

THE TWO-DIMENSIONAL ARGUMENT AGAINST MATERIALISM AND ITS SEMANTIC PREMISE

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1. PRELIMINARIES

Chalmers articulates his argument in terms of two-dimensional semantics and hence it will be helpful to begin with clarifying some key distinctions that are made within that semantics. We can think of functions (intensions) that assign to sentences and single terms truth values and referents, respectively, across possible (or conceivable) worlds.¹ The function which assigns truth values and referents across possible (conceivable) worlds conceived of as counterfactual is called *secondary intension*, whereas the function which assigns truth values and referents across possible (conceivable) worlds conceived of as actual is called *primary intension*. The value of secondary intension depends on how the actual world turns out. If the actual world turns out one way rather than another, this will affect what is possible (or conceivable) counterfactually. So secondary intension is a posteriori. On the other hand, the value of primary intension, according to Chalmers, does not depend on how the actual world turns out and, in this sense, primary intension is a priori.

Let's illustrate the above distinctions with examples. Although water is H₂O in the actual world, it is conceivable and possible that there might not be H₂O in the oceans and lakes but XYZ, say. If we think of those conceivable and possible worlds as the ways the actual world might turn out to be, we can say that 'water' picks out XYZ in those worlds and this would amount to saying that the primary intension of 'water' picks out XYZ in those worlds. Likewise, in those worlds the statement "Water is not H₂O" is primarily true. On the other hand, if we think of those conceivable and possible worlds as counterfactual worlds, 'water' does not pick out XYZ in them and that the statement "Water is not H₂O" is not true in those worlds, either. In other words, the secondary intension of 'water' does not

¹ As we will see, Chalmers argues that there is no difference between what is (ideally) conceivable and what is possible. But since this is the point that is at issue here, as it will become clear, I chose to speak of possible and conceivable worlds separately, at least for the purpose of introducing the two-dimensional framework.

pick out XYZ and the statement “Water is not H₂O” is not true when evaluated according to its secondary intension. For given that water is H₂O, the secondary intension of ‘water’ picks out H₂O in all worlds and the statement “Water is H₂O” is secondarily necessary.

2. THE TWO-DIMENSIONAL ARGUMENT

Let P be the statement that reports the complete microphysical truth about the universe and Q an arbitrary truth about phenomenal consciousness, for example that someone is undergoing the experience of seeing blue. And let (P) stand for premise and (C) for conclusion. Then Chalmers’ argument against materialism goes as follows:

- (P1) P&~Q is primarily ideally positively conceivable.
- (P2) Whatever is primarily ideally conceivable is primarily possible.
- (C1) P&~Q is primarily possible.
- (P3) The primary intensions of P and Q are identical to the secondary intensions of P and Q.
- (C2) P&~Q is secondarily possible.
- (P4) Materialism is true only if the entailment P>Q is secondarily necessary.
- (C3) Materialism is false.²

As Chalmers assumes in the premise (P4) materialism will be true so long as physical truths entail truths about consciousness across all possible (counterfactual) worlds and this amounts to saying that materialism will be true as long as facts about consciousness *supervene* on physical facts. Roughly, B-properties *supervene* on A-properties if no two possible situations (worlds) are identical with respect to their A-properties while differing in their B-properties.³ The point of Chalmers’ argument then is that there is a possible world, namely a zombie world, which is exactly like our world physically but in which facts about consciousness are different; a zombie world is a world in which physical facts are as they actually are but consciousness is missing. The possibility of such a world is stated in (C2).⁴ If a zombie world is possible, then consciousness does not supervene on the physical and materialism is false.

² This is Chalmers’ own reconstruction of his argument. See Chalmers [2006].

³ See Chalmers [1996].

⁴ According to Chalmers, zombie worlds are not the only kind of possible worlds which are identical to our world physically but not phenomenally. The other kind of worlds are worlds in which conscious states are inverted in relation to our world. If zombie worlds are possible, those other worlds, call them inverted worlds, are possible, too, and the possibility of such worlds will also imply the lack of supervenience of consciousness on the physical.

