COGNITIVE SIGNIFICANCE AND EPISTEMIC INTENSIONS

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Abstract

In this paper I discuss an important aspect of David Chalmers' interpretation of two-dimensional semantics. I will argue that his approach cannot be used to model something like Fregean sense: Semantic concepts similar to the notion of a sense do not, unlike the notion of an epistemic intension, depend on epistemological notions like apriority or acceptability on purely rational grounds. This conceptual difference gives rise to the problem that primary intensions cannot do the work Fregean senses were designed for: They cannot, contrary to what Chalmers suggests, explain cognitive role.

Introduction: Two Approaches to Meaning – Metaphysics vs. Epistemology

Meaning is usually spelled out in terms of metaphysics. Semantic theories from Carnap to Lewis or Cresswell describe meaning in terms of (sets or tuples of) individuals, truth values, worlds and so forth.[1] If this is an appropriate way of conceiving of meaning, then the notion of meaning strongly depends on metaphysical notions.

Unfortunately, most of these theories are unable to model certain aspects of meaning: They do not individuate meanings fine grained enough. To give an example: Most of these theories are unable to distinguish the meaning of 'Iron' from the meaning of the chemical expression 'Fe', given that Iron is Fe, and necessarily so, and that these expressions have different meanings. There are lots of closely related problems, like the problem of modeling the contribution of an intensional operator's meaning to the meaning of sentences in which the operator occurs, or explaining the cognitive role of expressions. And there are different ways to approach these problems. Most

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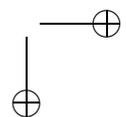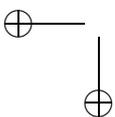
philosophers try to solve them using the metaphysical framework, introducing structured meanings as semantic values of complex expressions (Cresswell, 1985), or describing meanings in terms of algorithms (Moschovakis, 1984 & Muskens, 2005) or procedures (Tichy, 1984 & Materna, Duží, Jespersen, 2010), thus introducing entities which are finer grained than the semantic values we are familiar with from introductory logic-courses.

David Chalmers tries to approach some of these difficulties distinguishing two kinds of semantic values — those which are describable in metaphysical terms (in accordance with the tradition), and those which essentially involve an epistemological aspect. In a series of papers, he has developed a certain interpretation of what has come to be known as two-dimensional semantics. The general idea of two dimensional semantics is that we can associate three semantic values with an expression, two basic intensions which, together, form a two-dimensional intension. These values are interdependent in one sense or another — depending on the interpretation of the two-dimensional framework. Chalmers uses the framework in order to distinguish between an *expression's epistemological value* and what can be labeled the *expression's metaphysical value*. Whilst the metaphysical value (named 'secondary intension') is understood in the ordinary way, namely, as a function from possible worlds to extensions, an expression's epistemological value (or 'primary intension') is interpreted as a function from so called 'scenarios' to extensions. These scenarios are described as epistemological possibilities, or sometimes as centered worlds. The notion of a primary intension is based on epistemological notions, like the notion of apriority or acceptability on purely rational grounds (for a more detailed introduction, see below). In (Chalmers, 2002, 2004 & 2006) Chalmers suggests that primary intensions can be used to model some relevant aspects of Fregean sense, amongst which providing the resources to explain cognitive significance plays a prominent role. In this paper, it is argued that primary intensions do not relate to cognitive role in an appropriate way and that, therefore, primary intensions cannot be used to model Fregean sense. This is not to deny that expressions have primary intensions, or to argue that the two-dimensional framework Chalmers developed is in error. Rather, this paper attempts to show that the framework's range of application is more limited than Chalmers sometimes tends to suggest. The criticism is not based on traditional worries concerning the notion of apriority or similar notions. For what follows, it will be granted that Chalmers' use of the notion of apriority is acceptable.

I shall proceed as follows: In the first section, I will introduce the conceptual framework and sketch some distinctive features of two dimensional semantics. In the second part, I will develop an argument which is supposed to show that Chalmers' account faces a problem: Either, there are cases of cognitive roles which cannot be explained using primary intensions, or the notion of a primary intension cannot serve as a model for Fregean senses,

because it presupposes the notion of a Fregean sense in a way which makes primary intensions useless in this respect, or the account becomes circular. In addition, I will show that the arguments Chalmers gives in favor of his claim that primary intensions play a role similar to Fregean senses are fallacious.

