

THAT MAY BE JUPITER: A HEURISTIC FOR THINKING TWO-DIMENSIONALLY

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According to epistemic two-dimensionalism, every expression is associated with two kinds of meaning: a primary intension (a “Fregean” component) and a secondary intension (a “Russellian” component). While the first kind of meaning lines up with the speaker’s abilities to pick out referents of correctly employed expressions in hypothetical scenarios, the second kind of meaning is a version of what standard semanticists call “semantic content”—a kind of content which does not pivot on speaker abilities.

Despite its conciliatory temperament, epistemic two-dimensionalism has come under recent attack. It has been alleged that it is bound to attribute to speakers a priori identifying knowledge of the referents of correctly employed terms, and bound also to reject valid rules of inference such as exportation: $P(a) \rightarrow \lambda x[P(x)](a)$ (see, e.g., Soames 2005, Byrne and Pryor 2006). This paper challenges these allegations. It begins by developing David Chalmers’s (2002) rejoinder to the criticism that two-dimensionalism accedes to certain theses of descriptivism. Building on central claims of Chalmers (1996, 2002, 2006) and Chalmers and Jackson (2001), it then develops a heuristic for understanding two-dimensionalism non-descriptively. This heuristic employs a version of David Lewis’s

counterpart theory in place of the standard theory of canonical descriptions.

I. COGNITIVE INFORMATIVENESS AND THE A PRIORI GRASP OF CONCEPTS

A central aim of the work of David Chalmers (2002, 2006, forthcoming, manuscript a) is to offer an account of the Fregean notion of cognitive informativeness.¹ “Hesperus (if it exists) is Phosphorus” may be said to be cognitively informative, “Hesperus (if it exists) is Hesperus” may not. If terms contribute descriptive senses to truth-conditions, as Frege thought, this is predictable. “Hesperus” and “Phosphorus” are presumably associated with different descriptive senses; as a result, we can grasp the sense of “Hesperus” without automatically grasping the sense of “Phosphorus.” But, as Kripke (1980) convincingly argued, the Fregean position runs into severe difficulties which are straightforwardly avoided on the neo-Russellian assumption that “Hesperus” and “Phosphorus” make the same contribution to truth-conditions, viz., their referent Venus.

Chalmers’s account of cognitive informativeness circumvents the dispute between Fregeans and (neo-)Russellians by refurbishing the idea that intensions can play the role of meanings (or contents). Expressions are associated with two different intensions: a

function from metaphysically possible worlds to extensions (the secondary intension), and a function from scenarios to extensions (the primary intension). Scenarios are worlds compatible with what the speaker is *in a position* to know on a priori grounds but marked with a center (an individual and a time).²

The notion of apriority is idealized: we are asked to imagine that speakers are freed from cognitive limitations imposed by time constraints and logo-mathematical error or ignorance. Chalmers (2002: 147) admits that the idealization makes his account unsuitable as an account of the cognitive informativeness of mathematical and logical truths but suggests that if such an account is desired, the idealization can be relaxed. With the idealization in place, however, all epistemically possible worlds turn out to be metaphysically possible. This is what Chalmers calls “Metaphysical Plenitude.”³

Metaphysical Plenitude incurs the following commitment: metaphysically possible worlds supply the material that is to serve as our expressions’ secondary extensions *and* primary extensions. For example, while “Hesperus (if it exists) is Phosphorus” is true at any metaphysically possible world when we focus on the secondary extensions of “Hesperus” and “Phosphorus,” it may be false at some (centered) metaphysically possible worlds when we focus on their primary extensions. This is because at worlds at which Venus is the secondary extension of both “Hesperus” and “Phosphorus,” their primary extensions may be, for instance, Mars and Jupiter (this is so if Mars happens to be the brightest object in the evening sky, Jupiter happens to be the brightest object in the morning sky, and the speaker is disposed to take “Hesperus” to pick out the brightest object in the evening sky but is disposed to take “Phosphorus” to pick out the brightest object in the morning sky).

On Chalmers’s account, a sentence token is a priori iff its primary intension is metaphysically necessary.⁴ If, for example, a speaker

is disposed to take “Hesperus” to pick out the brightest object in the evening sky but is disposed to take “Phosphorus” to pick out the brightest object in the morning sky in hypothetical scenarios, then “Hesperus (if it exists) is Phosphorus” is cognitively informative or a posteriori for that speaker (the term “*hypothetical scenario*” is borrowed from Chalmers’s earlier work. See, e.g., Chalmers and Jackson 2001).⁵ For, in some hypothetical scenarios Venus is the brightest object in the evening sky but Jupiter is the brightest object in the morning sky. So, the primary intension of “Hesperus (if it exists) is Phosphorus” is contingent, in spite of the fact that “Hesperus” and “Phosphorus” refer to Venus in all worlds at which it exists.

