

# Asymmetric T-to-C movement in ATB constructions

## A PF deletion analysis

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I argue in this paper that across-the-board movement constructions are derived by applying deletion to a full sentential coordinate structure in PF. The relevant properties of the deletion operation in question can be summarized by its sensitivity to the periphery (or edge) and its insensitivity to constituency (i.e., it is based on linear order), which I take to indicate that it is a PF phenomenon. Based on this, I show that a previously unnoted phenomenon, which I call *asymmetric T-to-C movement*, is best explained by the PF deletion analysis of ATB constructions, while it is problematic for other approaches.

### 1. Introduction

The structure and derivation of across-the-board movement constructions (henceforth, ATB constructions), as in (1), are one of the perennial issues that has consistently received attention over the past several decades.

(1) Who will John like and Mary dislike?

Various mechanisms have been put forward in the literature, such as conjunction reduction (Chomsky 1957; Ross 1967), deletion (Tai 1969; van Oirsouw 1987; Wilder 1994, 1997), factorization (Williams 1977, 1978), three dimensional representation (Goodall 1983, 1987; Moltmann 1992), null operator movement (Munn 1993), sideward movement (Hornstein & Nunes 2002), and multi-dominance (Citko 2005), among others.

In this paper, I argue that there is reason to believe that a deletion approach to ATB constructions is the desirable one. Specifically, I suggest that ATB constructions are derived by applying deletion in PF to a full sentential coordinate structure. Based on this, I discuss a previously unnoted phenomenon, which I call *asymmetric T-to-C movement* that provides support for the PF deletion analysis. It is also shown that the current analysis sheds light on the nature of head movement. Especially, the current analysis provides support for the recent claim that head movement is a PF phenomenon (Boeckx & Stjepanović 2001; Chomsky 2000, 2001).

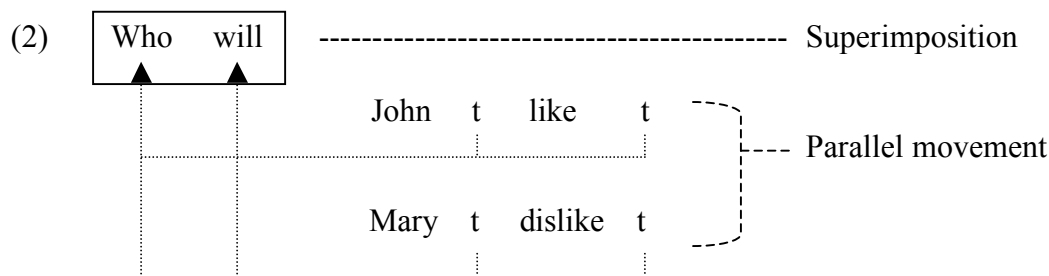
This paper is organized as follows: in section 2, I briefly summarize two previous analyses of ATB constructions – namely, the parallel movement analysis and the multi-dominance analysis; in section 3, I describe the properties of the PF deletion operation in question. I will focus on its sensitivity to the notion of edge and its insensitivity to constituency; in section 4, I introduce the phenomenon of asymmetric T-to-C movement; in section 5, I provide an analysis of asymmetric T-to-C movement based on the PF deletion analysis of ATB constructions; in section 6, I discuss some remaining issues; section 7 concludes.

## 2. Previous analyses

In this section, I will very briefly discuss two previous analyses of ATB constructions – namely, the parallel movement analysis and the multi-dominance analysis.<sup>1</sup>

### 2.1. Parallel movement analysis

The gist of the parallel movement analysis is that sentences like (1) are derived via parallel movement followed by some kind of “superimposition” process that is made possible by the identity of the moved elements. This is illustrated in (2).



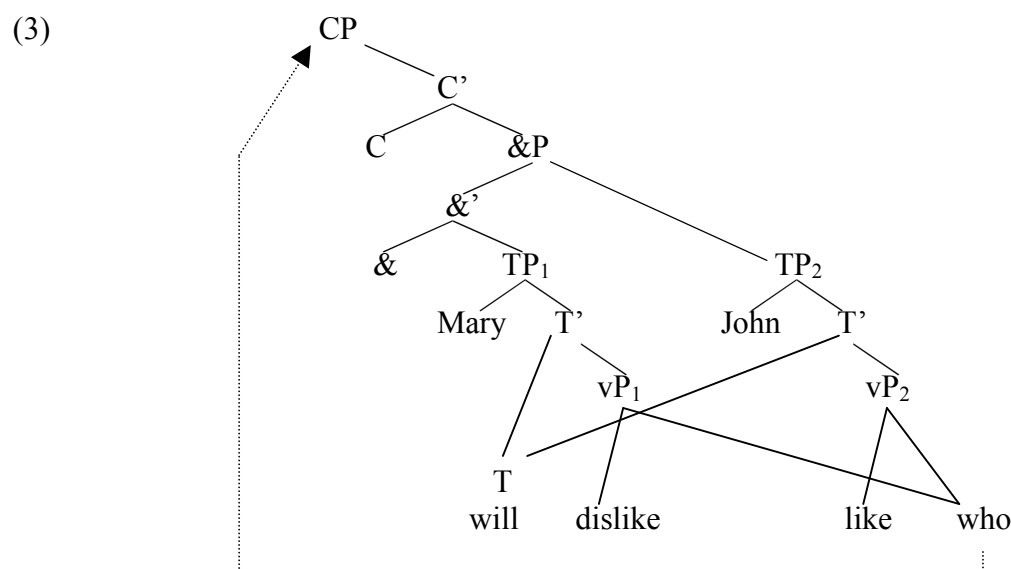
This line of analysis is pursued by Williams (1978), Goodall (1983), Burton & Grimshaw (1992). The immediate question that arises is: what is this superimposition process? While the idea of superimposition is plausible, postulating such an operation would be nothing more than a restatement of the facts. In addition, as Wilder (1997) points out, the superimposition operation (or the ATB formalism, to be more precise) is apparently only needed in ATB constructions, which makes it desirable to eliminate it and derive the relevant sentences in a more natural way.

<sup>1</sup> For reasons of space, I have chosen to include only these two analyses here because the former seems to be the most straightforward one and the latter the most recent one in the literature. This selection does not imply the superiority of these over others that are not discussed. Regarding these, see the references cited above. In any case, I would like to mention that the data discussed below also pose a problem for them as well.

Note also that the analyses described here are only intended to capture the intuition behind the analyses proposed by the authors cited in the text and is not to be taken as literal reproduction of their work. Needless to say, the original proposals of these authors are more sophisticated than this. For instance, Williams (1978) proposes an elaborate system of factorization, not the simplistic superimposition rule shown in (2), that allows identical elements to undergo ATB movement. However, these details do not matter for the current purposes.

## 2.2. Multi-dominance analysis

Citko's (2005) multi-dominance analysis of ATB constructions is based on a very precise interpretation of the phrase structure building process in the minimalist program. The gist of Citko's analysis is that the element that undergoes ATB movement is shared when it enters the structure.<sup>2</sup> Consider (3). (Irrelevant details are omitted.)



Citko points out that there is nothing inherent in the system that prohibits an element from being dominated by multiple mother nodes, though such a structure often leads to a crash due to violations of other independent principles – in particular, linearization. However, once the linearization issue is resolved, a multi-dominance structure can in fact be sanctioned (up to other principles) and, according to Citko, this is exactly what is happening in ATB constructions. For instance, since *who* in (3) is contained in TP<sub>2</sub> that occupies Spec&P, it must precede everything contained in TP<sub>1</sub> that occupies the complement position of &P. However, since *who* appears in the complement position of vP<sub>1</sub>, it must also follow everything in TP<sub>1</sub>. Therefore, there is a contradiction. However, if *who* moves to SpecCP, the ordering contradiction disappears, since in that position, *who* can precede everything.

While this analysis captures several properties of ATB constructions (see Citko 2005 for further discussion), it also seems to induce some complications. For instance, note that if an element undergoes ATB movement, it must have been shared at some earlier point. Given this, note that in (1), *will* also undergoes ATB movement. This then leads us to assume that it is multi-dominated by TP<sub>1</sub> and TP<sub>2</sub>, which requires the auxiliary to project two maximal categories simultaneously. The system also appears to complicate the feature checking system. For instance, in (3), *who* has to check accusative Case feature (and also theta-role) with both vP<sub>1</sub> and vP<sub>2</sub>. Reversely, the nominative Case (and/or the EPP) feature of the shared T would have to be checked by two DPs in SpecTP<sub>1</sub> and SpecTP<sub>2</sub>.<sup>3</sup>

<sup>2</sup> In some sense, this is a mirror image of the parallel movement analysis. That is, in the multi-dominance system, superimposition takes place before movement.

<sup>3</sup> Note that English does not allow multiple nominative constructions.

### 3. Deletion in coordinated structures

In this section, I outline the analysis of ATB constructions proposed in this paper. The crucial idea is that ATB constructions underlyingly involve a full sentential coordination and that it is subsequently reduced to give the surface ATB format. In particular, I argue that the relevant operation that reduces the underlying sentential coordination is a PF deletion process that is based on linear order. The main goal of this section is to suggest that such a PF deletion process, which I will call *Coordinate Deletion* for convenience, is independently required to capture certain aspects of sentences involving coordination. As a preview of the current analysis, derivation of ATB sentences like (1) can be represented as in (4).

(4) [CP Who does John like] and [CP ~~who does~~ Mary dislike]

Here, *who does* in the second conjunct is deleted under identity with the corresponding elements in the first conjunct.<sup>4</sup> This line of analysis of ATB constructions has actually been proposed in the literature in various forms (Chomsky 1957; Ross 1967; Tai 1969; Van Oirsouw 1987; Wilder 1994, 1997). The current analysis can therefore be considered a reinterpretation of these studies in more updated minimalist terms.

Below, in section 3.1 and 3.2, I will discuss two properties of Coordinate Deletion that are relevant for our current purposes: its sensitivity to periphery and its insensitivity to constituency. Then, in section 3.3, I will provide empirical evidence in support of the current analysis.

#### 3.1. Sensitivity to periphery

Coordinate Deletion is sensitive to periphery. What this means is that the element deleted should appear in the peripheral position or edge of the relevant portion of the structure. Furthermore, if an edge element is deleted, then the next element adjacent to the deletion site is considered to be peripheral and is subject to further deletion (up to other constraints such as identity). This is illustrated by (5).

(5) a. [~~X~~ Y Z ... ]  
 b. [~~X~~ ~~Y~~ Z ... ]  
 c. \* [X ~~Y~~ Z ... ]

In (5a), X can be deleted, since it occupies the periphery. As shown by (5b), after deletion of X, Y can also be deleted, since it is now the peripheral element. However, in environments like (5c), deletion of Y is not allowed, since it does not occupy the peripheral position.

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<sup>4</sup> Basically, I adopt the traditional notion of ‘deletion under identity’. However, the question of how to define the notion of identity is a very complicated issue, which I will not be able to discuss here. See Sag (1976), Neijt (1980), Dylą (1984), Franks (1993), Munn (1993), Wilder (1994, 1997), Johannessen (1997), among others, for relevant discussion.

## 3.2. Insensitivity to constituency

Note that under the analysis sketched in (4), repeated below as (6), the deleted materials do not form a constituent.<sup>5</sup> That is, in (6), Coordinate Deletion targets SpecCP and C, which are not a constituent.

(6) [CP Who does John like] and [CP ~~who does~~ Mary dislike]

Den Dikken, Meinunger & Wilder (2000) argue independently that Pseudocleft constructions, such as (7), are also derived by applying PF deletion to an underlying full sentential form, which is exactly like the current analysis of ATB constructions in relevant respects. The relevant derivation of (7) is illustrated in (8).

(7) What John bought was some wine

(8) What John bought was [~~he bought~~ some wine]

The point to note here is that just like (6), the deleted materials in (8) do not form a constituent.

## 3.3. Evidence for Coordinate Deletion

In this section, I provide empirical evidence in support of Coordinate Deletion. Consider the following data<sup>6</sup>:

(9) \*Yesterday John ate like a pig and today Ø drank all the beer (Ø= John)

In (9), although *John* in the second conjunct satisfies the identity requirement, it cannot be deleted, since it does not occupy the edge of the second conjunct. However, once the adverb *today*, which occupied the peripheral position, is removed, it becomes possible to delete *John*, as shown in (10).

(10) John ate like a pig yesterday and Ø drank all the beer today (Ø= John)

It is also noteworthy that in (11), the gap must be understood as *yesterday John*, which is also predicted by the current analysis.

(11) Yesterday John ate like a pig and Ø was very sick (Ø= yesterday John)

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<sup>5</sup> Note, however, that this does not necessarily mean that Coordinate Deletion does not have to target a constituent. It is in fact possible that Coordinate Deletion targets constituents, but applies cyclically. For instance, (6) may involve separate applications of Coordinate Deletion to SpecCP and, then, to C. It has to be borne in mind that the apparent insensitivity to constituency is a direct consequence of the edge-sensitivity property of Coordinate Deletion discussed in section 3.1.

<sup>6</sup> Some speakers find (9) not very bad. However, even for these speakers, there is a clear contrast between (9) and (i). That is, (9) is considerably worse than (i).

(i) Yesterday John ate like a pig and today he drank all the beer

To be fair, I would like to mention that although the English data in (9)-(11) are suggestive, it is not impossible to derive them without relying on Coordinate Deletion (though I will not dwell on the alternative derivations of (9)-(11) here). Therefore, I will present further data below that illustrate the relevant properties of Coordinate Deletion in a more striking way, providing strong support for the current analysis. The relevant data are from Korean. Consider (12).<sup>7,8</sup>

- (12) [CP Masa-nun [CP Ana-ka ppang-ul mekess-tako] ~~malhayssta~~] kuliko  
 M-TOP A-NOM bread-ACC ate-COMP said and  
 [CP Natasha-nun [CP Ana-ka bap-ul mekess-tako] malhayssta]  
 N-TOP A-NOM rice-ACC ate-COMP said  
 ‘Masa (said) that Ana ate bread and Natasha said that Ana ate rice.’

(12) involves a coordination of complex sentences. Here, the matrix verb of the first conjunct is deleted under identity. Note that the deleted verb in (12) occupies the periphery of the first conjunct. Next, consider (13).

- (13) [CP Masa-nun [CP Ana-ka ppang-ul ~~mekess-tako~~] malhayssta] kuliko  
 M-TOP A-NOM bread-ACC ate-COMP said and  
 [CP Natasha-nun [CP Ana-ka bap-ul mekess-tako] malhayssta]  
 N-TOP A-NOM rice-ACC ate-COMP said  
 ‘Masa (said that) Ana (ate) bread and Natasha said that Ana ate rice.’

In (13), the matrix verb and the embedded verb are deleted. Crucially, deletion of the latter is made possible as a result of deletion of the matrix verb. Compare (13) with (14), in which only the embedded verb is deleted, violating the periphery requirement.

- (14)\* [CP Masa-nun [CP Ana-ka ppang-ul ~~mekess-tako~~] malhayssta] kuliko  
 M-top A-nom bread-acc ate-comp said and  
 [CP Natasha-nun [CP Ana-ka bap-ul mekess-tako] malhayssta]  
 N-top A-nom rice-acc ate-comp said

The ungrammaticality of (14) corroborates the relevance of the periphery requirement discussed in section 3.1.

In (15), the domain affected by Coordinate Deletion is further extended. Note that although the embedded verb and the embedded object are not originally peripheral to the first conjunct, they can be deleted without any problems if Coordinate Deletion applies sequentially, from the most outer element to subsequently inner elements, as suggested earlier. Therefore, in the derivation of (15), we first apply deletion to the matrix verb, which makes the embedded verb

<sup>7</sup> Note that in Korean, the direction of deletion is opposite to that of English. That is, while English deletes elements in the second conjunct in the relevant contexts, Korean deletes elements in the first conjunct. Ross (1967, 1970) argues that this directionality correlates with the head parameter. That is, the direction of deletion is basically opposite to the direction of heads in the language. Therefore, in head-initial languages, deletion targets elements in the second conjunct, while it affects elements in the first conjunct in head-final languages. Although there are some exceptions to this generalization (see van Oirsouw 1987), this is sufficient for our current purposes.

<sup>8</sup> Below, I will parenthesize the words in English translation that correspond to the deleted items in the Korean sentence to make it easier for the reader to see which element is being affected by Coordinate Deletion.

the outermost element. Deletion of the embedded verb then induces the same effect on the embedded object, allowing further application of Coordinate Deletion.<sup>9</sup>

- (15) [CP Masa-nun [CP Ana-ka ppang-ul mekess-tako] malhayssta] kuliko  
 M-TOP A-NOM bread-ACC ate-COMP said and  
 [CP Natasha-nun [CP Nina-ka ppang-ul mekess-tako] malhayssta]  
 N-TOP N-NOM bread-ACC ate-COMP said  
 ‘Masa (said that) Ana (ate bread) and Natasha said that Nina ate bread.’

The sentence in (16) is somewhat more complicated. Here, the object of the embedded clause is fronted.

- (16) [CP Masa-nun [ ppang-ul<sub>i</sub> Ana-ka t<sub>i</sub> mekess-tako] malhayssta] kuliko  
 M-TOP bread-ACC A-NOM ate-COMP said and  
 [CP Natasha-nun [ bap-ul Ana-ka t mekess-tako] malhayssta]  
 N-TOP rice-ACC A-NOM ate-COMP said  
 ‘Masa (said that) bread, (Ana ate) and Natasha said that rice, Ana ate.’

