Analyticity, Necessity, and the Epistemology of Semantics*

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Contemporary philosophy standardly accepts Frege's conceptions of sense as the determiner of reference and of analyticity as (necessary) truth in virtue of meaning. This paper argues that those conceptions are mistaken. It develops referentially autonomous notions of sense and analyticity and applies them to the semantics of natural kind terms. The arguments of Donnellan, Putnam, and Kripke concerning natural kind terms are widely taken to refute internalist and rationalist theories of meaning. This paper shows that the counter-intuitive consequences about the reference of natural kind terms depend as much on Frege's conceptions of sense and analyticity as on what such theories of meaning say about the senses of natural kind terms. Rather than refuting the internalist and rationalist theories of meaning, the arguments of Donnellan, Putnam, and Kripke are best recast as refutations of their own Fregean assumptions. The paper also shows how autonomous notions of sense and analyticity enable us to reconstruct such theories, formulate an internalist/rationalist account of semantic knowledge, and preserve Donnellán's, Putnam's, and Kripke's insights about reference.

Introduction

Philosophers who agree on little else agree that analyticity—if there is such a thing—is (necessary) truth in virtue of meaning alone. I will call this "the standard view". The view derives from Frege's (1953, p. 4) definition of analyticity as truth based on proof based on logical laws and definitions. The standard view is taken entirely for granted both by philosophers like Carnap

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(1965, p. 8 and p. 222) who accept analyticity and necessity and also by philosophers like Quine (1953, p. 21) who reject them. Quine's (1953, p. 23) definition of an analytic statement in "Two Dogmas of Empiricism" as a statement that "can be turned into a logical truth by putting synonyms for synonyms"—which set the terms for the debate about analyticity—is a virtual paraphrase of Frege's definition. The general acceptance of the standard view is due to its being perceived as the only view on analyticity that intensionalists have available to them.

The standard view is as deeply influential as it is widely accepted. The arguments of Donnellan, Putnam, and Kripke concerning the semantics of natural kind terms, which most philosophers now take to be the decisive arguments against the traditional theory of meaning (i.e., the theory coming down to us from Descartes, Locke, and Kant) depend on the standard view and the Fregean notion of sense underlying it. Those arguments have had important philosophical consequences not only in the philosophy of language but also in areas such as the theory of knowledge and the philosophy of mind. Generalizing Donnellan's (1962, pp. 647–58) doubts about the connection between analyticity and necessity, Putnam called the very possibility of a priori semantic knowledge into question. Putnam's and Kripke's ingenious counter-examples to Frege's apriorist/internalist position and Putnam's conception of the social nature of linguistic semantics spearheaded an empiricist and externalist takeover in the philosophy of language. Given that the traditional theory of meaning was widely seen to be the last bastion of apriorism and internalism, the repercussions of this takeover have been felt in many other areas of philosophy.

In the present paper, I will argue that the standard view isn't the only intensionalist conception of analyticity. Analyticity, truth, and necessity are not related in the way the standard view takes them to be, they are not so related because analyticity is not what the standard view takes it to be, and that is because sense in natural language is not what Frege takes it to be. I will develop an alternative to the Fregean definition of sense and to the standard view of analyticity. I will argue that Putnam's and Kripke's arguments concerning the semantics of natural kind terms assumes the standard view and, hence, that my alternative blocks their arguments. If successful, my alternative not only goes a long way toward resurrecting the traditional theory of meaning, but shows that an empiricist/externalist view of semantic knowledge has not been established. At the end of the paper, I show how the non-Fregean conception of meaning and analyticity can be used to ground a rationalist/internalist conception of semantic knowledge.

2. Un Peu D'Histoire. It is remarkable indeed how much of twentieth-century philosophy of language and logic is a dialectic between Frege's semantics and Wittgenstein's (1953, section 79–87 inter alia) criticisms of it. Frege's
(1952, p. 57) definition of sense as the determiner of reference is the linchpin of his semantics. It provides a solution to both his old problem about identity in the Begriffsschrift and his new problem about substitution of co-referential expressions into oblique contexts. The definition also opens the way for Frege’s logicism by making analyticity a species of logical truth. In striking at Frege’s definition of sense, Wittgenstein struck at the core of Frege’s semantics and the centerpiece of his philosophy.

Wittgenstein’s basic criticism is that defining sense as the determiner of reference imposes too strong a constraint on reference. He elaborated a number of counter-intuitive consequences. For example, in a discussion which anticipates much of the best work on names over the last thirty five years or so, Wittgenstein (section 79) asks, “Has the name ‘Moses’ got a fixed and unequivocal use for me in all possible cases?”. Answering momentously for philosophy of language and indeed for philosophy as a whole, Wittgenstein (1953, sections 80 and 84) says, “we are not equipped with rules for every possible application of [a word]”. Clearly with Frege in mind, Wittgenstein (1953, section 81) says that meaning and understanding are not a matter of “operating a calculus according to definite rules”.

Donnellan (1962, pp. 647–58) was the first to explicitly raise Wittgensteinian doubts about whether we have comprehensive semantic rules in order to challenge the then widely held position that there are necessary truths which can be known a priori in virtue of their being analytic in the sense of the standard view. He (1962, pp. 658–59) observed that to establish the necessity of (1) on the basis of analyticity would require rules for “deciding what our present usage prescribes concerning all hypothetical situations”. After careful consideration of the prospects for showing that we have such rules, Donnellan concludes that:

There is no reason, a priori, why our present usage should legislate for all hypothetical cases. Given present circumstances the correct thing to say is that all whales are mammals. But whether this is, as we intend it, a necessary truth or contingent is indeterminate. It is indeterminate because the decision as to which it is would depend upon our being able to say now what we would say about certain hypothetical cases. And evidently we are not prepared to do that. (Donnellan 1962, p. 659)

This well-known challenge to the necessity of extra-logical truths is unclear on a critical point. What is it that Donnellan is saying cannot be legislated a priori? Is it the extension of the term “whale” or is it the intension? If the former, then Donnellan is right to say that there is no a priori reason why our language ought to legislate the application of “whale” for all hypothetical
cases. There is, as he says, no way to decide purely linguistically whether typical uses of (1) express a necessary truth.

However, if the answer is the intension, whether or not Donnellan is right depends on what intensions are taken to be. If intensions are taken to be Fregean senses, then, since Donnellan is right about extensions, he would seem to be right about intension, too. Given that Donnellan is right about extension, this would make the possibility of a rationalist/internalist epistemology for semantics come down to whether intensions have to be taken as Fregean senses. If intensions can be taken as something other than Fregean senses, there may be a way to meet Donnellan’s challenge and to have a rationalist/internalist epistemology for semantics.

In criticizing the attempt to connect analyticity and necessity, Donnellan (1962, p. 647) explicitly targeted C. I. Lewis’s (1946, pp. 15–42) notion of intension:

To know the sense meaning of an expression is to know what features in the situation would be necessary and sufficient for the expression to apply to it. [A sense is] a set of criteria in virtue of which [a term] is correctly applied to things.

Although Donnellan focused on Lewis’s notion of intension, he could just as well have targeted Carnap’s (1965, p. 234) notion of intension: “general conditions which an object must fulfil in order to be denoted by [a] word”. C. I. Lewis’s and Carnap’s notions are simply variants of Frege’s notion of sense. Since all intensionalists at the time were Fregean intensionalists, Donnellan was in fact taking on the entire prevailing intensionalist establishment.

