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Determinables, Determinates, and Causal Relevance[1]

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Mental causation, our mind's ability to causally affect the course of the world, is part and parcel of our 'manifest image' of the world. *That* there is mental causation is denied by virtually no one. *How* there can be such a thing as mental causation, however, is far from obvious. In recent years, discussions about the problem of mental causation have focused on Jaegwon Kim's so-called *Causal Exclusion Argument*, according to which mental events are 'screened off' or 'preempted' by physical events unless mental causation is a genuine case of overdetermination or mental properties are straightforwardly reducible to physical properties. In response to this line of reasoning, Stephen Yablo pointed out that any alleged exclusion of mental properties by physical properties can be avoided if we treat the former as *determinables* of which the latter are *determinates* (see Yablo, 1992, 1997, 2000, 2001; see also MacDonald & MacDonald, 1986). Yablo's idea that we may think of the mental/physical distinction as an instance of the determinable/determinate distinction is an interesting and original suggestion which so far has received

1 Early ancestors of this paper have been presented to and have benefited from audiences at the 2003 meeting of the *European Society for Philosophy and Psychology* in Turin (Italy), the annual conference of the *Austrian Ludwig Wittgenstein Society* in 2003 in Kirchberg (Austria) and at the GAP.5 conference of the *German Society for Analytic Philosophy* in 2003 in Bielefeld (Germany). The version originally submitted was written in 2004 while I was a visiting fellow at Ohio State University, thanks to a grant from the *German Academic Exchange Service* (DAAD). Support from both institutions is gratefully acknowledged. Finally, I would like to thank two anonymous referees for various helpful comments and for saving me from (at least) one major blunder.

little attention in the debate about the problem of mental causation. In this paper, I examine Yablo's position, arguing that in the end the determinable/determinate distinction is unlikely to yield a satisfying (dis)solution of Kim's *Causal Exclusion Argument*. Taken literally, the claim that mental properties are related to physical properties as determinables are related to determinates is false; understood more liberally, although true, it cannot deprive the *Causal Exclusion Argument* of its force.

I Causal Exclusion and the Determinable Hypothesis

In what follows, I will talk about the *causal relevance* of (mental) properties, as opposed to the *causal efficacy* of (mental) events. What does that mean? I take *events* to be Davidsonian datable, non-repeatable, object-like particulars (and not, like Kim, exemplifications of properties by objects at times). Events are causes, and an event which is a cause is (thereby) causally *efficacious*. Moreover, events cause what they cause because of how they are, i.e. in virtue of some of their properties and not in virtue of others. The properties in virtue of which a cause causes an effect are *causally relevant* (for the particular causal transaction in question, not necessarily *per se*). To take a famous example, the soprano's singing (event *c*) causes the window's shattering (event *e*), but *c*'s being the singing of a word with a certain meaning is causally irrelevant for its causing *e*, whereas its being the singing of a high *C* is causally relevant (see Dretske, 1989).[2]

Given this terminology, the question raised by Kim's *Causal Exclusion Argument* is whether mental properties are causally relevant: do mental events cause what they cause in virtue of their physical properties, in virtue of their mental properties, or perhaps both?

According to the *Causal Exclusion Argument*,[3] irreducible mental properties are inevitably preempted by physical properties, so that, barring overdetermination, non-reductive physicalism is committed to property

2 Given Kim's conception of events as property-exemplifications, he frequently talks about events and causation instead of properties and causal relevance, but nothing in principle hinges on this. Properties do matter for Kim, too, insofar as they are constituents of events.

3 Early versions can be found in Kim, 1988, 1989, 1990. Its most famous version, the *Supervenience Argument*, is formulated in Kim, 1998 and revised in Kim, 2003 and 2005 (for a critique see Walter, 2006 and *forthcoming-a*).

epiphenomenalism, i.e. to the claim that events can be causes in virtue of physical properties, but not in virtue of mental properties (see McLaughlin, 1989). Roughly, Kim's argument goes as follows. Suppose *c*'s having a mental property *M* is causally relevant for *e*'s having a mental property *M**. Assuming that *M** supervenes upon a physical property *P** of *e* — a minimal commitment of any physicalist theory (see Kim, 1998, 15) — *e*'s having *P** is non-causally sufficient for *e*'s having *M**. This creates a tension between *M* and *P**: Does *e* have *M** because *c* has *M* or because *e* has *P**? Resolving this tension, Kim submits, requires assuming that *c*'s having *M* is causally relevant for *e*'s having *M** in virtue of being causally relevant for *e*'s having *P**. In Kim's terminology: '*M* caused *M** *by* causing its supervenience base *P**' (Kim, 2005, 40).

Yet, given that the physical is causally closed, it must be possible to account for *e*'s having *P** in terms of purely physical causal factors. There must thus be a physical property *P* of *c* such that *P* is causally relevant for *e*'s having *P**. This in turn creates a competition between *M* and *P*, since *M* and *P* both claim to be the property in virtue of which *e* has *P**. Barring overdetermination, *M* seems bound to loose this competition, because once *P* is instantiated, everything that needs to be done for *e*'s having *P** is done and there is nothing left for *M* to contribute, causally speaking — *M* is causally irrelevant because it is preempted by *P*.

In response, non-reductive physicalists have pointed out that although strictly speaking the physical properties do all the 'causal work,' mental properties can still be causally relevant in virtue of fulfilling a compatibilist condition *C*, where (1.) fulfilling *C* is sufficient for a property's being causally relevant; (2.) properties which do not do any 'causal work' in the strict sense can nevertheless fulfill *C*; and (3.) *C* itself does not give rise to any kind of competition (see Walter, 2006 for details). They hence had to find a relationship that holds between irreducible mental properties and physical properties which is able to ground the causal relevance of the former. Candidates for such a relationship, i.e. for a compatibilist condition that renders irreducible mental properties causally relevant, include counterfactual dependence (see Lepore & Loewer, 1987), supervenience (see Kim, 1984b), non-strict causal laws (see Fodor, 1989; McLaughlin, 1989), or a combination thereof (see Segal & Sober, 1990). None of these suggestions, however, has been completely satisfying.

When the hope initially pinned on supervenience was eventually dashed (see McLaughlin, 1984; Kim, 1993), those who tried to ground the causal relevance of mental properties in their relationship to the physical properties of the cause (and not in some relationship they bear to the effect or its properties, like law-based or counterfactual accounts) had to find another candidate. Given the alleged multiple realizability of mental properties, the relationship in question had to be *asymmetric*, and in order to satisfy the constraints of physicalism, it had to be a relation of (non-causal) *dependence*, i.e. a relation of upward necessitation. Moreover, it had to *explain* the asymmetric necessitation of mental properties by physical properties in a characteristically physicalist way (i.e. it had to be a relationship of 'superdupervenience' in Horgan's 1993 sense). One promising candidate for such a relationship was *determination*, the relationship that holds between *determinates* and their *determinables*.

