

Semantic Verbs Are Intensional Transitives

JUSTIN D'AMBROSIO

Australian National University
justin.d'ambrosio@anu.edu.au

In this paper I show that we have strong empirical and theoretical reasons to treat the verbs we use in our semantic theorizing—particularly ‘refers (to)’, ‘applies (to)’, and ‘is true (of)’—as intensional transitive verbs (ITVs). Stating our semantic theories with intensional vocabulary allows us to partially reconcile two competing approaches to the nature and subject-matter of semantics: the Chomskian approach, on which semantics is non-relational, internalistic, and concerns the psychology of language users, and the Lewisian approach, on which semantics is fully relational, specifies truth-conditions, and has metaphysical implications. ITVs have two readings: an intensional, *de dicto* reading, and a relational, *de re* reading. A semantic theory stated with the *de dicto* readings of our semantic verbs captures the core insights of the Chomskian approach to semantics, in part because it allows us to assign extremely fine-grained semantic values to expressions, even when those expressions are empty. On the other hand, the *de re* reading yields a theory that is fully relational, and issues in truth-conditions. The resulting theories are related—and compatible—in that they are expressed by two different readings of the very same semantic vocabulary, and plausibly, the distinction between these two readings is one of scope.

1. Introduction

There is a strand of thought concerning the nature and subject matter of semantics on which semantics does not state relations between words and the world. On this view, semantics does not issue in truth conditions, nor do its lexical postulates state relations between words and objects. Instead, semantics is an internalistic enterprise that concerns the psychology of language users. This is the view proposed by Chomsky (1977, 1995, 2000), various versions of which are held by theorists working in the Chomskyan tradition, including Pietroski (2003, 2005, 2006, 2008, 2017), Collins (2008, 2009, 2014), and Jackendoff (1983), among many others. On Chomsky’s view, semantics attempts to explain how syntax interacts with our conceptual and intentional systems. It is only relative to an extremely detailed

context, along with fine-grained aspects of speakers' intentions, interests, beliefs, and desires—which may turn out to be theoretically intractable—that we can ever say that a word picks out a particular object in the world. Further, Chomsky thinks that even so relativized, there are still often no objects that are suitable candidates to serve as the worldly referents of a word, but this does not in any way threaten to deprive words of semantic significance. I will not rehash Chomsky's arguments for these claims here, but his main point is clear: the semantic features of words are not the result of their relation to any objects in the world, and the mind plays an important role in determining the semantic features of words in a way that renders assignment of objective reference either impossible or pointless.

But there is a competing line of thought according to which semantics does not concern speakers, their psychologies, or what makes them linguistically competent. Rather, semantics is a theory of the contents of natural-language expressions, where such contents are ultimately found in the world, or constructed mathematically out of pieces of reality. On this view, semantics makes use of lexical postulates that express genuine relations between words and objects or collections of objects, and from these premisses, semanticists derive theorems about what the world must look like for natural-language sentences to be true. This is the Lewisian conception of semantics (Lewis 1970, 1984, 1986), the main ideas of which are held by Soames (1987, 1989, 1992, 2002, 2005), Sider (2011), Williamson (2013), and Yablo (2014), among many others. Lewisian semantics is partly a metaphysical theory—it is a version of the theory of truthmaking.^{1,2}

In this paper, I argue for the adoption of a novel view of our semantic vocabulary that allows us to express both the Chomskyan and Lewisian forms of semantic theory using a single set of semantic postulates. This approach allows for a partial reconciliation between the views, revealing how the two types of theory can be stated

¹ These two conceptions of the nature and subject matter of semantics go by various names in the literature, but the distinction is ubiquitous. Sider (2011) aptly terms the two conceptions 'linguistic semantics' and 'metaphysical semantics', although his conception of metaphysical semantics is a bit more specific than the one applicable here. The idea of truth-making comes largely from D. M. Armstrong (1997, 2004). I recognize that there are important differences between the positions here, but each of them holds, roughly, that semantics states word–world relations, and that content is externalistic.

² Following Davidson (1966, 1967), some theorists, most notably Larson and Segal (1995), have tried to maintain that semantics is both a theory of semantic competence and a theory of word–world relations, but these views remain problematic for various reasons. See Szabó (1997) and Gross (2006) for discussion.

consistently, and how the theories are systematically related. Philosophers of language and semanticists working both inside and outside the Chomskyan tradition have largely assumed that reference, application, and truth (of) are purely extensional, and state relations between words and particular objects or other pieces of reality. This is why some Chomskyans have claimed that semantics should jettison the notions of reference and truth altogether, while many Lewisians have claimed that semantics should not concern itself with speakers, their psychologies, or what makes them linguistically competent.³ My central claim is that there are strong empirical and theoretical reasons to treat the verbs we use in our semantic theorizing—including ‘refers (to)’, ‘applies (to)’, and ‘is true (of)’—as intensional transitive verbs (ITVs). ITVs have two readings: an intensional, *de dicto* reading as well as a relational, *de re* reading. Stating our semantic theory with the *de dicto* readings of our semantic verbs yields a theory that is plausibly non-relational, and captures the main insights of the Chomskyan approach to semantics, while the *de re* reading yields a theory that is fully relational, and issues in truth conditions. These two approaches are related—and compatible—in that they are expressed by two different readings of the very same semantic vocabulary, and plausibly, the distinction between these two readings is one of scope.

A semantic theory stated with the *de dicto* readings of our semantic verbs can serve as a Chomskyan semantic theory because it provides us with new, intensional versions of reference and application that satisfy several important Chomskyan *desiderata*.⁴ The *de dicto* reading of a sentence involving an ITV can be true even when the noun phrase in its object position is empty, and also when that noun phrase does not pick out a specific thing. The object positions of ITVs also resist substitution of even co-intensive noun phrases. This allows the theory to assign extremely fine-grained semantic values to expressions, even when those expressions are empty or do not pick out a particular

³ Importantly, not all Chomskyans claim that we should jettison the notions of reference and truth altogether, although this is the lesson that some, including Pietroski (2003, 2005, 2006) at various points, draw from Chomsky’s arguments. I think that the best way of understanding Chomsky’s own comments in Chomsky (1995) and Chomsky (2000) is as endorsing a view on which semantics does make use of reference, application and truth, but construes them non-relationally, or intensionally.

⁴ Many of the arguments that Chomsky gives for abandoning the relational conception of semantics are based on the fact that reference and application exhibit intensional features, and he seems to hold that expressions refer, but that reference is not a relation, at least to ordinary objects. Admitting a *de dicto* reading of our semantic postulates allows us to capture this view precisely. More on this explication of Chomsky’s view in §7.

object. The ultimate nature of this theory will depend on the semantics we provide for ITVs more generally, but on several plausible views, including the one I favour, the correct semantics for the *de dicto* reading is non-relational. However, ITVs also have a reading on which none of these intensional features are present: their *de re* reading. The *de re* reading of a sentence containing an ITV expresses a relation between the subject and a particular, existent object or collection of objects, and does so independently of how that object or those objects are characterized by the object position of the sentence.⁵ This reading of our semantic vocabulary allows us to state a fully relational semantic theory, on which semantics has metaphysical implications.

My argument begins by showing that, in English, semantic verbs like ‘refers (to)’ and ‘applies (to)’ exhibit all of the features of intensional transitive verbs. However, in English these verbs are used to report things that speakers do: they are used to report speaker’s reference and application. But when these verbs are used to state the semantic features of words, as they are in semantic theorizing, they are used technically. Accordingly, I provide several arguments that the technical usage should incorporate the intensional features of the natural-language expressions. First, I argue that all theories of semantic reference appeal to speaker’s reference in their explanations—a fact that is rarely acknowledged—and so semantic reference should inherit the intensionality of speaker’s reference. I then argue that our technical terms ultimately need to be explained using non-technical vocabulary that we already understand, especially when such vocabulary is readily available. Further, in the case of our semantic verbs, there are practically no theoretical disadvantages of incorporating ITVs into our semantic theory, because ITVs subsume the traditional, extensional semantic notions as special cases. Lastly, making use of intensional transitive verbs in our semantic theorizing is theoretically enriching in a number of important ways, one of which is that it provides us with a novel mechanism for consistently expressing the two forms of semantic theory discussed above. But the view also allows us to make headway on several recalcitrant problems in the philosophy of language

⁵ Chomsky also allows that we can introduce technical senses of reference, application and truth that allow speakers to talk about the same stuff, for instance, in science (see Pietroski 2017, p. 6, and references therein). Thus, this proposal should be amenable to the Chomskyan, particularly because, as we will see, I think that the relational readings of our semantic verbs are just this: technical readings that are stipulated and divorced from ordinary usage.

and the foundations of semantics, including the problem of empty names and the Foster problem, along with its intensional variant.

