Gapping as a syntactic dependency[*]

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Abstract

The present paper shows that Gapping should be seen as the syntactic dependency established between the projection of a verbal null head in the second conjunct and the projection of its antecedent in the first conjunct. This way of approaching gapping will allow us to account for its characteristics and to predict its possibility or impossibility both in SVO and in SOV languages.

1 Introduction

The present paper aims to show that gapping should be understood as a syntactic dependency established between the projection of the first [+V, -N] null head appearing in the second conjunct and the projection of its [+V, -N] antecedent in the first conjunct (the symbol Ø will be used to mark the presence of the null head):

(1) [I will buy a house]$_i$ and [he Ø sell his flat]$_i$. (Ø=will)

The approach to gapping in this paper is in a way an extension of Williams' (1997) analysis, which was later followed by Ackema and Szendröi (2002). Williams sees gapping as the result of projecting a bivalent head, the second of which is null (i.e. it lacks any features) and anaphoric to the first head. The presence of this null head is licensed by the coordinate construction itself (p. 620):

(2) a. [T, 0]: TP and 0P
"John *will* eat pizza and Mary Ø drink wine" (Ø=will)
b. [V, 0]: VP and 0P
"It is ok to *eat* fish on Fridays and Ø meat on Wednesdays" (Ø=eat) (Ackema and Szendröi, 2002: 6)

*I wish to thank Ad Neeleman for his detailed comments on earlier versions of this paper and for stimulating discussion. Many thanks also to Hans van de Koot, Neil Smith and Peter Ackema for helpful suggestions. All errors are of course my own responsibility.

c. [C, 0]: CP and 0P
"That the Earth revolves around the Sun and Ø the Moon revolves around the Earth are well-established facts" (Ø=that) (Ackema and Szendröi, 2002: 6)

In our approach gapping is also considered the projection of a null verbal head which is dependent on its antecedent. However, our null head does have a whole set of features (categorial features [+V, -N], interpretable features and phi-features) although it is null in the sense that it is not related to a lexical entry, reason for which its projection must form a chain with the projection of its antecedent in order to avoid a violation of the Inclusiveness condition (Chomsky, 1995a). This condition assumes that the computational system can only access the information of lexical items. In Chomsky's (1995a: 225) words "(…) outputs consist of nothing beyond properties of items of the lexicon (lexical features) – in other words, that the interface levels consist of nothing more than arrangements of lexical features. To the extent that this is true, the language meets a condition of *Inclusiveness.*"

This paper will only deal with gapping in conjunction or, to be more precise, in constructions joined by the coordinator "and". On the other hand, at the risk of sacrificing accuracy for brevity, the term gapping will be used to refer only to forward gapping, which is understood as the absence of the first [+V, -N] head in the second and subsequent conjuncts independently of whether this absence occurs in initial, medial or final position of the sentence. Examples where the absence of the [+V, -N] head takes place in the first conjunct (cf. (3) below) will be ignored here since there is lack of agreement as to whether they should be really treated as instances of gapping (Ross, 1970) or as a case of Right-Node-Raising (Maling, 1972). I leave this as beyond the scope of the present work.

(3) (Examples taken from Ross, 1970: 251)

a. Watakusi wa sakana o tabe, Biru wa gohan o tabeta.
I (part) fish (part) eat Hill (part) rice (part) ate
"I ate fish, and Bill ate rice"

b. Watakusi wa sakana o, Biru wa gohan o tabeta.
"I (ate) fish and Hill ate rice"

The paper is organised as follows: Section 2 proves that gapping behaves like other grammatical dependencies. Section 3 examines how the dependency between gap and antecedent is established and explains why such a dependency is necessary. Section 4 focuses on examples which do not contain an overt auxiliary ("Peter bought a car and Mary Ø a motorbike"). Section 5 puts forward some of the implications which follow from the new analysis of gapping and section 6 concludes the paper.

2 Grammatical dependencies and gapping

This section is devoted to providing evidence that gapping should be treated as a grammatical dependency. For the sake of simplicity, I will basically deal in this section with examples which lack T (as in example (4)). Examples such as this in (5) will be ignored until section 4:

(4) I will buy the car and you Ø sell the motorbike. (Ø=will)
(5) I bought the car and she Ø the motorbike. (Ø= bought)

Koster (1987) and Neeleman and van de Koot (2002) pointed out that in order to accept that there exists a grammatical relation between a dependent α and an antecedent ß, five properties must be satisfied:

1. The dependent must take an antecedent. (Obligatoriness)
2. The dependent must have its antecedent within its local domain. (Locality)
3. Each dependent must take a unique antecedent. (Uniqueness of antecedent)
4. An antecedent can have more than one dependent. (Non-uniqueness of dependents)
5. The antecedent must be in a c-commanding position. (C-command)

Were gapping a syntactic dependency, it should satisfy those very same conditions for the outcome to be grammatical. The first four conditions are treated directly below whereas the next section will expand on the c-command condition. Let us consider each of the characteristics individually:

1. The dependent must take an antecedent:

(6) *Sarah will buy the old car and Hogan Ø sell the old motorbike. (Ø=would)

The gap in (6) cannot be filled by "would" because it would lack an antecedent in the previous conjunct. It is interesting to remark that the relationship between gap and antecedent cannot be simply of semantic nature. Notice, for instance, that gapping does not allow a VP which it affects to be matched with the contents of a

DP, unlike other elliptical processes such as VP ellipsis or pseudogapping[1] (cf. Johnson, 2003: 24) (the examples preserve the way of marking the absence of a constituent of the original source):

(7) *Sal is a forger of passports and Holly ~~forges~~ paintings. (Gapping)
(8) ?Sal may be a talented forger of passports, but surely he can't Δ paintings. (Pseudogapping)
(9) ?Sal is a talented forger, but Holly can't Δ at all. (VP-ellipsis)

One may still argue that although gapping is not possible in example (7), its ability to appear in discourse across speakers tips the balance towards considering it a dependency of semantic more than of syntactic nature:

(10) A: Peter can sing.
B: And Mary Ø dance.

Notice, however, that gapping can only occur in discourse if the coordinator is present:

(11) A: Peter can sing.
B: *Mary Ø dance.