Part one: Epistemic Intension and Fregean Sense

The aim of this first section is to give a rough idea of those fundamental aspects of Chalmers' interpretation of the two-dimensional framework which are relevant for our present concerns.[2] According to two-dimensionalism, an expression can be associated with two semantic values — a primary intension and a secondary intension, which, together, generate a third value: a two-dimensional intension. Chalmers interprets primary intensions as functions from scenarios to extensions at scenarios and secondary intensions as functions from possible worlds to extensions at possible worlds. Chalmers intends to use this framework in order to model some relevant aspects of meaning. Primary intensions are used to model something like Fregean sense. In order to understand the notion of a primary intension, we have to explain the notion of a *scenario* in the first place, and we have to explain how this notion is used in order to get a better grasp of how meaning, or Fregean sense, relates to cognitive significance. As already mentioned, there are two ways to conceive of scenarios: *scenarios as centered worlds* and *scenarios as epistemic possibilities*.

According to the centered world interpretation, scenarios are triples of ordinary possible worlds, individuals, and times. Individuals and times are introduced to handle indexical claims; they fix a certain point of view on or in the world. A primary intension of a sentence S obeys the following principle: S's primary intension delivers the value TRUE for a scenario W if and only if the conditional 'If W is actual, then S' is a priori.[3] Scenarios are associated with canonical descriptions. These canonical descriptions are supposed to guarantee that the material conditional of the form 'if W is actual, then S' comes in an appropriate form. There might be many different ways to refer to W we can use to generate instances of 'if W is actual, then S', but which do not suit the purpose of evaluating S at W using a material conditional of this form.[4] So, in a sense, it is the appropriate descriptions of worlds which

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[2] For a detailed introduction, see (Chalmers, 2004).

[3] I follow Chalmers in talking about sentences, rather than what they express, as being a priori, without committing myself to the claim that this is the best way of talking.

[4] For a detailed discussion of the notion of a canonical description and different ways to interpret or replace apriority, see (Chalmers, 2004 & 2006).

do the job of fixing the criteria for a primary intension, not the worlds themselves. To be more precise, the relevant conditional should be described as follows: 'If W (under description D), is actual, then S'. Note that on different occasions, Chalmers proposes different ways one might conceive of primary intensions, ways which do not involve the notion of apriority. They all have in common that they use one epistemic notion or another to evaluate the relation between a scenario under a description and a given expression. However, I think that the arguments I am about to give can be applied in similar ways to alternative specifications of the notion of a primary intension.

According to the second alternative, scenarios are described in epistemological vocabulary. Explicating this idea here in any way which comes close to a detailed discussion is impossible. Again, I will focus on one important fundamental aspect: The role of the notion of apriority or acceptability on purely rational grounds. According to this interpretation, we should conceive of a scenario as a complete description of a way the world might be, which meets two requirements: It is epistemologically possible, and it is complete, such that there is no question which cannot be settled with respect to this description on a priori grounds (Chalmers, 2004). More precisely: In this case, a scenario is an *equivalence class* of sentences, D, of (non-natural) language L, which is such that (i) any member of the class is epistemologically possible, and which (ii) is such that any member of it is complete in the sense that no sentence of L is epistemologically indeterminate given D (that is: There is no sentence which could be both, false and true, given D). *Epistemic possibility* is cashed out in terms of apriority or similar notions: A proposition p is epistemologically possible if and only of it is not a priori that not p, and p is epistemologically necessary iff p is a priori. Chalmers uses the term 'a priori' in the sense of 'justifiability, which is independent of experience' (Chalmers, 2004, p. 207). Similar notions seem to be at least co-extensive. Intuitively, primary intensions, on this interpretation, behave similar to how they behave in the scenarios-as-centered-worlds case: Consider a description D of the equivalence class. Then, for a sentence S, its primary intension yields TRUE for a scenario under D if and only if 'If D, then S' is a priori.