2. Intensional transitive verbs

A verb is considered transitive when it takes a noun phrase in its object position, occurring in sentences of the form NP V NP'.⁶ A transitive verb V is considered intensional when sentences of the above form exhibit some combination of the following three properties.

Emptiness: NP V NP' has a reading which fails to entail NP' exists, where NP' is upward-entailing.⁷

Non-specificity: NP V NP' has a reading that fails to entail NP Vs a particular NP'.

Opacity: NP V NP' has a reading that fails to entail NP V NP*, where NP' and NP* are extensionally equivalent.⁸

To see these properties in action, let's consider a canonical example. We can see that the verb phrase 'looking for' exhibits *Emptiness* by noting that (1) has a reading which does not imply (2):

- (1) John is looking for the fountain of youth.
- (2) The fountain of youth exists.

This establishes that 'looking for' exhibits *Emptiness*.

'Looking for' also exhibits the second property of ITVs, *Non-specificity*. Consider a case where 'looking for' has an indefinite noun phrase in its object position, such as the following:

- (3) John is looking for a capable business partner.

⁶ However, many verbs that are technically intransitive are treated as transitive when they occur in constructions of the form NP V P NP', where P is a preposition. This is typically done when the combination of intransitive verb and preposition have a transitive verb as a near-synonym, such as in the case of 'seeks' and 'is looking for'. Many of these verb + preposition combinations behave identically to transitive verbs, and so unless otherwise noted, I'll treat them as intensional transitives also.

⁷ By 'upward entailing' I mean to include positively quantified NPs like 'a dog', 'the men who robbed him', 'four gorgons', 'infinitely many numbers', as well as proper names, and bare plural NPs. I mean to exclude negative NPs like 'no dogs', 'no one', etc. By 'empty' I mean that nothing in the world answers to the NP.

⁸ It is important to note that there are many ITVs that do not have all of these features: typically, the presence of even one of these properties is sufficient to classify a verb as intensional. However, verbs like 'seek' are paradigmatically intensional, in that they exhibit all three of the properties. As will become clear, I am arguing that not only are our semantic verbs intensional, they are like 'seek' in being paradigmatically intensional.

Clearly there is a reading of (3) that does not entail (4):

- (4) John is looking for a particular capable business partner.

John may merely be seeking to share his entrepreneurial tasks with someone he thinks will help his business, and he might be satisfied with a great number of different individuals. We can bring this out with the following continuation:

- (5) John is looking for a capable business partner—but no one in particular.

Lastly, 'looking for' exhibits *Opacity*: given two coextensive NPs, substitution of one for another within its complement does not preserve truth:

- (6) John is looking for Ortcutt.

- (7) John is looking for the shortest spy.

In this case, John might not know that Ortcutt is the shortest spy, and so the goal of his search may be to find Ortcutt and not the shortest spy. Thus (6) may be true while (7) is false, which means that 'looking for' exhibits *Opacity*.

These inferential tests indicate that there is a reading of sentences containing ITVs on which their object position is not existence-entailing, can receive a non-specific interpretation, and resists substitution of co-extensive expressions. However, there is also a reading that does not have these features. Consider John's search for a capable business partner above. As we saw, John need not be looking for any particular person. However, he might be, and (3) can also be used to report just such a search. We can bring out this other kind of search with the following paraphrase:

- (8) There's a particular capable business partner for whom John is looking.

The truth conditions of (8) differ from those of the reading which we brought out with (5) above. This indicates that (3) is ambiguous between two readings. I will call the reading brought out by (8) the *de re* reading of (3), and the reading brought out in (5) its *de dicto* reading. Distinguishing between these two readings is in keeping with a long tradition. Quine (1956) originally distinguished between what he called the notional and relational readings of sentences like

- (9) I want a sloop.

The relational, *de re* reading of (9) can be brought out with the following paraphrase:

(10) There is a sloop such that I want it.

The notional, *de dicto* reading can be captured by the idea that I seek ‘mere relief from slooplessness’, and brought out with the continuation in (11):

(11) I want a sloop—but no particular one.

In the current literature these two readings are often called ‘specific’ and ‘non-specific’, or ‘extensional’ and ‘intensional’.⁹ In what follows, I will continue to use the terms *de re* and *de dicto*, because they are somewhat more theoretically neutral than the other pairs of terms used to mark the distinction, and they don’t tie the two readings to any one of the properties of ITVs. Additionally, the distinction between *de re* and *de dicto* is commonly captured in terms of scope, which I think is the best way to capture the distinction between the two readings of ITVs.¹⁰ We will return to issues of scope below.

⁹ The ambiguity is sometimes taken to arise only when the NP in object position is an indefinite description (Moltmann 1997; Zimmermann 1993, 2001, 2006). But like Mark Richard (2013), I think this is mistake. While there may be a specific/non-specific ambiguity that arises in connection with indefinite descriptions, this is simply a special case of the ambiguity that is characteristic of ITVs, which is much broader, and can occur with definite as well as indefinite NPs in object position, for instance, in ‘John imagined London’ or ‘John needs the antidote’. Thus I differ from semanticists who take *Non-specificity* as a necessary condition for a transitive verb to qualify as intensional.

¹⁰ While a scopal analysis of the *de re/de dicto* distinction is plausible, the relationship between scope and the *de re/de dicto* distinction is complicated. I adopt a two-way distinction here merely for ease of exposition, but recognize that, as Kripke (1977) showed, no two-way distinction can do justice to iterated intensional verbs and the scopal readings they generate. Ultimately I believe that explaining the different readings of intensional sentences as different scopal readings is the correct explanation, and so may need to jettison the terminology I have chosen to use here. However, Janet Fodor (1970), in her dissertation, shows that intensional verbs have more than just two readings—she claims that in some cases they have four, and argues that they do not have enough scopal readings to capture the four-way distinction. Fodor claims that the intensional status and the quantificational force of phrases in intensional positions can be evaluated independently. The four readings then correspond to each of the four possible combinations of (the presence or absence of) *Non-specificity* and *Opacity*. If the basic scopal analysis holds, it would predict only two of the readings, since on the scopal analysis, the entire noun phrase can scope only either over or under the verb, and thus *Non-specificity* and *Opacity* are predicted to co-occur. This indicates that there are not enough permutations of scope-bearing elements in intensional sentences to capture their readings, and accordingly, the scopal account of intensionality cannot be correct. See (Keshet 2008) for an overview, (Szabó 2010) for a defence of Fodor’s specific opaque reading, and Keshet (2011) for a new scopal account of *de re* and *de dicto* that accommodates Fodor’s data.

The non-equivalence of the (scopal) readings of a construction involving a transitive verb is sometimes seen as criterial for the intensionality of that verb, because the resulting ambiguity is not present in purely extensional verbs. A test for this non-equivalence often appears under the name 'failure of quantifier exportation' (Moltmann 1997, p. 3).¹¹ If the quantifier in the verb's complement fails to export, and can yield a falsehood when moved to a position where it takes scope over the verb, this shows the non-equivalence of the two readings, as in the following example:

(12) John is looking for a unicorn. \leftrightarrow

A unicorn is such that John is looking for it.

In more generality, the inference that fails is:

(13) NP Vs Q N \leftrightarrow

Q N is/are such that NP Vs it/them (Moltmann 1997, p. 3).

I will not take failure of quantifier exportation as criterial for intensionality, because I think the test is more coarse-grained than the tests mentioned above: quantified NP complements can fail to export either because they are non-specific or because they are empty. However, I will sometimes treat the ability to elicit two distinct readings as weak evidence for the intensionality of a verb, owing to the fact that judgments about intensionality can be subtle, and testing for the presence of a second reading provides us with another resource for its detection.

3. Representational verbs

Analyses of ITVs often restrict themselves to considering just a few paradigmatically intensional verbs, for example, 'seek', 'need' and 'want'. This can sometimes give the impression that the class of verbs that display some combination of the above features is relatively small. However, Friederike Moltmann (2008), pp. 242–244 lists six categories of transitive verbs that have intensional readings:

- (1) (Simple) predicates of absence: *need*, *lack*, *omit*, *fit (into, onto)*

¹¹ Failure of quantifier exportation is an idea originally due to Quine (1956), but see Kaplan (1968) for a discussion. Richard (2013) calls the two scopal readings of intensional constructions the D-reading and the R-reading, and takes the presence of the ambiguity as criterial for intensionality.

