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1. Introduction

Chalmers argues that zombies are possible and that therefore consciousness does not supervene on physical facts, which shows the falsity of materialism[1]. The crucial step in this argument – that zombies are possible – follows from their conceivability and hence depends on assuming that conceivability implies possibility. But while Chalmers's defense of this assumption – call it *the conceivability principle* – is the key part of his argument, it has not been well understood. As I see it, Chalmers's defense of the conceivability principle comes in his response to the so-called objection from a posteriori necessity. The defense aims at showing that there is no gap between conceivability and possibility since no such gap can be generated by necessary a posteriori truths[2]. I will argue that while Chalmers is right to the extent that there is no gap between conceivability and possibility within the standard Kripkean model of a posteriori necessity, his general conclusion is not justified. This is because the conceivability principle might be inconsistent with a posteriori necessity understood in some non-Kripkean way and Chalmers has not shown that no such alternative understanding of a posteriori necessity is available.

[1] See Chalmers [1996].

[2] Anthony Brueckner is one of the authors that acknowledge the key importance of Chalmers's discussion of a posteriori necessity in Chalmers's defense of the conceivability principle. See Brueckner [2001]. Brueckner argues that Chalmers's defense begs the question, but in my view Brueckner's diagnosis is not correct. As I will argue in what follows, although there is question-begging in the part of the argument that Brueckner refers to, the key argument is different.

2. Two-dimensional semantics

As Chalmers observes, the objection from a posteriori necessity is the most natural objection to the conceivability principle. The point of the objection is that the conceivability principle is inconsistent with the phenomenon of a posteriori necessity discovered by Kripke. Referring to the Kripkean a posteriori necessities, such as "Water is H_2O", one might think that we have clear examples of truths that are conceivable but a posteriori or 'metaphysically' impossible, such as "Water is not H_2O"[3].

Chalmers argues that the objection from a posteriori necessity is not a good objection against the conceivability principle. Since he discusses this objection within the framework of two-dimensional semantics, let me begin with laying down some key distinctions that are made within that framework. According to the two-dimensional semantics, there are two intensions associated with each concept: primary intension and secondary intension, where intension is understood as a function from possible worlds to reference. The primary intension picks out the reference of a given concept in a possible world considered as actual, whereas the secondary intension picks out reference in a possible world considered as counterfactual. The important point is that these two intensions turn out to be *different* in the case of natural kind concepts, such as 'water'. Whereas according to its primary intension, 'water' refers to the kind of stuff that is watery (has the manifest properties of water) in a given possible world considered as actual (to H_2O in our world and XYZ, say, in another possible world), the value of its secondary intension remains the same across all possible (counterfactual) worlds and depends on what water actually is. Thus, assuming that water is H_2O in the actual world, 'water' refers, according to its secondary intension, to H_2O in every counterfactual world. Hence, water is necessarily H_2O or, in other words, it is impossible for water not to be H_2O according to the secondary intension of 'water', whereas it is possible that water is not H_2O if we think of water in terms of the primary intension of 'water'.

[3] See Kripke [1980].

The reason why the primary intension of 'water' is different from its secondary intension has to do with the fact that 'water' is a rigidified definite description. 'Water' picks out its reference in the actual world under the description "the dominant clear, drinkable liquid in the oceans and lakes (more briefly: 'watery stuff')" and that description might have actually been satisfied by a kind of stuff that is different from what actually fits the description[4]. However, given that the description associated with 'water' is rigidified, 'water' will pick out in counterfactual possible worlds only one kind of stuff, namely one that satisfies the description in the actual world[5].

Further, Chalmers points out that in the case of natural kind concepts the primary intension is determined a priori:

> The primary intension of a concept, unlike the secondary intension, is independent of empirical factors: the intension *specifies* how reference depends on the way the external world turns out, so it does not itself depend on the way the external world turns out[6].

The secondary intension, by contrast, does depend on how the actual world turns out: it depends on what actually satisfies the description associated with a given natural kind concept. So the secondary intension of natural kind concepts, according to Chalmers, is determined a posteriori.

