

# Remarks and Replies

## The Emptiness of the Lexicon: Reflections on James Pustejovsky's *The Generative Lexicon*

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We consider Pustejovsky's account of the semantic lexicon. We discuss and reject his argument that the complexity of lexical entries is required to account for lexical generativity. Finally, we defend a sort of lexical atomism: though, strictly speaking, we concede that lexical entries are typically complex, still we claim that their complexity does not jeopardize either the thesis that lexical meaning is atomistic or the identification of lexical meaning with denotation.

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A certain metaphysical thesis about meaning that we will call Inferential Role Semantics (IRS) is accepted practically universally in linguistics, philosophy, and the cognitive sciences:<sup>1</sup> the meaning (or content, or "sense") of a linguistic expression<sup>2</sup> is constituted, at least in part, by at least some of its inferential relations. This idea is hard to state precisely, both because notions like metaphysical constitution are moot and, more importantly, because different versions of IRS take different views on whether there are constituents of meaning other than inferential role, and on which of the inferences an expression occurs in are meaning constitutive. Some of these issues will presently concern us, but for now it will do just to mention such familiar claims as that: it's part and parcel of *dog* meaning 'dog'<sup>3</sup> that the inference from *x is a dog* to *x is an animal* is

A number of people, including an anonymous reviewer, have asked us why we have singled out Pustejovsky's theory in particular. The first answer is that we haven't. This article is one in a series of publications devoted to criticizing, in detail, arguments for a decompositional view of the semantic lexicon (see Fodor 1970, Fodor, forthcoming:chap. 4, Fodor and Lepore 1992, Fodor and Lepore, forthcoming). The second answer is that many of the objections to Pustejovsky's theory do not depend on the details and apply to other theories as well.

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<sup>1</sup> By a "metaphysical thesis about X" we simply mean a thesis about which properties of Xs are essential. By stipulation: If theory T holds that it is metaphysically necessary that Xs are Ys, then T says that being Y is metaphysically necessary for being X, and that being Y is "constitutive" of Xness.

<sup>2</sup> The corresponding doctrine is generally supposed to be true of the meaning (content/"sense") of mental entities like concepts and beliefs. Our discussion is intended to apply, *mutatis mutandis*, to either version of IRS.

<sup>3</sup> Cited forms are in italics, as are emphasized expressions. Expressions enclosed in single quotation marks stand for semantic values (e.g., meanings or denotations). (Note that this reverses the notational convention that is customary in philosophy.) Semantic representations are in full caps.

However, citation conventions in quoted passages are as per the quoted text.

valid; it's part and parcel of *boil* meaning 'boil' that the inference from *x boiled y* to *y boiled* is valid; it's part and parcel of *kill* meaning 'kill' that the inference from *x killed y* to *y died* is valid; and so on. (See Cruse 1986:chap. 1 and passim.)

IRS brings in its train a constellation of ancillary doctrines. (We are neutral about whether these ancillary doctrines are literally entailed; that would depend on how IRS is formulated.) Presumably, for example, if an inference is constitutive of the meaning of a word, then learning the word involves learning that the inference holds. If *dog* means 'dog' because *dog* → *animal* is valid, then knowing that *dog* → *animal* is valid is part and parcel of knowing what the word *dog* means; similarly, learning that *x boiled y* → *y boiled* is valid is part and parcel of learning what *boil* means; and so forth.

IRS also constrains grammatical theories since, on standard versions of the IRS view, the *semantic lexicon*<sup>4</sup> of a language is supposed to be the component of a grammar that makes explicit whatever one has to (learn/) know to understand the lexical expressions of the language. IRS thus implies that meaning-constitutive inferences are part of the *semantic lexical entries* for items that have them. Lexical entries are therefore typically complex objects ('bundles of inferences') according to standard interpretations of IRS. It is the latter thesis that will primarily concern us in the present discussion. For reasons that we have set out elsewhere, we doubt that IRS can be sustained (Fodor and Lepore 1992); a fortiori, we doubt the cogency of arguments that take IRS as a premise. The primary question in what follows will be *whether there are any persuasive arguments for the complexity of lexical entries that do not presuppose IRS*. Our main interest in Pustejovsky 1995 is that it purports to provide such an argument.

Here is how we will proceed: The natural alternative to the claim that lexical entries are typically complex is the claim that lexical entries are typically atomic (i.e., they lack internal structure). We propose to adopt a version of this claim as a sort of null hypothesis: namely, that the only thing a lexical entry specifies is the denotation of the item it describes. Here again we scant the details for the moment. Roughly, though: the lexical entry for *dog* says that it refers to 'dogs'; the lexical entry for *boil* says that it refers to 'boiling'; and so forth.<sup>5</sup> We will try to show that all the standard arguments for rejecting this null hypothesis, Pustejovsky's included, either depend on assuming IRS or are independently unsound.

In sections 1 and 2 we consider Pustejovsky's account of the semantic lexicon; in particular, we discuss and reject his argument that the complexity of lexical entries is required to account for lexical generativity. In section 3 we consider whether our default theory, lexical atomism, might not actually be true. We argue that, strictly speaking, it probably is not; strictly speaking, lexical *entries* are typically complex. But we claim that they are complex in a way that does not jeopardize either the thesis that lexical *meaning* is atomistic, or the identification of lexical meaning with denotation.

<sup>4</sup> In what follows, *lexicon* always means 'semantic lexicon' unless we are explicit to the contrary.

<sup>5</sup> If it's assumed that it's necessary that dogs are animals, then, of course, whatever denotes a dog denotes an animal. But, according to the present view, the lexical entry for *dog* does *not* provide this information; it says only that *dog* denotes 'dogs'. Correspondingly, according to the present view, knowing that dogs are animals is *not* necessary for knowing what *dog* means.

## 1 Pustejovsky's Theory

We take the theory of the lexicon that Pustejovsky (hereafter JP) holds to be firmly within the IRS tradition. In particular, like other proponents of IRS, JP thinks that word meanings are constituted by inferences, hence that knowing what a word means involves knowing (some of) the inferences in which it participates. In fact, he apparently thinks (what IRS does not strictly require) that understanding a token (e.g., an utterance or inscription) of an expression involves actually drawing some of the inferences that the words that are tokened license: “The structuring of . . . taxonomic information . . . is not simply an exercise in domain modeling; it is necessary for driving *the inferences that a language reasoning system must perform in order to understand a sentence*” (p. 19, our emphasis). As usual with IRS-motivated theories of meaning, it is taken for granted that the semantic lexicon should somehow formally specify the inferences by which meaning (/knowledge of meaning/sentence understanding) is constituted.

We stress this because JP occasionally writes as though it were not the specification of *inferential roles* but rather the specification of *denotations* with which lexical semantics is primarily concerned: “Lexical semantics is the study of how and what the words of a language denote” (p. 1). But this is a little misleading. Roughly, according to JP, lexical entries specify denotations via their *meanings*, so that, for example, coextensive expressions may well be assigned distinct lexical entries.<sup>6</sup> Thus, *John bought the book from Mary* and *Mary sold the book to John* are made true by the same event; but they differ, according to JP, in a property of “headedness” or “focus” that they inherit from the lexical entries of their respective verbs. Patently, however, “headedness” is not a property of denotations (“things in the world”) but rather of denotations *as represented*. JP says that “[h]eadedness is a property of all event sorts . . .” (p. 72); but he can’t really mean that. What he must really mean is that it’s a property of all (semantically well formed) representations of event sorts (in English).