The example just cited suggests that the difference between the primary and secondary intension of a term is that the primary intension is a function that results from treating the term as a non-rigidified description, whereas the secondary intension is a function that results from treating the term as a rigidified description or constant. But Chalmers explicitly denies that there is always a description whose intension approximates that of the term. As he puts it, “the epistemic intension is a function, not a description. It is revealed in a subject’s rational evaluation of specific epistemic possibilities, not in any sort of explicit definition” (Chalmers 2002: 148). So, while there may happen to be a description whose intension approximates that of the term, as in the case of “Hesperus,” the two-dimensional framework does not require that there be one.

But if not a description, then what secures the primary referents of terms at scenarios?⁶ The key to an answer is found in the passage just cited and is spelled out in Chalmers and Jackson 2001. Chalmers and Jackson hypothesize that speakers who use a given expression correctly have an ability to identify its primary referent in complete canonical descriptions of hypothetical scenarios.⁷

A sentence has the primary extension *true* at a scenario iff it can be inferred on a priori grounds from a complete canonical description of the scenario.

Chalmers and Jackson's hypothesis regarding the reference-fixing abilities of speakers gains support from data concerning the concept of knowledge (see Chalmers and Jackson 2001, pp. 321–323; Garcia-Carpintero 2006). As the plentiful Gettier literature demonstrates, no counterexample-free analysis of the concept of knowledge is imminent. Even so, when confronted with a (less than maximally specific) description of a given scenario, competent speakers have no difficulty judging whether or not the concept applies (Chalmers and Jackson 2001, pp. 321–322). As Chalmers and Jackson put it:

Gettier's argument . . . proceeds by presenting the possibility that *G* [a Gettier scenario] holds, and appealing to the reader's concept of knowledge to make the case that if *G* holds, *K* [a particular judgment concerning whether or not the subject knows] holds. . . . Empirical information plays no essential role in justifying belief in this conditional. (Chalmers and Jackson 2001, p. 321)

Of course, speakers may be incompetent or have insufficient information, but in core cases competent speakers are able to apply the concept of knowledge in hypothetical cases without needing further empirical information.

It should be noted that Chalmers and Jackson do not assume that the acquisition of the concept of knowledge takes place in empirical vacuity. The acquisition of the concept presumably requires repeated encounters with applications to core cases. Acquiring the ability to make judgments vis-à-vis the concept's application is not an a priori affair. But once the concept has been acquired, competent speakers are in a position to put it to further use in actual or hypothetical cases. And it is this further use which requires no additional empirical information.⁸

While descriptions of scenarios (in Chalmers's technical sense) are maximally specific and Gettier cases are not, the case of knowledge lends support to the thesis that competent speakers have a like ability to apply, or identify the extension of, other expressions in their grip (Chalmers and Jackson 2001, pp. 323–325). As Chalmers and Jackson put it:

[P]ossession of a concept such as "knowledge" or "water" bestows a *conditional ability* to identify the concept's extension under a hypothetical epistemic possibility, given sufficient information about that epistemic possibility and sufficient reasoning. (Chalmers and Jackson 2001, p. 324)

It may take quite a bit of effort to get a good grasp of the concept of water but once one has a good command, one is in a position to apply it, given sufficient information about the world (or hypothetical scenario). Even technical terms such as "H₂O" or "high mean molecular energy" can be attained, and if one resorts to deferential use, they can be acquired without paying extra for courses in basic chemistry. A deferential use of an expression, of course, does not give one as solid a grip as a non-deferential use, for, in order to pick out the extension of the expression in a scenario, one will need expert assistance (embedded in the relevant scenario) (Chalmers 2006a, p. 109). But such expressions can be grasped some way or other.

II. DESCRIPTIONS: SPARSE OR INACCURATE

But all is not well. As Byrne and Pryor (2006, p. 46) point out, even if two-dimensionality does not require that there be a description whose intension is equivalent to that of the original term, one might worry that Kripke's epistemic argument against the description theory resurfaces here, albeit in a modified form.

This much became evident with Kripke: one may be competent with a name, even if

the information one associates with the name does not suffice to pick out a unique individual. As Kripke puts it, “most people, when they think of Cicero, just think of *a famous Roman orator*, without pretension to think that either there was only one famous Roman orator, or that one must know something else about Cicero to have a referent for the name” (Kripke 1980, p. 81). Likewise, one may be competent with a name but associate with the name a description that denotes a unique individual but, alas, the wrong individual. For example, one may use “Gödel” to refer to Gödel while thinking Gödel is the discoverer of the incompleteness of arithmetic, when the fact is that “the discoverer of the incompleteness of arithmetic” picks out Schmidt from whom Gödel stole the proof.

These are objections to the description theory. But, as Byrne and Pryor’s text makes evident, Kripke’s objections may seem to cause trouble, not only for the description theory, but also for two-dimensionalism. Here is one way to understand Byrne and Pryor’s concerns. If the information a speaker *implicitly or explicitly* associates with a name does not suffice to pick out an individual in the actual world, it does not suffice to pick out an individual in a hypothetical scenario either. And no other description is likely to suffice either, as even meta-linguistic descriptions may fall short in actual or hypothetical cases.⁹ Likewise, if a speaker possesses information that picks out the wrong individual in the actual world, then that information cannot ground the speaker’s alleged reference-fixing ability. So, if Chalmers and Jackson are right, then we are left to conclude that the speaker does not have competence with the name. But one lesson of Kripke’s teachings is that she may well have competence.