Regarding the position of the fronted object, note that the contrast in (17) and (18) shows that the object is still within the embedded clause. This is because it is impossible to place a matrix element after the fronted object.<sup>10</sup>

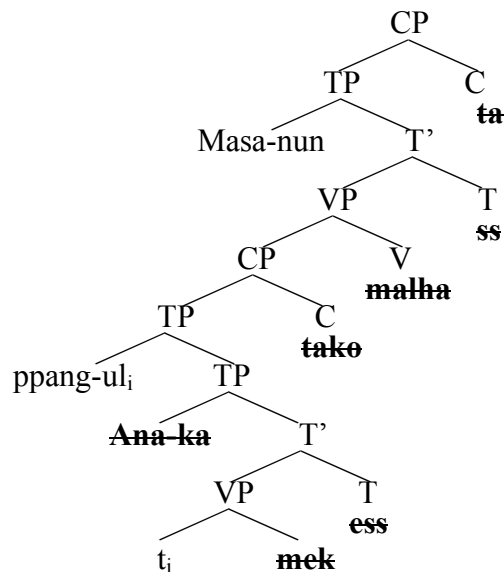
- (17) a. Masa-nun na-ekey ppang-ul<sub>i</sub> Ana-ka t<sub>i</sub> mekess-tako malhayssta  
 M-TOP I-DAT bread-ACC A-NOM ate-COMP said  
 ‘Masa said to me that Ana ate bread.’  
 b. \* Masa-nun ppang-ul<sub>i</sub> na-ekey Ana-ka t<sub>i</sub> mekess-tako malhayssta  
 M-TOP bread-ACC I-DAT A-NOM ate-COMP said  
 ‘Masa said to me that Ana ate bread.’
- (18) a. Masa-nun kun sori-ro ppang-ul<sub>i</sub> Ana-ka t<sub>i</sub> mekess-tako malhayssta  
 M-TOP big-sound-by bread-ACC A-NOM ate-COMP said  
 ‘Masa said loudly that Ana ate bread.’  
 b. \* Masa-nun ppang-ul<sub>i</sub> kun sori-ro Ana-ka t<sub>i</sub> mekess-tako malhayssta  
 M-TOP bread-ACC big-sound-by A-NOM ate-COMP said  
 ‘Masa said loudly that Ana ate bread.’

Given this, following the usual assumption, I assume that the fronted object in (16) is adjoined to the embedded TP. The relevant structure of (16) can be represented as follows:

<sup>9</sup> Note that in all these cases, deletion is possible only up to other constraints – in particular, identity.

<sup>10</sup> In (18), we are only concerned with the reading where *kun sori-ro* ‘loudly’ modifies the matrix predicate *malha-ta* ‘say’. In fact, (18b) is good under the reading where *kun sori-ro* ‘loudly’ modifies the embedded predicate *mek-ta* ‘eat’, meaning something like ‘to eat with loud noise’. We are not concerned with this reading.

(19)



Note that here, fronting of the object makes it possible to delete the embedded subject. In other words, the subject would not be adjacent to the deletion site if the object had not moved. This is illustrated by the ungrammaticality of (20) which is exactly the same as (16) but for the lack of object fronting.

- (20) \* [CP Masa-nun [CP ~~Ana-ka~~ ppang-ul ~~mekess-tako~~] malhayssta] kuliko  
 M-TOP A-NOM bread-ACC ate-COMP said and  
 [CP Natasha-nun [CP Ana-ka bap-ul mekess-tako] malhayssta]  
 N-TOP A-NOM rice-ACC ate-COMP said  
 ‘Masa said that Ana ate bread and Natasha said that Ana ate rice.’

The crucial property to note in all the grammatical sentences in (12)-(16) is that in none of these sentences do the deleted items form a constituent. Furthermore, the data clearly illustrate the property of the periphery requirement and its transitive nature. Based on these pieces of evidence, I conclude that Coordinate Deletion is a PF process that is based on linear order.<sup>11</sup>

#### 4. Asymmetric T-to-C movement

In this section, I will describe the properties of asymmetric T-to-C movement (henceforth, ATM). Recall that one of the preconditions for ATB movement is identity of the moving element. However, as I showed in An (2005a,b), there are cases of grammatical ATB constructions where the identity requirement is not met (see also Johannessen 1998 for similar cases). This is illustrated in (21).

- (21) Who **does** he like and they hate?

<sup>11</sup> Cedric Boeckx (p.c.) raised the question of why the deletion process in the Korean examples applies from right to left, although it is argued to be based on linear order. While the exact nature of this directionality requires further investigation, I think this has something to do with the head parameter. See footnote 7.



Here, the subjects of each conjunct do not have the same agreement value, which entails that the relevant INFLs agreeing with these subjects will also be non-identical. Therefore, given the lack of identity, we expect that ATB T-to-C movement of INFL will be impossible. Indeed, it appears that parallel T-to-C movement is blocked here, since the INFL that appears in C is singular. That is, given that the subject of the second conjunct is plural, the singular INFL in C in (21) could not have originated from the second conjunct. Moreover, when there is such a mismatch, it is always the INFL of the first conjunct that is affected by T-to-C movement, as shown by (22) (see also Aoun, Benmamoun & Sportiche 1994, 1999 for similar cases).

(22) \*Who **do** he like(s) and they hate?

In (22), INFL of the second conjunct is moved to C and the sentence is ungrammatical, regardless of what happens to the INFL of the first conjunct. If we switch the order between the first and the second conjunct in (21), we get the same pattern, as shown in (23).

(23) Who **do** they like and he hates?

Here, the subject of the first conjunct is plural. As expected, a plural INFL must appear in C. Again, T-to-C movement out of the second conjunct is impossible.

(24) \*Who **does** they like and he hate?

From this, I conclude that when there is a mismatch between INFLs, only the INFL of the first conjunct undergoes T-to-C movement. Hence, T-to-C movement here is asymmetric and is crucially not across-the-board.

In addition, (23) manifests another important property. Note that in the second conjunct, singular INFL is overtly realized on the verb. In fact, if INFL is not realized, the sentence becomes ungrammatical.<sup>12</sup>

(25) \*Who do they like and he hate?

This shows that in ATM environments, it is not that INFL of the second conjunct just disappears, but that it has to be licensed independently. I assume that the same consideration applies to (21) as well, although it is not so obvious because it happens that plural agreement in English is phonologically null. In other words, the surface structure of (21) should be represented as follows, to be more precise:

(26) Who does he like and they hate+Ø

ATM can also be observed in yes-no questions, which is another environment that requires T-to-C movement.<sup>13</sup>

<sup>12</sup> There is speaker variation regarding (23) and (25). I will discuss this issue in section 6.1.

<sup>13</sup> In yes-no questions involving ATM, the object has to be shared (i.e., identical across conjuncts). This can be achieved by applying Right Node Raising to the object. For some reason unknown to me, if the object is distinct, the sentence gets degraded.

(i) ?? Does he like the student from NY and they hate the student from CT?

However, this is a separate issue that does not concern us here.

- (27) **Does he like, and they hate, the student from Storrs?**
- (28) **Do they like, and he hates, the student from Storrs?**
- (29) **Has John liked and the children adored these plays?<sup>14</sup>**

Since the data in (27)-(29) manifest exactly the same behavior as the other ATM data examined above, I will not discuss them further.

To summarize, I have described in this section the properties of the previously unnoted phenomenon of ATM. I have shown that when there is a mismatch between INFLs, only the INFL of the first conjunct moves to C via T-to-C movement, while the one in the second conjunct has to be overtly realized on the verb within the second conjunct. One of the questions ATM data raise at this point is how asymmetric T-to-C extraction is possible, given the coordinate structure constraint in (30).

- (30) Coordinate Structure Constraint (CSC)  
 In a coordinate structure, no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjunct. (Ross 1967)

Note, in addition, that it is very unclear how the grammaticality of the ATM data can be explained under the previous approaches to ATB movement. Apparently, there is no ATB movement of INFL here in the first place.<sup>15</sup> In other words, we have no room for applying superimposition or multi-dominance to the relevant INFLs here. Therefore, these analyses would need additional mechanisms. In the next section, I will argue that the deletion analysis of ATB constructions can account for the ATM data without any problem.

### 5. ATM by coordinate deletion and PF T-to-C movement

I show in this section that the deletion analysis of ATB constructions provides an account of the ATM data.

#### 5.1. The nature of overt movement

Note that we are dealing here with an instance of overt head movement. Chomsky (1995:262-263) argues that overt movement in fact creates two separate chains. That is, a chain of formal

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<sup>14</sup> (29), which is drawn from Aoun, Benmamoun & Sportiche (1994:218), is in fact somewhat different from other ATM data. I will return to this in section 6.1.

<sup>15</sup> Hagit Borer (p.c.) pointed out to me an interesting possibility. She suggests that the agreement value of INFL is not determined in syntax at all. Rather, it is determined in the morphological component. In other words, in syntax, there is an underspecified category, say, u-INFL, in T. Then, there is no mismatch between the relevant INFLs in ATM environments, and it is possible to apply T-to-C movement out of each conjunct in a parallel fashion, i.e., *symmetric* T-to-C movement. When the structure is sent to the morphological component later in the derivation,  $\Phi$ -features of the closest subject, i.e., the subject of the first conjunct, will determine the agreement value of u-INFL that now appears in C.

While this idea seems reasonable, it cannot explain the data in (23), (25), and (28), where INFL has to be realized in the second conjunct. Therefore, I do not adopt the analysis here. See also section 6 for related discussion.

features ( $CH_{FF}$ ) and a chain of phonological features ( $CH_{CAT}$ ). Here, the latter step induces the effect of overt movement.<sup>16</sup> The rationale behind this proposal is considerations of economy of feature checking. Chomsky argues that when there is a need to check formal features (henceforth,  $\{ff\}$ ), the most economical way of checking these features would be to move only the relevant  $\{ff\}$ . In other words, for purposes of  $\{ff\}$  checking, formation of a  $CH_{FF}$  is sufficient. However, Chomsky further notes that where  $\{ff\}$  movement takes place before Spell-Out, considerations of the phonological component require that a  $CH_{CAT}$  be created as well, i.e., phonological features (henceforth,  $\{pf\}$ ) should also move. Chomsky suggests that this is because scattered features of a lexical item are illegitimate, i.e., unpronounceable, in PF.

However, notice that Chomsky does not explicitly say when a  $CH_{CAT}$  has to be created. It appears to me that, if formation of a  $CH_{CAT}$  is based on considerations of PF, it is reasonable (or, at least, should be possible) that the relevant operation takes place in PF. Given this, I assume that formation of a  $CH_{CAT}$  can in principle be done in PF.<sup>17</sup>

### 5.2. ATM under Coordinate Deletion

In this section, I will provide a step-by-step illustration of how an ATM sentence is derived under the current analysis. Recall that under the Coordinate Deletion analysis, an ATB wh-question is derived as follows:

(31)  $[_{CP}$  Who does John like] and  $[_{CP}$  ~~who does~~ Mary dislike]

Under this analysis, an ATM sentence like (23), repeated below as (32), will have the structure in (33) at some point in the derivation. (Irrelevant details are ignored.)

(32) Who do they like and he hates?

(33)  $[_{CP}$  Who  $C+\{ff\}$  they  $\{pf\}$  like] and  $[_{CP}$  ~~who  $C+\{ff\}$~~  he  $\{pf\}$  hate]

Now, suppose that Coordinate Deletion applies to (33), deleting *who* and the  $C+\{ff\}$  complex that occupy the periphery of the second conjunct. This will result in (34).

(34)  $[_{CP}$  Who  $C+\{ff\}$  they  $\{pf\}$  like] and  $[_{CP}$  ~~who  $C+\{ff\}$~~  he  $\{pf\}$  hate]

Then, in the first conjunct,  $\{pf\}$  of the plural INFL move to its  $\{ff\}$ , as shown in (35), which will eventually surface as *do* after *do*-support.

(35)  $[_{CP}$  Who  $C+\{ff\}+\{pf\}$  they like] ...

Now, the important question arises concerning the second conjunct in (34). Note that in the second conjunct,  $\{ff\}$  of the singular INFL are deleted. Therefore, it appears that we ended up with stranded  $\{pf\}$  here. Recall that Chomsky suggested that  $\{pf\}$  separated from their  $\{ff\}$  are illegitimate in PF. Why, then, is the sentence grammatical? I will answer this question in the next section.

<sup>16</sup> This is called ‘Generalized Pied-Piping’ (Chomsky 1995).

<sup>17</sup> The system is often called the *Two Chain Hypothesis* (TCH). See Ochi (1999) for an extensive discussion of the TCH.

## 5.3. Affix-hopping in ATM

I argue that the reason why the derivation depicted in (34) is not ruled out is due to the nature of a lexical item involved in the derivation. Crucially, note that we are dealing here with INFL which is an affix in English. I think that it is reasonable to attribute the affixal property of INFL to its {pf}.

Given this, note that the {pf} in question are adjacent to the verb in (34). Therefore, under the standard assumption that affix hopping requires adjacency (Chomsky 1957; Lasnik 1995; Bobaljik 1994, 2002), it should be possible to apply affix hopping to the {pf} in question. Therefore, it is predicted that singular inflection will appear on the verb in the second conjunct, which is indeed the case, as we have seen earlier.

(36) ... [<sub>CP</sub> ~~who~~ C+{ff} he hate+{pf}] → ... he hates?

Given the independently needed assumptions about affix hopping and overt movement, the deletion analysis of ATB constructions correctly captures the idiosyncratic properties of the phenomenon of ATM without introducing any additional assumptions. I will not discuss other grammatical instances of ATM, since it is easy to see how the current analysis applies to them.

Note that the current analysis makes interesting predictions. First, if it is correct that affix hopping takes place in the second conjunct, as shown in (36), then it is predicted that *do*-support will be triggered when there is negation in the second conjunct. The prediction is indeed borne out.

(37) Who **do** they like and he **does** not like? (cf. (23))

(38) Who **does** he like and they **do** not like? (cf. (21))

In (37) and (38), negation breaks adjacency between the {pf} of INFL and the verb. Therefore, *do*-support must apply, just like in normal negative sentences.

Second, it is predicted that if the element that appears in T in the second conjunct is not an affix, e.g., an auxiliary, then the sentence will be excluded, because we will not be able to apply affix hopping to save the stranded {pf}. In other words, the sentence will be ruled out because there will remain unpronounceable {pf}. This prediction is also borne out.

(39) \*What are they arguing against and he **is** arguing for?

(40) \*What is he arguing for and they **are** arguing against?

For instance, in (39), what occupies T is an auxiliary *be*, which is not an affix. After Coordinate Deletion, we will get the following configuration in the second conjunct:

(41) ... [<sub>CP</sub> ~~what~~ C+{ff} he {pf<sub>BE</sub>} arguing for]

Here, we cannot apply affix hopping, because the {pf} of *be* are not affixal. We cannot resort to *do*-support either, since the operation is reserved for affixes. Therefore, there is no way to

save the stranded {pf} in (41).<sup>18,19</sup> I present some more data below that pattern with (39) and (40). That is, a non-affixal auxiliary in the second conjunct leads to ungrammaticality.

- (42) a. \* What do they argue against and he will argue for?  
 b. \* What do they argue against and he has argued for?  
 c. \* What are they arguing against and he will argue for?  
 d. \* What are they arguing against and he has argued for?

#### 5.4. Summary

In this section, I have shown how the current PF deletion analysis of ATB constructions applies to the ATM data. It is shown that the current analysis captures the relevant properties of ATM without any additional assumptions.

Moreover, recall that the crucial question in section 4 was why there is no violation of the CSC in ATM environments. Under the current analysis, the question disappears, since there is no asymmetric extraction of T out of one conjunct in the first place, whereas previous analyses of ATB constructions must introduce additional assumptions to explain this.

In addition, it is important to notice that the crucial steps in the derivation of a grammatical ATM sentence, such as (34), (35), and (36), all take place in PF. Especially, in (35), movement of the {pf} of INFL that induces the effect of overt head movement, takes place in PF. In this respect, the current analysis provides empirical support for Boeckx & Stjepanović's (2001) and Chomsky's (2000, 2001) proposal that head movement is a PF phenomenon.<sup>20</sup>

#### 6. Further issues

In this section, I will discuss some further issues and speculate on their implications.

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<sup>18</sup> Note that (39) and (40) provide a minimal pair with the ATM data examined above. Here, too, there is a mismatch between the elements in T with respect to their number features, and all else is equal. The only difference from the ATM data is that (39) and (40) contain a non-affixal T.

<sup>19</sup> The question arises why the following sentence is ruled out:

- (i) \* Who does he like and she hates?  
 (cf. Who does he like and she hate?)

Suppose that (i) undergoes the derivation depicted in (ii).

- (ii) [<sub>CP</sub> Who C+{ff}+{pf} he like] and [<sub>CP</sub> ~~who~~ C+{ff} she {pf} hate]

If affix hopping applies to the stranded {pf} in the second conjunct, nothing seems to go wrong, contrary to fact. Compare this with the grammatical derivation in (iii).