Notoriously, examples for the determinable/determinate distinction are easier to provide than a strict definition. The property *being red*, say, is a determinable of determinates like *being crimson* or *being scarlet* and at the same time a determinate of the determinable *being colored*. The distinction also applies to predicates or events: the predicate 'red' is a determinate of the predicate 'colored' and a determinable of the predicate 'scarlet,' and the event of Socrates' drinking hemlock is a determinate of his taking up hemlock and a determinable of his guzzling hemlock (see Ehring, 1996, 462; Yablo, 1992, 260).

Informally, the determinable/determinate distinction can be explicated by saying that *G* is a determinate of a determinable *F* iff being *G* is one way for an object to be *F*. For instance, for an object to be red is for it to be colored in a certain way, viz. redly.

> *Def 1*: *G* is a determinate of a determinable *F* iff for an object to be *G* is for it to be *F*, not *simpliciter*, but in a specific way. (see Yablo, 1992, 252)

Having offered an account of determination as a relation closely associated with asymmetric necessitation, Yablo advances the *Determinable Hypothesis*, i.e. the claim that mental properties are determinables of physical determinates:

> *Determinable Hypothesis*: Mental properties are related to physical properties as determinables are related to their determinates.

According to Yablo, the *Determinable Hypothesis* can cure the 'epiphobia' (see Fodor, 1989) caused by the *Causal Exclusion Argument*. Allegedly, 'determinates do not contend with their determinables for causal influence' (Yablo, 1992, 259). Quite the contrary, actually: they are 'tolerant, indeed supportive, of the causal aspirations of their determinables' (Yablo, 1992, 260). The *Determinable Hypothesis* therefore allows one to avoid the problem of mental causation: 'since a determinate cannot preempt its own determinable, mental events and properties lose nothing in causal relevance to their physical bases' (Yablo, 1992, 250).

Yablo's argument has the following structure:

(1) Mental properties are related to physical properties as determinables are related to their determinates (the *Determinable Hypothesis*).

(2) Determinables are not excluded by their determinates.

(∴) Mental properties are not excluded by physical properties.

The point of Yablo's argument is *not* that mental properties are causally relevant simply in virtue of being determinables of physical properties. He only claims that when construed as determinables mental properties are not screened off by their physical determinates (Yablo, 1997, 275n25). The *Determinable Hypothesis* is thus not supposed to provide sufficient conditions of causal relevance. Rather, it is supposed to show that mental properties violate a necessary condition for the *Causal Exclusion Argument* to get off the ground, viz., not being related to physical properties as determinables to their determinates. (1) and (2), if true, would show epiphobia to be unwarranted (at least insofar as the *Causal Exclusion Argument* is concerned). Given (2), one could at most say that (barring overdetermination) irreducible mental properties are screened off by physical properties *unless* they are determinables of physical properties, and given (1), this exception clause is fulfilled.

However, (1) and (2) both seem to be problematic. Section II examines Yablo's rationale for (1) and finds it wanting. Section III argues that (1) is actually false because mental and physical properties have a feature incompatible with the *Determinable Hypothesis* (a similar point is made by Ehring, 1996; Leiter & Miller, 1998; Vicente, 2001 and Worley, 1997). Section IV argues that given the dialectical state of play between Yablo and the defender of the *Causal Exclusion Argument*, (2) is unconvincing or at least unsupported. Section IV also considers a variation on the argument based on (1) and (2) which appeals to a more liberal interpretation of the determinable/determinate distinction, but which ultimately succumbs to the same difficulty. Finally, section V criticizes a counterattack Yablo has leveled against the proponent of the *Causal Exclusion Argument*, based on the so-called *Proportionality Constraint* according to which physical properties, in contrast to mental properties, fail to fulfill a necessary condition of causal relevance.

II The Determinable Hypothesis

According to Yablo, the determinable hypothesis is plausible because two features of mental properties — their *strong supervenience* upon physical properties (S) and their *multiple realizability* (M) — jointly entail that they are *asymmetrically necessitated* by physical properties and asymmetric necessitation is in turn a necessary condition of determination.

> (S) *Supervenience*: Necessarily, for every object *o* and every mental property *M* of *o*, *o* has some physical property *P* such that necessarily all *P*s are *M*s. (see Yablo, 1992, 254)
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> (M) *Multiple Realizability*: Necessarily, for every mental property *M* and every physical property *P* which necessitates *M*, possibly some object *o* possesses *M* but not *P*. (see Yablo, 1992, 255)

(S) and (M) entail that mental properties are asymmetrically necessitated by physical properties, and asymmetric necessitation is necessary for determination: *G* determines *F* only if (i.) necessarily, for every object *o*, if *o* has *G* then *o* has *F*; and (ii.) possibly, for some *o*, *o* has *F* but lacks *G* (see Yablo, 1992, 252).[4] Yablo's argument for the *Determinable Hypothesis* thus seems to be that (S) and (M) entail that mental properties are asymmetrically necessitated by their physical realizers while asymmetric necessitation is in turn necessary for determination:

> Together, (M) and (S) make it a matter of necessity that something has a mental property iff it has a physical property by which that mental property is asymmetrically necessitated. But this is extremely suggestive, for with 'determines' substituted for 'asymmetrically necessitates,' it becomes
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> (D) Necessarily, something has a mental property iff it has also a physical determination of that mental property;
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> and (D) is an instance of the standard equation for determinables and determinates generally, namely, that something has a determinable property iff it has some determinate falling thereunder. This calls out for explanation, and the one that comes first to mind is that mental/physical relations are a species of determinable/determinate relations. (Yablo, 1992, 256)

If asymmetric necessitation were *sufficient* for determination, conjunctions would be determinates of their conjuncts and disjunctions would be determinables of their disjuncts, consequences which Yablo explicitly rejects: 'Probably it goes too far to identify determination with asymmetric necessitation outright; otherwise, for example, conjunctive properties determine their conjuncts and universally impossible properties are

4 Sara Worley claims 'that the sort of necessity involved in determination is metaphysical' (Worley, 1997, 285), but Yablo nowhere seems to commit himself to something as strong as metaphysical necessitation. If he did, the *Determinable Hypothesis* would be rendered problematic by the possibility (that some take more serious than others) that mental properties might supervene upon physical properties only with *nomological* necessity (Kim, 1984a, 49; 1984c, 66).

all-determining' (Yablo, 1992, 253n23). But if asymmetric necessitation is only necessary and not sufficient for determination, (S) and (M) do not entail the *Determinable Hypothesis*, even if they entail that mental properties are asymmetrically necessitated by physical properties (Leiter & Miller, 1998, 175-176; Worley, 1997, 285). *If* 'determines' is substituted for 'asymmetrically necessitates,' then (S) and (M) indeed entail the *Determinable Hypothesis*, but if asymmetric necessitation is not sufficient for determination, then 'determines' cannot be substituted for 'asymmetrically necessitates.'[5]

The last sentence of the passage quoted above suggests that the fact that (S) and (M) on the one hand and determination on the other both entail asymmetric necessitation 'calls out for explanation' and that the *Determinable Hypothesis* is the explanation that first comes to mind. Yet, what precisely is it that favors the *Determinable Hypothesis* over alternative explanations? Why not say, for instance, that the causal powers of realized (mental) properties/determinables are a *subset* of the causal powers of the realizing (physical) properties/determinates, respectively, which explains equally well why (S) and (M) on the one and determination on the other hand entail asymmetric necessitation?[6]

According to Yablo, the *Determinable Hypothesis* is 'to be evaluated like any other by the evidence for it and by its theoretical fruitfulness' (Yablo, 1992, 256-7). The evidence is, as just noted, meager and boils down to the claim that the reason to think that mental and physical properties are related as determinables to determinates is the fact that in both cases the relation in question is one of asymmetric necessitation, which is unpersuasive. What about the 'theoretical fruitfulness' of the *Determinable Hypothesis*, viz., its promise to cure epiphobia? First of all, it is unclear why the *Determinable Hypothesis* should cure epiphobia better than alternative hypotheses, or why one should think it can cure it at all (see section IV). Second, the *Determinable Hypothesis* might be theoretically fruitful, if it were true, but it may very well turn out to be false (see section III).