- (2) Psychological verbs of absence: *promise, desire, want*
- (3) Predicates of transaction and possession: *own, possess, owe, offer, buy, accept, have*
- (4) Verbs of representation: *draw, paint, portray, imagine, represent, show, indicate, point (to), talk (about), signify*
- (5) Epistemic predicates: *see, recognize, find, discover, count*
- (6) Verbs of creation in the progressive: *is building, is creating, is putting together*

This shows that the category of intensional transitive verbs is surprisingly broad, especially considering that several of the ‘epistemic predicates’ are usually taken to be paradigmatically *extensional*. However, for our purposes, the most important category of ITVs are the verbs of representation. Not only are these verbs intensional, in that they exhibit *Non-specificity*; they exhibit all three properties above, making them paradigmatically intensional.¹²

In what follows, I will argue that ‘refers to’ and the other semantic verbs mentioned above are paradigmatically intensional. Their intensionality, together with the fact that semantic verbs clearly express intentional notions, makes it plausible that semantic verbs fall into the category of representational verbs. More specifically, my arguments will establish that, in English, ‘refers to’ is roughly synonymous

¹² To see this, consider the following examples:

- (14) (a) The hammer and sickle represent a strong and industrious nation.
- (b) Dali drew a strange man.
- (c) The movie portrayed a pair of outlaws.
- (d) John imagined a distant city.
- (e) Newly developed economic metrics indicate a rise in stock prices.

It may well be the case that all strong and industrious nations are also unjust nations, and vice versa, but the hammer and sickle need not represent an unjust nation. Similarly, all strange men may be sad men, and vice versa, but Dali need not have drawn a sad man. Similar arguments can be made for the rest of the verbs. Thus representational verbs exhibit *Opacity*. One can also quickly see that none of these verbs are existence-entailing. What about *Non-specificity*? Clearly, the hammer and sickle need not represent a particular strong and industrious nation, Dali need not have drawn a particular man, and John need not have imagined a particular city; nor do the new economic metrics need to have indicated a particular rise in stock prices. Thus these verbs display all three traditional features of ITVs, and are paradigmatically intensional.

with 'talks about' or 'is about'. The intensionality of notions of aboutness and subject matter is well established (Martí 1989; Perry 1989), and it has been widely noted that 'about' is an intensional preposition, which occasions intensional contexts (Montague 1974, p. 267). But while the intensionality of aboutness is well known, the intensionality of 'refers to' and 'applies to' is surprising: what words refer to and apply to are typically taken to be thoroughly extensional notions, and 'refers' is supposedly an extensional verb par excellence.¹³

One last verb deserves comment: 'means' is also paradigmatically intensional, and this fact is highly suggestive. If semantics is supposed to be a theory of meaning (and what else could it be?), then it seems that any collection of semantic verbs that does not exhibit intensionality in the way that 'means' does is certain to be inadequate for specifying a theory of meaning.¹⁴ Showing that semantic verbs have an intensional reading goes a long way toward showing that they can serve to state such a theory.

¹³ My proposal is connected to a point made by David Lewis, in his paper 'Tensions' (1983), that has been drastically underappreciated. In the paper, Lewis shows that there is, in an important sense, no absolute difference between languages that are extensional and languages that are intensional. Instead, given a language in which every expression is assigned an intension, that language can be transformed into a language in that is fully extensional: just let each expression of the new language have, as its extension, the function that was the intension of the expression in the original language. Given a certain approach to the semantics of ITVs, this is what treating 'refers to' and 'applies to' does: it makes an expression's *intension* its referent.

¹⁴ This is closely related to points made by Davidson (1967, 1976) in response to what has come to be known as the Foster Problem (Foster 1976). Foster famously showed that a theory of truth could issue in theorems that were not interpretative. He pointed out that the theorems of a truth theory—biconditionals pairing sentences of the object language with their truth conditions—did not provide a tight enough connection to serve as meaning theorems. For example, such a theory could have theorems that were true but obviously not meaning-giving, such as "Snow is white" is true iff grass is green'. Davidson responded by claiming that the biconditionals needed to be laws of nature, and should be prefixed with an intensional operator, 'Necessarily', which rules out the simplest such cases. However, Soames (1989) recapitulates the Foster problem in the intensional setting, and tries to show that no theory that derives truth conditions from reference and satisfaction clauses can suffice as a theory of meaning. Soames shows that given any reference and satisfaction clauses, ones that are *intensionally* equivalent can be constructed, and these clauses allow us to derive identical truth conditions for sentences with obviously different meanings. In a sense, my strategy is the reverse. On my view, reference and satisfaction clauses have a reading that is hyperintensional, and so Soames's intensionally equivalent clauses can be distinguished from one another. This means that derivations involving them will yield different meanings, although it is unclear whether these derivations will themselves provide specifications of truth conditions. Truth conditions can be derived from the other reading of our reference and satisfaction clauses: their extensional reading.

4. Speaker's reference and application are intensional

This section presents empirical data showing that 'refers to', as it is used in English to report speaker's reference, is much closer to being intensional than extensional with respect to all three of the core features of intensionality.¹⁵ To collect these data, I designed and ran three studies, each of which tested 'refers to' for one of the three traditional features using the inferential tests laid out above. Each study compared 'refers to' to one paradigmatically intensional and one paradigmatically extensional transitive verb, and then took note of statistical differences with respect to one of the properties. As we will see below, 'refers to' was closer to being intensional in all three studies, and in the cases of *Non-existence* and *Opacity*, did not differ statistically at all from 'seeks', a paradigmatically intensional verb.

4.1 Experiment 1: *Non-existence*

The first study tested 'refers to' for *Non-existence*.

4.1.1 Methods In the study, 237 participants filled out a brief questionnaire.¹⁶ Each participant was randomly assigned to one of three conditions, either *Intensional*, *Refers* or *Extensional*, and answered one question associated with that condition. In what follows, I will refer to the three conditions as 'verb categories'. The questions associated with the verb categories differed only in that they contained either a paradigmatically intensional verb ('search'), 'refer to', or a paradigmatically extensional verb ('touch') as their main verb. To make sure the results were not peculiar to one particular noun phrase, participants were then assigned to one of four vignettes (*Unicorns*, *Elves*, *Magical Fountains*, or *Dodos*).

Each participant was asked to suppose that they knew that a certain kind of entity did not exist, but that their friend John didn't. For example, the first vignette consisted only of the following sentence:

Unicorns: Suppose that you know that unicorns do not exist, but your friend John doesn't.

¹⁵ The intensionality of speaker's reference is not a new idea. However, this is, to my knowledge, the first time that the standard linguistic criteria for being an intensional transitive verb have been explicitly applied to 'refers' to establish its intensionality. It is also, to my knowledge, the first empirical work has been done to support the conclusion.

¹⁶ Participants were recruited using Amazon's Mechanical Turk. The sample was 51.25% male, and the mean age was 35.5.

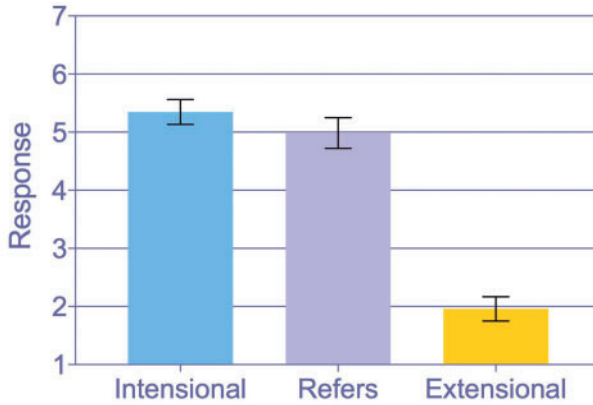


Figure 1: Mean ratings by condition in Experiment 1. Error bars show standard error

The participant was then asked one of the three questions below, depending on the condition to which they had been assigned:

Intensional: Is it possible for John to search for a unicorn?

Refers: Is it possible for John to refer to a unicorn?

Extensional: Is it possible for John to touch a unicorn?

The other vignettes, and the questions associated with them, differed only in that they had a different indefinite noun phrase in place of ‘a unicorn’; instead, the other three used ‘an elf’, ‘a magical fountain’, and ‘a dodo’, respectively. Participants responded to the questions on a 7-point Likert scale, with an answer of 1 indicating a response of ‘definitely not’ and 7 indicating ‘definitely yes’. Thus, if a participant responded with a high score on a question, it indicated that the participant took the verb to exhibit *Non-existence*, whereas a low score indicated the opposite.