Similarly, one of JP’s characterizations of an “event structure” specifies an event  $e_3$  such that “there is no other event that is part of  $e_3$ ” (p. 69). But, clearly, all events have parts (down to whatever physics determines is the microstructure of the universe). What JP means is really that no other event is *represented as* (or implied as) part of  $e_3$  by the form of words that expresses the event. Here again, what the semantics is telling us about is not (or not just) what a word represents, but how it represents it—in effect, not just the word’s denotation but also its sense.

We do not mean to insist on what are, probably, not confusions but a matter of being casual about the use/mention distinction. However, it is important to us to contrast JP’s sort of project with a bona fide denotational semantics, according to which satisfaction conditions, and properties defined in terms of them, are the only semantic features of linguistic expressions that lexical entries specify. In fact, JP enumerates a variety of constraints on semantic theories that a purely denotational lexicon clearly could not meet, hence that are supposed to motivate a richer notion

<sup>6</sup> Whether JP thinks that the semantic representations that the lexicon specifies actually *determine* denotations is unclear from the text, though there are passages that suggest he does. For example, discussing the “qualia structures” that constitute the lexical entries for nouns, he says that they “contribute to (or, in fact, determine) our ability to name an object with a certain predication” (p. 85).

of lexical semantic representation than a denotational lexicon could provide. With one exception, these are familiar from discussions in lexical semantics dating as far back as Katz and Fodor 1963. Consonant with our overall project, we propose to discuss them relatively briefly, putting aside the ones that are motivated either by IRS or by other assumptions that we regard as tendentious. This will leave for section 2 to consider what we take to be JP's main line of argument and the main contribution of his book: the claim that only if lexical entries are typically complex can the generativity of the lexicon be captured—a fortiori, that an atomistic lexicon would fail to explain “how words can take on an infinite number of meanings in novel contexts” (p. 42).

As far as we can make out, other than the considerations about generativity, JP offers three kinds of arguments for complex lexical representations; we take these up in sections 1.1–1.3.

### 1.1 *Interlexical Semantic Relations*

Lexical semantics is required to specify “how words are semantically related to one another” (p. 23), including, in particular, relations of “synonymy, antonymy, hyponymy and lexical inheritance, meronymy, entailment and presupposition.”<sup>7</sup>

Clearly, a lexical entry that says only that *dog* refers to ‘dogs’ will not thereby specify (e.g.) that dogs are animals (hyponymy); a lexicon that says only that *bachelor* refers to ‘bachelors’ will not thereby specify that *bachelor* means the same as *unmarried man* (synonymy); and so on. In fact, barring appeal to meaning postulates (of which JP disapproves; see pp. 54, 110), the only way of capturing such relations in the lexicon would seem to require complex lexical entries (e.g., ones that include ANIMAL in the entry for *dog* and UNMARRIED and MAN in the entry for *bachelor*). In short, if the lexicon is constrained to capture “interlexical relations,” then it is neither atomistic nor purely denotational.

The question, however, is how to motivate imposing this constraint on lexical entries, and here the problems are formidable. The basic issue is this: all the relations JP enumerates are species of *analyticity* (lexical entailment); so, in effect, he is requiring that the lexicon reconstruct the notion *analytic inference*. But this notion is notoriously problematic, and not just for the familiar Quinean reasons. Arguably there simply is no such notion. If so, then the program of lexical semantics that JP advocates cannot be carried out. This is, to be sure, a large issue, and it has implications for many projects other than JP's. Suffice it, for our present purposes, to stress just two points.

First, Quine's own doubts about analyticity are part of his larger skepticism about necessity. But the two need to be distinguished since analyticity does not follow even if necessity is granted. Suppose, for example, that *dog* → *animal* is necessary; that is, suppose nothing could be a dog that wasn't an animal. Remember that semantic lexicons are supposed to be repositories of (and only of) meaning-constitutive inferences, that is, of those inferences that one has to be prepared to draw on pain of not understanding the word in question. It seems clear, given this condition,

<sup>7</sup> JP says nothing about how to decide which lexical relations are on the list of interlexical relations to which grammars must be responsive, or whether the enumeration he provides is supposed to be complete.

that the *necessity* of an inference is not, per se, sufficient for its meaning constitutivity. *Two* → *prime* is necessary if anything is, but it's implausible that you can't know what *two* means unless you know that two is prime. Similarly, it's presumably necessary that what is square isn't circular, but it's implausible that you can't know what *square* means unless you also know what *circle* means. Such examples are legion.<sup>8</sup> The moral is that even if we had a theory of necessity, it wouldn't, all by itself, give us a theory of synonymy, antonymy, hyponymy, and the like; it wouldn't even certify the possibility of such a theory. Even if it were perfectly certain that the distinction necessary/contingent is principled, that would not be a reason for believing in analyticity (or, a fortiori, in synonymy, antonymy, hyponymy, and the like).

Second, and worse, even if analyticity is real, it is perfectly possible to doubt that it is connected, in anything like the way that lexical semanticists generally suppose, with facts about "what the speaker/hearer knows qua speaker/hearer." To see this, assume for the moment that semantics is purely denotational, so that the lexicon consists solely of a compendium of "disquotational" truths like "*red* denotes (the property) 'red'," "*dog* denotes (the property) 'dog'," "*two* denotes (the number) 'two'," and so on. It is perfectly possible for someone who believes in this sort of lexicon to hold that each of these disquotational truths is analytic—that is, that the truth of each is guaranteed just by the semantics of English together with logic. But it would not follow from there being analyticities in *that* sense that grasping the truths of disquotation is a necessary condition for speaker/hearers to know the lexicon of their language. It is, for example, not plausible that understanding the word *red* requires knowing what quotation is, or having the concept of denotation, or the concept of a property, and so on.

Nor would it follow that, by underwriting this notion of analyticity, the lexicon would thereby underwrite synonymy, antonymy, and the rest. Suppose *X* and *Y* are absolute synonyms; and suppose that their lexical entries are, respectively, the disquotational principles "*X* denotes *Xs*" and "*Y* denotes *Ys*"; and suppose both of these disquotational principles are analytic. Still, nothing that is in (or that follows from) the lexicon says that *X* and *Y* are synonyms. That's because nothing that is in (or that follows from) the lexicon says that 'being *X*' and 'being *Y*' are the same thing. On the present assumptions, then, the lexicon supports a notion of analyticity but not of synonymy.<sup>9</sup>

The moral, so far, is this. There is a tendency among lexical semanticists to think that synonymy, antonymy, hyponymy, and the like must be bona fide linguistic phenomena because, after all, linguists have spent such a lot of time studying them; "Thus I refute Quine," Samuel Johnson might have said. But, in fact, their bona fides depend on very strong, and very dubious, semantical assumptions, for which, to our knowledge, no serious defense is on offer. Methodology cannot constrain the lexicon to reconstruct analytic inference if, in fact, there is no such thing.

<sup>8</sup> Transitivity severely compounds the problem. Since it's necessary that what's circular isn't triangular, it follows that you can't know what either *square* or *circle* means unless you know what *triangle* means. And so on ad infinitum.