As Byrne and Pryor acknowledge, Chalmers and Jackson are unimpressed by these concerns. Chalmers, for example, thinks Kripke’s Gödel/Schmidt case is an affirming instance of the hypothesis that speakers

who understand a given expression have an ability to identify its primary referent in complete canonical descriptions of scenarios. When presented with Kripke’s hypothetical scenario, we are able to judge on a priori grounds that Gödel is not the discoverer of the incompleteness of arithmetic in the scenario. This, he says, indicates that we have a prior reference-fixing ability:

[W]e find that the epistemic intension of “Gödel” does not pick out the prover in this world, it picks out the publisher. If so, the epistemic intensions of “Gödel” and of “the man who discovered the incompleteness of arithmetic” are distinct. (Chalmers 2002, p. 169)

As far as Byrne and Pryor are concerned, Kripke’s Gödel/Schmidt case shows no such thing. For, as Kripke’s descriptions of the cases make explicit use of the names “Gödel” and “Schmidt,” they are not canonical (“A man named ‘Schmidt’ . . . actually did the work in question. His friend Gödel somehow got hold of the manuscript”) (Kripke 1980, p. 84; Byrne and Pryor 2006, p. 50). Kripke could have used a description instead of “Gödel,” for instance, “the member of the Institute for Advanced Study who starved himself to death.” But, they say, “if he had done so, . . . he would have been exploiting shared a posteriori identifying knowledge about Gödel, rather than identifying knowledge that we all have just in virtue of understanding *Gödel*” (Byrne and Pryor 2006, p. 50).

Byrne and Pryor’s point is that insofar as our knowledge that Gödel is the member of the Institute for Advanced Study who starved himself to death was acquired on a posteriori grounds after acquiring the term, this information cannot be taken to assist us in picking out the referent of the term. For our ability to pick out the referent of a term in a hypothetical scenario, they say, is supposed to be an ability we have “just in virtue of understanding” the term.

III. REFERENCE-FIXING ABILITIES

The main point contested by Byrne and Pryor (2006) is that speakers have a reference-fixing ability “just in virtue of understanding” the term. They think that in many cases, the speaker simply has no reference-fixing ability. In other cases, they do have a reference-fixing ability, but they have it on the basis of knowledge acquired after acquiring the term. Chalmers has replied to Byrne and Pryor that

an expression’s epistemic intension need not correspond directly to any descriptive belief of the speaker: for example, it is not required that one who uses a term *N* has a priori “identifying knowledge” to the effect the referent of *N* is ϕ , for some property ϕ . All that is required is that certain conditionals be epistemically necessary. (Chalmers 2006a, pp. 91–92, footnote 13)

Chalmers’s reply does not directly address Byrne and Pryor’s concern that speakers do not always have a reference-fixing *ability* “just in virtue of understanding” the term. Here is why. For the conditionals cited by Chalmers to be epistemically necessary (i.e., a priori) for the speaker in question, the speaker must be in a position to infer the conditionals’ consequents on the basis of their antecedents. But where the antecedents are (sufficiently specific) canonical descriptions of hypothetical scenarios, a speaker’s reference- or extension-fixing ability just is an ability to make a priori judgments concerning the truth-value of sentences such as “Hesperus is Phosphorus,” “water quenches thirst” and “Gödel is the discoverer of the incompleteness of arithmetic” on the assumption that the canonical description is true. So, it is not an option for Chalmers to deny that speakers have reference- or extension-fixing abilities. They must as a minimum have an ability (in ideal circumstances) to fix the extension of sentences with respect to canonical descriptions of hypothetical scenarios.

There is, however, a simple way of addressing Byrne and Pryor’s concern using Chalmers’s own resources. The two-dimensionalist may simply insist that Byrne and Pryor’s worries rest on an unduly narrow notion of understanding. Concentrating on names for the time being, it is generally accepted that there are two ways to fix reference: by ostension, i.e., by pointing to an object and declaring that it is to be named *N*. Or by description. London detectives introduced the name “Jack the Ripper” descriptively to refer to the person responsible for the murders of prostitutes from the Whitechapel district, Leverrier (as we may imagine) introduced the name “Neptune” descriptively to refer to whatever planet perturbs the orbit of Uranus,¹⁰ and “ π ” was introduced descriptively to refer to the ratio of the circumference to the diameter of a circle.¹¹ Of course, as ordinary baptismal events make clear, there may also be mixed cases.

