Integrating Lexical and Compositional Semantics: The Dynamics of Adjective Meaning

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0. Introduction

Starting from some widely shared common-sense ideas about meanings, we will show how some general methodological strategies can lead to the conclusion that at least one central ingredient of the meaning of a sentence must be a specification of the conditions under which it is true, and therefore that one central ingredient of word meanings must be their contribution to the truth-conditions of sentences. Truth conditions give both more and less information than the actual truth value of a sentence; more, because they specify truth values in all possible worlds, i.e. they tell what a state of affairs must be like for the given sentence to be true in it; but also less, because we may know the truth conditions without knowing which kind of world the actual world is. The kind of framework this leads to is known variously (with further differences on which we will be neutral here) as formal semantics, possible worlds semantics, model-theoretic semantics, and is contrasted with such other approaches as cognitive semantics, conceptual role semantics, and all approaches which view semantics as involving translation into some uninterpreted language of ”semantic representations”. (See Partee 1999). One challenge for formal semanticsists is to show cognitive scientists that in spite of the nomenclature, and in spite of the anti-psychologism of some of the contributors to the enterprise (Frege, Montague), linguists who are formal semanticsists are very much engaged in the investigation of human language competence.

A central concern for the study of meaning is how the meanings of complex expressions are composed from the meanings of their constituent parts.

Principle of Compositionality, First Version: The meaning of a whole is a function of the meanings of its parts.

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What are “parts”? The Principle of Compositionality requires a notion of part-whole structure that is based on syntactic structure.

Principle of Compositionality, Second Version: The meaning of a whole is a function of the meanings of the parts and of the way they are syntactically combined.

We will sharpen this principle further below, but this is a good if informal statement of the basic principle. There have been many challenges to it of different sorts; my own view is that (a) there are so many other variables in linguistic theories that it can hardly be a straightforwardly empirical claim, but (b) it makes a good working principle: apparent counterexamples are invitations to work hard to uncover new descriptive accounts or to make revisions somewhere in the theoretical framework.

The focus of the lecture will be some aspects of the dynamic interaction of meaning and context. One important challenge faced by compositional approaches such as formal semantics is how to account for context-dependent meaning shifts without abandoning compositionalty. We argue that in fact compositionality can be seen as one of the driving forces in context-sensitive meaning shifts. Our case study will be the semantics of different kinds of adjectives. The interplay of context-dependence and intensionality will be illustrated in showing why skillful is intensional but large is not, even though we may consider a large house not to be a large building. We will also take up the puzzles of “privateive” adjectives like fake and counterfeit and “redundant” adjectives like real. The perspective we will take is how attention to the semantics of syntactic structure (compositional semantics) sheds light on the word meaning, and how compositional semantics, lexical semantics, and the context of the utterance all interact. One of the broader implications of this perspective is that there should in principle be no conflict between the goals of “formal” and “cognitive” approaches to semantics, although there are of course differences in priorities and in favored forms of argumentation.

1. Compositionality and Montague’s contribution to natural language semantics

1.1. English as a Formal Language.

R. Montague 1970, “English as a Formal Language” begins: “I reject the contention that an important theoretical difference exists between formal and natural languages. ... In the present paper I shall accordingly present a precise treatment, culminating in a theory of truth, of a formal language that I believe may reasonably be regarded as a fragment of ordinary English. ... The treatment given here will be found to resemble the usual syntax and model theory (or semantics) of the predicate calculus, but leans rather heavily on the intuitive aspects of certain recent developments in intensional logic [due to Montague -- BHP].”

1.2. The Principle of Compositionality.

We stated above that a central principle of formal semantics is that the relation between syntax and semantics is compositional.

The Principle of Compositionality: The meaning of an expression is a function of the meanings of its parts and of the way they are syntactically combined.
Each of the key terms in the principle is a “theory-dependent” term, and there are as many versions of the principle as there are ways of specifying those terms. (meaning, function, parts (syntax)). See (Partee 1984).

Earlier linguistic tradition: 1960’s: Katz and Fodor argued for compositional semantics (“projections principles”), but with meanings as (uninterpreted) “semantic representations” in the form of bundles of “semantic features”; unclear criteria of correctness. Emphasis on accounting for ambiguity (deriving more than one semantic representation), anomaly (zero SR’s), some kinds of semantic relatedness.