It is worth emphasizing that Chalmers's distinction between the a priori and the a posteriori needs to be taken in this context very carefully. In particular, the claim that primary intension is determined a priori is not as obvious as Chalmers thinks. It is true that which values the primary intension of 'water', say, takes in various possible worlds does not depend on the a posteriori fact that watery stuff is H_2O. From this, however, it does not follow that the primary intension of 'water' is determined a priori, without making use of any a posteriori

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[4] See Chalmers [1996] p. 57.

[5] By contrast with natural kind concepts, theoretical concepts, such as 'H_2O' or 'XYZ', are rigid without being rigidified descriptions. Therefore, in their case the primary and secondary intensions coincide.

[6] Chalmers [1996] p. 57.

considerations. As Block and Stalnaker argue, there are limits as to what sort of watery stuff could count as water in the actual world and those limits are not determined a priori but depend on our theories and methodological principles, in fact, on everything we believe[7]. We now know that watery stuff is H_2O and we think of that stuff as identical with water. If we were to find out that the colorless, odorless, drinkable stuff in rivers and lakes is XYZ, we would conclude that water is XYZ. If we found out that such stuff is not really a liquid, we would have found out that water is not a liquid. Certainly, though, we can also imagine finding about watery stuff something totally unexpectable to normal English speakers, something that might force us to reject the supposition that watery stuff is water. Thus, not everything that is a priori possible will correspond to what is possible according to the primary intension of the word 'water' as we use it.

Chalmers's assumption to the effect that primary intension is determined a priori is not only false but would lead to question-begging in the defense of the conceivability principle. For to assume that primary intension is determined a priori is to assume that what is primarily possible follows from what is a priori conceivable and that is precisely what is at issue. Now, Anthony Brueckner thinks that Chalmers does beg the question in defending the conceivability principle[8]. For according to Brueckner, the key move that Chalmers makes in based precisely on assuming that primary intension is determined a priori. That is, according to Brueckner, Chalmers's reasoning is as simple as that: zombies are possible since they are possible according to the primary intension of the concept of consciousness and that they are primarily possible follows from the fact that they are a priori conceivable.

I do not think that Brueckner's reconstruction of Chalmers's reasoning is fair, at least it is not a good reconstruction of Chalmers's response to the objection from a posteriori necessity. If we think that Chalmers takes it for granted that a priori conceivability implies possibility according to primary intension, we must see Chalmers as defending the conceivability principle directly. But that is not, in

[7] See Block and Stalnaker [1999].

[8] See Brueckner [2001].

fact, what Chalmers is doing. Instead, Chalmers defends his conceivability principle indirectly, by arguing that the objection from a posteriori necessity is not a good objection against that principle. The interesting question then is whether Chalmers has shown *that*. I will argue that he has, at least if we understand a posteriori necessity in the standard Kripkean way.

Secondly, it needs to be pointed out that it would not be justified at this point to argue against Chalmers that the conceivability principle must be wrong if, contrary to what Chalmers believes, primary intension across possible worlds is not determined a priori. One might think that if primary intension is determined a posteriori, in Block's and Stalnaker's sense, what is conceivable might nevertheless be impossible according to that intension. But that does not follow. The a posteriori constraints over what is possible according to primary intension are constraints on the proper use of concepts and not on what is possible *per se*. It is certainly conceivable, to apply Block's and Stalnaker's example to the case of watery stuff, that watery stuff might have actually been an extinct flightless bird[9]. But even though we would not say, in the light of our knowledge and beliefs, that this kind of watery stuff might have been water, as Block and Stalnaker suggest, this does not mean that the conceived situation is impossible but only that it would not be correct to describe it as true of water. As I will argue, Chalmers gives a similar sort of response to the objection from a posteriori necessity – the sort of necessity that arises at the level of secondary rather than primary intension.