But there is no equally neat categorization of name acquisition events. Leverrier acquired the name “Neptune” by introducing it descriptively. A parent, too, may acquire a name by introducing it descriptively to refer to the child he or she is expecting. A student may acquire the name “Saul Kripke” by spotting an announcement of one of Kripke’s upcoming lectures, or by reading *Naming and Necessity*. A child may see a dog and acquire the name “Checkers” simply by calling him by that name.¹²

To acquire a name is to acquire an ability to apply the name on future occasions or in hypothetical scenarios (e.g., by being able to assign truth-values to identity statements, given canonical descriptions of scenarios). But a speaker’s ability to apply a name is likely to develop and change with new encounters with applications of the name, or with new pieces of information acquired about the referent of the name on a posteriori grounds.

Peter Smith’s parents, who decided seven months before Peter was born that “Peter

Smith” was to be the name of their future child, did not give a lasting reference-fixing priority to the description “the child scheduled to arrive in January 1976.”¹³ Their use of “Peter Smith” changed upon Peter’s arrival, even though the change was a change only in applications of the name in *hypothetical* scenarios. When (as we may imagine) Peter’s parents were presented with complete canonical descriptions of hypothetical scenarios before and after Peter’s arrival, they were disposed to pick out different individuals as the hypothetical referents of “Peter Smith” (compare Chalmers and Jackson 2001, pp. 322, 324; Chalmers 2006a, p. 97). On the first occasion, they were disposed to look for expecting parents to serve as their stand-ins,¹⁴ on the second occasion they were more inclined to look for someone who looked like Peter, their five-year old son.

These considerations underpin the thesis that one *can* have a reference-fixing ability at a given time “just in virtue of understanding” the name. One can acquire an *ability* to apply a name in actual or hypothetical scenarios by stipulating that the name is to apply to an actually demonstrated object or the actual denotation of a description. Or one can acquire an ability to apply a name in actual or hypothetical scenarios by being told that the name applies to an actually demonstrated object or actual denotation of a description. With repeated encounters with applications of the name or the acquisition of information about the name’s actual referent on a priori or posteriori grounds, this ability may change.¹⁵ Nonetheless, at any given point in time, a speaker may be able to apply the name in actual or hypothetical scenarios without the aid of further empirical information. It needn’t be the case that any single piece of information acquired on a posteriori grounds has reference-fixing priority. It may simply be that the name’s hypothetical referent is the one *judged* to be close enough to the actual referent in respect of the total information in

the speaker’s possession at the time of application. No doubt some properties are given reference-fixing priority in some cases (e.g., in the Leverrier case) but they need not be.

A couple of loose ends. First, Kripke’s examples of the names “Cicero” and “Feynman” suggest that a speaker’s information about the actual referent of a name may be scanty. When asked about Cicero, she may say “he was a famous Roman orator” and when asked about “Feynman” she may say “he’s a physicist or something.” Nonetheless, she may use “Cicero” to refer to Cicero and “Feynman” to refer to Feynman (Kripke 1980, p. 81). In such cases, if the speaker has an ability to pick out a referent in actual or hypothetical scenarios, the ability will be grounded in a deferential use of the term (Chalmers 2006a, p. 109). So, if the speaker were ideally rational and were given the task of picking out the referent of “Feynman” in a hypothetical scenario, she would look for stand-ins for herself and those from whom she actually acquired the term.

Second, it is plausible that most speakers have acquired some mistaken information about the referents of names they possess. I may hear an anecdote about Kripke from a reliable witness that turns out to be false. In spite of that I may have no trouble identifying the primary referent of “Kripke” in actual or hypothetical scenarios. But that then shows that my use of the name “Kripke” does not give reference-fixing priority to anecdotal information.

Likewise, suppose Kripke’s story about Gödel and Schmidt turns out to be true. There are then two possibilities. Either I lack the ability to use “Gödel” to refer to the actual referent of the name, or I do not. If I do, then I am not competent with the name. If I do not, then evidently my use of “Gödel” does not give reference-fixing priority to the property of being the discoverer of the incompleteness of arithmetic. I probably use the name deferentially. So, Kripke’s story about Gödel and

Schmidt does not pose a particularly difficult problem for two-dimensionalism.

IV. DE RE A PRIORI ASCRIPTIONS

Everything just said is in agreement with the central theses of Chalmers (2002, 2006) and Chalmers and Jackson (2001) concerning actual and hypothetical (primary) reference. It will now be argued that there are residual issues in Chalmers and Jackson’s work which appear to be analogous to certain problems facing descriptivism but which a heuristic permutation on epistemic two-dimensionalism may help to resolve.¹⁶

Chalmers notes in recent work that his two-dimensional approach cannot make sense of de re a priori ascriptions. As he puts it, “there is no clear analog of a *de re* modal intuition in the epistemic case: “Hesperus is the evening star” may be a priori, but it is not clear what it means to say that Hesperus (i.e., Venus) is such that it is a priori that it is the evening star” (Chalmers 2006a, pp. 101–102). Chalmers has later partially retracted this claim (in personal communication). The reason it may seem difficult to make sense of de re a priori ascriptions within a two-dimensional framework is that one can hardly have an ability to make a judgment in hypothetical scenarios concerning “*x* is the evening star.”