Now, there are two key notions involved in Chalmers' argument, the notion of possibility and the notion of conceivability, and they need some clarification. The notion of possibility that features in (P2) and the subsequent premises and conclusions is the notion of what could have been created by God. Clearly, this is the notion of possibility that is relevant to the truth of materialism. On an intuitive understanding, materialism is the thesis according to which God could not have created a counterfactual world which would be a zombie world. Chalmers refers to the possibility of what could have been created by God as *metaphysical possibility* and equates it with *logical possibility*. By logical possibility Chalmers means roughly what it is rational to believe as being possible. It is an open question as to whether everything that is metaphysically possible (that could have been created by God) is logically (rationally) possible; this implication may break perhaps due to our cognitive limitations. However, Chalmers assumes that anything that is rationally possible is something that could have been created by God. In other words, everything that is logically possible is metaphysically possible for Chalmers.

Turning now to the notion of conceivability it should be noted that Chalmers equates logical possibility with ideal conceivability, so in effect he assumes that anything that is ideally conceivable is metaphysically possible, which is reflected in (P2). The notion of conceivability is tied to the notion of conceptual coherence. A given statement *S* is positively conceivable when one can coherently imagine a situation in which *S* is the case. *S* is ideally positively conceivable when its *prima facie* positive conceivability cannot be defeated on ideal reflection. And *S* is primarily conceivable when *S* is conceivable according to its primary intension.⁵

One interesting question to ask at this point is why Chalmers begins his argument with the primary rather than secondary conceivability of $P \& \sim Q$. The answer is as follows. Chalmers wants to establish an a priori route to conclusions about metaphysical possibility. In particular, he wants to establish an a priori route from the conceivability of zombies to their metaphysical possibility. If so, the conceivability of zombies must be an a priori matter. But, as we saw earlier, whether or not *S* is conceivable is not always a priori, according to Chalmers. Whether or not *S* is conceivable is not a priori when the sort of conceivability involved is secondary rather than primary. Conceivability is *always* a priori only when it is understood primarily. Therefore the conceivability of zombies that is

⁵ For a detailed discussion of the notion of conceivability, see Chalmers [2002a].

the starting point of Chalmers' argument is their primary rather than secondary conceivability.⁶

We have a pretty clear grasp of the key notions involved in Chalmers' argument, so let's now briefly consider how Chalmers defends the premises of his argument. The firm intuition behind (P1) is that there is no prima facie conceptual incoherence in the notion of a zombie world. But further, Chalmers argues that there cannot be any incoherence in this notion even on ideal reflection. To render zombies incoherent even on ideal reflection would require that there be some sort of conceptual link between physical and phenomenal concepts and it is plausible to say that such a link simply does not exist.⁷

As for (P3) Chalmers assumes that the primary and secondary intensions of Q are identical although he argues that his argument will go through even if those intensions are different. For the primary intension of Q corresponds to the secondary intension of some proposition Q' and then the primary conceivability of P&~Q will entail the secondary possibility of P&~Q', which is enough to refute materialism. As for the primary and secondary intensions of P, Chalmers allows the possibility that those intensions might differ, too. For example, one might reasonably hold that whereas the primary intension of microphysical terms picks out whatever property plays a certain theoretical role, the secondary intension picks out the property that actually plays that role. One might then argue that even though P&~Q is possible primarily it is impossible secondarily. On this view, consciousness would not be necessitated by the structural profile of physics alone but by the combined structural and intrinsic profiles. In response, however, Chalmers argues that this view (which he calls Russellian monism or type-F monism or pan-protopsychnism) would be much closer to property dualism than to materialism and that many physicalists would not accept it anyway.⁸

(P4) in turn is undisputable by both physicalists and antiphysicalists. Although materialism is a view about our world, it has modal commitments: it can be true only if P>Q is true across all possible counterfactual worlds, in other

⁶ In Chalmers [2006] assumes that since secondary conceivability (along with secondary possibility) is affected by what is the case, zombies will not be secondarily conceivable if conscious and physical states are identical. But then, assuming that the primary and secondary intensions of P and Q are identical, Chalmers should say that zombies will not be primarily conceivable in this case, either. So allowing the possibility of the identity of conscious and physical states certainly creates a loophole in Chalmers' argument. In what follows I will argue that whether or not the conceivability of zombies is affected by assuming that conscious and physical states are identical, the identity will certainly imply that zombies are not possible.

⁷ See Chalmers [2003].

⁸ See Chalmers [2006].

words, only if $P > Q$ is necessary according to the secondary intensions of P and Q. To see that, assume that $P \& \sim Q$ is secondarily possible and hence that it is possible that there is a world physically identical to our world but phenomenally different. If such a world is possible, then after fixing the physical facts about our world, God had to do more work in order to fix the phenomenal facts. Intuitively, this would be inconsistent with the truth of materialism.

