

The Semantics and Syntax of Null Complements*

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I. Introduction

Consider sentences like (1):

1. *Null Complement Containing Sentences*

- a. Aryn followed
- b. Marie-Odile promised
- c. Corinne left
- d. Samir found out at midnight
- e. I applied
- f. They already know
- g. He volunteered
- h. Abdiwahid insisted
- i. I suppose
- j. Paul gave to Amnesty International

These illustrate the phenomenon of *null complements* -- also called ‘pragmatically controlled zero anaphora’, ‘understood arguments’, and ‘linguistically unrealized arguments’. In each case, a complement is (phonologically) omitted, yet (a) the sentence is well-formed and (b) the meaning effect is as if a complement were present. This contrasts on the one hand with structures that lack complements, but are ill-formed as a result – e.g., (2a-c) – and, on the other hand, with structures that lack overt complements, are well-formed, but do not exhibit the meaning effect of a complement – e.g., sentences (3a-b).

2. *Contrast with Ill-formed Structures*

- a. *Aryn purchased
- b. *Marie-Odile guaranteed
- c. *They already expect

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3. *Contrast with No Complement At All*

- a. He died
- b. Paul laughed

Throughout this paper, our focus will be on the nature of null complements, including especially the semantics and syntax of null complement containing sentences. There is another issue about null complements which interests us, namely what licenses them: what features of a verb determine whether it will allow null complements or not? But that question is addressed in another paper (Iten et al., 2005).

We begin with a very general characterization of the phenomenon. We assume in what follows that verbs have semantic frames, which specify the linguistically inherent participants for that verb. By a linguistically inherent participant, we mean one which the verb semantically demands, rather than one which its meaning “metaphysically” demands. To give an example, in English ‘know’ (in the sense of the French ‘savoir’, the Spanish ‘saber’, etc.) has two linguistically inherent participants, namely the knower and the fact known. It is arguably a metaphysical necessity that knowing also requires a source of the knowledge: did it come from perception, inference, speech, etc.? But some languages, English included among them, do not mark the verb ‘know’ as having to specify this information. Thus source may be a “metaphysically” inherent participant, but it isn’t a linguistically inherent one. Sometimes, a verb whose semantic frame specifies n linguistically inherent participants in non-subject positions can occur in a well-formed sentence that contains $n-1$ non-subjects. And yet, the sentence in question is well-formed. This, we think, is what “omission of a complement” comes to: the lack of isomorphism between what the semantic frame specifies as necessary, for the verb, and what non-subjects may appear overtly in well-formed sentences containing the verb in question. Our question here is: What exactly is going on in such apparently puzzling cases, especially with regard to the syntax and the semantic of such sentences?

II. Fillmore’s Account

In answering our question, we begin with Charles Fillmore’s influential account. As he stresses, one crucial element that needs to be accounted for is that, in English and many other languages, not all verbs are like ‘follow’, ‘promise’ and ‘leave’, allowing null

complements. Some verbs seemingly require that, when they appear in a sentence, each participant listed in their semantic frame must be phonologically realized. Null complements are simply not allowed with these verbs. Recall ‘lock’, for example. Its semantic frame identifies two linguistically inherent participants, the agent who does the locking, and the thing locked. But on Fillmore’s account, whereas ‘Aryn followed’ is fine, (4) is simply ungrammatical in English. Similarly, (5) and (6) are ill-formed:

4. *Catherine locked
5. *Rob guaranteed
6. *Steven vacated

These last examples serve to highlight another point stressed by Fillmore (1986): verbs which have quite similar meanings can nevertheless differ as to whether they permit a null complement. ‘Promise’ permits them, but the semantically close ‘guarantee’ does not; ‘leave’ permits them, but its semantic cousin ‘vacate’ does not.¹

Two further important details about Fillmore’s view. First, it seems that the default reading of a sentence with a null complement varies, as a function of the verb in question, between definite and indefinite. Fillmore (1986) describes the contrast as follows. With some verbs, the missing element must be retrieved from what is “given” in the context; the unspoken referent is, in these cases, one definite thing, and its precise identity must be recoverable from the speech context. Verbs which are read this way, Fillmore labels ‘definite null complements’ (DNC). In contrast, there are verbs such that when the non-subject is omitted, the identity of the “missing element” is unknown or a matter of indifference. The unnamed thing is indefinite, if you will. Verbs which are read in the second way, Fillmore labels ‘indefinite null complements’ (INC). Examples will help clarify this contrast. In (7) and (8), the default reading is that a particular contextually salient thing was found out/followed.