- (iii) [<sub>CP</sub> Who C+{ff}+{pf} he like] and [<sub>CP</sub> ~~who~~ C+{ff}+{pf} she hate]

I think there is a notion of maximality of deletion at work here, which I think derives from considerations of economy (den Dikken, Meinunger & Wilder 2000 also note the maximality-of-deletion effect in a different context). Note that I assume that both (ii) and (iii) are convergent at PF. However, (ii) is blocked since (iii) is shorter. That is, we need an additional operation in (ii), i.e., affix hopping. True, (iii) also involves an additional step of {pf} movement. But, it seems reasonable that PF can ignore it or, at least, consider it 'less costly' than affix hopping, since it is only a subcomponent of overt movement that was initiated earlier.

<sup>20</sup> See also Aoun & Benmamoun (1998) for a proposal that clitic left-dislocation in Lebanese Arabic is an instance of PF head movement.

## 6.1. Pseudo-ATM

It appears that there are some speakers (henceforth, the pseudo-ATM speakers) who accept the following variant of ATM:<sup>21</sup>

(43) Who do they like and he **hate**?

Compare this with the corresponding original ATM data repeated below. In fact, those speakers who accept (43) disallow (44).

(44) Who do they like and he hates? (=23)

Recall that in deriving the ATM data in (44), it was assumed that PF deletion applies before movement of the {pf} of INFL. Given this, let us suppose that for the pseudo-ATM speakers, the opposite is the case. That is, movement of the {pf} takes place before deletion. If this is the case, (43) must involve the following derivation:

(45) [<sub>CP</sub> Who C+ff+pf they like] and [<sub>CP</sub> ~~who C+ff+pf~~ he hate]

Note that after deletion, there is no stranded affixal {pf} in the second conjunct. Therefore, the analysis correctly captures the fact that the verb does not bear any agreement inflection in (43).

Notice that in applying deletion in (45), we are actually ignoring the number mismatch between the INFLs. I assume that for the pseudo-ATM speakers, number mismatch does not cause a problem in establishing identity for deletion (see also Wilder 1994, 1997 for relevant discussion). In this respect, Aoun et al.'s (1994:218) example in (29), repeated below as (46), is relevant.

(46) Has John liked and the children adored these plays?

Under the current analysis, (46) is derived as in (47).

(47) [Has John liked] and [~~have~~ the children adored] these plays?

Clearly, we are ignoring the difference between *has* and *have* in (47).

It is interesting to note that the speakers who accept the original ATM data in (44) (and disallow the variant in (43)) do not accept (46). What this means is that for these speakers,

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<sup>21</sup> Alan Munn (p.c.) pointed out this variation to me. However, the majority of my consultants accept the original ATM data and reject (43).

In addition, note that pseudo-ATM speakers also accept the following sentence, which is superficially identical to (21):

(i) Who does he like and they hate?

As pointed out earlier, this example does not immediately tell us anything on its own. That is, since plural agreement in English is phonologically null, we cannot easily tell where INFL is located in the second conjunct. However, the current analysis predicts that for the pseudo-ATM speakers, in (i), plural INFL will be in C, but not on the verb.

number mismatch leads to a failure of the identity requirement for deletion.<sup>22</sup> That is, deletion cannot target *have* in (47), since it is ‘not identical enough’ to its counterpart in the first conjunct to license deletion.

Given this conclusion, there seems to be an alternative way of capturing the difference between the ATM and the pseudo-ATM speakers without resorting to the relative ordering between deletion and {pf} movement. First, suppose that in principle, deletion can freely apply either before or after {pf} movement. Suppose further that speakers differ with respect to whether number mismatch between INFLs causes a problem for the identity requirement for deletion. That is, I suggest that there is a correlation between whether a speaker allows (pseudo-)ATM and whether number mismatch causes a problem for the identity requirement for deletion: a speaker who (or whose Coordinate Deletion mechanism, to be more precise) tolerates number mismatch will accept the pseudo-ATM data, while a speaker who does not tolerate number mismatch will produce the original ATM data.

Under these assumptions, let me briefly illustrate again how a (pseudo-)ATM sentence can be derived. Consider the derivational stage of (48) as in (49).

(48) Who do they like and he hates?

(49) [<sub>CP</sub> Who C+{ff} they {pf} like] and [<sub>CP</sub> who C+{ff} he {pf} hate]

As discussed in the previous section, if deletion applies at this point, we correctly get the ATM sentence in (48) (after subsequent {pf} movement in the first conjunct and affix hopping in the second conjunct). Suppose, on the other hand, that deletion applies after {pf} movement.

(50) [<sub>CP</sub> Who C+{ff} they {pf} like] and [<sub>CP</sub> who C+{ff}+{pf} he hate]

Here, if the speaker belongs to the ATM variety, deletion will fail, due to number mismatch. If the speaker belongs to the pseudo-ATM variety, deletion will take place without any problem and the result will be as in (43).<sup>23</sup>

If this is on the right track, then we do not need an explicit ordering between deletion and {pf} movement and the difference between the two speaker groups reduces to whether number mismatch matters for establishing identity or not.

## 6.2. Exceptions to the CSC

Previously, the question was raised why there were no violations of the CSC in the ATM environment. It is well-known that there are in fact systematic exceptions to the CSC, as shown by Culicover & Jackendoff (1997) and Postal (1998).

- (51) a. That is the drug which<sub>i</sub> [athletes take t<sub>i</sub>] and [become quite strong]  
 b. [How many dogs]<sub>i</sub> can [a person have t<sub>i</sub>] and [still stay sane]?  
 c. The stuff which<sub>i</sub> [Arthur sneaked in] and [stole t<sub>i</sub>]

<sup>22</sup> Note that for the speakers who allow ATM, even if the auxiliary in the second conjunct is allowed to stay in situ, the sentence will still be excluded due to the stranded {pf}, on a par with (39) and (40).

<sup>23</sup> The question arises why the derivation in (49) is not allowed for pseudo-ATM speakers. Regarding this question, see footnote 19.

Here, extraction only takes place from one of the conjuncts, while the sentence is still grammatical. Therefore, it appears that these sentences violate the CSC without any problem. However, there is a crucial difference between these and the ATM data. First, note that the data in (51) do not involve symmetric coordination. For instance, in (51a,c), the preceding conjunct stands in some kind of sequential or causal relation to the following conjunct. As a result, their order cannot be changed.

(52) \*That is the drug which<sub>i</sub> [become quite strong] and [athletes take t<sub>i</sub>]

In (51b), one conjunct represents a state of affairs that is unexpected given the state of affairs represented by the preceding conjunct. This is illustrated by the paraphraseability of *and* as *and nonetheless* (Goldsmith 1985; Culicover & Jackendoff 1997).

Crucially, none of these properties are observed with the ATM data. For instance, recall that the order between the conjuncts can be freely changed without affecting the grammaticality or meaning of the sentence. Therefore, I conclude that ATM is a genuine exception to the CSC (although there is actually no violation of the CSC under the current analysis).

### 6.3. Identity

In this subsection, I would like to briefly speculate on the question about identity conditions for Coordinate Deletion. In particular, an anonymous reviewer for ConSOLE asks how the current analysis would exclude the derivation in (53).

(53) \*Who<sub>i</sub> does John like and ~~who<sub>k</sub> does~~ Mary dislike?

As indicated by the indices, the sentence is intended to be a question asking about two different persons, which is normally not what one gets from an ATB wh-question. In other words, ATB wh-questions (in fact, ATB sentences in general) require some kind of semantic identity of the ATB raised elements. Therefore, the question arises how this type of identity can be guaranteed under the current analysis, where ATB sentences are derived by PF deletion under morpho-phonological identity.

In essence, the question is how we would establish a connection or communication between LF and PF, as the reviewer also points out. It seems to me that there are several directions to explore (which can in fact be reduced to one under certain interpretation), although I cannot determine at this moment which direction would lead us to a more fruitful result. One possibility is to reconsider the nature of the computational system itself. Perhaps, a single output model, in the sense of Bobaljik (1995), might be relevant. Another way of allowing such a connection is pursued by Hankamer (1979) and Wilder (1997), for instance, where various identity conditions such as referential identity, contextual identity, or structural identity are examined and attempted to be directly incorporated into the licensing condition of deletion. Merchant (1999) postulates a syntactic ellipsis feature that mediates the connection between the two components in question. According to his proposal, this special feature is licensed in LF if certain semantic requirements are met. Moreover, the presence of the ellipsis feature on lexical items triggers deletion of that element in PF.



In any case, devising a precise notion of identity is a perennial question whose exact answer is known to be very elusive. I put aside this “real” question for future research.

### *7. Conclusion*

In this paper, I have argued that ATB constructions are derived by applying deletion to an underlying sentential coordination. The current analysis can be considered a minimalist reinterpretation of the previous deletion approach that appeared in various forms at different times (Chomsky 1957; Ross 1967; Tai 1969; van Oirsouw 1987; Wilder 1994, 1997). In addition, I discussed a previously unnoted phenomenon of asymmetric T-to-C movement, where T-to-C movement apparently takes place out of only one conjunct in coordinated interrogative sentences, and showed that the deletion analysis successfully explains it. It was also pointed out that the current analysis provides evidence in support of the recent claim that head movement is a PF phenomenon (Boeckx & Stjepanović 2001; Chomsky 2000, 2001).

Before closing the paper, I would like to mention two questions (among others) that require further examination. First, recall that I suggested that {ff} of INFL move in syntax, while its {pf} can move in PF. However, it is somewhat unclear how the semantic features of INFL should be treated. There are at least three possibilities: they are moved with {ff} in the overt syntax; they are moved in LF; they stay in-situ. At this moment, I have no evidence in favor of one or another, especially, in the environment under investigation.

In addition, given that there appears to be no XP counterpart of ATM constructions and, also, given the usual interpretive properties of XP movement, it is unlikely that such a split movement system advocated in the current analysis (i.e., CH<sub>FF</sub> in syntax and CH<sub>CAT</sub> in PF) is available for maximal category movement. I speculate that the current state of affairs might be reflecting an inherent difference between XP and X<sup>0</sup> movement, though exactly how they are different requires further scrutiny. In this context, it is interesting to note that Grodzinsky & Finkel (1998) show that aphasic patients treat XP-chains and X<sup>0</sup>-chains differently. Boeckx & Stjepanović (2001) point out further differences between XP and X<sup>0</sup> movement.

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## A unified analysis of two classes of Slavic verb-prefixes

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The paper presents a unified analysis of the external and internal Slavic verb-prefixes, treating them as markers of agreement between the phrases representing the initiating and the result subevent in telic eventualities. Each verb-prefix has a counterpart among prepositions. When agreement is established between the two subevents of a telic eventuality and there is a preposition that semantically (nearly) matches the predicate of the result subevent, the verb will take the prefix that corresponds to that preposition. I argue that the same mechanism generates both classes of prefixes, and that only two special properties distinguish the structure in which external prefixes are generated. One is that the affected participant of the telic eventuality (the undergoer of the change) is represented not by a nominal expression, but by a VP, and the other that there is a context variable in the result phrase. I show how quantitative interpretations, associated with external prefixes, can be derived from prepositional meanings, in combination with the context variable in the complement of the result subevent phrase. While the earlier analyses all account for the differences, but not for the similarities between the two classes of prefixes, the present analysis explains both aspects of the classification.

### 1. Introduction

All Slavic languages have a rich morphological marking of aspect. Aspectual meanings are marked by verb suffixes, and at the same time they are sensitive to the presence or absence of prefixes on the verb, as illustrated in (1).

- (1) a. Jovan je gur-ao<sup>I</sup> kolica. Serbo-Croatian  
Jovan AUX push-PTC cart  
'Jovan was pushing the cart.'
- b. Jovan je od-gur-ao<sup>P</sup> kolica.  
Jovan AUX away-push-PTC cart  
'Jovan pushed the cart away.'
- c. Jovan je od-gur-av-ao<sup>I</sup> kolica.  
Jovan AUX away-push-I\_suff-PTC cart  
'Jovan was pushing the cart away.'
- d. Jovan je iz-od-gur-av-ao<sup>P</sup> kolica.  
Jovan AUX out-away-push-I\_suff-PTC cart  
'Jovan completed the/some eventuality of pushing (the) carts away.'

Before I continue, two remarks are due. One is that traditionally Slavic VPs are classified as perfective and imperfective, but there is no consensus on whether these two classes directly match with those related to telicity and inner aspect in general. Vaguely put, imperfective verbs can be related to atelicity, or homogeneity, and perfective ones to telicity, or quantization. I will be using the traditional labels ‘perfective’ and ‘imperfective’, but the analysis I propose in sections 2, 3 and 4 introduces more fine-grained properties and relations, which all deal only with elements of inner aspect. Superscripts ‘I’ and ‘P’ following the verb are used to mark the imperfective and perfective forms, respectively.

The other remark is that it is also possible to translate (1c) as ‘Jovan pushed the cart away’, but allowing only for the iterative reading of this translation. However, this translation is not a good match, not only because the English sentence naturally includes the singular reading (denoting that there was only one eventuality, i.e. the cart goes away only once), but also because it excludes the durative (progressive) reading which is available in the sentence in Serbo-Croatian (S-C). The translation that is provided in the example, which uses the English present continuous form, has both readings of the S-C sentence. The readings are: a) that there is a singular eventuality of pushing the cart away in a progressive interpretation (i.e. only its initiating subevent is really entailed), and b) that there is an unbounded set of iterations of a full telic eventuality (bare plural reading). Based on this parallel, some authors, such as Borer (2005b) and Arsenijević (2006), have claimed that the imperfective suffix *-va* corresponds to the present continuous in English.

As (1) illustrates, stem verbs are normally imperfective (there are exceptions, which I do not discuss here). Adding a prefix to a stem verb contributes to its lexical meaning, often even causing a shift in the lexical meaning of the verb, and as a consequence the verb becomes perfective. Literature on prefixes is divided as to whether they are functional elements that mark perfectivity, or they are just a lexical semantic component, and perfectivity that co-occurs with prefixation is a by-product: a consequence of some structural properties that prefixation involves (see for instance Filip 2003 and Gehrke 2005b). Adding the imperfective suffix (*I\_suff* in (1)) to a perfective verb (even to a perfective stem verb) marks the verb for being imperfective. The suffix does not shift the lexical meaning of the verb, nor does it contribute to it any other additional semantic material. Therefore, it is uncontroversially taken as a functional element, the only function of which is to mark aspect. It is less uncontroversial, however, what exactly the suffix marks: is it outer or inner aspect, and for either choice: what its exact interpretation actually is. Finally, there is also a group of prefixes which can appear on a verb that already has a prefix and a suffix, as in (1d). Verbs with two layers of prefixes and a suffix are perfective, which means that this latter type of prefixes is associated with some position that can neutralize the effects of the imperfective suffix (probably by having a wider scope, i.e. in syntactic terms by being higher in the structure).

Žaucer (2002) convincingly argues that verb-prefixes with spatial meanings in Slovenian are all stative, i.e. that they do not realize dynamic notions, like for instance paths. His arguments hold equally well for S-C. Observe the examples in (2). Prefix *iz-* (out) in this view corresponds to the state of being outside of some place and the prefix *do-* (next to, to) corresponds to the state of being at some place, nearly matching the meanings of their prepositional counterparts.

- (2) a. Jovan je     iz-bacio<sup>P</sup>    psa.   S-C  
           Jovan AUX    out-threw    dog.ACC  
           ‘Jovan threw the dog out.’
- b. Jovan je     do-vezao<sup>P</sup>   kola.  
           Jovan AUX   to-drive    car.ACC  
           ‘Jovan brought the car by driving.’ ‘Jovan drove the car to the relevant place.’

Not only for the Slavic languages, but also more generally, verb-prefixes and (separable) verb particles are often associated with resultative meanings (see for instance Lüdeling 1998). With respect to Slavic languages, this has been most explicitly put forward in Gehrke (2005a) and Arsenijević (2007). Both these papers argue that verb-prefixes in Slavic languages are generally resultative. The state of the dog being out of something in (2) is therefore viewed as the result of the telic eventuality of throwing the dog out, and the state of the car being at some place is the result of driving the car to that place.

This suggests that all verb-prefixes are derived as (parts/reflexes of) the predicates of the result component in the eventuality denoted by the VP. In this paper I argue that this indeed is the case. I analyze prefixes as instances of agreement with the predicate of the result subevent, and that this is why their semantics seems so closely related with the semantics of the result predicate. For a more general discussion of the claim that Slavic prefixes are resultative, see the cited works of Gehrke (2005a) and Arsenijević (2007).

The paper has two major aims. One is to present an analysis that accounts both for similarities as well as for differences between external and internal Slavic verb-prefixes (see DiSciullo & Slabakova 2005 and Svenonius 2004 for a detailed discussion of the classification of Slavic prefixes into the internal and external ones). The other goal is to show how prepositional meanings are involved not only in the meaning of internal, or lexical, prefixes, but also in the external, or superlexical, ones, which appear to have quantificational effects. I will argue that these quantificational interpretations are derived in the same structure, the only special property having to do with the argument that it takes. More precisely, quantificational interpretations arise when a telic eventuality takes another telic eventuality in the argument position representing the affected participant.

