

Mind-brain Identity to the rescue of Multiple Realization

Abstract

To counter the thesis of the identity of Types, Putnam raised the famous argument of the multiple realization of the mental. Having inserted into functionalist thesis, argument is weakened (i) by the reductionism of Kim and Armstrong / Lewis, and (ii) by option of disjunction of properties. To make the relation of realization and multiple realization more coherent, Shoemaker offers an alternative thesis. In a recent article (2001), incorporating Yablo's thesis on determinable properties, he constructs an original account on realized properties that on one side avoids reductionism and on the other gives way to multiple realization. However, as this article aims to show, the use of Yablo's thesis, mainly qualifying relation between the mental and physical as a relation of determinable to determinate, added to the individuation of properties according to their causal profile, somehow reintroduces the Type identity thesis.

1. The Type Identity thesis

a. The theory of the identity initiated by U.T. Put (1956), H. Feigl (1958), J.J.C. Smart (1959) and D.M. Armstrong (1968), understands each other as identity of Types. Such identity means that when one identifies a mental state as being a state which one links to pain for instance, this state is a type of activity of the brain. The token of pain is then identical not only to a token of event in the brain, but, they are the same type. Smart (1957, p. 121) acknowledges it and explains that the concept of mental states as pain, differ from our concepts of neural states. Nevertheless, identity mind-brain does not request the identity of one's concepts. Identity is between properties here. Thus, if to feel pain is a mental property, to have this property means to be in a state of pain. Therefore, the theory of identity is a theory of *the identity of properties*.

b. Identity does not mean correlation. According to the supporters of the thesis of identity, to assume that states of conscience are *correlated* with physical processes does not help in understanding of identity. For Smart (1956, p. 117), "to say that they are *correlated* is to say that they are something 'over and above'." As a result, to exile any idea of correlation,

it is therefore asserted that mental property is *identical* with material or physical property. Smart therefore adds: “you cannot correlate something with itself.” (Ibid.p.117). The star of morning cannot be correlated with the star of evening. In other words, identity and correlations, exclude mutually: *identity is not correlation*.

c. The identity of which Smart, and other defenders of theory, speaks is therefore an identity, in its strict sense. If A and B are strictly identical, then A *is* B. The reference of this identity is copied on the results of scientific research. Science for instance, has discovered that light is an electrical discharge and that water is H₂O, etc. The supporters of identity mind-brain, think that while the research on the brain will produce results, certain properties which we indicate by using mental terms, will be in fact properties of the brain. Indeed, the theory of identity consists to spread *strict* identity in properties. However, there is no way for the supporters of the thesis of identity to move forward identity which alone scientific research would be justified to produce. However, the thesis of identity gives the kind of following interpretation: by mentioning experiments of conscience, we mention events in our brain. *To mention a mental property is the same as to mention a physical property*.

2. The relation of realization and multiple realization

The thesis of non-reductive physicalism is a thesis which rejects the identity of properties. Expressly non-reductive, this physicalism accepts (i) that the mental states and properties are *realized* by states of brain but (ii), on the basis of the argument of the multiple realization of mental supervenient properties, excludes their identity with these states. This argument, true opposition against the theory of identity, is aimed to a definite objective. Putnam writes:

Thus if we can find even one psychological predicate which can clearly be applied to both a mammal, and an octopus (say ‘hungry’), but whose physical-chemical ‘correlate’ is different in the two cases, the brain-state theory has collapsed. It seems to me overwhelmingly probable that we can do this. (1967, p. 165)

Thus, the multiple realization of the mental comes as a true alternative in the theory of identity. This intuition is consistent in maintaining that a large variety of living beings, primates to reptiles, are likely to have a mental property, as for instance, ‘to feel fright’. From the functionalist theory angle (Block 1980, p. 173), by identifying the mental states with the

role which they play in, the cognitive system to which they belong, justifies the argument of multiple realization. N. Block (1990, p. 146) writes:

According to the cognitive science, the essence of mental is computational, and any computational state is « multiple realizable » by physiological or electronic states that are not identical with one another, and so content cannot be identified with any one of them. (1990, p. 146).

Suchlike, according to the functionalism, every mental property can be defined as a secondary property, that is to say, a property that have some property playing a functional role, specified in terms of intermediate causal roles between inputs, other mental states, and output of a system¹. This relation between the first and the second order defines itself as relation of *realization* between psychological property *M* and neural-physiological property *P*: the first ones are realized by the seconds. So, realization imposes the existence of a strong connection between both kinds of properties. Moreover, this relation must be explicative. So, *P* realize *M*, if $P \rightarrow M$ (relation of nomological necessity) and *P* explains *M* (LePore and Loewer (1989, p. 179)².

It is necessary to add here, that the relation of realization of a certain property *M* by another property *P*, is not a causal relation. In effect, to realize is not to cause. *P* does not cause *M*³ (Kim, 1998, p. 47-50, Jacob, 2000, p. 132). What explains realization of *M* by *P* is the underlying composition of the having states *P*. One can therefore characterize the relation of realization as a relation of non-causal determination between properties⁴.

