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Is meaning cognized?

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In this article, I defend an account of linguistic comprehension on which meaning is not cognized, or on which we do not tacitly know our language's semantics. On this view, sentence comprehension is explained instead by our capacity to translate sentences into the language of thought. I explain how this view can explain our capacity to correctly interpret novel utterances, and then I defend it against several standing objections.

KEYWORDS
knowledge of language, linguistic understanding, metasemantics, semantic competence, tacit knowledge

1 | INTRODUCTION

We understand. We encounter sentences and instantly comprehend them. Upon hearing "Bears fly" we grasp that it means that bears fly. How is this possible? Here is one answer: We unconsciously derive its meaning from tacit knowledge of what "bears" and "fly" mean, and of how meanings of sentences are determined by their parts' meanings. We comprehend sentences by tacitly knowing a compositional semantic theory, a body of axioms and rules with theorems assigning sentences meanings. This tacit knowledge is not of the kind epistemologists study. And it is not know-how. Rather, we internally represent or cognize a semantics, just as Chomsky (1980, 1986) thinks we cognize a grammar.[1] Meaning is thus cognized: We cognize the

[1]So, by "tacit knowledge of semantics" I do not mean either of the two notions of "implicit knowledge" of a theory of meaning discussed by Dummett (1976), the notion of a practical capacity for language use and the notion of a body of theoretical semantic knowledge that a speaker cannot articulate but could recognize if explicitly formulated and presented to them (p. 70). See Dummett (1993, pp. ix–xv) and Chomsky (2000, pp. 48–50) on how their understandings of "tacit linguistic knowledge" play totally different theoretical roles.

meanings of basic expressions, which enables us to interpret complex expressions. Call this view "cognitivism".

In this article, I defend a different view: We comprehend sentences by mapping them into thought in a meaning-preserving way.[2] Because we think in the language of Mentalese, this language-to-thought mapping enables us to comprehend sentences by mentally disquoting them. To interpret "Bears fly", we first token the gappy Mentalese correlate of "'Bears fly' means that _____". We then map "Bears fly" to its Mentalese translation which we place in the blank. We end up tokening a thought of the form "'Bears fly' means that bears fly", which is guaranteed to be true. Thus, we comprehend "Bears fly" without cognizing the meanings of its constituents.

My aim is to defend the model of sentence comprehension suggested by this mental disquotation, language-to-thought mapping story. Let us call it "the mapping model" (MM). Here is my plan. In Section 2, I explain why cognitivism is held to be true. In Section 3, I argue that the case for cognitivism is undermined by the viability of MM. In Section 4, I explore one key advantage that MM has over cognitivism. Finally, in Section 5, I consider and respond to objections to MM.

2 | WHY MEANING IS SAID TO BE COGNIZED

Why think that we cognize a compositional semantics for our language? Why believe in semantic cognizing? Semantic cognizing is posited to explain how we systematically and reliably interpret novel utterances. This, our capacity for linguistic comprehension, involves many interrelated phenomena, including both pragmatic capacities for interpreting speakers and semantic capacities for interpreting expressions. Further sub-capacities underlie these, including capacities for linguistic perception, syntactic parsing, and so on. Any of these might be called "a capacity for linguistic comprehension". And cognitivists of different stripes might disagree about which exploit semantic cognizing.

To avoid this complexity, I will focus just on this fact about English speakers (where L is a function from English sentences to what they mean)[3]:

> *Comprehension*: Normally, when we perceive a sentence S, we form a true belief that S means L(S).

I will use "comprehend" as a technical term. By stipulation, by "we comprehend sentences of our language", I mean just that the above thesis is true. Comprehending S just is truly believing that S means such-and-such.

[2]This view—which has gone under the labels "translationism" and "transductionism" (but see Rey, 2020, pp. 365–371, on why the metaphor of transduction may not be apt in this context)—was influentially proposed by Schiffer (1987) to explain how we grasp speech act contents, rather than, as I implement it, to explain how we grasp sentence meanings. Fodor (1983, 1987), Hornstein (1984, pp. 121–51, 1988), Devitt and Sterelny (1999, pp. 187–90), and Devitt (2006) offer similar proposals. See Lepore (1997) and Johnson and Lepore (2004, pp. 717–719) for discussion.

[3]To simplify, I ignore ambiguity, indexicality, context-sensitivity, nondeclarative moods, and the like. And I pretend that sentence-meanings are propositions denoted by that-clauses outside Sections 3.2 and 5.3, in which I drop this pretense, accommodate other accounts of sentence-meaning, and tackle indexicality.

Comprehension cries out for explanation. And cognitivism explains it:

Cognitivism: A human has a language just if they cognize its compositional semantics.[4]

If we cognize our language's semantics, we can access information from which we can (sub-personally) derive the meaning of any sentence S of our language. And if we can derive the meaning of any S, then, normally, when we perceive S, we will be positioned to comprehend S. Cognitivism is thus the basis of what Hornstein (1984) calls "*semantic* theories of interpretation", on which speakers have tacit "knowledge of how language relates to nonlinguistic reality", to "semantic objects" or semantic values, and that "it is *in virtue of* such knowledge that a speaker's interpretive abilities are explained" (pp. 12–16).

To explain comprehension, the cognitivist need not interpret "cognizing", "accessing information", or "derivation" too mentalistically. They need not think that a cognized semantics is explicitly represented in our mind or brain. It is enough if we cognize a semantics by implicitly computing or implementing it.

To see this, suppose cognitivism is what Stabler (1983) calls a "first-level computational theory" (p. 391), such that we cognize a semantic theory T just if we are in a set of physical states with causal interrelations isomorphic to the derivational structure of T.[5] (I presuppose no account of cognizing stronger than this in what follows.[6]) When we perceive S, we will be in physical states corresponding to the axioms of T that assign meanings to the constituents of S (and in physical states corresponding to the composition rules of T) which will together, triggered by the registration of S, normally cause us to enter into a state corresponding to the theorem of T that assigns S its meaning. This terminal state will be or realize in us a state of comprehending S, or at the very least will position us to comprehend S, conditional on the success of thought-formation processes downstream from linguistic processing.[7]

So semantic cognizing explains comprehension (even if it does not consist in explicit representations of meaning). And it also explains the dependencies between our capacities for comprehending sentences with shared constituents. For example, our capacity to comprehend (2) is dependent on our capacity to comprehend (1):

[4]Those advocating cognitivism (or some similar thesis) include Higginbotham (1983, 1986, 1989, 1991), Davies (1987), Peacocke (1989), Larson and Segal (1995), Heim and Kratzer (1997), Lepore (1997), Platts (1997), Ludlow (1999, 2011), Segal (2006), Lepore and Ludwig (2005, 2007) (arguably; see Pagin, 2012, pp. 53–55), Yalcin (2014), Glanzberg (2014), and Napoletano (2017).

[5]This is roughly computational structuralism (as defended by Chalmers, 1994) applied to semantic cognizing.

[6]On any plausible, physicalistically acceptable account of what it is to cognize a semantic theory T, implementing T is necessary for cognizing T. (If a speaker cognizes T, they must be in psychological states of cognizing T's axioms, states with causal powers enabling them to enter states of cognizing T's theorems. Given physicalism, these states of axiom-cognizing must supervene on physical states of the speaker from which they inherit their causal powers. Thus, the speaker must be in a set of physical states with causal powers mirroring the derivational powers of T's axioms, and so they must computationally implement T.) For this reason, to argue that the viability of MM undermines the case for cognitivism, I can simply treat cognizing as implementing. As I will argue, MM explains comprehension without requiring speakers to implement a semantics. So, no matter how cognizing is to be understood—because "semantic implementing" is necessary for (or just is) semantic cognizing but is not necessary to explain comprehension—the viability of MM shows that semantic cognizing is not necessary to explain comprehension.