3. Chalmers's response to the objection from a posteriori necessity

Equipped with his two-dimensional semantics, Chalmers argues that the objection from a posteriori necessity mentioned earlier is not a good objection against the conceivability principle. Without denying that possibility (in a broad metaphysical and not only nomological sense) depends on facts that are accessible a posteriori, Chalmers argues that those facts constrain only the way in which conceivable worlds should be *described*, without affecting their *possibility*.

[9] Block and Stalnaker use the example of an extinct flightless bird as the possible reference of the English word 'coumarone'. Coumarone, we are told, is another colorless liquid, not H_2O but C_6H_4OCHCH. See Block and Stalnaker [1999].

In order to understand Chalmers's response to the objection from a posteriori necessity, we need to get clear as to what the objection really amounts to within the two-dimensional semantics. What does it mean to say, in terms of that semantics, that something might be conceivable and yet a posteriori impossible, for example, that it is conceivable but not possible that water is not H_2O but XYZ, say? While the impossibility of water being XYZ is cashed out within that semantics as the necessary falsehood of the statement "Water is XYZ" when evaluated according to its secondary intension, its being conceivable that water is XYZ amounts simply to the idea that the statement "Water is XYZ" is *conceivably true* (as opposed to possibly true) according to the primary intension of 'water'[10]. That statement could not be conceivably true according to the secondary intension of 'water' for the secondary intension of 'water' picks out H_2O in all conceivable worlds and it is inconceivable that H_2O be XYZ. However, it is conceivable that watery stuff might have been XYZ and that is what the conceivability of the statement "Water is XYZ" amounts to when we evaluate that statement according to the primary intensions of the notions involved. Thus, coming back to the objection from a posteriori necessity, the point of the objection must simply be this: what is conceivable according to primary intension might be impossible according to secondary intension.

Chalmers's response to this objection is made most explicit when Chalmers says that "nothing about Kripke's *a posteriori* necessity renders any logically possible worlds impossible"[11]. I reconstruct this response as follows. The fact that the statement "Water is XYZ" is necessarily false when evaluated according to its secondary intension does not make impossible any of the conceivable worlds in which the statement "Water is XYZ" is true when evaluated according to its primary intension. The conceivable worlds, in which this statement is true, according to the primary intensions of the concepts involved, are the worlds in

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[10] Conceivable worlds are as good arguments of intensions as possible worlds and Chalmers himself speaks of the distinction between primary and secondary intensions also in the context of conceivable worlds, although he does not explicitly express the objection from a posteriori necessity in the way I am suggesting. See Chalmers [1996] p. 65-69.

[11] Chalmers [1996] p. 134.

which watery stuff is XYZ. But since the secondary intension of 'water' is 'H_2O' and not 'watery stuff', the fact that "Water is XYZ" is necessarily false according to the secondary intension of 'water' does not mean that it is impossible for watery stuff to be XYZ but only that it is impossible for H_2O to be XYZ. Thus, instead of making any conceivable worlds in which watery stuff is XYZ impossible, the impossibility of H_2O being XYZ only implies that it would not be correct to describe those worlds as ones in which water, according to the secondary intension of 'water', is XYZ. In this sense, as Chalmers says, the a posteriori necessity does not put a posteriori constraints on the space of possible *worlds* but merely constrains the way in which certain *terms* are used to describe it.

So Chalmers's response to the claim that it is conceivable but not possible that water is XYZ amounts to the simple idea that what is impossible in the case of water is not quite the same as what is conceivable. To say that it is conceivable that water is XYZ is to say that watery stuff might have been XYZ, whereas to say that it is impossible that water be XYZ is to say that it is impossible for H_2O to be XYZ. Since the subject matter of these two claims is different, they do not conflict with each other and hence do not provide the counterexample to the conceivability principle. The whole distinction between its being conceivable that water is XYZ and its being impossible that water be XYZ is only a distinction at the level of *statements*, as Chalmers puts it, and not at the level of *worlds*.