4.1.2 Results The average rating for each of the verb categories across the four vignettes can be found in Figure 1.

The key thing to notice is that the ratings for ‘refers’ were much closer to those given for the paradigmatically intensional verb than the extensional verb. When these averages were compared, the rating for ‘refers’ did not differ significantly from the intensional case, but was significantly higher than that for the extensional case ($p < 0.001$), and this difference was consistent across the four vignettes. Further,

comparing the means for the *Refers* and *Extensional* conditions revealed a large effect size.¹⁷

4.1.3 Discussion The results are striking, and seem to establish unequivocally that ‘refers’ exhibits *Non-existence*: it appears to pattern completely with ‘search for’, and bear very little similarity to ‘touch’. Consider the following sentences:

(15) John is referring to a unicorn.

(16) John is referring to an elf.

On the supposition that an affirmative response to the *Refers* question above indicates that (15) has a reading that does not entail the existence of unicorns, then the results indicate that sentences such as (15) and (16) exhibit *Non-existence*. This, I think, should be somewhat surprising; philosophers of language often take genuine reference to require existence. These results pose a dilemma for such theorists: either they are flatly wrong about the nature of reference, or the version of reference with which they are concerned is not the one that ordinary speakers make use of and have intuitions about. I will discuss this question at length in §§5 and 6.

4.2 Experiment 2: Non-specificity

The second experiment tested ‘refers’ for *Non-specificity*.¹⁸

¹⁷ The results were analysed using a 3 (verb category: intensional vs. ‘refers’ vs. extensional) × 4 (vignette) ANOVA. As expected, there was a significant main effect of verb category, $F(2, 225) = 66.6$, $p < 0.001$, but there was no significant main effect of vignette, $F(3, 225) = 2.2$, $p = 0.084$, and no significant interaction, $F(6, 225) = 1.2$, $p = 0.3$. To explore the differences between the intensional case, the extensional case, and the case of ‘refers’, I used Tukey’s post hoc tests. Unsurprisingly, participants gave higher ratings in the intensional condition ($M = 5.35$, $SD = 2.1$) than in the extensional condition ($M = 1.96$, $SD = 1.78$), $p < 0.001$. Ratings for ‘refers’ ($M = 4.99$, $SD = 2.16$) were significantly higher than those for the extensional case, $p < 0.001$, $d = 1.53$, but not significantly different from those for the intensional case, $p = 0.495$.

¹⁸ Two anonymous referees point to the fact that *Non-specificity* is itself a property that is slightly unclear. For instance, if John is looking for a dog, he might be looking for a specific property, even if he is not looking for a specific dog. I take *Non-specificity* to be present in cases where an agent is not related to any particular entity. The idea that an ITV might relate the subject to a specific property is, I believe, a piece of theory that attempts to explain the basic intensional datum, which is that when indefinites appear in the object position of an ITV, they need not pick out particular entities: they need not refer, or provide an entity that serves as the argument to the verb. Further, such indefinites are not merely instances of what Zimmermann (2001) calls ‘unspecificity’, namely, cases where what particular entity the indefinite picks out is left unspecified. I take the inferential test I introduced above and the questions in Experiment 2 to be genuine tests for non-specificity, rather than unspecificity. When an object is left unspecified, the continuation ‘but no particular one’ is not appropriate.

4.2.1 Methods In the study, 236 participants answered three questions each, one question for each of the three conditions, *Intensional*, *Refers*, and *Extensional*.¹⁹ The *Intensional* question contained a paradigmatically intensional verb ('look for'), the *Refers* question involved 'refers to', and the *Extensional* question contained a paradigmatically extensional verb ('touch'). The questions were presented in a random order. Each question asked the participant to suppose that the subject was involved in a particular activity or in a particular state, and then asked whether it was possible for the activity or state to be directed toward something non-specific. The activities and states were all characterized using an indefinite NP in the object position of the main verb, so the questions assessed whether a non-specific interpretation was available for the indefinite. To make sure that answers did not depend on the specific NPs used in the questions, each participant was assigned to one of five vignettes (*Dog*, *Person*, *Book*, *CC-Cookie*, or *Cigarette*) at random, each of which involved a different indefinite noun phrase. For instance, the first set of questions was as follows:

Intensional: Suppose that John is looking for a dog. Is it possible for John to be looking for a dog, but not a particular one?

Refers: Suppose that in a conversation, John is referring to a dog. Is it possible for John to be referring to a dog, but not to a particular one?

Extensional: Suppose that John is touching a dog. Is it possible for John to be touching a dog, but not a particular one?

The other sets of questions differed only in that they contained a different indefinite NP within the complement of the transitive verb. Since each respondent answered a question containing a verb from each category, they were able to compare the three questions asked, and adjust their answers accordingly. Participants responded to the questions on a 7-point Likert scale, with an answer of 1 indicating a response of 'definitely not' and 7 indicating 'definitely yes'. Thus, if a participant responded with a high score on a question, it indicated that the participant took the verb to exhibit *Non-specificity*, whereas a low score indicated the opposite.

4.2.2 Results As Figure 2 shows, the average rating for 'refers' was intermediate between the intensional and extensional cases. Ratings

¹⁹ Participants were recruited using Amazon's Mechanical Turk. The sample was 63.1% male, and the mean age was 25.5.

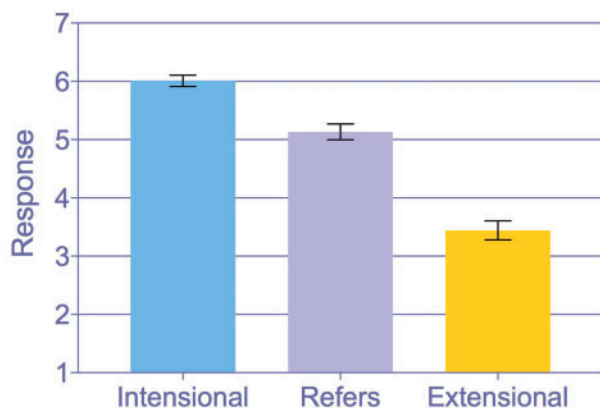


Figure 2: Mean ratings by condition in Experiment 2. Error bars show standard error

for ‘refers’ were significantly lower than the intensional verb, and significantly higher than the extensional one.²⁰ However, the average was still closer to that of the intensional verb, and the effect size when comparing the mean for *Refers* to the for *Extensional* was larger than the effect size when comparing *Refers* to *Intensional*.²¹

4.2.3 Discussion The results show that ‘refers’ differs significantly from both paradigmatically intensional and paradigmatically

²⁰ The data were analysed using a mixed-model repeated measures ANOVA, with verb category (*Intensional* vs. *Refers* vs. *Extensional*) as a within-subject variable and vignette (*Dog* vs. *Person* vs. *Book* vs. *CC-Cookie* vs. *Cigarette*) as a between-subject variable. As we would expect, there was a significant main effect of verb category, $F(2, 231) = 100.4$, $p < 0.001$. There was no significant main effect of vignette, $F(4, 231) = 1.5$, $p = 0.192$. There was a significant interaction, $F(8, 462) = 3.2$, $p = 0.002$.

²¹ To further explore the effect of verb category, and establish whether ‘refers’ is intensional or extensional, I ran separate ANOVAs comparing each pair of verb categories. As we would expect, ratings for the intensional verbs ($M = 5.99$, $SD = 1.53$) were higher than those for the extensional verbs ($M = 3.45$, $SD = 2.45$), $F(1, 231) = 155.7$, $p < 0.001$. Ratings for ‘refers’ ($M = 5.14$, $SD = 2.07$) were significantly higher than those for extensional verbs, $F(1, 231) = 86.25$, $p < 0.001$, $d = 0.74$. Ratings for ‘refers’ were also significantly lower than those for intensional verbs, $F(1, 231) = 24.05$, $p < 0.001$, $d = 0.48$. Looking at the differences between vignettes, we found that, in contrast to the first experiment, there was an interaction between which indefinite NP was involved in the vignette and whether a non-specific reading was available for ‘refers’. In particular, in one of the vignettes—*CC-Cookie*—the ratings for ‘refers’ were closer to extensional, although still intermediate, while in the other four vignettes the ratings were closer to the ratings for the intensional case. There are two possibilities for explaining this interaction. One is that the *CC-Cookie* vignette was an anomaly. The other is that there is a genuine interaction between the NP in the object position of a verb and whether a non-specific reading is available.

extensional verbs with respect to *Non-specificity*; the average for 'refers' was intermediate between the intensional and extensional cases. This indicates that with respect to *Non-specificity*, certain verbs can have an intermediate status. This intermediate status poses a question for standard ways of categorizing verbs as intensional versus extensional. Most semanticists take the distinction to be binary: either an intensional reading is available or it is not. The results show that a more nuanced approach is required. It may be that intensional readings are heard by some speakers and not others, or it may be that many speakers hear a genuinely intermediate rating. Preliminarily, the variance in responses for 'refers' indicates that some speakers get the non-specific reading while others do not. But then this poses a problem for the lexical semantics of intensional verbs: when speakers are divided about a verb's intensionality, should a lexical-semantic theory encode it?