The logic tradition: Frege, Tarski, Carnap, Montague. The basic meaning of a sentence is its truth-conditions: to know the meaning of a sentence is to know what the world must be like if the sentence is true. Basic criteria of adequacy: get the truth-conditions and entailment relationships right. Introduced into linguistics in the 1970’s (as “Montague grammar”), gradually became the dominant approach to semantics (now “formal semantics”).

The mental representation tradition: Fodor, Jackendoff, and others. Basic meaning of a sentence is a representation in a “language of thought” or “conceptual representation”. Compositionalism is then compositionalism of translation.

Compositionality in the Montague Grammar tradition:

The task of a semantics for language L is to provide truth conditions for every well-formed sentence of L, and to do so in a compositional way. This task requires providing appropriate model-theoretic interpretations for the parts of the sentence, including the lexical items.

The task of a syntax for language L is (a) to specify the set of well-formed expressions of L (of every category), and (b) to do so in a way which supports a compositional semantics.

Roughly: Syntax is an algebra, semantics is an algebra, compositionalism is homomorphism. (Montague)

Basic structure:

(1) Syntactic categories and semantic types: For each syntactic category there must be a uniform semantic type (Montague). This makes a compositional syntax-semantics relationship easier to achieve, but I have argued on linguistic grounds for greater category-type flexibility (Partee 1986), which need not undermine compositionalism. (More on this below.)

(2) Basic (lexical) expressions and their interpretation. For basic expressions, the semantics must assign an interpretation of the appropriate type. In early formal semantics, most lexical meanings were treated as primitives. Montague regarded the analysis of lexical meaning as an empirical rather than formal matter; he treated only the types of lexical meanings. Below we argue for greater integration of lexical and compositional semantics.

(3) Syntactic and semantic rules. Syntactic and semantic rules come in pairs:
<Syntactic Rule n, Semantic Rule n>: in this sense compositional semantics concerns “the semantics of syntax”.

Syntactic Rule n: If α is an expression of category A and β is an expression of category B, then Fn(α,β) is an expression of category C. [where F is some syntactic operation on expressions]

Semantic Rule n: If α is interpreted as α’ and β is interpreted as β’, then Fn(α,β) is interpreted as Gm(α’,β’). [where G is some semantic operation on semantic interpretations]

2. Integrating formal semantics, lexical semantics, natural language metaphysics

2.1. Formal semantics in the broader setting of natural language use.

(1) Model structures: arising from the way humans schematize situations they want to describe.

When we view a natural language as a formal language, we simultaneously view the world (or the set of possible worlds) as a model of it. This involves some abstraction and regimentation both of the language and of the world(s), as reflected in the type structure imposed on the language and the ontology of the model structures in which it is interpreted.

Ideally, this abstraction should mirror a “real” abstraction which our “language faculty” imposes on the real world, “natural language metaphysics” (Bach 1986) or naiвnaja kartina mira ‘naive picture of the world’ (Apresjan 1986).

(2) We consider a sentence or a text as a theory describing the model of the situation (model of this theory) (Borschev and Partee 1998)

(3) This theory is formed from several sources:

• text itself, its sentences are considered as formulas (formal semantics)
• meaning postulates corresponding to words of text (lexical semantics)
• contextual information (formal pragmatics in Montague’s sense)

The interaction of these constituents may be rather complicated.

2.2 Lexical semantics in Moscow school:

• Lexical definition is modeled as mathematical definition
• It is usually although not essentially assumed that there are some undefined notions, semantic primitives (atoms of meaning). We are neutral but skeptical on this point.
• Meaning of other words described by lexical definitions. Such a definition is a text describing necessary and sufficient conditions.
• We represent the meaning of the word as a set of meaning postulates, the theory of this word. This is our version of the Moscow school approach.

(i) Meaning postulates can specify semantic properties that distinguish various semantic subclasses within a given semantic type, such as the following two classes of adjectives.

(a) ∀x[P] δ [skillful(P)(x) → P(x)] (a skillful surgeon is a surgeon; this meaning postulate does not apply to adjectives like former and alleged.)

(b) ∀x[P] [former(P)(x) → ~P(x)] (former is a “privative” adjective)

(iii) A meaning postulate with enough information packed into it may constitute a definition; if the meaning postulate specifies necessary and sufficient conditions, it can be written with an “if” (→) rather than just as a one-way implication.