Given that intensions are Fregean extension determiners, Donnellan’s conclusion that there is no a priori reason for our present usage to legislate the intension of “whale” for all hypothetical cases is compelling. We can’t know whether the property of having mammary glands is part of the Fregean intension of “whale” without knowing whether all possible creatures to which the term applies have mammary glands. But, since we cannot know about more than a small number of such possible creatures, we are unable to say whether the criteria attaching to “mammal” are included in those attaching to “whale”. Being in no position to say now what we would say about a hypothetical creature having the overall look of observed whales but lacking mammary glands, we are in no position to say whether (1) expresses a necessary or contingent truth.

Donnellan’s claim about “whale” is not part of a general claim about the extra-logical vocabulary of the language. In the case of some terms, including some natural kind terms, Donnellan thinks that we can determine criteria inclusion. In particular, he (1962, pp. 652–53) says that “the criteria for applying ‘animal’ (whatever they may be) are included among the criteria for applying ‘cat’”. Donnellan accepts the analyticity of (2), and is also inclined to
(2) Cats are animals.

accept the analyticity of (3). He (1962, p. 653) argues that someone’s doubts

(3) Blue is a color.

about the analyticity of sentences like (2) or (3) “cast a shadow over our
confidence” in their grasp of the meaning of “cat” and “blue”.

But, in saying that such doubts cause us to be suspicious of the doubter’s
understanding of “cat” and “blue”, Donnellan seems to be making a distinc-
tion without a difference. Why isn’t the same argument available in the case
of (1) also? Or, more to the point, why is such an argument available in the
Case of (2)? The observed regularity supporting (2) can provide no better basis
for thinking that the criterion for “cat” contains the criterion for “animal”
than the observed regularity supporting (1) can for thinking that the criterion
for “whale” contains the criterion for “mammal”. It thus seems inconsistent
for Donnellan to claim that the question of whether a truth is necessary or
contingent is indeterminate for one natural kind term (“whale”) but that it is
determinate for the other natural kind term (“cat”). The fact that both terms
are natural kind terms makes it hard to contemplate splitting the cases. Don-
nellan’s appeal to a defective linguistic understanding should be available in
both cases or in neither.

Putnam’s (1962, pp. 658–71) paper “It Ain’t Necessarily So” resolves
this problem in favor of neither by showing how an appeal to linguistic un-
derstanding could also fail in the case of (2). Putnam’s discussion of his now
famous “robot cat” example explains Donnellan’s linguistic qualms about the
natural kind term “cat” as based on nothing more than a simple failure of
imagination. The discussion thus open up the possibility of generalizing
Dunnellan’s limited skepticism about the connection between intension and
necessity in the case of “whale” to all other natural kind terms.

Putnam’s (1970) subsequent paper “Is Semantics Possible?” attempts to
establish this generalization on the basis of new examples and an argument
that there is no a priori connection between intension and necessity in the
case of natural kind terms because knowledge of their intension depends on
empirical knowledge of their extension. Putnam (1970, pp. 140–41) argues
that the semantics of natural language is an empirical subject because the
meaning of natural kind terms is obtained from empirical investigation into
the nature of their referents:

A natural kind term … plays a special kind of role. If I describe something as a lemon … I
indicate that it is likely to have certain characteristics (yellow peel, or sour taste …); but I also
indicate that the presence of those characteristics is likely to be accounted for by some
‘essential nature’ which the thing shares with other members of the kind. What the essential
nature is is not a matter of language analysis, but of scientific theory construction.
Putnam wants to replace the traditional sense essentialism (i.e., something is a reference fixing intension of a natural kind term (or any term) in virtue of the a priori essence of the sense of the term) with a new reference essentialism (i.e., something is a reference fixing intension of a natural kind term in virtue of the a posteriori essence of the objects in the extension of the term).

The central assumption of Putnam’s argument is the Fregean idea that senses are reference determiners. Putnam argues that, to get the extension of a natural kind term like “aluminum” right, we need a sense which is more than a cluster of characteristics like ‘light metal’, ‘silver color’, ‘durable’, ‘rustless’, etc. Such a cluster, Putnam (1970, p. 150) points out, cannot guarantee reference determination because it does not suffice to get the extension of “aluminum” right: “[f]or all [we] know every one of [the characteristics] may also fit molybdenum”. To get the “customary meaning” of “aluminum” right “one has to be sure one has the right extension”. Putnam then argues that, to be sure of the right extension, one has to know the essential nature of its members. From these reflections, he (1970, p. 141) draws his epistemological conclusion that “what really distinguishes the classes we count as natural kinds is itself a matter of … [empirical] scientific investigation”. Semantic knowledge of natural kind terms is fundamentally empirical knowledge of the nature of their referents. If this argument works, Putnam has refuted the traditional views of meaning and analyticity, and also at least one form of necessity.

I think Putnam’s “Is Semantics Possible?”, like Quine’s “Two Dogmas of Empiricism”, was a landmark essay in presenting new empiricist ideas which, for better or worse, transformed subsequent Anglo-American philosophy. Subsequent papers of Putnam’s (1975a, pp. 215–71; 1975b, pp. 196–214; 1973, pp. 699–711) present novel variants of the “aluminum/molybdenum” argument which clarify its implications but do not improve upon it essentially.

These variants similarly depend on Frege’s conception of sense to argue that in order to get the extension right, we require empirical information about the essential nature of its members. The assumption of the Fregean conception of sense is completely explicit in the way Putnam argues from his Twin Earth example. First, he uses the example to show that (C1) and (C2) cannot both be true. Then, without saying anything to independently

(C1) Knowledge of the meaning of a term is just a matter of being in a certain psychological state.

(C2) The meaning of a term (in the sense of its intension) determines its extension (in the sense that sameness of intension determines sameness of extension).
establish that (C2) is true, Putnam concludes that (C1) is false. Without the Fregean premiss (C2) as an assumption of the argument, the famous Twin Earth argument would be an infamous Twin Earth fallacy.

Thus, Putnam’s disagreement with Frege and Carnap is not at all like Quine’s disagreement with them. In Putnam’s case, it is a Fregean family squabble. As early as “Is Semantics Possible?”, we find Putnam (1970, p. 151) saying that “[m]eaning indeed determines extension”. Where he disagrees with Frege and Carnap is on what constitutes meaning. In the case of natural kind terms at least, Putnam sees empirical information as determining extension. On Putnam’s (1970, p. 151) view of meaning, “extension (fixed by some test or other) is, in some cases, ‘part of the meaning’”. Stereotypic characteristics of the normal member of a natural kind (e.g., the yellow color and sour taste of lemons) are not enough. “One must”, Putnam (1970, p. 150) claims, “also convey the extension, one must indicate which kind the stereotype is supposed to ‘fit’”.

3. Intension and Its Relation to Extension. If the philosophical controversy about natural kind terms were to come down to nothing more than a Fregean family squabble, Putnam would certainly be right that meaning contains empirical information beyond what is represented in our psychological state. Moreover, Putnam’s argument pushes Frege’s notion that the sense of a term must contain the information necessary for determining its reference to its logical conclusion, which turns out, surprisingly, to be the abandonment of Frege’s original internalist/rationalist semantics in favor of an externalist/empiricist semantics.

But if the philosophical controversy about natural kind terms is more than a family squabble, then it is no longer clear that Putnam is correct in rejecting (C1) and accepting an externalist/empiricist semantics. Everything now hinges on (C2). If there is a form of intensionalism outside the Fregean family circle, Putnam’s arguments are in trouble. Since intensionalists like Frege, Carnap, and C. I. Lewis subscribed to Frege’s definition of sense and, hence, to (C2), they were helpless when Putnam turned (C2) against them. But an intensionalist who subscribes to a definition of sense that carries no commitment to (C2) might have more resources.