However, this problem is not too worrying in the case of 'refers'. Across the vignettes, the mean for 'refers' was much closer to that of the intensional verb than the extensional verb. If we keep to the relatively standard assumption that the distinction between intensional and extensional is binary, then it seems we have good grounds for saying that 'refers' exhibits *Non-specificity*. The averages clearly fall on opposite sides of the midpoint of the scale, which is 4.

Overall, this is an even more surprising result than that of the first experiment.²² Even when we restrict ourselves to consideration of speaker's reference, reference is ordinarily presumed to be fully specific. The fact that a non-specific reading is often available gives us strong reason to think that reference is not a relation between a speaker (or a word) and an object. Non-specificity cannot be explained by positing non-existent objects, as is often done to explain *Non-existence*, or by positing senses or conceptual covers, as is often done to account for *Opacity*.

4.3 Experiment 3: *Opacity*

The third experiment tested 'refers to' for *Opacity*.

²² It is also worth noting that the sample size for this experiment was quite large: in contrast to the other experiments, each of the participants in this experiment answered three questions: one for the intensional condition, one for 'refers', and one for the extensional condition, and so there were 237 data points available for each question, as opposed to around 80 in the other experiments.

4.3.1 Methods In the study, 231 participants filled out a brief questionnaire.²³ Each participant was randomly assigned to one of three conditions, either *Intensional*, *Refers*, or *Extensional*, and answered one question associated with that condition. As with the previous experiments, the questions associated with the verb categories differed only in that they contained either a paradigmatically intensional verb ('search'), 'refer to', or a paradigmatically extensional verb ('touch') as their main verb. For the sake of generality, each participant was randomly assigned to one of four vignettes (*Art Collector*, *Chief Justice*, *Murderer*, or *Spy*). As an illustration, the first vignette was the following:

Art Dealer: Suppose that the person with the largest art collection in the country just so happens to be the national record-holder in the high jump.

Participants were then asked to answer one of the following three associated questions:

Intensional: Now suppose that Mary is looking for the person with the largest art collection in the country. Does it have to be true that Mary is looking for the national record-holder in the high jump?

Refers: Now suppose that in a conversation, Mary is referring to the person with the largest art collection in the country. Does it have to be true that Mary is referring to the national record-holder in the high jump?

Extensional: Now suppose that Mary is touching the person with the largest art collection in the country by shaking his hand. Does it have to be true that Mary is touching the national record-holder in the high jump?

The other vignettes, and the questions associated with them, differed only in that they made use of a different pair of definite descriptions. Participants answered their question on a 7-point Likert scale, with an answer of 1 indicating 'definitely not' and an answer of 7 indicating 'definitely yes'. In this case, lower scores indicated a higher degree of *Opacity*.

4.3.2 Results The average rating for the three questions corresponding to the different verb categories can be found in Figure 3.

²³ Participants were recruited using Amazon's Mechanical Turk. The sample was 46.9% male, and the mean age was 33.5.

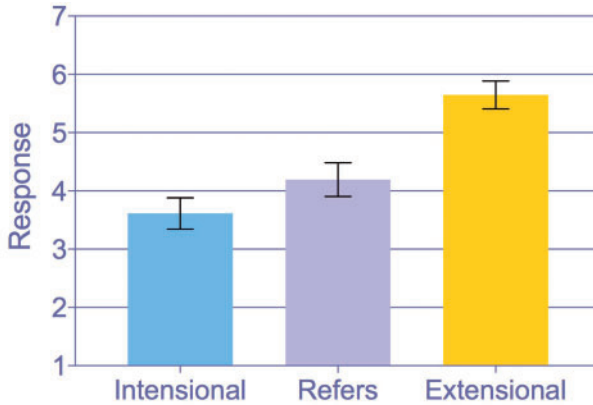


Figure 3: Mean ratings by condition in Experiment 3. Error bars show standard error

As in the first study on *Non-existence*, but in contrast to the second study on *Non-specificity*, the average rating for ‘refers’ did not differ significantly from the average rating for the intensional case. But as with both previous studies, ‘refers’ differed significantly from the average rating for the extensional case, with a moderate effect size.²⁴ In contrast to the previous two studies, however, a significant main effect of vignette was observed, and as in the study addressing *Non-specificity*, we observed a significant interaction between vignette and the status of ‘refers’.

4.3.3 Discussion As we can see from the figure above, ‘refers’ again patterns with the paradigmatically intensional verb as opposed to the paradigmatically extensional verb. However, here the data are less clear than in the previous two experiments. We observed an overall effect of vignette on participants’ responses, and also an interaction between the vignette and participants’ ratings for ‘refers’ relative to the controls. I think these facts are due to a slight anomaly in two of the four

²⁴ The results were analysed using a 3 (verb category: *Intensional* vs. *Refers* vs. *Extensional*) \times 4 (*Art Collector* vs. *Chief Justice* vs. *Murderer* vs. *Spy*) ANOVA. There was a significant main effect of verb category, $F(2, 219) = 16.67, p < 0.001$, and a significant main effect of vignette, $F(3, 219) = 6.47, p < 0.001$. To explore the differences between the intensional case, the extensional case, and the case of ‘refers’, I used Tukey’s post hoc tests. Unsurprisingly, participants gave lower ratings in the intensional condition ($M = 3.61, SD = 2.52$) than in the extensional condition ($M = 5.65, SD = 2.00$), $p < 0.001$. Ratings for ‘refers’ ($M = 4.19, SD = 2.45$) did not differ significantly from the intensional case, $p = 0.215$, but were significantly lower than those for the extensional condition, $p < 0.001, d = 0.64$. We also observed an interaction effect of verb category and vignette, $F(6, 219) = 3.98, p = 0.001$.

intensional questions, which received higher ratings than the others. The effect of the intensional questions getting these lower scores was to bring the overall intensional average up, and closer to that of ‘refers’. Thus, while the average for ‘refers’ does not differ significantly from that of the intensional condition, my conclusion is that with respect to *Opacity*, ‘refers’ is best construed as intermediate between intensional and extensional, rather than patterning perfectly with verbs of search.

Even though it is likely that the results only support an intermediate status for ‘refers’ with respect to *Opacity*, this intermediate status is still surprising. This shows that our ordinary notion of reference differs from the technical notion of extension with respect to granularity: reference is, to some degree, dependent on description. The idea that reference is description-dependent is even more surprising considering that opaque contexts are often *defined as* contexts in which co-referential terms are not substitutable. If we keep this definition, but treat ‘refers’ as opaque in its object position, it may turn out that no contexts are opaque. They are all fully extensional; it is just that ‘refers’ itself is opaque. But alternatively, we can define an opaque context as one in which co-extensive expressions are not substitutable, although this will force us to divorce reference from extension.

4.4 Conclusions

Together, the results of the three above studies indicate that speakers recognize intensional readings of sentences such as

- (17) John is referring to a unicorn.
- (18) John is referring to a dog.
- (19) Mary is referring to the person with the largest art collection in the country.

On its intensional reading, (17) can be true, but does not entail the existence of unicorns. Similarly, speakers seem to recognize a reading of (18) on which John is referring to a dog, but not to a particular one. And finally, speakers recognize a reading of (19) on which Mary need not be referring to the national record-holder in the high jump, even if that person happens also to be the person with the largest art collection in the country. But ‘refers’, like ‘seeks’, also has an extensional reading: there is a reading of (18) on which John is referring to a particular dog, just as he may be seeking a particular dog. As mentioned above, I will call the intensional reading of a sentence involving and ITV its *de dicto* reading, and I will call its extensional reading its *de*

re reading, and I will call the forms of reference reported by these two readings 'reference *de dicto*' and 'reference *de re*'.

However, one might worry that, even given the data above, speakers' judgements are not being driven by the presence of a genuine *reading* of the sentence whose presence needs a semantic explanation, but are instead being driven by pragmatics. After all, it is common practice to attempt to explain, or explain away, substitution failure within the contexts of attitude verbs by appealing to pragmatics. However, there are several reasons why such an approach is unlikely to succeed in this case. First, 'refers' patterns quite closely with a paradigmatically intensional verb, 'seeks'. It is possible that the intensional features of 'refers' recorded in the studies are due to pragmatics, but if this is true, why should we not say the same for 'seeks'? It doesn't seem that there is a reason why we should treat the intensional features of the two verbs differently. Thus, one can hold that the intensionality of 'refers' is due to pragmatic features only if one believes the same thing about all intensional verbs, which amounts to the denial that there *any* genuinely semantic intensional phenomena in natural language. But most working semanticists believe that some verbs are intensional, and that this intensionality is a datum for which a semantic theory must account, and I am content for my view to depend on this view, which seems to be the consensus view among semanticists.