Up to now, we have focused on sentences. Primary intensions for subsentential expressions pose special problems, so I will merely comment on primary intensions of singular terms which do not involve indexicals, and I will presuppose that we take scenarios to be centered worlds. In this relatively simple case, a singular term's (S) primary intension is a function from scenarios (W) under descriptions (D) to extensions (E), such that the relevant instance of the schema "If W (under D) is actual, then E = S" is a priori. For example, if a world in which the brightest star in the morning is Riegel Delta is actual then Hesperus is Riegel Delta. This inference is a priori/based on purely rational grounds.

Whilst the first approach to scenarios is based on the notion of metaphysically possible worlds we are familiar with, the second approach describes scenarios in epistemological terms from the beginning. Nevertheless, in order to construct primary intensions, we have to introduce epistemological notions in both cases. The basic idea is that primary intensions are functions which obey epistemological constraints. I will use the term 'scenario' in both cases, just like Chalmers does. What sort of scenario is relevant on different occasions will become apparent from context.

Let us now turn to the question of what one might expect (and of what Chalmers expects officially) from an epistemological interpretation of two-dimensionalism. In "On sense and Intension" Chalmers describes four relevant aspects of Fregean sense, and he argues that with respect to these descriptions, primary intensions are similar to Fregean senses:

   (i) Every expression which has an extension has a sense.
  (ii) Sense reflects cognitive significance.
 (iii) The sense of a complex expression depends on the senses of its parts.
 (iv) Sense determines extension. (Chalmers, 2002, p. 138 ff.)

From these descriptions we can derive four requirements a type of semantic values has to meet in order to play a role relevantly similar to the role Fregean senses are supposed to play. The crucial aspect is referred to in (ii): Sense reflects cognitive significance. This point is crucial because in this respect, sense differs from classical intensional (functions from worlds to extensions) semantic values, for which criteria similar to (i), (iii) and (iv) can be met. We can assume that what has an extension has an intension, that intensions can be combined to determine intensions of complex expressions, and that the intension determines an expressions extension at a given world. But intensions do not model cognitive significance. So, the relevant claim is that primary intensions have an advantage over ordinary intensions (or structures of ordinary intensions) in that they are able to reflect cognitive significance.

Let us have a look at how Chalmers introduces the idea that epistemic intensions reflect cognitive role in the relevant way:

Chalmers 1)
In "Über Sinn und Bedeutung" (1892), Frege lays out the central issue roughly as follows. The sentence 'Hesperus is Hesperus' is *trivial*. It can be known a priori, or without any appeal to experience. [...] By contrast, the sentence 'Hesperus is Phosphorus' is
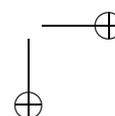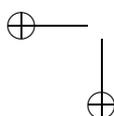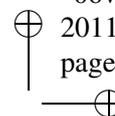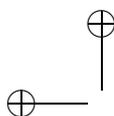
> *nontrivial.* It can only be known a posteriori, by appeal to empirical evidence. [. . .] As Frege put it, 'Hesperus is Phosphorus' is *cognitively significant* whereas 'Hesperus is Hesperus' is not. Intuitively, this difference in cognitive significance reflects a difference in the meanings of 'Hesperus' and 'Phosphorus'. (Chalmers, 2002, p. 137)

From the idea that the cognitive significance of such identity-statements 'reflects' a difference in meaning, he goes on introducing a way of approaching the notion of Fregean sense or (non-Fregean) meaning.

> Chalmers 2)
> An attractive idea is that when an expression plays a certain cognitive role for a speaker, then it will be associated with certain tacit criteria for identifying the extension of the expression [. . .]. It is natural to hope that these criteria will reflect the cognitive role of the expression in some deep respects. In order to tie a condition on extension to cognitive significance in this way, it is important that the relevant condition on extension be understood *epistemically [. . .]* (Chalmers, 2002, p. 143)

The cognitive role of an expression is what gives access to an expression's extension at least if we know which scenario matches the actual world. It gives access to extensions at scenarios considered as actual. Therefore, Chalmers suggests, we can understand the conditions on extension, or the criteria we use to identify the extension, epistemically. (I will criticize this move and an alternative argument he gives in favor of the claim that primary intensions model sense later on.) Understanding conditions on extension epistemically (I use 'epistemics' and its variants as stylistic variants of 'epistemology' and its variants) takes us to primary intensions: A primary intension just is an epistemic intension of a certain sort, and it is described as a function which, given enough knowledge which is delivered by the relevant canonical description, enables a subject to fix an extension at an epistemic possibility/a possible world.