So (P1), (P3) and (P4) are initially plausible. The only premise left is (P2). Hereafter I will refer to (P2) as *the conceivability-possibility thesis* (in short, CP). This is indeed the premise that makes the whole argument work. And this is the premise that has been taken to be the most controversial. In what follows I will outline the most influential criticism of (CP) in the current literature. According to that criticism, (CP) is unjustified because it rests on a certain unjustified premise concerning the semantic conditions under which necessary statements can be true a posteriori. My exposition will have two parts. First I will argue that there is a certain natural objection to (CP), namely that zombies will be impossible if conscious and physical states are identical on a posteriori grounds. Then I will argue that Chalmers is not able to rule out this objection because the objection undermines the semantic assumption about necessary a posteriori statements that Chalmers tacitly accepts.

3. FROM THE TRUTH OF PSYCHOPHYSICAL IDENTITY TO THE FALSITY OF THE CONCEIVABILITY-POSSIBILITY PRINCIPLE

A natural reaction to (CP) is that it is false if we can consistently assume that the corresponding conscious states and physical states are *identical* and that the primary and secondary intensions of P and Q coincide. If conscious states are identical with physical states, psychophysical identity will be secondarily necessary given that physical concepts as well as the concepts of conscious states are rigid. So $P > Q$ will be secondarily necessary. But then, assuming that the primary and secondary intensions of P and Q are identical, $P > Q$ will be primarily necessary as well, which will undermine (CP).

Let Q^* stand for a certain type of experience, say, the experience of seeing blue and let $P^*=Q^*$ be the statement of the identity of Q^* with a certain type of a physical state P^* . Then the argument that leads to the falsity of (CP) can be spelled out as follows:

(P1) $P^*=Q^*$ is true a posteriori.

(P2) The phenomenal concept Q^* and the physical concept P^* refer rigidly (have the same referents, respectively, in all possible counterfactual worlds).

(C1) $P^*=Q^*$ is secondarily necessary.

- (C2) The entailment $P > Q$ secondarily necessary.
- (P3) The primary intensions of P and Q are identical.
- (C3) $P > Q$ is primarily necessary.

Recall that P reports the complete microphysical truth about the universe and that Q says that someone is undergoing the experience of seeing blue. According to those assumptions, the truth that there is P^* is a part of P and the occurrence of Q^* is something that makes Q true. If this so, it is easy to see how (C1) implies (C2). By (C1) P^* is identical with Q^* across all possible worlds described under the secondary intensions of ' P^* ' and ' Q^* ' and hence all possible worlds in which the statement P, according to its secondary intension, is true, are worlds in which the statement Q, according to its secondary intension, is also true. So this means that the entailment $P > Q$ is secondarily necessary.

Now, if (C3) is true, $P > Q$ will be primarily necessary despite being primarily conceivably false. So if (C3) is true, primary conceivability does not entail primary possibility and Chalmers' argument against materialism collapses.

The premises (P2) and (P3) in this argument are relatively uncontroversial and Chalmers himself accepts them. The only controversial move is the combination of (P1) and (P3). (P3) implies that P^* and Q^* refer *directly*, without any mediation of contingent reference-fixers and this by itself is uncontroversial, too. But (P3) taken together with (P1) amount to assuming that $P^* = Q^*$ can be true a posteriori despite the fact that both P^* and Q^* refer directly and that is not obvious at all. Arguably there is no other case of a posteriori identity that would be direct in this sense. In particular, all standard theoretical identity statements are contingent at the reference-fixing level. This is because the concepts of natural kinds flanking one side of the identity sign in those statements refer descriptively, by connoting properties that are distinct from the relevant natural kinds.

The key question here is how we are going to account for the *a posteriority* of $P^* = Q^*$. In the case of standard theoretical identities, a posteriority is explained precisely by the fact that natural kind concepts refer descriptively. So, for example, given that the concept of water picks out the stuff that is watery (the stuff that is liquid and transparent, fills rivers and lakes, etc.), one cannot determine that water is H_2O unless one finds out on empirical grounds that H_2O is watery. In the case of $P^* = Q^*$, on the other hand, there is no room for any explanation along these lines. Assuming that Q^* refers directly and not by describing some causal role, we cannot say that the physical state P^* that is identical with Q^* is the state that plays the relevant causal role. So we cannot determine the identity of P^* and Q^* by finding out on empirical grounds what causal role is played by P^* .