<sup>9</sup> An "informational" semantics—one that construes meaning in terms of nomic or causal world-mind connections—might have very much this character. By contrast, lexical semantics simply takes for granted that semantic facts are basically epistemological—that they are grounded in facts about what speaker/hearers know about their language. We think that lexical semantics is ill advised to assume this. For discussions, see Fodor and Lepore 1992, Fodor 1994, forthcoming.

These remarks apply to lexical semanticists at large; but in fact JP's theory faces even greater problems, since many of the inferences that he thinks lexical entries determine (e.g., from *want a cigarette* to *want to smoke a cigarette*; see below) are "defeasible" (p. 46), hence not even strictly necessary. One might reasonably feel that if the necessity of an inference does not imply the semantic relatedness of its lexical constituents, no weaker modality is likely to do so. JP's comments on these sorts of issues tend not to be illuminating. For example, "[O]ne fairly standard definition states that two expressions are synonymous if substituting one for the other in all contexts does not change the truth value of the sentence where the substitution is made. . . . A somewhat weaker definition makes reference to the substitution relative to a specific context. For example in the context of carpentry, *plank* and *board* might be considered synonyms, but not necessarily in other domains . . ." (p. 23). But neither notion of synonymy can be right since, on the one hand, no two words substitute, *salve veritate*, in every context (see Mates 1950); and, on the other hand, any two words substitute, *salve veritate*, in some context (e.g., *elephants* and *asteroids* substitute in the context *are often bigger than a breadbox*). One could perhaps counter this objection if one had an account of how to individuate semantic "domains"; but JP provides none.

JP does not address the problem that is implicit in making notions like "defeasible inference" respectable as a basis for semantic theory, namely, the problem of distinguishing what the language tells one from what one knows about the world. "[*My wife uses the subway every day*] . . . is a near paraphrase of 'My wife travels on the subway every day,' an interpretation that is made possible by our knowledge of what the function of a subway is" (p. 87). But if this interpretation is indeed made possible by what we know about subways, then the conclusion should be that the two sentences are not "near paraphrases" in any sense that semantic theory is concerned with. If lexical entries really do express meanings, then what's in the semantic lexicon is information about words, and not information about the world. That's why it's perfectly possible both to understand *Sarah likes to use the subway* and to wonder what she likes to use it for.

If IRS is true, then there must be some answer to the questions "What distinguishes linguistic knowledge from world knowledge?" and "What distinguishes lexical entailment from mere necessity?" IRS guarantees that some interlexical relations are meaning constitutive and should thus be specified by lexical entries, even if it is not quite clear which ones these are. In the present discussion, however, we are explicitly *not* taking IRS for granted. We are therefore impressed by the difficulty of saying with any clarity which interlexical relations are the semantically relevant ones, or how they should be individuated. Accordingly, in what follows we will assume that the failure of an atomistic, denotational lexicon to capture such relations as synonymy, hyponymy, and the rest is not a decisive argument against it.

### 1.2 Semantic Well-Formedness

JP writes, "I will introduce a notion of *semanticity*, analogous to the view of grammaticality [*sic*]. . . , but ranging over semantic expressions rather than syntactic structures. Semanticity refers to the semantic well-formedness of expressions in a grammar" (p. 40).

No doubt, if there is such a property as semanticity, the lexicon should contribute to determining it. The trouble is that it's not clear what property it might be. JP provides no general characterization, and the few examples he offers are not transparent.

Consider pleonasms like *?Mary kicked me with her foot* and *?Mary buttered the toast with butter* (p. 40). On any account, what's wrong with these sentences is that the prepositional phrase adds nothing to what the rest of the sentence says, so a Gricean imperative ("Be informative") is violated. We suppose JP must think that the locus of the redundancy is the meaning of the verbs; anyone who knows what *buttering* means knows that it's done with butter. This consideration does not, however, argue unequivocally that the lexical entry for *butter<sub>tr</sub>* is COVER WITH BUTTER or the like. Suppose that the dictionary says only that *butter<sub>tr</sub>* refers to 'buttering'. Still, anyone who knows this, and knows what 'buttering' is, can tell that the sentences in question are redundant. It seems that this kind of "unsemanticity" does not, after all, argue for "a level of representation in the semantics, which operates according to its own set of constraints" (p. 42).

Here are some of JP's other examples of semantic ill-formedness (p. 41):

- (1) a. ?John began the dictionary.
- b. ??Mary began the rock.

According to JP, these are "semantically odd because of what we normally associate with the semantic possibilities of a noun such as *dictionary* and *rock*" (p. 41). We're inclined to think, on the contrary, that there's nothing wrong with (1a) at all, and that, if there's anything wrong with (1b), it's that one can't imagine what it was that Mary began to do with (/to) the rock. Given a clue (e.g., she began, in either sense, to paint it), the perplexity vanishes and so does the intuition that something is awry with the sentence.

The trouble, in a nutshell, is this: if capturing semantic well-formedness is to be a constraint on representations of lexical meanings, hence on lexical entries, it has to turn out that what's wrong with a semantically ill-formed sentence is that *what it means* is defective, not just that it would be "normally" or "generally" hard to "readily" interpret without contextual support. It is not clear that any of JP's examples have this property. Indeed, it is not clear that there *is* such a property as defectiveness of meaning as distinct from ungrammaticality, necessary falsity, and any of a variety of kinds of pragmatic malfeasance. Barring more persuasive examples, or an independent argument for "a level of representation in the semantics" whose rules would determine the semantic well-formedness conditions for expressions, we are inclined to doubt that failure to mark (1a–b) and the like as defective militates very strongly against purely denotational lexical entries.

### 1.3 Distribution

It is a widely held view that the semantic properties of a lexical item "give rise to" (p. 19) its syntactic properties: syntactic distribution is somehow determined or explained by, or is anyhow predictable from, meaning; so a lexicon that represents only denotation would miss linguistically salient generalizations. In this spirit, Higginbotham (1994) remarks that "...the meanings of lexical items systematically infect grammar. For example, ...it is a condition of object preposing

in derived nominal constructions in English that the object be in some sense ‘affected’ in the events over which the nominal ranges: that is why one has . . . *algebra’s discovery (by the Arabs)* [but] not *\*algebra’s knowledge (by the Arabs)*” (p. 102). Similarly, according to JP, “the diversity of complement types that a verb or other category may take is in large part also determined by the semantics of the complements themselves” (p. 10).

It is, however, notoriously difficult to assess the claimed correlations between lexical semantics and syntactic distribution, because one is never told what the semantic representations themselves mean. What, exactly, is it for an object to be “in some sense ‘affected’ in an event”?<sup>10</sup> This imprecision tends to undermine the supporting examples. So, for example, JP says that the difference between *John is running. (Therefore, John has run.)* and *John is building a house. (\*Therefore, John has built a house.)* “is whether an action is homogeneous in nature or has a culmination of some sort” (p. 16). Well, one might have thought that the process of *starting to run* has a culmination of *some sort*—namely, running. But *John is starting to run* → *John has started to run* looks fine (cf. *John is starting to build a house* → *John has started to build a house*, etc.). Our point isn’t that this is a counterexample to JP’s generalization; rather, it’s that the generalization is formulated so imprecisely that one can’t tell whether it’s a counterexample. JP’s emendation to “having a culmination” (“culminates in a changed state, i.e., . . . is an accomplishment” (p. 16)) doesn’t help much. Does it rule “starting to run” in or out? By what criterion? After all, *culminates in* is a *technical* term when it’s used this way (as are, for example *agent*, *patient*, *theme* as they are used in the theory of  $\theta$ -roles, and to which the present points apply *mutatis mutandis*). Assuming *culminates in* without explication in the language used to specify the semantics of lexical entries thus begs the key issue: whether predicates that are syntactically similar to *build* do, in fact, share anything *semantic*.<sup>11</sup>

In fact, we know of no cases in the lexical semantics literature where the semantic end of putative semantics/syntax correlations has been made out with sufficient clarity to permit the claims to be evaluated.