The requirement of the presence of the conjunction seems to be indicating that, as Neijt (1979) pointed out, we are dealing with the collaboration of two people in what is actually a single sentence. Thus, those examples do not provide us with evidence for seeing gapping as semantically dependent on its antecedent as neither do examples of the style of (12):

(12) A: I can sing.
B: and I Ø dance.

Sag et al. (1985: 160) and Chao (1988:14) base themselves on the shift in first person singular deixis in those examples to reject that they constitute a two-speaker collaboration on a single sentence. However, the fact that there is a shift in deixis is the direct consequence of the presence of two different speakers, not an indication

[1] The term "Pseudogapping", coined by Levin (1978, 1979), makes reference to the deletion process which displays simultaneously properties of gapping (in the sense that there is a right remnant, i.e. a constituent to the right of the gap that contrasts with a constituent occupying the same position in the first conjunct) and properties of VP-ellipsis (in the sense that there is a finite auxiliary).

that both contributions do not form a single grammatical structure. In a normal conversation, we very often find situations where one of the speakers is clearly ending the sentence of the other and in those cases the shift in deixis is immediate:

(13) (Context: James is going to tell Sarah that Sue likes him but Sarah already knows it and interrupts him)
James: I have to tell you that Sue likes _____
Sarah: you (*me)

The same explanation applies to gapping.

2) Locality: As is the case with other grammatical dependencies, gapping seems to be constrained by certain locality conditions which force the gapped conjunct to follow the antecedent conjunct immediately (cf. (14a) below), and which do not allow gapping to go down into subordinate clauses (cf. (14b) below) or to occur in subordinate clauses (cf. (14c)):

(14) a. *Jane can eat the sandwich, Louise could drink a beer and Sue Ø try the hotdog. (Ø=can)
b. *Jane will eat the bread and I think that Paul Ø drink the coke. (Ø=will)
c. *Jane will eat the bread because Paul Ø drink the coke. (Ø=will)

We will come back and explain these locality restrictions later in the discussion. What is important at this point is that gapping has to obey certain locality conditions and, in this sense, the relationship between gap and antecedent is much stricter than that we find in VP-deletion or pseudogapping where those locality conditions do not seem to apply, at least not to the same degree (see also Johnson, 2003: 18):

(15) VP-ellipsis
a. Jane will eat the bread and I think that Paul will ~~eat the bread~~ too.
b. Jane will eat the bread because Paul will ~~eat the bread~~ too.
(16) Pseudogapping
a. ?Jane will eat the bread and I think that Paul will ~~eat~~ the fruit.
b. ?Jane will eat the bread because Paul will ~~eat~~ the fruit.

3. Each dependent must take a unique antecedent:

(17) *My cousin can wash his t-shirt, my mother must iron her skirt and I Ø sew my trousers. (Ø= can *and* must)

Notice that gapping again differs in this point from VP-ellipsis and pseudogapping (examples retrieved from Johnson, 2003: 23-24):

(18) Wendy is eager to sail around the world and Bruce is eager to climb Kilimanjaro, but neither of them can Δ because money is too tight. (Δ=sail or climb)

(19) ??Wendy should sail the English Channel and Bruce climb Whitney, but surely they won't Δ the Pacific or Kilimanjaro. (Δ= sail or climb)

4. An antecedent can have more than one dependent:

(20) Alan will go to London, Richard Ø travel to France and Paola Ø visit Canada. (Ø=will)

Taking the previous discussion into account it seems licit to look into the possibility of explaining gapping in terms of a syntactic dependency. This conclusion has been previously hinted at by Hankamer (1979) although the apparent lack of c-command between gap and antecedent has frustrated all efforts to deal with gapping in terms of a grammatical dependency. Hankamer's (1979: 21) comment is revealing. Talking about the similarities between gapping and Reflexivization with respect to locality restrictions, he states "(...) but the restriction on Gapping, unlike that on Reflexivization, cannot be formulated in terms of the more primitive notion of command, since the deleted constituent in this rule neither commands nor is commanded by its antecedent." To this conundrum we will turn our attention in the next section.

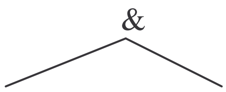
3 Gapping and c-command

The present section puts forward how the syntactic dependency between gap and antecedent takes place, whilst explaining why such syntactic relation is necessary. As was the case in the previous section I will continue dealing exclusively with cases of T-gapping.

Before proceeding with the discussion, it is convenient to clarify some assumptions which will be central for the approach to gapping presented in the lines that follow.

Firstly, I accept a binary-branching analysis for coordination (cf. for instance Munn (1993), Johannessen (1998) or Hartmann (2000)) in which the first conjunct asymmetrically c-commands the second:

(21)



Secondly and crucially, I assume that the coordinating conjunction is a head which lacks categorial features (see also Ackema and Szendröi, 2002: 10, fn. 2). Notice for instance, that the selectional requirements of any category can be satisfied independently of the presence of the conjunction. For example, "very" selects for an adjective or an adverb and those requirements are satisfied in (22) in the same way that the selectional requirements of "has" are satisfied in (23), in spite of the fact that in both (22) and (23) we find the same conjunction:

(22) She is very intelligent and shy.
(23) She has drank and eaten as she never did.

On the other hand, notice that there is no lexical or functional category which selects for a coordinate phrase.

Lastly, following Jackendoff (1997) I assume that each lexical item is associated with a particular linking index. Since syntax only sees syntactic features, all the words included in (24a) are syntactically identical (cf. Jackendoff, 1997: 91). The same is true for the words included in (24b), (24c) and (24d):