However, in reply to this difficulty some philosophers argue that we can account for the a posteriority of psychophysical identity claims in purely psychological terms. That is to say, we can assume that the reason why we do not see a priori that those claims are true is simply that the corresponding physical and phenomenal concepts are cognitively distinct concepts that function in different ways. For example, Hill and McLaughlin [1999] argue that the application conditions of phenomenal and physical concepts are radically different. Whereas sensory experiences that guide us in applying physical concepts are different from the states that physical concepts pick out, sensory experiences that justify us in applying phenomenal concepts are identical with the states that are picked out by phenomenal concepts. This then explains why we do not see a priori that $P^*=Q^*$ is true. Given the relevant cognitive differences between the concepts of P^* and Q^* we cannot determine the truth of $P^*=Q^*$ simply in virtue of understanding those concepts.

So it seems that $P^*=Q^*$ can be true a posteriori even assuming that both P^* and Q^* refer directly and hence even assuming that the primary and secondary intensions of P and Q are identical. But if $P^*=Q^*$ is true a posteriori and the primary and secondary intensions of P and Q are identical, $P>Q$ will be primarily necessary despite being conceivably false and hence (CP) is unjustified.

To be sure, Chalmers does not commit himself to the view that the primary and secondary intensions of P and Q coincide. As we saw, he leaves it open that those intensions might differ. However, part of his argument depends on assuming that the primary and secondary intensions of P and Q do coincide and here I argued that this part of the argument does not seem to go through.

It is interesting to see how Chalmers himself uses the assumption about the identity of the primary and secondary intensions of P and Q . He starts off by arguing that the move from primary conceivability to primary possibility is not undermined by Kripke's a posteriori necessities and having taken on this basis (CP) as a working hypothesis, he then assumes that the identity of the primary and secondary intensions of P and Q , respectively, strengthens his argument because it justifies the move from the primary possibility of zombies to their secondary possibility. If what I argued here is right, however, this move is too quick because the identity of the primary and secondary intensions of P and Q undermines the initial claim that zombies are primarily possible. There is nothing wrong with assuming that zombies are primarily possible if the primary and secondary intensions of P and Q , respectively, are different. In this case, zombies will be primarily possible even if consciousness is necessitated by physical properties in the secondary sense. But if we assume that the primary and secondary intensions of P and Q are identi-

cal, the relation between consciousness and physical properties that is secondarily necessary will be necessary also in the primary sense.

4. THE SEMANTIC PREMISE OF THE TWO-DIMENSIONAL ARGUMENT

One might argue that the argument I just sketched is badly flawed. It relies on assuming that psychophysical identities are true and one might argue that this assumption is question-begging as a part of an argument that aims to undermine (CP). This is because CP rules out the truth of psychophysical identities. Of course, given the identity of the primary and secondary intensions of P and Q, the truth of psychophysical identities will imply that $P \supset Q$ is primarily necessary. But from Chalmers' point of view, the reversed reasoning is true: the primary conceivability of zombie worlds implies their primary possibility and, assuming that the primary and secondary intensions of P and Q are identical, the primary possibility of zombie worlds implies further that mind cannot be identical with any physical state.

On closer reflection, however, this accusation of question-begging turns out to be unjustified. This is because Chalmers' justification for CP, according to physicalists, is based precisely on assuming that psychophysical identities cannot be true a posteriori given that both physical and phenomenal concepts refer directly. Thus by arguing that psychophysical identities can be true a posteriori physicalists do not beg the question against Chalmers; instead they undermine the initial justification for CP.

Let me explain this further. Speaking in more general terms, Chalmers' two-dimensional argument, according to physicalists, is based on assuming that a necessary statement (that is, necessary secondarily) can be true a posteriori only if it is primarily contingent or, in other words, only if it is contingent at the reference-fixing level. This is the tacit *semantic premise* of the two-dimensional argument. According to physicalists, this is the premise that Chalmers tacitly presupposes in order to justify (CP). The justification proceeds as follows. As Chalmers shows within the framework of his two-dimensional semantics outlined at the beginning, a posteriori necessities that are primarily contingent are always consistent with (CP). So if a posteriori necessities are always primarily contingent, as the semantic premise states, (CP) will always come out true.