Another of JP’s examples (p. 10) is given in (2). Compare:

- (2) a. The woman ate her meal quickly.  
 b. The woman ate quickly.  
 c. The dog devoured the cookie.  
 d. \*The dog devoured.

Why can speakers drop the direct object of *ate* but not of *devoured*? The explanation, according to JP, is that “while *eat* denotes an activity of unbounded duration (at least lexically), *devour*, one might argue, denotes a transition. . . . [*D*] *devour* . . . carries a completive implicature that is absent from *eat*” (p. 11).

<sup>10</sup> If you think your intuitions tell you, ask them whether algebra was more, or less, ‘affected’ by being discovered by the Arabs than the electric light was by being discovered by Edison. Our intuitions say such questions are plain nonsense.

<sup>11</sup> Another way to put this point is that, on the kind of theory JP advocates, lexical entries express *senses*, not just denotations. But the sense of *culminates in* is at least as obscure as the sense of *build*, so it is hard to see how appealing to the one could much illuminate the other.

There is some uncertainty about how much JP is claiming here; if (as seems likely; see pp. 9–12 *passim*) JP thinks that the fact that *eat* is lexically represented as denoting an unbounded activity explains why its object can be dropped (i.e., that it provides a sufficient condition), then he must believe that there could not be a word that means what *eat* does but does not allow its direct object to delete. This claim is remarkably strong and there is no reason to suppose that it is true. Notice that all of the following are bad, though unbounded activities are apparently involved in each: \**John stroked*; \**John ground (/his teeth)*; \**John pounded*; \**John smelled (/the salt air)*; and so on.

But, maybe unboundedness is a *necessary* condition for the direct object to delete? Apparently not, since *win*, *lose*, and *tie* are surely bounded and *John won/lost/tied* ← *John won/lost/tied the race* seems fine. In any event, the usual problem crops up; we can't really evaluate the proposal because we don't really know what it is for an expression to "denote an activity of unbounded duration (at least lexically)." For example, nobody eats forever; why doesn't that make *eat* bounded? And why doesn't the "change of state" from eating to not eating that occurs when one stops eating constitute "a transition," just as much as the cessation of devouring that occurs when one stops devouring? If *devour* carries a completive implication, why is *She never finished devouring her meal* all right? And even supposing that *devour* does carry a completive implication, so too, surely, does *finish eating*. But *The woman finished eating her meal* is perfectly fine though \**The woman finished devouring* isn't.

The fact is, nobody knows what, if anything, it is for a word to denote a transition; so nobody knows whether *devour* does. Similarly, we believe, for the other claims about the semantic determinants of syntactic distributions with which the lexical semantics literature abounds. What's worse, it's possible to wonder, in such cases, whether there really are two different things to correlate. Perhaps the intuition that *devour*, but not *eat*, is *semantically* completive is just a hypostatic misconstrual of one's *syntactic* knowledge that the first but not the second verb takes a direct object mandatorily. One can't correlate a thing with itself; that is why Pooh never caught a Woozle. (See Milne 1957. For further discussion, with further examples, see Fodor, forthcoming.)

Finally, suppose that, despite the unconvincingness of the examples and the imprecision of the metalanguage that is used to describe them, it really is true, in God's eyes as it were, that (some or all) syntax is semantically driven. Would that show that there's something more to lexical representations than denotations? Not obviously. For, even if it's *devouring*'s being a transition that explains why *devour* has to have an object, why should knowledge of this fact count as part of what speaker/hearers know about *devouring* rather than as part of what they know about 'devouring'? A priori, it seems as reasonable that syntax should be driven by what people know about what a word denotes as that it should be driven by what they know about what the word means. Barring some principle for choosing between these two interpretations, we do not see how the putative influences of semantics on syntax could count in favor of a semantics of lexical meanings *rather than* denotations.

So much for the polemical background. Though one finds all these sorts of arguments in JP's book, they have a considerably older provenance, and JP's treatment of them is not more convincing than what earlier discussions offer. What makes JP's book interesting is his argument

from the semantic generativity of the lexicon to the semantic complexity of lexical entries. We turn to that now.

## 2 Generativity

A word about method: JP develops considerable apparatus in setting out his proposals about lexical generativity, and neither his notation nor his exposition is strikingly perspicuous. Therefore, we will in most cases not reconstruct the technical details. Instead, we will consider several of his examples of how his theory applies to the analysis of linguistic data. We will try to show that these analyses do not work, but our main purpose is not to impugn them; rather, it is to illustrate the character of the theory and of its defects. We claim that JP's failures to get the data right are principled and show that there is something wrong with the *kind* of account of the lexicon he endorses. We aren't, in short, just quibbling about cases.

JP's discussion of generativity starts by invoking the distinction between "polysemy" and mere accidental homonymy.<sup>12</sup> Intuitively, the paradigm of polysemy is the kind of quasi ambiguity exhibited by the *believe* in *John believes Mary*, on the one hand, and *John believes that 2 is less than 3*, on the other. However, according to JP, polysemy can also be exhibited by expressions that, unlike *believe* in this example, are syntactically homogeneous: for example, the *window* that JP says means 'aperture' in *He crawled through the window* and the *window* that means 'physical object' in *The window is rotting*. Similarly, JP thinks *good*, though it has only one lexical entry, means something different in *good knife* and *good secretary*.

Many linguists have shared JP's sympathy with Weinreich's (1959) complaint that standard treatments of the semantic lexicon fail to reconstruct the difference between polysemy and mere homonymy. In effect, by postulating distinct lexical entries for each meaning of a polysemous term, "sense enumeration lexicons" (SEs) miss "[t]he fact that [the] two senses [of a polysemous expression] are logically related. . ." (p. 37). However, on JP's view, the fact that *believe* or *window* (or *use*; see below) seem to take on different, but related, senses in their various contexts, is itself just a special case of the perfectly general fact that "words can assume a potentially infinite number of senses in context. . ." (p. 105). Correspondingly, the theorist's goal is to capture the context sensitivity of lexical meaning "while limiting the number of senses actually stored in the lexicon" (p. 105), that is, without proliferating lexical entries beyond necessity.

To see how this is to be accomplished, let's start with JP's treatment of the polysemy of *bake*.

Prima facie, *bake* is polysemous between "a creative activity" as in *bake a cake* and a "change-of-state predicate" as in *bake a potato*. "Intuitively, we would like to capture the fact that the former objects are prototypically brought about by the activity they are in composition with. . ." (p. 123)—that is, that "certain objects come into being by virtue of an activity which can otherwise simply change the internal state of an object" (p. 98).

