

More than you ever wanted to know about epistemic two-dimensionalism

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1 From contextual to epistemic two-dimensionalism

In response to the problems with the two dimensionalist system which (I suggested) is found in *The Conscious Mind*, Chalmers has modified his views. The main change is that he now rejects his earlier close association of primary intensions with Kaplan-style characters, and consequently also rejects the view that a sentence is a priori iff it is true whenever it is uttered. Because the earlier version of two-dimensionalism took

primary intensions to be functions from contexts to extensions, he calls this *contextual* two-dimensionalism. Because the later version of two-dimensionalism takes primary intensions to be functions from epistemic possibilities to extensions, he calls this the *epistemic* version of two-dimensionalism.

To keep things straight:

primary intension = epistemic intension

scenario = epistemic possibility = the kind of thing which is argument for an epistemic intension

secondary intension = subjunctive intension

So we hold in place the two central theses of *The Conscious Mind*:

[T1] A sentence is a priori iff it has a necessary primary intension.

[T2] A sentence is (metaphysically) necessary iff it has a necessary secondary intension.

But we now reject the third:

[T3] Truth conditions for primary intensions can be defined in terms of Kaplan's characters. A sentence's primary intension is true at a world w iff relative to w as context, the sentence delivers a secondary intension which is true at w .

And replace it with:

[T3*] Primary intensions are epistemic intensions. Epistemic intensions are functions from epistemic possibilities — hypotheses about the world that cannot be ruled out a priori — to extensions. The primary intension of S is true at a scenario e iff e epistemically necessitates S .

Combining [T3*] rather than [T3] with [T1], we get that a sentence is a priori iff every epistemic possibility epistemically necessitates the sentence.

2 Epistemic two-dimensionalism and the status of [T1]

The key question about the framework concerns the nature of epistemic possibilities — the things which epistemic intensions take as arguments, and deliver extensions as values — which Chalmers calls 'scenarios.' Regarding scenarios, we have two possibilities: (i) define them in epistemic terms, taking epistemic possibility as a primitive, or (ii) define them in terms of centered possible worlds (Chalmers (2006a), §3.4).

2.1 The epistemic understanding of scenarios

Here we consider the first possibility, which we can call the epistemic understanding of scenarios:

[T4] e is a scenario \equiv_{df} e is an epistemically possible and complete hypothesis about the world that cannot be ruled out a priori.

Think of these maximal hypotheses of being long sentences of an ideally expressive language that are both epistemically possible (not ruled out a priori) and epistemically complete (such that there is no sentence S which is such that both it and its negation can be conjoined to the scenario to yield an epistemically possible sentence). If the language is indeed ideally expressive, then we can assume the following Epistemic Plenitude principle:

[EP] Every epistemic possibility is epistemically necessitated by some epistemically possible and complete hypothesis.

Let's add to this the view that epistemic necessitation is a priori entailment, so that S epistemically necessitates e iff the material conditional ($S \rightarrow e$ is a priori). This gives us a definition of truth at a world for primary intensions:

[T5] e epistemically necessitates $S \equiv_{df}$ ($e \rightarrow S$) is a priori.

Recall our discussion of contextual two-dimensionality. There we had an understanding of what primary intensions were supposed to be which was independent of [T1], and we could go on to ask whether we could assign primary intensions to expressions in some way which would make [T1] come out true. This turned out to be difficult to do.

By contrast, now there is no problem at all in reconciling the present view of primary intensions with [T1]. After all, [T4], [T5], and [EP] jointly entail [T1]. To see that, consider the following argument by cases (the connection between primary and epistemic intensions is taken for granted):

Suppose that S is a priori. S is true at every scenario iff for any scenario e , e epistemically necessitates S iff for any scenario e , the conditional ($e \rightarrow S$) is a priori. But if S is a priori, then any conditional with S as consequent will be a priori. So S is true at every scenario.

Suppose now that S is not a priori. Then the negation of S is epistemically possible. So, by [EP], the negation of S is epistemically necessitated, and therefore true at, some scenario w . But scenarios are always epistemically possible, so no scenarios contain both S and its negation. So S is false at w .

This gives us both directions of [T1]. However, it does not give us both directions of [T1] in an especially impressive way. Epistemic intensions are simply defined in such a way that [T1] comes out true. Anyone who grants that epistemically possible and complete sentences make sense, and that some conditionals are a priori knowable, should therefore concede that, on this understanding of primary intensions, every a priori truth has a necessary primary intension.