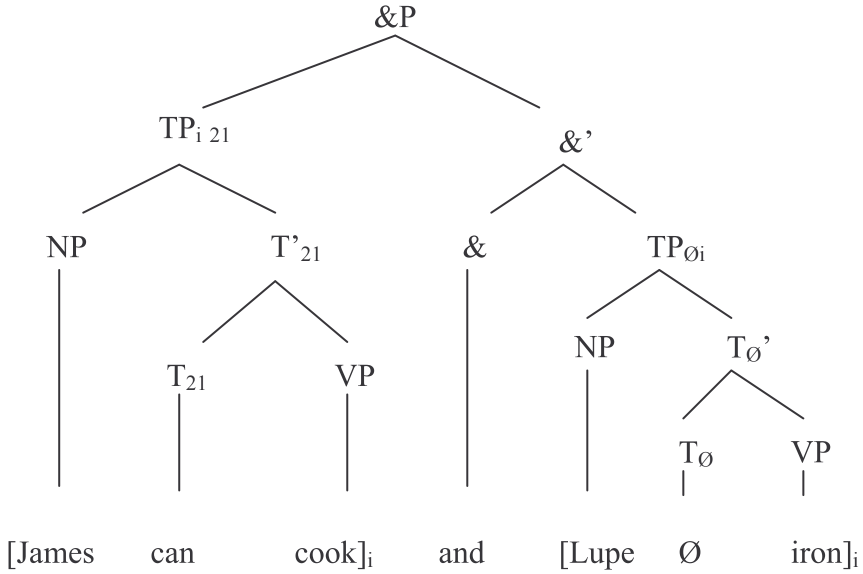
(24) a. dog, cat, armadillo.
b. walk, swim, fly
c. gigantic, slippery, handsome
d. on, in, near

But there has to be some way in which it is determined that a particular slot is occupied by the word *dog* rather than *cat*. Words are then singled out by means of a lexical address which relates them to a particular lexical entry. So, for instance, *dog* could be said to have a lexical address 101, *cat* a lexical address 204, etc. That is, this lexical address allows them to be tracked through the syntax.

Taking all this information into account, we are now in the position of explaining how the syntactic dependency between gap and antecedent is established. I consider that the null head T resulting from gapping has categorial features [+V, -N], phi-features and tense but it is null in the sense that it is not associated with a lexical address. This null head has a requirement which forces it to be bound by an antecedent [+V, -N] which allows it to be associated to a lexical entry in order not to violate Inclusiveness, the condition which establishes that all the information of lexical items must come from the lexicon (Chomsky, 1995a). However, the null head cannot be associated with the lexical address of its antecedent in situ because there is not a relation of c-command between them. I hypothesise that it is the chain formed between the projection of the null head and the projection of its antecedent which allows the null head to be associated with a lexical entry and satisfy inclusiveness[2]. Let us see how this process takes place by means of an example:

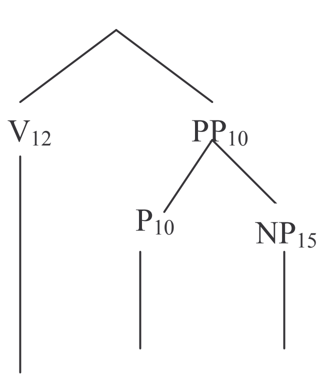
(25) [James can cook]$_i$ and [Lupe Ø iron]$_i$. (Ø=can)

(25')



In the same way that the features of a head are present in all its projections, I assume that the lexical address of a lexical item is also copied into the different projections. This is not an ad hoc decision. There is independent evidence for such an affirmation. For instance, a verb like "depend" selects for the preposition "on". Therefore, to satisfy its selectional requirements, it is necessary to postulate that the index of the preposition "on" is also present in its projection:

(26)



[2] Notice that the concept of chain used here is similar to that in Brody (1995) in the sense that our chain is not the result of movement.

Depend on Mary

Therefore, by means of the cha between the projections of the dependent and the antecedent, the null head is associated to a lexical entry whilst respecting the Chain Uniformity Principle (Chomsky, 1995b: 406):

(27) A chain is uniform with regard to phrase structure status.

Notice that the way in which this syntactic dependency is established is not different from the way in which the dependency between anaphors like “himself” and its antecedent takes place. In the anaphor “himself”, it is “self” that requires to be bound by an antecedent in a local domain:

(28) John$_i$ likes himself$_i$.

However, it is the chain {John, himself} that satisfies this selectional requirement.

In this section we have shown that the relation of c-command between the projection of the null head and its antecedent is necessary to allow the null head to be associated to a lexical address and satisfy Inclusiveness. Notice that, as with other syntactic dependencies, lack of c-command between dependent and antecedent results into ungrammaticality:

(29) *[Mary heard the rumour [that Peter will leave]$_i$] and [she Ø act accordingly]$_i$. (Ø=will)

(30) *[Sarah Ø buy the old car]$_i$ and [Hogan will sell the old motorbike]$_i$. (Ø=will)

The fact that the null head must be c-commanded by its antecedent explains why gapping must take place in the second conjunct[3] (as pointed out by Maling, 1972; Hankamer, 1979; Zoerner and Abgayani, 2000; te Velde, 2005, amongst many

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[3] In many languages (Japanese, Korean, etc) the gap seems to occur in the first conjunct. However, recall from the introduction that it is not clear whether the omission of the verb in the first conjunct is an instance of gapping or should be considered an instance of Right Node Raising since it is usually possible only when the verb occurs in final position (see, for instance, Maling, 1972):

(i) Abel yuu, maku bizie, ne xwain jumE been
Abel house, Markos well, and Juan basket made
S O S O S O V

(ii) *Xwain yuu, abel mulE, ne nap makU yu
Juan house Abel money and has Markos land
S O S O V S O

(Zapotec, American Indian language; Rosenbaum, 1977: 385) others). If the null head appeared in the first conjunct, its projection would c-command its antecedent.

4 Traditional examples of gapping

Although up to this point we have been mainly dealing with T-gapping, the term "gapping" has been traditionally applied to the elision of the verb (cf., for instance, Jackendonff, 1972). In fact, there are many examples of gapping in which, at least apparently, the verb and not the auxiliary has been deleted:

(31) The boy in red played football and the one in black Ø basketball. (Ø=played)

Notice that in those cases the gap must also comply with the characteristics attributed to grammatical dependencies:

(32) *Leah ate a sandwich and Paul Ø a hamburger. (Ø=devour)
(33) *Leah Ø a sandwich and Paul ate a hamburger. (Ø=ate)
(34) a.*Leah ate a sandwich and I think that Paul Ø a hamburger. (Ø=ate)
b.*Leah ate a sandwich, Tom drank a beer and Sue Ø a hotdog. (Ø=ate)
c. *I think that Leah ate a sandwich and that Tom Ø a hotdog. (Ø=ate)
(35) *Leah ate a sandwich, Tom drank a beer and Sue Ø her soup. (Ø=ate and drank)
(36) Leah ate a sandwich, Tom Ø a hotdog and Sue Ø a whole pizza. (Ø=ate)

Example (32) shows that the gap must have an antecedent, whereas example (33) proves that this antecedent must c-command the gap. That the gap is subjected to locality conditions is reflected in the examples included in (34) whereas example (35) shows that the uniqueness of the antecedent must be satisfied. Finally, that the non-uniqueness condition of the dependents applies to those examples is reflected in (36).