<sup>12</sup> Terminological stipulation: We take ambiguity to be the generic property of which polysemy and homonymy are species.

The kind of “sense enumeration” analysis that JP wishes to reject might distinguish two lexical entries for *bake*: CREATED versus HEATED UP, or something of the sort. JP’s account, by contrast, has a single lexical entry for *bake* and distinguishes the semantics of *bake a cake* from the semantics of *bake a potato* on the basis of a difference in the lexical representations of the object nouns *cake* and *potato*: “. . . we can derive both word senses of verbs like *bake* by putting some of the semantic weight on the NP. This view suggests that, in such cases, the verb itself is not polysemous. Rather, the creation sense of *bake* is contributed in part by the meaning of *a cake*, by virtue of it being an artifact” (p. 124).

This treatment is characteristic of JP’s general approach; indeed, much of the book consists of applying it to a wide variety of examples. Notice, in particular, the idea that the sense of “governing” expressions is inherited partly from their lexical entries, but partly also from the semantics of the expressions that they govern in a context. According to JP, this is true not just of the relation between verbs and their complements but also, for example, of the relation between adjectives and the nouns they modify (e.g., *good* inherits FOR CUTTING from *knife* in *good knife* (p. 129)). Notice also that pursuing this strategy *places constraints on the lexical contents of the governed expressions*. *Use* can inherit TO RIDE ON from *subway* in *use the subway* only if the “telos” (function) of a subway is part of the entry for *subway*. Likewise, the creative sense of *bake a cake* can emerge from the occurrence of ARTIFACT in the entry for *cake* only if that entry specifies the information that cakes are artifacts; and so on. In effect, the more context sensitive the meanings of governing expressions are supposed to be, the richer must be the lexical entries for the expressions that they govern. So, JP’s standard tactic for arguing that there is a certain piece of semantic information in the lexical entry for a noun is to show that there is a context in which the information is inherited by a verb to which the noun functions as a complement, or by an adjective that modifies the noun, and so on.

Since, in all these respects, JP’s analysis of *bake* is paradigmatic, the failure of the analysis is characteristic of the general inadequacy of the theory. We turn to considering this analysis at some length.

To begin with, suppose that JP is right and the reason that *bake* in *bake a cake* means ‘create’ and *bake* in *bake a potato* means ‘warm up’ is that cakes are artifacts and potatoes are “natural kinds.” But would that explain why the two *bakes* aren’t merely homonyms? According to JP, “[Artifacts] such as cookies, cakes, and bread are typically baked. The process of baking, modulo such objects, is a creative activity, while relative to objects such as potatoes, carrots, and other natural kinds, it is simply a change of state predicate. . . . [T]o classify the verb *bake* as having both senses lexically specified is to miss the semantic generalization. . . .” (p. 98). (See also p. 47.) Apparently, on this account, what makes the two *bakes* not merely homonyms is that both express the same “process of baking” that, in one case, constitutes a creative activity and, in the other case, merely effects a change of state.

But now: By what criterion do both kinds of baking count as the same process? What decides that the *bake* in *bake a cake* (hence creating one) denotes the same activity as the *bake* in *bake a potato* (hence heating one)? (Whereas, presumably, *bank* is homonymous because the *bank* in *bank a check* counts as a *different* process from the *bank* in *bank a plane*.) This is just the polysemy

problem all over again; all that's happened is that it has been kicked upstairs from the semantics to the ontology: whereas we used to worry about how to count senses, we are now invited to worry about how to count processes. Six of one, half a dozen of the other.

But, for the sake of the argument, let's put ontological qualms aside and go back to the linguistics.

If the creative sense of *bake* is determined by something that it inherits from its direct object—and if *bake* and *cake* are themselves univocal—then *bake a cake* must have *only* the “creative” reading. But, in fact, *bake a cake* is ambiguous. To be sure, one can make a cake by baking it; but also one can do to a (preexistent) cake just what one does to a (preexistent) potato: put it in the oven and (noncreatively) bake it. Since *bake a cake* is ambiguous and *cake* is univocal, it must be that *bake* is lexically ambiguous (specifically, polysemous) after all, contrary to JP's analysis.

The ambiguity of *bake a cake* shows that JP is wrong about the polysemy of *bake*. But it does not show that he is wrong about *cake* being lexically marked as an artifact. Indeed, at first blush, it looks as if *only* distinguishing artifacts from “natural kinds” could account for the differences between *bake a cake* and *bake a potato*, since the latter appears to have only the noncreative reading. Maybe some of JP's program can be saved after all.

But, in fact, even assuming that the lexicon distinguishes artifacts from natural kinds is not enough. Notice that although knives and trolley cars are artifacts, *bake a knife* and *bake a trolley car* resist a creative reading quite as much as *bake a potato* does. But if *bake a cake* is heard as creative because *cake* is marked as denoting an artifact, then *bake a trolley car* should be heard as creative too. Clearly, something has gone wrong.

In fact, there is a striking difference between JP's informal account of *bake* and what he actually puts in the examples of lexical entries that he offers. According to the informal account, “the creation sense of *bake* is contributed, in part, by the meaning of *a cake*, by virtue of it being an artifact” (p. 124). But the lexical entry for *cake* specifies not that *cakes are artifacts*, but, in effect, that *cakes are made by baking* (p. 123). (Compare JP's discussion of “co-compositionality.”) Presumably, this is required in order to distinguish *cake* from *potato*, on the one hand, and from *knife*, on the other: the entry for *potato* says potatoes are a “natural kind,” and *knife* is presumably lexically specified for some means of production other than (and exclusive of) baking.<sup>13</sup> In short, in order to explain why *knife* doesn't select the creative sense of *bake*, JP is required to claim that you don't know what any term for an artifact means unless you know how that kind of artifact is made. If, like the present authors, you don't know how pencils are made, you don't know what *pencil* means.

The right story is surely this: As far as the language is concerned, *bake* is polysemous and *bake a potato* and *bake a knife* are both ambiguous. What makes *bake a potato* and *bake a knife* sound funny is a thing about the world, not a thing about the words: everybody knows that you can't make either a potato or a knife by baking them. If you didn't know this, you would hear

<sup>13</sup> How one gets such exclusion (/inclusion) relations to hold among semantic representations without, in effect, resorting to meaning postulates is a traditional, and unsolved, problem in the literature on lexical semantics.

the ambiguity, as indeed you do in *John is baking something* or *What is John baking?*<sup>14</sup> Contrary to JP's analysis, *bake* is lexically ambiguous and the semantics of *bake NP* offer no argument that the lexicon contains ontological information.

But is the *bake* case representative? We will look briefly at some of JP's other examples. We claim that JP offers no convincing cases where the meaning of a governing expression is modulated by the lexical content of the expressions that it governs. In fact, it's our view that this never happens.

Consider JP's treatment of *begin*. The idea is that *begin (/finish)* picks up the 'telic role' of its direct object (pp. 115–117). This is to account for such inferences as (3a–c).

- (3) a. . . . begin a book → . . . begin to read a book  
 b. . . . finish a cigarette → . . . finish smoking a cigarette  
 c. . . . begin a beer → . . . begin drinking a beer

It's this sort of example that provides JP's primary evidence that information about function is part of the lexical entry for *book*, *beer*, and the like.