Having applied to the non-reductive physicalism, the relation of realization asserts that in order to have a mental property *M*, any entity must have a physical realizer property *P*. The central point of this relation is that property *P* does not constitute a condition necessary for

¹ According to Kim (on 1998, p. 19), physical realization can be represented as “the conjunction of physicalism with the functionalist comprehension of mental properties”.

² “The existence of an explanatory connection between two properties is stronger than the claim that $P \rightarrow M$ is physically necessary since not every physically connection is explanatory” (LePore et Loewer 1989, p. 179).

³ Searle (on 1983, p. 265) inside what it names a « biological naturalism » support that the mental states *are caused* by the neural foundation, and maintains principle that “mental states are both *caused by* the operations of the brain and *realized in* the structure of the brain.” The relation of realization cannot be assimilated with causal relation as much as it fails two requisits of the causation. In effect, the relation of realization is simultaneous and not contingent.

⁴ We follow so the point of view of Kim (1998) and Schoemaker (2001) which interpret realization as simple relation between levels. R.A. Wilson (2001) and C. Gillet (2002), criticizing approaches of Kim and Schoemaker, add to the standard principles of physical realization, a clause enlarging the notion of realizers. For Gillet, realized and realizers properties, can occur in different objects. For Wilson, realization must take into account the notion of feelings in context. The principle of realization which guides us is this one of realizers of states or properties, entirely constituted physically by the intrinsic physical states of individuals having these states or these properties.

realization of M . The realizers are metaphysically *sufficient* for realization. It is so, as the relation of realization allows the insertion of multiple realization. In effect, inside the picture of multiple realization, there is not a simple neural type, which for instance, accomplishes pain in all types of organisms. Every distinct physical realizer is sufficient to instantiate a mental property, but no one is necessary. Consequently, the argument of multiple realization can then come to falsify the thesis of the identity of properties. Indeed, any psychological property M can therefore, according to the thesis of multiple realization, be realized by a cluster heterogeneous of physical properties $\{P_1 \vee P_2 \vee \dots P_n\}$ ⁵.

3. The local reduction and the legitimacy of disjunctive properties

The argument of multiple realization, being supposed to do block the Types Identity thesis, is weakened by the possibility of the local reduction. Kim, in his article “Multiple Realization and the Metaphysics of Reduction” (1992), by explaining why and how psychology can be reduced in physics, subjects it to the test of the reduction⁶. It is not the place of this article to explain the argument of Kim, however, it is necessary to discuss it in order to specify its orientation.

Two objections are brought by Kim (1992, p. 731, 1996, p. 233) in conditional relation $P \rightarrow M$. Firstly, first order property P is likely to realize M in organisms or of systems of a definite type. Indeed, if in humans, pain is a certain activation of fiber-C, it is not necessarily so in organisms that have a different neural structure. This activation of the fiber-C, in a non-human organism could accomplish a completely different mental function. Kim’s conclusion (1996) explains that relation $P \rightarrow M$ must be expressly put into perspective in a kind or a structure. Secondly, Kim uses the example of an engineer technician having to realize a machine to carry out computational tasks. In the same case, any computational token must be controllable by the physical token that is realizing it⁷. So, the realizer P must be *necessary and sufficient* at the same time for the realization of M .

⁵ As much as no member of multirealizable set $\{P_1 \vee P_2 \vee \dots P_n\}$ is coextensive of M , relation $M \leftrightarrow P_1 \vee P_2 \vee \dots P_n$ does not allow $M \leftrightarrow P$.

⁶ The other functionalist thesis, that Block calls “specifiers functional point of view” (Block, on 1980) and defended by Lewis (1966) and Armstrong (1968), identifies a property as *to feel a pain* with the occupiers of the causal role. The realizer is assimilated here with the pain itself. The predicate ‘to feel pain’ covers a diversity of properties then. Mental property is not any more a simple and only property consequently, but it is shared by all living beings that can be represented as feeling of pain. Consequently, multiple realization is only a family of similar properties.

⁷ It is for instance, the layout of an electrical circuit and the selection of components, which will be able to accomplish one or several electronic functions. These different functions can then operate on the control of an

The second facet in Kim's reductionist argument concerns legitimacy of disjunction of realizers properties. Indeed, if the properties of the basis are structurally heterogeneous, they also have to be causally heterogeneous. Surely, when the physical realizers have different structural explanation, disjunctive properties cannot support inductive general implementation (example of the jadeite and the nephrite)⁸. Kim then concludes:

Disjunctives properties, unlike conjunctive properties, do not guarantee similarity for instances falling under them. And similarity, it is said, is the core of our idea of a property. (1992 p. 736)⁹

The local reduction and the question of disjunctive realizer property strikes (fatally?) the second order's property realized in a multiple manner. Indeed, what these two arguments put in an obvious place is a difficulty for a property of the second order to achieve the status of true autonomous property. Shoemaker takes up this challenge:

On the account I am defending, functional properties are genuine properties whose instantiations confer conditional powers and play a role in the production of various effects. (2001, p. 445).