In Semantic Theory (Katz, 1972), I presented such a definition of sense. This was the definition (D). (D) defines sense, not as the determiner of referential properties and relations, but as the determiner of sense properties and relations. (D) poses a threat to Putnam style arguments because, as we have seen, those arguments assume sense determines reference, and a theory of meaning based on (D) can reject this assumption. Putnam style arguments
The sense of an expression is that aspect of its grammatical structure which is responsible for its sense properties and relations, i.e., having a sense (meaningfulness), sameness of sense (synonymy), multiplicity of sense (ambiguity), repetition of sense (redundancy), opposition of sense (antonymy), and so on. (Katz 1972, pp. xvi–xxvii and 1–12).

Work only if the empirical information necessary to fix the reference of natural kind terms must be part of their sense. But, on (D), where senses are only required to contain the linguistic information necessary to determine sense properties and relations, empirical information does not have to be part of sense.

Putnam overlooked this. He overlooked it because he (1970, pp. 144–46) misrepresented the theory of sense based on (D) as a “translation into ‘mathematical’ language of precisely the traditional theory that it has been our concern to criticize”. Given the characterization of my theory of sense as such a “translation”, it is, of course, easy for Putnam to “refute” it. He (1970, p. 145) needs only point out that “[i]t follows that each counterexample to the traditional theory is at once a counterexample to Katz’s theory”. This misrepresentation prevents Putnam from recognizing how radically (D) differs from Frege’s definition of sense and how a theory of sense based on (D) leads to a different conception of the relation between sense and reference.

The critical feature of (D) is that it makes no reference to reference. It cuts the definitional connection Frege had made between the concept of sense and the concept of reference, replacing Frege’s referential explanation of sense with one on which sense is explained as a feature of the internal structure of sentences. To see how sharply this separates the theory of sense from the theory of reference, note that the theory of sense cannot even express the principle that sense determines reference—or, for that matter, any other principle about the relation between sense and reference. A principle like (E) which states the conditions under which something is the referent of a term is

(E) The referent of a term is something that falls under its sense.

Inexpressible because the vocabulary of the theory contains no concepts from the theory of reference, not even ‘referent’. Similarly, the principle (F) is inexpressible in a referentially autonomous theory of sense. If such principles

(F) If a sentence is analytic, it expresses a necessary truth.

8 JERROLD J. KATZ
are to be expressed at all, they have to be expressed outside the theory of sense, in the theory of reference.

But, once the Fregean notion of sense is taken away, the existing rationale for adopting (E) and (F) in the theory of reference is also taken away. This frees us to consider other, far looser, relations between sense and reference. I (1992, pp. 689–720) have argued that this freedom allows intensionalists to develop a "new intensionalism" in which sense plays an essential role in the fixing of reference but does not determine it. On the new intensionalism, sense mediates rather than determines reference.

To explain what this means, we have to distinguish the reference of linguistic types from the reference of linguistic tokens. This is to adopt a distinction like Strawson's (1950) distinction between sentences and expressions, on the one hand, and their utterances, on the other. When we say that the English proper noun "Smith" refers to many different people or that the English common noun "unicorn" does not refer to anything, we are talking about the reference of linguistic types. When we say that someone refers or that an utterance refers, we are talking about the reference of linguistic tokens. The mediation thesis claims that sense determines neither "type-reference" nor "token-reference", but plays an essential role in the way each is fixed.

Absence of determination in the case of token-reference was precisely what Wittgenstein expressed in saying that "we are not equipped with rules for every possible application of [a word]". Non-literal uses of language in and of themselves show that the sense of an expression type does not determine the reference of its tokens. But even when a token is used with its literal sense, that sense does not determine the reference of the token. This is what examples of "reference under a false description" establish. In Donnellan's (1966) example, a token of (4) refers to a man drinking sparkling water despite the fact that the sense of the subject of the token of (4) is

(4) The man in the corner drinking champagne is tall.

' the man in the corner drinking champagne'. In this case, sense-subsumption is pre-empted as the criterion for determining the referent of the token of (4) because it is clear in the context that it is the man drinking sparkling water to whom the speaker intends to refer and falsely believes to be drinking champagne.¹

¹ Reference under a false description is a quite general phenomenon. Tokens of nearly all noun phrases can have a literal meaning but not literal reference as a consequence of Donnellan style situations. For example, if Cotton Mather were to use a token of "The witch standing in the front is the most dangerous" to refer to a woman apprehended for witchcraft, it would have the sense 'witch' but not refer to witches. Women without supernatural powers would be the referents even though they do not fall under the sense
In contrast, absence of determination in type-reference is much less obvious. I suspect that Boghossian (1993) speaks for philosophers generally when he claims that sense must determine type-reference. There even seems to be a compelling argument for the claim. Let's say the sense of the English word "bachelor" is the property of being an unmarried man. Since the set of all and only the things which exemplify that property is the set of bachelors, we have to say—in the theory of reference, to be sure—that the property 'unmarried man', *ex hypothesi* the sense of "bachelor", determines the type-reference of "bachelor". Exemplification delivers determination.

What is wrong with this argument is that it depends on Fregean intensionalism. Within Fregean intensionalism, the notion 'type-reference (extension) of the term t' and the notion 'set that P picks out' are co-extensive. Hence, given that a property P is the sense of a term t, the type-reference of t is the set that P picks out within Fregean intensionalism. But, outside Fregean intensionalism, the notions need not be co-extensive. It is supposed that they must be because (E) is taken for granted. If we were compelled to accept (E), then, of course, we would have to accept the set that a property P picks out as the extension of any term with P as its sense. But acceptance of (E) is acceptance of Fregean intensionalism. Here is precisely where the question is begged. (E) is forced on Fregean intensionalists, because, on their definition of sense, (E) is the trivial truth that the referent of a term is something that falls under the determiner of its referent. But nothing compels non-Fregean intensionalists to accept (E).

On (D), the function of a sense is just to determine the sense properties and relations of an expression type. Accordingly, on the new intensionalism, (E) is not the trivial claim that the referent of a term is something that falls under the determiner of its referent. (E) is the significant claim that what determines the sense properties and relations of expression types also determines their referential properties and relations. This is why we are not compelled to accept (E). And, if we are not compelled to accept (E), we are not compelled to accept the co-extensiveness of 'the type-reference (extension) of the term t' and 'set that P picks out'. For non-Fregean intensionalists, exemplification does not deliver determination.

(D) makes it possible to reject the Fregean principle that sense determines type-reference, but why actually reject it? Since the Fregean principle can appear in the theory of reference without compromising a theory of sense based on (D), why opt for the weaker claim of mediation, why say that sense is a necessary but not sufficient condition for type-reference? There are various reasons to prefer mediation to determination as a general principle about type-

'witch' because everyone in the context falsely believes there are witches, has the appropriate mutual knowledge about each other's beliefs, and recognizes Cotton Mather's intention to refer the women in question. (See Katz (1990a, pp. 31–61, 1990b, and 1994).
reference. One of them is, ironically, Putnam's own "aluminum"/"molybdenum" style arguments. Given that a cluster of characteristics like 'light metal', 'silver color', 'durable', 'rustless', etc. is the sense of "aluminum", that is, that sense is the best hypothesis to explain the sense properties and relations of "aluminum", (E) would commit us to falsely claiming that the reference of "aluminum" includes molybdenum. Thus, once Frege's principle is no longer part of the theory of sense, Putnam's own arguments force us to opt for the mediation thesis's weaker claim about the relation between sense and reference.