Those examples might raise the question of whether we are really dealing here with T- or V-gapping since there is no overt T and the verb is absent. However, the fact that the subjects must occur in nominative[4] (cf. (37) below) is a clear indication that they agree with T and appear in spec-TP:

(37) *Him played football and her Ø basketball. (Ø=played)

If we accept that those examples involve the coordination of two TPs and our approach to gapping is correct, then the null head should be T and not V since this is the only head which can be associated to a lexical address by means of the chain formed between its projection and the projection of its antecedent. Thus example

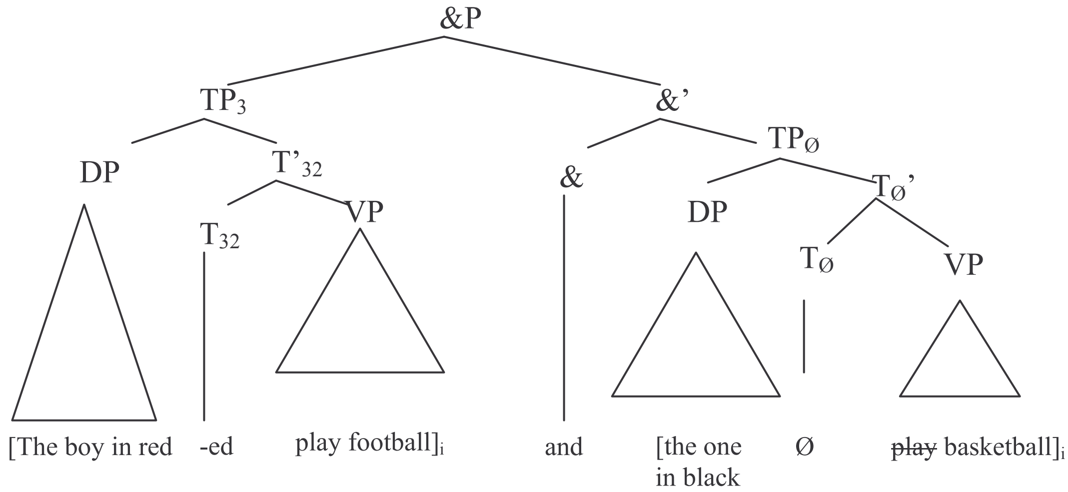
[4] Some speakers accept the accusative case in the subject of the second conjunct.

(31) repeated here as (38) should be the result of projecting a null head T plus the deletion of verb:

(38) $[_{TP}$ The boy in red $[_{T}$ -ed $[_{VP}$ play football$]_i]$ and $[_{TP}$ the one in black $[_{T}$ Ø $[_{VP}$ ~~play~~ basketball$]_i]$. (Ø=-ed)

I assume that the verb stem and the tense marker are inserted at different terminal nodes (see also Bobaljik, 1995 and Lasnik, 1995). Each of the morphemes of the verb "played" above has a different lexical entry: the lexical entry for "play" and the lexical entry for the past morpheme "-ed" (cf. Jackendoff, 1997: 143-144). Witness the representation of (38):

(38')



As in previous examples, the null head in (38') is related to a lexical address by means of the chain formed between its projection and the projection of its antecedent. In this way Inclusiveness is not violated. The only difference with respect to the examples where the null head is related to the lexical entry of an auxiliary rather than the lexical entry of a bound morpheme is that in the latter case the verb must also be elided. This is presumably due to some condition which establishes that verb stems, like affixes, cannot be stranded. To put it another way, the "stranded affix" filter (formulated by Lasnik, 1981; but see also Bobaljik, 1995, and Lasnik, 1995) should be extended in order to be applicable to verb stems:

(39) A morphologically realized affix *or a stem* must be a syntactic dependent of a morphologically realized category, at surface structure. (Lasnik, 1981) (Taken from Lasnik, 1995) (The text in italics is mine).

Of course it is licit to wonder what licenses the elision of the verb in examples such as (39). Although I will not go deeper into this discussion, the omission of the verb could be the result of dependent ellipsis, i.e. an ellipsis which depends and is licensed by the null head itself (in the line of Williams (1997) and Ackema and Szendröi (2002)).

The same explanation can be used for examples such as this included under (40) where tense is apparently not realized with an inflectional ending on the verb:

(40) My parents bought the bread and your mother the butter.

I also assume that in those cases the verb is composed of two different morphemes, the past morpheme (-ed) and the stem base (buy), which become "bought" in morphology:[5]

(40') [My parents –ed buy the bread]$_i$ and [your mother Ø ~~buy~~ the butter]$_i$. (Ø=-ed)

The way in which the null head is associated with a lexical address in those examples is identical to what we find in (38) and therefore it will not be repeated here.

This section has hopefully shown how our account of gapping can be easily extended to those examples where there is not an overt auxiliary.

5 Gapping as a syntactic dependency: some implications

The lines that follow show how the treatment of gapping presented in this paper can explain why its occurrence is limited to directly coordinated clauses. On the other hand, it will put forward how our analysis can account for the fact that the gapped null head must have the same tense as its antecedent but not the same agreement features. Finally, this section will show how our analysis predicts that

[5] There are two facts which I take in favour of considering "bought" as formed by two separate morphemes. On the one hand if negation intervenes between T and V, do-support is required, which seems to show that features and stem are separated in the syntax and fuse in phonology:

(i) a. *My parents not bought the bread.
b. My parents did not buy the bread.

On the other hand, notice that deletion of a constituent takes place under identity with another constituent. If we accept that irregular past forms are composed of two different morphemes, examples such as (iia) do not have to be seen as deletion under apparent incomplete identity, providing that we assume that deletion takes place before the bare stem has associated with the inflectional affix (Lasnik, 1995: 266):

(ii) a. Peter bought cheese and Mary will jam.
b. Peter -ed buy cheese and Mary will ~~buy~~ jam.

the possibility or impossibility of gapping in a language is determined by the status of the coordinator itself.