4. Shoemaker's alternative response

Shoemaker's account (2001) centred on the defence of the causal job of functional properties, offers an unusual solution. This solution allows at the same time, to include the intuition of multiple realization and to keep the property of the second order, the characteristics of irreducibility on their basis. The approval of such demonstration would, according to Shoemaker (Ibid. p. 430), prevent, the pre-emption of the realizer's property basis on realized property, and at the same time, return consistent the intuition of the multiple realization of some properties by basis properties.

abstract machine, as a machine of Turing for instance. Consequently, the realizer of abstract function, as much as he guarantees case or not case of this one, is therefore *necessary and sufficient*.

⁸ Fodor (1997, p. 150 and following) continue defending the projectibility in spite of the non reduction. For Fodor, there are laws about pain 'as such'. Although property *to feel pain* has various bases, it is not disjunctive therefore.

⁹ For Armstrong (1978, p. 20), but also for Lewis (on 1983, p. 344), to accept the existence of such disjunctive properties is apparently illicit. Armstrong (Ibid. p. 20) writes: "disjunctives properties offend against the principle that genuine property is identical in its different particulars. Suppose *a* has a property P, but lacks Q while *b* has Q but lacks P. It seems laughable to conclude that from these premises that *a* and *b* are identical in some respect."

4.1 Insert multiple realization

The causal theory of properties, defended by Achinstein (1974) and Shoemaker (1980, 1998), supports that properties are individuated by the causal relations which they enter (Shoemaker 1980, p. 222-223). In other words, to have a property means to make a causal difference for its holder. So, the powers which an object has, are owed to the property which has this object. As Shoemaker writes:

Any property whose instantiation can be a cause or partial cause of something will be such that its instantiation bestows on its subject a set of what I call “conditional powers.” (2001, p. 430)

The conditional powers with which properties endow objects, are not therefore, for Shoemaker, sufficient to confer some powers on these objects. In other words, conditional powers cannot act alone in the causation. Indeed, the property for a blade to be sharp confers some power on this knife. However, this property will exercise its power only provided that this blade is made of a metal enough hard and resistant. Indeed, a knife-shaped will have power to cut, only if it has other some properties, such as a sharp form, a particular structural composition, (metal rather than rubber), some dimension, etc.

This causal analysis of properties is refined by Shoemaker (2001, p. 432), when offering distinction between the causal powers bestowed on some property. The “*forward-looking structures*” are powers to produce certain effects. On the other hand, causal structures of the states of affairs, which could be produced by some causes, are “*forward-looking causal structures* ». Shoemaker’s analysis suggests then, that if a certain property P realizes property Q , then “*forward-looking causal structures*” of Q form a subset of “*forward-looking causal structures*” of P .

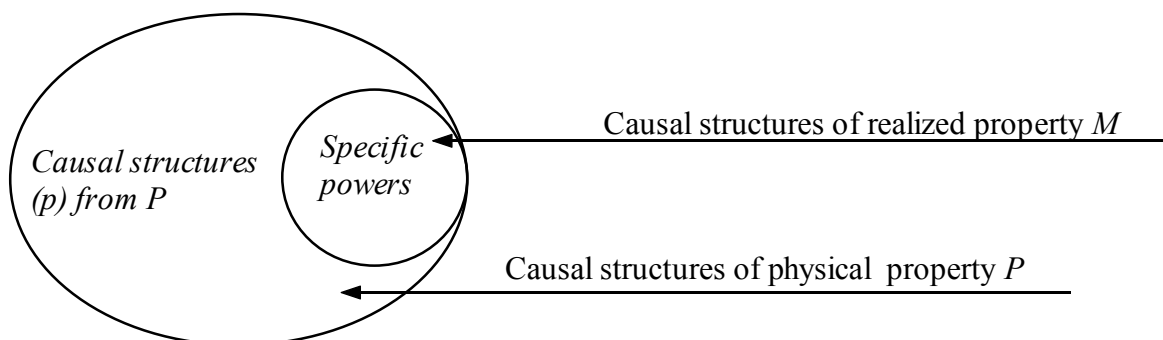


Figure 1: Inclusion of causal structures.