Part 2: Do Epistemic Intensions explain Cognitive Role?

Frege's observation was that, in order to explain the existence of cognitively significant identity-statements, we have to add *senses* to our ontology (Frege, 1892). Senses are supposed to explain the cognitive role a certain language item plays. As we have seen, Chalmers uses this argument to

motivate his approach, and he explicitly argues that primary intensions relevantly reflect cognitive role. Therefore, he is committed to the claim that primary intensions explain cognitive role. Just like certain identity statements are cognitively significant/insignificant *because* of the meanings (Fregean senses) of the terms the identity symbol connects, they are cognitively significant/insignificant *because* of these expressions' primary intensions. So, do primary intensions explain cognitive role just like senses do?

According to the two ways we are invited to conceive of scenarios, there are two options for primary intensions to perform the explanation task. If we take scenarios to be centered worlds, it must be true that an expression (sentence S, or singular term X, or predicate . . .) has its cognitively relevant semantic features in virtue of the fact that its primary intension (f) maps scenarios on extensions or truth values as follows: For any scenario W under description D, 'If W (under D) is actual, then S (X = Y, . . .)' is a priori if and only if f maps W onto TRUE (or, for sub-sentential expressions, maps the scenario onto the expression's extension at that scenario, described by the relevant elements of D). According to the scenario-as-equivalence-class view, we are directly confronted with a description in a certain language, instead of a world under a certain description considered as actual. The cognitive role of an expression is then explainable by reference to its a priori role across different equivalence classes (scenarios).

To get the argument started, let us again consider Chalmers' remarks on the notion of apriority: A statement is a priori iff it is (true and) justifiable independent of experience. This interpretation is advantageous over alternative interpretations, like taking epistemic necessity as a primitive, because it gives an idea of where the explanatory power of the account might stem from. Unfortunately, for different sorts of speakers or thinkers, different kinds of sentences or thoughts are justifiable independent of experience (and, similarly, acceptable on purely rational grounds and epistemologically necessary), depending on how their cognitive systems are shaped, and, therefore, on how they get access to knowledge. Humans' capacities to gain knowledge independent of experience are rather limited. There seem to be at least three ways to do so: Stipulate meaning for an expression, reflect on meaning as a competent speaker, and the way an author can have access to knowledge about his fictional characters, which is, I assume, not stipulating meaning for an expression. It is rather knowledge by creation: The author can generate fictional characters by pure will, whatever this means in detail. At least, it seems to be true that he can know truths about fictional situations in virtue of having created them (or in virtue of creating them at the time the relevant thought is employed). Knowledge about that does not

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involve more experience than meaning stipulation or access to mathematical truths.[5] Other beings might have a priori access to truths of a different sort: Omniscient beings, Gods and so forth might know things on a priori grounds (on ideal rational reflection, etc.) we are incapable of having access to independent of empirical evidence. I will now try to argue that for some semantic features, which are cognitively relevant according to Chalmers' definition, primary intensions do not play any explanatory role at all. There are two ways to accommodate this result: either giving up the idea that primary intensions model Fregean senses, or modify the definition of a primary intension. If we modify the definition, the account becomes circular, or it presupposes the notion of a Fregean sense, rather than giving an interesting and independent model of Fregean sense.

As a minor point, note that if we assume that in fact, all these variants of justified access to truth independent of experience are relevant for determination of primary intensions, Gods and authors will associate primary intensions with certain expressions we are incapable of grasping. For God, it is a priori that water is H_2O. For Laurence Sterne, it was (could have been) a priori that Tristram Shandy was the only fictional character in his novel who wished "that either [his] father or [his] mother, or indeed both of them, since they were in duty both equally bound to it, had minded what they were about when they begot [him]." (Sterne, 1760/2003, p. 5)