I will use only examples from S-C, but for most of the phenomena they are supposed to illustrate – the situation is the same in other Slavic languages. Therefore, the present paper really directly talks only about S-C, but I am, so far, unaware of any points in which it would not be universally applicable to all Slavic languages.

The paper is organized as follows. In section 2, I briefly sketch the event structure that I will be using and especially the way it represents telic eventualities. In section 3, I present an analysis of the internal Slavic verb-prefixes based on the presented event structure. Section 4 presents the external Slavic verb-prefixes, and their main differences from the external ones. In section 5 I show how the same analysis developed for the internal verb-prefixes can be applied to the external ones. In this section I also discuss the differences between the two classes can be accounted for, and especially how the quantificational meanings associated with the external prefixes can be derived. Section 6 discusses a number of consequences of the presented analysis and some questions that it opens, and that are not directly discussed in earlier sections, and section 7 concludes.

## 2. *Event structure*

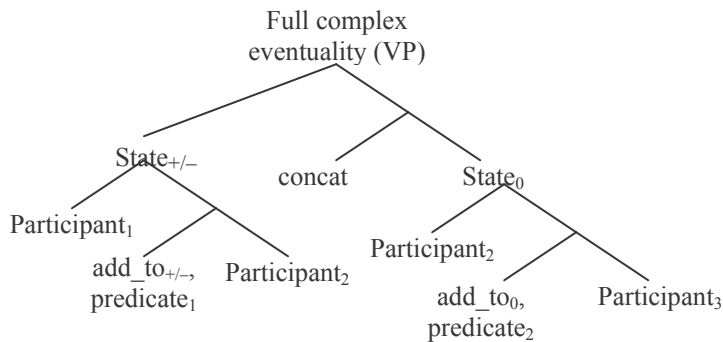
Throughout this paper, I will use the event structure model presented in Arsenijević (2006). This model represents all atelic eventualities as predicates that are assigned one temporal trace. Telic eventualities are seen as a product of the predicate of concatenation applied to two atelic eventualities, and thus also to their temporal traces. The predicate of concatenation marks that its two arguments, the one appearing in the specifier position and the one in the complement, are concatenated, i.e. that they undergo sum without any overlap, being immediately adjacent with each other. The two arguments in the telic template are states, and being concatenated for them

means that the end of the temporal interval of one of them is immediately adjacent with the beginning of the temporal interval of the other.

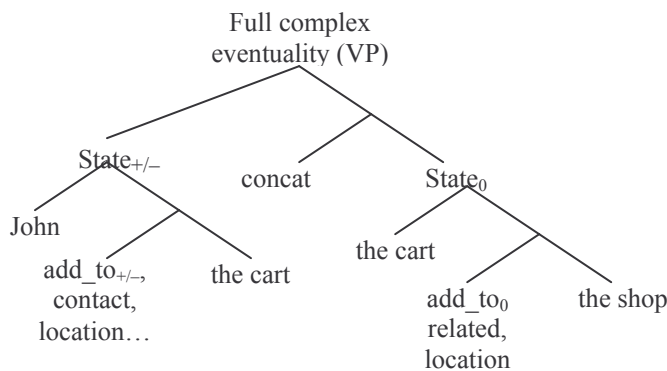
This is illustrated in (3). In (3a), I give a general pattern of this structure, and in (3b) an example of its application to a concrete VP.

(3) Telic eventuality as a concatenation of two atelic ones

a. The template



b. An example ‘John pushed the cart to the shop.’



In this example, two predicates are independently assigned an unbounded temporal interval each, which makes them atelic eventualities. For all atelic eventualities, I use the term *states*, distinguishing between two types of states, the dynamic ones – involving a monotone increasing or decreasing function that maps times to properties and therefore marked  $State_{+/-}$ , and the proper states – constant functions from times to properties, which are marked  $State_0$ . Dynamic states correspond to what is traditionally referred to as processes, and proper states correspond to the traditional denotation of the term *states*. The telic eventuality in the example is a concatenation of two such states. In one of them, which is dynamic, John acts in a way that affects the location of the cart and involves physical contact. It represents a process in which John pushes the cart, causing it to move. In the other, which is a proper state, the location of the cart is at the shop (i.e., as in the representation, it is related to the location of the shop). These two predicates are concatenated asymmetrically: the temporal interval of the dynamic state in which John acts in a pushing manner with respect to the cart, thus affecting its location, is adjacent to and immediately precedes the temporal interval of the proper state in which the cart is at the shop. The asymmetry is encoded in the structure: in each concatenation, the element in the specifier of the predicate *concat* precedes the one in its complement.

In this way both the thematic roles and the inner aspect of the eventuality are derived in terms of syntactic structural relation *c-command* and a number of very simple predicates. Thematic

roles usually referred to as the Initiator (i.e. Agent or Causer), Undergoer (i.e. Theme or Patient) and Goal correspond, respectively, to the specifier of the dynamic state, the argument appearing both in the complement of the dynamic state and in the specifier of the proper state and the complement of the proper state. Their thematic properties are derived from their structural contexts. Telicity, as the inner aspect value of the eventuality, is derived from the concatenation of one dynamic and one proper state. Some change that is described by the dynamic state (in (3b), the change of the location of the cart) is entailed to go on until the property under change (in (3b), the location of the cart) establishes the value specified in the proper state (in (3b): at the shop).

In order to derive the described semantics of a telic eventuality, the structure in (3) has to satisfy three general conditions.

1. it is asymmetric: the structurally higher subevent temporally precedes the lower one.
2. the complement of the higher subevent must corefer with the specifier of the lower subevent (Participant<sub>2</sub> in (3a), universally denoting the undergoer of change)
3. the higher subevent must have a dynamic interpretation (i.e. it must be a process).

Nothing prevents grammar from generating structures similar to (3a), but which do not satisfy these conditions, and in fact such structures are present in language. However, only structures that satisfy these conditions represent telic eventualities. A telic change will only be specified if there is a dynamic predicate, and its temporal interval goes until some other predicate is established, and if the same referent is being affected in the earlier state and is the holder of the predicate of the later one.

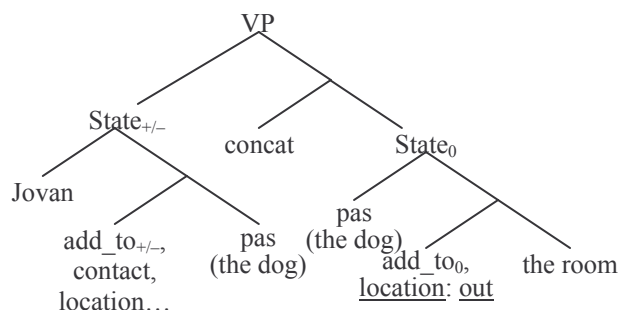
The structure in (3) represents telic eventualities at the syntax-semantics interface. It is a well-formed syntactic structure, in which head positions are not filled with formal syntactic features, but with primitive predicates, i.e. elements with a certain semantic load. The syntactic structure appears non-standard in some respects, like for instance the independent generation of the identical material in different positions (in particular the appearance of the Undergoer in the complement of the dynamic state and in the specifier of the proper state). As for the particular issue of multiple independent generation of the same material, I see it in the context of approaches like Distributive Morphology (Halle & Marantz 1993): it is only the relevant semantic material that is generated in the syntactic positions in question, and not its lexicalization. When it comes to lexicalization, syntax inspects the locality relations between nodes with the identical material, and if the relevant locality is satisfied, some of the instances are reduced to resumptive pronouns, clitics, or to full deletion. This reduction happens at the interface of syntax with phonology, and the interface with semantics, which is discussed in this paper, deals with full semantic representations of the material involved.

### 3. *Internal verb-prefixes*

In Arsenijević (2007, 2006) I propose to analyze internal Slavic verb-prefixes (ISVPs) as instances of agreement between the contents of the two atelic subevents that concatenate to build a telic eventuality. I present this idea on an example in (4).



- (4) Jovan je iz-bacio<sup>1</sup> psa iz sobe.  
 Jovan AUX out-threw dog.ACC from room.GEN  
 ‘Jovan threw the dog out of the room.’



The structure in (4) uses the general template that generates telic eventualities, proposed in Arsenijević (2006). This template, as explained above, asymmetrically concatenates two atelic events, one dynamic ( $State_{+/-}$ ) and one which is stative ( $State_0$ ). The asymmetry consists in the requirement that the dynamic subevent comes first in the concatenation. The dynamic subevent is thus interpreted as the initiating subevent, leading to the state determined in the stative subevent, which is thus interpreted as the result. The requirement that the complement of the initiating (i.e. dynamic) subevent is co-referential with the specifier of the result (i.e. stative) subevent guarantees that the two subevents specify phases of the same change, i.e. that the same participant that is affected in the initiating subevent is the one that bears the property specified in the result subevent.

The event denoted by the sentence in the example in (4), throwing out of the dog by Jovan, is analyzed parallel to the English example in (3). There is a dynamic subevent of Jovan acting with respect to the dog in a throwing manner (i.e. involving physical contact that affects the location of the dog), concatenated with a stative subevent of the dog being located out of the room. The aggregate interpretation is that Jovan's action of throwing involves a monotone function that maps times to values of the location property of the dog in such a way that, in a certain final temporal subinterval of the whole eventuality, the location property of the dog has the constant value *out of the room*.

The predicate of the initiating subevent, which is for the example in (4) the spatial nature of the affected property (location), has to establish agreement with the predicate of the result subevent, here the spatial nature of the property specified as the result (due to agreement, naturally, again location). This agreement can in S-C be marked by a prefix, which appears on the verb, and reflects the nature of the predicate in the result subevent. In the example in (4), this is the locative predicate specifying the location of the participant in  $SpecState_0$  (the dog) as being out of the location of (the space taken or somehow else determined by) the participant in the complement of this phrase (the room). The relevant spatial predicate is thus the one of coming into the 'outside' relation, corresponding to the S-C preposition 'iz' (out of). In general, since it is generated as a marker of agreement between the initiating and the result subevent, an ISVP will always correspond to the preposition that appears as the closest match of the predicate of the result subevent. I argue that the same holds of external Slavic verb prefixes.

## 4. External verb-prefixes

External Slavic verb-prefixes (ESVPs) appear to have no semantic contribution internal to the eventuality described by the verb to which they attach, neither regarding the lexical meaning of the verb, nor by changing the argument structure or other syntactically relevant properties of the VP. In addition, they are argued not to directly semantically relate to the phonologically corresponding prepositions, they predicate higher than the imperfective suffix (which predicates over the eventuality) and their meanings are rather quantitative than lexical. This is the reason why most researchers in the field considered external prefixes to semantically form a different class (Filip 2003, Gehrke 2005a) and to be syntactically generated in a different position, somewhere above the VP (Svenonius 2004, DiSciullo & Slabakova 2005, among others).

Properties of the ESVPs listed above are illustrated in (5).

- (5) a. Jovan je iz-od-gura-va-o<sup>P</sup> kolica.  
 Jovan AUX out-away-push-I\_suff-PTC cart  
 ‘Jovan pushed carts away to the exhaustion of the presupposed quantity of pushing carts away to be done by him.’
- b. Jovan je na-u-baci-va-o<sup>P</sup> knjige u orman.  
 Jovan AUX on-in-throw-I\_suff-PTC books in cupboard  
 ‘Jovan threw the books into the cupboard so that as a result a large quantity of throwing books into the cupboard has taken place.’

Observe, especially, the quantificational contribution that these prefixes appear to have with respect to the interpretation of the eventuality, reflected in the underlined parts of the English translations in (5).

Structural asymmetry between the two classes of prefixes is also visible in the fact that there can normally be only one ISVP, while the ESVPs can stack so that one verb can have up to three ESVPs, as illustrated in (6).<sup>1</sup>

- (6) Jovan je iz-na-po-od-guravao<sup>P</sup> kolica.  
 Jovan AUX out-on-over-away-push-I\_suff-PTC cart  
 ‘Jovan pushed carts away to the exhaustion (*iz*) of the presupposed large (*na*) and distributed (*po*) (in this case, over carts) quantity of pushing carts away to be done by him.’

It is quite clear already after a superficial look at these examples that the significant differences between ESVPs and ISVPs strongly suggest that the two classes cannot be generated in exactly the same way, no matter the actual analysis. However, most analyses proposed for ESVPs generate these two classes of elements in radically different ways (e.g. Svenonius 2004, who generates ISVPs VP internally, within the PP representing the result of the eventuality, and ESVPs in an aspectual projection on top of the VP).<sup>2</sup> This is in conflict with several significant similarities that the two types of predicates display, such as those listed in (7).

<sup>1</sup> There are in fact even examples with four or five ESVPs, but most often the lowest among them appear to be lexicalized, and are not perceived as prefixes but as part of the root.

<sup>2</sup> An exception, but only to some extent, are DiSciullo & Slabakova 2005.

- (7) a. All or almost all morphemes appearing as ESVPs also appear as ISVPs.  
 b. There is a certain sense of resultativity in the quantitative predicates contributed by ESVPs, with respect to the eventuality denoted by the verb.  
 c. Both classes contribute perfectivity, with all the same consequences for the syntactic behaviour of the verb.

An account that views the two classes of prefixes as completely different elements both in terms of syntax and semantics needs to explain these similarities before being accepted, which does not look like an easy task. An analysis that naturally derives both differences and similarities between the two classes is proposed in the next section.

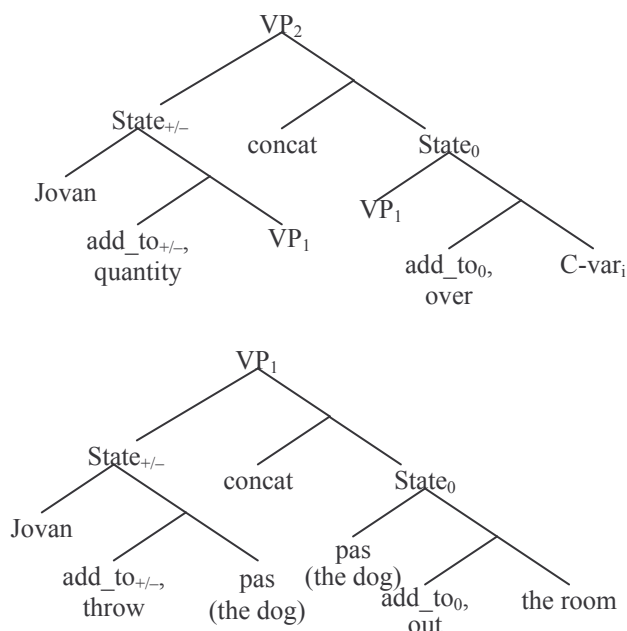
### 5. *ESVPs: telic template babushkas*

The essence of the analysis I propose for ESVPs is that they are generated in the same templatic structure of telic eventualities, and in the same way, as ISVPs. ESVPs are, just like ISVPs, instances of agreement between the relevant property of the affected participant from the initiating subevent and the relevant property of the result state. The special thing about ESVPs is that the templatic structure of a telic eventuality in which they are generated takes eventualities, i.e. other telic templates, and not only nominal expressions, as its Undergoer (the argument representing the affected participant), and that there is a context-variable in the complement of the phrase representing the result subevent.<sup>3</sup> This is presented in (8).

- (8) Jovan je po-iz-baci-va-o<sup>P</sup> pse iz sobe.  
 Jovan AUX over-out-threw-I\_Suff-PTC dogs.ACC from room.GEN  
 ‘Jovan threw the dogs out of the room so that the eventuality of throwing distributes over some contextually available set.’

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<sup>3</sup> I postulate here a context variable because it can easily be determined by the pragmatics. This may explain the prominence of the interpretations that have the right referent interpreted in this position. Another option is to have overtly specified the referent that is supposed to be interpreted in this position, but in that case there will be a significant variation between different ESVPs with respect to the element that appears in this position.



The intuition behind this structure is that the telic eventuality of Jovan throwing dogs out of the room (telic in the sense of requiring the result state) is embedded, as the affected argument, into another telic eventuality. In the bigger telic structure, the initiating subevent is the one in which Jovan acts with respect to the quantity of the embedded eventuality, and the result subevent is that the quantity of the embedded eventuality is determined by the distribution of this eventuality over some contextually provided set. This contextually provided set, represented here through the contextual variable (C-var), is usually either the embedded eventuality itself (in this case such a reading would be non-informative) or the set denoted by one of the participants of the embedded eventuality (in this case the most natural reading is that the eventuality distributes over its affected arguments, i.e. the set of dogs). A third option is that the eventuality distributes over some presupposed set of reference times.