Such analysis allows Shoemaker to assert that sometimes the realized property *via* its instance, and *not realizer*, causes some effects. The distinction between properties *P* and *Q* is vindicated, according to the above-mentioned principle of individuation of property, by difference between the causal powers of each of instances. In other words, the conditional powers bestowed by property *Q* form a different subset, of those bestowed by property *P* (figure 1). Such approach is particularly linked to the conception of properties, which are in a report of relation of determinable to determinate. One could say for instance, that “the set of conditional powers bestowed by redness will be a proper subset of the conditional powers bestowed by scarlet, for example” (Ibid. p. 431). So, causal structures involved in causal transaction belong then to the subset, which realized property shares with all its realizers. Consequently, the multiple realization of property *Q* allows an explanation and avoids the reduction. Indeed, realization of *Q* can be the result of some conditional powers $\{q\}$ bestowed by *Q* (figure 2), but these powers can also be included by another property *R*. The notion of subset of some conditional powers of the physical properties of the basis, allows so to introduce a cluster of common conditional powers in different properties, as shown in the figure below, by different properties.

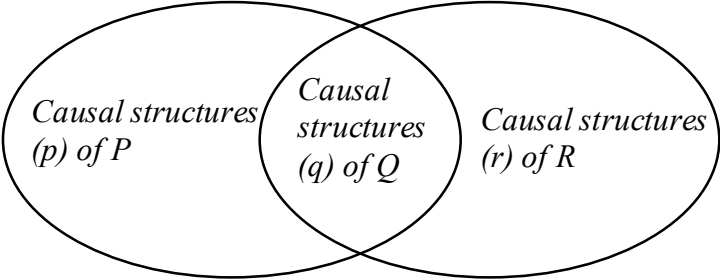


Figure 2: Common causal powers in two different properties

Thus, for an object *a*, the possession of *P* seems sufficient to have *Q*. In other words, when *P* is present, so is *Q*. However, presence of *P* is not necessary for presence of *Q*. This last can be realized indeed by *R*. Such picture seems to give a proper explanation of the assimilation of multiple realization inside the relation of realization, while avoiding the reduction. If property *Q* is a mental property, according to functionalism, it can be realized by a large variety and in different ways. So, an organism *a* having *Q*, will also have *P*. In the same way, an organism *b*, also having *Q*, will be able to have *R*. Moreover, this manner of

inserting the intuition of multiple realization, agrees perfectly with functionalist thesis about the mental. Indeed, for the functionalist, the possession of a mental property endows the organism which has it, a set of specific causal powers in this organism. These specific causal structures, that Shoemaker (1981, p. 265-266) name “*core realization*”¹⁰, proves that the same physical state could realize different functional properties at different instants (Block and Fodor, on 1972, p. 163).

4.2 Answer the threat of the reduction

The second aspect of Shoemaker’s resolution is characterized by the resistance to the different threats, to which realized properties are exposed: pre-emption, epiphenomenalism, reduction. Each of these threats drives, to conclude in the ineffectiveness of the causal job of the second order property. Shoemaker’s account bounces against this threat and asserts the irreducible character of these properties.

Let consider a certain kind of pain M that I feel – headache. The instance of this property M appears causally responsible for my displacement, towards the place where aspirins are. According to the relation of realization, M is a property realized by a physical basis P . In other words, the causes of my behaviour, is the possession of some causal powers $\{p$ and $q\}$ bestowed by P on my organism. However, alone certain specific or partial causal powers indeed constitute the cause of my displacement. In other words, the pain which I feel, as the figure 3 (below) shows it is a subset of the causal powers bestowed by realizer property P .

¹⁰ Shoemaker (1981, p. 264-266) differentiates for the functional states, the *core* of realization and *complete* realization. So, the realization in an organism, for instance to feel pain, would result from the conjunction of two properties. Indeed, according to functionalist hypothesis, property to feel pain could be accomplished by an organism a , in which the C-fiber (P) realizer of pain at the human beings, would not be present. So, for an organism, the possession of P , is not therefore sufficient to have the property expressed by the functional predicate ‘to feel pain’ (pF). One thinks of functional ownership pF then as the determined form of property: *to be constituted physically so that P play the final causal role of pain*. The full and complete realization of pain for a is the conjunctive property expressed by ‘ pF and P ’.

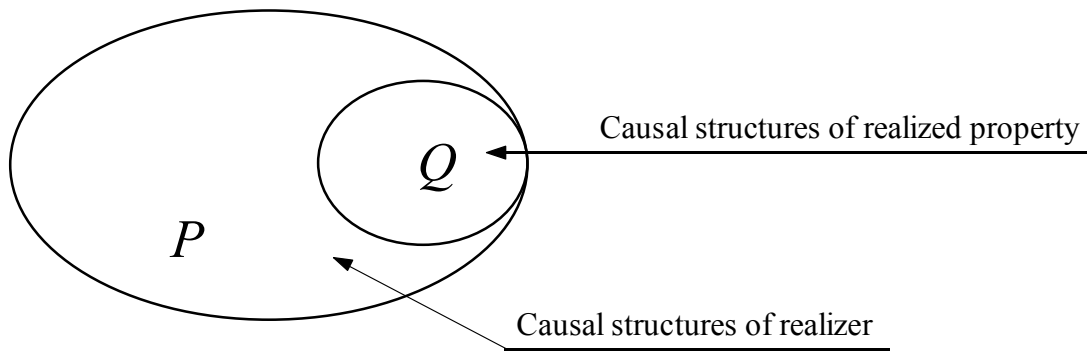


Figure 3: *Property incorporating some causal structures.*

Certainly the pain which I feel is realized by the possession of *P*. However, alone the specific powers bestowed by *M* are appropriate, by their restricted contribution, in the causation of my behaviour. Other powers bestowed by the possession of *P*, not constituting powers of pain, do not contribute, by the appropriate way in the realization of property to feel pain.