[7]See Peacocke (1989) for a more detailed account of how a semantics might be implemented, building on Evans (1981) and Davies (1987).

(1) Goats eat cans.
(2) Goats eat cans and clothes.

Plausibly, these capacities flow from one source. As such, comprehension is "structured".[8] And semantic cognizing explains why. For if we comprehend (2) by cognizing its constituents' meanings, we also cognize the meanings of (1)'s constituents, and so must comprehend (1).

Finally, because we finite beings might cognize a finitely axiomatized semantics with infinitely many theorems, semantic cognizing also explains the finitely grounded yet infinite (or finite yet massive) scope of comprehension. If we cognize such a semantics, this explains how we can comprehend an infinity of (or massive number of) sentences.

3 | AGAINST SEMANTIC COGNIZING

So semantic cognizing is posited by a good explanation of comprehension. But MM is a rival explanation that does not posit semantic cognizing:

> *The mapping model*: When we perceive a sentence S, we can form a true belief about what S means by mapping S into Mentalese.

On this view, when we perceive S, we mentally disquote S to arrive at its meaning. We form a belief realized by the Mentalese correlate of the disquotational specification of meaning ⌜'S' means that S⌝, formed by translating S into Mentalese. In this way, without cognizing the meanings of words, we can form true semantic beliefs.

Let us unpack this in more detail.

3.1 | Forming semantic beliefs by disquotation

In advancing MM, I presuppose that there is a language of thought, such that for any belief of ours in a certain natural class (i.e., perhaps the class of our "explicit beliefs"), if it is a belief in p, then there is a neural sentence-token t such that (i) t is tokened in our brain in our "belief-box", (ii) t bears the content p, and (iii) the tokening of t realizes our belief in p.

I also follow Schiffer (1987) and assume the existence of a certain function f from Mentalese representations of English sentences to Mentalese translations of those sentences. To characterize f, let "δ" be a variable over Mentalese representations of English sentences and let "σ" be a variable over Mentalese sentences. f is a recursive function from Mentalese expressions to Mentalese expressions such that (i) f can be defined purely syntactically and (ii) whenever $f(\delta) = \sigma$, if the English sentence denoted by δ means p, then σ means p (and so a tokening of σ in the belief-box realizes a belief in p).

Now, to explain comprehension, I say that we have a belief-forming mechanism that follows this rule (using capitalized expressions like "COW" to denote the Mentalese symbols corresponding to English words like "cow"): If a Mentalese sentence containing some δ—a

[8]See Davies (1981, pp. 53–57).

Mentalese symbol of some sentence of our language—is in the belief-box, and the Mentalese translation of that sentence is σ, then write in the belief-box the Mentalese sentence ⌜δ MEANS THAT σ⌝! Call this rule "Map":

Map: If ⌜... δ ...⌝ is written and $f(\delta) = \sigma$, then write ⌜δ MEANS THAT σ⌝!

Following Map requires implementing *f*. But as per (i) above, we might implement *f* purely syntactically, via a mechanism that does not compute meanings.[9] We might implement *f* via an acquired, hardwired "translation manual" from English to Mentalese without cognizing a semantics (as I argue at greater length in Section 5.2 below).[10]

If we follow Map, this explains comprehension. To see this, imagine John perceives an utterance of "Goats eat cans". And let ⌜⌜S⌝⌝ denote the Mentalese symbol that denotes the sentence S. Now, John's belief that "Goats eat cans" was uttered is realized by a sentence of Mentalese containing ⌜Goats eat cans⌝ in his belief-box.[11] The Map-following mechanism then kicks in, and it writes *m* in his belief-box:

m = ⌜Goats eat cans⌝ MEANS THAT GOATS EAT CANS.

m is written because John implements *f* and *f*(⌜Goats eat cans⌝) = GOATS EAT CANS. Finally, the token of *m* realizes in John the true semantic belief that "Goats eat cans" means that goats eat cans. And, despite appearances, this belief has a non-trivial content. It is not like the metalinguistic belief that "'Goats eat cans' means that goats eat cans" expresses a truth. Rather, it is a belief in a substantive semantic truth that, while expressed in a trivial-seeming linguistic guise in English, is also expressed non-trivially by the German sentence "'Goats eat cans' bedeutet dass Ziegen Dosen fressen".

Generalizing, we can comprehend sentences by following Map. And, on the face of it, following Map does not require cognizing a compositional semantics. If so, MM explains comprehension without semantic cognizing, and blocks abducing cognitivism from comprehension.

Moreover, MM also explains the structure of comprehension and its finitely grounded yet infinite scope. These result from the structure and infinite scope of Mentalese. Because thought is compositional, if *f*(⌜Goats eat cans and clothes⌝) is a sentence of Mentalese, so is *f*(⌜Goats eat cans⌝). So, if following Map positions us to comprehend "Goats eat cans and clothes", it also positions us to comprehend "Goats eat cans"; our capacities to comprehend these sentences are inseparable. And because there are potentially infinitely many sentences of Mentalese, there are potentially infinitely many semantic facts that following Map will enable us to grasp.

[9]On this point, see Fodor (1990, pp. 186–87) in reviewing and agreeing with Schiffer (1987).

[10]See also Schiffer (1987, pp. 204–207, 1993, pp. 243–247). Grandy (1990) objects that *f* exists only if both English and Mentalese have a compositional semantics (pp. 562–563). This is a problem for Schiffer, who argues that the possibility that we comprehend sentences by implementing *f* undercuts the main argument that English *has* a compositional semantics (Schiffer, 1987, pp. 177–209). But Grandy's objection is no problem for me; I only challenge that we *cognize* a compositional semantics. So it is also no problem for me if Pagin (2003) is right that Schiffer's explanation of comprehension requires that English has a "systematic semantics" (pp. 18–20).

[11]Here I assume that whenever we comprehend a sentence, we have some prior belief about that sentence realized by a Mentalese sentence containing a Mentalese representation of that sentence.

So MM seems to be at least as good of an explanation of comprehension as is cognitivism.[12] But before pressing on, I should flag that MM can be implemented without assuming that states of linguistic comprehension are beliefs realized by Mentalese sentences in the belief-box. Suppose that what deserves the name "comprehension" has a non-belief-like computational role. Suppose it is realized by Mentalese sentences in the *comprehension-box* instead, such that if σ is tokened in the comprehension-box and σ means *p*, this realizes in us a state of comprehending the meaning *p*. We should then modify Map as follows:

> Map*: If ⌜... δ ...⌝ is written in the belief-box and $f(\delta) = \sigma$, then write σ in the comprehension-box!

As before, by following Map*, John can comprehend what the sentence symbolized by δ means upon perceiving it.

There are reasons to run MM with Map* over Map. Doing so dispenses with the perhaps stretched analogy of mental disquotation, and thus does not require the non-neutral assumption that ⌜'S' means that S⌝ accurately encodes the meaning of S. And perhaps it is an advantage of a Map*-based explanation of comprehension that it does not entail that states of comprehension represent the meaning or "means that" relation. This should all be kept in mind. But I will use Map across the rest of the article and continue to mean "true semantic belief" by "comprehension".

3.2 | Sentence-meanings

I have argued that by translating language into thought, we can comprehend, say, that "Bears fly" means that bears fly upon perceiving "Bears fly". But what if "Bears fly" does not mean the proposition *that bears fly*? What if sentence-meanings are not propositions? The details of MM can be modified accordingly.