But there are also more specific reasons why the intensionality of 'refers' cannot be pragmatic. Ordinarily, the intensional phenomenon that philosophers try to explain away using pragmatics is *Opacity*. And, restricting attention to this particular aspect of intensionality, I think that these attempts at pragmatic explanation are plausible, for it seems that the phenomenon of *Opacity* does not interact with the rest of our semantic machinery. It seems to be a relatively isolated phenomenon. However, the above studies show that 'refers' also exhibits *Non-specificity*, which does interact with the rest of our semantic machinery, and these interactions give us reason to think that the phenomenon is semantic. First, the presence of a non-specific reading for an object position indefinite licenses a peculiar form of quantification that has come to be called *special quantification*, on which a quantifier replaces the entire quantified NP in object position:

- (20) (a) John is referring to a ruby.
 (b) John is referring to something.
 (c) John is referring to something valuable.

Special quantifiers are ordinarily existential, and are formed from combinations of a determiner and the morpheme ‘-thing’. Accompanying the possibility of special quantification are restrictions on the kinds of anaphora licensed by non-specific indefinites. Notably, (20a) does not license anaphoric reference with ordinary pronouns; nor does it entail readings on which the indefinite takes scope over the verb:

- (21) (a) \rightarrow John is referring to it.
- (b) \rightarrow There is a ruby to which John is referring.
- (c) \rightarrow A ruby is such that John is referring to it.

Rather, intensional indefinites only license special anaphora, which makes use of special pronouns and descriptions, such as ‘the same thing’, ‘one’, ‘what’, and possibly ‘that’:

- (22) (a) John is referring to what Bill is referring to.
- (b) John is referring to one too.
- (c) John is referring to a ruby. Bill is referring to the same thing.
- (d) John is referring to that. (?)

The inferential behaviour above seems to indicate that ‘refers’ has two readings, only one of which licenses a non-specific interpretation for the indefinite, and neither of which entails the other. Further, the two readings seem most naturally treated as two scopal readings, particularly in light of the sentences in (21), and scope is a distinctively semantic phenomenon. These inferential patterns are not easily explained pragmatically, and thus we have reason to take the intensional features of ‘refers’ at face value.

One final point is in order: it is not just ‘refers’ that is intensional in English. It is plausible that verbs expressing speaker’s predication, such as ‘ascribes’ and ‘attributes’, also exhibit intensional features in both their direct and indirect object positions. Consider the following sentence:

- (23) Jack ascribes supernatural powers to a relic.

In (23), ‘a relic’ can be read either specifically or non-specifically. Further, Jack may not ascribe healing powers to a small piece of wood, even if that’s just what the relic is (perhaps it’s a shard of the

cross). Additionally, there may be no such property as possessing supernatural healing powers, and even if there is, Jack need not ascribe it to a relic by any other name. Thus, both the direct and indirect object positions of (23) are intensional. Further, if we replace 'ascribes' with 'attributes' in (23), exactly the same arguments suffice to show that it is intensional as well.

5. Semantic reference and application are intensional

All of the sentences in the studies above have speakers as subjects, which means that the studies have an important limitation: they only establish that 'refers' is intensional when we use it to report what speakers are referring to. Borrowing a distinction from Kripke (1977), the studies show that speaker's reference is intensional, but semantic reference may well still be extensional. This section will provide arguments that semantic reference does in fact inherit the intensionality of speaker's reference. However, statements of semantic reference are less common in ordinary language than statements of speaker's reference, and so the semantic verbs that figure in these statements are best considered technical terms. As a result, surveying native speakers about their features will not help us understand how they function; native speakers can't be expected to have intuitions about technical terms, and further, since these terms are technical, semanticists are at liberty to stipulate their features. In light of this, the next three sections will provide some arguments that semantic reference *does* inherit the features of speaker's reference, along with arguments that we *should* make use of intensional semantic vocabulary in our theorizing.

Let's start with some metasemantic arguments. First, on many views, what a word refers to is ultimately determined by how speakers use that word: linguistic intentionality is explained in terms of the intentionality of thought. On such views, semantic reference will be determined by instances or patterns of speaker's reference. But the last section showed that speaker's reference is intensional: it is much closer to a paradigmatically intensional notion than it is to an extensional one. Accordingly, on views that privilege the intentionality of thought, it is natural to expect that the intensional features of speaker's reference will carry over into our account of semantic reference. If semantic reference does inherit the intensionality of speaker's reference, semantic reference will come in two forms, reference *de re* and reference *de dicto*. These two forms of reference are a generalization of the

traditional notion of reference, which subsumes the traditional notion as a special case. Reference *de dicto* is a novel form of reference that exhibits the intensional features characteristic of the intensional readings of ITVs, while reference *de re* is the traditional, extensional notion of reference that is transparent, specific, and existence-entailing.²⁵

Following (Crane 2013, p. 113), we can distinguish four main theories of linguistic intentionality: descriptive, pictorial, causal and functional. I think it is reasonably clear that on the descriptive, pictorial and functional accounts of intentionality, instances or patterns of speaker's reference ultimately determine what a word refers to, so I will only discuss them briefly. However, causal theories of reference also ultimately rely on speaker's reference, but I think this fact is less obvious, and rarely appreciated, so I will discuss the causal theory at greater length. In the case where an image fixes what a linguistic expression is about, it is plausible that the image is one associated with the expression by a speaker, and further, that no image could be about an object without an agent who intends or takes it to be so.²⁶ Similar things can be said about the descriptive case: presumably, if a linguistic expression refers to something in virtue of being associated with a particular description, it is because some particular speaker or group of speakers associates this descriptive content with the expression. Thus the reference of the word will be dependent on instances of speaker's reference involving a description, which, as we showed above, exhibit the features of intensionality.

The idea behind functional theories of reference is that a word's reference is determined by fulfilling a certain function, say, allowing an agent or group to successfully navigate their environment. On a view such as that in Millikan (2004), a word refers to an object just in case, roughly, taking it to refer to that object confers an advantage on an agent or group. This is explicitly a case in which patterns of speaker's reference serve to determine semantic reference. Thus, while I do not take these observations to remove all possibility that on one of

²⁵ I am open to the possibility that the three features of intensionality can come apart; in fact, it is my belief that they do come apart, and can be treated separately. So, like Fodor (1970), I do not think a two-way distinction is adequate to explain them. However, I am using the terminology of *de re* and *de dicto* more to streamline the discussion than because I think the terminology captures a deep distinction. Rather, I think the important thing is just that semantic verbs are ITVs, and that ITVs have different readings that can be accounted for in terms of scope. The *de re/de dicto* distinction is only adequate for describing scopal distinctions in simple cases.

²⁶ See Putnam's example of a likeness of Winston Churchill that has been accidentally traced by an ant crawling through the sand.

these views semantic reference could be determined independently of speaker's reference, I do take them to make the involvement of speaker's reference plausible, and thus make it plausible that semantic reference inherits its intensionality.²⁷

Accounts of the causal theory of reference ordinarily begin with a discussion of a baptism: a case where a speaker initially uses a word and attempts to attach it to a piece of non-linguistic reality. Although various theorists differ on the details of how baptism works, and baptisms themselves come in various forms, their canonical form is when a speaker uses a word to pick out a piece of non-linguistic reality with which they are in causal contact, and this causal or perceptual contact then serves to fix the reference of the term on its subsequent uses. On other views, the baptist is seen as fixing a condition; when an object uniquely satisfies the condition, that object is fixed as the referent of the expression. However, causal theories struggle to account for cases of reference to abstract objects, such as numbers, where there is no causal connection. Given a causal theory of reference, it is not plausible to think that we refer to the number 6 in the same way that we refer to Barack Obama.