Both examples describe conceptually possible cases of a priori knowledge as described by Chalmers. Sterne can know it by deciding it, God (if actual) knows it in virtue of his omniscience. Accordingly, they can accept their beliefs on *purely rational grounds*. So, we must conclude that for an omniscient being, 'water is H_2O' is not cognitively significant. Why? 'Water is H_2O' is not cognitively significant because 'water' and 'H_2O' play the same a priori roles for God: For any appropriately described scenario, God will have a priori access to the relevant identity relations at these scenarios. Since we do not have a priori access to these identity relations, the expression tokens we use have different primary intensions.[6] The same holds for Laurence Sterne: In our example, he grasps a thought fundamentally different from the thought we grasp when we read the abovementioned sentence — if thoughts are determined (at least partly) by primary intensions. I think

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[5] Access to mathematical truths might be slightly different and, thereby, generate a fourth way to have access to truths independent of experience. I will not comment on that here, since it poses special problems.

[6] This amounts to the fact that, for conceptual reasons, no omniscient being can speak the language we speak, or even think the thoughts we express with sentences of our language.

that this is an undesirable result. However, even if we are ready to accept this result, there is a more fundamental problem.[7]

For a notion to pick out something in a way such that it can explain cognitive role, it must meet at least the following requirement: For any cognitively relevant semantic aspect of an expression, for any subject, it must enable us, at least in principle, to explain why the expression has this cognitively relevant semantic aspect (plays the relevant cognitive role for that subject). To give an example, let us assume that the notion of a mode of presentation (as a set of properties under which something is presented) is unproblematic. This notion is designed to explain cognitive role: Cognitive role depends on the properties under which something is presented by a mode of presentation. The properties which form the mode of presentation determine every cognitively relevant semantic aspect of the expression which expresses this mode of presentation, and these properties seem to be explanatorily relevant. Similarly, primary intensions should give us the details of why a certain expression has the cognitively relevant features it has.

Let us turn back to Gods and authors. For an omniscient being, it is a priori that water is H_2O. Accordingly, 'water' and 'H_2O' have the same primary intension. This is supposed to explain why they play the same cognitive role for God. We have to tell a story similar to the mode-of-presentation-story. So, let us have a look at how primary intensions could explain cognitive role. In order to do so, consider an argument Chalmers developed in favor of his claim concerning the similarity between senses and primary intensions (I will comment on this argument later). He puts it as follows:

> Chalmers 3)
> The intension of an expression can be thought of as an *epistemic* intension: it captures (very roughly) the way the extension of the expression depends on which epistemic possibility turns out to be actual. For a sentence S and a scenario W, for example, a useful heuristic is to ask: *if* W is actual, is it the case that S? Or to stress the epistemic nature of this conditional: if W *turns out* to be actual, will it turn out that S? If yes, then the intension of S is true at W. [...] The intuitive characterization of epistemic intensions using the heuristics I have given here makes a strong prima facie case that expressions have epistemic intensions. (Chalmers 2002, p. 145)

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[7] If we are not willing to accept this result, we have to assume that it is not independence of experience alone which makes for the relevant sort of justification. The only alternative I see is to introduce the notion of meaning or sense: Epistemic necessity in the sense relevant here has to be spelled out in terms of analyticity rather than apriority. A similar conclusion will be drawn later from another observation, and its undesirable results will be pointed out.

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The useful heuristic mentioned here consists in the idea to consider relevant scenarios and evaluate, for example, whether or not certain identity-statements hold true at this scenario. To *evaluate* this, we have to reflect on descriptions. These descriptions give us the resources to evaluate the relevant conditionals, or to evaluate the relevant epistemological necessities, independent of whether or not we describe epistemological necessity in terms of apriority, or ideal rational reflection, or take it to be a primitive. These descriptions come with intensions (meanings, or conceptual contents). It is these intensions we base our a priori evaluations on: When we consider a world under a certain description as actual, and when we then try to find out whether or not a certain statement is true at this world, and when we do so on purely rational grounds, we will focus on the conceptual content in or expressed by these descriptions and the sentence we try to evaluate. The heuristic so described points to how we have to conceive of the relevant explanation relation between cognitive role and primary intension: We explain cognitive role via the condition on extension which is based on semantic relations between descriptions of scenarios and our target-expressions.