3.2.1 | Sentence-meanings as subpropositional

Suppose a sentence S's meaning is not or does not determine a complete, truth-evaluable proposition, but is rather an incomplete or gappy proposition that a speaker must pragmatically

[12]Again, by "comprehension" I just mean our capacity to normally form true beliefs about sentence-meaning. This is important because, as Lepore (1997) and Fricker (2003) argue, MM leaves unexplained the rational and epistemic justificatory statuses of semantic beliefs. But I leave these normative statuses out of the explanandum. My task is just to offer a rival to cognitivism, which, as I formulate it, *also* fails to explain these normative statuses, and does not aim to. Moreover, MM is compatible with views on which these normative statuses must be explained by semantic knowledge of a different kind than is posited by cognitivism. For example, as Waights Hickman (2021) argues, the view that we possess personal-level "knowledge of language"—"fully fledged knowledge of the *speaker*" rather than "information contained in sub-personal systems of the speaker's mind"—explains and vindicates the "conception of language use as distinctively and intrinsically *rational* activity" (pp. 708–709). We can maintain this with MM while denying cognitivism because MM does not aim to explain the rational use of language, and because the falsity of cognitivism does not entail that we lack "fully fledged" knowledge of language. (This requires that "fully fledged knowledge" of language is of the non-Chomskyan variety. But perhaps Waights Hickman disagrees (p. 710, fn. 7). If so, our disagreement is exegetical; I read Chomskyan "cognizing"-talk at a sub-personal level of description.)

enrich to grasp the content of an utterance of S.[13] And let ⌜-S-⌝ refer to the subpropositional meaning of S.

Now, either the meaning of a that-clause ⌜that S⌝ is also -S- or not. Suppose it is. Suppose, as Bach (1994) suggests, that "if a stand-alone sentence can express merely a propositional radical, it can do likewise when embedded in a that-clause" (p. 131).[14] Then, when a speaker following Map translates S into Mentalese, they will form a true belief about the meaning of S, namely, the belief that S means -S-. No modification of the MM explanation of comprehension is required after all.

Alternatively, suppose the meaning of ⌜that S⌝ is not -S-, but is rather something else. This is no problem. For there are other ways to disquotationally specify sentence-meanings other than by use of that-clauses. For example, in place of ⌜'S' means that S⌝, either of the following serves just as well: ⌜'S' means this: S⌝ or ⌜'S' means S⌝. So, I could instead say that a speaker comprehends "Bears fly" by tokening ⌜⌜Bears fly⌝ MEANS BEARS FLY⌝ in their belief-box, which realizes believing that "Bears fly" means -Bears fly-.

One might object that if ⌜Bears fly⌝ MEANS BEARS FLY is in one's belief-box, its constituent BEARS FLY will not express -Bears fly-, as I need it to, but will instead express an enriched, complete proposition. The principle behind this objection is that while sentences of natural language express subpropositional what-nots due to semantic underdeterminacy, sentences of Mentalese do not.[15]

My reply is that if the translation function *f* exists, then, so long as *f* maps ⌜Bears fly⌝ to BEARS FLY, then "Bears fly" and BEARS FLY must have the same meaning. And so they must *both* express -Bears fly-. If so, then BEARS FLY cannot express some complete proposition, and a tokening of ⌜Bears fly⌝ MEANS BEARS FLY must realize the true belief that "Bears fly" means -Bears fly-. Again, no serious modification of the MM explanation of comprehension is called for.

3.2.2 | Sentence-meanings as Kaplanian characters

Suppose a sentence S's meaning is instead a Kaplanian character, a "meaning rule" governing which propositions S expresses as the referents of any indexicals it may contain vary across contexts of utterance (Kaplan, 1989, p. 505). Characters are modeled as functions from contexts to propositions, but it is crucial to recall that characters are rules.[16] As such, grasping the character of a sentence is a matter of pairing it with a particular rule. Following Kaplan, we might display the character of "I am hungry" as something like the following (admittedly incomplete) rule: "I am hungry" means that the speaker is hungry! Or, to avoid giving the false impression that this rule says (falsely) that the meaning of "I am hungry" is *the* unique descriptive proposition *that the speaker is hungry*, we might display it like this,

[13]Advocates of this popular view have many names for subpropositional sentence-meanings: "radicals" (Bach, 1994, p. 127), "skeletons" or "matrices" (Soames, 2005, p. 365), "schemata" or "templates" (Carston, 2000, p. 12), "blueprints" (Neale, 2004, p. 85), or "scaffoldings" (Taylor, 2001, p. 53).

[14]Carston (2008) agrees that a that-clause need not express a proposition and can instead express something subpropositional (p. 335).

[15]For critical discussions of this principle which seem to me to rob it of plausibility, see Clapp (2012) and Picazo Jaque (2019).

[16]On the importance of this point, see Richard (2003, pp. 234–38). See also Braun (1995) for an argument that characters cannot be literally identified with functions.

(R) In any context, the content of "I am hungry" is that the speaker is hungry.

and read (R) such that which proposition "that the speaker is hungry" denotes is variable across contexts. For instance, at a context in which Floyd speaks, "that the speaker is hungry" denotes the proposition that Floyd is hungry.[17]

Now, I will offer one way to formulate a variant of the Map rule that one could follow to comprehend a meaning-rule like (R) for an arbitrary novel sentence. To do so, I appeal to a de-indexicalizing function *h*, a function from Mentalese representations of sentences to Mentalese representations of sentences. If S is an indexical sentence, *h* maps ⌜S⌝ to the Mentalese representation ⌜S′⌝ of the sentence formed by de-indexicalizing S, S′: the sentence formed by replacing the indexicals in S with non-indexical expressions with which they co-refer (and adjusting the surrounding linguistic context to preserve grammaticality). For example, roughly, $h(\ulcorner \text{I am hungry} \urcorner) = \ulcorner \text{The speaker is hungry} \urcorner$. And if S is non-indexical, $h(\ulcorner S \urcorner) = \ulcorner S \urcorner$.

Here is the Map-variant that *h* allows us to display[18]:

Map-for-Characters: If ⌜... δ ...⌝ is written and $h(\delta) = \delta'$ and $f(\delta') = \sigma$, then write:

⌜THE MEANING RULE FOR δ IS: IN ANY CONTEXT, THE CONTENT OF δ IS THAT σ!⌝!

By following Map-for-Characters, upon perceiving an utterance of "I am hungry", we will have in our belief-box a sentence realizing in us the true belief that the meaning rule for "I am hungry" is (R). From this, we can determine that, in our context, the content of "I am hungry" is—in accordance with (R)—the proposition that the speaker (of our context) is hungry. And this, together with our knowledge of who is speaking, will enable us to single out which singular proposition is (at our context) the proposition that the speaker of the context is hungry, and thereby recover the utterance's content.[19]

Of course, to follow Map-for-Characters, we must be able to implement the de-indexicalizing function *h*. Admittedly, de-indexicalizing translation is no easy task. But neither is ordinary translation, after all. And I suggest that, like the translation function *f*, *h* could be implemented purely syntactically. To implement *h*, a speaker need only be hard-wired to transform representations of certain sentences into representations of other sentences. And all that need be computed for this purpose is syntactic information about *h*'s inputs. For this reason, computing *h* will not require semantic cognizing. And so it is open to the MM theorist to claim that we comprehend the characters of sentences by following Map-for-characters.

[17]I assume "the speaker" acts (when satisfied) like a non-rigid singular term, referring at a context to the speaker of that context, following Heim and Kratzer on definite descriptions (1997, pp. 73–85). But I am not wedded to this view; see fn. 19 below.

[18]This is grossly oversimplified. But my aim here is just to sketch a strategy. See Schiffer, 1987 (pp. 200–203) for a related, more rigorous MM-friendly treatment of indexicality.

[19]In more detail, because, at a context *c*, "the speaker" refers to the speaker of *c*, its Mentalese translation, THE SPEAKER, will too. So, when THE SPEAKER IS HUNGRY is in the belief-box of someone in some *c* in which Floyd speaks, this will realize in them the belief that Floyd is hungry. But if "the speaker" and THE SPEAKER do not refer to speakers, one strategy is to say instead that after ⌜I am hungry⌝ is de-indexicalized into ⌜The speaker is hungry⌝ and then translated into THE SPEAKER IS HUNGRY, this is then rigidified into DTHAT (THE SPEAKER) IS HUNGRY—following Rey (1992) in positing a Mentalese analogue of Kaplan's (1978) "Dthat" operator—which realizes the belief that Floyd is hungry.