There are also reasons quite apart from the semantics of natural kind terms. One is the existence of meaningful expression types that have no type-reference. Examples are "relative adjectives", e.g., "big", "small", "fat", "thin", etc. It makes no sense to assign an extension to "big ones" or a truth value to "There are small ones", not even a null extension as would be appropriate in the case of "the largest integer" or falsehood as in the case of "There is a largest integer". The meaning of relative adjectives does not provide the necessary information about the standard of comparison (see Katz (1972, pp. 254–61). Another class of examples, more controversial but still arguably appropriate, are proper names. The meaning of a proper name does not provide information about either what its bearers are or which of them is the contextually unique bearer which its definiteness requires (see Katz (1990a and 1994). In section 6, I will argue that natural kind terms are also examples of meaningful expression types whose sense provides too little information to fix type-reference. I will also present an alternative to (E), (E*), which will explain how extra-semantic information supplements semantic information to fix type-reference.

4. The Rejection of the Standard View. Since sense properties and relations are the only ones that sentences have in virtue of their linguistic meaning, reference and truth cannot be properties that sentences have in virtue of their linguistic meaning. Analyticity qua property that a sentence has in virtue of the kind of meaning it has cannot be a property a sentence has in virtue of the kind of relation it has to the world. Hence, analyticity cannot be understood as a species of logical truth, that is, as (necessary) truth in virtue of meaning.

A sense theory based on (D) rejects the standard view. Analyticity has to be understood as a property that sentences have in virtue of having a sense with a particular internal structure. Analyticity has to be understood in the same way as other sense properties and relations, such as ambiguity, redundancy, and synonymy. This becomes clear when we consider the analyticity of (5) alongside the redundancy of (6). Both derive from the

(5) Squares are rectangles.
same containment of the sense ‘rectangle’ in the sense ‘square’. The only difference between (5) and (6) is that, in the former case, the contained and containing senses are, respectively, senses of a predicate and a subject, while, in the latter case, they are, respectively, senses of a modifier and head.

The idea of analyticity as a particular internal structure of a sense enables us to correct the defects in the traditional conception of analyticity. Both Locke’s (1924, p. 306–8) and Kant’s (1951, p. 14) conceptions restrict analyticity to subject-predicate sentences, and Kant’s is formulated as a psychological statement about our thought processes. Frege (1953, pp. 99–100) exploited such difficulties to argue that his notion of analyticity is superior to the traditional one because it avoids such a restriction and psychologism. But analyticity does not have to be made a species of logical truth to avoid those defects. A mentalistic formulation is unnecessary because the defining condition for analyticity can be stated directly in terms of sense structure. The restriction to subject-predicate sentences can be avoided by replacing the condition that the sense of the subject contains the sense of the predicate with the general condition that the sense of some term (subject, direct object, indirect object, etc.) contains the sense of the entire sentence (see Katz (1972, pp. 171–97)). Thus, we have a generalization like (G).

(G) A sense of a simple sentence is analytic if that sense is fully contained in the sense of (any) one of its terms.

sentences (i.e., sentences containing no clause structure) with any finite number of terms. (G) not only captures subject-predicate sentences like (5) but also relational sentences like (7). Such sentences exhibit the same redundant predication as subject-predicate sentences, but they do so with respect to some term other than the subject.

(7) People walk with those with whom they stroll.

Removing Kant’s restriction of the containing term to subjects undercuts Frege’s (1853, pp. 100–101) famous “fruitfulness” argument. Once we have a non-logical notion covering relational sentences like (7), the argument that a logical notion of analyticity is preferable to a non-logical one because it is more “fruitful” is revealed as begging the question of whether a definition of analyticity for natural language ought to cover relational sentences which express logical truths. Frege ignores the possibility that a logically fruitful notion might be “too fruitful” for the explication of analyticity as a sense prop-

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2 (G) is not intended as a definition of analyticity, but only as a presentation of the core idea.
Saying that a sense is analytic on the new intensionalism means only that the sentence has a particular configuration of component senses: the containment structure sketched in (G). It says nothing about the relation of the sense, or of sentences which express it, to objects in the world. Thus, we have to go beyond the theory of sense to the theory of reference to say that an analytic sentence like (5) or (7) expresses a truth. In section 7, I will discuss the concepts that the theory of reference will require to assign analyticity the proper referential correlate.

5. Donnellan and Putnam Revisited. In this section, I will try to show that the existence of the new intensionalism blocks the “sweeping reinterpretation of the notion of necessity” that Donnellan (1962, p. 658) contemplated, and that the arguments concerning natural kind terms of Donnellan, Putnam, Kripke, and Fodor are widely taken to establish.

5.1. Donnellan. Given that he was thinking in terms of the standard view of analyticity, Donnellan was quite right to claim that we are unable to determine whether (1) is analytic. But, on (D), we can determine whether a sentence is analytic in a quite straightforward matter. In connecting sense properties and relations like meaningfulness, ambiguity, synonymy, antonymy, etc. with the senses of expressions, (D) provides us with a means for deciding whether the claim that a sentence is analytic is correct. This connection enables us, on the basis of familiar philosophy of science style considerations, to provide a methodology for (in principle) determining the truth of claims about the senses of expressions.

Consider Donnellan’s (1962, pp. 647–58) question whether the zoologist or the sailor is right about the sense of “whale”. We frame a hypothesis H1 on which the sense of “whale” contains the sense of “animal”. We also frame hypotheses H2, …, Hn on which the senses of the two words are not so related. Assuming the hypotheses are as simple as possible, we compare the predictions they make about the sense properties and relations of sentences in which “whale” and “animal” appear with the judgments speakers make about the sentences. If H1 makes significantly better predictions than H2, …, Hn, we accept H1 in the same spirit as we accept other scientific hypotheses. If it does not, we accept the hypothesis that makes the best predictions or continue the study.

These considerations throw a different light on the apparent inconsistency of Donnellan’s claiming, on the one hand, that “we cannot at present pass judgment” on all hypothetical situations involving the use of the natural kind term “whale”, and, on the other, of his claiming that someone’s doubts about the analyticity of sentences like (2) “cast a shadow over our confidence” in
their grasp of the meaning of “cat”. Our present language does not determine whether expressions or sentences have a referential property or relation, but it does determine whether they have a sense property or relation. Since analyticity is a matter of the sense structure of words, it could be that (2) but not (1) is analytic in present English. It could also be that, whatever the status of (1), it is much less transparent to speakers than is the status of (2). Hence, Donnellan might well be correct to claim that doubt about the analyticity of (1) is entirely appropriate, but that doubt about the analyticity of (2) “cast[s] a shadow over our confidence” in the doubter’s understanding of the meaning of the word “cat”. He has not made an inconsistent claim.

He is, however, unwarranted in claiming that “whether [(1)] is, as we intended it, a necessary truth or contingent is indeterminate”. (1) is either analytic or not, and if it is analytic, it might be necessary. Whether it is depends, as we shall see, on what the referential correlate of analyticity is and on the nature of the relation between analyticity and its referential correlate.

5.2. Putnam. The great strength of Putnam’s arguments in application to Frege, Carnap, and C. I. Lewis is that such intensionalists share the critical assumption of the arguments. As a consequence of assuming that sense is Fregean sense, those philosophers have no way to defend themselves against Putnam. He hoists them on their own petard. However, the new intensionalism turns this great strength of Putnam’s arguments into a fatal weakness. In application to this intensionalism, the arguments are questioning begging.