∀x[P](former(P)(x) ↔ [PAST(P(x)) & ~P(x)])

Whether such meaning postulates are possible for more than a small fraction of the lexicon of a natural language is a matter of debate.

(iv) Meaning postulates can put constraints on the interrelations that must hold among the meanings of certain words without necessarily treating one word as “more basic” than another or decomposing both of them into some common “atoms”. Decompositional analyses are not forbidden but are not required; that issue can be open to exploration and debate.

∀x∀y[husband(y)(x) ↔ wife(x)(y)]
3. Introduction to adjective semantics

Montague (1970a) presented a semantic treatment of adjectives which he credited to then unpublished work done independently by Hans Kamp and Terence Parsons (Kamp 1975, Parsons 1970); see also (Clark 1970). The central claim in that work was that adjective meanings should be analyzed as functions from properties to properties. Among adjective meanings, some might satisfy further constraints such as intersectivity or subsectivity, but no such constraint can be imposed on the class as a whole, the argument goes, because of the existence of adjectives like false, ostensible, alleged.

The strategy of “generalizing to the worst case”, followed by Montague in order to have a uniform assignment of semantic types to syntactic categories, called for giving all adjectives the type of functions from properties to properties. More restricted subclasses of adjectives, such as the subjective (skillful, good) and intersective (purple, carnivorous) adjectives, might be indicated by the use of meaning postulates. In theories which allow type multiplicity and type-shifting, the intersective adjectives might indeed be assigned the simpler type of one-place predicates; this is now widely assumed.

Kamp and Partee (1995) review the more or less standard “hierarchy” of classes of adjectives as a preliminary to arguing that arguments concerning the appropriateness of prototype theory as a part of the account of the semantics of adjective-noun combinations should be restricted to intersective adjectives. The hierarchy ranges from intersective adjectives like carnivorous to privative adjectives like counterfeit, fake, and fictitious. The same article makes some proposals for coercion of adjective meanings in context, driven by certain general constraints, which help to explain a number of kinds of shifts and adjustments that take place when adjective-noun combinations are interpreted in various kinds of contexts. Some problem cases remained, especially the case of stone lion, where it seems that the noun rather than the adjective shifts its meaning when faced with incompatibility of the primary senses of each word.

But now I want to argue that in fact adjective meanings are more constrained than was appreciated either at the time of the work of Montague, Kamp, Parsons and Clark or at the time of the work of Kamp and Partee. In particular, I will argue that some facts about the possibility of “NP-splitting” in Polish cast serious doubt on the standard hierarchy, and that the data become much more orderly if privative adjectives like counterfeit, fake, and fictitious are reanalyzed as subjective adjectives. Further evidence for that move comes from long-standing puzzles about what to say about sentences like Is that gun real or fake? The revised account requires the possibility of coerced expansion of the denotation of the noun to which such an adjective (as well as adjectives like real, genuine, which were not examined in the earlier-cited literature) is applied. Such coercion can be motivated by treating the constraints on possible adjective meanings as presuppositions that must be satisfied by any use of an adjective; the corresponding coercion may then be seen as a form of presupposition accommodation.

The rest of the talk is structured as follows. Section 4 briefly reviews the adjective classification familiar since the work of the 1970’s as summarized in Kamp and Partee (1995) and in (Partee 1995). The Polish NP-splitting data (Nowak 2000) and the problem they pose for the familiar hierarchy are presented in Section 5. In Section 6 I review some of the constraints on possible adjective meanings proposed in Kamp and Partee (1995) and propose further constraints that exclude privative adjectives and account for the coercion of the noun meaning in cases that would otherwise come out as privative.

4. Adjective classification

4.1. Meaning postulates for classes of adjectives

An adjective like carnivorous is intersective (Parsons: predicative); (4) holds for any N.

\[ \text{carnivorous} \cap \text{N} = \text{N} \]

But skillful is not, as shown by the invalid inference pattern in (5), familiar from the work of Kamp, Parsons, Clark, and Montague cited in the introduction.

(5) Francis is a skillful surgeon.