3.2.3 | Sentence-meanings as Mentalese sentences

Suppose a sentence's meaning is more like a syntactically structured mental representation built of concepts. The meaning of "Bears fly" is a complex of our concepts *bears* and *fly*. Assuming that concepts are expressions of Mentalese, a sentence's meaning is its Mentalese translation.[20] This allows us to say that we comprehend sentences by following this rule:

Map-for-Mentalese: If ⌜... δ ... ⌝ is written and $f(\delta) = \sigma$, then write: ⌜δ MEANS ⌜σ⌝⌝!

where ⌜⌜σ⌝⌝, adapting my earlier convention, denotes the Mentalese representation of the Mentalese sentence σ, the exact nature of which will depend on how Mentalese represents itself.

3.2.4 | Sentence-meanings as semantic instructions

Suppose, finally, that what a sentence means is instead a precursor to a saturated, fully spelled-out Mentalese sentence. It is something like a "set of conceptual addresses" (Sperber & Wilson, 1995, p. 206) for accessing concepts to combine, or a structured string of "concept schemas, or pointers to a conceptual space" (Carston, 2002, p. 360), or an "instruction for how to build a thought" (Pietroski, 2018, p. 55).

Following Pietroski's formulation of this view, let ⌜μ(*e*)⌝ refer to the meaning of the linguistic expression *e* (2018, pp. 25–35). For a sentence like "Bears fly", μ(Bears fly) will be the instruction Join[μ(bears), μ(fly)] (where "Join" denotes a conjunctive operation) executable by conjoining the concepts μ(bears) and μ(fly), the Mentalese terms BEARS and FLY. Simplifying, the meaning of "Bears fly" is the instruction Join[BEARS, FLY].

The MM explanation of comprehension can accommodate Pietroski's view. Because it is possible for us to implement the function *f* from (representations of) English expressions to their Mentalese translations without cognizing a semantics, it is thereby *also* possible for us to implement a function *g* from (representations of) English expressions to their semantic instructions without cognizing a semantics. We might implement *g*, the semantic instruction function, as follows: First, by implementing *f*, we compute that "Bears fly" is to be translated into Mentalese as BEARS FLY—this sets the target of comprehension. Then, needing access only to syntactic information about BEARS FLY for selecting which constituents must be conjoined in order to token it, we follow a procedure for writing a semantic instruction for how to token BEARS FLY—for how to hit the target—which looks like this in English:

Write "Join" then "[" then "BEARS" then "," then "FLY" then "]"!

What results is a mental representation of the semantic instruction for "Bears fly", which can then be executed to token BEARS FLY.

[20]For a clear statement of this view, see Horwich (1998, pp. 44–6). If one's language of thought is what Lewis (1970) calls "semantic markerese" (pp. 189–190), as Fodor seems to think (1975, pp. 119–122), then this is also the view of the generative semanticists and their descendants in the tradition of Katz and Fodor (1963) and Katz (1972). For classic critical discussions of this view, "translational semantics", see Lepore and Loewer (1981) and Lepore (1983, pp. 167–172).

So, by implementing *g*, we can comprehend sentences by following this rule (where 'ξ' is a variable over Mentalese representations of semantic instructions):

Map-for-Instructions: If ⌜... δ ... ⌝ is written and $g(\delta) = \xi$, then write: ⌜δ MEANS ξ⌝!

I do not see how following this rule could require cognizing a compositional semantics. It seems, then, that no matter what sentence-meanings are, there is a viable story about how we are positioned to grasp them without semantic cognizing.

4 | COGNITIVISM VERSUS THE MAPPING MODEL

So far, I have argued that MM rivals cognitivism for the status of best explaining comprehension. But why think MM is the better explanation?

The cognitivist's explanation of comprehension makes an incorrect prediction: that we can comprehend any subsentential expression of our language *just as* we comprehend any of its sentences. But we cannot. We comprehend sentences more readily, clearly, and consciously than we comprehend subsentential expressions. The MM explanation of comprehension avoids this difficulty. It does not predict that expression comprehension is on a par with sentence comprehension.

In other words, the cognitivist's explanation predicts the following (where *i* maps each English expression to its meaning):

> *Unrestricted comprehension*: Normally, if we perceive *any* expression *e*, we can form a true belief that *e* means *i*(*e*).

The cognitivist says we can comprehend English sentences because they are interpreted by a semantics we cognize. But that semantics interprets *all* English expressions. So we should be equally positioned to comprehend them all, such that unrestricted comprehension is true.

But it is implausible that comprehension is unrestricted in this way. Most of us cannot form true beliefs about the meanings of common words like "the", "if", "like", "of", "a", and "in". This is puzzling if we have access to theorems specifying their meanings, access of the same kind that we have to theorems specifying the meanings of sentences; that is, access enabling us to consciously comprehend those sentences, as the cognitivist says we have.

The issue is not whether we *understand* words like "the" or "if". There are many legitimate senses or uses of "understanding a word", both folk and theoretical, on which it is true to say that we understand these words and all words of our language. We understand words by knowing how to use them correctly, by comprehending sentences containing them, and by associating them with information-rich mental files. And, if cognitivism is true, then there is a sense in which we understand a word in virtue of cognizing a semantics that interprets it.

The issue is only whether the thesis of unrestricted comprehension is on even footing with the restricted thesis that normally we can comprehend sentences. I think it is not. If we have *any* capacity to form true beliefs about subsentential meaning, it is quite different from sentence comprehension.[21] Consider the following expressions:

[21]More carefully, we are not ordinarily positioned to immediately form mental representations of expression-meaning with the same functional or computational role as our mental representations of sentence-meaning.

(3) and dances
(4) which is empty
(5) snake next to him

You are forgiven if (3)–(5) strike you as unintelligible. But we *can* detect that (3)–(5) are well-formed expressions of English, as is brought out by contrasting (4) and (5) with the ill-formed "is which is empty" and "to snake to next him", respectively. Perhaps this enables us to detect that (3)–(5) *have* meanings. And perhaps we can do this by cognizing the syntactic properties of (3)–(5), recognizing that they can serve as units of larger sentences.

But that (3)–(5) are well-formed means that they are assigned specific meanings by the correct compositional semantics for English.[22] So if cognitivism is true—if semantic cognizing makes it effortless for us to comprehend the specific meanings of sentences—then it should also make it effortless for us to form true beliefs about what (3)–(5) mean. For the meanings of (3)–(5) are derivable from the semantics of English just as the meanings of English sentences are. But we struggle to form any thoughts about what (3)–(5) mean, at least without significant effort or leveraging prior instruction in linguistics.

Even if we can comprehend what (3)–(5) mean after a bit of thought, or after thinking up sentences containing (3)–(5), this is irrelevant for two reasons. First, this only shows that we can comprehend (3)–(5) on the basis of comprehending sentences containing them. But if cognitivism is true, we should have an independent basis for comprehending them. And second, it is equally a problem for the cognitivist if it is possible for a speaker cognizing English's semantics to lack the capacity to comprehend expressions like (3)–(5). Insofar as this is plausibly possible, this fact should puzzle the cognitivist.

In response, the cognitivist might insist that comprehension *is* unrestricted, but that although we can comprehend what (3)–(5) mean, these beliefs are for some reason not as expressible or accessible as beliefs about sentence-meaning. But if they go this route, the cognitivist must explain why semantic cognizing grants us accessible, expressible beliefs about sentence-meaning, but apparently inaccessible, inexpressible beliefs about subsentential meaning. Why do our beliefs about sentence-meaning *seem* so different from our beliefs about subsentential meaning, even if the difference is ultimately superficial?