5.1 Gapping is restricted to directly coordinated clauses

It has been noted by many (Hankamer, 1979; Rooryck, 1985; Chao, 1988; te Velde, 1997; amongst many others) that gapping cannot "go down into" subordinate clauses,

(41) *[Alfonse will eat the bread]$_i$, and I think (that) [Sally Ø drink the coconut juice]$_i$. (Ø=will)

and cannot occur in subordinate clauses (cf. for instance, Ross, 1970; Jackendoff, 1972; Hankamer, 1979; Neijt, 1979; Lobeck, 1999; Johnson, 2003):

(42) *[Theresa will finish her PhD]$_i$ because [her parents Ø get help from the State]$_i$. (Ø=will)

Thus, in principle, it seems that as Hankamer (1979: 19) pointed out "the Gapping rule has to be constrained to operate strictly in structures directly conjoined with each other". It remains to be explained why gapping is constrained by such locality conditions. Let us see how this is the expected result in our approach. The null head [+V,-N] has some requirement which forces it to have an antecedent which is also [+V, -N]. Therefore, the projection of the null head must form a chain with an antecedent with those categorial features. In a coordinate structure [TP_x & $TP_Ø$], the projection of the null head $TP_Ø$ forms a chain with TP_x which corresponds to the first c-commanding constituent which is [+V, -N]. Recall that we assume that the coordinating conjunction lacks categorial features. This is the right antecedent since the null head will be correctly related to the lexical entry of T, which is the position that the null head occupies in the second conjunct.

However, the presence of a C or CP preceding the projection of TP in the first conjunct (and this is what we find in (41) and (42) above) will immediately block the formation of the chain between this projection and the projection of the null head due to a Relativised minimality effect (Rizzi, 1990). Since C and CP are also [+V, -N] they are potential binders.[6] As a consequence chain formation is

[6] It is important to remark that when we talk about relativised minimality, we are concentrating on the kind of features which are important for the dependency. To put it otherwise, a head C can block the formation of a chain between maximal projections because it has the features [+V, -N] which are relevant for the grammatical dependency established between null head and antecedent.

impossible; the null head cannot be related to a lexical entry and the derivation crashes. The reasons for the ungrammaticality of examples such as (41) and (42) are not different from those that cause the deviance of examples such as (43):

(43) *[Tom can break the door]$_i$, [Will could open the window]$_j$ and [Jenny Ø pull the gate]$_i$. (Ø=can)

The T/TP in "Will...window" is [+V, -N] and therefore will bring about a relativised minimality effect.

Thus, the fact that gapping is strongly restricted to occurring in directly conjoined structures has to do with the fact that coordinating conjunctions, unlike subordinating ones, lack categorial features and, as a result, do not bring about a minimality effect.

5.2 Tense and agreement features in the null head and the antecedent

Let us move on to show how this way of approaching gapping accounts quite straightforwardly for the fact that the gapped constituent must have the same tense as its antecedent (Wilder, 1994, 1997 amongst others). This is witnessed by the following example:

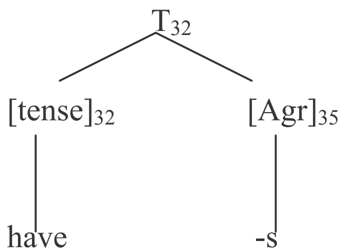
(44) *[My mother can talk to the doctor today]$_i$ and [my brothers Ø interview the nurse yesterday]$_i$. (Ø= could)

However, gap and antecedent can have different agreement features:

(45) Judith has eaten the bread and the kids Ø drank the wine. (Ø=have)

I assume that the lexical entry of T contains tense but not agreement features. The latter are added as T is selected for the numeration:

(46)



Both features have different lexical addresses. Only the lexical address of the tense feature moves to the different projections of T, presumably to indicate which features belong to the lexical entry of T. Thus, when the null head is associated to the lexical entry of T it will have the features and, as a consequence, the tense of that lexical entry. This is the reason why both null head and antecedent must occur in the same tense. Otherwise, there would be a clash between the tense feature of the null head and that of the lexical entry to which it is associated. On the contrary, the agreement features are not present in the lexical entry of T and therefore, null head and antecedent can be endowed with different agreement features when they are selected for the numeration.

5.3 Gapping in SVO and SOV languages[7]

This section puts forward how the analysis presented in the previous lines provides us with a new account for the existence or non-existence of what has traditionally been understood as forward gapping, i.e. the presence of gapping in the second or subsequent conjuncts. We will concentrate our attention on SVO and SOV languages in this paper since those were the languages on which the well-known alternative approach of Ross (1970) focused.

Before putting forward our explanation of the directionality of gapping, let us consider briefly Ross's hypotheses.

5.3.1 Ross's directionality of gapping

Ross (1970), followed by Koutsoudas (1972), postulated that the directionality of gapping is structurally determined, i.e. it depends on the position occupied by the verb at the time the rule of gapping applies. In Ross's words: "The order in which Gapping operated depends on the order of elements at the time that the rule applies; if the identical elements are on left branches, Gapping operates forward; if they are on right branches, it operates backward." (Ross, 1970: 251). According to this hypothesis, SOV languages are expected to gap backwards (since the verb is on a right branch) whereas SVO languages will do it forwards (since the verb is on a left branch).

However, this initial hypothesis had to be modified due to the existence of SOV languages at surface structure which, contrary to Ross's expectations, gapped forwards (such as Hindi or Basque) even when the verb was on a right branch:

(47) Hindi

[7] This section has been possible thanks to the help of many of the members of the Association of Linguistic Typology (ALT) who have provided me with a great variety of examples in different languages and very useful comments. Particularly I would like to extend my gratitude to Alan Kim, Alec Coupe, Anders Ahlqvist, Annarita Puglielli, Arnold M. Zwicky, Assibi Amidu, Bernhard Waelchli, Even Hovdhaugen, Harald Hammarström, I Wayan Arka, Jan Anward, Kingkarn Thepkanjana, Manfred Krifka, Martin Haspelmath, Ray Fabri, Seppo Kittilä and Stéphane Robert. Equally, I would like to thank Anand Kappagantula, Balkiz Ozturk, Felicity Sheridan-Johnson, Hiroyuki Uchida, Hitoshi Shiraki, Reiko Vermeulen and Ui Su Kim.