However, the framework’s alleged inability to handle de re a priori statements is no trivial matter. For de re statements are derivable from their de dicto counterparts via the rule of property abstraction (the inference from left to right is also sometimes called “exportation”):

Property Abstraction (PA): $\Box [P(a) \equiv \lambda x[P(x)](a)]$

Necessarily, P(a) iff a has the property of being a thing x such that P(x)

(PA) reflects genuine syntactic movement of the familiar sort undergone by quantified noun phrases. “Some girl,” as it occurs in

“every boy loves some girl,” moves either to a subject position for the sentence as a whole or to a subject position in the predicate, in each case leaving behind a trace that is bound by it (May 1977). The logical forms for “every boy loves some girl” can be given by: “Every boy is such that he loves some girl” and “some girl is such that every boy loves her.” Names undergo the same sort of syntactic movement when subjected to property abstraction (May 1977, see also Montague 1973 for a reasonable explanation). “John” as it occurs in “some girl loves John” moves to the subject position for the sentence as a whole (“John is such that some girl loves him”) or to the subject position in the predicate (“some girl is such that she loves John”).

As (PA) reflects genuine syntactic movement, it is not an option to deny that (PA) is valid. But if (PA) is valid, and $\lambda x[P(x)](a)$ follows from $P(a)$ via (PA), then $\lambda x[P(x)](a)$ is semantically significant just when $P(a)$ is. There is nothing surprising here, for “ $\lambda x[P(x)](a)$ ” is true iff a is in the extension of the predicate “ $P(x)$,” which it is iff $P(a)$. As an instance, we have: “ $\lambda x[\text{it is a priori that } x \text{ is the evening star}](\text{Hesperus})$ ” is true iff Hesperus is in the extension of the predicate “it is a priori that x is the evening star,” which is true iff “Hesperus is the evening star” is a priori.

It will be noted that the issues pertaining to de re a priori ascriptions are closely tied to the issues pertaining to descriptivism. On a descriptivist framework, (PA) must be rejected, because names refer to different entities depending on where they occur. Names refer to their ordinary referents in extensional contexts but to their customary senses in intensional contexts. The descriptivist, therefore, cannot account for the validity of inferences such as that from “Lois Lane believes that Superman can fly” to “Superman is such that Lois Lane believes that *he* can fly.” The violation of exportation incurred by Fregean semantics has been exposed as

a reason against solving belief puzzles by allowing reference shifts (Pautz forthcoming). The alleged violation of (PA) in de re a priori contexts is analogous to the Fregean violation of exportation in belief contexts (or other intensional contexts). Hence, if two-dimensionalism cannot make sense of de re a priori ascriptions, it would seem to inherit at least some of the weaknesses of descriptivism. As we will now see, however, with the aid of a heuristic permutation on two-dimensionalism which employs a version of David Lewis's counterpart theory—a theory specifically developed to account for de re modality—the semantic significance of de re a priori ascriptions is easily explained and the non-descriptivist repute of two-dimensionalism sustained.

V. COUNTERPARTS

We shall assume that names and kind-terms are constants, as suggested by Kaplan (1973), Kripke (1980), and others. Constants have their referents as their semantic values. How names and kind-terms manage to refer need not concern us. For expository simplicity, we shall simply assume that some externalist account of reference is correct. But we add, as a requirement, that if a speaker's use of a term refers, then the speaker would be able to identify its actual referent, if she were not burdened by her actual cognitive limitations (see Chalmers and Jackson 2001). So, we idealize away lack of access to one's own use of the terms in one's possession. If, for example, the speaker uses a term deferentially, she will then have an ability to look to others' use of the term and identify the referent in that way. Moreover, we shall assume that a speaker's use of the term on a given occasion determines which properties have reference-fixing priority. *a*'s deferential use of *N*, for example, may give reference-fixing priority to the property of being the person called *N* by those from whom *a* acquired that name.

We treat *counterfactual* secondary reference the way it has been customary to treat it since 1980. *N* refers to someone with the same origin as the actual referent of the term in every world in which there is such an individual.¹⁷ But we model hypothetical primary reference on the counterpart relation, as uncovered by David Lewis (1968).¹⁸ In Lewis's counterpart-theoretical framework, "counterpart" is characterized in terms of "close resemblance".¹⁹

The counterpart relation is our substitute for identity between things in different worlds. Where some would say that you are in several worlds, in which you have somewhat different properties and somewhat different things happen to you, I prefer to say that you are in the actual world and no other, but you have counterparts in several other worlds. Your counterparts resemble you closely in content and context in important respects. They resemble you more closely than do the other things in their worlds. But they are not really you. (Lewis 1968, p. 28)

If *a* is a part of a world w_1 , and *b* and *c* are parts of a world w_2 , then *b* is a counterpart of *a* only if *b* resembles *a* more than *c* does in certain respects fixed by context. The counterpart relation thus differs from the relation of identity in a number of respects. First, it is non-transitive and non-symmetric. Second, different contexts will determine different counterpart relations. Third, an object need not stand in a counterpart relation to exactly one object in a world (Lewis 1968: 28, cf. Fara and Williamson 2005: 24). For example, indiscernibles at a world will all be counterparts if one is.