Does this mean that the two-dimensionalist has won the day? No. All that has been shown so far is that we can define a property of sentences (the property of having a necessary epistemic intension) such that a sentence has it iff it is a priori. Given that this property was defined using the property of a priority, this by itself does not show anything.

Chalmers (2006a) (§3.11) recognizes that [T1] is simply made true by definition on this approach. But, he says, this does not make two-dimensionalism trivial. Rather, the value of epistemic two-dimensionalism consists in its giving us a well-defined value of expressions which can be used to explain various phenomena. The value of the system consists in how well it explains those phenomena.

We will return at the end to the question of how well epistemic intensions, on the present interpretation, can explain the phenomena in question.

2.2 *The metaphysical understanding of scenarios*

First we turn to a different understanding of scenarios, which does not seem to make [T1] true by definition. This is what Chalmers (2006a), §3.4 calls the *metaphysical* understanding of scenarios.

[T4*] e is a scenario \equiv_{df} e is a centered possible world (a metaphysically possible world with a designated agent and time).

We then need to replace Epistemic Plenitude with Metaphysical Plenitude:

[MP] Every epistemic possibility is epistemically necessitated by some centered metaphysically possible world.

[MP] should not be understood to entail the false thesis that ‘It is metaphysically possible that water is not H_2O ’ is true. On the present view what is required is not that there be possible world with respect to which what we say by ‘Water is not H_2O ’ is true, but only one which is such that, were that world actual, and were we to know everything about it, it would be a priori that ‘Water is not H_2O ’ is true.

We keep for now the definition of epistemic necessitation in terms of the a priori given by [T5].

It is clear that just as [T4], [T5], and [EP] imply [T1], so also [T4*], [T5], and [MP] imply [T1], so long as we assume one further plausible thesis:

[T6] Every centered metaphysically possible world is also epistemically possible.

We can then argue as follows:

Suppose that S is a priori. S is true at every scenario iff for any scenario e , e epistemically necessitates S iff for any scenario e , the conditional $(e \rightarrow S)$ is a priori. But if S is a priori, then any conditional with S as consequent will be a priori. So S is true at every scenario.

Suppose now that S is not a priori. Then the negation of S is epistemically possible. So, by [MP], the negation of S is epistemically necessitated, and therefore true at, some scenario w . But by [T4*] and [T6] scenarios are always epistemically possible, so no scenarios contain both S and its negation. So S is false at w .

Again, we pretty much have the ‘core thesis’ of two-dimensionalism, [T1], entailed by the definitions of primary intension, scenarios, and epistemic necessitation. The only difference between this case and the case of the epistemic understanding of scenarios is that here we also have to assume [T6], which is plausible, and [MP], which is less clearly true. (More on [MP] below.)

This is better, of course, than [T1] being false. But it is important to be clear all the same that the truth of every one of the above theses does not exactly amount to the discovery that every a priori truth has a necessary primary intension. Rather, we have defined primary intensions in terms of a priority so that [T1] comes out true.

(This is to be contrasted with contextual two-dimensionalism. There if we could show that every a priori sentence really did have a character which was true in all contexts, this would have been an interesting discovery. But that was because primary intensions on that view were not defined in terms of the a priori.)

So the interesting questions are not whether sentences have primary intensions, or sentences are a priori iff they have primary intensions which are necessary. Everyone should, as far as I can see, grant both of these points. For this reason it is a bit misleading to characterize [T1] as the distinctive thesis of two-dimensionalism, as in, e.g., Chalmers (2006b). The interesting question is: once we have defined primary intensions in either of the above ways, what, if anything, can they explain?

3 Some more detail about epistemic intensions

Given these definitions, it might be useful to examine some examples of expressions, and try to figure out the best way to think about their epistemic intensions. To do this, it will be useful to first go over what Chalmers is doing when he talks about canonical descriptions.

3.1 Canonical descriptions

In the case of the epistemic conception of scenarios, scenarios are epistemically possible and complete sentences. In the case of the metaphysical conception of scenarios, they are centered possible worlds — but for now let’s treat scenarios as sentences. If the metaphysical conception of scenarios is preferred, these could be descriptions of the relevant centered worlds.