Now, having established that the necessary identity of water and H_2O does not undermine the conceivability principle, Chalmers assumes that no example of a posteriori necessity that we are familiar with can do that. This is because all known cases of a posteriori necessity can be explained within the two-dimensional framework in the same way as the case of water and H_2O, that is, by assuming that there are two different intensions associated with the relevant natural kind concepts. Hence, in all other cases the distinction between conceivability and possibility will be only a distinction at the level of intensions or statements.

To summarize, Chalmers's response to the objection from a posteriori necessity is as follows:

(1) The Kripkean a posteriori necessity attaches to a posteriori identity statements and only if the secondary intension of at least one of the concepts flanking the identity sign is different from the primary intension[12].

(2) What is impossible according to secondary intension is not conceivable, so it cannot be said that the Kripkean a posteriori necessity makes impossible what is conceivable according to secondary intension. On the other hand, the Kripkean a posteriori necessity does not make impossible what is conceivable according to primary intension, either. For if the secondary and primary intensions of the concept *F* are different, the distinction between its being conceivable that *F* is not *G* and its being impossible that *F* is not *G* is only a distinction at the level of statements.

(3) So the Kripkean a posteriori necessity does not make any conceivable truths impossible.

There is no question-begging in Chalmers's reasoning as reconstructed above. Without assuming that conceivability implies possibility, Chalmers has shown that the objection from a posteriori necessity does not work as an objection against the conceivability principle.

This result, according to Chalmers, defends the possibility of zombies against the objection that zombies might be a posteriori or metaphysically impossible despite their conceptual coherence. Since in all cases of a posteriori necessary identities that we know of the space of possible worlds is not a posteriori constrained, then, by analogy, the possibility of zombies should not be a posteriori constrained by the a posteriori and necessary identity, if any, between consciousness and some physical property, either. The point is that even if such identity were true, it could only make a semantical and not a metaphysical difference, that is, it could only constrain the way in which zombies should be described, without affecting their possibility.

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[12] A posteriori necessity results within the Kripkean framework from rigidifying at least one of the concepts flanking the identity sign and, as I pointed out earlier, rigidification is responsible for the divergence of the primary and secondary intensions of the concept rigidified.

4. Chalmers's response elaborated further: strong metaphysical necessity

To be sure, however, Chalmers has only shown at this point that the conceivability principle is not undermined by the Kripkean model of a posteriori necessity. But why should we think that this is the only model of a posteriori necessity available? If there is an alternative model, one that puts a posteriori constraints on the space of possible worlds, the conceivability principle would be false.

The alternative account should allow the possibility that identity statements be necessary and a posteriori also in the case when the primary and secondary intensions of both concepts flanking the identity sign are identical. Within the Kripkean framework, an a posteriori identity statement can be necessary only in the case when the primary and secondary intensions of at least one of the concepts flanking the identity sign are different and, as Chalmers has shown, due to this difference of intensions the relevant necessity does not generate any conflict between conceivability and possibility at the level of worlds so that no impossible truth of the form (*F* is not *G*) is conceivable or, in other words, no conceivable truth of the form (*F* is not *G*) is impossible. But in the alternative model, the relevant conceivable truths of the form (*F* is not *G*) would be impossible. To make it clear, assume that the identity statement "*F* = *G*" is a posteriori and necessary so that it is impossible that F is not G and that the primary and secondary intensions of both '*F*' and '*G*' coincide. In this case, assuming that it is conceivable that *F* is not *G*, we could not interpret the distinction between its being conceivable that *F* is not *G* and its being impossible that *F* is not *G* as a distinction at the level of statements or intensions. We would have to say that the very situation that is conceivable is impossible and not just that it is not correct to describe it in a certain way. So under the assumption that the primary and secondary intensions of both '*F*' and '*G*' coincide, the relevant a posteriori necessity would put a posteriori constraints on the space of possible worlds and the conceivability principle would be false.