We make the following amendments to Lewis's original theory. First, we take the relevant counterpart relations to give weight to all and only properties to which the particular use of the term gives reference-fixing priority. Further, the resemblance relation will be grounded in the speaker's reference-fixing ability. So *x* resembles the actual referent of a

given term t most in its world iff if the speaker had full access to her actual use of t , then x would be the object she would select as the primary referent of t . Thus, we do not require that a given counterpart x satisfy all the properties that are given reference-fixing priority but only that x be close enough in the relevant respects to an individual that does bear those properties (viz., the actual referent).

Second, Lewis's postulate P2 says that nothing is in two worlds: $\forall x \forall y \forall z (Ixy \ \& \ Ixz \ . \ \supset \ y = z)$ (1968: 27). This is not a postulate of the proposed framework. But to secure a unique actual world, we substitute for P2 the postulate that nothing that is a world is in two worlds: $\forall x \forall y \forall z (Wx \ \& \ Ixy \ \& \ Ixz \ . \ \supset \ y = z)$. Furthermore, we add the postulate that nothing has more than one counterpart in a world: $\forall x \forall y \forall z \forall v (Cyx \ \& \ Czv \ \& \ Iyv \ \& \ Izv \ . \ \supset \ y = z)$.²⁰ This follows naturally on the assumption that no rational speaker would pick out two individuals as the referent of a name in the same scenario. If two objects in w resemble the actual referent of t equally in the relevant respects and resemble it more closely than anything else in w , then t does not have a primary referent at w . We then get the following welcome implication: "N (if N exists) is not in two distinct exact locations at the same time" and "N (if N exists) does not share all its parts with a distinct object" are a priori for any speaker and any substitution instance that results from substituting a name for "N."

Given this framework, we can accept a version of Kaplan's (1973) non-modal semantics. Sentences express structured Russellian propositions relative to contexts, and indexicals and demonstratives with their associated demonstrations have their actual referents as their semantic values. An object- or substance-involving structured proposition is metaphysically necessary iff it is true at all possible worlds relative to the relation of identity (of origin or individual essence),²¹ and an object- or substance-involving struc-

tured proposition is a priori iff it is true at all possible worlds relative to the contextually determined counterpart-relations. Non-object- and non-substance involving structured propositions will correspond to the same primary and secondary intensions.

Notice that within the current framework (as in Chalmers and Jackson's), "Hesperus (if it exists) is Phosphorus" and "water (if it exists) is H₂O" may well turn out to be a priori. If I use two names, a and b , interchangeably in the actual world (i. e., with the same primary intension), then " $a = b$ (if they exist)" is a priori.

Since the counterpart-theoretical framework takes the notion of a reference-fixing ability as basic and Metaphysical Plenitude for granted, the counterpart-theoretical framework and Chalmers's original framework will yield the same 2D evaluations in the core cases. But, besides being overtly non-descriptivist, a counterpart-theoretical explication of two-dimensionalism helps to make sense of de re a priori ascriptions. If Leverrier were to say: "It is a priori that Neptune is the planet that perturbs the orbit of Uranus," he would be saying something true iff his use of "Neptune" gives reference-fixing priority to the property of being the planet that perturbs the orbit of Uranus. But as property abstraction is valid, and Leverrier's use of "Neptune" (ex hypothesi) gives reference-fixing priority to that property, it follows that Neptune is such that it is a priori for Leverrier that *it* is the planet that perturbs the orbit of Uranus. The actual referents of Leverrier's uses of "Neptune" and "it" will thus have the same counterparts in the envisaged context.

A further virtue of the proposed heuristic is that it makes natural predictions about what is or isn't a priori. For Chalmers, scenarios are worlds with or without centers (some scenarios do not have centers, because "I exist" is not a priori). Centered worlds are required to account for indexicals. "I" maps the speaker to the individual in the center, and

“now” maps the speech time to the time in the center. For Chalmers, the center also plays other roles. Chalmers suggests that properties such as *being the brightest object in the evening sky* may be treated as relating to the individual in the center.²² But suppose, now, that the ancient Greek woman Athena’s use of “Hesperus” gives reference-fixing *authority* (not just priority) to *being the brightest object in the evening sky*, which is to say, as she is using the name “Hesperus,” its primary referent (if it has one) cannot fail to be the brightest object in the evening sky. The following will then also be a priori for Athena: “Hesperus and I both exist iff Hesperus is the brightest object in evening sky”; “if Hesperus and I both exist, then I am observing Hesperus”; and “if Hesperus and I both exist, then I am not blind.” Explanation: at centerless worlds, the left-hand side is false, but so is the right-hand side (by supposition, Hesperus, if it exists, is the brightest object in the evening sky relative to the individual in the center). At centered worlds, the left-hand side is true if some object is the brightest in the evening sky relative to the individual in the center. But if it is, then the right-hand side is true too.