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5 Yablo says that '[f]or *dialectical reasons*, I try to remain as neutral as I can about where determination leaves off and 'mere' asymmetric necessitation begins' (Yablo, 1992, 253n23; emphasis S.W.), but treating a necessary condition as necessary and sufficient is certainly more than dialectics.

6 If a property G is realized by/a determinable of a property F, then according to the *Subset Model* (see, e.g., Heil, 2003) the causal powers G bestows on its bearers are a proper subset of the causal powers F bestows on its bearers, so that any object which has F by possessing the set of causal powers individuative of F thereby possesses the set of causal powers individuative of G and therefore has G, but not *vice versa*, which neatly explains why G is asymmetrically necessitated by F.

III Rejecting the Determinable Hypothesis

The alleged theoretical fruitfulness of the *Determinable Hypothesis* can be ignored, if the *Determinable Hypothesis* is false, and indeed the argument based on (1) and (2) cannot cure epiphobia because (1) is false: in order for properties to be related as determinables and determinates they must fulfill a condition which mental and physical properties, by their very nature, fail to fulfill.

For properties to be related as determinables and determinates they must fulfill a couple of conditions. For instance, nothing can have a determinable unless it has some determinate of that determinable. That is, nothing can be colored without having a particular color and nothing can have a weight without having a particular weight. Moreover, conjunctive properties should arguably not count as determinates of their conjuncts and disjunctive properties should not count as determinables of their disjuncts:

> *Principle of Downward Necessitation*: If $\{G_1, \ldots, G_n\}$ is a complete set of samelevel determinates of a determinable F, then if an object has F, it has one of $\{G_1, \ldots, G_n\}$.
> *Principle of Non-Conjunctive Determinates*: No determinate of a determinable F is a conjunctive property $G_1 \wedge G_2$ such that G_1 is F or a determinate of F and G_2 is some property that does not necessitate F.
> *Principle of Non-Disjunctive Determinables*: No determinable of a determinate G is a disjunctive property $F_1 \vee F_2$ such that F_1 is G or a determinable of G and F_2 is some property not necessitated by G. (see Ehring, 1996; Johnson, 1921, ch. 11)

Douglas Ehring has argued that determinables and determinates must fulfill at least four more conditions that mental and physical properties all violate.[7] With regard to three conditions, I think, he is wrong. But with regard to the fourth condition, as we will eventually see, he is right, and this shows that (1), the *Determinable Hypothesis*, is false.

The first potentially problematic condition is a *Principle of Exclusion* according to which objects can have at most one samelevel determinate of a given determinable — no red object, for instance, can be crimson and

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7 Ehring explicitly denies that this is a problem for Yablo whose account, he maintains, 'does not depend on the claim that mental **properties** are full-fledged determinables of physical **properties** (although [it] does depend on the claim that mental properties supervene on physical properties)' (Ehring, 1996, 477; bold emphases in original). Ehring is right in an important respect (see section IV), but even if Yablo does not take the *Determinable Hypothesis* literally, someone else could (see, e.g., MacDonald & MacDonald, 1986), and so the considerations in this section are important even if they do not apply to Yablo directly.

(simultaneously and at the same place) scarlet, and no object can have a weight of 1 kg and (simultaneously) a weight of 1.5 kg:

> *Principle of Exclusion*: If $\{G_1, \ldots, G_n\}$ is a complete set of samelevel determinates of a determinable F, then if an object o has F, o has only one of $\{G_1, \ldots, G_n\}$. (see Ehring, 1996, 470)

Ehring argues that mental and physical properties violate the *Principle of Exclusion* because an object can have a mental property in virtue of having (simultaneously) two of its physical realizers:

> There is nothing in the dual doctrines of supervenience and multiple realizability to guarantee this exclusion. Nothing in principle rules out the same person simultaneously instantiating distinct ... realizers of being in M, such as being in P and being in P'. The person may be in M in virtue of multiple ... realizers ... This is the first disanalogy with determinates. (Ehring, 1996, 472)

First of all, it is unclear whether the scenario envisaged by Ehring is at all compatible with any kind of physicalism worth that name. Suppose an object o is M in virtue of being P_1 and in virtue of being P_2. How are the *instances* of M, P_1 and P_2 related? Given that the P_1- and the P_2-instance are arguably distinct, the M-instance cannot be identical to the P_1- *and* the P_2-instance. Of course, the distinctness of P_1 and P_2 alone does not entail the distinctness of the respective instances, but if the latter were identical, we would be asked to imagine that M, *being in pain*, for instance, has a multiplicity of physical realizers, say *having c-fiber firing* and *having d-fiber firing*, and that a single creature is in pain in virtue of having c-fiber firing and in virtue of having d-fiber firing. Now, if the P_1- and the P_2-instance were identical, we would have to assume that a single property-instance can occur at two distinct places, viz., where the c-fiber firing occurs and where the d-fiber firing occurs, and this seems impossible. Hence, the P_1- and the P_2-instance are distinct and the M-instance cannot be identical to the P_1- *and* the P_2-instance.

Neither can the M-instance be identical to the P_1- but not to the P_2-instance, or *vice versa*. Suppose the M-instance is identical to the P_1- but not to the P_2-instance. Consider an object o_2 in which only P_2 realizes M. If the M- and the P_2-instance are distinct in o but identical in o_2, then if P_2 realizes M, sometimes the P_2- and the M-instance are identical and sometimes not, which is unacceptable. Hence, the P_2- and the M-instance are distinct in o_2. Consider now an object o_1 in which only P_1 realizes M. If the P_1- and the M-instance are identical in o_1, P_1 realizes M in o_1 by means of instance-identity, while P_2 realizes M in o_2 by means of instance-distinctness; if the P_1- and the M-instance are distinct in o_1, P_1 realizes M in o_1 by means of instance-distinctness but in o by means of instance-identity. Since neither alternative is acceptable, the M-instance cannot be identical to the P_1- but not to the P_2-instance.