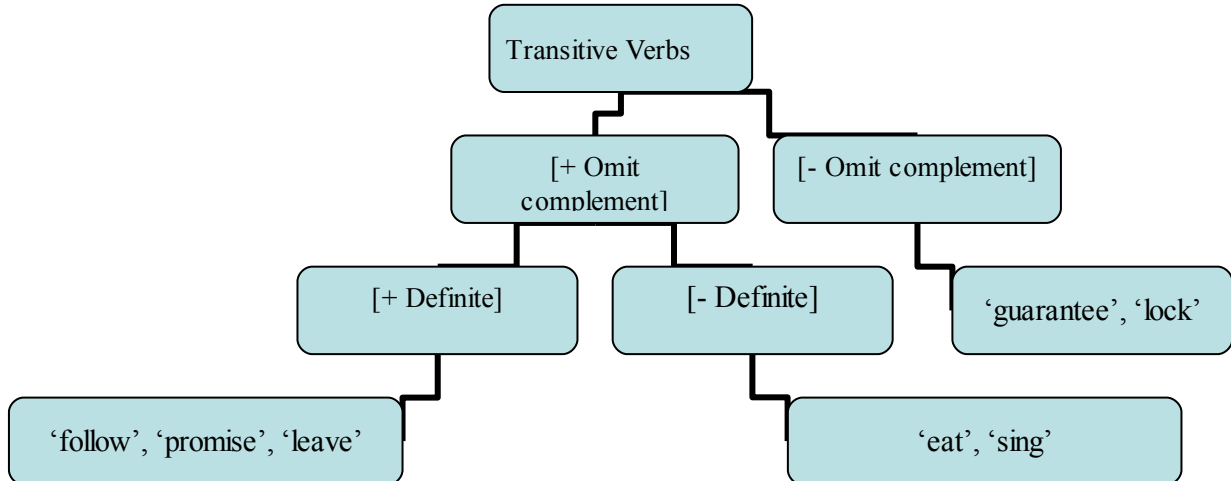
7. Samir found out at midnight
8. Hershah followed quietly

In (9) and (10), by contrast, something gets eaten/sung at midnight – but the precise identity of the element eaten/sung is not at issue:

9. Omar eats at midnight
10. Khalid sings at midnight

Fillmore (1986) offers a useful pragmatic heuristic for distinguishing DNC from INC verbs. With the former, it is odd for a speaker to say “*A* v-ed. I wonder what *A* v-ed?” Thus ‘Samir found out at midnight. I wonder what he found out?’ is a distinctly peculiar sequence for one person to say. In contrast, it is not pragmatically odd, in the case of an INC verb, to say the sequence “*A* v-ed. I wonder what *A* v-ed?” Notice, for instance, that someone who utters (10) can follow by saying ‘I wonder what he sings’ without any awkwardness. We would add, as a supplemental test, that in the case of DNC verbs “*A* v-ed” means something quite like “*A* v-ed it”. Whereas, in the case of INC verbs, “*A* v-ed” means something more like “*A* v-ed something” or “*A* v-ed stuff”. Thus the natural reading of (8) is close to ‘Hershad followed *it* quietly’, while the natural reading of (10) is closer to ‘Khalid sings *something* at midnight’. (We will have much more to say below, about what the precise truth-conditional contrast is here. But at present we are explaining Fillmore’s view as he himself presents it.) We thus arrive at the following taxonomy:

Figure 1:



The last detail of Fillmore's view has to do with what thing it is that permits, or does not permit, a null complement. We spoke above of "the verb" allowing/disallowing omission. But, for Fillmore, it seems rather to be a verb-on-a-sense that permits/prohibits null complements.² Thus consider the contrasts below, lifted from Fillmore (1986: 101-102):

11. 'Apply'

- a. I applied for the job → I applied
- b. They applied the bandage → *They applied

12. 'Arrive'

- a. She arrived at the summit → She arrived
- b. She arrived at the answer → *She arrived

13. 'Hear'

- a. I heard that you resigned → I heard
- b. I heard the song → *I heard

14. 'Know'

- a. They know that she resigned → They know
- b. They know her → *They know

15. 'Leave'

- a. She left home → She left
- b. She left this package → *She left

16. 'Volunteer'

- a. He volunteered to help you → He volunteered
- b. He volunteered his sons → *He volunteered

In sum, for Fillmore the phenomenon of null complements has four sub-parts: a) some verbs which have *n* linguistically inherent participants listed in their semantic frame can nevertheless appear in fully grammatical sentences that do not contain *n* phonological realizers for those participants; b) some verbs allow this freely, others do not; c) when a phonological realizer is absent, at least two different kinds of default readings can be found, definite and indefinite, depending upon which verb is in play; d) it is not "the verb" so much as "the verb-on-a-sense" that seems to permit/prohibit null complements.