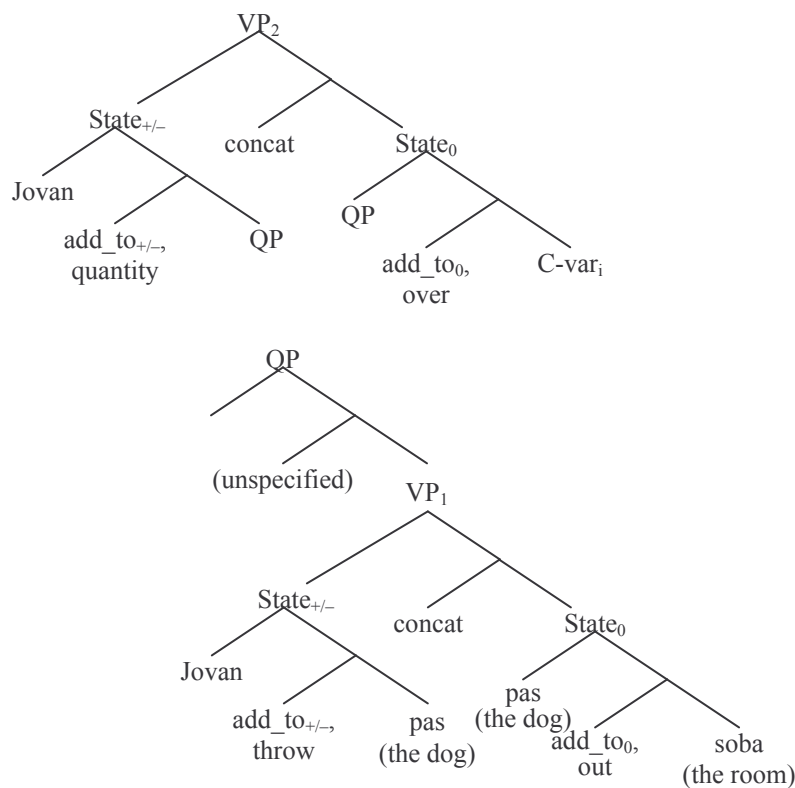
On the one hand, this analysis explains similarities between the two classes of prefixes, which are expected if they are generated in the same template (perfectivity is then just a particular grammaticalization of resultativity and telicity). The differences are accounted for in terms of the arguments of the template. ISVPs mark agreement in telic eventualities that involve only nominal arguments. There can be only one such level – already the first embedding will produce a template that takes VP arguments – and therefore generates an ESVP. This is why ISVPs do not stack. ESVPs scope over the suffix and over ISVPs because they are generated higher in the structure (I refrain here from a deeper discussion of the syntax and semantics of suffixes, which lies beyond the domain of this paper; a detailed discussion is available in Arsenijević 2006).

One property reserved for ESVPs that has not yet been explained is why it is exactly the property of quantity that is affected in the structure generating ESVPs. This question opens another one, related to the tentative generalization that all prefixes have prepositional meanings. An answer has to be provided for the questions why and how prepositional meanings can derive quantificational interpretations.

The answer to the first question follows directly from the view of the telic template presented in Arsenijević (2006), where I argue that the telic template corresponds to the predicate of division in the nominal domain (see Borer 2005a), i.e. to the category of grammatical number. This category is for both Borer and Arsenijević immediately dominated by the predicate of quantification. The telic VP, as presented here, can therefore be seen as a divided, i.e. plural

eventuality, syntactically represented as a structure with the potential to project a phrase that marks quantification, i.e. as an expression that is most naturally directly specified for quantity. In other words, we may have  $VP_1$  in the structure in (8) replaced by a quantificational phrase (QP) that takes  $VP_1$  as its complement, as represented in (9). QP is a projection headed by a quantificational predicate, which introduces the quantification over the eventuality; its direct counterpart in the nominal domain is the projection in which overt nominal quantifiers are generated. In the verbal domain, it is usually not overtly realized, simply because most languages lack morphemes with quantificational meanings that attach to the verb (exceptions are languages with event classifiers, like Chinese). The head of QP is not directly filled by any element, but it eventually gets assigned a certain value by the structure in which QP appears.

(9) Quantifier Phrases instead of VP<sub>a</sub> introducing embedded eventualities



The quantificational predicate is the one that immediately attaches to the main eventuality, and therefore exactly the property that it specifies is affected in the embedding structure. At the same time, in this representation, the argument positions are filled by QPs, which, unlike VPs, have bounded denotations and therefore must have referential meanings and cannot be generic. Therefore, they do not have the option to semantically incorporate into the main eventuality.

Let us now take a look at the example in (8), with the representation in (9), and try to answer the second part of the question above: can we keep the generalization that prefixes reflect the meanings of their (phonologically) corresponding prepositions, and still cover the quantificational interpretation of ESVPs. For the given example, it appears quite easy. Prefix *po-* corresponds to its corresponding preposition *po* (over), which indeed involves the meaning of distribution, or mapping, of one entity over/with another. If it is further specified that the interpretation of the predicate denoted by this element is to be quantificational, it is straightforward that the distributive interpretation of quantity will be derived. But how about other ESVPs? Quite much

the same. Several most frequent ESVPs are given in (10), with meanings that intuitively give quantificational interpretations like a large quantity, exhaustion, inception or completion.

- (10) a. iz-E (out-E) → E out of E → exhaustion  
 Jovan je iz-od-gura-va-o<sup>P</sup> kolica.  
 Jovan AUX out-away-push-I\_suff-PTC cart  
 ‘Jovan exhausted the presupposed quantity of the eventuality of pushing carts away.’
- b. na-E (on E) → E on E → accumulation  
 Jovan je na-od-gura-va-o<sup>P</sup> kolica.  
 Jovan AUX on-away-push-I\_suff-PTC cart  
 ‘Jovan did a lot of pushing carts away.’
- c. do-E (to E) → E to E → completion  
 Jovan je do-od-gura-va-o<sup>P</sup> kolica.  
 Jovan AUX to-away-push-I\_suff-PTC cart  
 ‘Jovan completed some presupposed quantity of pushing carts away.’
- d. za-E (behind E) → E behind E → inception, partitivity  
 Jovan je za-peva-o<sup>P</sup> pesmu.  
 Jovan AUX behind-sing-PTC song  
 ‘Jovan started singing the song.’  
 Jovan je za-lomi-o<sup>P</sup> vazu.  
 Jovan AUX behind-break-PTC vase  
 ‘Jovan partially broke the vase.’ ‘Jovan broke off a little piece of the vase.’

Apart from the advantages presented above, related to accounting for both similarities and differences between ISVPs and ESVPs, this analysis is also theoretically simpler (or ‘less costly’). Unlike other proposed analyses, in particular DiSciullo & Slabakova (2005), Svenonius (2004) and Ramchand (2004), which are forced to introduce two different functional projections for the two classes of prefixes, the present analysis involves, as relevant, only one functional projection – the one marking concatenation between two atelic eventualities.

#### 6. *Some open questions and consequences of the analysis*<sup>4</sup>

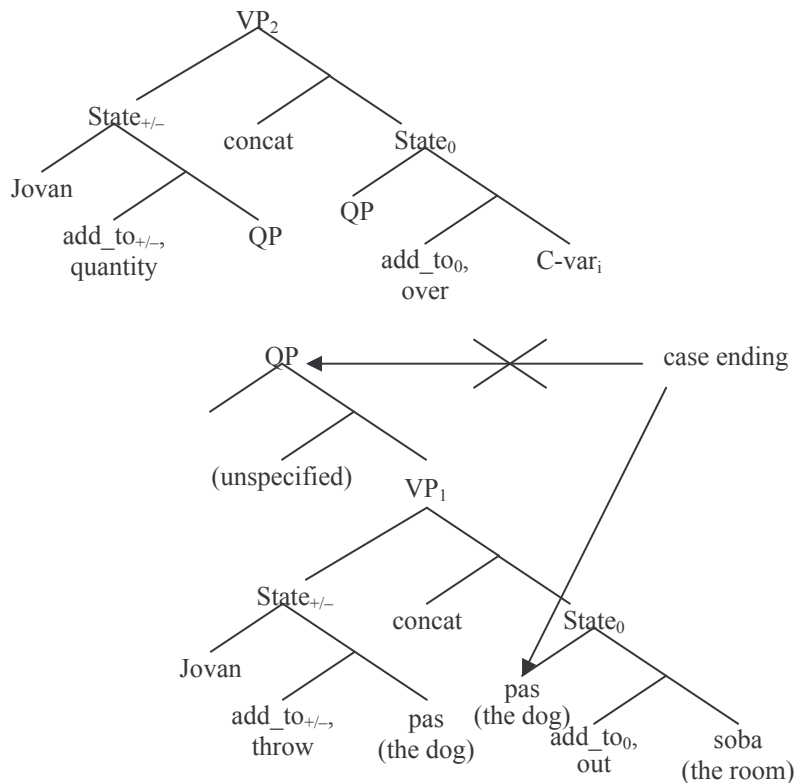
Certain aspects of this analysis have important consequences, or open interesting new questions. For instance, perfectivity as a property of verbs or VPs in Slavic languages, which is usually seen as a matter of outer rather than inner aspect, is derived in the same structure that derives telicity. This implies that either outer aspect in general has to be accounted for in terms of the telic template, i.e. as a ‘sort of’ telicity, or that there is also outer aspect, but that it does not include the distinction between perfective and imperfective verbs in Slavic languages.

Another question that this analysis opens is how come arguments of embedded eventualities (especially its affected participant) seem to carry the structural cases of the arguments of the embedding structure. The answer does not have to be difficult or complicated. It is possible that case endings behave like the English genitive ‘s in the fact that it can attach to any category that belongs to the expression that takes the relevant genitive marking, as long as it satisfies some phonological requirements. Similarly, assuming that eventualities appearing as arguments cannot

<sup>4</sup> The introduction of most of the material in this section, as well as several other points in the paper, is initiated by the review of the paper by Lanko Marušič, for which I am very grateful.

be marked for case because there are no case morphemes in the lexicon that can be attached to the verb or to the entire VP, the relevant case ending must look for a suitable candidate within that eventuality. Let us look again at (9), repeated as (11).

(11) The case of the embedded eventuality surfaces on one of its arguments



The accusative case of the main eventuality (i.e. the accusative assigned by VP<sub>2</sub>) should be assigned to its Undergoer, i.e. to the embedded eventuality (QP). However, accusative case morphemes contained in the lexicon are all restricted to appear on nominal expressions, and not on eventualities. The assignment is therefore impossible. The next option is to assign the case ending to some element within the QP. Since the two concatenated states are not nominal expressions, there are three possible candidates: *Jovan*, *pas* and *soba*. *Jovan* and *soba* are already assigned cases, *Jovan* in the main eventuality (nominative) and *soba* by the preposition that it appears with (*iz*, out). The only good candidate is *pas*, and it indeed ends up hosting the accusative case ending. I believe that a similar analysis can be applied to most or all of the ECM cases, where the accusative is supposed to be assigned to an infinitival clause, but since it cannot host it, and it has one argument without any case assigned (the subject of the infinitive), this argument is assigned the pending accusative.<sup>5</sup> This is, however, only a sketch of the possible analysis, and do not go any further into discussing this problem. The goal of this paper is to sketch the major lines of the particular analysis that I propose, and its main advantages and disadvantages, and I leave these and other newly opened questions for further research.

Talking about case, throughout the paper, I mostly deal with eventualities that have all their arguments specified and all of them at least in one instance overtly lexicalized. Therefore, I owe a brief explanation about different argument structures with a smaller number of arguments, especially about the unaccusatives and unergatives. I consider these VPs to be derived in the

<sup>5</sup> I want to thank Rint Sybesma for pointing out to me the parallel between the analysis I propose for the accusative on an embedded argument and the ECM constructions.



same structures: in one state if atelic and in the telic template if telic. The only difference is that they have one or two arguments unspecified (like unaccusatives and unergatives), and/or one of their arguments is incorporated in the verb (for instance telic VPs without specified Goals, involving verbs like *to kill*, *to destroy* and *to create*, with the Goal incorporated into the verb).

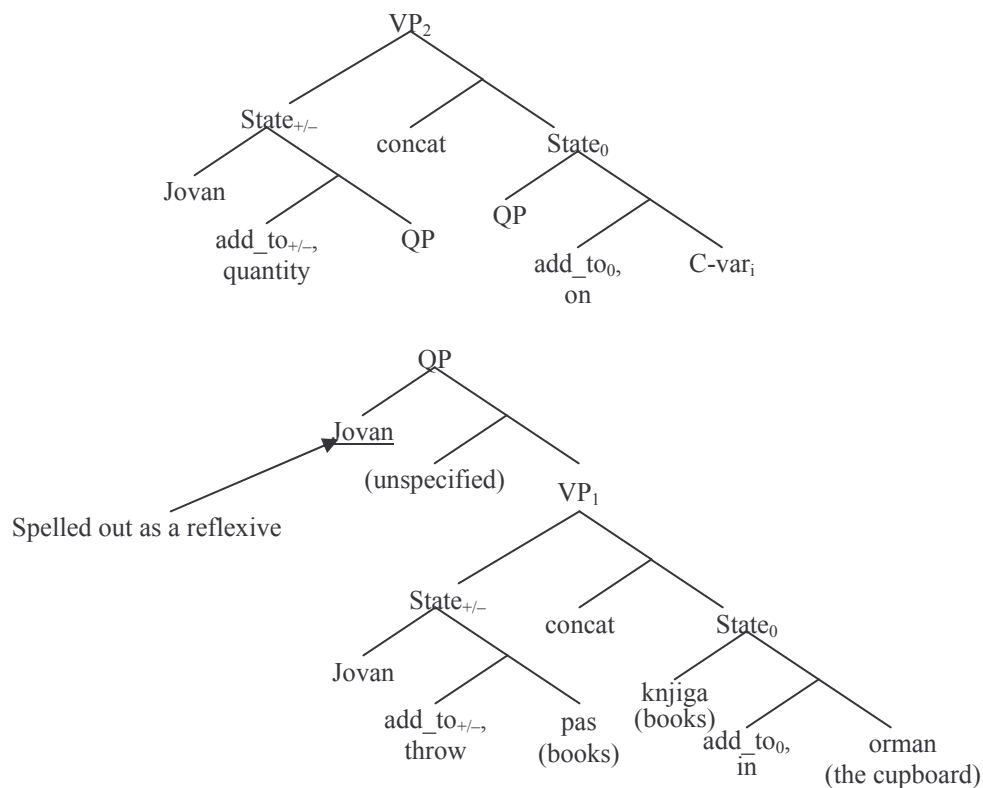
A related issue is that of the ESVPs appearing in the structure with a reflexive carrying accusative and with the embedded Undergoer in genitive, as in (12).

- (12) Jovan se na-u-baci-va-o<sup>P</sup> knjiga u orman.  
 Jovan REFL.ACC on-in-throw-I\_suff-PTC books.GEN in cupboard  
 ‘Jovan threw the books into the cupboard so that as a result a large quantity, for the standards determined based on some properties of Jovan, of throwing books into the cupboard has taken place.’

In all such examples, the quantity of the embedded eventuality is somehow related to the subject of the main eventuality. The fact that the subject of the main eventuality also binds the reflexive, the element that most prominently distinguishes these sentences from the regular ESVP ones, hints that the reflexive may be responsible for the difference in meaning with respect to the expressions with an ESVP and without the reflexive.

I suggest the analysis presented in (13), which generates the reflexive from (12) in the specifier position of the embedded QP.

- (13) The structure deriving ESVPs with a reflexive



This directly explains why the quantity of the embedded eventuality is interpreted as determined based on some properties of the subject of the main eventuality – it is natural, if the subject is also the specifier of the embedded QP. It explains as well why the reflexive takes the accusative case: the instance in the specifier of QP need to be visible, and therefore must be assigned case.



Furthermore, it is the structurally highest candidate in the embedded QP to bear the accusative case, which makes it the most local one with respect to the structure that assigns it. Its syntactic relation with the subject licenses it to be lexicalized as a reflexive. The Undergoer of the embedded eventuality takes genitive, the case that in Slavic languages typically marks nominal expressions internal to the direct arguments of the main VP.

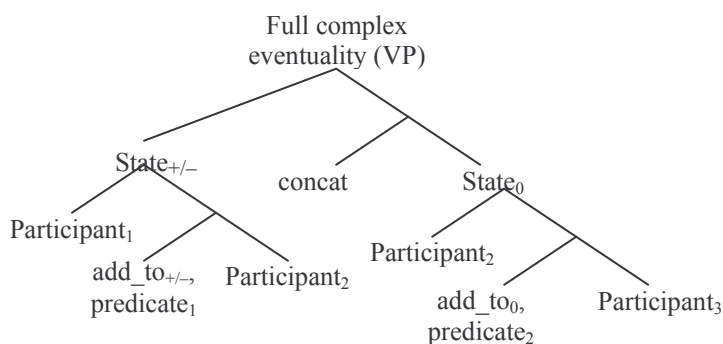
Finally, the analysis proposed for ESVPs explains the facts about verbs with doubled prefixes of this kind. On the one hand, ESVPs are characterized by the ability to stack, which means it should also be possible for them to be doubled. On the other hand, sentences involving doubled prefixes are generally degraded. A sentence with a doubled ESVP, like (14), would correspond to a structure in which one ESVP structure is embedded into another one of the same kind. The sentence in (14) is quite unusual, but not really ungrammatical, and certainly not semantically infelicitous. Its meaning is clear, although bizarre: there was an eventuality initiated by Jovan, that resulted in a large quantity of another eventuality, described as an eventuality initiated by Jovan and resulting in a large quantity of throwing books into the cupboard.

- (14) ? Jovan je na-na-u-baci-va-o<sup>P</sup> knjige u orman.  
 Jovan AUX on-on-in-throw-I\_suff-PTC books in cupboard  
 ‘Jovan threw the books into the cupboard so that as a result a large quantity of throwing books into the cupboard has taken place.’

The problem with the sentence in (14) is rather that it is pragmatically strange, i.e. its meaning requires a context which is very difficult even only to construct, not to mention its likelihood to appear in language use.

