation: Given multiple realizability, M cannot be straightforwardly identified with a P.

However, when all the M instances are identifiable with instances of physical properties, as in Scenario 2 and 4, we can, as we have seen, at least say that the group of individuals picked out by the predicate M is exhaustively composed of groups of individuals picked out by predicates of the form P (where P stands for a physical property) or *P-on-occasion/s-o/s*, and, hence, it is definable in physical terms. Moreover, under a conception of the subset/set relation as a part/whole relation,[35] it will be possible to regard the set of the M instances as a whole whose parts are exclusively sets corresponding to physical properties or parts of physical properties. As I argued elsewhere, this can, intuitively, capture the idea that M is nothing over and above some physical properties (or parts of physical properties). My point here is that when mental instances are related to physical instances by constitution instead of identity, reductive claims of the sort just considered are no available.[36]

Moving on to considering (b): Given that (numerical) identity in causal powers can no longer be ensured on the grounds of the identity between mental and physical instances, we'd need to regard constitution as capable of replacing identity in ensuring identity in causal powers. But does it follow from the fact that X constitutes Y that the causal powers of Y are identical to the causal powers of X? One might have worries, here, arising from the fact that the constitution of Y by X cannot ensure that we can say the same of X and Y in worlds other than the actual.

---

[35] Cf. Lewis 1991.

[36] Remember that *constitution*, here, is not understood as a part/whole relation, but, rather, in accordance with the characterization given on p. 3. (The relevant paradigm case is that of a statue being constituted by a portion of clay, rather than that of a wall being constituted by some bricks.)

That leaves room for differences in counterfactual statements, and hence, given the common association of causal notions with requirements expressed by counterfactual statements, for differences in causal powers too.

Finally, considering (c), one could argue that constitution is as good as identity with respect to explanation: If the question 'Why Y?' is satisfactorily answered by saying 'because X, and because X is identical with Y', so should we regard the same question as satisfactorily answered by saying 'because X, and because Y is constituted by X'. However, we are here entering the mine-field surrounding the notion of explanation. Given the complexities of (and controversies about) this latter, I think that the claim above cannot be supported merely by appeal to intuitions on the matter —it requires some more sophisticated argument that, as far as I know, has not yet been given. To this extent, I think that there is at least some room for not being completely confident about the possibility of satisfying (c) on the basis of constitution as opposed to identity.

It is thus important to realize that if we conceive of Scenario 4c as allowing for mental instances to be constituted by (as opposed to identical to) physical instances, the satisfaction of some possible physicalist requirements might fail to be guaranteed. Or at least: it can be so when the entities considered in the reductive requirement are mental and physical instances. For if they are, rather, what is picked out by descriptions of the form *the instance of M-on-occasion-o* and *the instance of P-on-occasion-o*, it will —as we have seen— be possible to speak of identity as opposed to constitution. To this extent, it will thus be possible to achieve reduction as discussed in section II. Remember, though, that in order to do that for the whole sets of entities picked out by descriptions of the form *the instance of M-on-occasion-o*, we needed a Scenario of type a. Accordingly, if we understand physicalism as requiring the reducibility, in the way discussed, not only of *portions* of the sets above, but, indeed, of the whole sets, and if we want realization to capture physicalism, then we'll need to understand realization in terms of Scenario 4a (as in section II), as opposed to Scenario 4c.

One could object to the understanding of physicalism under discussion, by arguing that it would saddle physicalism with an excessively strong requirement, with the result of making the whole thesis implausible right from the start. Whether this is so or not is a complex issue that cannot be addressed here in passing.[37] The important point to note in the present context, however, is that whatever the understanding of the reductive requirement —i.e. as more or less strong— there will be a suitable type of Scenario. It is not as though to understand physicalism in terms of one requirement as opposed to the other would have as a consequence that physicalism can no longer be captured by realization. And the same applies to the issue of whether physicalism requires psychophysical token identities. If it doesn't, it will be possible to capture physicalism in terms of a Scenario understood as allowing for the possibility that mental instances are merely constituted by (as opposed to identical to) physical instances. If, on the other hand, physicalism does require psychophysical token identities, we can still have a Scenario (i.e. Scenario 4 a or c, according to our choice concerning reduction) which is capable of capturing physicalism; the only difference is that, this time, the co-instantiations in play will involve mental and physical instances (understood as entities capable of existing in more than one possible world), and not only the kinds of world-bound entities picked out by predicates of the form *the instance of M-on-occasion-o* and *the instance of P-on-occasion-o*.