Ehring's scenario is thus coherent only if the instances of M, P_1 and P_2 are distinct. In this case, however, physicalism seems to be false, unless it is understood in an absurdly weak manner. If the mental is distinct from the physical even at the level of *property-instances*, then there is no substantial relation between the mental and the physical at all. All there is in this case is brute correlation. What would distinguish such a position from other correlationist positions which are clearly incompatible with a physicalist worldview, like, say, a modern form of pre-established harmony between mental and physical property-instances? Since the purpose of the *Determinable Hypothesis* is to avoid the kind of epiphobia that is typically assumed to arise within a physicalist worldview, Ehring's objection, by presupposing a scenario incompatible with such a worldview, seems unproblematic.[8]

Apart from that, and more importantly perhaps, the *Principle of Exclusion* does not, *pace* Ehring, express a condition necessary for determination. Why not say that borderline cases between yellow and red are both yellow *and* red, simultaneously and at the same place (see Hyde, 1997), although *being yellow* and *being red* are samelevel determinates of *being colored*, or that a sauce is, simultaneously, sour and sweet, although *being sour* and *being sweet* are samelevel determinates of *being flavored*? Moreover, if descending from determinables to determinates simply means 'adding' more details — that, say, something is crimson is more specific than that it is red, etc. — why are *having a color* and *having a shape* not two determinates of *having a property* (see Fales, 1982, 30)? In this case, since something can simultaneously have a shape and a color, the *Principle of Exclusion* is false. It may be objected that *being sour* and *being sweet*, and *having a color* and *having a shape*, are not *samelevel* determinates, but then one would like to hear more about the notion of samelevelness. Apart from that, the example concerning borderline cases between yellow and red seems to hold independently of any considerations about samelevelness.

The second potentially problematic condition is a *Principle of Incomplete Determination* according to which properties do not count as full determinates of determinables if they are themselves determinables

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8 I acknowledge that, as an anonymous referee has put it, 'there are plenty of physicalists who are not even (mental-physical) token property or token event identity theorists,' but for the reason given in the text, I would say that their position is a kind of *property-dualism* and not one which deserves the label 'non-reductive *physicalism*.'

relative to another determinate: *being red* is a determinate of *being colored*, but since there are determinates of *being red* and *being colored* — *being crimson*, *being scarlet*, etc. — *being red* is not a *full determinate* of *being colored*.

> *Principle of Incomplete Determination*: If a determinable F has a determinate G and there is a determinable H that is a determinable of F and G, then F is not a full determinate of H. (see Ehring, 1996, 471)

Why does Ehring think that mental and physical properties violate the *Principle of Incomplete Determination*?

> [S]uppose that *M* is a fully determinate type of mental state. For example, make *M* a precise state of searing pain such that there is no room for further specification of this mental state **qua** pain state. *M* is, of course, a determinate of the property 'being in pain.' Suppose that *M* and 'being in pain' have a physical ... realizer, *P*.... Our principle then requires that *M* cannot be a fully determinate pain state. This is so since there are **further** determinates of that pain state and of 'being in pain' — in the form of *P*. But, in fact, *M* is a fully determinate pain state by hypothesis. (Ehring, 1996, 473; bold emphases in original)

Given that *M* and *being in pain* have a common physical determinate *P*, Ehring claims, the *Principle of Incomplete Determination* requires that *M* cannot be a fully determinate pain state. In fact, however, the *Principle of Incomplete Determination* only requires that *M* is not a full determinate of *being in pain*. Given *P*, *M* cannot be a *full determinate* of *being in pain*. But *M* can fail to be a full determinate of *being in pain* and still be a *fully determinate pain state* if there is no determinate of *M* and *being in pain* which is a pain state. *M* is a *full determinate* of *being in pain* iff *M* is a determinate of *being in pain* and there is no determinate of *M* and *being in pain*. In contrast, *M* is a *fully determinate pain* state iff *M* is a determinate of *being in pain*, *M* is a pain state and no pain state is a determinate of *M* and *being in pain*. Since, *ex hypothesi*, *M* is a fully determinate pain state, how could any property below it be a pain state? In particular, how could *P* be a pain state if it realizes a fully determinate pain state? Hence, *M* can be a fully determinate pain state even if it is not a full determinate of *being in pain*. *Pace* Ehring, mental properties thus seem to fulfill the *Principle of Incomplete Determination*.[9]

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9 There must be something wrong with Ehring's objection, for consider the following variation on it which, if sound, would show that colors, our prime example of the determinable/determinate relation, violate the Principle of Incomplete Determination: Let *G* be a determinate of *being red*, a precise shade of red such that there is no room for further specification of it *qua* shade of red. Suppose that *G* and *being red*

The third potentially problematic condition is a *Principle of Ordering* and holds that the determinates of a given determinable can be arranged in a similarity-ordering in virtue of differences among the determinates with respect to the determinable — *being red*, say, is more similar to *being orange* (with respect to *being colored*) than it is to *being green*.

> *Principle of Ordering*: If $\{G_1, \ldots, G_n\}$ is a complete set of samelevel determinates of a determinable F, then for any set of objects $\{o_1, \ldots, o_n\}$ such that o_i has G_i, $o_1, \ldots, o_n$ can be ordered with respect to F in virtue of differences among these determinates. (see Ehring, 1996, 471)

Allegedly, mental and physical properties violate the *Principle of Ordering*:

> [M]ultiple realization does not guarantee, and perhaps makes it unlikely, that the physical realizers of a mental properties [sic!] will satisfy this orderability principle with respect to their would-be mental determinables. [Physical realizers] can be widely disparate ... such that their physical ordering may fail to correspond to the ordering of their supervening mental properties with respect to further determinables ... of those mental properties. (Ehring, 1996, 472)

If the *Determinable Hypothesis* were true, says Ehring, a similarity ordering of P_1, P_2, P_3 etc. *qua* physical would have to reflect a similarity ordering *qua* mental of the mental properties that P_1, P_2, P_3 etc. realize. Yet, the physical realizers of mental properties are likely going to be so heterogeneous from a physical point of view that a similarity ordering *qua* physical will not reflect a similarity ordering *qua* mental, because 'whereas p_1 is more like p_3 than it is like p_2 **qua** physical properties, the specific pain properties which supervene on these states may be ranked **qua** pain such that the p_1 is more like the p_2 than it is like the p_3 pain' (Ehring, 1996, 472-3; bold emphases in original).

It is true, as Ehring says, that mental properties violate the *Principle of Ordering*. Yet, once again the *Principle of Ordering* does not express a necessary condition on determination. Wave-packages containing combinations of waves of different length result in the same (perceived) color; hence, an object o_1 may be more similar *qua* (perceived) color to an object o_2 than it is to an object o_3, while the wave-package emitted by o_1 may be more similar *qua* physical to the one emitted by o_3 than it is to the one emitted by o_2. Similarly, consider three objects o_1, o_2 and o_3, such that

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have a physical determinate P (a micro-structural property of colored objects, say). The *Principle of Incomplete Determination* requires that G cannot be a fully determinate red shade because there are further determinates of G and of being red. But G is a fully determinate red shade *by hypothesis*.

o_1 is a piece of iron weighting 1 kg, o_2 is a piece of iron weighting 10 kg, and o_3 is a piece of copper weighting 2 kg. A similarity-ordering based on the physical differences between o_1, o_2 and o_3 will rate o_1 as more similar to o_2 than to o_3, although a similarity ordering *qua* determinable, viz., *qua* the property of having (a) weight, will rate o_1 as more similar to o_3 than to o_2.