However, it has been largely overlooked that every case of baptism involves a speaker intending to refer to something, and thus involves an act of speaker's reference. This provides at least the beginnings of a solution to the puzzle of how we can refer to things with which we are not in causal contact. As we saw in the last section, speakers can successfully refer *de dicto* whether or not they are in genuine causal contact with an object, and whether or not the condition they specify is uniquely satisfied, or satisfied at all. As a consequence, speakers can initiate causal chains with acts of speaker's reference *de dicto* even if they fail to refer *de re*. Causal or perceptual connection to an object might be required for the term to have a *de re* reference, and when such connections are present, the baptized term will come to have both a *de dicto* reference and a *de re* reference: roughly speaking, an intension and an extension. However, when such connections are

²⁷ One anonymous referee makes the point, however, that it is plausible that speaker's thoughts are intensional and idiosyncratic—at least in terms of their granularity—in a way that meanings in a public language are not. Even though different speakers may all refer using, for instance, a mode of presentation, the extension is all that such uses have in common, and so we ought to assign the extension as the reference of that expression. However, this can be accommodated on my view, for saying that semantic reference is intensional is merely to say that it has an additional, intensional reading. The extension of a linguistic expression can be assigned with the *de re* reading of a reference clause.

absent, the baptized term will not have an extension, but the *de dicto* speaker's reference will provide the name or term in question with distinctive intensional semantic features. That is to say, the act of speaker's reference built into every baptism can guarantee that the term is not semantically trivial. In a case like that of Leverrier and Vulcan, this means that we can capture Leverrier's act of reference with (24):

(24) Leverrier used 'Vulcan' to refer to the planet responsible for the irregularities in Mercury's orbit.

And his successful act of speaker's reference initiated a particular usage for 'Vulcan', which we can capture with the *de dicto* reading of (25):

(25) 'Vulcan' refers to the planet responsible for the irregularities in Mercury's orbit.²⁸

It is this true reading that allows us to explain why (25) sounds true, while (26) is totally wrong:

(26) 'Vulcan' refers to phlogiston,

or why (27) seems to be a fine way of specifying one aspect of Vulcan's semantic profile:

(27) 'Vulcan' refers to Vulcan, not to Nibiru.²⁹

None of Vulcan, phlogiston or Nibiru exists, and so if (25) is false on account of Vulcan's non-existence, we are left without a way to distinguish why (25) sounds so much better than (26), and why (27) seems like a good way of capturing one of 'Vulcan' 's semantic features.

Similarly, in ordinary speech, if someone asks me what 'unicorn' refers to, I would respond by saying that it refers to horses with spiralling horns projecting from their foreheads. Whether or not unicorns exist seems to be totally beside the point.³⁰ The following seems to capture my willingness to respond that way:

²⁸ Mark Sainsbury (2005) states reference clauses using universally quantified biconditionals. His reference clauses can be paraphrased in the following way: for all *x*, 'Vulcan' refers to *x* if and only if *x* is identical to Vulcan. This allows for uniformity in our reference postulates. However, Sainsbury operates with a negative free logic, which makes all statements containing empty names false. This, in my opinion, is an intolerable result, for it makes sentences like 'Sherlock Holmes is famous' false.

²⁹ Nibiru is a planet that was supposed to collide with Earth at the end of the Mayan calendar in 2012, resulting in our planet's destruction. Thankfully, Nibiru does not exist.

³⁰ Compare this point to Parsons (1979, 1980).

(28) 'Unicorn' refers to horses with spiralling horns projecting from their foreheads.

In contrastive cases, the intuition is even stronger:

(29) 'Unicorn' refers to horses with spiralling horns projecting from their foreheads, not to horses generally.

(30) 'Sherlock Holmes' refers to Conan Doyle's famous detective, not to a Tolkien character.

Thus it is plausible to think that statements of semantic reference made true by a causal chain inherit the *Emptiness* of the act of speaker's reference that originated the causal chain.

Similar arguments can be made to show that semantic reference is opaque. Suppose that a Babylonian sees a planet in the evening and baptizes it 'Hesperus'. This is an act of speaker's reference, and speaker's reference, as we argued above, exhibits *Opacity*. This means that the Babylonian can refer to Hesperus while not referring to Phosphorus or Venus, from which it seems to follow that (31) has a false reading:

(31) The Babylonians used 'Hesperus' to refer to Phosphorus.

But if we trace the semantic features of 'Hesperus' back to its original uses in acts of Babylonian speaker's reference, there is nothing to prevent those features from being preserved in our statements of semantic reference, and neglecting them completely seems to be an oversight. Speaker's reference is ambiguous between a *de re* reading and a *de dicto* reading, and we lose nothing if we treat semantic reference as inheriting both of these readings. Rather, they make available a more general notion of semantic reference. If we see semantic reference as anchored in an act of speaker's reference, then (32) will have both a true reading and a false reading:

(32) 'Hesperus' refers to Phosphorus.

The true reading is inherited from the transparent, *de re* form of the Babylonian's acts of speaker's reference, while the false reading is inherited from their opaque, *de dicto* reference.

Inheritance of these two readings allows us to satisfy several important constraints on a theory of semantic reference. First, it is often considered important that statements of semantic reference are obvious, or even a priori. This is important, because this is the only way they can appropriately figure in a theory of meaning, in psychological

explanations, and in explanations of communication. To see this, consider (33):

(33) ‘Hesperus’ refers to Hesperus.

If our theory of meaning is fully extensional, then (33) will entail (32). But (32) obviously does not state a fact about the meaning of ‘Hesperus’. Thus our semantic theory will have consequences that are themselves not statements of meaning, and that no reflection on our knowledge of meaning could ever reveal. Further, suppose that we try to explain an act of successful communication with the sentence ‘Hesperus is bright’. Suppose that John utters the sentence to Bill. Bill looks up in the sky and sees Hesperus, comes to agree with John, then forms the belief that Hesperus is bright. One part of our explanation for how Bill came to have that belief is that John uttered the word ‘Hesperus’, and ‘Hesperus’ refers to Hesperus. But were we to state our explanation by saying that ‘Hesperus’ refers to Phosphorus, our explanation would be a bad one. It would not explain how Bill came to have his belief on the basis of John’s linguistic act. Similar things can be said concerning successful communicative interactions with empty terms. This shows that explanations of communication are intensional, and so if reference is to play a role in a theory of communication, reference must be intensional also. Allowing statements of semantic reference to have a *de dicto* reading accomplishes both of these tasks: it allows us to specify the meanings of expressions in a way that is independent of such metaphysical facts, and at a degree of granularity that is appropriate for a theory of meaning and a theory of communication. This seems like the right result, since ‘means’ is itself an intensional transitive verb. Overall, countenancing an intensional reading of our semantic vocabulary makes semantic theory more suitable for integration with our theories of communication, meaning and mind.³¹

6. Technical terms and ordinary English

The previous sections argued that in English, semantic verbs are intensional transitives, and gave metasemantic arguments showing that

³¹ It is instructive to point out the connections between this argument and the arguments given by Chomsky (1995, 2000). His basic claim is that what we are referring to depends in intricate ways on our intentions, goals, interests, and other aspects of our psychology, not on a pairing with an external object. This is just another way of saying that reference should cohere with the rest of our psychological and communicative lives.

the technical notion of semantic reference does, or a least should, inherit their intensionality. But this does not establish that we must make use of the English terms in theorizing about the meanings of English expressions. You might think that even if semantic verbs are intensional in English, we should still do our linguistic theorizing with totally extensional vocabulary. It is surely the prerogative of the semanticist, you might argue, to define technical terms as she sees fit, and to stipulate that 'refers to' and 'is true of' hold only between linguistic expressions and specific, existing objects or collections of objects.

In general, I agree that theorists are at liberty to define their terms as they see fit. However, if semantics is going to define 'refers to' and 'true of' so that they do not resemble their natural-language counterparts, semanticists need to have a reason for this divergence. Perhaps these technical definitions are more fruitful than employing ordinary intensional language, or the intensional language is not clear enough to be suitable for theorizing. But there can be no such reasons, because traditional, extensional semantic postulates are just one reading of the ambiguous, intensional semantic postulates. Traditional, word–world connections are stated by the *de re* readings of constructions that are systematically ambiguous between *de dicto* and *de re* construals. Thus, semantic postulates stated in English *subsume* the technical reading of those postulates *as a special case*. The English words are simply more flexible, and more general. Accordingly, while we lose some univocity by stating our theory with intensional semantic vocabulary, the flexibility gained allows us to recapture the traditional notions of reference and truth, while also allowing for a pair of new notions corresponding to the *de dicto* readings of our semantic postulates.³²

³² Further, if we treat our semantic vocabulary as technical and divorced from ordinary usage, then we are forced to posit a lexical ambiguity between the colloquial and technical uses of our semantic verbs. But if instead we use state our semantic theory with the terms as they are used in English—as ambiguous between *de dicto* and *de re* readings—it keeps our semantic verbs lexically univocal. What would have been two separate senses of our semantic verb phrases emerge as merely two different readings of our lexical semantic postulates, and are no more ambiguous than 'seeks'. Further, if we think, as is plausible, that the *de re/de dicto* ambiguity is to be captured in terms of scope, then we can hold that the difference between the colloquial and technical senses is a structural ambiguity. Accepting such a structural ambiguity seems much more palatable than holding that our concepts of reference and truth are ambiguous between colloquial and technical senses. Consider a comparison. Imagine that we are proposing to give a theory of action that makes use of the notions of belief and desire. Clearly, 'believe' and 'desire' are intensional verbs; in fact, they are paradigmatically intensional. Noun phrases in their clausal complements can be interpreted either inside or outside the scope of the verb, yielding *de dicto* and *de re* construals of the beliefs and desires, and they