As I just mentioned, Chalmers does not explicitly endorse the semantic premise. Still, this is the premise that he is committed to, according to physicalists, because this is the premise that initially saves the conceivability-principle from the obvious objection that appeals to the necessary truth of a posteriori identities. Surely, one might think, we can conceive of identicals as distinct even though there is no possible world in which they are distinct. Chalmers' familiar reply to

this objection is that when we think we can conceive the distinctness of identicals we are under an illusion. What we conceive of in such cases is rather that some property that is only contingently related to A might not be B. So, for example, when we think that water might not be H₂O what we are really conceiving of is that watery stuff might not be H₂O which is genuinely possible. Thus it is clear that Chalmers assumes that (CP) is not inconsistent with a posteriori identities because he assumes that a posteriori identities are always contingent at the reference-fixing level. But that just means that Chalmers tacitly presupposes the truth of the semantic premise.

By that premise, Chalmers concludes that psychophysical necessities cannot be true a posteriori given that both phenomenal and physical concepts refer directly and not contingently. But, obviously, they are not true a priori, either because they are conceivably false. So this means that they are not true at all and hence that there is no necessary connection between consciousness and physical properties. So consequently zombies are not only conceivable but also possible.

Physicalists argue in response that the semantic premise is unjustified. That is, they argue that even though there are no counterexamples to the semantic premise outside of the mind-body domain, we can consistently suppose that psychophysical necessities are true a posteriori because we can explain their a posteriori in purely conceptual rather than semantic terms. If this is so, then we can consistently suppose that zombies are not possible even though they are ideally conceivable. So (CP) is unjustified.

This line of response to Chalmers is advocated by the most influential materialists, in particular by Brain Loar [1999] and David Papineau [2006]. They both assume that (CP) is dependent on the semantic premise and they criticize that premise by arguing that a posteriority can be explained purely conceptually. To some extent this line of response to Chalmers is also supported by another influential physicalist, Joseph Levine [2001]. Similarly as Loar and Papineau, Levine assumes that (CP) depends on the semantic premise and argues that the premise is unjustified. But the reason why the premise is unjustified, according to Levine, is not that there is a conceptual explanation of a posteriority but rather that the premise has counterexamples. That is to say, Levine argues that there are clear cases of statements of a posteriori identities or necessities in which both concepts flanking the identity sign refer directly, namely statements of standard theoretical identities, such as "Water is H₂O". While the standard assumption is that such statements are not counterexamples to the semantic premise because natural kind concepts refer descriptively, Levine assumes that natural kind concepts refer directly because he assumes that they refer casually. Under this assumption, ac-

According to Levine, we get a counterexample to the semantic premise and also a counterexample to (CP) because even though water is necessarily identical with H₂O, we can conceive of zombie-H₂O in the sense that we cannot deduce a priori facts about water from facts about H₂O. If 'water' refers descriptively, then facts about water are deducible from facts about H₂O, in particular from the fact that H₂O is watery. Without this descriptive reference-fixing, the deduction is no longer possible.

Chalmers replies, however, that this argument does not go through. Facts about water are deducible from physical facts even if we assume that 'water' refers causally. This is because the physical facts which are the basis for the deduction include facts about the relevant causal link that fixes the reference of 'water'.⁹ In addition, Chalmers argues that the assumption that 'water' refers causally does not undermine the semantic premise as such. This is because the causal link that fixes the reference of 'water' is contingent in the sense that it might link 'water' to XYZ, say, instead of H₂O in a different possible actual world. So, in this sense, 'water' refers contingently even though its reference is not fixed by any canonical description.¹⁰

In the light of Chalmers' objections to Levine, the strategy of explaining the a posteriority of psychophysical necessities in conceptual terms appears to be a more promising way of rejecting the semantic premise. So let me proceed with that strategy a bit further. There are two potential objections to that strategy. The first objection is that it is ad hoc to assume that the a posteriority of psychophysical necessities is to be explained in purely conceptual terms given that all other a posteriori necessities are contingent at the reference-fixing level. However, Loar points out in reply that this assumption is not ad hoc given that phenomenal concepts refer directly and not contingently. Natural kind concepts that enter into standard theoretical necessities all refer contingently and phenomenal concepts do not. If so, it is hardly surprising that mind-brain necessities should be the only examples of a posteriori necessities that are not primarily contingent.

Now, physicalists acknowledge that one might argue that the semantic premise is justified in the following way. If two concepts refer directly, we should be able to see a priori that they pick out the same property if they do. For if they refer directly, they must be *transparent* in the sense that they must reveal the essence of their referents. So, in particular, one might argue that phenomenal concepts are transparent and therefore cannot pick out physical properties since they

⁹ See Chalmers, Jackson [2001].