Putnam (1962) argues that (2) cannot be analytic on the grounds that it is possible for all past applications of “cat” to refer to non-animals. But his argument works only if the analyticity of (2) is inconsistent with literal applications of “cat” referring to non-animals. This is so if (2) is analytic in the Fregean sense where intension determines extension. But if (2) is analytic in the sense of (G) and intension only mediates extension, the possibility of “cat” referring to non-animals is entirely consistent with the analyticity of (2). Putnam’s conclusion does not follow.3

3 The reference to robots with the word “cat” is straightforwardly explained as a case of reference to robots under the false description ‘feline animal’. Putnam’s case works exactly like Donnellan’s case of the man drinking sparkling water. In Putnam’s case, as in Donnellan’s, the belief on the basis of which the description was chosen is, unbeknownst to the speaker(s), false. In Putnam’s case, we believe that there are feline animals and that they appear and behave in the way the robots do. Reference to the robots succeeds via the false belief because, as in Donnellan’s case, it is clear in the context to whom the speaker intends to refer and of whom he or she has the belief. Since reference to a sparkling water drinker in a literal application of “man in the corner drinking champagne” is not a counter-example to the claim that the sense of “man in the corner drinking champagne” analytically contains the sense of “man drinking an alcoholic beverage”, reference to robots in a literal application of “cat” cannot be a counter-example to the claim that the sense of “cat” analytically contains the sense of “animal” See also footnote 9.
Putnam (1970) argues that, because a collection of characteristics like ‘light metal’, ‘dull silver color’, ‘durable’, and ‘rustless’ fits molybdenum as well as aluminum, the sense of the term “aluminum” must include empirical information about the nature of aluminum in order for it to determine the true extension of “aluminum”. But without (C2) the sense of “aluminum” does not have to determine the extension of a term, and, hence, the sense of “aluminum” does not have to include empirical information. Similarly, Putnam (1975a) concludes that the sense of “water” must include the empirical information that water is H₂O in order to avoid taking the existence of XYZ on Twin Earth to be the existence of water. Without (C2), this conclusion does not follow.⁴

5.3. Kripke. Kripke’s (1972, 1980, pp. 116–34) arguments are essentially the same as Putnam’s. Kripke (1972, 1980, p. 121) uses the Fregean notion of sense as the determiner of reference to show that the meaning of a natural kind term is not “a ‘cluster concept’ in which most, but perhaps not all, of the properties used to identify the kind must be satisfied”. Kripke (1972, 1980, p. 128, fn. 66) explicitly calls such putative reference fixing cluster concepts “Fregean intensions”. His arguments show that Fregean intensions misidentify the referents of natural kind terms in counterfactual situations, but, like Putnam’s arguments, they do not apply to intensions that are not required to identify the referents of terms.

Kripke’s (1972, 1980) “blue gold” case is parallel to Putnam’s “robot cat” case. In the latter case, we refer to robots under the false description ‘feline animal’ because we are unaware that the Martians are deceiving us. In the former case, we refer to a blue metal under a false description like ‘metal of a

⁴ Putnam has not provided independent support for Frege’s principle (C2). He (1983, p. 149) has argued that, with (C2),

... we have a clear reason for saying that “grug” has a different meaning in North Ruritanian and in South Ruritanian. Since the word “grug” clearly has a different reference in the two dialects of Ruritanian, it also has a different meaning. Once we decide to put reference (or rather difference in reference) aside, and to ask whether “grug” has the same ‘content’ in the minds of Oscar and Elmer, we have embarked on an impossible task. Far from making it easier for ourselves to decide whether the representations are synonymous, we have made it impossible.

Putnam begs the question in his argument from a difference in the reference of “grug” in the two dialects to a difference in its meaning in them because the argument appeals to (C2). This makes his claim that we ought not relinquish (C2) rest entirely on his claim that synonymy cannot be determined without it. But, as must be clear by this point, that claim is false. A theory based on (D) provides a way of determining sameness of sense which makes no reference to (C2): two expressions are counted as synonymous just in case they are represented as having the same sense in the simplest grammar that best predicts their sense properties and relations. For further discussion of Putnam’s claim, see Katz (1990b, pp. 222–24).
natural kind whose normal members are very heavy, rustless, durable, extremely malleable, and a yellow color' because we are unaware that an optical illusion makes blue substances appear yellow. Kripke's (1972, 1980, p. 119) argument from his iron pyrites example is the same as Putnam's argument from his molybdenum example. Kripke's (1972, 1980, pp. 119–21) tiger example splits into two cases, one in which an optical illusion makes us mistakenly think tigers have four legs when they really have only three and the other in which we discover tiger-like creatures that are reptiles rather than mammals. The former is parallel to the gold case with leggedness playing the role of color; the latter is parallel to the molybdenum case, with tiger-like reptiles playing the role of molybdenum.

5.4. Fodor. Fodor's (1994, pp. 103–5) argument against decompositional semantics also assumes that senses or concepts must be Fregean intensions. In fact, his argument is a version of Putnam's "aluminum" argument, with only the natural kind term changed. Fodor (1994, p. 104) says that "Concepts can't be definitions because most concepts don't have definitions. At a minimum, to define a concept is to provide necessary and sufficient conditions for something to be in its extension (i.e., for being among the things the concept applies to)." Fodor (1994, p. 104) claims that there is no definition for a concept like the one "dog" expresses: "try actually filling in the blanks in 'x is a dog iff x is a …' without using words like 'dog' or 'canine' or the like on the right-hand side". Let us assume Fodor is right about this: the best we can do to fill in the blanks are characteristics like 'animal', 'mammal', and 'carnivore' which do not collectively provide a necessary and sufficient condition for the application of "dog". So what? In decompositional semantics, definitions are only supposed to analyze the sense of a term into the senses and relations between them that make it up, not to fix its extension. That definitions are hypotheses about sense properties and relations and nothing more is quite clear from Semantic Theory (1972, pp. 1–10) and other works which are explicit in not taking senses to be determiners of reference.

6. Reference Under an Incomplete Description. Even though Putnam's, Kripke's, and Fodor's arguments beg the question against the new intensionalism, their examples raise the question of how the new intensionalism explains the type-reference of natural kind terms. In this section, I want to answer this question.

Let us assume that the evidence from sense properties and relations of sentences containing "aluminum" shows that the best hypothesis about the sense of "aluminum" is that it is 'metal of a natural kind whose normal members are light in weight, with a bluish silver-white color, durable, and rustless'. Let us go further with Putnam and also assume that molybdenum is a metal of a natural kind whose normal members are light in weight, with a bluish...
silver-white color, durable, and rustless. Given these assumptions, Putnam would want to say that molybdenum is put into the type-reference of "aluminum". Thus, we need to show that either this is not the case or that, if it is, it is no problem for the new intensionalism.

It would be no problem if "aluminum" and "molybdenum" were synonymous. They could be on our assumptions. Without evidence about the sense properties and relations of "molybdenum", we cannot rule out the possibility that it, too, has the sense 'metal of a natural kind whose normal members are light in weight, with a bluish silver-white color, durable, and rustless'. If it did, the synonymy of "aluminum" and "molybdenum" would automatically provide an explanation of their having the same type-reference.

But we will go all the way with Putnam. In any case, it seems more plausible to say that "aluminum" and "molybdenum" are not synonymous. This brings us to the critical issue that Putnam style natural kind examples raise for the new intensionalism: On what grounds can the new intensionalism mark "aluminum" and "molybdenum" as nonsynonymous? What makes this the critical issue is that Putnam's fundamental criticism of traditional intensionalist theories is that they cannot assign different senses to natural kind terms like "aluminum" and "molybdenum" without sacrificing apriorism and internalism.