So, resources for explaining cognitive significance seem to be tied to the notion of a description: It just is justifiability on the basis of descriptions. In more detail, the explanatory power of primary intensions, if any, seems to stem from the semantic relation between the description used in the antecedent and the expression used in the consequence of the relevant conditional we have to evaluate on purely rational grounds. This is what primary intensions are designed for: They give us the explanatory resources because they are defined via a priori (rationality) relations between descriptions of scenarios and the expressions we are interested in. Modes of presentation explain cognitive role via properties; primary intensions (should) explain cognitive role via a priori or rationality relations which, in turn, are based on relations between descriptions and our target-expressions.

If this is correct, then primary intensions lack the resources to explain cognitive significance of some beliefs of Gods and authors. This is due to the fact that in these cases, the insight in truth does not depend on the relation between the description of a scenario in the antecedent and the relevant expressions in the consequence. That the relevant conditionals are a priori for God does not depend on descriptions, but rather on God's direct insight into truths. What this direct insight into truths has got to do with cognitive role is not clear, if, in general, an expression's cognitive role is based on an epistemic relation which is concerned with justification based on a relation between scenarios (under certain descriptions) and expressions. So, in the case of God, primary intensions do not play any explanatory role at all. Authors pose a similar problem: In this case, cognitive role depends on what can be labeled 'direct access to creationistic decisions'. The relation between scenarios (under certain descriptions) and the target-expressions evaluated

considering the relevant conditional is irrelevant. So, in these cases, primary intensions lack the resources to explain cognitive role. The best way to cope with this problem seems to consist in denying that for God, 'water is H_2O' is cognitively insignificant. It is not very interesting for him, but nevertheless, even for God, it differs from statements like 'a snake is a serpent'. In this sense, 'water' and 'H_2O' play different cognitive roles for him, unlike 'snake' and 'serpent'. This can be incorporated in the Chalmers-framework if we modify the notion of apriority. How could this be done? On at least one occasion, Chalmers gives a more exhaustive description of what he takes to be the relevant notion of apriority, or rational acceptability. According to this interpretation, a sentence is a priori for a speaker if access to its truth is based on ideal rational reflection on *concepts involved in this sentence* (Chalmers, 2002, p. 147). This seems to come close to what I described to be the relevant source of apriority or acceptability on purely rational grounds for justification, and, thereby, for explaining cognitive role. It is reflection on descriptions, which come with meanings, or senses, or conceptual content. One could try to describe the relevant notion of apriority, or epistemic necessity, or acceptability on purely rational grounds as follows: It is justifiability in virtue of the meaning of the expressions involved — a notion which comes close to a notion of analyticity. Even if for an omniscient being it is a priori that water is H_2O, it is not derivable from reflection on the relation between descriptions of scenarios and 'water is H_2O', or on the meaning (the Fregean sense) of the terms 'water' and 'H_2O'. If we modify the epistemic notions which govern primary intensions, we can tell a unified story about how cognitive roles depend on primary intensions. But then, another problem arises.

Chalmers suggests using the notion of a primary intension in order to model Fregean sense. This would be desirable, because the notion of Fregean sense is far from being clear — it seems to be a mere place-holder for whatever explains cognitive significance of semantic aspects of expressions, just like similar terms ('intension' in non-formal contexts, 'meaning' and so forth). But it turned out that the revised version of epistemic two-dimensionalism *depends* on these notions. So, far from enabling us to get rid of these unclear notions, they are rather presupposed by Chalmers' account. They enter the definition of epistemic necessity, which is used to explain the concept of a primary intension.

If we try to replace the notion of a Fregean sense and similar notions by the notion of a primary intension, at least in contexts in which we are concerned with cognitive significance, the account becomes circular. The notion of meaning or sense as used in the re-definition of apriority (justification on the basis of meaning alone) seems to be the notion of Fregean sense. Justification on the basis of meaning is justification based on what determines

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the cognitive role of an expression. Accordingly, it should be possible to re-place the notion of sense or meaning by the notion of a primary intension — if, as Chalmers claims, primary intensions reflect cognitive role in the same way Fregean senses are supposed to do. But then, the notion of a primary intension is defined by the notion of a primary intension.

This amounts to the fact that primary intensions do not explain cognitive role at all. Either, there are cases in which they clearly do not, or the notion of a primary intension is slightly changed, such that these cases are excluded. But then, the notion of a primary intension either depends on the notion of a Fregean sense, such that it cannot be used to replace it, or it becomes circular.