¹⁰ See Chalmers [2002b].

do not reveal that the nature of the properties they pick out is physical. That is the second objection to Loar's and Papineau's strategy of rejecting the semantic premise.

This objection requires a qualification. This is because the sense in which phenomenal concepts are meant to refer directly is to be distinguished from the sense in which, say, indexicals or demonstratives refer directly. The latter refer directly in a much weaker sense because they pick out different objects in different contexts. But the referents of phenomenal concepts do not change from one context to another. So, for example, the phenomenal concept of pain does not pick out different types of phenomenal states. In order to know what indexicals or demonstratives refer to we need to know on empirical grounds the relevant context in which they are used. By contrast, we do not need to know any empirical facts in order to know what phenomenal concepts refer to. We know what they refer to simply by understanding them. And the natural way to explain why this is so is to assume that phenomenal concepts are transparent. In this respect phenomenal concepts resemble theoretical concepts, such as the concept of electron. I know what the concept of electron picks out simply in virtue of understanding that concept. If I understand the concept of electron, namely that electron is a particle that is negatively charged, I do not need to know any further empirical facts in order to know what the concept of electron picks out; the concept of electron simply picks out a negatively charged particle. So the concept of electron is transparent. Similarly, the argument goes, phenomenal concepts are also transparent. And if they are transparent, they cannot pick out physical properties. For they do not reveal that the essence of their referents is physical.

In response to this argument, however, physicalists argue that it is not ad hoc to suppose that phenomenal concepts, even though direct, are not transparent. This is because there are some features of phenomenal concepts that distinguish them from other directly referring concepts. Thus Loar argues that phenomenal concepts are unique among directly referring concepts in being type-demonstratives and type-demonstratives in general hide the nature of their referents. Papineau, on the other hand, argues that unlike in the case of other concepts, we can explain why phenomenal concepts refer directly without assuming that they are transparent. One such explanation appeals to the idea that phenomenal concepts 'use' or 'quote' the properties they pick out in the sense that phenomenal properties are parts of phenomenal concepts. Given this sort of intrinsic connection between phenomenal concepts and phenomenal properties, phenomenal concepts will always pick out the same type of property. However, there is no inconsistency in supposing that the properties that phenomenal concepts quote are for all we know physical.

So, again, the semantic premise turns out to be unjustified. If phenomenal concepts can pick out physical properties directly and without being transparent, then psychophysical identities or necessities can be true a posteriori despite the fact that phenomenal concepts along with physical concepts refer directly and not contingently.

5. THE SEMANTIC PREMISE AND KRIPKE'S ARGUMENT AGAINST THE IDENTITY THEORY

Let me end with a historical observation. As we saw, the key role in Chalmers' two-dimensional argument is played by the semantic premise. This is the premise that justifies (CP). It is worth noting then that the way of thinking of (CP) as dependent on the semantic premise goes back to Kripke. The semantic premise is also the tacit assumption of Kripke's well known argument against the identity theory. Kripke's argument begins with the observation that identities, if true, are necessary and hence that a relation that is not necessary is not the relation of an identity. Kripke then argues that the relation between conscious states and physical states, such as brain states, cannot be necessary and consequently that mind and brain are not identical. Why isn't the relation between mind and the brain necessary? This is because the statements of the necessary relation between mind and the brain (mind-brain necessities) cannot be true. Given that zombies are conceivable, mind-brain necessities can only be true a posteriori and the trouble is that we have no explanation of how they can be a posteriori, in other words, we have no explanation of how they can appear possibly false. We can explain how standard theoretical necessities appear possibly false but not how mind-brain necessities can do so on the assumption that they are true. Standard necessities appear possibly false because they are contingent at the reference-fixing level, which is illustrated by the water example I just referred to, and Kripke tacitly assumes that this is the only possible explanation of how a true necessary statement can appear possibly false. So Kripke tacitly assumes the semantic premise.

Chalmers is following Kripke in this respect. The only essential difference between Chalmers and Kripke is that Chalmers articulates Kripke's argument in two-dimensional terms. Whereas Kripke argues that we cannot, strictly speaking, imagine that, say, water might not be H₂O, Chalmers argues that we can given the distinction between possible actual and possible counterfactual worlds. We cannot imagine that water might not be H₂O when we think of possible worlds as counterfactual worlds but we can imagine that water might not be H₂O when we think of possible worlds as actual worlds. For any imagined actual world in which watery stuff is not H₂O is an imagined (and possible) world in which water is not H₂O.

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