On our theory of sense, there are three ways that "aluminum" and "molybdenum" can be nonsynonymous without sacrificing the internalist/apriorist stance of the new intensionalism. They are the following:

(H*) The senses of "aluminum" and "molybdenum" are different, but not opposed.

(H**) The senses of "aluminum" and "molybdenum" are opposed, and the sense components which express the opposition also conceptually characterize its nature.

(H***) The senses of "aluminum" and "molybdenum" are opposed, but the sense components which express the opposition provide no conceptual characterization of its nature. They simply mark the opposition.

On (H*), the terms "aluminum" and "molybdenum" are nonsynonymous and nonantonymous. This hypothesis represents their senses as differing in the manner of the senses of "plumber" and "electrician". It might be, for example, that the concept 'sonorous' occurs in the sense of "aluminum" but not "molybdenum", or the concept 'relatively infusible' occurs in the sense of the latter but not the former. On (H**) and (H***) in contrast, "aluminum" and "molybdenum" are antonymous. In the case of (H**), the senses of the terms...
are represented as differing in the manner of the senses of “male” and “female” or “sighted” and “blind”. “Aluminum” and “molybdenum” are, we might say, “informatively” antonymous, since the components of their senses that are responsible for the antonymy provide an explication of the conceptually opposed contents. It might be, for example, that the concept of forming alloys with some particular substance occurs in the sense of one term and the concept of not forming alloys with that substance occurs in the sense of the other. Finally, on (H***), the senses of “aluminum” and “molybdenum” are antonymous, but not informatively so. (H****) represents their senses as differing in the manner of the senses of “blue”, “red”, and other color terms. The sense components responsible for the nonsynonymy mark the incompatibility of the terms with each other and with the other members of their antonymous n-tuple, but those components express no more than bare incompatibility.

We now turn to the type-reference of “aluminum” and “molybdenum” in the cases (H*), (H**), and (H***). If natural kind terms have a sense of the form (H*) or (H**), a theory of reference can employ (E) for assigning type-reference to such terms. Accordingly, the type-reference of a sentence like (8)

(8) Aluminum is a more abundant metal than molybdenum.

is a statement about aluminum. If, on the other hand, the sense of “aluminum” has the form (H***), its sense would not be informative enough to yield the correct type-extensions on the basis of (E). If (E) were employed, (8) would be wrongly taken to express the statement that aluminum and molybdenum is more abundant than aluminum and molybdenum. Hence, as indicated above, a theory of reference cannot employ (E). Given that the senses of “aluminum” and “molybdenum” have the form (H***), the senses are incomplete descriptions of the extensions of these natural kind terms. In this case, I will call the reference of such terms “reference under an incomplete description”.

As in the case of reference under a false description, extra-linguistic information is required to compensate for the deficiency of the description. We have two questions to answer about reference under an incomplete description. First, since the compensating information can’t be contextual information in a case of type-reference, what is it? Second, since the principle governing cases of reference under an incomplete description can’t be (E), what is it?

The answer to the first question is that the extra-linguistic information is knowledge of the natural kind, that is, as Putnam urged, scientific knowledge.

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5 I (1972, pp. 47–55, pp. 157–71) referred to such classes of terms as “antonymous n-tuples”. I (1972, pp. 82–88) referred to the components of semantic markers which provide such a brute representation of incompatibility as “distinguishers”.

18 JERROLD J. KATZ
of its natural essence. But, of course, there is an important difference between the way we see the status of such knowledge and the way Putnam does. We draw a distinction between linguistic concepts and explanatory conceptions. A linguistic concept is what a term expresses in the language, what we have been calling a sense. A linguistic concept is specified by the analytic sentences of the language—in the sense of (G)—which contain the term. In contrast, an explanatory conception is what a term conveys about its referent in some body of scientific theory or conventional lore. An explanatory conception is specified by the non-analytic (synthetic) sentences about the nature of the term's referent in the appropriate theory or body of lore. This distinction corresponds to the classical distinction between nominal definitions and real definitions: nominal definitions define linguistic concepts and real definitions define explanatory conceptions. Given these distinctions, we have (I).

(I) A sense s is an incomplete description for a term t just in case s is the linguistic concept that t expresses in the language (as fixed by t's nominal definition), but, as a criterion for the reference of t, s fails to determine the extension of t as given by the appropriate explanatory conception (as fixed by its real definition).

Given that the information which fixes the type-reference of terms with a sense of the form (H*** comes both from the language and from the real definitions of the terms, the principle for reference under an incomplete description is:

(E*) The type reference of a term having a sense of the form (H*** are the thing(s) falling under both the sense and the real definition of the term.

Speakers' sense competence, in particular, their knowledge of the senses of “aluminum” and “molybdenum”, informs them that they are incomplete semantic descriptions, and, hence, that extra-linguistic information about aluminum and molybdenum will be necessary for the application of the terms. Speakers' referential competence, in particular, their knowledge of (E*), in-

6 Putnam (1973, 1975b, p. 204) ignores the linguistic concept/explanatory conception distinction by treating semantic descriptions on my theory as representations of stereotypes, that is, as he (1975a, pp. 249–52) puts it, pieces of conventional wisdom about what something "looks like or acts like or is" (see Katz (1972, pp.450–52)). Thus, Putnam mis-represents me as buying into a form of semantic empiricism when he (1970, 1975b, p. 141) represents me as holding that empirical information is part of the meaning of natural kind terms.

7 This distinction was drawn by Locke (1924, pp. 306–7), emphasized early in this century by realists such as Holt (1960, pp. 169–70)), and recently re-emphasized by Kripke (1972, 1980, pp. 59–60).
forms them that the real definitions of aluminum and molybdenum provide
the necessary compensating information. (E*) further fleshes out the mediation
thesis: the sense of natural kind terms provides a necessary but not
sufficient condition for their type-reference.8

Let us now turn briefly to token-reference of terms that have a sense of the
form (H***). Sometimes speakers know the real definitions themselves; for
example, they might be metallurgists in the aircraft industry. More often,
however, they do not. Here the new intensionalism can use Putnam’s ideas
about the application of natural kind terms.9 As Putnam (1975, pp. 235–38)
suggests, speakers can apply a natural kind term with the intention of referring
to a substance of the same nature as certain paradigmatic cases of the
kind. Thus, speakers who are appropriately informed about the construction
of aircraft can use (8) to state that aluminum is more abundant than molybde-
num. In the extreme case of ignorance about even the appropriate paradigms,
speakers can exploit their relation to knowledgeable members of the language
community to fix reference indirectly, as Putnam (1975, pp. 227–29) sug-
gests in his Division of Labor Hypothesis. People who can’t tell aluminum
from molybdenum or an elm from a beech can piggyback on the experts who
can.

Kripke’s (1972, 1980, p. 118) case in which gold is blue but looks yel-
low due to an optical illusion involves reference under both a false and in-
complete description. Speakers can refer to the blue metal in spite of the fact
that the sense of “gold” contains the concept ‘yellow color’ because, in our
ignorance of the illusion, we believe the metal is yellow. We are able to refer
to the right blue metal because, even though the sense of “gold” says nothing
about the nature of the element, many of us have extra-linguistic knowledge
of its atomic structure and others can piggyback on the experts who can.