Furthermore, as Chalmers points out, to accommodate demonstratives within his framework, “one may need further information in the center of the world: marked experiences, as well as a marked subject and time” (Chalmers 2006a, p. 82). If we suppose a child succeeds in dubbing a dog “Checkers,” the primary intension of an utterance of “that is Checkers” is a set of scenarios marked with the boy’s experiences as of looking at the dog. Given this treatment of demonstratives, the following will, counterintuitively, be a priori for any speaker: “if that [pointing to any object] exists, then so do I,” “if that [pointing to any object] exists, then I am not a zombie,” “if that [pointing to any object] exists, then I am not asleep.” Explanation: if there are centered experiences, then they must be experiences of the individual in the center.

The referent of “that” is the object that causes those experiences. So, if the object which causes the experiences exists, then there is an individual in the center that has them.

In conversation, Chalmers has mentioned that there are various ways for the two-dimensionalist to avoid these conclusions. We will get the right results, he says, as long as we understand primary intensions in the right way. For example, we might take primary intensions to have extensions at uncentered worlds or at centered worlds at which the subject at the center lacks visual experience. What counts as the right primary intension depends on the speaker. The counterpart-theoretical framework just outlined offers a heuristic for explicating Chalmers’s last point. The primary referents of “I” and “that” at hypothetical scenarios will be counterparts of the actual referent under some counterpart relation. It is evidently possible for that dog in front of me to have a counterpart at a world at which my counterpart is a zombie or asleep. Likewise, it is possible for that dog to have a counterpart at a world at which I do not exist.

Properties such as *being the brightest object in the evening sky* we can simply treat as dispositional, and “the evening sky” we can treat as involving restricted quantification (perhaps its denotation is the part of the evening sky visible from London). Being the brightest object at some scenario requires only that one would be perceived that way by a normal observer under normal circumstances, where what counts as normal is determined by the speaker’s linguistic community. If being the brightest object in the evening sky is treated as dispositional, then it is clearly possible for an object to be the brightest in the evening sky at a world at which I am blind, a zombie, or do not exist.

VI. CONCLUDING REMARKS: EPISTEMIC POSSIBILITY

It has been argued that a heuristic based on counterpart theory will help expose two-dimensionalism as non-descriptivist. If we begin with something like Kaplan's (1973) semantics, a heuristic for the two-dimensionalism can be built by stipulating that structured propositions correspond to two different kinds of intension: primary and secondary. Structured propositions correspond to primary intensions relative to counterpart relations and secondary intensions relative to the relation of identity. A structured proposition is metaphysically necessary iff the secondary intension to which it corresponds is necessary, and it is a priori iff the primary intension to which it corresponds is necessary.

Before closing, it is worth briefly mentioning a rarely noticed asset of the sort of two-dimensional framework outlined here and in Chalmers (1996, 2002, 2006) and Chalmers and Jackson (2001).²³ Suppose I point to Venus and say "*That* may be Jupiter." Standard accounts of epistemic possibility will treat my utterance as equivalent to "for all I know, *that* is Jupiter." But "for all I know" can operate on Russellian propositions only if we allow non-classical models, for instance, models with worlds where Venus exists, and Jupiter (\neq Venus) exists, and Venus is identical to Jupiter. As such models are non-classical, model theory for epistemic possibility must be non-classical, even for empirical statements.

While this may not present a problem for standard accounts of epistemic possibility,²⁴ it is worth noting that two-dimensionalism offers a straightforward account of epistemic possibility for empirical statements, requiring only classical models. "It might be that," "it may be that" and "for all I know" operate on primary intension. "That [pointing to Venus] may be Jupiter" is true iff there is a metaphysically possible world compatible with what the speaker knows a priori or a posteriori in which the primary referent of the demonstrative plus demonstration is not identical to the primary referent of "Jupiter." As my use of "that" and "Jupiter" have distinct primary intensions, there is such a world. So, what I said is true.

"That may be Jupiter," "that might be Jupiter," and "for all I know on whichever grounds, that is Jupiter" are true relative to a context *c* iff the primary intension of "That is Jupiter" is true at some world compatible with what is known a priori or a posteriori relative to *c*. A proposition, then, is epistemically possible iff its primary intension is true at some world compatible with what is known by the subject a priori or a posteriori. Setting aside the logo-mathematical realm, good old-fashioned epistemic possibility just is a form of metaphysical possibility, as envisaged by two-dimensionalists.²⁵

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NOTES

1. The term "cognitive informativeness" will be used here instead of the perhaps more common phrase "cognitive significance," for, as Neil Tennant points out (in personal communication), "the earlier theorists of cognitive significance (in the period of late Logical Empiricism, and in decades since) would have been happy to regard all analytic truths as cognitively significant. Hence, 'Hesperus (if it exists) is Hesperus' would be cognitively significant."

2. Chalmers (2006a, p. 99) argues that the centers are required to deal with indexicals. We will return to this supposition below. For simplicity's sake, we will treat scenarios (hypothetical or actual) as worlds and focus on centers only when relevant.