Remember that S is true at a world w iff e epistemically necessitates S , i.e., if $(e \rightarrow S)$ is a priori. Suppose now that part of the relevant scenario is the sentence ‘Water is H₂O.’ But this raises a problem (as noted in Chalmers (2006a), §3.5). Is this sentence a description

of the relevant world taken as actual, or taken as counterfactual? If the former, then we will be presupposing epistemic intensions in our definition of the scenarios in terms of which those epistemic intensions are defined. If the latter, then ‘Water is H₂O’ will be true of an XYZ world, since this sentence is true of an XYZ world, taken as counterfactual — despite the fact that ‘Water is not H₂O’ is supposed to be epistemically necessitated by such a world, in order to deliver the result that it is epistemically possible, so that its negation is a posteriori.

This means that we need to block terms like ‘water’ from appearing in the descriptions of the relevant scenarios. In general, we need to block terms whose epistemic (primary) and subjunctive (secondary) intensions do not coincide. These will include names, natural kind terms, and indexicals. Chalmers calls these *semantically neutral* terms. So we should think of the descriptions of scenarios as excluding terms of this sort.

Below we’ll return to the question of whether Chalmers can hold his other theses in place while maintaining his restriction to semantically neutral terms.

3.2 *The epistemic intensions of names*

Take some name that you understand, e.g. ‘John Jenkins.’ The epistemic intension of this name is a function from epistemic worlds to referents in those worlds, considered as actual. On the view sketched in §3.7 of Chalmers (2006a), this works something like this in the typical case. In the description of the scenario e , there will be some singular term ‘the F ’ in the description of e such that the sentence ‘John Jenkins is the F ’ is epistemically necessitated by (i.e., a priori given) the description of e . (I take it that we are licensed to assume that the singular term will be a description because names are not semantically neutral, and are therefore blocked from appearing in the canonical descriptions of scenarios.) The ‘epistemic referent’ of ‘John Jenkins’ at e is then whatever is denoted by ‘the F ’ at e .

The epistemic referent of ‘John Jenkins’ at e will obviously not always be John Jenkins. And in fact, this is key to the system. A true non-identity like

John Jenkins is Monk Malloy.

is supposed to be necessarily false, but epistemically possible (since it is a posteriori). So it must by [T1] be true at some scenario. Call the description of this scenario *prez*. Then we know of this scenario that there are descriptions ‘the F ’ and ‘the G ’ such that the following are true:

‘ $prez \rightarrow$ (the F is John Jenkins)’ is a priori.

‘ $prez \rightarrow$ (the G is Monk Malloy)’ is a priori.

‘ $prez \rightarrow$ (the F is the G)’ is a priori.

What could this scenario, and these descriptions, be? Here’s a list of sentences that might occur in the description of the world:

‘Monk Malloy’ was the name of the president of the largest Catholic university in the largest city in northwest Indiana ten years ago.

‘John Jenkins’ is now the name of the president of the largest Catholic university in the largest city in northwest Indiana.

The president of the largest Catholic university in the largest city in northwest Indiana ten years ago is the president of the largest Catholic university in the largest city in northwest Indiana now.

This contains some non-semantically neutral terms, and would need to be filled out more, but I take it that this is the kind of thing that would be in the description of the relevant kind of scenario. The idea would then be that when we learn that John Jenkins is not Monk Malloy, what we learn is that scenarios of this sort are not actual.

For a clear discussion of how the epistemic intension of ‘water’ might work, see Schroeter (2003).

3.3 *Epistemic intensions and definite descriptions*

Critics of Chalmers, like Soames (2005), often think of his view as being that expressions which are not semantically neutral are equivalent to rigidified descriptions. Chalmers objects that his view of epistemic intensions is not committed to this. What’s going on here?

Two things are going on. First, in *The Conscious Mind*, Chalmers asserted that ‘water’ is conceptually equivalent to a rigidified description, and said nothing that would indicate that this was not a general view. Moreover, contextual 2-dimensionalism requires names and kind terms to be indexicals, and rigidified descriptions look like the best bet.

However, Chalmers is correct that these arguments don’t carry over straightforwardly to epistemic two-dimensionalism. The epistemic intension of a term is a function from scenarios to extensions. What is required for a term to have an epistemic intension for a speaker is for that speaker to have the ability to identify extensions for a term given various hypotheses about the actual world.

One might object that there will always be some definite description — perhaps an extremely complicated one — which captures a term’s epistemic intension. But even if this is so, Chalmers does not need to identify the term’s epistemic intension with that definite description. The epistemic intension can just be the relevant function from scenarios to extensions. (See below for more discussion of this point.)

(There is some irony here, since two-dimensionalists like Jackson sometimes used the ability to identify extensions in this way as an argument for descriptivism. The present dissociation of primary intensions from descriptions would seem to undercut those kinds of arguments.)