The multiple realization of pain means that *M* is present in organisms that have different realizers properties. Let suppose that the realizers constituting the physical basis of realization of *M* are two different physical (neural) realizers, having properties *P* and *R* (figure 2). According to the intuition of multiple realization, *M* will be realized by any property, including the causal powers which *M* bestows on her possessors (figure 2)¹¹. As a result, if *M* is realized by *P* or *R*, it will be only some causal powers of each realizer $\{p, q, r\}$, that will be appropriate for the possessor of *M*. These specific causal powers or causal structures are those that have property *Q*. In this picture, property *M* is realized in a numerous manner by *P* or *R*, in virtue of property *Q*, its physical realizer. Consequently, none of these two properties is therefore necessary for the presence of *M*.

The principle of the individuation of properties based on causal powers forms the metaphysical support of which, resolution comes on top. This resolution allows Shoemaker to construct a consistent exit for the relation of realization, inserting the intuition of multiple realization. Both problems abashing the non-reductive physicalism, the reduction and pre-emption, become problems without clear links to realized property. Indeed, the resolution of the inclusion of causal powers inside structures realizers allows avoiding ontology of levels,

¹¹ This treatment of the analysis of the theses of Shoemaker is partly indebted in the analysis of J. Heil (1999, p. 189-208)

and disarms the reductionism. As for the pre-emption of realized properties by the properties of the basis, because the first ones are not floating properties above the second, it cannot perform. Shoemaker's resolution then removes two characteristics of the functionalist theory of mind: (i) the ontology of levels, and (ii) idea that living beings could have property *M* without sharing some physical property.

This alternative resolution of Shoemaker is partly indebted in Stephen Yablo's hypothesis about the mental. And before objecting to the resolution of Shoemaker, Yablo's point of view must be presented here.

5. Yablo's hypothesis in the account of Shoemaker

5.1 Yablo's thesis

For Stephen Yablo (1992, p. 256), the relation between the mental and physical qualifies itself as a relation of determination, like scarlet determining the red. At a point of departure, a problem appears under the form of a relation between two types of properties. To begin the reasoning, Yablo introduces relation between determinable / determinate, as an extension of the principle of the indiscernibility of identicals. Indeed, one can support affirmation that two properties *P* and *Q* are identical, if and only if, an object is *P*, it is also *Q*. However, such affirmation is not very brightening. Adding the modality of necessity then, Yablo acquires what he names, the necessary conditions of identity:

[Indiscernibility of identicals properties] *P* is identical to *Q* only if: necessarily, for all *x*, *x* has *P* iff *x* has *Q*.

In other words, two properties are identical, if it is impossible for a thing to have the one, without having other one. This type of necessity, introduced by Yablo is not, a *conceptual* necessity or *a priori*, but a *metaphysical necessity*. That is to say, that the identity between properties is not warranted conceptually, but is *a posteriori* to it. In the same way, the necessity of the extension of identity Hesperus / Phosphorus is not *a priori* warranted. So, the identity between two properties is only the result of an empirical inquiry.

However, to reinforce the hypothesis, Yablo uses the relation of supervenience of the mental on a physical basis. In term of dependence, the relation of supervenience is an asymmetrical metaphysical necessitation:

[Supervenience/dependence] Mental depends on physical, insofar as it cannot have a mental difference without a physical difference.

The link with the indiscernibility of properties can then be enunciated, in the following way:

[Supervenience / indiscernibility of properties] Necessarily, for every x and every mental property M of x , x has some property P such that necessarily all P s are M s.

The principle of supervenience can express itself by the following slogan: « there cannot be a difference in M without a difference in P ». However, this converse is wrong. Therefore physical does not supervene on the mental. That's why, while difference in the mental cannot occur without a difference in physical, a mental property can be realized by different physical properties. To say it in another way, physical varies if the mental varies, but the mental does not necessarily vary, when physical does. These characteristics, of dependency and asymmetry of M with P , allow Yablo, to assimilate the intuition of multiple realization in its hypothesis of determination.

[Multiple realization] Necessarily, for every mental property M , and every physical property P which necessitates M , possibility something M but not P .