Of course, the alternative model of a posteriori necessity would apply to the case of statements of psychophysical identity since the primary and secondary intensions of phenomenal and physical concepts coincide. Thus, even though we

find psychophysical identity statements conceivably false according to their primary intensions, those statements will have to be necessary when interpreted according to their primary intensions after all if we assume that they are necessary according to their secondary intensions. This affects, of course, the possibility of zombies. As we saw, Chalmers argues that, assuming that the primary and secondary intensions of given concepts differ, what is necessarily true according to secondary intension cannot affect what is possible according to primary intension. Thus, he says that even if we assume that zombies are impossible according to the secondary intension of the concept of consciousness, they may still be possible according to the primary intension of the concept of consciousness. Of course, Chalmers can say that only assuming that the primary and secondary intensions of the concept of consciousness differ. If we assume that the primary and secondary intensions of the concept of consciousness are the same, zombies will not be primarily possible after all[13].

Now, Chalmers is well aware of the objection that we could account for the necessity of psychophysical identity within a non-Kripkean model of a posteriori necessity. In response to this objection, then, Chalmers simply argues that the alternative model, construed in the way described above, is, indeed, impossible. The alternative model would generate what Chalmers calls 'strong metaphysical necessity' as opposed to the Kripkean 'weak' necessity that only constrains the way in which possible worlds should be described. Chalmers then argues that the idea of strong necessity is unacceptable. In *The Conscious Mind* Chalmers gives the following reasons against that idea:

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[13] Chalmers seems to be confused about it in *The Conscious Mind*. On page 132 he says that his argument for dualism will go through if we concentrate on the primary intension of the concept of consciousness and ignore the secondary intension. Then, on page 133, he says that "the irrelevance of *a posteriori* necessity can be further supported by the observation that with consciousness, the primary and secondary intensions coincide." Chalmers's dialectic here seems to be the following. Zombies are possible according to the primary intension of the concept of consciousness since they are conceivable according to that intension. And once it has been granted that zombies are primarily possible, they then must be seen as possible according to the secondary intension of the concept of consciousness, too, assuming that the primary and secondary intensions of that concept are identical. The first move, of course, begs the question against materialists who deny the conceivability principle.

(1) Strong necessity will put constraints on the space of possible worlds that are brute and inexplicable. While there may be brute and inexplicable facts about our world, the realm of the possible has no room for this sort of arbitrary constraint;

(2) The idea of strong necessity cannot be supported by analogies since all necessary truths we are familiar with are the Kripkean necessities of the sort "Water is H_2O" or "Hesperus is Phosphorus" and those necessities require only a single space of worlds;

(3) There cannot be a posteriori constraints on the space of possible worlds since a posteriori information can only tell us about our world[14];

(4) What is logically possible (conceivable) is conceptually coherent and presumably it is in God's power to do anything that is coherent, hence it is presumably in God's power to create a zombie world. However, the advocate of strong necessity must say either that the possibility is coherent but God could not have created it, which is unjustified, or that God could have created it but it is nevertheless metaphysically impossible, which is entirely arbitrary;

(5) Even if you believe in strong necessity, it remains the case that facts about consciousness cannot be derived from physical facts. So in order to explain the supervenience of the phenomenal on the physical you need to introduce certain primitive connecting principles. But then for all explanatory purposes you are left in the same position in which property dualism leaves you;

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[14] This point has been emphasized all along in the recent discussion of a posteriori necessity. One might think that the existence of necessary a posteriori truths implies that there is some sort of necessity that is accessible only a posteriori. Thus, one might think that the necessity of the statement "Water = H_2O", say, must be accessible a posteriori since the sentence "Water = H_2O" is a posteriori true. But that is a mistake. The a posteriori status of "Water = H_2O" is a status of that sentence in the actual world, whereas necessity is a matter of truth across all possible worlds. Thus, from the fact that "Water = H_2O" is a posteriori true it certainly does not follow that the necessity of that statement is accessible a posteriori, too. In fact, we cannot infer that water is necessarily H_2O merely from the fact that "Water = H_2O" is a posteriori true. We need to assume in addition that 'water' is a rigid designator, that it designates in all possible worlds only one kind of stuff, namely one that is watery in the actual world. But once that assumption is in place, it then becomes a conceptual truth that *if* H_2O is the actual watery stuff, then water is H_2O across all possible worlds. That is to say, the inference is licensed by the way we use the concept of water. See Jackson [1997].