There are, we think, two key problems with the third plank of Fillmore's view. First, there is a problem (or rather, a cluster of them) with Fillmore's description of the "meaning effects" of complement omission, several of them noted by Groefsema (1995). Second, there is a problem with the very taxonomy that Fillmore offers, precisely because it posits two sub-varieties of null complements.

III. Problems with Fillmore's Account of the "Meaning Effects" and Our Alternative

We begin with issues about the supposed "meaning effects" of omission, on Fillmore's view. First, on what "(in)definiteness" amounts to. Fillmore makes the unfortunate remark that that being marked indefinite means that the null complement "is obligatorily disjoint in reference with anything saliently present in the pragmatic context" (1986: 97). We disagree. To begin with, 'disjoint' is surely too strong. As Groefsema (1995: 142) notes, (17) is perfectly consistent with Ann eating *some* of the sandwiches:

17. John brought the sandwiches and Ann ate

Here, the null complement of 'ate' is not disjoint with the salient sandwiches – though it is not wholly co-referential with it either. Second, and speaking of "reference", we think that a better characterization of indefiniteness is what Fillmore hints at elsewhere in the paper: the null complement is interpreted as some kind of existential quantification, hence not as reference at all. The contrast is thus not "reference to something salient, versus reference to a particular but unknown object". At best, it is reference versus (existential) quantification.

But even this isn't quite right: in general, INC verbs are not subject to the sort of scope ambiguities one would expect, if they were covertly existentially quantified.

Notice, first, that (18) and (19) do not share the same readings:

18. No one ate something

19. No one ate

Whereas (18) has a reading with 'something' given wide scope – there is a dish, say the spinach spaghetti with tofu balls, that no one ate – (19) has no such reading. Compare also (20) with (21), and (22) with (23):

20. Joaquim eats everyday

21. Joaquim eats something every day

22. Joaquim ate all day

23. Joaquim ate something all day

If we must find a synonym for (19) that has something overt in the complement spot, ‘No one ate stuff’ would serve better. In light of these sentences, Fillmore will need to say that INC verbs are read as “V-ed stuff”.

Fillmore’s gloss of *definiteness* is incorrect too. In particular, it is not the case that the null complement in DNC cases must refer to some particular entity made salient. Instead, the null complement can function as a variable bound by a higher quantifier. Thus, in a situation in which various wives are hiding various different secrets, (24) can be read as “Each husband found out his wife’s secret”. Similarly, the second sentence in (25) need not mean that no one left the salient place at which the sentence is spoken, nor any other one contextually spot. Rather, each departure-candidate can be said to have not left whichever threatened theme park s/he was at. Finally, what the press follows in (26) is not some salient individual from the context; rather, the press follows each respective important politician.³

24. Each husband found out

25. There were terrorist threats to several of Disney’s theme parks. But not one customer left

26. Whenever an important politician takes a trip to Moscow, the press follows

A better description of DNCs, then, would be that their null complements behave like variables: they may be left free, in which case they must pick out an object salient in the context; or they may be bound by a quantifier (supplied explicitly, higher in the sentence, or by other means).

Notice that this latter, alternative, proposal explains another bit of data which bedevils Fillmore’s distinction. As he describes it, one would expect each verb sense to be either [+ definite] or [- definite]. The twain should never meet, and there should be no cases which are hard to classify. But some verbs do seem hard to classify, and do seem to permit either reading – with pragmatic context being crucial. Consider: Is ‘aim’ INC or DNC? One can imagine the null complement referring to some salient thing, as in (27),

but one can also imagine a use of ‘aim’ without a phonologically realized object, that is more existential in tone, as in (28).⁴

27. Jean Pierre saw the deer, and aimed carefully

28. To avoid accidents, it’s important to aim carefully

Similar points apply to ‘disagree’, and a host of other cases. Crucially, if null complements are read as variables, as we propose, then it’s no surprise that they may be read as free, or as quantificationally (including existentially) bound, depending upon the context.

In sum, regarding INC verbs, at a minimum one must excise talk of “disjoint reference”, and substitute the idea that INC verbs are read as “V-ed stuff”. Regarding DNC, rather than taking such verbs to be always referential (to some contextually salient something), we would urge that they are read as if they had a variable -- which is available for binding, or may be read as deictic. But, for reasons that will emerge immediately below, even this isn’t enough to fix the overall account.