The multiple realization of the mental by a physical basis, takes into account a disjunctive cluster of properties. Indeed, according to multiple realization, it is heterogeneous cluster of properties $\{P_1 \vee P_2 \vee \dots P_n\}$ which realizes property M . Thus, each of this property is at the same time *distinct* and *sufficient* for the realization of M . As a result, none of them is *necessary*, to realize the upper property. So, the hypothesis of multiple realizability of mental integrates perfectly the thesis of Yablo, as asymmetrical necessitation. So, from the indiscernibility of properties, Yablo deduces the relation of determination (Ibid. p. 252):

[Determination] P determines Q only if:

- (i) Necessarily, for all x , if x has P , then x has Q ;
- (ii) and possibly, for some x , x has Q but lacks P .

It is this feature, in Yablo's hypothesis namely, that relation between determinable and determinate would be a kind of internal relation, which allows Shoemaker to specify his thesis. For Shoemaker, the instance of the mental is a determinable subset, of determinate

physical instances. This inner relation commits the relation of determination between two properties, as inseparable. Mental property and physical property, as scarlet and red, cannot be separate. For Kistler (2004, p. 334), Yablo's point of view shows, that mental property and physical property relates to the same type of property. So, the determinable and the determinate enter relation as the whole and his parties. This is what Kistler (Ibid. p. 334) names, the logical nature of the concept of determination¹². This internal relation enters determinable and determinate, allows then to avoid the threat of pre-emption:

... 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*. (1997, note 22, p. 275)

5.2 Why can Shoemaker insert the thesis of Yablo?

For Shoemaker, when to say that an object has some property, it does not mean that property is *in* the object. This distinction, between what acts by the instance, and property itself, allows Shoemaker to insert the hypothesis of Yablo. The notion of inclusion of instances is therefore possible, only in virtue of separation between property and instance. It is therefore, because to this separation, that Shoemaker can follow the hypothesis of Yablo:

While it seems wrong to say that a determinable property is part of each of its determinate, or that a functional property is part of each of its realizer properties, it does not seem inappropriate to use the part-whole relation to characterize the relationship between the instances of these pairs of properties. The instantiation of the determinate entails the instantiation of the determinable, and can quite naturally be said to *include* it. (2001, p. 434-435)

Indeed, distinction set / subset can perfectly suit for objects. One can easily categorize, in a box with pearls, the red subset of pearls. However, one would make a mistake of category by speaking about sets and subsets of properties. When one grabs the box containing all the pearls, one also holds in its hand, the red subset of pearls. Notion set / subset suits therefore perfectly, to speak about particular objects. Nevertheless, they cannot say that an object is constituted of properties, as a glass pearl is constituted of atoms of silicon. In Shoemaker's resolution powers $\{p, q, r\}$ include *subset* $\{q\}$. However, they cannot strictly speak about a

¹² For Kistler (2004) the hypothesis of Yablo of determinable / determinate relation is a conceptual relation. It is not because one can « deduct *a priori* to the fact that an object is scarlet, makes it more abstract than the object is red » said Kistler (Ibid. p. 335) that one can recognize its mental property by abstraction of all neural-physiological property.

relation of sets and subsets of properties. As a result, the thesis of the set / subset is possible because, *property is not present in its instance*. Relation set / subset is therefore valid only for instances. They cannot separate introduction of the hypothesis of Yablo in the resolution of Shoemaker, a certain particular understanding of property.

Now, this resolution is subjected to two objections. The first one questions the hypothesis of Stephen Yablo about the mental. The second shows the "obstinate" link which exists between the alternative report of Shoemaker and the thesis of the Types Identity.

6. Objection n°1: The existence of determinable property

Shoemaker interprets the thesis of the determinable as a subset of the instances of determinate property:

Suppose that we say that the instance of scarlet involved in Yablo's Sophie example¹³ has the instance of red as a part. Because the part-whole relation is not identity, we cannot argue that the instance of red caused whatever the instance of scarlet caused. But given that Sophie's pecking was the consequence of the instance of scarlet, we can ask whether what caused it was this instance as a whole or some proper part of it. (Compare: Someone's dying might be said to be a consequence of the fusillade of shots may have missed it may be that what caused his death was not the fusillade as a whole but some part of it. (Shoemaker, 2001, p. 435-436)

Shoemaker's hypothesis allows therefore the instances of determinable property, as parties of a whole, to be at the same time identical and to share only some number of causal powers, with its determinate. One can accept indeed, that it is the whole platoon that killed the man. However, it seems also legitimate to choose a party of this fusillade, as a sole reason for the death of the man. Suchlike, according to the example of the platoon, Shoemaker estimates that is legitimate in the case the mental, to name determinable mental property rather than all the powers of the determinate physical property, in charge of effect. Determinable property is therefore the efficient property.