The last issue that I will discuss is whether the postulation of the two states in the telic template is confirmed by the modificational capacities of the structure, i.e. by the possible adjunction sites for the typical modifiers of eventualities. The telic template, repeated in (15), predicts three possible adjunction sites for e.g. a temporal modifier: the dynamic state, the proper state and the VP.

- (15) The telic template



The data signal that only the first of the three adjunction sites appears problematic, as illustrated in (16).

- (16) a. ? John flew for three hours to London.  
 b. John flew to London for ten days. (the reading where he stays there ten days)  
 c. John flew to London in three hours.

Most speakers judge sentence like (16a) very strange, even degraded, but not totally out. A discussion of this type of construction is available in Arsenijević (2006), and for the present paper it is most important that the possibility of modifying three different predicates is indeed there.

### 7. Conclusion

I argued that internal and external SVPs are generated in the same telic eventuality templatic structure and by the same mechanism of agreement. A structural template of telic eventualities is used, in which a telic eventuality is seen as a concatenation of two atelic subevents, the first of which is dynamic (the initiating subevent) and appears as the specifier of the concatenation predicate, while the second is stative (result subevent) and appears as the complement of the concatenation predicate. The mechanism by which both classes of prefixes are generated is the one of establishing agreement between the predicates of the initiating and the result subevent.

This allows us to assign the following two properties to both classes of prefixes: they are all generated as agreement between the two subevents in the telic template and they all have meanings corresponding to the meanings of their phonological counterparts among prepositions. Differences between the two classes are all consequences of the fact that ISVPs are generated in telic templates that have all their arguments represented by nominal expressions, while ESVPs are generated in telic templates where at least the affected participant (the undergoer of the change) is referred to by QP projected over VP. In addition, the result subevent of the telic template generating an ESVP has its complement position filled with a context variable, an anaphoric element the interpretation of which is determined by the context. The quantitative interpretation linked to ESVPs is a result of two components characteristic of this construction. One is the fact that QPs involved have variable heads, without a fixed specification, and thus are open for specification by the structure in which they appear. The other component includes particular interpretations that arise in the interaction of prepositional meanings associated with prefixes and interpretations of the contextual variables involved in the result subevent.

A number of consequences and related questions are discussed. They show that the proposed model has correct predictions and the potential to explain some difficult questions related more or less directly to the topic of the paper, such as case assignment, ECM or prefix doubling.

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## There is no ambisyllabicity (in German)

Emilie Caratini

‘Ambisyllabicity’ is often used by phonologists, especially when they deal with the distribution of long and short vowels in German. Even if it is a very convenient concept, it raises a set of problems; and those problems can be solved if ambisyllabics are considered as geminates. Diachronic facts will be provided in order to reveal where those ambisyllabics come from. It will also be shown that German schwa does not behave like other vowels (it does not build open syllables) and that there is a relationship between (vowel) length and (consonantal) voicing in German.

### 1. Preamble

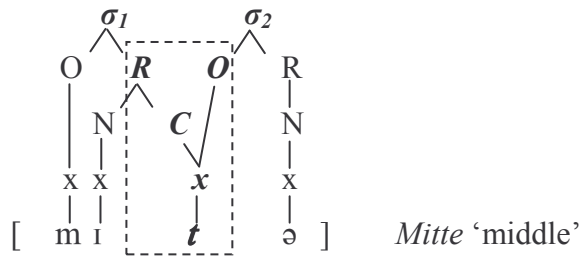
The work presented here is the synchronic part of a broader study which consists not only of a synchronic but also of a diachronic and dialectological survey of German vowel length distribution. The ultimate goal of this paper is to show that it is possible to account for vowel length distribution in German without the help of ambisyllabicity.

Ambisyllabicity is a rather old concept, which, to my knowledge, has been first imagined by Paul et al. (1998:75-76, 1<sup>st</sup> edition 1881). It has then been (re-)introduced, quite late, in Generative Phonology (Kahn 1976). But, as far as the phonology of *German* is concerned, its purpose has not changed since Paul et al.

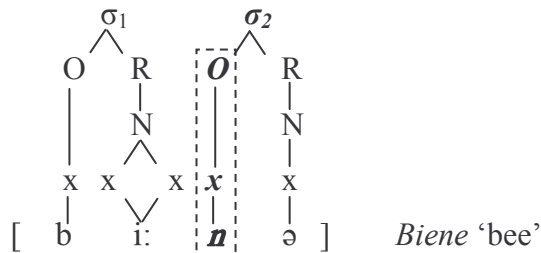
It was well known among Neo-grammarians that, in Modern Standard German, long vs. short vowels occur in open vs. closed syllables respectively. Ambisyllabicity was introduced in their analyses, as well as in modern proposals, in order to explain why some short vowels occur in *a priori* open syllables: ambisyllabicity pushes onset consonants which follow a short vowel into the coda of the preceding syllable. The preceding vowel stands in an (artificially) closed syllable, which provides a reason for its shortness (see Becker 1998, Benware 1986, Hall 2000, Kohler 1977, Meinhold & Stock 1980, Ramers 1991, Vennemann 1990 or Wiese 1996). In the phonology of German, the *only purpose* of ambisyllabicity is to find a way to account for the distribution of long and short vowels.

An ambisyllabic consonant, as shown in (1), is a single intervocalic consonant which belongs *simultaneously* to two syllables. The representation of *Mitte* [’mitə] ‘middle’ – with ambisyllabic /t/ – can be compared to those of *Biene* [’bi:nə] ‘bee’ (cf. (2)) and *finde* [’fində] ‘I find’ (cf. (3)), which respectively have a ‘standard’ open vs. closed syllable.

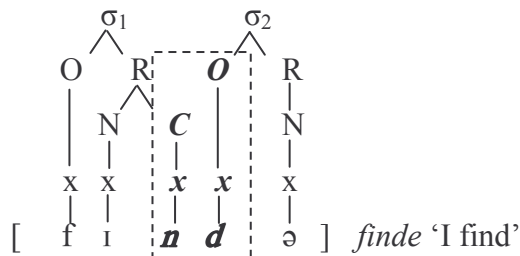
## (1) Ambisyllabicity



## (2) Open syllable



## (3) Closed syllable



A structure such as (1), i.e. containing an ambisyllabic consonant (in italics), is very attractive: following any standard syllabification algorithm, an intervocalic simple consonant occupies only *one* x-slot, and is usually associated with the following syllable node *only* ('onset maximisation' principle); ambisyllabicity allows the only x-slot of this consonant to be linked – as a coda – to the preceding syllable at the same time (ambisyllabification rules). This way, the preceding vowel stands in a closed syllable. Therefore, it has to be short in order to conform to the 'rhyme-weight requirement' that governs the phonology of Standard German (i.e. long vowels occur in open, short vowels in closed syllables; see 2.2).

However, it raises a problem: why are identical intervocalic consonants sometimes ambisyllabic (cf. *kennen* [ˈkɛnən] '(to) know') and sometimes not (cf. *König* [ˈkø:nɪç] 'king')? The situation is in fact even worse: German exhibits some minimal pairs such as the 'famous' *Miete* [ˈmi:tə] 'rent' vs. *Mitte* [ˈmɪtə] 'middle' one. However, these should not exist. Any account of the facts has to provide an explanation for those problematic cases (section 4).

The 'fight' against ambisyllabicity is not the only objective of this paper: I want to account for the German facts without the help of ambisyllabicity, and therefore I also have to offer an alternative to the ambisyllabic approach. The analysis, which is provided in part 4, has to rely on two remarkable things; those are stated under (4), and are closely related to the main issue of this article (vowel length).

(4)

- a. first of all, ‘schwa’, i.e. [ə], has a special status in Standard German – as well as in other languages: it does not behave like ‘full’ vowels. In Standard German, it has (diachronically) triggered the shortness of the preceding vowel;
- b. second, there seems to be a link between the length of a vowel and the voice value of the following intervocalic consonant (voiced vs. voiceless consonants respectively are preceded by long vs. short vowels).

(4a) is nothing new, neither for German nor for other languages. The special behaviour of schwa has already been acknowledged for German and for Dutch, concerning the distribution of [ɪŋ] vs. [ɪ] (cf. Vennemann 1970 for German; Trommelen 1983 or Oostendorp 1995 for Dutch). It has also been identified among Romanists (see Charette 1991 or Anderson 1982), or even among Slavists (‘abstract vowels’ already exist in Lightner 1965). In German, schwa does obviously not pattern together with other vowels; it seems to be the same as nothing. If it is present, it has the same consequences as if there were no vowel at all:

- a. /ŋg/ distribution: [ɪŋg] surfaces when it is followed by a full vowel, [ɪ] when the following syllable contains a schwa (cf. *Ingo* [ɪŋgo] ‘Ingo’ vs. *Inge* [ɪŋə] ‘Inge’);
- b. vowel length: schwa has triggered the shortness of the preceding vowel, whereas full vowels have triggered its length (cf. MHG *künik* ‘king’ vs. *doner* ‘thunder’ > NHG *König* [køniç] ‘king’ vs. *Donner* [dønɐ] ‘thunder’).

The idea stated in (4b) was already known among Slavists (see Scheer 2004:522) and Italianists (Baroni 2000): there seems to be a relationship between consonantal voice value and the length of the preceding vowel. In other words, if the vowel is followed by a voiced (intervocalic) consonant, it is long; and if it is followed by a voiceless (intervocalic) consonant, it is short.<sup>1</sup> This second observation is also new for German.

In the following section, I will briefly introduce the data that are going to be used, and I will present the standard generative views concerning vowel length distribution in German. The third part will be devoted to the problems encountered by the analysis discussed in part 2:

- a. the (quasi-)total absence of consideration for stress and the role it plays, concerning the distribution of long and short vowels in German
- b. the difference between synchronic vowel length distinctions: process vs. lexical property
- c. the pre-final consonant context ( \_\_ C #), which gives birth to minimal pairs
- d. the concept of ambisyllabicity itself and the facts it cannot account for
- e. and the synchronic facts which show the existence of a relationship between consonantal voicing and vowel length.

In the fourth section, I will present a concurrent analysis, which is based on the ideas that schwa is different, and that the voicing value of an intervocalic consonant has an effect of the length of the preceding vowel.<sup>2</sup> The last part of the paper will provide concluding remarks.

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<sup>1</sup> As the reader might notice, I assert that vowel length and consonantal voicing are linked, even though I know of the existence of apparent counter-examples which German speakers will probably notice: *Miete* [ˈmi:te] ‘rent’ or *Vater* [ˈfa:tɐ] ‘father’, which both have a long vowel even though the following obstruent is voiceless. However, those counter-examples can easily be incorporated into the analysis, as has been done in Caratini (2005). I will briefly mention the main kinds of counter-examples that exist in section 4.

<sup>2</sup> I would have liked to show how easily the facts can be integrated into a theory like CVCV, but I did not have enough space to explain the ideas, the data, the problems and the framework, so I chose to make it easy for everybody and to use the well-known concepts: syllables, onsets, rhymes, nuclei and codas.

## 2. Data and standard analysis

### 2.1 Data

The data used in this work originate from an electronic corpus which contains 12 210 German words taken from a CD-Rom version of the standard orthography dictionary of German (Duden (Maurer et al. 1996-2000)). This 12 210 words selection, which can be qualified as exhaustive, has been built in the following way.

The dictionary contains some 120 000 entries. In order to simplify the analysis (which otherwise would be quite a hard task), and for the sake of clarity, only monomorphemic words have first been retained. In fact, an examination of the whole German lexicon reveals (see 3.2) that once the length of a (tonic) vowel is defined in a root, it does *never* vary, even in the course of derivation, inflection or composition. It would not only be a foolish but also a ‘perilous’ idea to use the whole lexicon for the analysis: the words are too numerous, and the addition of any suffix would alter our perception of what the pertinent phonological context is. Considering a root which contains a long vowel such as *leb-* [’le:p] ‘(to) live’, the quantity of the vowel will not be affected by the adjunction of any type of suffix: *leb-en* [’le:ben] ‘(to) live’, *Leb-tag* [’le:ptak] ‘life’ and *leb-st* [’le:pst] ‘you live’ all enclose a long [e:]. A look at a form like *Leb-tag* [’le:ptak] ‘life’ could make one think that long vowels can freely occur in closed syllables, which is of course false: this is possible *only* when the syllable boundary between the two consonants coincides with a morpheme boundary.

Now that the origin of the data has been cleared, I will give a summary of what the standard synchronic generative analyses propose.

### 2.2 Standard analysis

Long and short vowels are said to be in complementary distribution in German (see Becker 1998, Benware 1986, Giegerich 1992, Hall 1992, Lenerz 2002, Ramers 1992, Vater 1992, Vennemann 1982): long vowels are found in open and short vowels in closed syllables (cf. (5)). From now on, I will refer to this first assumption, made by the various authors listed above, as ‘standard analysis’. This standard analysis gives birth to the ‘rhyme-weight requirement’ for Standard German: a rhyme has to dominate two skeletal slots (i.e. either a short vowel and a coda consonant, or a long vowel, or a diphthong).<sup>3</sup>

If this statement were reflecting the exact reality, one could not be able to find long vowels in closed syllables and, vice versa, short vowels in open syllables, which is not true as table (6) shows.

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<sup>3</sup> According to Wiese (1996) or Hall (1992, 2002), a rhyme can *at least* dominate two units (morae or C/V positions). According to Lenerz (2000, 2002), two is the *exact number* of units a tonic (internal or final) rhyme *has to* dominate. However they all agree that, in internal (tonic) syllables, rhymes dominate exactly two units : either a short vowel and a coda, or a long vowel / diphthong.



## (5) Vowel length distribution: first approximation

	a. Long vowels			b. Short vowels		
	German	IPA <sup>4</sup>	Gloss	German	IPA	Gloss
[i:] / [ɪ]	<i>Biene</i>	bɪ:nə	bee	<i>Spindel</i>	ʃpɪndəl	spindle
[y:] / [ʏ]	<i>Bühne</i>	by:nə	stage	<i>Münze</i>	mʏntəsə	coin
[u:] / [ʊ]	<i>Blume</i>	blu:mə	flower	<i>Ulme</i>	ʊlmə	elm
[e:] / [ɛ]	<i>Beere</i>	bɛ:rə	berry	<i>Grenze</i>	grɛntsə	limit
[ø:] / [œ]	<i>Öde</i>	(ʔ)ø:də	desert	<i>Mönch</i>	mœnç	monk
[o:] / [ɔ]	<i>Boden</i>	bɔ:dən	ground	<i>Hopfen</i>	hɔpfən	hop
[ɑ:] / [a]	<i>Name</i>	nɑ:mə	crumb	<i>Galgen</i>	galgən	gallows
[ɛ:] / [ɛ]	<i>hämisch</i>	hɛ:mɪʃ	aggressive	<i>ächzen</i>	ɛçtsən	(to) groan
[aʊ]	<i>Bau</i>	baʊ	construction	/	/	/
[aɪ]	<i>Ei</i>	(ʔ)aɪ	egg	/	/	/
[ɔɪ]	<i>Eule</i>	(ʔ)ɔɪə	owl	/	/	/
6 506 (100 %)			5 686 (100 %)			
In open syllables: 4 066 (62,50 %)			In open syllables: 1 700 (29,90 %)			
In closed syllables: 2 440 (37,50 %)			In closed syllables: 3 986 (70,10 %)			

## (6) Vowel length distribution: counter-examples

	a. Long vowels <i>in closed syllables</i>			b. Short vowels <sup>5</sup> <i>in open syllables</i>		
	German	IPA	Gloss	German	IPA	Gloss
[i:] / [ɪ]	<i>Kien</i>	kɪ:n	shaving(s), cutting(s)	<i>binnen</i>	bɪnən	in (time)
[y:] / [ʏ]	<i>Müesli</i>	my:sli	müesli	<i>brüllen</i>	brʏlən	(to) shout
[u:] / [ʊ]	<i>husten</i>	hu:stən	(to) cough	<i>brummen</i>	brʊmən	(to) buzz
[e:] / [ɛ]	<i>Beet</i>	bɛ:t	patch	<i>Keller</i>	kɛlə	cave
[ø:] / [œ]	<i>blöd</i>	blø:ət	stupid	<i>Böller</i>	bœlə	drum
[o:] / [ɔ]	<i>Mond</i>	mɔ:nt	moon	<i>Sonne</i>	zɔnə	sun
[ɑ:] / [a]	<i>ahnden</i>	a:nden	(to) punish	<i>Hammer</i>	hɑmɐ	hammer
[ɛ:] / [ɛ]	/	/	/	<i>fällen</i>	fɛlən	(to) blow down
[aʊ]	<i>raunzen</i>	ʁaʊntsən	(to) moan	/	/	/
[aɪ]	<i>Leiste</i>	lɛɪstə	moulding	/	/	/
[ɔɪ]	<i>räuspfern</i>	ʁɔɪspɛn	(to) clear one's throat	/	/	/
<b>=&gt; 2 440 !</b>			<b>=&gt; 1 700 !</b>			

<sup>4</sup> All phonetic transcriptions follow the convention of the International Phonetic Association. The abbreviation 'IPA' stands for 'phonetic transcription following the convention of the International Phonetic Alphabet'. In this article, I sometimes use other abbreviations: MHG stands for 'Middle High German', NHG for 'New High German', OHG for 'Old High German', VB for 'verb', ADJ for 'adjective', GEN for 'genitive', SG for 'singular', PL for 'plural', 1ST for 'first person marker', 2ND for 'second person marker', 3RD for 'third person marker', V for 'vowel', C for 'consonant', O for 'onset', R for 'rhyme', N for 'nucleus' and C for 'coda'.