(6) The sort of materialism that is based on the idea of strong necessity is far more mysterious than the dualist alternative. The invocation of brute principles constraining the space of possible worlds introduces an element much more problematic, and indeed far les naturalistic, than the mere invocation of further natural laws postulated by property dualism.

Now, I agree with Chalmers that the idea of strong necessity is far from obvious. However, I do not think that any of Chalmers's objections mentioned above undermine the intelligibility of the idea that psychophysical identity statements can be necessary and a posteriori on the assumption that the primary and secondary intensions of the concept of consciousness are identical. Think about such statements independently of Chalmers's objections. If there is any difficulty in viewing such statements as a posteriori and necessary, it seems that it cannot lie in thinking that they should be necessary *if* they are true a posteriori. That inference seems to be justified by the fact that both phenomenal and physical concepts are rigid. So assuming that statements of psychophysical identity can be true a posteriori, they simply can be a posteriori and necessary, and I do not see why any of Chalmers's objections mentioned above should rule that out.

But let's look at the objections systematically. First, the necessity of psychophysical identity within the alternative model of a posteriori necessity does not seem to be brute and inexplicable, as Chalmers suggests. The alternative model provides an explanation of how the necessity arises. According to this model, the necessity of psychophysical identity simply follows from assuming that the identity is a posteriori true and assuming that the primary and secondary intensions of phenomenal and physical concepts, respectively, are the same. There seems to be nothing mysterious or inexplicable about that inference. Secondly, the mere fact that the necessity of psychophysical identity cannot be supported by standard a posteriori necessary identities of the Kripkean sort does not carry any weight. We have perfectly good reasons to think that the necessity of psychophysical identity is sui-generis since the semantics of phenomenal concepts is radically different form the semantics of other natural kind terms; unlike in the case of other natural kind concepts, the primary and secondary intensions of

phenomenal concepts coincide[15]. Thirdly, we are not assuming that the a posteriori identities (psychophysical identities) that constrain the space of possible worlds are true of other possible worlds a posteriori; that they are true of other possible worlds follows a priori from the fact that the primary and secondary intensions of phenomenal and physical concept, respectively, are the same. As for the forth objection, it needs to be clarified what Chalmers means by conceptual coherence in this context. If he means to say that if something is conceivable, it is rational for us to believe it is possible, then we need not assume that what is conceivable is always conceptually coherent. For again, within the alternative model of a posteriori necessity it is not rational after all to think that conceivability implies possibility. As for the fifth objection, we are not assuming that phenomenal facts supervene upon physical facts; rather we are taking phenomenal facts to be identical with physical facts. And finally, as for the sixth objection, the alternative model of a posteriori necessity does not look mysterious; this is the point that was already made in response to the first objection.

Chalmers emphasizes that the fundamental problem with the idea of strong necessity is that this sort of necessity breaks the natural tie between rationality and modality. As Chalmers says, there is a circle of interrelated modal notions, such as possibility, consistency and rational entailment, and the framework of possible worlds is supposed to make sense of those notions. But the introduction of strong necessity does not help in making sense of those notions, according to Chalmers. This is precisely because the tie between rationality and modality is broken within the framework of strong necessity. The tie is broken since strong necessity breaks the tie between conceivability and possibility.

Clearly, Chalmers assumes in this line of reasoning that there is a tie between conceivability and rationality so that if something is conceivable it is rational or conceptually coherent to believe it is possible. But then what he sees as the fundamental objection against the idea of strong necessity really amounts to the forth objection discussed above and, as we saw, the force of this objection is questionable.

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[15] This has been emphasized by Brian Loar. See Loar [1997].