IV. Problems with Fillmore’s Taxonomy, and Our Alternative

We said there were two problems with Fillmore’s account. The first had to do with the meaning effects he suggests for null complements. The second, which is our focus now, has to do with the taxonomy he provides. That problem comes into focus when we inquire why there are verbs (or, more precisely, verb-senses) marked as INC at all. Since, as just argued, what had been called DNC verbs can be either free or bound, why also have null complement verbs which can only be (existentially) bound? Or again, why can verbs like ‘eat’ never be read referentially, if they genuinely belong to the same syntactic class as ‘follow’? And why can INC verbs never be read as bound by some contextually supplied non-existential quantifier, if they share the same syntax as ‘leave’? (E.g., ‘Whenever Moonisah cooks lasagna, John eats’, does *not* have a reading on which it means *Whenever Moonisah cooks lasagna, John eats it.*) This might just be a brute semantic difference not reflected in the sentential syntax: something which must be stipulated in the lexical entry of INC verbs. But we think a more insightful treatment is available – a treatment which reconceives things rather radically.

We will defend the unorthodox idea that *all* genuine null complements are interpreted as variables. If their syntax is really that of a null complement, with the requisite lower number of realized non-subjects compared to what the semantic frame prescribes, their semantics is that of a variable. *All* can thus be read as referential or quantified, depending upon context. And none is restricted to existential quantification. That is the single semantic rule that governs all sentences which contain null complements.⁵

Verbs which have obstinately existential readings, the so-called INC verbs, we reclassify as not really null complement verbs after all. Verbs like ‘eat’ -- which, when used without a complement, cannot mean ‘V-ed it’, with ‘it’ either free or bound by a non-existential quantifier -- are marked in the lexicon as intransitives. Hence not, in fact, as verbs which allow null complements. This preserves the generalization regarding semantic effect, does away with the apparent exceptions (i.e., the ones which are *always* quasi-existential), while still accommodating the existence of so-called INC verbs: the latter, it turns out, are plain old intransitives.

But, it will be objected, this introduces an unacceptable ambiguity. There is now the intransitive ‘eat’, which is what we see when the verb appears alone, and in addition the transitive verb, which is what appears with an overt complement. Continues the objection, this is unacceptable on two fronts. First, specifically with respect to introducing the intransitive ‘eat’, whenever someone eats, they eat something; but, goes the worry, treating ‘eat’ as intransitive we will miss this fact. Second, with respect to both entries, we are positing an ambiguity without necessity here. Our reply to the first worry is that this fact, i.e., about eating requiring that something be eaten, is real enough, but is not reflected in the semantic frame of the intransitive verb. The thing-eaten is not a linguistically inherent participant, the verb being intransitive, but it is a “metaphysically” inherent one – and that’s enough to capture the fact in question. (To see the reasonableness of this suggestion, compare: whenever someone eats, they eat somewhere; that, however, is patently a poor reason for thinking that ‘eat’ is linguistically marked as expressing a three-place relation between an agent, a thing-eaten, and a location.) Our reply to the second worry is that there is no ambiguity posited without necessity, *because*

we do not believe that there is a transitive verb ‘eat’! Instead, the sole semantic frame for ‘eat’ is (29):

29. a. Verb: ‘eat’

b. Semantic Frame: [Participant = Agent]

This, in turn, raises an obvious question: How, then, can ‘eat’ take a complement, if it’s always intransitive? ‘Die’ and ‘fall’, genuine intransitives, cannot. The answer is that ‘eat’ is an intransitive verb *which is marked for optional addition of an argument*.