4 Potential explanatory roles for epistemic intensions

Given the above definitions, ‘having a necessary epistemic intension’ is indeed a property a sentence will have iff it is a priori. But, for the reasons sketched above, this is by itself not a very important result. What we want to know is, given the above definitions of epistemic intensions, what these properties of expressions can explain.

4.1 *Explaining a priori knowledge*

One task for which epistemic two-dimensionalism seems to be ill-suited is explaining how a priori knowledge is possible, or explaining why some sentences rather than others express a priori truths. Since facts about epistemic possibility and the a priori are built into the definitions of epistemic intensions, it doesn’t seem as though those facts could get an explanation.

To make things more concrete, suppose that it is suggested that there is a scenario whose canonical description includes both ‘the *F* is bright red all over’ and ‘the *F* is bright green all over.’ This would lead to the mistaken result that ‘Nothing is bright red and bright green all over’ is a posteriori. So how can we be sure that there is no such scenario? Presumably by the requirement that the scenario description be epistemically consistent. But now, having rejected the proposed scenario via this requirement, we can hardly use its absence to explain a priori knowledge of color incompatibilities.

Chalmers, as far as I know, does not claim that this framework can give an explanation of the a priori. But I think that one of the attractions of two-dimensionalism for many is that it promises an explanation of necessity and the a priori in terms of (some kind of) meaning. At this point, I don’t see how either could work.

(How different are matters if we take scenarios to be canonical descriptions of centered worlds (the metaphysical conception of scenarios)?)

A further note is that if, as is possible, ‘Hesperus’ and ‘Phosphorus’ have the same epistemic intensions for me, it follows from this approach to the a priori that ‘Hesperus is Phosphorus’, as uttered by me, will be a priori.

4.2 *Solving Frege’s puzzle*

Frege’s puzzle is to explain the difference in informativeness between, e.g., ‘Hesperus is Phosphorus’ and ‘Hesperus is Hesperus.’ Chalmers suggests that epistemic intensions can play the role of Fregean senses in explaining the difference between these sentences. A few points about this claim:

1. Fregean senses are often taken to be properties of expression types. However, epistemic intensions will not be. The epistemic intension of a name will vary between almost any two speakers, and will often vary over time for a single speaker. This makes Chalmers’ solution in some ways more similar to ‘pragmatic’ solutions to

Frege's puzzle than to semantic solutions preferred by orthodox Fregeans, in that Chalmers' solution is based on properties of expression tokens rather than types.

2. Related to the first point, it seems that Chalmers' view has the result that 'Hesperus is Phosphorus' will differ in cognitive significance from 'Hesperus is Hesperus' for some speakers, but not for others. You might not learn the terms by learning the descriptions with which they were historically associated. Or you might learn them that way, and then later forget which is which. Then it is natural to think that you will associate the same primary intension with each. This is connected to some problems with attitude ascriptions (see below).
3. This solution to Frege's puzzle assimilates cognitive significance to the aposteriority, and cognitive insignificance to the a priori. But this is not quite right. A priori sentences can, in Frege's sense, be cognitively significant, and pairs of sentences like the following can intuitively differ in cognitive significance:

The square of the sum of 36 and 13 is the positive square root of 2041.

The positive square root of 2041 is the positive square root of 2041.

But this difference in positive significance can't be explained via differences in the epistemic intensions of the two descriptions (since if the two did have different epistemic intensions, this would entail the falsity of [T1]. Chalmers (2006a) (§3.12) and Chalmers (ms.) (§7) recognize this mismatch between epistemic intensions and Fregean senses. The suggestion is that we can come up with a third dimension of meaning, which will be defined in a way analogous to but different than epistemic intensions, which will more closely correspond to Fregean sense. As above, there is no problem with defining such a value — call it Frege-intension — which is such that two sentences which don't differ with respect to Frege-intension never differ with respect to cognitive significance. But the obvious way to do this is (also as above) to define these values in terms of cognitive significance, in which case Frege-intensions will no more explain cognitive significance than epistemic intensions will explain the a priori.

4.3 Playing a role in the semantics of attitude ascriptions

Closely related to Frege's puzzle is the phenomenon of substitution failures in propositional attitude ascriptions. Chalmers suggests that we can explain the difference in truth-value between

Hammurabi believed that Hesperus is Hesperus.