<sup>5</sup> Some of the words under (4) have *graphic* geminates, as in *Sonne* ['zɔnə] 'sun'. This does *not* reflect any phonetic reality in Standard German, since the phonetic system does not include any geminate (however this is not true for the dialects of German: Bavarian, for instance, has real geminates). In Standard German, those double consonants have a pure graphic existence which is *in no way* grounded on the phonetic level. Some authors have argued that this graphic germination is *only* a way to remind the reader of the shortness of the preceding vowel (see Augst 1991 among others).



Table (5) illustrates the general pattern. However, paying attention to the figures at the bottom of table (5) and to the data like those under (6), it will be noticed that German exhibits a large number of counter-examples (precisely 4 140 items, i.e. 33 % of the whole corpus) which can be divided into two groups:

(6a) contains words in which long vowels are followed by at least one tautosyllabic consonant, i.e. stand in closed syllables.

(6b) illustrates a symmetric situation: 1 700 words, in which the tonic vowel occurs in an open syllable, enclose a short vowel (more than 60 % of the (tonic) vowels that occur in an open syllable are short).

How can the standard analysis account for those facts, without giving up the syllable theory? If one does not want to reconsider the initial observation that short vs. long vowels seem to occur in closed vs. open syllables, one has to find a strategy which will for instance force the intervocalic consonants of the words under (6b) into the coda of the first syllable, in order to make it closed and ‘allow’ the preceding vowel to be short. One also has to find a way to explain why the presence of ‘coda’ consonants under (6a) does not cause the preceding vowels to be short.

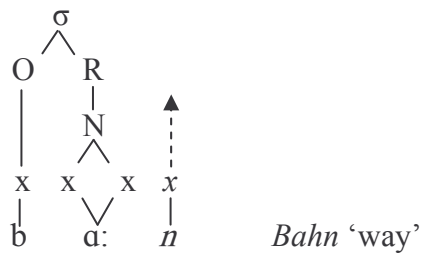
Both situations will be dealt with in the following sections.

### 2.2.1 Long vowels in closed syllables: extrasyllabicity

The first set mentioned (cf. (6a)) is composed of 2 440 words, which have one property in common: they all exhibit a long vowel which stands in a closed syllable. This set can be divided into three sub-groups: the first one, in which the long vowel precedes a final consonant (2 263 forms, like *Bahn* [’ba:n] ‘way’); a second one in which the vowel is followed by at least two consonants at the end of the word (91 items, as in *Trost* [’tʁo:st] ‘comfort’), and another one in which the closed syllable is not final (87 words, as in *husten* [’hu:stən] ‘(to) cough’). The two last sets form a small group of counter-examples (only 7,3 % of the entire (6a)-Class, i.e. less than 1,46 % of the whole corpus), and this is the reason why I will not examine them in detail here.<sup>6</sup> However, the first group contains a lot of items, and is therefore a bigger problem for the analysis. It is composed of exactly 2 262 words, which exhibit a long vowel, itself followed by only one (simple) final consonant. This can be accounted for thanks to the concept of extrasyllabicity or to the notion of appendix (see for instance Giegerich 1992, where a definition of both concepts is explicitly given). Both can be used in order to postpone the association of the consonant to the syllable structure (as in (7)), and to let the syllable open until the vowel length rule has applied.

<sup>6</sup> Those 178 words, whose existence I cannot explain here, exhibit some peculiar features: some of them are loan words (98 forms, like *Nurse* ‘nurse’, from the English *nurse*) which are not yet phonologically integrated; others contain a s + C cluster (25 items, as in *Trost* ‘comfort’), which is known to regularly exhibit a special behaviour (see for instance Kaye 1992); others contain a diphthong in New High German, or had a diphthong in Middle High German, which appears to be a special object (21 words: MHG *wuost* > NHG *Wust* ‘pile’) – see Caratini (2005); some others have lost a post-tonic vowel in the course of time – between Middle High and New High German (precisely 20, as in MHG *anelih* > NHG *ähnlich* ‘same’) – the vowel was however still there during the quantity adjustment which occurred in MHG; eleven of them contain a r + C cluster, in which /r/ is known to have triggered compensatory lengthening as in *zart* [’tsa:t] ‘mild’. The few forms that still remain unexplained are: *fahnden* [’fa:ndən] ‘(to) search’, *ahnden* [’(?)a:ndən] ‘(to) punish’ and *Mond* [’mo:nt] ‘moon’. Here tonic vowels are followed by coronal consonants cluster, which are also known to be special objects (see Paradis & Prunet 1991). For more details, I refer the reader to Caratini (2005).

(7) Extrasyllabicity

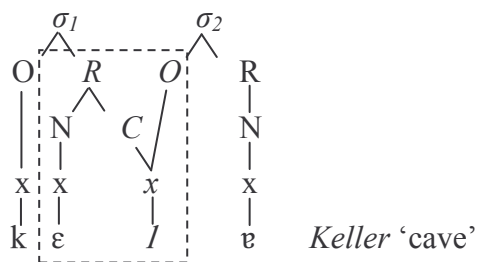


(7) gives the underlying structure of the word *Bahn* ‘way’. The final consonant /n/ is left unparsed. The preceding syllable is therefore not closed. This allows the vowel to be long, following the theory. However, if one confronts the idea to the data, it appears that both long and short vowels can occur in this context. Why should the /n/ in *Bahn* [ˈba:n] ‘way’ (2 263 forms) be extrasyllabic contrary to the one in items like *dann* [ˈdan] ‘then’ (787 words)? On the one hand, if one adopts the extrasyllabicity / appendix solution, more than 6,4 % of the corpus remain unaccounted for; on the other hand, if extrasyllabicity / appendix is not used, 18,3 % of the corpus have to be considered as exceptions. This problem will be detailed below in section 3.3.

2.2.2 Short vowels in open syllables: ambisyllabicity

The counter-examples – under (6b) – have short vowels in open syllables. The strategy which is currently used in order to palliate to the existence of such forms consists in forcing the intervocalic consonant into the coda of the preceding syllable: this is the only use of ambisyllabicity (see Lernerz 2000, Vennemann 1982 and Wiese 1996 among others). All intervocalic consonants of the (6b)-set are analysed as belonging *simultaneously* to two syllables: as a coda to the preceding one, and as an onset to the following one, giving birth to a hybrid structure as the one shown under (8) for *Keller* ‘cave’ (see also the representation of *Mitte* [ˈmitə] ‘middle’ in (1) above).

(8) Ambisyllabicity



However, as I have already mentioned, this representation also raises a problem. One can easily find words in which the intervocalic consonant, even if standing in a similar environment as those in the words under (6b), is preceded by a long vowel: *König* [ˈkø:nɪç] ‘king’ has a ‘normal’ /n/ vs. *kennen* [ˈkɛnən] ‘(to) know’, which is supposed to have an ambisyllabic /n/. The problem is even worse: there are in fact minimal pairs like *Miete* [ˈmi:tə] ‘rent’ (‘normal’ [t]) vs. *Mitte* [ˈmitə] ‘middle’ (ambisyllabic [t]). For the moment, I only intended to point at the problem, which will be discussed below (3.4).

### 2.2.3 Summary

The assumption that long vs. short vowels occur in open vs. closed syllables cannot account for all the facts. However, it is a fact that it illustrates quite well the general pattern (only 26 % of the corpus remain unexplained). If one wants to guess the length of a vowel standing either in a final open, or in an internal closed syllable, no problem arises: vowel length can be easily predicted in those two environments. The difficulty arises in final closed or internal open syllables, because in those environments, both short and long vowels can be found: *dann* [ˈdan] ‘then’ but *Bahn* [ˈba:n] ‘way’; *Miete* [ˈmi:tə] ‘rent’ but *Mitte* [ˈmɪtə] ‘middle’.

In the following section, the five main problems encountered by standard analyses will be discussed. First of all, I will examine the role of stress – in relation to vowel length. I will then mention the two possibilities that arise if one looks at any synchronic complementary distribution: considering it as a synchronic process vs. as a lexical property. I will then come back to the \_\_ C # context (see 3.3), and to ambisyllabicity in section 3.4. The last paragraph will be devoted to an observation which will appear to be fundamental in section 4: the case of voiced ambisyllabic consonants, and their (*quasi-*)absence in German.

## 3. Problems of the standard analysis

### 3.1 Stress

The standard assumption that short vowels occur in closed vs. long ones in open syllables discussed above is only a first approximation. Five other elements have to be taken into account in order to predict German vowel length synchronically. The first of them is *stress*. It is a fact that vowel length distinctions in German crucially depend on stress. In other words, stressed vowels can be long or short (depending on the context), but unstressed vowels cannot be long. As table (9) shows, (i) apparent length alternations between the two columns are *systematically* associated with stress differences, and (ii) long vowels cannot show up in unstressed positions<sup>7</sup>.

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<sup>7</sup> An anonymous reviewer mentioned some words (namely *Herzog* [ˈhe:ʁtsɔk] ‘duke’, *Wermut* [ˈve:ʁmʊt] ‘vermouth’, *Japan* [ˈja:pən] ‘Japan’ and *Motor* [ˈmo:tɔr] ‘motor’) which, according to him/her, exhibit a long vowel in unstressed position. Wermke & al. (2000) confirm this assertion for *Herzog*, *Wermut* and *Motor*, however they transcribe *Japan* with a short (second) [a]. I have also asked native speakers about their intuitions concerning those four forms. They underlined the fact that the second vowels in *Herzog*, *Wermut*, *Japan* and *Motor* are similar in quality to those italicised in *zog* [tsɔ:k] ‘pull 1SG Preterit’, *Mut* [mʊ:t] ‘courage’, *Motor* [mɔ:toʊ] ‘motor’ or *Motoren* [moˈtɔ:ʁən] ‘motors’ and *Japan* [ˈja:pən] ‘Japan’ or *Japaner* [jaˈpɑ:nɐ] ‘japanese person’; but that the quantities in both series are definitely different (the examples are not even mine, but were spontaneously proposed by one of my informants). I will finally add that *Herzog* and *Wermut* are respectively derived and composed, and that *Japan* and *Motor* are loan words, which make them all ‘dangerous’ counter-examples...

## (9) Stressed or not stressed?

a. Stressed <sup>8</sup> (long or short vowels)			b. Unstressed <sup>9</sup> (only short vowels)		
German	IPA	Gloss	German	IPA	Gloss
<i>Möbel</i>	ˈmø:bəl	furniture	<i>möblieren</i>	møˈbli:ʁən	(to) furnish
<i>Model</i>	ˈmɔ:dəl	(cake) tin	<i>Modell</i>	mɔˈdɛl	model
<i>übersetzen</i>	ˈ(?)y:bʊzɛtsən	(to) cross (river)	<i>übersetzen</i>	(?)yβəˈzɛtsən	(to) translate
<i>aktiv</i>	(?)akˈtɪ:f	activ	<i>aktivieren</i>	(?)aktɪvi:ʁən	(to) activate
<i>Dosis</i>	ˈdɔ:zɪs	dose	<i>dosieren</i>	dɔˈzi:ʁən	(to) measure

One cannot talk about length distribution in German without taking stress into account: the complementary distribution of long and short vowels holds in stressed syllables *only* (in German, no vowel can be long if it is not stressed). Another illustration for this would be that lots of monosyllabic unstressable prepositions – such as *von* [fɔn] ‘of, by’, *hin* [hɪn] ‘to’ or *bis* [bɪs] ‘to’ – never show up with a long vowel, whatever the context in which the vowel occurs: no length is possible without stress.

## 3.2 Vowel length distribution: process vs. lexical property?

The second point I would like to draw attention to has to do with the status of German length distinctions. It has been argued (see Wiese 1996:195, for instance) that vowel length in Modern German can be *synchronically* derived. According to such a proposal, every vowel of Modern German is *underlyingly long*; those which are short on the surface *also* derive from underlying long vowels *but have been shortened* because of standing in a closed syllable (‘closed syllable shortening’).

However, vowel length does not vary *at all* in German: no adjunction of suffix (whatever its nature is – derivational, inflectional) or even of a whole word (in composition) is able to influence the length of the root. This is illustrated in (10) below.<sup>10</sup>

<sup>8</sup> Under (9), italicised vowels are stressed in (9a), stressless in (9b).

<sup>9</sup> The quality of the vowel does not vary, however: stressless short vowels under (9b) have the same quality as their stressed counterparts in (9a); the [+/- ATR] value is identical in both columns.

<sup>10</sup> For a larger set of examples, I refer the reader to Caratini (2004:8-9).

## (10) Length stability

Root	IPA	Gloss	Suffix	IPA	Gloss	Result	IPA	Gloss
<i>Aas</i>	'(ʔ)a:s	carrion	<i>Geier</i>	'gare	vulture	<i>Aasgeier</i>	'(ʔ)a:s - gare	vulture
			<i>-es</i>	əs	GEN	<i>Ases</i>	'(ʔ)a:zəs	vulture (GEN)
			<i>-en</i>	ən	VB	<i>Aasen</i>	'(ʔ)a:zen	(to) waste
<i>leb-</i>	'le:p	live	<i>Tag</i>	'ta:k	day	<i>Lebttag</i>	'le:ptak	life
			<i>-e</i>	ə	1ST.SG	<i>Lebe</i>	'le:bə	(I) live
			<i>-st</i>	st	2ND.SG	<i>Lebst</i>	'le:pst	(You) live
<i>Bett</i>	'bət	bed	<i>Decke</i>	'dekə	cover	<i>Bettdecke</i>	'bətdekə	blanket
			<i>-es</i>	əs	GEN	<i>Bettes</i>	'bətəs	(of the) bed
			<i>-en</i>	ən	VB	<i>Betten</i>	'bətən	(to) put to bed
<i>Eck</i>	'(ʔ)ək	corner	<i>Ball</i>	'bal	ball	<i>Eckball</i>	'(ʔ)əkbal	corner (football)
			<i>-e</i>	ə	PL	<i>Ecke</i>	'(ʔ)əkə	corners
			<i>-ig</i>	ɪç	ADJ	<i>Eckig</i>	'(ʔ)əkɪç	angular

This generalisation holds for the bigger part of the lexicon; however, I have to admit that there are some exceptions: those are the well-known ‘strong’ paradigms (‘starke Paradigmen’) which exhibit apparent regular length alternations (for instance: *geben* [gɛ:bə'n] ‘(to) give’ vs. *gibt* [gɪpt] ‘(he) gives’<sup>11</sup> or *schneiden* [ʃnaɪdən] ‘(to) cut’ vs. *Schnitt* [ʃnit] ‘(a) cut’). But these form a small subset of the lexicon, and they seem to be fully lexicalised (non-productive morphology).

If one leaves those strong forms apart, there is no real vowel length alternation in Modern German. So, as there is no alternation, why should one posit – like Wiese (1996) for instance – that, underlyingly, all vowels have the same length value (namely long), and that some of them (those which are phonetically short) undergo a shortening process because they stand in closed syllables? I have found no motivation for this.

Vowel length does not vary. If a consonantal suffix like *-st* ‘3RD.SG’ is added to a stem like *leb-* ['le:p] ‘(to) live’ which has a long vowel, the resulting structure still has a long vowel. One could think that long vowels occur freely in open as well as in closed syllables. However this generalisation does not work for monomorphemes, for which vowel length and (syllable) structure are closely related to each other (*finden* [fɪndən] ‘(to) find’ but \*[fi:ndən]). This is the reason why I have chosen to build a corpus of monomorphemic words, and to exclude – if possible – inflected and derived forms as well as compounds.

### 3.3 Final simply closed syllable: the \_\_ C # context

I will briefly go back to the dilemma first mentioned in 2.2.1: even though both vowels in *Fuß* [fu:s] ‘foot’ and *Nuss* [nʊs] ‘nut’ stand in a closed syllable, they do not have the same length. Why does the final consonant in *Nuss* behave as a ‘real’ coda (i.e. closes the preceding syllable, so that its vowel is short) contrary to the one in *Fuß* which does not trigger the shortness of the preceding vowel?

Everything is trouble-free if one looks at internal closed syllables, which always cause their vowel to be short. Why do final closed syllables behave differently as internal ones?

<sup>11</sup> Some speakers prefer [gi:pt] to [gɪpt], indicating that strong forms also obey the main rule.

Table (11) illustrates the four patterns that can be observed in closed syllables: short and long vowels in internal closed syllables, short vs. long vowels in final closed syllables.