Therefore Francis is a skillful violinist. [Not valid]

Skillful is not intersective, but it is subjective (Parsons: standard); (6) holds for any N.

\[ \text{subjective: [skillful]} \subseteq \text{N} \]

The adjectives former, alleged, counterfeit are neither intersective nor subjective.

\[ \text{(i) intersective(9):[former senator]} \neq \text{[former]} \cap \text{[senator]} \]

(7) [former senator] \subset [senator]

Nonsubjective adjectives may either be “plain” nonsubjective (no entailments at all, no meaning postulate needed), or privative, entailing the negation of the noun property. The meaning postulate for privative adjectives is stated informally in (8).

\[ \text{counterfeit} \cap \text{N} = \emptyset \]

Additional examples of each type are given below.

\[ \text{(ii) non-intersective but subjective: typical, recent, good, perfect, legendary.} \]

\[ \text{non-subjective and privative: would-be, past, spurious, imaginary, fictitious, fabricated (in one sense), mythical (maybe debatable); there are prefixes with this property too, like ex-, pseudo-, non-.} \]

\[ \text{plain non-subjective: potential, alleged, arguable, likely, predicted, putative, questionable, disputed.} \]

The conclusion drawn by Parsons, Kamp, Clark and Montague was that the simplest general rule for interpretation of the combination of an adjective with a noun (or common noun phrase: CNP) is the following: Adjectives are functions that map the (intensional) semantic value of the CNP they combine with onto the semantic value of the ADJ + CNP combination. That is, “The denotation of an adjective phrase is always a function from properties to properties. (This was one of the proposals advanced by Kamp and Parsons.)” (Montague 1970a, p.211 in Montague 1974)

In terms of the type theory of Montague’s Intensional Logic (Montague 1970b, Montague 1973), where common noun phrases are of type \(<<s,e>,t>\), this meant that the most general type for adjectives was taken to be \(<<s,<<s,e>,p>\>\), \(<<<s,e>,p>>\>. On the variant of Bennett
Among many other debated points, one which has always been troubling, and to which we will return, is the question of whether an adjective or adjectivally used noun like *fake* toy is really privative. One nagging problem, to which we will return, is the evident tension between the apparent truth of (13a) and the undeniable well-formedness and interpretability of (13b).

\( (13) \quad \text{a. A fake gun is not a gun.} \)
\( \text{b. Is that gun real or fake?} \)

4.2. Is tall intersective or subsective?.

In section 4.1 above we indicated that the inference pattern (5) was a test of whether an adjective was intersective. By this test, it looks like vague adjectives like *tall* and *young* are non-intersective:

\( (5') \quad \text{a. Tom is a tall 14-year-old.} \)
\( \text{b. Tom is a basketball player.} \)
\( \text{c. ?? Therefore Tom is a tall basketball player.} \)

Does that mean that *tall* is not intersective? No; perhaps it is intersective but vague and context-dependent. How can we tell the difference?

First argument. Keep the ADJ-N sequence constant but change other aspects of the context. That can help to show whether it is the intension of the noun that is crucial.

\( (5')' \quad \text{a. My two-year-old son built a really tall snowman yesterday.} \)
\( \text{b. The linguistics student built a really tall snowman last weekend.} \)

Further evidence that there is a difference between truly nonintersective subsective adjectives like *skillful* and intersective but vague and context-dependent adjectives like *tall* was noted by Siegel (1976b): the former occur with *as*-phrases, as in *skillful as a surgeon*, whereas the latter take *for-*phrases to indicate comparison class: *tall for an East coast mountain*. (An adjective can be nonintersective and also vague, and then one can use both an *as*-phrase and a *for*-phrase: *very good as a diagnostician for someone with so little experience.*)

5. Privative adjectives and Polish NP-split phenomena

Nowak (2000) studied the phenomenon of “split PPs” and “split NPs” in Polish. (See also (Gouskova 2000) for related work on Russian, as well as (Junghans 2000, Melhorn 2000).) Ignoring PPs for simplicity, and ignoring the topic-focus structure that motivates the splitting, the facts are that an NP consisting of Adj and N in Polish may be “split”, with either the Adj sentence-initial and the N sentence-final, or the N sentence-initial and the Adj sentence-final. Sequences of Adj’s can be sentence-initial; only a single element can be sentence-final. Examples of NP-splits (all actually PP-splits, which combine properties of NP-splits with constraints on where the preposition can end up) are given in (14 - 15) below.