Hammurabi believed that Hesperus is Phosphorus.

in terms of the difference in epistemic intension of the two names. The idea (which is familiar from our discussion of contextual two-dimensionalism) is that a belief ascription $\ulcorner A$ believes that $S \urcorner$ is true in a context C iff (i) A has a belief with the same secondary intension of S , as uttered in C , and (ii) the epistemic intension of A 's belief is 'similar

enough' to the epistemic intension of S in C , given the standards of similarity operative in C .

One immediate problem is the fact, noted above, that 'Hesperus' and 'Phosphorus' might well have the same epistemic intension for me. That means that a principle of free substitution of these names will hold for attitude ascriptions uttered by me.

This is displeasing. Consider the two attitude ascriptions above, first as uttered by me, and then as uttered by you (for whom these names have different epistemic intensions). In both cases they will seem to differ in truth-value, but in one case but not the other this difference will be explained in terms of a difference in epistemic intensions. But the 'two' phenomena really seem as though they should get a unified explanation.

4.4 Giving a level of mental content which can explain behavior

Take the beliefs that I and my twin on Twin-Earth express using our respective sentences 'There's some tasty water in my glass.' It seems that these thoughts, even if different at the level of secondary intension, are the same at the level of the explanation of behavior. Proponents of narrow content try to capture such a level of thought content. Chalmers suggests that epistemic intensions can play this role, since they are plausibly narrow, and seem to capture what the thoughts of these two agents have in common. (See, among other places, §6.2 of Chalmers (ms).)

One worry here is the same as the above: 'a priori' and 'obvious' or 'cognitively insignificant' don't come to the same thing. So there will be differences in the explanation of behavior which correspond to no difference in epistemic intension.

There is also some reason to doubt that epistemic content is narrow. (See §5.1 below.)

4.5 Providing a link between conceivability and possibility

Differences between the epistemic and metaphysical conceptions of scenarios. The epistemic conception of scenarios does not seem to ground any move from conceivability to possibility.

The metaphysical conception of scenarios grounds only a particular kind of move from conceivability to possibility. Suppose (with Chalmers) that for S to be conceivable is for S 's negation not to be a priori. Then if S is conceivable, S is epistemically necessitated by some centered metaphysically possible world. But this is not the same thing as S being true with respect to that possible world. Arguably, though, in the cases that matter, there is no important difference. If something like

My intrinsic physical duplicate has no conscious experiences.

Is epistemically necessitated by the canonical description of some metaphysically possible world, then it is plausible that it is also true with respect to that world. On the metaphysical conception of scenarios, though, this move is only licensed if [MP] is true,

and every epistemic possibility is epistemically necessitated by a metaphysically possible world. The traditional defender of the view that body-mind connections are necessary a posteriori is likely to reject [MP].

5 Objections to epistemic two-dimensionalism

5.1 Problems with contextual two-dimensionalism revisited

One of Chalmers's central reasons for rejecting contextual two-dimensionalism was that it made sentences like

Language exists.

come out a priori. But, as Schroeter (2005) argues, it is plausible that we can generate related problems for epistemic two-dimensionalism.

To see this, think about the epistemic intension of a word like 'water', and consider a scenario in which you are located near some collections of H₂O and some collections of XYZ. Considering that scenario as actual, what is water? Remember that we are not permitted to import our knowledge about our actual history of usage of 'water', since if we were, epistemic intensions would collapse (in at least many cases) into secondary intensions. So it seems that nothing favors the view that the collections of H₂O are in its extension over the view that collections of XYZ are in its extension. How about the view that 'water' has both in its extension? So far, nothing we know about this scenario favors this verdict over the others. Remember that we are considering the scenario as actual, so we can approach this issue by asking how we would think about actual such cases. In actual such cases, we say that whether the term in question applies to one but not the other ('gold' applies to gold but not iron pyrites) or to both (as 'jade' applies to both jadeite and nephrite) depends on the actual history of the use of the expression in question. So, in this scenario considered as actual, whether H₂O, or XYZ, or both are in the extension of 'water' depends on the history, *in the scenario*, of the use of 'water.'

But suppose that 'water' does not exist in this scenario; there's plenty of H₂O and XYZ, but no one around to talk about it. In that case, it seems plausible that 'water' has no determinate reference. So, in such a scenario considered as actual, 'water' has no determinate extension.

In such a scenario, what is the truth-value of 'Water exists'? It seems that it is not true. In order for 'Water exists' to be true in such a scenario, the word 'water' has to exist and have a history of usage. So, in every scenario in which there is H₂O and XYZ and 'Water exists' is true, the word 'water' exists. So it appears that the following is true in every scenario:

If H₂O and XYZ exist and water exists, then language exists.