5. The a posteriori status of psychophysical identity

As I suggested, once we assume that psychophysical identity is true a posteriori, it is hard to see why it should fail to be true necessarily according to both the secondary and primary intensions of the notions involved. However, one might argue that the problem with psychophysical identity statements is that they cannot be true a posteriori. In fact, this is what Chalmers suggests in his later formulations of the argument from the conceivability of zombies. Thus, already in *Mind and Modality* Chalmers assumes explicitly that an identity statement can be true a posteriori only if it has a contingent primary intension and that claim, if true, would rule out the possibility that psychophysical identity statements be true a posteriori[16]. However, Chalmers's defense of his assumption is not convincing. Chalmers defends his assumption indirectly, by arguing that its denial would be unacceptable since it would commit us to believing in strong metaphysical necessity and strong necessity is itself unacceptable, as Chalmers argues, for the reasons that he already gave in *The Conscious Mind*. But clearly, whether or not strong metaphysical necessity is unacceptable is precisely what is at issue. And as we just saw, the reasons that Chalmers gives in *The Conscious Mind* are not good reasons against believing in strong necessity.

Given that there seems to be nothing wrong with assuming that certain identity statements, in particular psychophysical identity statements, can be necessary in the strong sense if we allow them to be true a posteriori, the defense of the claim that such statements cannot be true a posteriori cannot depend on assuming that they cannot be necessary in the strong sense. So here is the key question: why should we think that psychophysical identity statements cannot be true a posteriori? The potential difficulty seems to be this. Given that the primary and secondary intensions of both phenomenal and physical concepts, respectively, coincide, the properties that fix the reference of those concepts are identical with the referents of those concepts. Thus, if we assume that phenomenal and physical concepts pick out the same properties, we would have to assume that the

[16] See Chalmers [1998].

properties that fix the reference of phenomenal concepts are identical with the properties that fix the reference of physical concepts. In this respect, psychophysical identity statements would differ from standard a posteriori identities, such as "Water = H_2O" or "Heat = molecular motion". For the properties that fix the reference of 'water' (watery properties) are different from the property that fixes the reference of 'H_2O' (the property of being composed of H_2O molecules) and the property that fixes the reference of 'heat' (heat sensations) is different from the property that fixes the reference of 'molecular motion' (the property of being molecular motion). Now, why should this difference between standard a posteriori identities and psychophysical identity carry any weight against the latter? You might think as follows. The a posteriori truth of standard theoretical identities is justified by the discovery of certain a posteriori relations between the properties that fix the reference of the relevant concepts. Thus, the identity of water and H_2O is true since the fact that water is composed of H_2O molecules *explains* why water is watery, and the identity of heat and molecular motion is true since molecular motion *causes* heat sensations. But there is no room for the corresponding a posteriori relations between the properties that fix the reference of theoretical-physical concepts and the properties that fix the reference of phenomenal concepts since, by assumption, those properties are identical.

I do not see why this difficulty should carry much weight. Granting that there is no a posteriori relation of the relevant sort between the properties that fix the reference of phenomenal and physical concepts, we can justify the a posteriori truth of psychophysical identity by appealing to the fact that phenomenal and physical states always appear at the same place in the causal scheme of things[17]. Phenomenal states have certain behavioral effects and we are justified in assuming that those are the effects of certain physical states since we can explain the occurrence of those effects in physical terms. Thus, we are justified in assuming on a posteriori grounds that phenomenal states and the relevant physical states are identical.

[17] This point is emphasized by David Papineau. See Papineau [1999].

There seems to be a residual difficulty. Given that the properties that fix the reference of phenomenal and physical concepts are identical, we might expect that we should be able to see a priori, simply in virtue of understanding those concepts, that they pick out the same properties. However, many philosophers, in particular Brian Loar, argue that this expectation – *the expectation of transparency*, as Loar calls it – is an illusion. Phenomenal and physical concepts have radically different cognitive roles and this difference keeps them unconnected a priori despite the fact that the properties fixing the reference of those concepts are identical[18].