Sentences (14b) and (15b) are ‘split’ versions of sentences (14a) and (15a), which represent the unmarked word order. In (14b) the proposition and adjective in sentence-initial position and the bare noun is sentence-final, while in (15b) the proposition and noun are sentence-initial and the adjective is sentence-final. All examples are from Nowak (2000).
6. Principles of interpretation

The hypothesis I propose is that Nowak’s data tells us that adjectives fake and imaginary aren’t actually privative, but subsective, and that no adjectives are actually privative. In interpreting a question like (13b) above or a sentence like (20) below, I hypothesize that we actually expand the denotation of ‘fur’ to include both fake and real fur.

20. a. I don’t care whether that fur is fake fur or real fur.
   b. I don’t care whether that fur is fake or real.

In fact, even in (13a), it is reasonable to suppose that the first occurrence of gun, modified by fake, is similarly coerced, whereas the second, unmodified, occurrence is not. Normally, in the absence of a modifier like fake or real, all guns is understood to be real guns, as is evident when one asks how many guns the law permits each person to own, for instance. Without the coerced expansion of the denotation of the noun, not only would fake be privative, but the adjective real would always be redundant.

Kamp and Partee (1995), in discussing the “recalibration” of adjective interpretations in context, introduced a number of principles, including the following “Non-Vacuity Principle”.

21. Non-vacuity principle (NVP):
In any given context, try to interpret any predicate so that both its positive and negative extension are non-empty. (Kamp and Partee 1995, p.161)

The Non-Vacuity Principle applies not only to simple predicates but to predicates formed, for instance, by combination of an adjective and a noun: these should be interpreted in such a way that the ADJ + N combination is a non-vacuous predicate.

However, Kamp and Partee (1995) also argued, in part on the basis of clear examples like (22), that in ADJ + N constructions, one first interprets the noun in the given context (ignoring the adjective), and then “recalibrates” the adjective as necessary. This principle is expressed as the “Head Primacy Principle” in (23).

22. The Head primary principle (HPP): In a modifier-head structure, the head is interpreted relative to the context of the whole constituent, and the modifier is interpreted relative to the local context created from the former context by the interpretation of the head. (Kamp and Partee 1995, p.161)

In many cases, the Non-Vacuity Principle and the Head Primacy Principle cooperate to account for the observed results, including not only the examples in (22), but also the fact that the truth of (24b) below is compatible with a non-redundant use of the modifier in (24a).

23. a. This is a sharp knife.
   b. Knives are sharp. (Kamp and Partee 1995, p.162)

4 Maybe Polish ‘past’ is different from English ‘former’ in allowing corresponding expansion of the extension of the noun it applies to. Compare the uncertainty in classifying retired, dead as intersective vs. privative. Probably the line is not sharp because the extension of nouns is very ‘adjustable’. Lakoff (1987) discusses this, including nice discussion of how the adjective real can ever be non-redundant.

6 “In the simplest cases, the effect of the interpretation of a head noun on a given context will be to restrict the local domain to the positive extension of the head in the given context.” (Kamp and Partee 1995, p.161, fn.23)
If the Head Primacy Principle is absolute, the proposed shift in the interpretation of the head noun under coercion by a privative adjective like *fake* or a “tautologous” adjective like *real* would be impossible. But there are other examples as well that suggest that the Head Primacy Principle probably has to be seen as non-absolute. In particular, there is a large and productive class of "constitutive material" modifiers that occur in examples like *stone lion, wooden horse, velveteen rabbit, rubber duck*. It is evidently so easy to shift nouns from their literal meaning to a meaning “representation/model of …” that we hardly notice the shift. The perspective of Optimality Theory suggests that we can account for this situation by saying that the Non-Vacuity Principle outranks the Head Primacy Principle. We normally try to obey both. But if there is no reasonable way to obey the Non-Vacuity Principle without shifting the noun outside its normal bounds (as in the case of *fake* and *real*), then it may be shifted in such a way as to make the compound predicate obey the Non-Vacuity Principle. (Since this is always necessary with privative and “tautologous” modifiers, there might even be some subtle syntactic phenomena that particularly indicates the need to shift the head to which they apply.) And if there is an extremely productive and “easy” shift of the noun that would make it easy to satisfy the Non-Vacuity Principle, as in the case of the “representations” in *wooden horse, etc.*, there too we can override the Head Primacy Principle.