On second thought, however, the analysis of *begin* doesn't work; it is not, in general, the case that if what NP denotes has a function, then *begin NP* means 'begin to use NP to perform its function'. *Begin a car* doesn't mean 'begin to drive a car'; *begin a thermometer* doesn't mean 'begin to measure the temperature'; and so on. *Enjoy*, another of JP's salient examples of a verb that incorporates the telic role of its direct object (p. 88), fails for the same sort of reason. JP notes cases like *enjoyed the meal* → *enjoyed eating the meal*. But his account incorrectly predicts the well-formedness of *\*enjoyed the doorknob*, *\*enjoyed the federal government*, *\*enjoyed the carpet tack*, all of which are bad. The first and last of these examples are especially problematic for JP's account since *enjoyed using the doorknob (/carpet tack)* is fine.

Indeed, *use* may seem more suitable for JP's purpose than *begin* or *enjoy*, since if X uses Y, where Y is something that has a (conventional/typical) use, then the invited inference is that X uses Y for what Y is used for. (Even so, there's something odd about . . . *used a glass of beer*, . . . *used a meal*, and the like.) In fact, however, *use* raises a thorny problem for JP's account since it's perfectly possible to use things that don't have uses: a rock to break a window, snow to make a snowball. (*Enjoy* works this way too since one can perfectly well enjoy things that have no function (the clement weather; dancing the eightsome reel; etc.)) These examples raise a serious question about which JP has little to say: what happens if a verb makes a demand on an argument that the lexical entry of the argument doesn't satisfy?

JP's view may be that, if the governing expression demands X in the lexical entry for the governed expression and that entry is not marked for X, the resulting phrase is interpreted as existentially generalized in respect of X. We infer this from JP's treatment of *Mary believes John* (pp. 120–122). According to JP, *believes* wants a proposition in the lexical entry for its direct

<sup>14</sup> Assuming that gapping is semantic, JP's theory requires that *John baked the potatoes* and *Mary the cookies* means that Mary heated up the cookies, not that she made them. We don't think that prediction is true either.

We suspect that gapping *is* semantic, and that it distinguishes polysemy from true homonymity; hence, *\*He banked the plane and the check*.

object, which, however, the lexical entry for *John* presumably does not contain. Though the mechanism by which it's achieved is unclear to us, JP's solution is that the interpretation of *Mary believes John* contains an existential quantifier over the required propositional argument: something like 'Mary believes what John communicated'.<sup>15</sup> Assuming that *believe John* constitutes a precedent for *use a rock*, then *John used a rock* should come out meaning something like 'John used a rock to perform some function'.

If, however, that is the treatment that JP has in mind, it's certainly untenable. The problem is that, given interpretive mechanisms that strong, it becomes unclear how a combination of a verb with an NP argument could ever *fail* to be interpretable. For example, JP's own analysis of *begin a rock* is undermined; it should be (but isn't) heard as meaning 'begin to use a rock for something'. In like wise, why doesn't *John asserted a rock* mean 'For some rock-involving proposition P, John asserted P'? Conversely, why doesn't *Bill used that John is tall* mean 'For some function F, Bill used the proposition that John is tall to perform F' (compare *Bill used John's being tall to illustrate the effect of diet on growth*)? In order to argue for telic roles in the lexical entry for NP arguments, what's really needed is a verb that picks the telic role when there is one and that yields unsemanticity when there isn't one. But, as far as we know, there is no such verb.<sup>16</sup>

Let us summarize the argument so far. JP's general strategy is to explain the apparent polysemy of governing expressions by appealing to the semantic heterogeneity of the objects they govern: if X is a governing expression that is prima facie A/B polysemous, assume that the expressions that it governs are lexically cross-classified as being either A or B.

We know of no cases where this strategy works. For one thing, it predicts that an A/B polysemous expression should be univocal in the A direction when it governs a univocal A-expression, whereas, in all the cases we can think of, A/B polysemous expressions are A/B ambiguous in both A and B contexts (cf. *bake a cake*). For another thing, the claim that governing expressions inherit semantic content from and only from the lexical entries of the expressions they govern fails in both directions: *begin* inherits a 'telos' from *a cigarette* but not from *a car*, and the propositional construal of *believes John* cannot derive from the lexical entry for *John*. And so on.

<sup>15</sup> In particular, according to JP, the semantic representation of *Mary believes John* is the existential generalization of the  $\rho_2$  in BELIEVE ( $\wedge \rho_2$  (JOHN)) (MARY) (p. 122). The problem is, Where does the propositional constant  $\rho_2$  in this formula come from? Surely not from the lexical entry for *John*, since *John* doesn't mean anything propositional. As JP himself says, "Unlike the case of . . . *the book* . . . the [proposition] type required by selection [is not part of] the [lexical] interpretation of the complement" (p. 121). As far as we can tell, JP never suggests an answer to this question. (*About* raises a structurally analogous problem, since it seems to govern an event in *a book about Vietnam* (i.e., *about the Vietnam War*) but not in *a book about Nixon*. Where does this event come from? JP says only that *about* "covers" objects of two different ontological types in the two cases—which, we suppose, is just to say that it's polysemous.)

<sup>16</sup> On pages 137ff., JP provides an (unconvincing) explanation of *John asked me (/wondered) the temperature*. But he doesn't consider why, given that *John wondered what the temperature is* is well formed, the statement *John wondered the temperature* doesn't have a reading on which *the temperature* is "coerced" to an interrogative proposition.

We conclude:

1. Apparent polysemy is generally real; the reason *bake* seems to be lexically ambiguous is that it is. This is compatible with a denotational semantics on the assumption that baking (creative) and baking (warming up) are different processes. JP provides no grounds for doubting this assumption.

2. There is no evidence that the meaning of governing expressions is ever modulated by the semantics of the expressions that they govern. For all the arguments show so far, *bake* behaves the same way in *bake a cake* and in *bake a potato* (it's ambiguous in both); *enjoy* means the same thing in *enjoy a cigarette* and in *enjoy the sunset* (it means 'enjoy'); *good* means the same thing in *good knife* and in *good car* (it means 'good'); and so on. If *bank* means something different in *bank a check* and *bank a plane*, then *bank* is not polysemous but homonymous, and the context effects are not modulation but selection.

### 3 Compositionality and Logical Form

We start this section by distinguishing two kinds of issues that JP's treatment generally runs together: on the one hand, questions about how *complex* lexical entries are; and, on the other hand, questions about the *generativity* of the lexicon. As we have shown, JP typically argues for lexical complexity by claiming that it is needed to account for generativity. (*Cake* must contain ARTIFACT in order to account for the polysemy of *bake*; *telephone* must contain a "telos" in order to account for the polysemy of *use*; and so on.) However, in principle, the issues are dissociable. Someone who agrees with us that JP's arguments for lexical complexity are unconvincing and who shares our suspicion that content is just denotation could wonder, nonetheless, whether a denotational lexicon might not be generative. So let's turn to this.

Suppose, for the sake of the argument, that the lexical entry for *cake* contains MADE BY BAKING. What happens next? Actually, JP gives two different accounts, though he does not acknowledge that they are distinct. First: the lexicon is generative; *cake* contributes MADE BY BAKING to the meaning-in-context of *bake*, thereby bestowing a "creative" sense on the verb. "Thus, we can derive both senses of verbs like *bake* by putting some of the semantic weight on the NP. This view suggests that, in such cases, the verb itself is not polysemous [i.e., it has only one lexical entry]. Rather, the creation sense of *bake* is contributed in part by the meaning of *a cake*. . . . The verb appears polysemous because certain complements . . . add to the basic meaning by co-composition" (p. 124).