Ultimately, however, Ehring is right that there is one condition necessary for determination that mental and physical properties do *not* fulfill.

Distinct samelevel determinates of a determinable are distinct precisely because they differ from each other with respect to the determinable. In other words: Distinct determinates of a determinable F cannot be exactly the same with respect to F-ness. For instance, *being crimson* and *being scarlet* are distinct determinates of *being red* precisely because they differ with respect to redness. It is nonsense to hold that *being crimson* and *being scarlet* are distinct determinates of *being red* but nevertheless exactly similar with respect to redness. This idea is expressed by the following *Principle of Difference*:

> *Principle of Difference*: Distinct samelevel determinates $G_1, \ldots, G_n$ of a determinable F differ from one another with respect to F. (see Ehring, 1996, 471)

In contrast, mental properties are said to be *realized* by physical properties for no other reason than to account for the intuition that *exactly the same* mental property can be had by having *distinct* physical properties which differ widely from a physical point of view. Mental properties are said to be multiply realizable precisely because *distinct* physical realizers can be *exactly the same* with respect to the mental property they realize, so that two individuals may have pain or believe that Iowa is west of Indiana while one is in this state in virtue of having physical property P_1 and the other is in the same state in virtue of having a different physical property P_2. The core idea of functionalism, for instance, is that systems with a radically different physical make-up can be exactly the same with respect to the machine table they implement, or that radically different physical properties can be exactly the same with respect to the mental property they realize. On some versions of functionalism this follows straightforwardly from the way mental properties are characterized, viz., as the properties of having a physical property which occupies a certain functional role. The physical realizers of mental properties are *by definition* undistinguishable with respect to the functional role they occupy and thus undistinguishable with respect to the mental properties in question.

Hence, while it is nonsense to say that distinct determinates are exactly the same with respect to a given determinable of them, distinct physical properties are exactly the same with respect to the mental property realized by them. Suppose you are presented with a series of six patches, each of which has a different shade of red, and you are asked to sort them with respect to their redness. It might be difficult to solve the task — lightening conditions might be bad or some shades might be barely discriminable — but no doubt you understand what you are asked for. Suppose, on the other hand, you are presented with a series of six physical realizers $P_1, \ldots, P_6$ of the property *believing that Iowa is west of Indiana* and asked to sort them with respect to that property. In that case, you are justified in complaining that you do not understand what you are asked for. What could it mean that, say, P_3 is more similar to P_5 than to P_2 with respect to the property of believing that Iowa is west of Indiana, given that $P_1, \ldots, P_6$ realize *believing that Iowa is west of Indiana* precisely because they are exactly alike with regard to that property?

The *Principle of Difference* does indeed express a necessary condition on determination. I would even claim that it expresses a *conceptual* constraint on determination, so that someone who holds that distinct determinates of a determinable F can be exactly the same with respect to F-ness does not understand the very concept of a determinable. But if the *Principle of Difference* expresses a condition necessary for determination, the argument based on (1) and (2) is unsound because (1), the *Determinable Hypothesis*, is false: mental properties cannot be determinables of physical determinates since they violate the *Principle of Difference*. That the *Determinable Hypothesis* could avoid epiphobia if it were it true is thus irrelevant because it is actually false. Section IV argues that it is even unclear that the *Determinable Hypothesis* would cure epiphobia if it were true.

IV Causal Exclusion, Determinables, and Parts

According to (2), determinables are not excluded by their determinates. Interestingly, however, Yablo never defends (2). He simply observes that everyone 'must respect the *truism* that determinates do not contend with their determinables for causal influence' (Yablo, 1992, 259; emphasis S.W.). 'Assuming that the patch's crimsonness was sufficient for [the pigeon's] pecking,' he asks rhetorically, 'does anyone seriously want to conclude from this that its redness made no causal difference?!' (Yablo, 2001, 67-68).

> Imagine a pigeon Sophie trained to pick at red shapes. No one would call the triangle's *redness* irrelevant to her pecking on the grounds that the effect was already provided for by its specific *shade* of red. ... Nor would anyone think that my screaming was irrelevant since my screaming 'wake up!!' was sufficient. Examples like these confirm what seems obvious anyway: determinates do not preempt their determinables. (Yablo, 1997, 256)

There is no doubt that (2) seems obvious. The question, however, is not whether (2) seems obvious, but whether it is *true*. And defendants of the *Causal Exclusion Argument* do not simply claim that (2) is false, they bolster this claim by an argument. They argue that since the determinates do all the 'causal work' and 'causal work' is not something that can be doubly done (except for rare cases of genuine overdetermination), determinates exclude their determinables, contrary to (2).[10] I am not saying that their argument is ultimately convincing. I am just saying that they are at least offering an argument, while Yablo offers no support whatsoever for (2). Yablo's response to the *Causal Exclusion Argument* rests on denying something that follows directly from the *Causal Exclusion Argument*, viz., that determinables are excluded by their determinates, and he does not even provide any justification for his way of viewing the issue.

One could justify (2) by arguing that the causal relevance of determinates just *is* the causal relevance of their determinables: since *being crimson* is a way of *being red*, it may be said, for *being crimson* to be causally relevant is *ipso facto* for *being red* to be causally relevant. Yablo, entirely correctly, rejects this suggestion because it seems that causally relevant determinates can have causally irrelevant determinables: Hannah's singing at less than 90db is not causally relevant for the window's shattering just because singing at 80db is both causally relevant and a determinate of singing at less than 90db (Yablo, 1992, 259n32).

Incidentally, this reinforces the point made above that the argument based on (1) and (2) proves at most that if mental properties are con-

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10 Of course, talk about 'causal work,' although ubiquitous in recent discussion about mental causation, is at best metaphorical. One important question is what is meant by 'doing the causal work' to begin with. What people like Kim who use this expression have in mind is 'a conception of causation as ''production'' or ''generation''' (Kim, 2002, 675) according to which to be causally efficacious is to add some kind of 'metaphysical push,' or 'oomph,' to the world, so that causes literally occupy 'the role of a puller and shover and twister and bender' (Bennett, 1988, 22). This explication immediately raises the further question how a property can be said to do some 'causal work,' given that it is a universal, and not a particular. I tend to think that a promising answer would have to appeal to the idea, promoted, among others, by Shoemaker (see Shoemaker, 1980, 2001), that properties can equip their bearers with causal powers, but this is not the place to go into the details of this issue. Suffice it at this point to note that given such a framework, the reason why determinates screen off their determinates could be put as follows: The causal powers of determinables must be a subset of the causal powers of their determinates (otherwise something could have a determinate by contributing all causal powers individuative of it, but fail to have the determinable by lacking the additional causal powers, so that determinates would not asymmetrically necessitate their determinables), which straightforwardly entails that determinates, in contrast to determinables, are guaranteed to contribute all required causal powers to their bearers.

strued as determinables they are not screened off by the physical properties that act as their determinates, not that they are *ipso facto* causally relevant: 'I am not saying that redness *inherits* causal relevance from scarlet; I am just denying that scarlet can *deprive* redness of causal relevance' (Yablo, 1997, 275n25):

> [O]ur position [the argument based on (1) and (2); S.W.] is wholly negative: for all that the exclusion argument shows, mental phenomena *can* be causally relevant compatibly with the causal sufficiency of their physical bases. It is a further question whether they *will* be in any particular case. (Yablo, 1992, 273)

In a sense, thus, the argument based on (1) and (2) alone cannot cure epiphobia, because for it to be persuasive Yablo needs an argument for (2) and such an argument goes beyond what the appeal to the *Determinable Hypothesis* can supply.