It is an essential task of science to tell whether a property is instantiated or not. Furthermore, as supported by Shoemaker, the individuation of property is made according to their causal profile. One can say therefore that a property causally efficient is a property, of which instantiation, in an individual, contributes to its causal powers. Suchlike, a measurable property as for instance of a *100 ohm resistance*, is a determinate property. The instantiation

¹³ Yablo (1992, p. 257) imagines that a pigeon named "Sophie" conditioned to grab objects instantiating determinable property to be red, will also grab an object instantiating determinate property to be scarlet.

of this one is then causally responsible for an effect, in a component installed in an electrical circuit. One can indeed explain the behaviour of a material by its absolute property determined by electrical resistance. Such effect will be function of other determinate properties, measured in Amperes (Intensity) and in Volts (Tension). So, an individual can satisfy the predicate 'a 100 ohm resistance' by virtue of the instantiation of determinate ownership of a *100 ohm resistance*. Thus, does one need to suppose determinable property *to be resistant*? In other words, are there instances of determinable property? As soon as a determined property exists, determinable property seems to accompany it.

Lets take an example. There are two squares, a blue and a yellow. Can one indeed, when considering these two squares, suppose their property *to be coloured*? For two individuals, to share a property means to share certain similarities. Indeed, there is one hardly negotiable intuition, that the concept of property is linked to a certain similarity between entities sharing an aspect. In that case, both squares share different colours apparently. Certainly, one can say that the yellow is *colour* of daffodils and what the blue is *colour* of the sky, but these facts are contingents. Indeed, one waits for properties that provide the necessary truths. A property must give in its instance, a real role in the causation. Property with a *resistance of 100 Ohms* or with a *value of 0-0-255* of the numerical blue codification of the presentation of a certain colour¹⁴ is its true property. If one supports Shoemaker, and that property endows their possessors of causal powers, to postulate a determinable property moreover the determinate, adds nothing. No additional causative power accompanies determinable property.

As a result, if following the example that Armstrong names Eleatic principle (1997, p. 41) and Kim « the dictum of Alexander » (1998, p. 119), - principles that one can sum up to: *To be real is to have causal powers* - determinable property does not contribute to the causal powers of the individuals which are endowed there. In other words, according to these principles, such property does not exist¹⁵.

¹⁴ The numerical codification RGB is used in video for billing on screens, and in the software of imagery.

¹⁵ Armstrong issues a doubt also as for the existence of some determinable as colour for instance: "There is of course, no need to postulate determinable universals as truthmakers for the true application of every determinable predicate. *Being coloured* is a determinable, but the science of colour suggests that no universal corresponds to it." (2004, p. 135) In effect, because the determinable establish only a conceptual distinction with the determinate, Armstrong has asserted for a long time (on 1978, p. 111-113) that there could not be determinable concept, referring in determinable one real *of re*. However, although it still supports (1997, p. 50) that "it is not at all obvious that when two things have different lengths, then there is something *identical* that both things, or perhaps both lengths, have.", it supposes that there is probably an ontological point of view, of determinable (on 1983, lecture 7). These determinable are the elements of functional laws. In effect, Armstrong asserts that « quantities provide at least the most obvious examples of classes of properties where determinable / determinate distinction is naturally drawn » (Ibid. p. 63). This distinction which brings Armstrong, between

7. *Objection n°2: mental property and physical property: of absorption to identity.*

Distinction between realized property and its basis realizer, in the context of Shoemaker's resolution appears thin. Indeed, how can property *P* and *M* (figure 3) be differentiated? Apparently, *P*, which is a determinate property, is a true property, but what about *M*?

The argument of multiple realization, was constructed as a barrier against the theory of the Types Identity. However, what type of property corresponds to the subset of constituting specific powers of *M*? This type seems to define itself, as a type of common, empirical physical property in the organisms to which it applies a mental predicate. If such an identified mental property is represented as a pain, it is then identified also as being a physical property. The resolution of Shoemaker settles for objective to solve the mystery of the causal effectiveness of realized property which is not pre-empted, by its realizer properties (Shoemaker on 2001, p. 451). So, the causal powers of realized property form a subset of the causal powers of realizer property. Certainly, they are not pre-empted, but didn't they become identical? It seems strange to lead to conclusion that a thesis that give its entire place to the intuition of multiple realization, is built with the aid of certain identity between mental properties and physical properties. Shoemaker would defend himself from it. For him, the nature of property is a *contribution* in powers issued by their instances. Powers themselves do not form the nature of properties.

... it seems doubtful that we should identify the mental property instance with the instance of the physical property that realizes it – or that we should identify the instance of red and the instance of scarlet. If we think of the instantiation of a property as the conferring on something of the conditional powers associated with that property, then when properties confer different sets of conditional powers, the instantiation of one of them is not identical with the instantiation of the other. But it seems to me right to say that properties are causally efficacious in virtue of their instances being efficacious. (Ibid. p. 434)

The causation is therefore the result of the job of instances. The instances of realized property form a subset of the instances of realizer property. However, even if there is one

some determinable introduces a debate which it is not useful to open as part of this article. Gillet and Banks (on 2005, p. 493-502) criticize the point of view of Armstrong as for the existence of the determinable through functional laws, by using the argument of the double counting. In an opposite direction, Ingvar Johansson (2000) develops from the immanent realism of Armstrong, an extension of the determinable as universals, not only in determinable quantifying, but in a large number were not quantified as colours for instance.