Peter ne chocolate khaya aur Mary ne Bread
Peter part. chocolate ate and Mary part. bread.
"Peter ate chocolate and Mary bread"[8]

Ross concluded that if a language is SOV in the surface structure and gaps forwards, it has an underlying order SVO. The verbs start before their objects but "after gapping has had a chance to apply forward, they are obligatorily moved to the end of their VP, where backward gapping will subsequently also be able to apply." (Ross, 1970: 257). Therefore, only strict SOV languages will gap only backwards and, as a consequence, languages like Hindi and Basque cannot be considered strict SOV languages.

Notice that, independently of the accuracy of this approach, there does not seem to exist a straightforward explanation of why the position of the verb should determine the direction of gapping. On the other hand, to conclude that SOV languages have an SVO underlying structure on the basis of gapping might be too risky, especially when there is other evidence which points in the opposite direction. Finally and crucially, Ross's analysis has to face an important problem. According to this analysis, a strict SOV language (i.e. a language which is also SOV in deep structure) will be able to gap only backwards. On the other hand, a language which is SOV in surface structure but SVO in deep structure will be able to gap forwards or backwards depending on where gapping applies since gapping is an "everywhere rule" (P. 259), i.e. we could find the order SOV SO if gapping takes place in the deep structure before the movement of the verb (SVO SVO→SVO SO→SOV SO), or we could find the order SO SOV if gapping takes place after the movement of the verb (SVO SVO→ SOV SOV→ SO SOV). From this it follows that "no SOV language will allow only forward gapping". If a language is strict SOV, the verb can only gap backwards because it occurs on a right branch. If a language is not a strict SOV language, then it should allow both forward and backward gapping depending on when gapping applies. In fact, Ross states that every language which exhibits the order SOV+SO+SO also exhibits SO+SO+SOV (p. 256). Unfortunately, we will see that this is not true for all cases and that there are languages like Standard Persian which have a surface order SOV but only allow forward gapping (SOV+SO+SO). If we follow Ross's analysis, we would have to stipulate that in some languages gapping must take place at the deep structure but, by doing so, we lose the generalization about the behaviour of gapping. It is no longer true that gapping can take place before or after scrambling. New rules have to be introduced and this leads us to a descriptive account of the data, but does not provide us with enough tools to predict and explain the directionality of gapping.

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[8] Thanks to Anand Kappagantula for this example.

Thus, a new explanation of the directionality of gapping is required. We will try to help to undertake this task in the next section by concentrating our attention in the behaviour of forward gapping.

5.3.2 Forward gapping is determined by the nature of the coordinator

Let us start by considering the data in table 1, which shows some (at least superficially), SOV languages which allow the presence of forward gapping:

(48) Table 1. Gapping in SOV languages

Language	Conjunction "and" NP	Conjunction "and" Clauses	Examples of gapping
Turkish	ve/-da	ve/-da	a) Ben ekmek ye-di-m, Meter da cikolata.[9] I bread eat-past-1ps -da chocolate "I ate bread and Peter chocolate" b) ?Ben ekmek ye-di-m ve Peter cikolata. I bread eat-past-1ps and chocolate "I ate bread and Peter chocolate"
Hindi	aur	aur	Peter ne chocolate khaya aur Mary ne Bread Peter chocolate ate and Mary bread. "Peter ate chocolate and Mary bread"
Standard Persian	væ/-o[10]	væ/-o	æli sib xord væ/ -o mærzi hulu. Ali apple ate and Marzo peach. "Ali ate apples and Marzy peaches" (Mahootian, 1997: 74)
Punjabi	te	te	mãi káánii páR ríaa ãã te tusii axbaar. I story read ing-ms am and you newspaper. "I am reading a story and you a newspaper" (Bathia, 1993: 115)
Basque	ta	ta	Miren zinemara joan da, eta Pello antzerkira. Miren cinema.to go AUX.3A and Pello theatre.to "Miren has been to the cinema, and Pello to the theatre" (Hualde and de Urbina, 2003: 873)

[9] I owe those examples to Balzik Ozturk.

[10] The use of the clitic –o is more common in informal speech (see Mahootian (1997)).

In Turkish, Hindi, Punjabi and Basque the elision of the verb in the first conjunct is also grammatical although, with the exception of Turkish, the elision of the verb in the second conjunct is the preferred option. In Standard Persian only the elision in the second conjunct is allowed. Notice that there is a common factor among those SOV languages which allow (sometimes exclusively) gapping, namely the fact that they use one and the same conjunction "and" independently of the syntactic category of the coordinands (here we can see that the same conjunction is used to link clauses and NPs, but this is also true with APs, PPs, etc). However, those SOV languages which use different coordinators depending on the syntactic category of the conjuncts do not seem to accept the presence of gapping. Examples of this are Japanese and Korean:

(49) Japanese

a. Watakusi wa sakana o tabe, Biru wa gohan o tabeta.
I (part) fish (part) eat Hill (part) rice (part) ate
"I ate fish, and Bill ate rice"

b. *Watakusi wa sakana o tabe, Biru wa gohan o.
"I ate fish and Hill (ate) rice"

(50) Korean

a. John-I Mary-(wa) mannassta, kuliko Bill-i Sue-wa mannassta.
John-Nom Mary-with met, and Bill-Nom Sue-with met.
"John met Mary and Bill met Sue.

b. *John-i Mary-wa mannassta, kuliko Bill-I Sue-wa.
"John met Mary and Bill (met) Sue"

(Adapted from Nakamura, 1996: 6)

As Haspelmath (forthcoming: 18) pointed out "the most widespread contrast for conjunction is that between NP conjunction and event conjunction (i.e. VP or clause conjunction)". In Japanese NPs are usually conjoined by "to", "ni" or "ya"[11] (cf. Kuno, 1973):

(51) John *to* Mary *to* Tom (*to*) ga kita.
John and Mary and Tom came.

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[11] For a comprehensive explanation of the differences among those conjunctions, I refer the reader to Kuno (1973).

(52) John *ni* Mary *ni* Tom ga kita.
John and Mary and Tom came.

(53) John *ya* Mary *ya* Tom ga kita.