Yablo admits that there are '*some* ... relations ... whose relata do compete for causal influence' (Yablo, 1997, 255; see also Yablo, 1992, 272). One may thus expect that a characteristic feature of the determination relation is responsible for the absence of exclusion. However, the allegedly characteristic principles discussed in section III will not do the job. The *Principle of Difference* is violated by mental and physical properties; the *Principle of Exclusion* and the *Principle of Ordering* are not characteristic of determination; given the familiar layered framework in which properties at each level have realizers at lower levels, the *Principle of Downward Necessitation* can also be generalized to all higher-level properties, irrespective of whether they are related as determinables and determinates; and the *Principle of Non-Disjunctive Determinables*, the *Principle of Non-Conjunctive Determinates*, and the *Principle of Ordering* are too specific to provide any general reason for thinking that determinables are not excluded by their determinates. What, then, is the characteristic feature of determination that supposedly avoids the exclusion of determinables by their determinates?

When responding to the objection that the *Determinable Hypothesis* is false, Yablo says in a more recent paper:

> Admittedly, the pain/[physical realizer] : red/scarlet analogy isn't perfect. ... As far as I can see, all that '*Y* is a determinate of *X*' *needs* to mean ... is that *Y* necessitates *X* (not because it has a metaphysically infallible way of bringing *X* about but) because *X* is immanent in or included in *Y*. This is all it takes to kill the appearance of causal competition. (Yablo, 1997, 275n22)[11]

11 The difference between 'mere' metaphysical necessitation and immanence crops up already in Yablo, 1992, 256-257n29. When Ehring says that Yablo's position 'does

What matters is thus not whether mental properties are literally determinables of their physical realizers but whether they are *immanent* in them. But what does it mean that *F* is *immanent* in *G*, as compared to *G*'s bringing *F* about with metaphysical infallibility? In yet another paper, Yablo argues that the key to curing epiphobia is to look for an intimate relationship between mental and physical properties and that a good candidate is the intensive part/whole relation, viz., 'the relation in which Socrates' drinking the hemlock, say, stands to his guzzling the hemlock; or someone's driving home on a certain occasion stands to her speeding home' (Yablo, 2001, 67). Determination is one of 'the principal examples we have of intensive part/whole relations' (Yablo, 2001, 67), but mental properties can be intensive parts of physical properties even if the former are not literally determinables of the latter.

Maybe for *F* to be immanent in *G* is thus for *F* to be an intensive part of *G*. The appeal to immanence or parthood may then be taken to show that the arguments in sections II and III were mute. If it is *immanence* or *parthood* that matters, and not determination in a literal sense, the falsity of the *Determinable Hypothesis* is unproblematic for Yablo because his key argument can be reformulated without it. If the immanence or intensive part/whole relation is more general than the determination relation, the considerations advanced in section III show that (1) is false, but they leave (1*) unaffected.

(1*) Mental properties are immanent in or parts of physical properties.

(2*) If property *F* is immanent in or a part of property *G*, then *F* is not excluded by *G*.

(∴) Mental properties are not excluded by physical properties.

One would of course like to hear more about the immanence or intensive part/whole relation — in particular about how exactly one property can be a 'part' of another and about the difference between being immanent in and 'merely' being brought about by a property with metaphysical inevitability — but suppose for the sake of argument that (1*) is true.

The justificatory status of (2*) is no better than that of (2). Whatever holds for (2) applies *mutatis mutandis* to (2*). The *Causal Exclusion Argument* holds that parts and wholes compete with each other, a competition

not depend on the claim that mental properties are full-fledged determinables of physical properties' (see Ehring, 1996, 477 and n. 6) he seems to have something like this distinction in mind.

that the parts inevitably are going to win: ascribing all lower-level properties to, say, a table's appropriately related parts exhaustively fixes the table's causal powers, so that there is nothing left, causally speaking, for the whole table to contribute. As above, it is hard to see how a response to the *Causal Exclusion Argument* could be based on a crucial premise like (2*) — one, moreover, which defenders of the *Causal Exclusion Argument* have good reasons for denying — if all that is said in its favor is that it 'seems obvious anyway' (Yablo, 1997, 256).

The argument based on (1*) and (2*) cannot cure epiphobia unless there is a reason for thinking that (2*) is true. And since the *Causal Exclusion Argument* provides reasons for thinking that (2*) is false, it seems that for the argument based on (1*) and (2*) to get off the ground, one must already have a valid response to the *Causal Exclusion Argument*, and that is exactly what the whole argument was supposed to provide in the first place.

At this point, one option is to attempt to formulate adequate sufficient conditions of causal relevance that show how wholes can play a causal role in addition to their parts. To my knowledge, Yablo has never said what he takes to be sufficient conditions of causal relevance. He instead opts for a second option. He argues that the *Causal Exclusion Argument* cannot be correct because the properties it deems to be causally relevant, viz., the physical properties which do all the 'causal work,' violate a necessary condition of causal relevance. Physical properties, in contrast to the mental properties they supposedly screen off, are overloaded with unnecessary details and thus not *proportional* to their alleged effects, while *proportionality* is necessary for causal relevance. Section V argues that Yablo's counterattack on the *Causal Exclusion Argument* fails because proportionality as defined by him is not necessary for causal relevance.[12]

V Causal Relevance and Proportionality

As said above, the argument based on (1*) and (2*) shows at best that mental properties are not screened off from causal relevance. It thus cures epiphobia only if there is no other reason for thinking that mental properties are causally irrelevant:

12 In a sense, the appeal to proportionality can be understood as an attempt to provide an answer to the question why we should suppose that determinables (or wholes) are not excluded by their determinates (or parts). Thanks to an anonymous referee for suggesting this reading.

> One could argue that as between, say, my pain, and the underlying brain state, the 'real' cause of my wincing is the brain state — not because the pain is preempted by the brain state (wholes don't preempt their parts) but just because, well, we don't want to have *two* causes, and the pain offers no advantages to compensate us for the sheer kookiness of nominating a non-physical event as the cause of a physical one. (Yablo, 2001, 68)

In response to this charge, Yablo points out that it is 'a general principle of causation that we want causes to be as far as possible *proportional* to their effects: that is, to be *required* by them — nothing less would have done — and *enough* for them — nothing more was needed' (Yablo, 2001, 68).[13] Relative to the behavioral act of Hannah's drinking milk, for instance, the exact physical realization of her desire for milk contains too many unnecessary details, but relative to the exact physical trajectory of her body while she is drinking milk, Hannah's desire for milk is not detailed enough and the exact physical realization would be more appropriate, i.e. proportional (see Schröder, 2003, 180). Similarly, with respect to Hannah's receiving a speeding ticket near a police radar unit (Yablo, 1997, 258-9), her driving through the radar was not enough for her being ticketed because she had to drive over the speed limit, but her speeding through the radar sober was not required because her sobriety had nothing to do with her being ticketed. Hannah's speeding through the radar is *proportional* to the effect in question because it is specific enough without adding too much which is not required, and it is itself required because nothing less would have been enough.