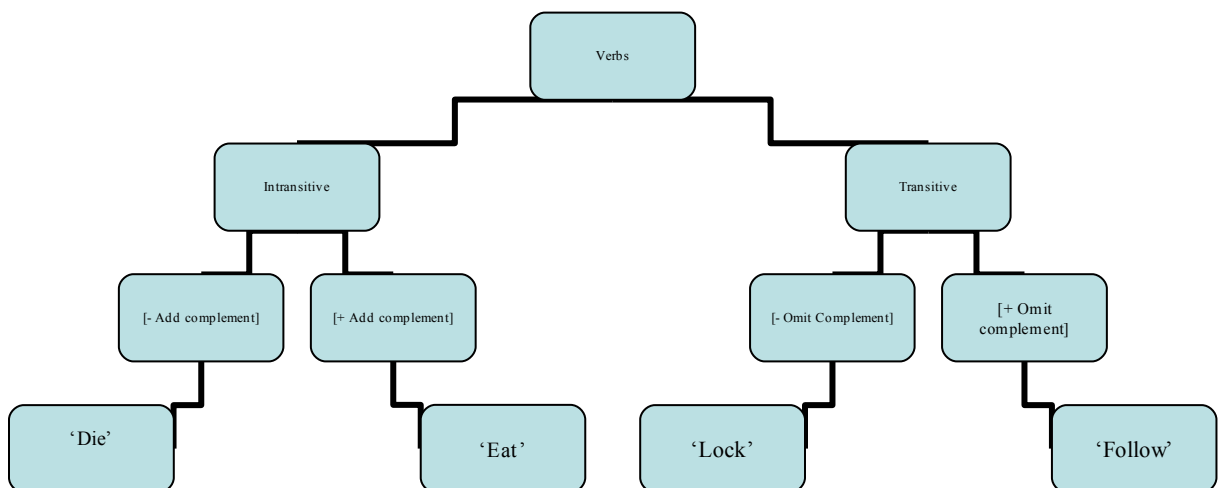
Whereas ‘promise’ is marked [+ omit complement] (and ‘lock’ is marked [- omit complement]), ‘eat’ is marked [+ add complement]. (And ‘die’ is marked [- add complement].⁶) Sentences which have previously been classed as transitive occurrences of ‘eat’, such as (30) and (31), we now classify as occurrences of the intransitive ‘eat’, but with an added argument.

30. Renald ate [a sandwich]

31. Tracy ate [that apple you bought]

Thus ‘eat’ is not ambiguous after all: it is univocally intransitive, though marked [+ add complement]. In sum, in contrast to Fillmore’s taxonomy, given above, our taxonomy looks like this:

Figure 2



This approach has two further advantages. First, it explains why it is difficult to find a complement-containing paraphrase of ‘No one ate’ (and similar sentences), a paraphrase which shares all of the logico-semantic properties of (19), including scoping possibilities: this is so difficult because ‘No one ate’ is the underived form. ‘No one ate’ is not derived by the phonological omission of ‘something’ from (18). It’s not derived by the phonological omission of any term. It’s not surprising, then, that (19) doesn’t exactly mean ‘No one ate something’, or even ‘No one ate stuff’. ‘No one ate’ means, rather, that no one ate. Second, it explains a usage-based contrast between ‘eat’ and true null complement verbs. Informal questioning by the authors revealed that, in the vast majority of cases, untrained speakers, when instructed to give examples of sentences containing words like ‘follow’ and ‘promise’ – which we class as genuinely exhibiting null complements – provided sentences in which a complement is phonologically realized. Examples offered included ‘You promised me I could have a hamburger’, ‘You promised me you would clean your room’, ‘I promised to finish my homework tonight’, ‘She promised to marry me. I was thrilled’, ‘They promised the world but never delivered’, ‘He follows in his father footsteps’, ‘My favorite program follows the news’, ‘They followed me right into the trap’ and ‘I told him to follow me’. Not attested were things like ‘He followed’ and ‘They promised’ *tout court*. In contrast, when asked to give examples of sentences containing ‘eat’, ‘sing’ and ‘sew’ -- which we believe do not genuinely exhibit null complements, but are rather [+ add complement] -- untrained speakers strongly tended to provide sentences without complements. Though certainly not the only one, one obvious explanation for this usage pattern is that, in giving example sentences, speakers tend to opt for the “default” specified in the semantic frame – neither adding nor omitting complements, even though this is optionally permitted. If that’s what speakers are doing, in giving example sentences, the result we predict is that ‘promise’ and ‘follow’ would appear in their “basic form”, with a complement, while ‘eat’ and such would equally appear in their “basic” form, without a complement. And this is just what our initial testing found.

Conceiving things this way, we save our elegant generalization about what null complements mean. But, turning to another possible objection, don't we do so at the cost of introducing a bizarre unattested feature? Have we not avoided the mystery that Fillmore faces – viz., why there are two kinds of meaning effects for a single syntactic construction – by fabricating another? The point is well taken: at first glance, [+ add complement] may seem a very curious feature for a verb to have. In fact, however, something of this kind is attested cross-linguistically. East Cree, for example, has a class of verbs that are morphologically intransitive, but which can nevertheless take third person objects. For instance, 'minihkweu', meaning *s/he drinks*, is morphologically marked as intransitive: the verb does not carry the usual affixes which appear on transitive verbs. Nevertheless, unlike other intransitive verbs, this intransitive verb can optionally take animate (e.g. 'milk') or inanimate (e.g., 'tea') objects. In short, 'minihkweu' is *overtly* [+ add complement].⁷ Interestingly, such verbs in East Cree pass Fillmore's test for (so-called) INC verbs. Thus (32) is perfectly felicitous:

32. Chii minihkwe-u David. Eishi chekwaayuu chii minihkwe-u?

past drink-3 David. Wonder what *past* drink-3

"David drank. I wonder what he drank."