Second: "The semantics *for the VP* [our emphasis] *bake a cake* results from several operations. . . . The operation of co-composition results in a qualia structure for the VP that reflects aspects of both constituents" (p. 124). "The result of co-composition is a semantic representation *at the VP level* [our emphasis] that is identical in structure to the lexical form for a creation verb such as *build*" (p. 125). According to this second account, the lexicon isn't generative after all; *cake* never contributes anything, at any level, to the representation of *bake*. Rather, *cake* contributes its lexical content (atomistic or otherwise) to the interpretation of the VP *bake a cake* (as does, *mutatis mutandis*, *bake*).

Our polemical reason for insisting on the difference between these two accounts is that it's news if the lexicons of natural languages are generative; everybody always thought they are just lists. But it's no news that there's an infinity of VPs.<sup>17</sup>

However, we have a second reason for stressing the distinction: though we're very dubious that the meaning of a word is ever a function of its context, we have no doubt at all that (barring idioms) the meaning of a phrase is always a function of the meanings of its lexical constituents. In short, all semanticists, whatever they may think about the generativity of the lexicon, have to face the problem of compositionality—the problem, that is, of saying how lexical semantics contributes to determining the semantic interpretation of phrases. And, though we take the question to be largely moot, we are inclined to think that the exigencies of the compositionality problem really do require that lexical entries cannot just specify denotations even assuming denotation is all that there is to content.

Consider the phrase *want a beer*; and assume—what, to be sure, is tendentious—that the right interpretation of this phrase is 'want to have a beer'<sup>18</sup> whereas, by contrast, the right interpretation of *drink a beer* is just 'drink a beer'. How does the theory that derives the meanings of phrases from the meanings of their lexical constituents ensure this difference of interpretation?

One way would be to agree with SEL that there are two *wants*, differing somehow in meaning, one of which takes an infinitival complement and one of which takes an NP. But here we agree with JP; this treatment is too unrevealing to be plausible. In particular, it misses the equivalence of *wants a beer* and *wants to have a beer*; and it fails to explain why, if Bill wants to drink a beer and Mary wants a beer, then they both want something and they both want to have something;<sup>19</sup> and it fails to explain why the two *wants* are in complementary distribution. So, what's the right way to handle *want*?<sup>20</sup> Roughly, we think, like this: *Want* denotes the relation that holds between *x* and *y* when and only when *x is a creature & y is a state of affairs* (or whatever kind of thing infinitive expressions like *to have a beer* denote), and *x wants y*.<sup>21</sup> The way to avoid the lexical polysemy is to maintain that *want* denotes this relation both in *wants a beer* and in *wants to have a beer*; that is, it denotes this relation whether its complement is an infinitive or an NP.

<sup>17</sup> We are not, by the way, denying that JP's two accounts are compatible. Perhaps he thinks that *cake* adds to the interpretation of *bake a cake* by modulating the meaning of *bake*. Our point is that evidence that *cake* contributes to the meaning of *bake a cake* is neutral as to whether the lexicon is generative.

<sup>18</sup> In JP's account, of course, this is *not* the right interpretation; it is part of the account that *want* is generative and that *want a beer* means 'want to drink a beer'. We will return to this presently.

<sup>19</sup> You should be prepared to admit this even if you doubt there is something (viz., to have a beer) that Bill and Mary both want or both want to have.

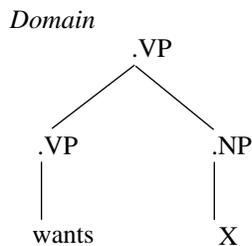
<sup>20</sup> We are concentrating on whether *want NP* is polysemous and ignoring the questions that are raised by its intentionality (viz., by the opacity of the NP position to existential generalization and substitution of coreferentials). If you like, assume that *wants* expresses an "intentional relation," and plug in your favorite account of them.

<sup>21</sup> Actually, the talk of creatures, states of affairs, and the like is entirely heuristic. That is because, on the present view, the lexicon is not required to specify a *sense* for *want* but only required to say what *want* denotes. Perhaps, if *x* wants *y*, then, necessarily, *x* is a creature and *y* is a state of affairs. But a purely denotational lexicon is not required to say that this is so, any more than it is required to say that dogs are animals or that 2 is prime. A denotational theory thus avoids the commitments to unanalyzed semantic entities and properties ("agents," "patients," "events," "transitions," "being in some sense affected," etc.) by which, as we have remarked above, standard views of lexical semantics are plagued.

Of course, this proposal faces an immediate problem: a beer isn't a "state of affairs" (i.e., it isn't the sort of thing that infinitival complements denote). Then how could *want a beer* and *want to have a beer* denote the same relation? This is just the polysemy problem over again; how can the semantics ensure that expressions of the form *want NP* get the same semantic value (viz., the same denotation) as corresponding expressions of the form *want INF* without assuming two lexical entries for *want*? Or, to put the same question in slightly different terms, how does a compositional semantics operate to assign the interpretation 'wants to have NP' to expressions of the form *wants NP*?

Here is our proposal: A lexical entry is allowed to be complex. If it is, it specifies (a) a meaning (viz., content, viz., denotation) and (b) a rule of composition that contributes to determining the *logical form* of the phrases of which the item is a constituent.

A (very) schematic derivation of the interpretation of expressions of the form *wants X* (where *X* is a lexical item) should serve to introduce the general idea. We assume that the semantic interpretation proceeds, node by node, from the bottom to the top of a (surface) syntactic tree. In the present case, the crucial steps are as follows:



Stage 1 *Input:*  $\langle \text{wants}_V, X_{NP} \rangle$

*Operation:* Assigns lexically specified semantic interpretations.

*Output:* Interpretations of (viz., assignments of denotations to) the lexical nodes: Assigns to the V node the set of ordered pairs  $\langle y, x \rangle$  such that *y* wants *x*, and assigns to the NP node the lexically specified denotation of *X*.

Stage 2 *Input:* The domain tree with the lexical nodes interpreted as per stage 1.

*Operation:* Interprets the node VP.

*Output:* VP is assigned  $\{y: y \text{ wants to have } F(X)\}$  where  $F(X)$  designates the interpretation that *X* receives in stage 1.<sup>22</sup>

*Note:* We assume that the operation in stage 2 is driven by a composition rule that is part of the lexical entry for *want*: namely, if the constituents of  $VP_1$  are  $\langle \text{wants}_V, X_{NP} \rangle$ , then the interpretation of  $VP_1$  is 'want to have  $F(X)$ '.

<sup>22</sup> If the sentence under interpretation is of the form  $NP_1 \text{ wants } X$ , a later cycle will identify *y* with the denotation assigned to  $NP_1$ .

Several comments, in no particular order.

1. The derivation of *wants to drink a beer* assumes that the surface syntax of that sentence is not relevantly different from its logical form. The composition rule assigns to the VP node the set ‘{y: y wants to drink a beer}’. In this case, the composition rule is presumably not lexically governed; this is the unmarked treatment for phrases consisting of a verb with an infinitive complement.