It is worth pointing out that the above response drawing on the nature of phenomenal concepts does not by itself justify the claim that phenomenal and physical concepts pick out the same properties. This is, in fact, what Chalmers complains about in his response to Loar. That phenomenal and physical concepts have different cognitive roles shows that those concepts cannot be connected a priori but that does not yet guarantee that those concepts have the same referents[19]. Chalmers's point is, of course, right. However, there is nothing to complain about here. Loar's point about the different cognitive roles of phenomenal and physical concepts is not meant to be the complete account of the coreference of those concepts. The point is only meant to explain away the expectation that we should be able to see a priori that phenomenal and physical concepts have the same referents *if* they do. The explanation of why those concepts actually corefer has to be supplemented by some independent reasons. As I mentioned above, it seems natural to suggest that the explanation in question can be based on the fact that phenomenal and physical states play the same roles in the causal scheme of things.

Let me review the key points of the last two sections. We have been wondering whether identity statements whose primary and secondary intensions coincide, in particular statements of psychophysical identity, can be necessary and a posteriori. If they can, the relevant identities will put a posteriori constraints on

[18] See Loar [1997].

[19] See Chalmers [1999].

the space of possible worlds. Of course, full discussion of whether the sorts of statements in question can be necessary and a posteriori goes beyond the scope of this paper. But whether or not those statements can be necessary and a posteriori, it seems clear that Chalmers himself leaves us with no reason to think that they cannot. This is important in our context for this means that Chalmers is not justified in assuming that there can be no a posteriori constraints on the space of possible worlds. Thus, it remains an open question whether or not there are a posteriori constraints on the possibility of zombies. If psychophysical identity statements can be necessary and a posteriori, zombies will be impossible.

6. Conclusion

Chalmers argues that the conceivability principle is not inconsistent with the phenomenon of a posteriori necessity. I have argued that while Chalmers is right in so far as a posteriori necessity is understood in the standard Kripkean way, his argument is not conclusive because it is far from obvious that the Kripkean model of a posteriori necessity is the only model of a posteriori necessity we can think of. To assume that it is, as Chalmers does, is to assume that an a posteriori identity statement can be necessary only in the case when the primary and secondary intensions of at least one of the concepts flanking the identity sign are different. My point is that Chalmers has not explained why that should be true. Thus, it remains possible that certain identity statements, in particular psychophysical identity statements, can be true a posteriori and necessary even though the primary and secondary intensions of both concepts flanking the identity sign in those statements coincide. If so, the conceivability principle would be inconsistent with such truths.

Clearly, what is really at stake in Chalmers's defense of the conceivability principle against the objection from a posteriori necessity is whether or not psychophysical identity can be true a posteriori and necessary. If Chalmers is right about his assumption that a posteriori necessity requires the divergence of primary and secondary intensions, then statements of psychophysical identity cannot be both true a posteriori and necessary. Thus, if Chalmers's assumption is

true, it would create a problem for physicalism regardless of whether the conceivability principle as such is true for then it would follow that the alleged necessary relation between consciousness and the physical world could be justified neither a posteriori nor a priori; the lack of a priori justification follows from the mere conceivability of zombies.

Paradoxically, then, Chalmers's argument for dualism does not require the conceivability principle as such. The way Chalmers initially formulates the challenge for physicalism comes down to the question as to whether or not zombies are possible. If the question is put this way, Chalmers has to defend the conceivability principle since the only evidence for the possibility of zombies he can offer is their conceivability. However, while defending the conceivability principle against the objection from a posteriori necessity Chalmers assumes implicitly that the Kripkean model of a posteriori necessity is the only model we can think of, and since that model is not applicable to psychophysical identity statements, Chalmers's assumption leads directly to the antiphysicalist conclusion to the effect that there cannot be the relation of a posteriori and necessary identity between consciousness and the physical world. As I have argued, however, Chalmers's assumption in question is left without sufficient justification and for this reason Chalmers has not shown that psychophysical identity cannot be necessary and a posteriori.

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