Something quite similar occurs in Blackfoot: some intransitives are marked [+ add complement], and semantically they correspond to what traditionally would be treated as (obstinately existentially quantified) "null complements". What's more, the class of intransitive verbs that take an object can, in Blackfoot, only take nouns that are inflected with a non-referential suffix. (See Frantz 1991: 40-41.) So, our semantic generalization – it is actually intransitives that are always heard as existentially quantified -- is partly mirrored in overt syntax, in Blackfoot: when verbs are intransitive, but are used with an object, they can only take morphologically non-referential objects. This suggests that the property of being non-referential/quantificational is, as hypothesized, associated with (morphological) intransitivity. In sum, Algonquian overt verbal morphology independently suggests an "add complement" approach: intransitive verbs to which an object can be added. (This in contrast to the more traditional "omit complement" approach: a transitive verb from which an object can be omitted.)

Nor is the Algonquin data just an isolated case. “Valency increase” (i.e., addition of a core argument to a verb) is a common derivational procedure, employed across languages to create new words (or constructions). In English, a beneficiary can be added to a transitive to yield a ditransitive applicative: ‘sings’ gives rise to ‘sing me a song’. (Something similar seems to occur with causatives derived from intransitives: ‘walk’ gives rise to ‘walk the dog’.) And in some languages, even an intransitive can have a beneficiary added, to become an applicative verb. (See Dixon and Aikhenvald 2000 for discussion.)

Given this cross-linguistic evidence, we can, without introducing anything especially odd, hold to our generalization that all genuine null complements are understood as if they had a variable – which can be either deictic/free or bound. We can sustain the generalization precisely by denying that ‘eat’-type verbs are genuine null complement verbs after all. Their normal form is without a complement. It is ‘eat’ *with* a complement that is special.

V. Our Syntax for Null Complements

We have said that genuine null complement constructions – of which ‘Anita ate’ is *not* an example, being instead an intransitive – are read “as if the empty spot was a variable”. That variable can be free, in which case the sentence is understood as if it had a referring context-sensitive term; or it can be read as if bound by a quantifier, supplied either by prior linguistic material or by non-linguistic context. This is our positive view about the semantics of null complements. But what syntax would we propose for the resulting null complement containing sentences?⁸ In particular, taking ‘The press followed’ as our example, is there a special never-pronounced empty element where an overt complement would typically sit, as in (33)? Is there an ordinary phrase present in the syntax, but simply not pronounced when speaking, as captured by the syntactic structure in (34)? Or is there nothing there at all, as in (35)?

33. [S The press [I' [INFL *past*, 3rd *person*][VP [V follow][NP e]]]]

34. [S The press [I' [INFL *past*, 3rd *person*][VP [V follow][NP him]]]]

35. [S The press [I' [INFL *past*, 3rd *person*][VP [V follow]]]]

Some evidence that there isn't covert *ordinary* syntax – run of the mill material which is simply not pronounced in this instance -- is provided by Grimshaw (1979). She notes that the null complement spot can be semantically controlled by a syntactic item which cannot itself occur in that spot. For example, as Grimshaw notes (1979: 308-309), the null complement containing sentences in (36)-(38) are fine, though their fully spelled out counterparts are quite bad:

36. Bill asked the time, so I inquired. [Versus *'...so I inquired the time']

37. Bill claimed to want to know the reasons for my decision, but he didn't really care.
[Versus *'...but he didn't really care the reasons for my decision']

38. Bill desperately tried to discover the name of the person who had abducted him, but the police didn't give a damn. [Versus *'...but the police didn't give a damn the name of the person who had abducted him']

39. Bill wanted to know the height of the building, but I wasn't sure. [Versus *'...but I wasn't sure the height of the building']

Nor can an ordinary indexical be what appears in the syntax, though unpronounced. The continuations in (36)-(43) are bad as well:

40. ...so I inquired it

41. ...but he didn't really care it

42. ...but the police didn't give a damn it

43. ...but I wasn't sure it

So, at the very least, it seems that it cannot be phonological deletion that is going on, since the “fully pronounced” version, supposedly produced but partly unspoken, would be ungrammatical.

One might reply to Grimshaw's worry by maintaining that the unpronounced ordinary material in (36)-(39) should not be an NP, but a semantically related S-bar. Thus the material which would go unpronounced in (37) ought to be not ‘the name of the person who had abducted him’, nor ‘it’, as suggested above, but rather (44):

37. Bill claimed to want to know the reasons for my decision, but he didn't really care

44. [_{CP} what the reasons for my decision were]

This suggestion of a CP continuation, however, is not workable; indeed, it brings up another general reason for abandoning the “unpronounced ordinary material” approach.