Alternatively, the cognitivist might reject unrestricted comprehension but deny that their explanation of sentence comprehension predicts unrestricted comprehension. These two responses can be addressed at the same time, for they both require modifying the cognitivist's explanation of comprehension by specifying some condition Φ such that:

> When we perceive an expression *e* and can immediately and accessibly form a true belief that it means *i*(*e*), that is because we cognize a semantics on which *e* means *i*(*e*) and Φ.

And both responses require that condition Φ is satisfied only if *e* is a sentence.

A natural suggestion is that Φ states that the perceived expression *e* is of the right type to figure as an acceptable input into a specialized mental process of interpretation, a process that terminates in accessible semantic beliefs. If we imagine that this process is the activity of a semantics module in the mind, or of a semantic component of the language faculty, then we

[22]Indeed, these examples are pulled from Heim and Kratzer (1997), where their syntax is displayed and standard proposals about their semantic values are canvassed: (6) (p. 52), (7) (p. 88), (8) (p. 201).

can think of it as a device taking linguistic expressions (or representations thereof) as inputs and outputting interpretations of them. If this device is the source of our accessible semantic beliefs, then it is natural to think of its outputs as Mentalese sentences expressing semantic facts. The suggestion, then, is that the condition Φ is met just if *e* is an acceptable input of our semantic-belief-forming device. If so, this device must only accept sentences as inputs.

I recommend this extended account to the cognitivist. But it makes their appeal to semantic cognizing redundant. For now they posit both semantic cognizing *and* a mental mechanism to do exactly what a Map-following mechanism does. Their semantics module takes sentences and maps into thought accessible beliefs about what they mean, just like a Map-following mechanism. But I have argued that such a device can explain sentence comprehension without the help of semantic cognizing. So semantic cognizing is an idle wheel in the cognitivist's extended account.

Now, the cognitivist might resist jettisoning semantic cognizing from their account if they have taken the route of insisting that we can form inaccessible true beliefs about subsentential meaning. For they might say that we need to explain this very fact by appeal to semantic cognizing. But this cognitivist *is* ultimately free to jettison semantic cognizing, for their case for it is now weak. Unlike sentence comprehension—a pre-theoretically obvious phenomenon—the capacity to form true inexpressible beliefs about subsentential meaning is a theoretical posit. Belief in it is a commitment incurred by the cognitivist. If we *can* comprehend all expressions of our language, then this comprehension is plausibly tacit just as our knowledge of semantics (if there is such a thing) is tacit; it is more accurately described as *cognizing* subsentential meaning.

This reveals that the cognitivist's case for semantic cognizing has become unpersuasive. They now appeal to semantic cognizing to explain semantic cognizing. They propose to explain how we cognize subsentential meaning by saying that we cognize a semantics. Their explanans is too close to their explanandum for comfort. And, moreover, the adherent of MM is free to deny the cognitivist's explanandum.

For these reasons, in my assessment, MM outdoes cognitivism.

5 | OBJECTIONS AND REPLIES

5.1 | The entailment objection

Chomsky (2000) objects to MM by pointing out, correctly, that there is more to semantic competence than sentence comprehension. We can also grasp entailments between sentences. Chomsky challenges anyone with a view on which comprehension consists in mapping sentences into Mentalese without the help of semantic cognizing to explain entailment comprehension.[23]

The cognitivist's explanation is, roughly, that semantic cognizing enables us to grasp a sentence's semantic or logical form in addition to its meaning. And that by grasping semantic form, we can grasp entailments. Here is an artificially simple example: The cognitivist says that we grasp that "Bob smokes" entails "Someone smokes" because (i) by cognizing our language's semantics, we interpret "Bob smokes" as having the logical form $F(a)$ and "Someone smokes" as having the logical form $\exists x(F(x))$, and because (ii) we have enough tacit logical competence to grasp that if a sentence of the form $F(a)$ is true, then the correlative sentence of the form

[23]In context, Chomsky is objecting to the MM-like views of Schiffer (1987) and Fodor (1990). Higginbotham (1987) raises the same objection to Schiffer (1987) and Stich (1983).

$\exists x(F(x))$ must be true. If this explanation works, it is a problem if there is no rival MM explanation.

But I think there is. Chomsky's challenge, in more detail, is to explain our grasp of the entailments between sentence pairs like (6) and (7) without adding an "extra layer of complexity" to MM and raising new problems (2000, pp. 176–77)[24]:

(6) a. Tom chased Bill.
    b. Tom followed Bill with a certain intention.
(7) a. John persuaded Mary to take her medicine.
    b. Mary came to intend to take her medicine.

Let us grant that (6a) entails (6b), (7a) entails (7b), and that their semantics forms are such that cognizing them, together with logical competence, suffices for grasping these entailments.

Now, if we follow Map, we can thereby form the true beliefs that (6a) means that Tom chased Bill and that (6b) means that Tom followed Bill with a certain intention. And I say these beliefs, together with our ordinary knowledge of chasing—namely, our knowledge (following Chomsky in taking this to be a truth) that if someone chases someone, then they must follow them with a certain intention—help us grasp that (6a) entails (6b).[25]

If the cognitivist wants to object to this MM explanation, they must argue that, unless we cognize a semantics for English, we cannot come to believe the following about chasing and persuasion[26]:

(8) Necessarily, if *x* chases *y*, then *x* follows *y* with a certain intention.
(9) Necessarily, if *x* persuaded *y* to take their medicine, then *y* came to intend to take their medicine.

But how could they? Given that we do know (8) and (9), surely monolingual German speakers, who cognize no semantics for English, can as well.

The cognitivist might reply that although *one could* know (8) and (9) without cognizing a semantics for English, what best explains how *we* know (8) and (9) is that we do cognize one. But if this is right—if semantic cognizing best explains ordinary bits of knowledge—then the cognitivist has seriously underplayed their hand. Why the focus on sentence comprehension as the central explanandum?

But perhaps they have underplayed their hand.[27] A cognitivist might explain our knowledge of (8) as follows: First, by cognizing a semantics, we grasp that "*x* chases *y*" entails "*x* follows *y* with a certain intention" by virtue of their semantic form. Second, by cognizing a semantic rule like (R),

(R) If a sentence S entails a sentence S′, then the sentence ⌜Necessarily, if S, then S′⌝ expresses a truth.

We come to know that the sentence "Necessarily, if *x* chases *y*, then *x* follows *y* with a certain intention" expresses a truth. Third, again by semantic cognizing, we comprehend that the

[24]McGilvray (2001, pp. 20–22) echoes Chomsky's doubts.

[25]Perhaps also together with our knowledge that if (a) *x* means that *p* and (b) *y* means that *q* and (c) if *p*, then it must be that *q*, then *x* entails *y*.

[26]For at this stage of the dialectic they cannot argue that we cannot grasp what (6a) and (6b) mean without cognizing a semantics. Blocking my appeal to our non-linguistic knowledge of (8) and (9) is their only way forward.

[27]I am indebted to an anonymous referee for convincing me to take this possibility more seriously.

sentence "Necessarily, if *x* chases *y*, then *x* follows *y* with a certain intention" expresses the *proposition* (8). Fourth and finally, we come to know (8) on the basis of our newly formed true belief that a sentence expressing (8) is true.

Perhaps this four-stage explanation of how we know (8) is viable given cognitivism. But if so, I do not need to rule it out. To respond to Chomsky's objection, I only need to point to a viable alternative account of how we know (8) that makes no appeal to semantic cognizing. Surely there is such an account.