(Examples taken from Kuno, 1973: 112)

Those conjunctions are used almost exclusively to connect nouns. In order to connect clauses it is common to use the gerundive form of the verbals (Kuno, 1973: 112) (cf. (54a) below) or several conjunctions with the meaning of "and" "besides", "moreover". Those include "soshite", "mata", "Shikamo", "sono ue", "sore ni", "sara ni", "oyobi" (see Kaiser (2001: 72). The use of "to", "ni" or "ya" results in ungrammaticality (cf (54b)):

(54) a. John ga Tokyo ni ik-i, Mary ga Osaka ni iku.
John to Tokyo go-ing Mary to Osaka to go.
"John goes to Tokyo and Mary goes to Osaka"

b. *John ga Tokyo ni iku *to*/*ni*/*ya*, Mary ga Osaka ni iku.
(Kuno, 1973: 113)

(55) John-wa ringo-o kai *soshite* banana-o tabeta.
John-top apple-acc buy-ger. and banana-acc ate
"John bought apples and ate bananas"[12]

"Soshite" may also be used to conjoin NPs:

(56) John-wa ringo-o *soshite* banana-o katta.
John-top apple-acc and banana-acc bought.
"John bought apples and bananas"

A very similar situation can be found in Korean. As Sohn (1999) pointed out "unlike in English, different conjunctors are used for sentential and nominal coordinators" (p. 123). Sentential *and*-coordination can be done in at least two different ways (see Sohn (1999) for a more comprehensive discussion):

1) By means of the conjunctive adverb "kuliko":

(57) Pwusan-ey ka-ss-ta *kuliko* Minca-wa swuyenghay-ss-ta.
Pusan-to go-PAST-DC[13] and Minca-with swim-PAST-DC

[12] I owe this example to Reiko Vermeulen.

"He went to Pusan, and swam with Minca"

2) By means of the use of conjunctive verbal suffixes attached to the non-finite form of the predicate of the first conjunctive clause. Those include "-ko", -"mye" (only in formal contexts) and "-yo" (very formal and only used to conjoin copulative clauses) (all the examples have been retrieved from Sohn, 1999: 118-119):

(58) Na-nun ilpon-ey ka-(ss)-*ko* Minca-nun mikwuk-ey ka-ss-ta.
I-TC[14] Japan-to go-(PAST)-and Minca-TC America-to go-PAST-DC
"I went to Japan and Minca went to America."

(59) Nalssi-to nappu-*mye* kipwun-to nappu-ta.
Weather-also bad-and mood-also bad-DC
"The weather is bad, and my feeling is bad too."

(60) Ku pwun-un oykyokwan i-*yo* hakca ta.
The person-TC diplomat be-and acholar be-DC
"He is a diplomat, and is a scholar."

On the other hand, for nominal *and*-coordination Korean uses particles such as "-(k) wa", "-hako" and "-(i) lang" among others (examples taken from Sohn, 1999: 123):

(61) Minca-*wa*/*hako*/*lang* Yongho-nun umak-ul culki-n-ta.
Minca-and Yongho-TC music-AC enjoy-IN[15]-DC
"Minca and Yongho enjoy music"

As was the case with "soshite" in Japanese, the conjunctive adverb "kuliko" can also be used to coordinate nominals in Korean:

(62) John kuliko Mary-ga haksaeng-i-da.
John and Mary- Nom. student-be-dec.
"John and Mary are students"[16]

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[13] DC= Declarative sentence-type suffix.

[14] TC= Topic-contrast particle.

[15] IN= Indicative mood suffix.

[16] I thank Ui Su Kim for this example.

Thus, only those SOV languages which have a single coordinator "and" to conjoin all types of conjuncts allow gapping. Let us consider how this fact is predicted by the analysis of gapping offered in the previous lines.

Let us start by assuming that a conjunction forms part of the extended projection (Grimshaw, 1991) of a lexical head. If it conjoins clauses it forms part of the extended projection of V, if it conjoins DPs, it forms part of the extended projection of N, and so on.

There are two types of coordinators: those which have selectional requirements (in the sense that they can only coordinate certain type of constituents) and those which can be used to link any type of constituent independently of its syntactic type. We have seen that languages like Japanese or Korean have a different coordinator for linking clauses and for linking NPs. The coordinator used to link clauses can therefore only occur in the extended projection of V and, crucially, we must suppose that it can only form part of the extended projection of V because it has the categorial features [+V, -N]. However, recall from previous sections that any constituent which is [+V, -N] and which intervenes between the null head and the antecedent brings about a Relativised minimality effect. Thus, in Japanese and Korean the [+V,-N] coordinator blocks the formation of the chain and, as a consequence, gapping is impossible.

It remains to be explained what happens in those languages like Turkish, Hindi, Punjabi and Basque where one and the same coordinator "and" is used to link constituents of different syntactic type, i.e. the coordinator lacks selectional requirements. I hypothesise that in those cases the coordinator lacks categorial features (reason by which it can occur in any extended projection) and therefore it does not block the formation of the chain between the null head and the antecedent. Of course this implies that we need to revise Grimshaw's (1991) definition of extended projection in order to accommodate it to coordinate structures. Thus, the original definition (63) can be revised into the definition in (64):

(63) Grimshaw's definition of extended projection: A head Y is an *extended head* of X and YP is an *extended projection* of XP iff:

1) Y dominates X
2) Y and X share all categorial features
3) All nodes intervening between X and Y share all categorial features
4) The F value of Y is higher than or the same as the value of X.

(64) Revised definition: A head Y is an *extended head* of X and YP is an *extended projection* of XP iff:

1) Y dominates X

2) If Y and X have categorial features, they must share the same categorial features
3) If Y and X have categorial features, all the nodes with categorial features intervening between X and Y share all categorial features
4) If Y has an F value this has to be higher than or the same as the value of X.

To put it differently, a head can form part of an extended projection either if it has the same categorial features of all the nodes within that extended projection or it lacks any categorial features. Thus, the coordinators which are [+V, -N] can only occur in verbal projections. On the contrary, the coordinators which lack categorial features can form part of the extended projection of any lexical head (V, N, A…).

The F value of a coordinator might be a value higher than that of C or simply null:

(65) & [+V, -N] {F --}

In both cases we would find a well-formed extended projection.

To summarise, those languages (like Korean and Japanese) which have a specific coordinator for clauses do not allow forward gapping because the coordinator has the categorial features [+V, -N] and therefore does not allow the null head to be related to the lexical entry of its antecedent.