According to Yablo, although physical properties are enough for the occurrence of their effects, they often offer more than is required, while the mental properties they realize are often equally enough without bringing in too much unnecessary ballast. As to the question whether Hannah's brain state b or her pain p causes her wincing w, one cannot simply say that since b was enough for w, p was superfluous and thus has no right to be considered as w's cause. Rather, it is b which 'appear[s] to be overloaded with unneeded microstructural detail.... But then to call the mental state an unneeded excrescence gets matters exactly backwards' (Yablo, 1997, 254). According to Yablo's *Proportionality Constraint*, if p and b are both enough for w, but only p is required by w, then p carries the day. If proportionality is necessary for causal relevance, the *Causal*

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13 In the context of his discussion of proportionality, Yablo usually talks about causation instead of causal relevance (largely because he applies 'causal relevance' not to properties but also to events and thinks that events can be causally relevant even if they are not causes; Yablo, 1992, 273-4). He acknowledges, however, that 'there is a related story about mental properties' (Yablo, 1992, 274n55).

Exclusion Argument cannot be correct because the physical properties which actually seem to bring about an effect are often not proportional. In order to evaluate this objection, precise definitions are helpful (see Yablo, 1997, 266-267; 2001, 68):

> *Def 2*: An event c_1 *screens off* an event c_2 from an effect *e* iff had c_1 occurred without c_2, *e* would still have occurred.
> *Def 3*: An event *c* is *required* by an event *e* iff *c* is not screened off from *e* by any of its determinables (or parts).
> *Def 4*: An event *c* is *enough* for an event *e* iff *c* screens off all of its determinates (or wholes) from *e*.
> *Def 5*: An event *c* is *proportional* to an event *e* iff *c* is both required by and enough for *e*.
> *Def 6*: An event *c causes* an event *e* only if *c* is proportional to *e* (the *Proportionality Constraint*).

Given *Def 6*, *p* may actually be in a better position to be considered the cause of *w* than *b*:

> Arguably it is the brain state, weighed down with superfluous microphysical detail, that suffers in the comparison. After all, I would still have [winced] even if my pain had occurred in a different microphysical way. Whereas the issue of how I would have behaved had the brain state occurred in the pain's absence cannot even be raised, because the brain state includes the pain. (Yablo, 1997, 257-8)

Given *Def 6*, *b* causes *w* only if *b* is proportional to *w*; by *Def 5*, *b* must thus be required by and enough for *w*. By *Def 3*, *b* is required by *w* iff *b* is not screened off from *w* by any of its determinables. Yet, *p* — which is a determinable of *b* — screens *b* off from *w*. By *Def 2*, *p* screens off *b* from *w* iff had *p* occurred without *b*, *w* would still have occurred, which is true if *p* is multiply realizable: in the closest possible world in which *p* occurs without *b*, another brain state, say *b*′, 'takes over' and *w* occurs. Hence, *b* causes *w* only if *b* is proportional to *w*, but *b* is not proportional to *w* because *b* is not required by *w*, and *b* is not required by *w* because *b* is screened off from *w* by *p*:

> To the extent that the pain screens my brain state off from my wincing — to the extent that my wincing would still have occurred had the pain been differently implemented at the neural level — my [pain] is more proportional to the wincing and hence a better candidate for the role of cause. (Yablo, 2001, 68)

(2*) claims that *b* does not exclude *p*, and the *Proportionality Constraint* entails that *p* is even a better candidate for the cause of *w* than *b*. The *Proportionality Constraint* thus helps to establish (2*) by rebutting the argument against (2*): if causally relevant properties must be proportional to the alleged effects and if physical properties often fail to be proportional, the *Causal Exclusion Argument* cannot be correct and there is no longer any reason to deny (2*).[14]

However, the *Proportionality Constraint* is false: proportionality is not necessary for causal relevance. Vernacular causal discourse treats properties which are not proportional to the alleged effects nevertheless as causally relevant. Yablo admits (Yablo, 1992, 259n32) that if a window shatters if someone sings at 70db or more and Hannah sings at 80db on a given evening, her singing at 80db is causally relevant for the window's shattering. Yet, Hannah's singing at 80db is not proportional to the window's shattering. Substituting in *Def 3*, *Def 4* and *Def 5*, one gets:

(3) Hannah's singing at 80db is proportional to the window's shattering iff (i.) Hannah's singing at 80db is not screened off from the window's shattering by any of its determinables; and (ii.) Hannah's singing at 80db screens off all of its determinates from the window's shattering.

Hannah's singing at less than 90db is a determinable of her singing at 80db and since Hannah's singing at less than 90db screens off Hannah's singing at 80db from the window's shattering, (i.) is false. Why does Hannah's singing at less than 90db screen off Hannah's singing at 80db? Substituting in *Def 2* one gets:

(4) Hannah's singing at less than 90db screens off Hannah's singing at 80db from the window's shattering iff had Hannah sung at less than 90db without singing at 80db, the window would still have shattered.

As usual, counterfactuals are to be evaluated according to the Lewis/Stalnaker method: '"if it had been that *P*, then it would have been that *Q*" is true iff *Q* is true in the *P*-world best resembling actuality' (Yablo, 1992, 274n56). The minimal change required to make Hannah sing at less than 90db but not at 80db is to have her sing at just a bit less or more than 80db, at 79.5db or at 80.5 db, say, in which case the window still shatters. Hannah's singing at 80db is thus screened off from the window's shattering by her singing at less than 90db and hence not

14 Given what has been said about the dialectics of the argument based on (1*) and (2*) in section IV, the argument would then be sound, assuming that (1*) is granted, but superfluous since the *Causal Exclusion Argument* against which it is directed can be shown to be flawed by appeal to the *Proportionality Constraint* alone.

proportional to it. Were *Def 6*, the *Proportionality Constraint*, correct, we would have to conclude that we could not say truly that the window shattered because Hannah sung at 80db.

One might concede this and retort that, strictly speaking, the window indeed shattered because Hannah sung at 70db or more. However, it is only a rough estimate that the window shatters if someone sings at 70db or more. It might shatter even if someone sings at 69.97db or it might barely tolerate someone's singing at 70.03db. Suppose the former was the case on the given evening. Hannah's singing at 69.97db or more is a determinable of Hannah's singing at 70db or more and screens it off from the window's shattering. In the closest possible world in which Hannah sung at 69.97db or more without singing at 70db or more, the window would have shattered, so that Hannah's singing at 70db or more is not required for the window's shattering. This argument can be repeated until one finally seems to reach the truly proportional cause, say Hannah's singing at 69.9746462db or more.[15] Yet, not even this can be the truly proportional cause, because the window's shattering arguably does not require that *Hannah* sings at 69.9746462db or more or that Hannah *sings* at 69.9746462db or more. Can the *Proportionality Constraint* be adequate if it prevents us from saying truly that the window shattered because Hannah sung at 80db, or at 70db or more or at 69.9746462db or more? In particular, is this the notion of 'causal relevance' that causal compatibilists who are opposed to the *Causal Exclusion Argument* have been after all the time? If the vernacular intuitions appealed to by causal compatibilists themselves set the standard, the *Proportionality Constraint* is too restrictive and thus false. This point can be reinvigorated by yet another example.