As Clapp (2002) and Elugardo and Stainton (2001) have both stressed, in a slightly different context, there will often be no single candidate for what the ordinary but unpronounced material would be, consistent with the content asserted: either there are too many candidates, or there are none available to the language users. Applied to the case at hand, there is no reason to choose precisely ‘what the reasons for my decision were’ as the material omitted in (37). Equally good (and hence equally bad) would be ‘what reasons I had for my decision’, ‘what those reasons were’, etc. Put crudely, the content of the null complement slot is often more vague than any ordinary item of structure, supposedly unpronounced, would be: each paraphrase is too precise to be *the* thing left out.

A second piece of evidence against taking the null complement to result from surface phonological deletion comes from facts about how the complement may (and may not) serve as antecedent. The view that there is unpronounced ordinary material makes the wrong predictions about this. For instance, suppose the question is asked, ‘How do we know that Jim robbed a bank?’. If the answer in (46) was syntactically and semantically just like (45), underlyingly, as per the view being discussed, then one would expect (45) with the material spoken and (46) with the null complement to have precisely the same meaning potential, in that discourse context:

45. He confessed that he robbed a bank, though we still don’t know when

46. He confessed, though we still don’t know when

But, in fact, even as a response to ‘How do we know that Jim robbed a bank?’, (46) is apt to be heard as just meaning that we don’t know when he confessed, while (45) is apt to be heard as ambiguous between not knowing that, and not know when he robbed the bank. The explanation of this semantic divergence, we think, is that the abbreviated answer to ‘How do we know that Jim robbed a bank’, viz. (46), does not contain the ordinary syntactic material [_{CP} that he robbed a bank] at any level of representation, hence this material is not available as an antecedent to the sluicing construction ‘we don’t know when’.

Similarly, (47) is grammatically better than the abbreviated (48), because – *contra* the phonological omission account of null complements -- only the former actually contains an appropriate antecedent for the anaphor ‘so’:

47. Juan testified that Anabelle was guilty, but in his heart he still didn't think so

48. ??Juan testified, but in his heart he still didn't think so

None of this refutes definitively the idea that null complements involve unpronounced ordinary syntactic material. But enough has been said for present purposes. Still possible, for all we have said above, is the idea that what appears in the null complement position is a special element of syntax, which never has a pronunciation. Or better, what appears are several such elements: one for each syntactic category of null non-subject. At a minimum, something along the lines of null DPs, null CPs, null (infinitival) IPs, and null PPs would be required, as in:

8. Hershad followed [_{DP} e] quietly

1b. Marie-Odile promised [_{CP} [_C e] [_{IP} e]]

1g. He volunteered [_{IP} [_I e] [_{VP} e]]

12a. She arrived [_{PP} [_P e] [_{DP} e]]

(Recall that (12a) was used to mean that she arrived at the summit.) Our reasons for rejecting this latter idea are methodological, and theory internal -- they have rather less to do with data coverage. True, we have been at pains to argue that null complements are interpreted *as if* there were a variable present. But that is far from a sufficient reason for positing a variable present, but unheard, *in the syntax*. We object in general to positing hidden structure solely on the basis of what an expression means; and we think that, at present, this is the only positive evidence for such empty elements, in the case of null complements. For this reason, we presently opt for (35) as the syntax for 'The press followed'. That said, we fully recognize that there is much more to be said on the issue.

A remaining question is how an expression with the syntax in (35) could end up with the meaning it has. Specifically, where is the content "as of" a variable coming from, if it is not in the syntax? Addressing this in detail would require a whole other paper. The short answer, however, is that the semantic component can recognize that a null complement construction is in play, can introduce a variable on that basis, and this variable can then be bound, or free *in the semantics*. More exactly, the semantics need only be able to recognize that a verb with an n-participant semantic frame is occurring with too few overt participants, recognize on the basis of surface syntax and the semantic frame which participant is unrealized, and then, at the level of content, treat the verb as

having a variable in that slot. The “binder” too, if there is one, can then be provided either by prior syntax, or by context. This requires, of course, that the semantic component do more than (i) assign a content to each element of syntactic structure, and (ii) apply several iterations of function-argument application. It also implies that compositionality, in Richard Montague’s very strict sense of isomorphism between syntactic structure and semantic content, does not hold for null complements. But these implications don’t bother us, since we take them to be independently established. Indeed, natural languages are simply rife with constructions that impact the semantics directly. (See Goldberg 1995 for numerous examples, and discussion. Note that we do not endorse Goldberg’s larger theoretical framework. But we do emphatically agree that constructions are crucial for semantics.) Null complements is just one more example.