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8 Burge (in conversation) asks whether there is still a place for Fregean intensions in
semantics. I am not claiming they have no place in semantics, only that senses are not
Fregean intensions and Fregean intensions have no place in the theory of sense. Given
principles like (E) and (E*) for one or another class of expressions, Fregean intensions
(or, Carnapian functions from the domain of a language to sets of objects from the do-
main) are part of the theory of reference. Externalism comes in with principles like (E*)
where fixing the reference of a class of terms requires real definitions to complement
224–32).

9 Kripke’s causal theory for the reference of names can be incorporated into the new in-
tensionalism, though without Millianism. Dropping the Millianism is all to the good, since,
one senses are no longer construed as reference determiners, Millianism is more trouble
than it’s worth, since it brings back the Fregean puzzles about names that have motivated
taking names to have sense (see Katz (1994)).

10 Putnam (1962, p. 660) says that, after we discover that all applications of the word “cat”
refer to non-animals, “we should continue to call these robots that we have mistaken for
animals … ‘cats’”. Maybe, but nothing hangs on what future speakers decide to do about
the word “cat”. The younger generation could get it into its heads to apply “square” to
circles. This would not mean that the proposition that (5) expresses is not the obvious

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JERROLD J. KATZ
We have shown that the new intensionalism can handle the natural kind examples that figure in Putnam style arguments. We have thus shown that the arguments which most philosophers take to be decisive against traditional theories of meaning are decisive only against Fregean intensionalism. New intensionalists can thus enlist those arguments in the cause of convincing intensionalists not to be Fregeans.

7. Rationalist Semantics. Even though Putnam’s arguments do not establish that the epistemology of semantics is empiricist, they show that Frege’s semantics and his epistemology are incompatible. If we accept his semantic claim that sense is the determiner of reference, we have to say that the sense of a natural kind term contains empirical information about the essential nature of the kind. In that case, knowledge of the sense of the term is empirical, and therefore we have to deny Frege’s claim that the epistemology of semantics is rationalist. Alternatively, if we accept Frege’s epistemological claim that knowledge of sense is a priori, we have to deny that the sense of a natural kind term contains empirical information about the essential nature of the kind. In that case, the sense of the term does not prevent it from applying to other substances, and therefore we have to deny that sense is

analytic truth it is. The significant issue concerns the sense of “cat” in applications that come under Putnam’s counterfactual. Without his assumption that sense must be Fregean sense, Putnam can no longer claim that the hypothetical fact that we have been using “cat” to refer to robots is incompatible with ‘feline animal’ being the sense of “cat” in those past applications.

The discovery that gold is blue would certainly entrain a change in our scientific conception of gold, but whether the discovery would also entrain a change in the sense or reference of the English word “gold” would remain open. Actual cases of comparable discoveries have gone both ways. The discovery that stars are corruptible bodies led to a change in the meaning of “star”, but not a change in its reference. Due to developments in modern science, the term “atom” acquired both a new sense and a new reference. And, despite the discovery that the sun is stationary, the verb in “The sun rises at seven” seems to have the sense ‘to move from a lower to a higher (apparent?) position’. Accordingly, assuming the notion of yellow color is part of the sense of “gold”, the discovery that gold is blue might cause a semantic change in which that notion is dropped from the sense of “gold”—with or without the notion of blue color replacing it. Then again, the meaning might be retained despite the discovery that gold is not yellow. Perhaps, as in the case of the term “sunrise”, speakers continue to experience the full force of the illusion.

Change of meaning belongs to diachronic linguistics, but the criterion for change of meaning involves applying the methodology for synchronically determining the senses of words twice, once to the language at the early stage and then to it at the later stage. There is a change in meaning just in case the hypothesis which best explains the sense of the word at the early stage and the hypothesis which best explains it at the later one assign different senses. Thus, Donnellan’s (1962, pp. 653–57) objection that there is no distinction in Lewis’s semantics between change of meaning and change of belief, though a valid objection to an appeal to change of meaning within Fregean intensionalism, is not a valid objection within the new intensionalism.
the determiner of reference. Putnam’s arguments show that philosophers cannot maintain both Fregean semantics and Fregean rationalism.11

Having rejected Fregean semantics and having shown that Putnam style arguments do not force us to say that semantic knowledge is \textit{a posteriori}, we can explore the possibility that semantic knowledge in our sense is \textit{a priori}. This exploration brings us back to Donnellan. Donnellan (1962, pp. 657–58) could see “no reason, a priori, why our present usage should legislate for all hypothetical cases”. Since the possibility of a rationalist epistemology for semantics depends on there being such a reason, we have to answer the following two questions:

(Q1) What grounds are there for taking knowledge of sense structure, and of analyticity in particular, to be \textit{a priori}?

(Q2) What grounds are there for taking the knowledge of the referential structure which connects analyticity to necessity to be \textit{a priori}?

We can be brief in answering (Q1) since section 5.1 already sketches the methodology for acquiring knowledge of sense structure. We know sense properties and relations of expressions on the basis the speaker’s \textit{a priori} linguistic intuitions in clear cases. For example, our linguistic intuition tells us that “Sherlock Holmes loves his mother” is meaningful, that “The number seventeen loves its mother” is nonsense, that “Sherlock Holmes dusted the table” is ambiguous, that “sister” and “female sibling” are synonymous, that “open” and “closed” are antonymous, that “unmarried bachelor” is redundant,

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11 There were three reasons at the time why Putnam’s choice of Fregean semantics seemed to be the right one. None are convincing now. The first was Putnam’s own arguments that empirical information concerning the essence of natural kinds is necessary to fix the reference of such terms. As long as there is no alternative to the Fregean principle that sense determines reference, Putnam can argue from the necessity of empirical information for fixing the reference of natural kind terms to the conclusion that the sense of such terms contains empirical information. But, once we have the mediation principle and (E*) to explain how empirical information about the extension of a term can fix reference without being part of its sense, he cannot.

The second reason was the influence of Quine’s (1953 and 1960) arguments against meaning and analyticity. However, Quine ((1990); also Clark (1993)) himself now concedes those arguments are ineffective against a theoretical account of meaning based on (D) and analyticity in the sense of (G) (see also Katz (1988 and 1990b)). Quine admits that the linguistic concepts of meaning and analyticity might be no worse off than the concept of the gene about forty years ago (though, of course, he is not personally hopeful). This, as I see it, concedes that he has not provided a philosophical argument that no objective sense can be made of meaning and analyticity.

The third reason why Putnam’s choice seemed right was that his attractive proposals about language use (e.g., the Division of Labor Hypothesis) were thought to depend on an externalist and empiricist conception of the sense of natural kind terms. But, as we have seen, such proposals can be directly incorporated into the new intensionalism’s account of token-reference. Hence, the desire not to pass up such attractive pragmatic proposals is not a reason for choosing Fregean semantics over Fregean rationalism.
that “Squares are rectangles” is analytic, and that “Squares are circles” is contradictory.\textsuperscript{12} Beyond such intuitively obtained knowledge, knowledge of sense structure requires only reason to systematize it. Systematization of such facts in the form of laws and theories can be obtained on the basis of the kinds of \textit{a priori} reasoning we use in other formal sciences. The sense properties and relations in unclear cases can be deduced from the laws and theories that were erected on the basis of the clear cases.\textsuperscript{13}

(Q2) requires us to exhibit an \textit{a priori} connection between analyticity and necessity. Suppose we know \textit{a priori} that (2) is analytic in the sense of (G). Given our sharp sense/reference distinction, this, by itself, tells us nothing about the referential status of (2) or about the referential status of literal uses of its tokens. The conclusion to draw from this limitation, however, is not that referential knowledge is \textit{a posteriori}, but only that referential knowledge cannot be purely grammatical \textit{a priori} knowledge. Knowledge of the referential status of analytic sentences and their literal tokens has to be extra-grammatical, but it can still be \textit{a priori}.