2. Notice that, according to this proposal, *want* never means (denotes) anything except a relation between a creature and a state of affairs—not even in *wants a beer* (i.e., not even in an expression where its surface complement *fails* to denote a state of affairs). Therefore, *want* is not polysemous; its *content* is absolutely context invariant. We’re as far from a generative lexicon as it is possible to get.

The cost of this univocality is complex lexical entries, which determine not only the content of an item but also the logical syntax of the phrases to which they contribute their content.

3. The proposed mechanism does the same sort of job that JP’s notion of ‘type coercion’ is designed to do. There are, however, differences other than the fundamental one that distinguishes a lexical semantics of complex senses from an atomistic lexical semantics of denotations. For example, it’s part of what we take to be the context insensitivity of *want* that it always introduces the same ‘light verb’ into the VP it governs. This repeats the remark we made in footnote 18: we assume that *wants a pretzel* means ‘wants to have a pretzel’, not ‘wants to eat a pretzel’. The meaning of *want* doesn’t decide what one can want a pretzel for.

Indeed, we think, exactly contrary to JP, that it is this consideration that distinguishes expressions like *want*, which introduce light elements, from expressions like *use*, *enjoy*, and *begin*, which don’t. In our view, the semantic interpretation of *use NP* is the set ‘{y: y uses NP}’. Part of the evidence for this is that there is no relation (other, of course, than using) that y has to have to the NPs that y uses. Contrast the necessary truth that every y that wants NP ipso facto wants to have NP.

4. There is a variety of lexically governed effects on logical form other than light verb introduction. For example, we think it plausible that *good* introduces a quantifier into the interpretation of *good NP*; roughly, a good NP is one that is good for *whatever it is* that NPs are supposed to be good for (cf. Ziff 1960). Notice that this treatment makes *good* context insensitive; *good* quantifies over the function of the NP it modifies, and the way it does so is independent of which NP it is. Since the meaning of *good* is context independent, the lexical entry for the NP need not specify a ‘telos’; so the semantics of *good knife* provide no argument that *knife* has a definition that includes its function. (This is just as well since, as JP himself remarks (p. 43), *good children* and *good weather* are perfectly fine, though neither children nor the weather have functions. See above for the corresponding point about *enjoy* and *use*.)

5. Our discussion has not assumed that there is a *level* of logical form at which, for example, *want a beer* is represented as WANT TO HAVE A BEER. On our account, all that happens is that wanting to have a beer (material mode) is assigned as the denotation of the expression *wants a beer*. Our treatment is, however, compatible with positing an explicit level of logical syntax should there prove to be any reason to do so; we have no views on the matter for present purposes.

We close with two pending questions; the first strikes us as not very urgent, but the second is vital.

First: What about polysemy? We do not have a theory of polysemy beyond the suggestion, implicit in the preceding, that where it is sensitive to the syntactic structure of the context, polysemy belongs not to the theory of content but to the theory of logical form. That leaves many residual cases like *lamb* ('meat' vs. 'animal'), *window* ('the opening' vs. 'what fills the opening'), *newspaper* ('the thing that is read' vs. 'the organization that publishes it').

We suspect that there is nothing interesting to say about such cases; the meanings of words can partially overlap in all sorts of ways, so there are all sorts of ways in which polysemous terms can differ from mere homonyms. Nothing in the literature convinces us that there are powerful generalizations to state.<sup>23</sup>

Surprisingly, JP apparently shares this view so far as the polysemy of *nouns* is concerned (see pp. 90–95). In cases like *lamb* and *window*, JP's account does exactly what SELs do: it has branching lexical entries that allow one to say, for example, that *lamb* always means 'physical object', but doesn't always mean 'animal' or always mean 'food'. This is really unavoidable, given JP's architecture: governing expressions get their ambiguity from what they govern, so the governed expressions have to get theirs from the lexicon. Of course, as JP himself points out when discussing SELs, appealing to branching entries to distinguish polysemy from homonymy is a merely notational solution. It "accounts for the data, but in a *post hoc* fashion, without making any predictions as to whether a particular datum should be possible or not" (p. 42). *Bank* 'river' versus *bank* 'building' is presumably homonymy rather than polysemy, but both *banks*, like both *lambs*, mean (hence are "branches" of the representation that corresponds to) 'physical object'.<sup>24</sup> Nor is it clear why, if nouns can be really (viz., lexically) polysemous, verbs can't be too.

Second: Prima facie, our notion of coercion is more constrained than JP's. For example, it cannot turn out that the content of one expression ever depends on the content of another; it is not allowed that *want NP* sometimes means 'want to eat NP' and sometimes means 'want to drink NP'.

Nevertheless, we do allow that the logical role of an expression can be determined by the lexical entries of the forms that govern it; *beer* is the logical object of *drink* in *want to drink a beer*, but it is the logical object of *have* in *want a beer*. This departs from the most rigorous notion of compositionality, according to which each constituent contributes its content and only its content to its hosts, and the effect of a constituent on its hosts is absolutely context independent.

The entirely rigorous notion of compositionality seems to us almost certainly not attainable. For example, *want* and the like to one side, it is a truism that *logical* vocabulary is typically defined "in use" (i.e., in a grammatical context), so that the lexical entry for (as it might be) *the*

<sup>23</sup> There is a semiproductive generalization according to which terms for tastes double as terms for personalities: *sweet*, *bitter*, *sour*, *tart*, *acid*, *bland*, *salty*, and so on. Could anyone really suppose that lexical semantics should be required to capture this regularity? And, if not, why should it be required to capture the polysemy of *window*, *door*, *newspaper*, and the like?

<sup>24</sup> The function of JP's dot operator (see pp. 92ff.) is not clear to us, but we suspect that it has the effect of allowing components of lexical entries to combine freely, in the way that features do. If that is the right reading, then JP's lexical entries are even less constrained than those of classical SELs like Katz and Fodor's (1963).

determines the logical role of the NP in *the NP* and does so in a way that is specific to *the*; presumably the logical role of the NP in *an NP* is quite different. Indeed, it is arguable that the lexical content of *the* is exhausted by what it says about the logical form of *the NP*.<sup>25</sup>

But if pure compositionality can't be had, it also can't be that just anything goes. What we've said is tantamount to saying there can be context effects on what a lexical item contributes to logical form but not on what it contributes to content. But since we don't know how to be rigorous about the form/content distinction, we're not persuaded that the notion of coercion that we've sketched actually succeeds in constraining the ways that a constituent can affect its hosts. Which is to say that, though we're sure that language is compositional, we don't know what the claim that it is amounts to. That, and not polysemy and the like, seems to us to be the main problem of lexical semantics.

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<sup>25</sup> By contrast, the lexical entry for *and* is, of course, not exhausted by the compositional rule it gives; it also must supply a denotation, so as to distinguish between sentences of the logical form  $P \& Q$  and sentences of (e.g.) the logical form  $P \vee Q$ ,  $P \rightarrow Q$ , and so forth. (Likewise with the entries for *all* and *some*.)

If this is right, then there are perhaps four kinds of lexical entries: ones that specify only a composition rule (*a, the*), ones that specify only a denotation (*Tom, eat*), ones that specify both (*want, believe, good*), and ones that specify neither (expletives and the *do* of *do*-support).