Our knowledge of (8) and (9) is, on the face of it, knowledge about chasing and persuasion and so is knowledge about the non-linguistic world. And it seems backwards to explain our knowledge of a worldly fact *p* wholly in terms of prior semantic knowledge of the truth of a sentence expressing *p*. Our knowledge of chasing and persuasion goes beyond the competence with "chasing" and "persuasion" that semantic cognizing affords. And I think Chomsky would agree on this point.

Our knowledge of facts like (8) and (9) are part of what Chomsky calls our "common-sense understanding", a system of beliefs about the nature of the world afforded by "the faculty of mind", which is crucially distinct from "the language faculty" with which it interacts (1975, p. 35). Our "commonsense understanding" outstrips our tacit "knowledge of grammar" or of "sound-meaning relations" (Chomsky, 1980, pp. 91–92).[28] Thus, given the viability of Chomsky's own account of how we know things like (8) and (9), I can evade his objection that MM cannot explain our grasp of entailments.

5.2 | The "no semantics-free translation" objection

Matthews (2003) doubts that implementing the language-to-thought mapping *f* "*could be* wholly syntactic and not at all semantic", and he asks "on what basis" the MM theorist could "conclude this" (p. 197). But his skepticism that we might implement *f* without cognizing meaning seems undue.

The following possibility claim is not immodest:

(10) It is possible for someone to have a mechanism implementing a recursive function *f* from (representations of) sentences of their language L to their translations in Mentalese, and they do not cognize a semantics for L.

In support of (10), we can compare it with (11):

(11) It is possible for someone to possess a mechanism implementing a recursive function *f* from (representations of) sentences of their language L to their translations in French, and they do not cognize a semantics for L.

Because (11) is plausible, so is (10).[29]

[28]See also Chomsky (1980, pp. 94–5, 1992, pp. 206–7, 1993, pp. 34–5).

[29]Schiffer (1987) makes this point more quickly, arguing, in effect, that (10) should be unproblematic "in the same way that it is unproblematic that there should be a recursive mapping of French sentences onto English sentences that is statable without reference to any semantic features of those sentences but yet maps each French sentence onto its English translation" (p. 197).

Why think (11) is plausible? Well, if (11) is false, then it should be *impossible* to design a device that takes a representation of an English sentence as input and, by purely syntactic recursive symbol manipulation, outputs a French sentence with the same meaning. But there could be such a device. (Perhaps Google Translate is already such a device.) This is a technological possibility, not just a distant logical possibility. It is a good bet that in the not too distant future there *will* be such a device.

But Matthews has an argument that (10) is false. He argues that an implementation of *f* must be "semantics-involving" because "it effects the mapping specified by a semantic theory, and hence it is a computational implementation of the speaker's knowledge of [that] semantic theory" (p. 202), where "the mapping specified by a semantic theory" T is a pairing of sentences with the meanings assigned to them by T (p. 203). This argument has two main premises:

(12) If a speaker implements *f*, then they must implement a function *j* from English sentences to their meanings;
(13) and if they implement *j*, then they must implement a compositional semantic theory *T* that specifies *j*.

I will grant (12).[30] But I deny (13).

If a speaker implements *j* by implementing *f*, we cannot credit them with cognizing a compositional semantic theory T just because T specifies *j*, or just because T assigns a sentence S the meaning *m* just if $j(S) = m$. After all, there is a multitude of semantic theories specifying *j* in this way. They agree about what sentences mean but wildly disagree about what subsentential expressions mean. Speakers who compute *j* cannot cognize all of these theories. So even if Matthews is right that implementing *f* must involve implementing *j*, implementing *j* does not entail cognizing a compositional semantics.

The cognitivist might resist this argument by insisting that an assignment of sentence meanings will not massively underdetermine rest of the semantics. But suppose this is right. Suppose there is a unique compositional semantic theory T such that it is a theorem of T that S means *m* just if $j(S) = m$. Even so, why think that it follows from this that implementing *j* entails implementing T? There is good reason to think this does not follow. Consider the set X of finitely specifiable theories *of any kind* that specify *j* just as T does. Even if X contains only one compositional semantic theory, X has many other members. Speakers who compute *j* cannot cognize them all. But then why should they cognize just T? It cannot be because T specifies *j* (for all of X's members do). And it would be utterly mysterious and question-begging for the cognitivist to say that out of X they cognize just T because T is the unique compositional semantic theory in X.

[30]But (12) is far from beyond dispute. After all, *f* is not itself a mapping from English sentences to their meanings. The domain of *f* is not the set of English sentences but is rather the set of Mentalese symbols of English sentences. And the range of *f* is not decidedly a set of sentence-meanings, unless we grant that sentence-meanings just are Mentalese sentences, a view on which I remain neutral. Moreover, (12) is in tension with the live empirical hypothesis that a speaker's language of thought just is their native natural language. (This view is argued for by Harman (1970, 1973, pp. 84–111, 1975), Carruthers (1996, pp. 40–72) for "conscious thinking" (p. 72), Ludlow (1999, pp. 165–169), Devitt (1981, pp. 75–80, 1996, p. 158, fn. 13, 2006, pp. 149–152), and Devitt and Sterelny (1999, pp. 140–146). See Dupre (2021) for recent discussion.) For if this hypothesis is correct, then *f* merely maps a symbol of a sentence to that very sentence, not unlike a function mapping a quote-name of a sentence to that sentence, and so it is extremely hard to see how computing a semantic interpretation function might be required to implement *f*.

Moreover, if the cognitivist instead says that implementing *j* involves cognizing all theories that specify *j*, this deflates the cognitivism-friendly upshot of Matthews's objection that implementing *f* (and so *j*) involves or requires cognizing a compositional semantics. For it now equally involves cognizing all of the *non*-compositional semantic theories specifying *j*. Thus, it seems that if Matthews is right about how semantic cognizing lives on in the MM account of comprehension, this is uninteresting.

In fairness to Matthews, however, I admit that any mechanism implementing a recursive function like *f* is bound to be similar to a mechanism cognizing a compositional semantics in its causal organization.[31] For example, a system implementing *f* will presumably be such that if it outputs $\delta = f(S)$ upon receiving S as input and outputs $\sigma = f(S')$ upon receiving S′, it will output the Mentalese conjunction of δ and σ upon receiving as input S conjoined with S′, and so on for other Boolean connectives. Plausibly, if we possess a mechanism satisfying the structural requirements for implementing *f*, it must be in some sense productive and compositional. It must be *like* the "semantics-involving" system postulated by the cognitivist in certain high-level structural respects. Matthews's argument can perhaps be read as highlighting this fact, which I do not deny. I agree that whatever implements human semantic competence non-trivially exhibits a degree of productivity, compositionality with respect to certain operations, systematicity, recursion, and the like.

But the degree of structure required to implement a full compositional semantic theory is not required to implement *f*. If we cognize by implementing a semantic theory T, then we must have a system *s* that computes the full semantic interpretation function *i* specified by T: The function *i* such that it is a theorem of T that expression *e* means *m* just if $i(e) = m$. To implement *i*, if *s* takes an input corresponding to *e*, *s* must deliver an output corresponding to *m*. Presumably, the input and output will be Mentalese representations of *e* and *m*, respectively. So, if we implement *i*, we are required to have a system accepting arbitrary (representations of) English expressions as inputs and outputting (representations of) their meanings. But this is not a requirement for implementing *f*. Crucially, a Map-following mechanism need not accept subsentential expressions as inputs. It could implement *f* without accepting "snake next to him" as an input.

For this reason, a system can implement *f* without being structurally isomorphic to the derivational structure of a compositional semantics. A system might implement *f* without being in any states that correspond to semantic axioms assigning meanings to the basic expressions of English, or without being in states with causal powers that mirror the derivational powers of those axioms. We might comprehend "Bears really do fly" by implementing *f* in a way that is not causally enabled by our being in four discrete states encoding lexical entries for "bears", "really", "do", and "fly".