To sum up, we have thus seen, in this section, how, by understanding realization in terms of our Scenarios (or, which is

[37] Here is, though, at least an indication of where my sympathies lie: I am, actually, inclined to regard physicalism as associated with the strong requirement. For I can't see how a physicalist can allow in his/her ontology some entities (i.e. mental properties) which are neither physical nor reducible to the physical —once we understand the core idea of physicalism as the thesis that there is nothing over and above the physical (cf. the papers cited in the previous note). As for the idea that by conceiving of physicalism as a thesis concerning all possible worlds, as opposed to merely the actual world, we would make physicalism implausible, and thus doomed, right from the start, I'm inclined to side with Teller 1984, where it is shown how a claim of metaphysical necessity of the kind relevant to the present discussion might not be that implausible after all.

the same, as an identity-like relation), it is apparent that realization can provide a satisfactory way of expressing at least the notion of physicalism constrained by some or all the desiderata considered. The particular Scenario that is needed for that will then depend on the desiderata: We'll need Scenario 4a if we take physicalism to require reduction in the strong sense discussed above, and a privileged position of the physical, over other kinds of properties, when considering the relation to the mental not only in the actual world, but also in all the other possible worlds. If, on the other hand, we are happy to speak of physicalism even if the relation relevant to psychophysical reduction is guaranteed to hold only between actual instances of physical and mental properties, and even if the physical is guaranteed to have a privileged position, over other kinds of properties, when considering the relation to the mental only in the actual world, then Scenario 4c is enough. In any event, the choice is between Scenario 4a and Scenario 4c. (Scenarios 1, 2, 3 are out of the game because I'm following Melnyk in thinking that no good reason has yet been provided for taking local psychophysical supervenience and one-one relations between mental and physical properties to be required for physicalism. Scenarios 1 and 3 can, besides, be ruled out also for the reasons considered at the end of section I.) And, if capturing the strong requirement is —as in section II— set as one of the Jobs on its own, i.e. independently of the Job of expressing physicalism, then Scenario 4a is definitely the one we should go for. By adopting this specific way of understanding realization as an identity-like relation, we have seen, in sections II and III, that and how realization can discharge the Jobs discussed.

REFERENCES

Baker, L., 1999, "Unity Without Identity: A New Look at Material Constitution", *Midwest Studies in Philosophy*, 22.

——, 1997, "Why Constitution is not Identity", *The Journal of Philosophy*, 94, pp. 599–621.

Block, N. & J. Fodor, 1972, "What Psychophysical States are not", *Philosophical Review*, 81, pp. 159–181. Reprinted in N. Block (ed.), *Readings in the Philosophy of Psychology*, vol. 1, Methuen, 1980. [Page references are to this latter edition.]

Boyd, R., 1980, "Materialism Without Reductionism: What Physicalism Does Not Entail", in N. Block (ed.), *Readings in the Philosophy of Psychology*, vol. 1, Methuen, London.

Chalmers, D., 1996, *The Conscious Mind*, Oxford University Press, Oxford.

Gibbard, A., 1975, "Contingent Identity", *Journal of Philosophical Logic*, 4, pp. 187–221.

Jackson, F., 1998, *From Metaphysics to Ethics*, Clarendon Press, Oxford.

Kim, J., 1998, *Mind in a Physical World*, The MIT Press, Cambridge, Massachusetts.

Lewis, D., 1994, "Lewis, David: Reduction of Mind", in S. Guttenplan (ed.), *A Companion to the Philosophy of Mind*. Blackwell, Oxford.

——, 1991, *Parts of Classes*, Blackwell, Oxford.

——, 1986, *On the Plurality of Worlds*, Blackwell, Oxford.

——, 1983, "New Work for a Theory of Universals", *Australasian Journal of Philosophy*, 61, pp. 343–377.

——, 1972, "Psychophysical and Theoretical Identifications", *Australasian Journal of Philosophy* 50, pp. 249–258. Reprinted in N. Block (ed.), *Readings in the Philosophy of Psychology*, vol. 1, Methuen, 1980. [Page references are to this latter edition.]

Melnyk, A., 1996, "Formulating Physicalism: Two Suggestions", *Synthèse*, 105, pp. 381–407.

——, 1995, "Physicalism, Ordinary Objects, and Identity", *Journal of Philosophical Research*, 20, pp. 221–235.

Nagel, E., 1961, *The Structure of Science*, Routledge & Kegan Paul, London.

Plantinga, A., 1976, "Actualism and Possible Words", *Theoria*, 42, pp. 139–160.

Putnam, H., 1960, "Minds and Machines", in S. Hook (ed.), *Dimensions of Mind*, New York University Press, New York.

Sidelle, A., 1992, "Identity and the Identity-like", *Philosophical Topics*, 20, pp. 269–292.

Smart, J.J.C., 1976, "The Revival of Materialism", in *Essays Metaphysical and Moral*, Blackwell, Oxford, 1987.

——, 1963, "Materialism", in *Essays Metaphysical and Moral*, Blackwell, Oxford, 1987.

Snowdon, P., 1989, "On Formulating Materialism and Dualism", in J. Heil (ed.), *Cause, Mind, and Reality*, Kluwer Academic Publishers.

Teller, P., 1984, "A Poor Man's Guide to Supervenience and Determination', *Southern Journal of Philosophy*, 22, pp. 137–167.

Thomson, J., 1998, "The Statue and the Clay", *Noûs*, 32, pp. 149–173.

Yablo, S., 1987, "Identity, Essence, and Indiscernibility", *The Journal of Philosophy*, 84, pp. 293–314.