And I would suggest that no adjectives are privative (Partee in press). “Normal” adjectives are always subsective, and there should be some ways to identify “modal” adjectives as a special subclass, such that only they are not necessarily subsective.

One surprising piece of data that remains in the Polish facts is that the adjective corresponding to English *past* does allow NP splitting and can occur in predicate position. This calls for further investigation: perhaps Polish *past* is different from English *former* in allowing a corresponding expansion of the extension of the noun it applies to. There are certainly unclear cases in English: witness the uncertainty in classifying *retired, dead* as intersective vs. privative. Probably the line is not sharp because the extension of nouns is quite “adjustable”.

When thinking about a question like (25a) below, there is in normal circumstances no temptation to include dead poets. Note that it’s not that the predicate *poet* by itself presupposes that the entities it applies to are alive, since we readily talk about anthologies of works by 18th century poets, and we don’t usually refer to them as dead poets or former poets or ex-poets (the movie title *Dead Poets Society* has the feel of an intentionally surprising phrase). And *be in Amherst* cannot be said to presuppose that the entities it applies to are living animate entities. Yet the combination of *poet* with an extensional present-tense predicate together carries at least a very strong implication that we are to count “live” poets. But exactly the opposite is true for question (25b), since the predicate *are buried*, discounting ghoulish situations, when combined with a subject noun phrase that (normally) denotes an animate being, normally presupposes that the ’animate entities’ it applies to are dead.

(25) a. How many poets are there in Amherst?
   b. How many poets are buried in Amherst?

The conclusion from such examples seems to be that whether the extension of a noun like *poet* at a given time includes only poets living at that time or both living and dead poets is highly dependent on the rest of the context, and easily shifts. Similar examples can easily be multiplied, and there may well be other phenomena that should be looked at in a similar light. Bennett (1974) observed that Montague’s list of intensional verbs contained verbs of two different sorts. The typical intensional verb in Montague’s list was *seek*, which exhibits all the classic opacity properties. But Montague’s list also included *worship* and *remember*, and Bennett noted that an indefinite object with those verbs is always interpreted as "specific", not “non-specific”; the only sense in which it is “intensional” is that the object in question need not exist at the world and time of the worshipping or remembering.

If the hypothesis proposed in this section can be maintained, then the classification of adjectives would be much more neatly constrained. Adjectives would still be functions from properties to properties the most general case, but in harmony with the traditional notion of *modal* adjectives, which are not so constrained; the Polish data would provide fuel for a proposal to consider them syntactically as well as semantically distinct. I have said nothing to help with the problem of how to constrain the nonsubsective adjectives to just the kinds of “modal” adjectives which actually occur and not allow random nonsubsective functions: this challenge is raised in (Heim 1999), and I have no solution to it. But if we can exclude privative adjectives completely, that would be one step in the direction of constraints. Of course more work also needs to be done on the detailed lexical semantics of each of the putatively privative adjectives, since they are far from identical; but that is beyond the scope of this talk.

7. Conclusions

The adjective puzzles that I have been discussing were designed to illustrate several issues. One is the need to study lexical semantics and principles of semantic composition together; decisions about either may have major repercussions for the other. More importantly for this context, I have tried to show that while contextually influenced meaning shifts pose challenges for compositionality, we can see compositionality as playing an essential role in constraining the kinds of meaning shifts that take place. We hold the principle of compositionality constant in working out (unconsciously) what shifts our interlocutors may be signaling. In the extreme case we (like children) depend on compositionality to figure out the meanings of novel words: if we can use contextual clues to guess what the whole sentence meant, we can then “solve” for the meaning of the unknown word. Compositionality would thus appear to be one of the most cognitively basic principles in the realm of semantics. While many of the most important foundational questions in the field remain open, I would suggest that the principle of compositionality has shown its value as a central working hypothesis guiding semantic research.

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8 Bennett (1974) observed that Montague’s list of intensional verbs contained verbs of two different sorts. The typical intensional verb in Montague’s list was *seek*, which exhibits all the classic opacity properties. But Montague’s list also included *worship* and *remember*, and Bennett noted that an indefinite object with those verbs is always interpreted as “specific”, not “non-specific”; the only sense in which it is “intensional” is that the object in question need not exist at the world and time of the worshipping or remembering. It might be fruitful to consider these verbs as ones which sometimes cohere expansion of the domains in which their direct objects are interpreted rather than as intensional.
References