7. Consequences

On my view, our semantic vocabulary is structurally ambiguous between two readings, a *de dicto* reading and *de re* reading. These two readings yield two ways of doing semantics. On the one hand, we can do semantics by specifying semantic significance using the *de dicto* readings of our semantic locutions: we can do semantics *de dicto*. Or, on the other hand, we can do semantics by reading our semantic locutions *de re*. Stating our semantic theory with the *de dicto* readings of our semantic postulates allows our semantic theory to serve as a theory of meaning or semantic competence in exactly the way envisioned by those working in the Chomskyan tradition. This is made possible because *de dicto* semantics provides us with a novel form of semantic evaluation that overcomes several problems faced by views that treat semantic evaluation as purely extensional. First, the *de dicto* readings of our semantic verbs are not existence-entailing, so they can provide distinctive semantic values for empty NPs, including empty names, and they also allow for a form of non-specific reference.³³ Additionally, since ITVs are hyperintensional within their complements, they can assign semantic values to expressions that are much more fine-grained than ordinary extensions; *de dicto* semantics is able to assign hyperintensional semantic values.³⁴

resist substitution within their complements. But now suppose that we insisted on stating our theory with the extensionalized, technical, *de re* readings of ‘believes’ and ‘desires’. This would save us the trouble of having to come up with a theory that captures the intensionality of these verbs; and correspondingly, we might think that the theory is clearer, because we know quite well what it is to believe something about a particular object, as opposed to bearing a relation to some kind of finer-grained intermediary. But on the other hand, using only this vocabulary would drastically distort, and severely cripple, our proposed theory of action. It seems as though many of our actions can only be adequately explained by the finer-grained, intensional readings of belief ascriptions, and extensionalizing merely limits the theory’s expressive resources, likely making the theory empirically inadequate. If extensionalizing has these consequences for a theory of action, why should we extensionalize the vocabulary with which we state a theory of meaning?

³³ Of course, there are already some views on the correct semantic values for empty names. For instance, Kripke (1973) and van Inwagen (1977) hold that many empty names, particularly fictional names, refer to fictional characters instead of ordinary objects, and that fictional characters exist. But this view of empty names commits these theorists to drastically unintuitive claims like ‘Sherlock Holmes exists’ and ‘Vulcan exists’. For other creationist views of fiction, see (Salmon 1998), (Searle 1979) and (Thomsson 1999).

³⁴ However, while the *de dicto* reading of our semantic postulates makes available this new form of semantics, it is not necessary to treat it as a general form of semantic evaluation; it can be deployed only for proper names, while making use of the relational, *de re* reading for non-empty referring expressions. Construing empty expressions as having intensional semantic values provided by the *de dicto* readings of our semantic postulates does not imply that we should take

The semantic values that *de dicto* semantics assigns to empty NPs will be of the same type as the semantic values of the complements of intensional transitive verbs generally, when they are read *de dicto*. The exact nature of these semantic values will depend on what the best semantics for ITVs turns out to be.³⁵ If we were to adopt Montague's view that the semantic value of an ITV's complement, when read *de dicto*, is an intensional quantifier, then the *de dicto* readings of 'refers to' and 'applies to' would assign intensional quantifiers as the semantic values of names and predicates. Alternatively, with Zimmermann (1993, 2001, 2006), we might hold that the *de dicto* readings of ITVs specify relations to properties, in which case all names in our language would have semantic values of predicative type. This would pair well with the view, advocated by Fara (2015), that names are predicates. Or we might even hold that the *de dicto* reading of an ITV is non-relational, treating such complements as adverbial modifiers, as in (Forbes 2006, ch. 5). On this latter view, and on any view which holds that the *de dicto* reading of an ITV should be understood non-relationally, the semantic values of names will not serve as ordinary arguments of the verb 'refers'. Rather, they will serve either to modify an underlying event or state, or to form a complex predicate. Whatever semantics for ITVs turns out to be correct, it will have to account for the intensional behaviour of the object position on the *de dicto* reading, and so will assign a semantic value to that position which accounts for the three features mentioned above.

In pointing toward a method for finding semantic values for empty names, *de dicto* semantics helps us make progress on the problem of empty names; it shows us how empty expressions can be meaningful and make non-trivial contributions to the meanings of sentences in

the same approach to non-empty expressions. The view thus allows for a 'disjunctivist' approach to the class of referring expressions, on which the *de dicto* reading specifies the semantic values of empty expressions, but the *de re* reading specifies the semantic values of non-empty expressions. There are, however, some considerations that push us toward a uniform treatment of the class of referring expressions, and since the *de dicto* reading is always *available*, it is my view that we should make use of it as a general, uniform, existence-neutral mechanism of semantic evaluation.

³⁵ Admittedly, I am not endorsing any particular view of ITVs here, so my proposal concerning semantic values for empty names, and the nature of semantic evaluation more generally, is necessarily schematic. The exact account of empty names, and of *de dicto* semantic values, will depend on finding the correct semantics for ITVs. I propose a non-relational account of the semantics of ITVs in other work, but the value of the present proposal does not depend on the correctness of my particular semantic proposal. The properties of ITVs yield constraints on how such a theory must look, but different proposals may satisfy these constraints in different ways, and yield different accounts of our *de dicto* semantic theory.

which they figure. Moreover, the fact that the *de re* readings of our lexical postulates for empty expressions are false allows us to retain a sense in which these expressions are genuinely empty. Many views that provide semantic values for empty names fail to fulfil this desideratum. Further, since the *de dicto* reading of an ITV is hyperintensional, the semantic value assigned to the expressions in its object position will be extremely fine-grained. This allows *de dicto* semantics to overcome problems of insufficient granularity that have historically kept truth-conditional semantics from issuing in interpretative theorems.³⁶

The ability to accomplish these related tasks is part of what makes *de dicto* semantics such a good candidate for playing the role of a Chomskyan theory of semantics. But there are several further reasons. First, many of the reasons that Chomsky gives for rejecting relational reference and application have to do with the fact that these semantic notions behave intensionally as opposed to extensionally. For instance, Chomsky (1995, p. 21) offers the example of ‘al-Quds’ and ‘Jerusalem’, which are both supposed to be names for the same city: Jerusalem. The force of the example comes from the intelligibility of the proposal to move al-Quds to a site north of Jerusalem. In the example, these names co-refer on a *de re* construal of reference, but on the *de dicto* construal of reference they refer to different things, which allows us to talk about moving one without moving the other. In so far as Chomsky’s point is that we can often refer to an object under one name but not another, or move between relational and non-relational senses of reference, my proposal captures Chomsky’s point perfectly. Similar claims can be made about many of Chomsky’s other examples. Chomsky often points to the instability and abstractness of referents as evidence for the non-relationality of reference. For instance, London might be reduced to dust and be built in another place, but we can refer to it all along. If we were referring to the concrete object in the first place, it would pose a serious puzzle for how the referent of ‘London’ could move from a concrete object to an abstract object and then back to a concrete one. A non-relational view of reference solves this puzzle. Lastly, Chomsky (2000, p. 178) often challenges advocates of the Lewisian view of semantics to give an account of the reference of expressions like ‘Joe Sixpack’ which seem to refer non-specifically. *De dicto* semantics handles this case straightforwardly, because it countenances a form of non-specific reference that results from the non-specific reading of an ITV.

³⁶ See note 14 above for a discussion of these problems, together with references.

A final reason to think that intensionality is the right way of capturing Chomsky's view of semantics is that the truth of many intensional constructions, particularly reports of searches, desires for, and beliefs in, depend crucially on facts about the intentions, beliefs and interests of the subject, and this is exactly what Chomsky claims is the case for reference and application. Consider the case where London is destroyed and rebuilt in another place. According to Chomsky, the conditions under which the rebuilt city is considered London are determined by both psychological and social factors—they are not to be accounted for metaphysically. In so far as Chomsky thinks that fine-grained psychological factors play a role in what it is that words refer and apply to, he seems to be saying that reference and application are intensional, in that they depend on facts about the subject's psychology, or are mind-dependent in some way. Just as 'John seeks a dog' says something about John's psychology—that is, John's intentions, goals, beliefs and desires—claims about reference may partly concern psychological and social facts, and do not report relations to particular objects.³⁷

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