It is understandable that one might doubt this. There is a temptation to think that if a mechanism implements *f*, it must contain a subsystem implementing a function from arbitrary grammatical expressions to semantic values. But this is a mistake.

5.3 | The indexicality objection

One might object that if we follow Map to interpret a sentence containing an indexical, we will be wrong about its meaning. If I perceive Obama utter "I tweet" and follow Map, I will end up believing:

[31]Thanks to an anonymous referee for raising this point.

(14) "I tweet" means that I tweet.

But (14) seems false. The "I" outside the quotes in (14) will refer to *me*. But "I tweet" in Obama's mouth does not mean that *I* tweet. It means that Obama tweets, or so goes the objection. I have three different responses to this difficulty.

The first is that if we should handle indexicality by modeling sentence-meanings more like Kaplanian characters, then, by appealing to the rule Map-for-Characters in Section 3.2.2 above, and I can avoid this problem.

The second reply is that this objection is dialectically ineffective, at least in a debate about whether cognitivism or MM best explains comprehension. If MM cannot be extended to explain how we comprehend indexical sentences, this is no occasion for cognitivists to celebrate. For if only a small fragment of our language is indexical, as Cappelen and Lepore (2005) argue, then the MM explanation of comprehension does not go far wrong. And it is no problem if this explanation is incomplete. After all, the cognitivist's explanation of comprehension is equally incomplete. If we need knowledge of context to recover the meanings of indexical sentences, we cannot get it from semantic cognizing; we must rely on perception and our pragmatic competence. So it is no point in favor of cognitivism that our language is indexical.

The third reply is to suggest one way in which the indexicality objection might rest on a mistake. Consider the parallel objection that following Map results in error for context-sensitive sentences. Suppose "rich" is context sensitive. And imagine I hear someone utter "Gates is rich" in context *c*, follow Map, and wind up believing:

(15) "Gates is rich" means that Gates is rich.

Now, let "is rich*" context-insensitively express the specific property expressed by "is rich" in (15) (i.e., the property it expresses in *c*). If (15) is true, then (16) must also be true:

(16) "Gates is rich" means that Gates is rich*.

But (16) is false. If (16) were true, then "Gates is rich" and "Gates is rich*" would mean the same thing, for "Gates is rich*" also means that Gates is rich*. But they do not mean the same thing because "is rich" and "is rich*" differ in meaning. Thus, it looks like (15) is false. So following Map led to error, or so goes the objection.

Now, any argument that something as obvious as (15) is false must go wrong somewhere. The misstep, I conjecture, is the thought that (15) entails (16). It is puzzling how this could be wrong though. (15) and (16) only differ in that "is rich" in (15) is replaced with "is rich*", with which it is co-referential, in (16). But this may be a mistake: thinking that co-referential terms can be intersubstituted *salva veritate* in "means that"-contexts. This looks more like a mistake if properties are individuated coarsely, in such a way that "is rich" and "is rich and such that $4 + 3 = 7$" express the same property. While (15) is true, (17) is false:

(17) "Gates is rich" means that Gates is rich and such that $4 + 3 = 7$.

Perhaps it is a mistake, then, to think that following Map goes wrong with context-sensitive sentences. But if so, then for the same reason it is a mistake to think that Map goes wrong with indexical sentences. One cannot argue, about our original case, that (14) is false because "I tweet" does not mean that *I* tweet, even though the "I" in (14) refers to me in our context.

So, what following Map leads me to believe—that "I tweet" means that I tweet (i.e., (14))—is not so clearly false.

Indeed, I suggest that (14) should be taken seriously as a candidate fact of indexical meaning. This is in line with a suggestion from Ludlow (1999) that the meanings of sentences containing indexicals must be displayed disquotationally using those very indexicals (pp. 62–3).[32] Taking this suggestion seriously requires denying that sentence-meanings are propositions. For if "that I tweet" denotes a proposition in (14), it presumably denotes the proposition that *I* tweet, which is not the meaning of "I tweet". But Ludlow's suggestion makes more sense on a view on which sentence-meanings are instead more like subpropositional blueprints, as discussed in Section 3.2.1. For if that-clauses can also express blueprints, we can distinguish what "that Gates is rich" in (15) means—something subpropositional—from what "that Gates is rich*" in (16) means—a complete proposition, as we stipulated. In this way I can resist the worry that comprehending context-sensitive sentences by following Map leads to error. In the end, I find these three replies to the indexicality objection equally promising.

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REFERENCES

Bach, K. (1994). Conversational implicature. *Mind & Language*, *9*(2), 124–162.
Balcarras, D. (2020). On what language is (Doctoral thesis). Massachusetts Institute of Technology.
Braun, D. (1995). What is character? *Journal of Philosophical Logic*, *24*(3), 227–240.
Cappelen, H., & Lepore, E. (2005). *Insensitive semantics: A defense of semantic minimalism and speech act pluralism*. Blackwell.
Carruthers, P. (1996). *Language, thought and consciousness: An essay in philosophical psychology*. Cambridge University Press.
Carston, R. (2000). Explicature and semantics. *UCL Working Papers in Linguistics*, *12*, 1–44.
Carston, R. (2002). *Thoughts and utterances: The pragmatics of explicit communication*. Blackwell.
Carston, R. (2008). Linguistic communication and the semantics/pragmatics distinction. *Synthese*, *165*, 321–345.
Chalmers, D. (1994). On implementing a computation. *Minds and Machines*, *4*(4), 391–402.
Chomsky, N. (1975). *Reflections on language*. Pantheon.
Chomsky, N. (1980). *Rules and representations*. Columbia University Press.
Chomsky, N. (1986). *Knowledge of language: Its nature, origin, and use*. Praeger.
Chomsky, N. (1992). Explaining language use. *Philosophical Topics*, *20*(1), 205–231.
Chomsky, N. (1993). *Language and thought*. Moyer Bell.
Chomsky, N. (2000). *New horizons in the study of language and mind*. Cambridge University Press.
Clapp, L. (2012). Is even thought compositional? *Philosophical Studies*, *157*, 299–322.

[32]See also Ludlow (2007, pp. 166–167). Rumfitt (1993) makes a similar suggestion, inspired by McDowell (1977), who argues that the "sense" of "Hesperus" is "displayed" by "'Hesperus' stands for Hesperus" but not by "'Hesperus' stands for Phosphorus", even though "Hesperus" and "Phosphorus" co-refer (p. 164).