3. Metaphysical Plenitude says: For all S, if S is epistemically possible, there is a centered metaphysically possible world that verifies S (Chalmers 2006a, p. 82). For criticism of this thesis, see, e.g., Yablo 1999 and Yablo 2002, and for replies, see Chalmers 1999 and Chalmers 2004. Metaphysical Plenitude will not be defended here.
4. Strictly speaking, an enriched proposition (i.e., a Russellian proposition and a structured primary intension) is a priori at a world w iff the primary intension determined by that proposition is necessary at w , and the proposition is entertainable at w (Chalmers manuscript c, note 18). An enriched intension is live at a scenario v iff the Russellian component has the same extension as the primary component at v . An enriched proposition is entertainable at a world w iff each of its components is live at a scenario corresponding to w . As the entertainability clause plays a role only when a sentence is embedded in mixed modal environments, we shall ignore this complication here.
5. Chalmers and Jackson write: “[W]hen given sufficient information about a *hypothetical scenario*, subjects are frequently in a position to identify the extension of a given concept, on reflection, under the hypothesis that the scenario in question obtains. Analysis of a concept proceeds at least in part through consideration of a concept’s extension within *hypothetical scenarios*” (Chalmers and Jackson 2001, p. 322, italics added); and also “This ability to identify a concept’s extension is not restricted to true empirical information about the actual world. If the world had turned out differently, we could still have identified the concept’s extension. Correspondingly, we can evaluate the concept’s extension given *hypothetical* information about ways the actual world might be” (Chalmers and Jackson 2001, p. 324).
6. Stalnaker (2006) raises this question and expresses pessimism about various possible answers.
7. A canonical description is a description that contains no names or kind-terms, that is, one which is “semantically neutral.” See Chalmers 2006a, p. 86ff.
8. There is an interesting parallel between the notion of a reference-fixing ability and the notion of apriority expounded in the work of Jenkins. See, e.g., Jenkins 2005.
9. For instance, it might be suggested that speakers associate with a name N the description “the person called N by those from whom I acquired that name.” But, say Byrne and Pryor (2006, p. 52), suppose a speaker baptizes Gödel “Gödel” but forgets that this is so. Her use of “Gödel” refers to Gödel but, as she didn’t acquire the name from anyone, “the person called ‘Gödel’ by those from whom I acquired that name” does not fix the referent.
10. As Tennant (forthcoming) points out, it is not strictly correct that Neptune was named before it was discovered. The body was named only after its existence was confirmed. We will henceforth think of the Leverrier story as hypothetical.
11. The last example is from Jeshion (2004, p. 609). We shall follow Jeshion in taking names introduced by description to be no different from other names semantically speaking.
12. The example is inspired by an example in Byrne and Pryor (2006, p. 47).
13. “Reference-fixing priority” is a play on Byrne and Pryor’s term “reference-fixing authority,” which will be used presently. See Byrne and Pryor (2006, p. 53).
14. Of course, the hypothetical referents of the name “Peter Smith” in the scenario associated with a use of this name prior to Peter’s birth are not the counterparts of Peter’s parents but the child their counterparts are expecting. Thanks to an anonymous referee.
15. For discussion, see Chalmers and Jackson 2001, Chalmers 2006, and Garcia-Carpintero 2006.
16. This is not to say that they cannot be resolved within Chalmers and Jackson’s framework.

17. On Kripke's theory, it is the origin of the name that matters to actual reference because it is the latter we trace back until we get to some baptismal event or event where the name was introduced but it is the origin of the actual referent that matters to "counterfactual reference."

18. Chalmers's distinction between "considered as actual" and "considered as counterfactual" will not be employed here.

19. For convenience, Lewis (1968, p. 27) treats "world" and "counterpart" as primitive.

20. Note that this postulate does not rule out the existence of epistemically possible worlds with more than one kind of substance, for instance, a world with XYZ and H₂O. If water has a mixture of XYZ and H₂O as its counterpart at a given world, then water has a unique counterpart at the world in question (viz., the mixture), and so the postulate is observed.

21. If identity across worlds is found to be counterintuitive, an account of counterfactual secondary reference could be given in terms of counterpart theory but one that takes the relevant counterpart relation to be "one that gives decisive weight to perfect match of origin" (Lewis 1968, p. 43).

22. More recently, Chalmers has proposed to treat *being the brightest object in the evening sky* as equivalent to *being the brightest object in the evening sky to those in my linguistic community*. This will allow him to avoid counting all of the below statements as a priori. However, "Hesperus and I both exist iff Hesperus is the brightest object in the evening sky" still comes out as a priori. Thanks to Chalmers here.

23. But see Chalmers (manuscript b).

24. Arguably, it is required anyway for the epistemic possibility of false logical and mathematical statements. The fact (if it is a fact) that Goldbach's conjecture or classical logic is true is not cognitively transparent.

25. Thanks to David Chalmers, Joe Salerno, Neil Tennant, and two anonymous referees for comments that improved the paper considerably.

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