Consider the event k, Hannah's experiencing a pain in her knee. Does k cause her wincing w? Given *Def 6*, k causes w only if k is proportional to w, which (by *Def 3*, *Def 4* and *Def 5*) means that (i.) k is not screened off from w by any of its determinables; and (ii.) k screens off all of its determinates from w. For all Yablo says, k counts as a determinate of p, Hannah's experiencing a pain. Hence, if p screens off k from w, (i.) is false and k does not cause w. Substituting in *Def 3*, one gets:

(5) p screens off k from w iff had p occurred without k, w would still have occurred.

15 Assuming for the sake of argument that the precise value of db that the window could (in the circumstances given) just withstand is expressible by a finite number.

In the closest possible world in which Hannah experiences pain without experiencing a pain in her knee, she presumably still winces (*ceteris paribus*) because she still experiences pain. p thus screens off k from w, so that k does not cause w. However, not even Hannah's experiencing pain is proportional to w. Experiencing pain entails but is not entailed by having a wincing causing experience (hearing a sudden loud noise, seeing something cruel etc. also cause wincings), so that having a wincing causing experience seems to qualify as a determinable of experiencing pain.[16] In the closest possible world in which Hannah has a wincing causing experience without experiencing pain, she still winces, so that her experiencing pain is not proportional to and not the cause of her wincing. Given that determinables and determinates were appealed to in order to fight epiphobia, this does not seem to be the kind of conclusion one would want to end up with.

At this point it may be complained that the arguments in this section rely too much on 'vernacular intuitions.' Why, for instance, can the Yablovian not bite the bullet and hold that strictly speaking it is indeed a very restrictive and narrow property which is causally relevant, but add that for our practical everyday purposes of *explanation*, one can successfully cite all the other properties?[17] First of all, I am not illegitimately forcing *my* intuitions on Yablovians. The intuitions I am pushing (that the window shattered because Hannah sung with 70db or more, that Hannah winced because she has a pain in her knee, etc.) are exactly those that the opponents of the *Causal Exclusion Argument* originally set out to vindicate in their struggle to avoid epiphenomenalism. One cannot appeal to intuitions about causal relevance when it fits one's purpose, for instance when one maintains that the claim that mental properties are causally irrelevant is just 'crazy,' but not when it does not suit one's purpose, for instance when one's own theory which was supposed to salvage the causal relevance of a given class of properties renders them causally irrelevant. Second, it won't do for the Yablovian to admit that, strictly speaking, generic properties are screened off by very restrictive and narrow properties and seek refuge in the claim that they nevertheless play an important role in our explanatory enterprise. The issue between defendants and opponents of the *Causal Exclusion Argument* was never one about explanation, but always one about cau-

16 At the very least, the relation between having a wincing causing experience and experiencing pain is certainly not one of being brought about with metaphysical inevitability (see section IV).

17 Thanks to two anonymous referees for independently raising this worry.

sation.[18] From the point of view of the causal compatibilist, to admit that generic properties are only explanatorily and not causally relevant is to acknowledge defeat.[19]

VI Conclusion

To sum up: Proportionality as expressed by *Def 5* is not necessary for causal relevance. Hence, the fact that physical properties are often not proportional to an alleged effect does not show that the *Causal Exclusion Argument* is flawed. In saying this, I am not denying the intuition behind the *Proportionality Constraint*. Intuitively, Travis Hafner's hitting a homerun in the last inning may indeed be a more natural cause of the Indian's victory than his hitting the ball 410 feet along a certain parabolic trajectory at an angle of 7 degrees to a line running through home plate and the mound (an example taken from Barrett, 1995). At the *metaphysical* level, however, it remains a fact that as long as the fundamental physical details were as they were, the homerun, the hitting of the ball 410 feet along a certain parabolic trajectory at an angle of 7 degrees to a line running through home plate and the mound and the Indian's victory were bound to occur. And this means — given the *Causal Exclusion Argument* — that the fundamental physical properties are the only causally relevant properties. Maybe important generalizations (or something like that) are missed if one says that what was causally relevant for the victory were certain fundamental physical properties and neither the homerun nor the hitting of the ball 410 feet along a certain parabolic

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18 This is especially pertinent in the following passage from Kim's 1998 book:

> [T]he presence of two causal stories, each claiming to offer a full causal account of a given event, creates an unstable situation requiring us to find an account of how the two purported causes are related to each other.... That the explanations arise in different areas of inquiry ... or that they are responses to different epistemic or pragmatic concerns, makes no difference.... [T]urning away from metaphysics to embrace epistemology, or away from causation to embrace explanation, will not dissipate the need for an account of mental causation. (Kim, 1998, 64-7)

19 Philosophers like Lynne Rudder Baker or, in a slightly different vein, Frank Jackson and Philip Pettit (see Baker, 1993, 1995; Jackson & Pettit, 1990) try to ground the causal relevance of mental and other macrolevel properties in the indispensable role these properties play for our explanatory practice in our everyday life and in science. Baker's account is criticized in Walter, *forthcoming-b*, where I argue that the appeal to the explanatory value of mental properties alone cannot solve the problem of mental causation. Jackson and Pettit's *Program Explanation Account* is criticized in Walter, 2005.

trajectory at an angle of 7 degrees to a line running through home plate and the mound. But unless there is already an independent reason to think that the *Causal Exclusion Argument* cannot be correct, this alone cuts no causal ice, and the independent reason suggested by Yablo, his *Proportionality Constraint*, doesn't hold.

Claiming that mental properties are determinables of physical properties in the same sense in which *being red* is a determinable of *being scarlet* cannot cure epiphobia because this *Determinable Hypothesis* is false (see section III). Claiming that mental properties are immanent in or parts of physical properties — whatever that more liberal interpretation is supposed to amount to exactly — leaves open the question why one should accept the further claim that wholes are not excluded by their parts. As long as there is a reason to think that the *Causal Exclusion Argument* is correct, there is good reason to insist that, *pace* (2*), properties related by the part/whole relation do exclude each other, to the detriment of the wholes (see section IV). To get the argument based on (1*) and (2*) off the ground, Yablo would either have to provide adequate sufficient conditions of causal relevance, or show that the *Causal Exclusion Argument* which threatens (2*) cannot be correct. Yablo has nothing to say about sufficient conditions of causal relevance, and his objection against the *Causal Exclusion Argument* fails because the *Proportionality Constraint* is false: proportionality is not necessary for causal relevance (not at least against the background of the vernacular intuitions usually appealed to by causal compatibilists).

No matter exactly how the determinable/determinate distinction is understood, it has nothing positively to contribute to a (dis)solution of the *Causal Exclusion Argument* and to the cure for the fear that irreducible mental properties might turn out to be mere epiphenomena.

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