Davies, M. (1981). *Meaning, quantification, necessity: Themes in philosophical logic*. Routledge.
Davies, M. (1987). Tacit knowledge and semantic theory: Can a five per cent difference matter? *Mind*, *96*(384), 441–462.
Devitt, M. (1981). *Designation*. Columbia University Press.
Devitt, M. (1996). *Coming to our senses: A naturalistic program for semantic localism*. Cambridge University Press.
Devitt, M. (2006). *Ignorance of language*. Oxford University Press.
Devitt, M., & Sterelny, K. (1999). *Language and reality: An introduction to the philosophy of language* (2nd ed.). The MIT Press.
Dummett, M. (1976). What is a theory of meaning? (II). In G. Evans & J. McDowell (Eds.), *Truth and meaning: Essays in semantics* (pp. 67–137). Oxford University Press.
Dummett, M. (1993). *The seas of language*. Oxford University Press.
Dupre, G. (2021). What would it mean for natural language to be the language of thought? *Linguistics and Philosophy*, *44*, 773–812.
Evans, G. (1981). Semantic theory and tacit knowledge. In S. H. Holtzman & C. M. Leich (Eds.), *Wittgenstein: To follow a rule* (pp. 118–137). Routledge.
Fodor, J. (1975). *The language of thought*. Harvard University Press.
Fodor, J. (1983). *The modularity of mind: An essay on faculty psychology*. The MIT Press.
Fodor, J. (1990). *A theory of content and other essays*. The MIT Press.
Fodor, J. F. (1987). *Psychosemantics: The problem of meaning in the philosophy of mind*. The MIT Press.
Fricker, E. (2003). Understanding and knowledge of what is said. In A. Barber (Ed.), *Epistemology of language* (pp. 325–366). Oxford University Press.
Glanzberg, M. (2014). Explanation and partiality in semantic theory. In A. Burgess & B. Sherman (Eds.), *Metasemantics: New essays on the foundations of meaning* (pp. 259–292). Oxford University Press.
Grandy, R. (1990). Understanding and the principle of compositionality. *Philosophical Perspectives*, *4*, 557–572.
Harman, G. (1970). Language learning. *Nous*, *4*(1), 33–43.
Harman, G. (1973). *Thought*. Princeton University Press.
Harman, G. (1975). Language, thought, and communication. In K. Gunderson (Ed.), *Language, mind, and knowledge: Minnesota studies in the philosophy of science* (Vol. VII, pp. 270–298). University of Minnesota Press.
Heim, I., & Kratzer, A. (1997). *Semantics in generative grammar*. Blackwell.
Higginbotham, J. (1983). Is grammar psychological? In L. S. Cauman, I. Levi, C. Parsons, & R. Schwarz. (Eds.), *How many questions? Essays in honor of Sidney Morgenbesser* (pp. 170–179). Hackett.
Higginbotham, J. (1986). Linguistic theory and Davidson's program in semantics. In E. Lepore (Ed.), *Truth and interpretation: Perspectives on the philosophy of Donald Davidson* (pp. 29–48). Blackwell.
Higginbotham, J. (1987). Is semantics necessary? *Proceedings of the Aristotelian Society*, *88*, 219–241.
Higginbotham, J. (1989). Knowledge of reference. In A. George (Ed.), *Reflections on Chomsky* (pp. 153–174). Blackwell.
Higginbotham, J. (1991). Remarks on the metaphysics of linguistics. *Linguistics and Philosophy*, *14*(5), 555–566.
Hornstein, N. (1984). *Logic as grammar*. The MIT Press.
Hornstein, N. (1988). The heartbreak of semantics. *Mind & Language*, *3*(1), 11–27.
Horwich, P. (1998). *Meaning*. Oxford University Press.
Johnson, K., & Lepore, E. (2004). Knowledge and semantic competence. In I. Niiniluoto, M. Sintonen, & J. Wolenski (Eds.), *Handbook of epistemology* (pp. 707–731). Springer.
Kaplan, D. (1978). Dthat. In P. Cole (Ed.), *Syntax and semantics 9: Pragmatics* (pp. 221–243). Academic Press.
Kaplan, D. (1989). Demonstratives: An essay on the semantics, logic, metaphysics, and epistemology of demonstratives and other indexicals. In A. Almog, J. Perry, & H. Wettstein (Eds.), *Themes from Kaplan* (pp. 481–563). Oxford University Press.
Katz, J. J. (1972). *Semantic theory*. Harper & Row.
Katz, J. J., & Fodor, J. A. (1963). The structure of a semantic theory. *Language*, *39*, 170–210.
Larson, R., & Segal, G. (1995). *Knowledge of meaning: An introduction to semantic theory*. The MIT Press.
Lepore, E. (1983). What model-theoretic semantics cannot do. *Synthese*, *54*(2), 167–187.
Lepore, E. (1997). Conditions on understanding language. *Proceedings of the Aristotelian Society*, *97*(1), 41–60.
Lepore, E., & Loewer, B. (1981). Translational semantics. *Synthese*, *48*(1), 121–133.

Lepore, E., & Ludwig, K. (2005). *Donald Davidson: Meaning, truth, language, and reality*. Oxford University Press.
Lepore, E., & Ludwig, K. (2007). *Donald Davidson's truth-theoretic semantics*. Oxford University Press.
Lewis, D. (1970). General semantics. *Synthese*, *22*(1–2), 18–67.
Ludlow, P. (1999). *Semantics, tense, and time: An essay in the metaphysics of natural language*. The MIT Press.
Ludlow, P. (2007). Understanding temporal indexicals. In M. O'Rourke & C. Washington (Eds.), *Situating semantics: Essays on the philosophy of John Perry* (pp. 155–177). The MIT Press.
Ludlow, P. (2011). *The philosophy of generative linguistics*. Oxford University Press.
Matthews, R. (2003). Does linguistic competence require knowledge of language? In A. Barber (Ed.), *Epistemology of language* (pp. 187–213). Oxford University Press.
McDowell, J. (1977). On the sense and reference of a proper name. *Mind*, *86*(342), 159–185.
McGilvray, J. (2001). Chomsky on the creative aspect of language use and its implications for lexical semantic studies. In P. Bouillon, B. Federica, & B. Boguraev (Eds.), *The language of word meaning* (pp. 5–27). Cambridge University Press.
Napoletano, T. (2017). Why truth-conditional semantics in generative linguistics is still the better bet. *Erkenntnis*, *83*(3), 673–692.
Neale, S. (2004). This, that, and the other. In M. Reimer & A. Bezuidenhout (Eds.), *Descriptions and beyond* (pp. 68–182). Oxford University Press.
Pagin, P. (2003). Schiffer on communication. *Facta Philosophica*, *5*, 25–48.
Pagin, P. (2012). Truth theories, competence, and semantic computation. In G. Preyer (Ed.), *Donald Davidson on truth, meaning, and the mental* (pp. 49–75). Oxford University Press.
Peacocke, C. (1989). When is a grammar psychologically real? In A. George (Ed.), *Reflections on Chomsky* (pp. 111–130). Blackwell.
Picazo Jaque, C. (2019). Are mental representations underdeterminacy-free? *Synthese*, *196*, 633–654.
Pietroski, P. (2018). *Conjoining meanings: Semantics without truth values*. Oxford University Press.
Platts, M. (1997). *Ways of meaning: An introduction to a philosophy of language* (2nd ed.). The MIT Press.
Rey, G. (1992). Semantic externalism and conceptual competence. *Proceedings of the Aristotelian Society*, *92*, 315–333.
Rey, G. (2020). *Representation of language: Philosophical issues in a Chomskyan linguistics*. Oxford University Press.
Richard, M. (2003). Objects of relief. In A. Jokic & Q. Smith (Eds.), *Time, tense, and reference* (pp. 157–190). The MIT Press.
Rumfitt, I. (1993). Content and context: The paratactic theory revisited and revised. *Mind*, *102*(407), 429–454.
Schiffer, S. (1987). *Remnants of meaning*. The MIT Press.
Schiffer, S. (1993). Actual-language relations. *Philosophical Perspectives*, *7*, 231–258.
Segal, G. (2006). Truth and meaning. In E. Lepore & B. Smith (Eds.), *The Oxford handbook of philosophy of language* (pp. 189–212). Oxford University Press.
Soames, S. (2005). Naming and asserting. In Z. Szabo (Ed.), *Semantics versus pragmatics* (pp. 356–382). Oxford University Press.
Sperber, D., & Wilson, D. (1995). *Relevance: Communication and cognition* (2nd ed.). Blackwell.
Stabler, E. (1983). How are grammars represented? *Behavioral and Brain Sciences*, *6*(3), 391–421.
Stich, S. (1983). *From folk psychology to cognitive science: The case against belief*. The MIT Press.
Taylor, K. (2001). Sex, breakfast, and descriptus interruptus. *Synthese*, *128*, 45–61.
Waights Hickman, N. (2021). (implicit) knowledge, reasons, and semantic understanding. *Mind & Language*, *36*(5), 707–728.
Yalcin, S. (2014). Semantics and metasemantics in the context of generative grammar. In A. Burgess & B. Sherman (Eds.), *Metasemantics: New essays in the foundations of meaning* (pp. 17-54). Oxford University Press.

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