Now, how about Chalmers' positive arguments in favor of his account? In Chalmers 2) (see above), Chalmers moves from the observation that (i) when an expression plays a certain cognitive role, it will have a condition on exten-sion which enables a speaker to individuate the expression's extension, and the assumption that (ii) this condition on extension reflects the expression's cognitive role in "some deep respect", to the claim that this condition is to be understood epistemically. In Chalmers 3) Chalmers gives a more precise version of this argument. First, some clarification: Instead of 'intension', 'meaning', or 'sense' I will use the term 'condition on extension'. Instead of 'epistemic intension' I will talk about 'primary intensions'.

The argument goes as follows:

(i) When we try to individuate conditions on extension, we (can) use primary intensions: They enable us to check how extensions vary with different epistemic possibilities. (*Useful heuristic*)

(ii) Therefore, primary intensions "capture" conditions on extensions. (Follows from (i))

(iii) Therefore, conditions on extensions can be thought of as primary in-tensions. (Follows from (ii) plus the assumption that 'to capture' in this sense guarantees relevant similarity, such that if A captures B, then we can think of B in terms of A)

Under a certain interpretation, (i) and (ii) seem to be above suspicion. We can use primary intensions to get access to how extension depends on possibility, and in this very sense, primary intensions *capture* conditions on extension; but does this sense of 'to capture' guarantee that we can think of the relevant conditions on extension in terms of primary intensions? To be sure: Primary intensions *are* a certain kind of conditions on extension, but, as I tried to argue above, they are not conditions on extension of the appropriate kind. They do not explain cognitive role. However, even if we take the notion of a condition on extension to be such that conditions on extension explain

cognitive role, (i) and (ii) can be true. But then, (iii) is not implied by (i) and (ii).

Frege argued that 'A' and 'B' in an appropriate instances of the schema 'A = B' must have different senses, because the relevant instance is, even if true, cognitively significant (Frege, 1892, p. 50). We can vindicate this argument using Chalmers' heuristics: Consider a possibility and check how 'A' and 'B' (with senses kept stable) behave at this possibility. So, in a sense, primary intensions capture sense: They give access to conceptual differences, or conceptual identities, or other conceptual issues. This is true even if we conceive of sense (or conditions on extension) in a non-epistemological way. For example, modes of presentation as described above can be described as conditions on extension: The Fregean *Begriffsmerkmale*, a concept's features, (Frege, 1892b) are conditions on extensions in the sense that they are properties something has to have in virtue of belonging to the concept's extension. These features form modes of presentation. Modes of presentation, understood in this way, reflect cognitive role in the sense that they determine the expression's cognitive role. Individuating modes of presentations, or checking relations between different modes of presentation, we can use primary intensions. This is the case iff modes of presentation *determine* primary intensions, even though they do not have to be described using epistemological vocabulary. This being possible, it is not necessarily true that if primary intensions *capture* conditions on extension, conditions on extension *can be thought of as* primary intensions. So, we were able to construct a possible condition on extension in non-epistemic vocabulary and let this condition on extension determine primary intensions, such that primary intensions mimic differences/identities/other relations in the realm of conditions on extension. Therefore, in a relevant sense, primary intensions *capture* conditions on extension, even though it is not the case that therefore, conditions on extension should be thought of as primary intensions. Chalmers argument is not valid.

Conclusion

Since primary intensions do not explain cognitive role, and in virtue of the fact that they seem to presuppose the notion of a Fregean sense (or a similar notion), while, at the same time, they model a procedure we can use to identify an expression's extension at a given possibility, we should conclude that primary intensions *describe* cognitive roles, rather than explain them: An expression's primary intension is an exhaustive model of that expression's (semantic) cognitive role. This is in accordance with Chalmers' line of argumentation: Checking the cognitive role is a way *we arrive at* relations in the realm of conditions on extension. But primary intensions do not

ground cognitive role. They reflect cognitive role in the sense that they describe cognitive role, whereas sense reflects cognitive role in the sense that it *determines* and *explains* cognitive role, and, thereby, primary intensions.

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