Of course the same explanation is applicable to SVO languages. Only those SVO languages which use the same coordinator to conjoin NPs, clauses, PPs and so on (like English) should allow the presence of gapping. Table 2 shows that our predictions are borne out:

(66) Table 2. Disallowance of gapping in SVO languages

Language	Conjunction "and"		Examples of gapping
	NP	Clauses	
Yoruba (spoken in Nigeria)	àti	sì	*Bólá je isu Ayò ***si*** ògèdè. Bola ate yam Ayo and banana "Bola ate yam and Ayo *(ate) banana"

			(Lawal, 1985: 155)
Wolof (spoken in Gambia, Mauritania And Senegal)	ag/ak	te	*Jënd naa woto, te yow mobilette to-buy PERF1SG car, and you motorbike "I bought a car and you a motorbike"[17]
Chinese	hé, gēn, tong, yǔ[18]	suǒyǐ, yincǐ, yě (…)	*Zhangsan xihuan pingguo, Lisi juzi. Zhangsan like apples Lisi orange. "Zhangsan likes apples and Lisi oranges (Tang, 2001: 201)
Thai	kap	lǽ?[19] (gaw)	*Peter sʉ́: rót lǽ? Mary mɔ:tə:say Peter bought a car and Mary a motorbike[20]

Contrary to languages like English, Finish, Swedish, Spanish, Maltese, etc., which have one single coordinator "and" which can be part of the extended projection of any lexical category (it lacks categorial features) and therefore allow the presence of gapping, the coordinators which link clauses in the SVO languages of table 2 can only be used as part of the extended projection of a verbal head presumably because they have the categorial features [+V, -N]. As a consequence, gapping is not allowed.

One may think of Indonesian (SVO) and Swahili (SVO) as counterexamples to our hypothesis. Indonesian uses the same conjunction "dan" ("and") to conjoin all types of constituents but gapping is not allowed. However, firstly, as I Wayan Arka pointed out to me (personal communication), gapping is not allowed in written language but it would be accepted by most speakers in spoken language, which leads us to think of prescriptivism as the responsible for the absence of gapping in the written language. I Wayan Arka provided me with the following example:

(67) Peter membeli mobil dan Mary, sepeda motor
Peter buy car and Mary bike motor

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[17] I owe this example to Dr. Stéphane Robert.

[18] For a more comprehensive list, I refer the reader to Po-ching and Rimmington (2004: 328).

[19] The use of "gaw" is optional put after either "laeo" or the subject of the second clause:

(i) Meua-keun-nee fon tok, laeo lom (gaw) phat raeng duay.
"Last night it rained and the wind blew hard"
(Higbie and Thinsan (2002: 147)

[20] I owe this example to Kingkarn Thepkanjana.

"Peter bought a car and Mary a motorbike."

Secondly, our hypothesis predicts that only languages which use one and the same coordinator "and" allow gapping but from this it does not follow that all languages which satisfy this characteristic must necessarily have a rule of gapping. It might be the case that a language lacks a rule of gapping in its grammar. In fact this might be the case in Swahili. In Swahili there is also one single conjunction "na" ("and") used to link both NPs and clauses but gapping does not seem to be possible neither in spoken language nor in written in language.[21] We might conclude then that the grammar of this language simply lacks the rule of gapping:

(68) *Mary amenanua gari na Paeter pikipiki
Mary bought a car and Peter a motorbike
"Mary bought a car and Peter a motorbike"

Therefore, neither Indonesian nor Swahili represent counterexamples for our hypothesis. Truly counterexamples would be offered by any language which has a [+V,-N] coordinator which can therefore only conjoin clauses but does allow forward gapping.

To summarise, although more data are required, it seems that the possibility or impossibility of forward gapping depends upon the coordinator itself.[22] If our hypothesis is correct, we can predict whether a language would accept forward gapping or not simply by looking at its coordinators.

6 Conclusion

The present paper has shown that gapping should be understood as the syntactic dependency established between the projection of a null head [+V, -N] and its antecedent. This accounts for the fact that gapping satisfies all the characteristics which are usually attributed to grammatical dependencies. This new approach to gapping has provided us with an answer to three questions which are closely linked to this phenomenon, namely 1) why gapping occurs in the second conjunct (at least in language like English), 2) why gapping is restricted to occurring in directly

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[21] The deletion of the verb in the first conjunct is also excluded.

[22] One may question our hypothesis of gapping by considering data with the conjunction "or". Even those languages which have a different coordinator "and" to link clauses and NPs, usually have a single coordinator "or" to conjoin both NPs and clauses and therefore it appears that we are predicting the possibility of gapping in those cases, contrary to facts. For reasons which remain to be clarified it seems that if a language does not allow gapping with "and", gapping is not allowed with other conjunctions either.

coordinated clauses and 3) why gap and antecedent must have the same tense but do not need to share the same agreement features. All those facts follow from the dependent status of the null head. Since the null head requires to be c-commanded by its [+V, -N] antecedent, it must necessarily occur in the second conjunct since in an asymmetric analysis only the first conjunct c-commands the second. Any [+V, -N] constituent which intervenes between null head and antecedent will bring about a minimality effect blocking the formation of the chain, reason for which gapping is restricted to directly coordinated clauses, providing that the coordinating conjunction “and” does not have categorial features [+V, -N]. Finally, since the null head will be associated to the lexical entry of its antecedent, it will necessarily have the same tense as the antecedent, since tense forms part of the lexical entry of T. The agreement features are added in the numeration and therefore null head and antecedent can differ in these features.

It is licit to wonder whether gapping could be extended to C and V since both of them are also [+V,-N]. In principle, there is no reason why gapping of C and V should not be possible according to our approach (see also Williams, 1997; Ackema and Szendröi, 2002). An example of C-gapping would be the one offered in (69) whereas an example of V-gapping can be found in (70) where the presence of accusative case in both subjects is an indication that we are dealing with the coordination of two VPs rather than the coordination of two TPs:

(69) [Who can Mary help]$_i$ and [who Ø Peter advice?]$_i$ (Ø= can)
(70) [Him go to the opera]$_i$ and [her Ø to the theater]$_i$? I don’t think so! (Ø=go)

Although there are other factors of non-syntactic nature which must be taken into account at the time of understanding examples containing an instance of gapping (number of remnants, parallelism, necessity of contrast between remnants…), it was one of the aims of this paper to show that contrary to Kuno’s (1976) and Sag et al.’s (1985) postulations, gapping is indeed a syntactic phenomenon.

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