“intimate relation” (Ibid. p. 434) between an instance of functional property, and the instance of property which realizes it, realized functional property, is not for Shoemaker, a part of realizer property. Instances are linked by relation set / subset, but properties are differentiated¹⁶.

However, if one considers property P (see figure 1, 2 and 3) as a complex property (see figure below), instances of which are constituted by all causal powers $\{p$ and $q\}$. P is then constituted by P_1 and by P_2 , respective properties bestowing causal powers on their possessor $\{p$ and $q\}$. M is then identified by P_2 , constituting of P .

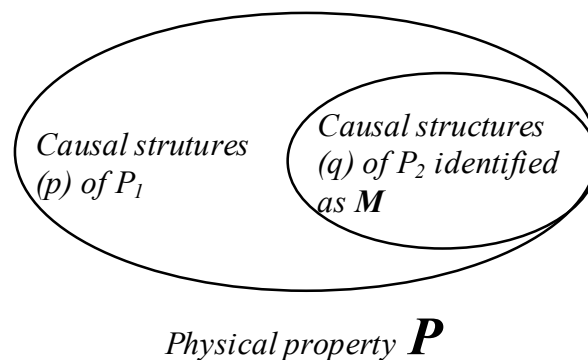


Figure 4: *Complex property*

The question is therefore: how can an organism have P_2 and M ? As much as to have P_2 is identical to have property M , the addition of causal powers is superfluous. Indeed to have M for an organism, that is to say to be endowed with powers $\{q\}$, also requires for this organism to have P , that is to say, to be endowed with all powers $\{p$ and $q\}$. A double counting of powers is, curiously operated here:

To have P , it is to be endowed with powers $\{p$ and $q\}$ [individuation on the basis of causal powers].

M is identified by virtue of the possession of P_2 [subset].

To have M , it is to be endowed with powers $\{q\}$ [individuation on the basis of causal powers].

To have M requires having P [determination].

To postulate M is identical to count causal powers twice $\{p$ and $q (+ q)\}$.

¹⁶ « I no longer want to identify a property with a cluster of conditional powers. While rejecting that identification bars me from construing realized properties as parts of their realizer properties, it does not bar me from construing instances of realized properties as parts of instances of realizer properties.”(Ibid. notes n ° 11, page 435)

To avoid it, it is necessary to suppose that property M is entirely overwhelmed when this one is identified by P_2 .

(α) M is absorbed P_2 .

To resist to (α) and assert, as does Shoemaker, that instances must not be amalgamated with properties, because these last are not “wholly present” in each of its instances, will not prevent the identification of property M by the physical property P_2 , realizing a cluster of causal powers. So, even if M cannot be reduced to P_2 , it is represented as constituent of physical property P . As a result, if one continues to postulate M , one must accept that:

(β) M is identical to P_2 constituent of P .

Indeed, P_2 is the property that share organisms which satisfies the predicate ‘to be M ’. Of multirealizable, property M , because it bestows on his possessors the same causal powers $\{q\}$, would be then candidate for the Types Identity. So, the three characteristics of the Types Identity introduced at the beginning of the article, meet in this construal of the thesis of Shoemaker:

[*To mention a mental property is identical to mention a physical property.*]: The application of a determinable predicate has a determinate property as truthmaker.

[*Identity is not correlation*]: Inclusion does not any more allow invoking the relation of realization as relation between two *different* properties.

[*The identity of properties*]: M is identical to P_2 constituent of P .

7. Conclusion

Shoemaker’s demonstration supports the thesis of the non-reductive physicalism. It is, at the same time an alternative in the threat of the reduction and gives a possibility of inserting the intuition of the multiple realization of the mental. Recommended resolution is that of the inclusion of causal powers of realized properties, inside structures realizers. Such resolution allows avoiding ontology of levels and disarms the reductionism. Shoemaker’s resolution

removes two characteristics of the functionalist theory of mind: (i) the ontology of levels, and (ii) idea that living beings could have a mental property, without sharing some physical properties.

I wanted to show however, that the thesis of the individuation of properties according to their causal profile, does not allow to assert two different properties. It is indeed, with help of a particular conception of properties, that Shoemaker develops the thesis of inclusion: *properties are not entirely present in their instances*. This particular approach gives Shoemaker an opportunity to insert Yablo's hypothesis to the mental properties, which would become determinable properties.

Against the thesis of Shoemaker I put forward two objections. The first demonstrates that determinate property alone, answers the criterion of individuation according to causal profile; the second, that a double counting of causal powers causes (i) the absorption of realized property by the physical property or (ii) identity with physical realizer property. Therefore, a peculiar return of the thesis of Types Identity rescues Shoemaker's multiple realization account.

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