To sum up, then. The fundamental mark of the null complement phenomenon is a mismatch between the number of linguistically inherent participants noted in a verb’s semantic frame, and the number of “phonologically realized” non-subjects in fully grammatical sentences containing that verb. That’s what it is to exhibit a null complement -- what “omission” amounts to. In terms of semantics, the meaning effect in all such cases was as if there were a variable. Sometimes the variable occurs free, in which case the utterance reads as if it had an extra deictic. Sometimes the variable occurs bound, in which case the utterance sounds quantificational. Cases which seem to violate this generalization – e.g., ‘Anita ate’ – we reclassify as not really involving omitted complements: they are actually intransitives which are marked for the addition of a non-subject. Regarding the syntactic structure of sentences exhibiting this “mismatch”, we argued that there is not unpronounced ordinary material, and suggested briefly that there are not unpronounced special null elements either. (Admittedly, the latter claim is based on methodological orientation, rather than on data.)

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¹ Some authors would argue that this overstates the case. On their view, there isn't a binary divide between verbs which do and verbs which do not grammatically allow null complements. Instead, goes the idea, some verbs allow omission very easily, some less easily, and some only under quite special circumstances. (For discussion, see Cummins & Roberge 2003, 2004.) Two kinds of arguments are typically given for preferring this graded scale. First, corpus studies consistently find null complement involving uses of verbs like 'lock' and 'devour' which, on a Fillmore-type account, simply cannot occur grammatically without complements. Second, corpus examples aside, there are constructions which intuitively seem to allow null complements fairly freely, even for those which Fillmore would label as not subject to omission. For instance, take the construction: "There are those who merely ___ (close/promise/leave) and those who ___ (lock/guarantee/ vacate)". Our own view is that these arguments don't really show that there is gradation. But we won't pursue the point here, resting content with the idea that some verbs allow null complements freely, which others resist them.

² One might balk at the terminology of 'verbs on a sense'. In particular, some of these examples might be better treated as homophony: wholly distinct verbs which happen to sound alike, rather than one verb with a variety of senses. The crucial point for us, however, is that it is not a *mere* sound pattern that does or does not allow null complement – it is, at a minimum, a sound pattern plus a content.

³ Binding of null complement slots was noted independently in Partee (1989).

⁴ Groefsema (1995) points out that 'won', which Fillmore labels DNC, can actually appear without a specific, contextually-given competition. Her example is 'Martina Navratilova has won again', uttered during a discussion of the achievements of older sports people. This is another example of the kind of problem we have in mind, of purported DNC verbs shifting from reference to quantification.

⁵ M. Kawai (p.c.) rightly noted that our taxonomy is not exhaustive. For instance, reflexive verbs like 'shave' don't seem to fit anywhere. They are not obstinately existential, so they aren't intransitive. And they can't be read as having a free variable as complement content either -- being reflexive, the complement content is always the agent -- so they aren't transitive null complements either. (Cf. 'John shaved' cannot be used to mean that John shaved the salient man with all the nasty razor burn.)

⁶ In using the notation of features, we are by no means committed to the idea that they can apply freely to verbs, regardless of the content of the verb in question. There undoubtedly are semantic constraints to be met as well. Thus, to take an obvious example, it is no accident that 'die' is an intransitive that cannot add a complement, for what would that added complement be?

⁷ Cree also has verbs which, like English 'die', are strictly intransitive; and it has verbs, which, like English 'buy', are strictly transitive. Cree verbs are marked for transitivity in several ways, first by an affix called the verb final which combines semantic content as well as transitivity marking, then by a direction morpheme indicating subject and object person combinations, and finally by person agreement suffixes. See Junker et al. (2005). Our thanks to Louise Blacksmith for help with the East Cree examples.

⁸ This question about syntax is an interesting and important issue in its own right. But, though we haven't space to address them here, it also has important implications for the on-going debate about whether pragmatics plays a part in determining what is strictly and literally asserted. Specifically, the question arises whether pragmatics plays this part when complements are omitted in talk exchanges. We hope to return to this larger issue in a separate paper. See Bach (1994a, 1994b), Carston (1988), Recanati (1989, 2002), Searle (1978, 1980), Sperber & Wilson (1986), Stainton (1997) and Travis (1985) for arguments in favor of pragmatic determinants of what is said. See Stanley (2000) for an opposing view.