But, if this is true in every scenario, then it is a priori. But this is clearly incorrect. And it is plausible that this sort of thing will work for any name or natural kind term.

At this stage, this might seem confusing. I said above that the truth of [T1] follows from the definitions of epistemic intensions, epistemic necessitation, etc. But isn't the above sentence a counterexample to [T1]?

This conflict is only apparent. The above argument is an argument against the conjunction of the above definitions of epistemic intensions and related notions, [T1], and the restriction of scenario descriptions to non-twin-earthable canonical vocabulary. We could easily block the above counterexample by including 'water' in scenario descriptions — then 'Water exists' would not be undefined in the worlds where there is H₂O and XYZ, but no language.

So why not take this way out? It would be devastating to the ambitions of two-dimensionalism, for the following reasons:

- There is a difficulty, as Chalmers recognizes, with interpreting the suggestion that 'water' figure in the canonical descriptions of scenarios. Should it have its epistemic or secondary intension it is in such descriptions? The former seems incoherent. For now, if we ask what the epistemic intension of 'water' is, that is defined in terms of scenarios in which 'water' occurs, as used with its epistemic intension. So it seems that 'water' must occur with its secondary intension. But the secondary intension of 'water' will differ for me and my twin; so the space of scenarios will differ for me and my twin. But this means that epistemic content will not be narrow content, since intrinsic duplicates will associate 'water' with epistemic intensions which are defined over a different class of epistemic possibilities.
- Since 'Water is H₂O' is a posteriori, there would have to be some scenario which includes 'Water is not H₂O'. But then that scenario (given that 'water' here has its secondary intension) would not correspond to any metaphysically possible worlds. This would obviously preclude identifying scenarios with centered metaphysically possible worlds. But it would also block any justification for conceivability/possibility inferences of the kind discussed above.

5.2 Consequences of denying supervenience without a priori deducibility

A consequence of any form of two-dimensionalism is that there is no such thing as a necessary connection between two kinds of facts which cannot be known a priori to obtain. But, as Byrne (1999) notes, there are some worrying consequences of this view. For example, it is tempting to respond to the skeptical paradox of Kripke (1982) by (following Soames (1999)) citing the distinction between interpretations of 'determines' as 'a priori implies' and 'necessitates.'

(For a defense of this consequence of two-dimensionalism, see Chalmers and Jackson (2001).)

5.3 The nature of the 'possibilities' ruled out by de re assertions

Soames (2006) gives an example of a de re assertion which predicates an essential property of an object, like the assertion of 'This briefcase (if it exists) is made of cow leather.' Such

claims will be necessary a posteriori, so they will rule out some epistemic possibilities. What epistemic possibilities does the assertion about the briefcase rule out?

Intuitively, it rules out the possibility that this briefcase — this very object — is made of something other than cow leather. But this is not the view of epistemic two-dimensionalism. According to epistemic two-dimensionalism, what is ruled out is some scenario which epistemically necessitates ‘This briefcase is not made of cow leather.’ And this scenario cannot be one in which this very briefcase is not made of cow leather, since that is not metaphysically possible, and scenarios are supposed to be centered metaphysically possible worlds (on the metaphysical conception of scenarios). So the possibility which is ruled out is one in which some other briefcase is demonstrated, and is not made of cow leather.

But this seems counterintuitive. The point of my assertion was to rule out possible views about this object, not possible views about some other superficially similar object.

5.4 *Contents vs. intensions*

As noted above, the best way for the two-dimensionalist to avoid analyzing names and kind terms as rigidified descriptions is for him to take their epistemic intensions to be functions from scenarios to extensions rather than descriptive conditions which determine those functions. But this view of contents faces some problems in explaining concept acquisition.

5.5 *A posteriori necessities in semantically neutral vocabulary*

Recall that semantically neutral terms are terms which are not ‘twin Earthable’, for which there is no distinction of epistemic and secondary intensions. It would be a problem for two-dimensionalism if there were examples of the necessary a posteriori which were framed solely in such terms. Some potential examples:

- The existence of God.
- Mathematical truths which are not knowable, even in principle.
- Connections between physical truths and semantic/moral/mental facts.
- The laws of nature, on some views.

Chalmers calls these ‘strong necessities’, and denies that they exist. Their existence is ruled out by any view of scenarios on which they have to be metaphysically possible.

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