For such knowledge to be \textit{a priori}, we have to be able to establish the appropriate referential correlate for analyticity \textit{a priori}. Given the influence of the standard view, the first such correlate that comes to mind is necessary truth. But adopting (F) makes a sentence like (2) a necessary truth even though there exist worlds in which there are no cats for (2) to be true of. To preserve (F) in the face of catless worlds, a simple sentence like (2) has to be interpreted as a truth-functionally compound one. From the standpoint of the

\textsuperscript{12} Knowledge of what kinds of sense properties and relations are found in natural language has to be \textit{a priori}, too. Such knowledge can be obtained independently of experience on the basis of intuitions about the meaning of meta-linguistic terms in natural languages. There is a wide range of clear cases where we can tell, intuitively, whether or not the meaning of such a term involves the notion of sense. We can see \textit{a priori} that the predicate “is nonsense” means ‘does not have a sense’, that the predicate “is ambiguous” means ‘has two or more senses’, and that the predicate “is synonymous” means ‘has the same sense’. Here, too, the approach is to construct a theory on the basis of the clear cases of sense properties and relations and use it to settle the status of unclear cases.

\textsuperscript{13} Even though semantic systematizations rest solely on \textit{a priori} reasoning from \textit{a priori} knowledge of clear cases, they are revisable in the light of further information. Knowledge of sense structure remains \textit{a priori} because revisability only takes place on the basis of information from further \textit{a priori} intuitions of sense structure or further \textit{a priori} reasoning. (See Hale (1987, pp. 142-48) on the issue of revisability.)

The question of the ontological status of sentences and senses has to be addressed in any complete account of \textit{a priori} semantic knowledge, since if sentences and senses are concrete objects, say, psychological or biological objects as they are on Chomsky’s (1965, 1986) approach, semantic knowledge would have to be \textit{a posteriori}. Hence, a rationalist epistemology for semantic knowledge must claim that grammatical objects are abstract objects. Taking a realist (or Platonist) view of linguistics, in turn, raises a host of issues, some belonging to the foundations of linguistics like the conflict between linguistic realism and Chomsky’s linguistic conceptualism, and others of a purely philosophical nature like those Benacerraf (1965, 1973) has raised. I address the former in (1981, 1996 and (with Postal) 1991) and the latter in (1995, in press).
new intensionalism, this interpretation is unacceptable because it assigns analytic sentences in the sense of (G) a logical form on which they become a species of logical truth. Indeed, this was just the interpretation that Frege cooked up to bring traditional examples of analyticity under his logical definition of analyticity.

There is more than a little irony here, insofar as it was also Frege who cooked up the distinction which leads to an alternative referential correlate for analyticity. His (1952, pp. 68–70) distinction between the assertion and the presupposition of a proposition (i.e., the condition “that the simple or compound proper names used have reference”) suggests that the correlate we want is a modal property in which necessity applies to the assertion but not the presupposition. Taking our cue from Kripke’s (1972, pp. 48–49) discussion of rigid designation, we take the referential correlate for analyticity to be ‘weakly necessary truth’, that is, the truth of a proposition in all possible worlds where its full presupposition is satisfied (i.e., where each of its referring terms has a non-empty extension). Every necessary truth is a weakly necessary truth, but not every weakly necessary truth is a necessary truth.

Given (J) and (K), we can define the correlate of analyticity as (F').

(J) A possible world w is a satisfier world for a proposition p just in case, for each term t in p, there are objects in w which fall under t.

(K) A proposition p is a weakly necessary truth just in case (i) p is a logical truth or (ii) there are possible worlds which are satisfier worlds for p and p is true in every satisfier world for p.14

(F') If a sense of a sentence p is analytic in the sense of (G), then p is a weakly necessary truth.15

An answer to (Q2) is an a priori argument for the principle (F') which connects analyticity to necessity. Here is such an argument. Consider an arbitrary sentence, say, (2), with a sense p that is analytic with respect to (G).

14 Existential sentences like “Golden Mountains exist” express weakly necessary truths (see Katz (1986a)), but existential sentences like “A largest integer” do not, since the first component of (ii) in (K) is not met.

15 Sentences like “Married bachelors are bachelors”, “Round squares are round”, etc. are not weakly necessary truths (see Katz (1972, pp. 145–48)). Since analyticity is purely a matter of having the appropriate sense structure, such sentences will be analytic. Since, on our theory of meaning, the complementary property of contrariorness is also a purely structural property, they will also be contradictory. Since the referential correlate of being a sense with an inconsistent term is being necessarily neither true nor false, the fact that such sentences are both analytic and contradictory causes no trouble. In fact, the sense concepts together with this referential correlate is the only way to express what is the full truth of the matter: the sentences in question are analytic and contradictory (in our sense) and also necessarily without a truth value. See Katz (in preparation) for further discussion of this.
Given \( p \) is analytic with respect to (G), it contains a term \( t \) having the entire sense content of \( p \). Hence, the conditions for \( t \) having a non-empty extension include the truth conditions of \( p \). In determining weakly necessary truth, the worlds with which we are concerned are all and only the satisfier worlds for \( p \). Since \( t \) has a non-empty extension in all of those worlds, \( p \) is true in all of its satisfier worlds, and, by (K), \( p \) is a weakly necessary truth. Since this argument for \( (F') \) is based on reason alone, we know \( (F') \) a priori.

Since the answer to (Q1) showed that we can know a priori that (2) is analytic, this argument that we know \( (F') \) a priori enables us to conclude that we can know a priori that (2) expresses a weakly necessary truth.

Further, since the statements made in literal uses of (2) express the analytic proposition that cats are animals, those statements are weakly necessary truths. Hence, we can now say that Donnellan's challenge to rationalism has been met. We have provided a reason to claim that we can know "in advance of experience" whether a sentence expresses a weakly necessary truth, and, further, a reason to claim that the statements we make in literal uses of it are weakly necessary truths. It is, therefore, of no concern that, on suppositions like Putnam's, a sentence like (2) might not be true in the actual world. (2) will be true in all worlds where feline animals exist, and, hence, we can say a priori that, for all possible worlds, everything in them is either a cat and an animal or no cat at all.

8. Conclusion. Donnellan's, Putnam's, and Kripke's arguments, though they do not refute an internalist concept of sense or a rationalist epistemology for semantics, show that Frege's intensionalism puts intensionalists on a slippery slope with externalism and an empiricist epistemology for semantics at the bottom. Once on the slope, there is no stopping short of the bottom, but, with the option of the new intensionalism, there is no need for intensionalists to step on the slope in the first place. The significance of this option is different for those intensionalists, like Donnellan, Putnam, and Kripke who seem happy with their destination and for those like myself who wouldn't be. For the former, the significance of the option is the loss of their inference ticket for the trip, while, for the latter, it is the opportunity to stay home.

Beyond this, the new intensionalism forces a comprehensive reassessment of the current externalist/empiricist position in the philosophy of language. When we reflect on the broad consensus this position now enjoys in philosophy, we can reasonably expect that, aside from its considerable effects within the philosophy of language, such a reassessment will at the very least reopen issues in epistemology, philosophy of mind, and metaphysics which were closed on the basis of conclusions wrongly drawn from Donnellan's, Putnam's, and Kripke's important work on natural kind terms.
Bibliography


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