(11) Internal vs. final closed syllables: \_\_ C . C vs. \_\_ C #

Syllabe		German	IPA	Gloss	Number	
a. Internal	i. Short	<i>finden</i>	'fɪndən	(to) find	3198 – 94,73 %	=> rule
		<i>halten</i>	'hɛltən	(to) hold		
	ii. Long	<i>Zierde</i>	'tsi:ɐdə	ornament	178 – 5,27 %	=> exception
		<i>husten</i>	'hu:stən	(to) cough		
b. Final	i. Short	<i>Nuss</i>	'nʊs	nut	<b>787 – 25,8 %</b>	=> <b>exception</b>
		<i>Bett</i>	'bɛt	bed		
	ii. Long	<i>Fuß</i>	'fu:s	foot	<b>2263 – 74,2 %</b>	=> <b>rule!</b>
		<i>Sieg</i>	'zi:k	victory		

Long vowels in internal closed syllables seem to be exceptional (only 5,27 % of the items containing a vowel in internal closed syllable). Furthermore, as stated in 2.2.1, forms like *Zierde* exhibit peculiar features which are mentioned in foot-note 6. On the contrary, long vowels in final closed syllables seem to be the normal case (more than 74 %). However, there is a great number of exceptions: 26 % of the words whose vowel precedes a final consonant exhibit a short vowel. One could say that final consonants do not count as codas, as does the extrasyllabic analysis. The remaining 26 %, which represent 787 forms, would count as 'exceptions'. But these cannot be left unaccounted for: if the /s/ in *Fuß* is extrasyllabic, so has to be the one in *Nuss*. And if the /s/ in *Nuss* is a coda, the final /s/ of *Fuss* also has to be<sup>12</sup>. Phonology has to account for this. Besides, the *a priori* specificity of German is that both patterns (final consonant as a coda vs. something else) seem to co-exist: usually, a given language only exhibits one of the two possibilities (homogeneous behaviour). In German, final consonants are 'schizophrenic': sometimes a coda, and sometimes nothing; sometimes triggering the shortness of the preceding vowel, sometimes not...

Furthermore, the reasons why those segments should be extrasyllabic have to be explained; and *if* it turns out that the only motivation for extrasyllabicity in the phonology of German is the need to give an account for vowel length distribution, it will be an obvious case of circularity, since vowel length defines the set of extrasyllabic consonants, which itself defines vowel length...

Final consonants do not generally behave as codas in German: most words (precisely 74,2 %) whose tonic vowel precedes a final consonant exhibit a long vowel.<sup>13</sup> Therefore I claim that (simple) final consonants are not codas in Standard German, and that the (at first sight simple) consonants that trigger the shortness of the preceding vowel are in fact (virtual) geminates.

<sup>12</sup> Otherwise, how can the underlying structure be constructed by an algorithm? The problem is, of course, avoided if the structure is present in the mental lexicon.

<sup>13</sup> In fact, an investigation shows that the exceptions to this generalisation either historically (in MHG or/and OHG) attested a geminate, or belong to the class of unstressable function words (prepositions, conjunctions etc).



## 3.4 Ambisyllabicity

As I mentioned in 2.2.2, a symmetrical problem exists word internally, in open syllables. As table (12) shows, both long and short vowels are found in this context. The problem is even worse: minimal pairs as those under (13) can be found.

(12) Vowel dilemma before an intervocalic (phonetically simple) consonant

a. Long vowel			b. Short vowel		
German	IPA	Gloss	German	IPA	Gloss
<i>haben</i>	'hɑ:bən	(to) have	<i>schrubben</i>	'ʃχʊbən	(to) rub
<i>Biene</i>	'bɪ:nə	bee	<i>können</i>	'kænən	can
<i>beten</i>	'bɛ:tən	(to) pray	<i>Ratte</i>	'ʁatə	rat
<i>Küken</i>	'ky:kən	chick	<i>backen</i>	'bakən	(to) bake
<i>hören</i>	'hø:ɾən	(to) hear	<i>schnorren</i>	'ʃnɔɾən	(to) pout
<i>Kugel</i>	'ku:gəl	ball, bowl	<i>Bagger</i>	'bægə	excavator
<i>Bogen</i>	'bɔ:gən	bow	<i>eggen</i>	'ɛgən	(to) harrow

(13) Minimal pairs

	a. Long vowel			b. Short vowel		
	German	IPA	Gloss	German	IPA	Gloss
1	<i>bieten</i>	'bɪ:tən	(to) offer	<i>bitten</i>	'bɪtən	(to) beg
2	<i>wider</i>	'vɪ:də	against	<i>Widder</i>	'vɪdə	ram
	<i>wieder</i>	'vɪ:də	again			
3	<i>beten</i>	'bɛ:tən	pray	<i>betten</i>	'bɛtən	(to) put to bed
4	<i>Sehne</i>	'sɛ:nə	rope	<i>Senne</i>	'sɛnə	alp
5	<i>stehlen</i>	'ʃtɛ:lən	(to) steal	<i>stellen</i>	'ʃtɛlən	(to) place
6	<i>zählen</i>	'tsɛ:lən	(to) count	<i>Zellen</i>	'tsɛlən	cell
7	<i>zehren</i>	'tsɛ:ɾən	(to) mine	<i>zerren</i>	'tsɛɾən	(to) pull
8	<i>fühlen</i>	'fy:lən	(to) feel	<i>füllen</i>	'fy:lən	(to) fill
9	<i>Hüte</i>	'hy:tə	hats	<i>Hütte</i>	'hɪtə	hut
10	<i>Höhle</i>	'hø:lə	cave	<i>Hölle</i>	'hœlə	hell
11	<i>Buhle</i>	'bu:lə	lover	<i>Bulle</i>	'bʊlə	bull
12	<i>spuken</i>	'ʃpu:kən	haunt	<i>spucken</i>	'ʃpʊkən	spit
13	<i>Ofen</i>	'(ʔ)ɔ:fən	oven	<i>offen</i>	'(ʔ)ɔfən	open
14	<i>Schote</i>	'ʃɔ:tə	pod	<i>Schotte</i>	'ʃɔtə	scottish
15	<i>wohnen</i>	'vɔ:nən	(to) live	<i>Wonnen</i>	'vɔnən	excitement
16	<i>Ahle</i>	'(ʔ)ɑ:lə	awl	<i>alle</i>	'(ʔ)alə	all
17	<i>fahre</i>	'fɑ:ɾə	drive (I)	<i>Farre</i>	'fɑɾə	young bull
18	<i>haaren</i>	'hɑ:ɾən	(to) lose one's hair	<i>harren</i>	'hɑɾən	(to) wait
19	<i>Haken</i>	'hɑ:kən	nail	<i>hacken</i>	'hakən	(to) chop (up)
20	<i>rate</i>	'ʁɑ:tə	(I) guess	<i>Ratte</i>	'ʁatə	rat

In order to eliminate the problem, it has been argued that the vowels in the words under (12b) and (13b) (but not (12a) and (13a)) are followed by an ambisyllabic consonant (see Hall 1992; Hall 2000; Ramers 1992; Vennemann 1982; Wiese 1986; Wiese 1996). This causes the preceding vowel to stand in a closed syllable, and allows it to be short.

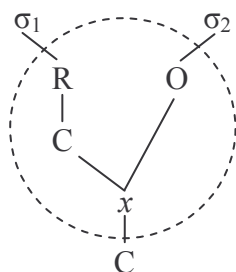
I would now like to underline five things, which suggest that there is no ambisyllabicity in German.

First of all, why should the [t] in *Hütte* [ˈhʏtə] ‘hut’ be ambisyllabic, contrary to the one in *Hüte* [ˈhy:tə] ‘hats’? There is no apparent reason for this, apart from the fact that it provides an explanation for the problem at hand. The difference between both /t/s has nothing to do with phonetics, syllabification, sonority principles or even with phonotactics (apart from vowel length distribution). So how can one know, how a /t/ has to be syllabified? Ambisyllabicity has no external justification: no argument in its favour can be found outside the world of vowel length. So on the one hand, theoretical assumptions concerning vowel length need the concept of ambisyllabicity (if it did not exist, how can the standard analysis in terms of syllable weight account for the words under (13b)?). On the other hand, however, ambisyllabicity is defined in accordance with the length of the preceding vowel. That is a circular analysis (see (15a)). These two remarks seem to indicate that ambisyllabicity is a lexical property; but, syllable structure is the product of an *algorithm*. So, how can it be lexical if it is constructed? The only reason for ambisyllabicity to exist in German is the following: it was the only ‘manipulation’ one could think of in order to defend / maintain the analysis in terms of syllable weight. But syllable weight in turn defines which segment has to be ambisyllabic. This hypothesis cannot be falsified.

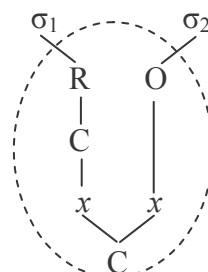
Furthermore, this concept can combine two ‘qualities’. It is a very ‘practical’ tool: as the consonant is linked to only one x-slot, it is phonetically short; on the other side, it belongs simultaneously to two syllables, which makes it structurally dual. Ambisyllabicity is a very convenient concept: it combines a *simple articulation* – which mirrors the phonetic reality – with a *complex structure*. Its complex structure provides a justification for the shortness of the preceding vowel. But if this hybrid object has the effect of two consonants, why don’t phonologists simply assume that ambisyllabics are in fact geminates (cf. (14b))? The answer is quite simple: because ambisyllabics *never* surface as *phonetic* geminates; and such an assumption would be considered as very ‘abstract’ (see (15b)).

(14) Ambisyllabic vs. geminate consonants

a. Ambisyllabic consonant



b. Geminate consonant





A third observation will be that even if ambisyllabics are coda consonants<sup>14</sup>, they are not affected by coda processes, such as devoicing, spirantisation or vocalisation. Their presence also prohibits compensatory lengthening (see (15c)). They seem to be immune to coda-processes. Those particular properties will remind the reader of a specificity of geminate consonants, which is known as ‘geminate inalterability’ or ‘geminate integrity’ (see Kenstowicz 1973, Hayes 1986, Schein 1986 or Selkirk 1991). This inalterability of ambisyllabic consonants is usually accounted for by a ‘Linking Constraint’ (as in Kahn 1976, Hayes 1986 or Wiese 1996) in standard analyses: every rule stipulation has to be interpreted as exhaustive, which means that coda processes only apply to consonants which are in coda position and *only in coda position*, i.e. not in onset position (‘Linking Constraint’, see Hayes 1986, or Hulst 1985). This formulation excludes clearly – and uniquely – ambisyllabic consonants. So why do phonologists not posit that those ambisyllabics are in fact (virtual) geminates – whose integrity is ‘famous’ – instead of creating a new structure which has no external justification and whose effects (shortness of the preceding vowel) and properties (integrity) are the same as those of geminates?

The fourth argument will be to say that most of the ambisyllabic consonants in New High German come from Middle High German geminates (see (15d)). I do not claim that vowels preceding ambisyllabics are short in NHG because the following consonants were true geminates in MHG. This would make no sense: NHG speakers do not usually speak MHG, so they do not know what MHG looked like. But the fact that those ambisyllabic consonants historically come from MHG geminates is a clue to their real identity: NHG ambisyllabic consonants are in fact virtual geminates (with a structure like the one under (14b)). ‘Virtually’ means that they are *phonologically* geminates, even if they never surface as such in NHG, at the phonetic level. This is however not surprising, because Modern Standard German does not have any geminate at the phonetic level.<sup>15</sup> They do not themselves reveal their identity (they are not long, contrary to ‘standard’ geminates), however their structure can be read on the preceding vowel, which is short.

The fifth and last clue to the identity of ambisyllabic consonants come from their graphic representation: every ambisyllabic consonant is written as a geminate (cf. (15e)). This is true for 83,5 % of the forms which contain an ambisyllabic consonant. The last 16,5 %, which do not have a graphic geminate, have something in common: in each item, the intervocalic consonant either is a complex grapheme (like <ch>, <sch>, <chs>), or represents a cluster (like <x> which stands for [ks]), which could be the reason why they are not graphically geminated. Once again, I do not claim that all graphic double consonants have a phonological / cognitive reality in every language; rather, that *in German* graphic forms are giving us clues to the identity of those consonants.

Table (15) provides a summary of the arguments mentioned above, and gives an illustration for each case.

<sup>14</sup> Every ambisyllabic consonant is associated, at its left, with the coda of the preceding syllable, even if the segment is only partly in coda position. Nevertheless it has coda effects on the preceding vowel, therefore it is also supposed to behave like a coda, i.e. to be affected by the four coda-processes mentioned below (cf. Wiese 1996 among others).

<sup>15</sup> The only geminates that German could have would be created by affixation. However, if a prefix like *-ab* /ab/ ‘dis-’ is added to base like *biegen* [ˈbi:gən] ‘(to) bow’, the resulting form will be *abbiegen* /ab+bi:gən/ [a**bi**:gən] ‘(to) turn’, with a simple consonant, and not \*[a**bbi**:gən].

## (15) Five arguments against ambisyllabicity

Observations	Examples	
a. No external motivation	<i>Miete</i> [ˈmi:tə] ‘rent’ vs. <i>Mitte</i> [ˈmɪtə] ‘middle’	
b. Effect (preceding vowel)	Same effects as clusters (preceding vowel = short)	<i>finden</i> [ˈfɪndən] ‘find’, <i>halten</i> [haltɪn] ‘(to) hold’, <i>bitten</i> [ˈbɪtən] ‘(to) please’, <i>Hammer</i> [hamɐ] ‘hammer’
c. No sensibility to coda processes	Devoicing:	<i>Rad</i> [t] "wheel" vs. <i>Bagger</i> [g] "excavator"
	/ʁ/-vocalisation:	<i>Herr</i> [ɐ] "Mister" vs. <i>Herren</i> [ɛ] "Misters"
	Comp. lengthening:	<i>Arzt</i> [ˈaːtst] "doctor" vs. <i>harren</i> [ɛ] "(to) wait"
	/g/-spirantisation:	<i>Honig</i> [ç] "honey" vs. <i>Knigge</i> [g] "savoir-vivre manual"
d. Origins	MHG geminates MHG clusters	NHG <i>Keller</i> ‘cave’ < MHG <i>keller</i> NHG <i>Zimmer</i> ‘room’ < MHG <i>zimber</i>
e. Graphic form	NHG ambisyllabics are written as geminates	<i>Stimme</i> ‘voice’, <i>Nonne</i> ‘nun’, <i>Kasse</i> ‘cash-box’, <i>Acker</i> ‘field’, <i>Rippe</i> ‘rib’

Before I start to discuss the relationship that exists between consonantal voicing and vowel length, I would like to draw attention on something interesting.

Let me go back to the ambisyllabic hypothesis. Contrary to the virtual geminate analysis, ambisyllabicity is unable to account for the ambiguous length distribution in final closed syllables. Clearly, ambisyllabicity cannot be used in this context: how could the /ʁ/ in *klar* ‘clear’ or in *narr* ‘dumb’ be ambisyllabic, since the words are isolated and monosyllabic?<sup>16</sup> The final consonant cannot be linked to a following syllable since there is none. However, if ambisyllabics are in fact geminates, they *can* occur *both* word-internally *and* word-finally. The virtual geminate hypothesis consists in saying that:

- a. first, short vowels are followed by geminates (coda-onset word-internally, and complex coda clusters word-finally) whereas long ones precede simple consonants (both word-internally and word-finally);
- b. second, that final (simple) consonants are *not* codas (in German), but something else (onsets) or even nothing.
- c. of course, there is no need of a synchronic ‘gemination rule’: consonants are *lexically* long or short.
- d. and consonantal length defines vowel length, not the contrary.

### 3.5 Voice value and its relationship with the length of the preceding vowel

This (last) part of the section will be devoted to a new comer in German phonology: the relationship that obviously exists between consonantal voicing and vowel length in German. If one considers the (monomorphemic) lexicon of the language, and looks at surface forms only (i.e. in pre-theoretical terms, forgetting the ambisyllabicity hypothesis), the following table can be established:

<sup>16</sup> However, it has been argued that final consonants could be ambisyllabic in Swets (2004). She presents an analysis of Tilburg Dutch in which she includes such a hypothesis, but her ‘final ambisyllabic’ consonants are similar to the virtual geminates I propose for German, i.e. one melodic segment linked to two skeletal slots.

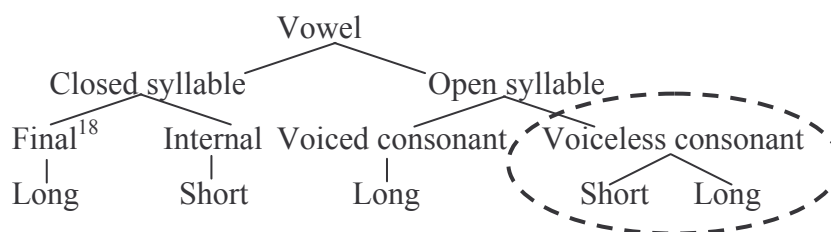
## (16) Intervocalic consonants preceded by a short (tonic) vowel

Type of Consonant	Type of word	Words	IPA	Gloss	Number	%
a. Voiced obstruent	Native	<i>Roggen</i>	'ʁɔgən	rye	10 – 8,85 %	0,72
	Loan	<i>Bagger</i>	'bagə	excavator	103 – 91,15 %	7,37
b. Voiceless obstruent	Native	<i>messen</i>	'mɛ.sən	measure	346 – 44,59 %	24,77
	Loan	<i>Office</i>	'ɔfɪs	office	430 – 55,41 %	30,78
c. Sonorant	Native	<i>Finne</i>	'fɪnə	fin	225 – 46,11 %	16,11
	Loan	<i>Barrel</i>	'bɑɪəl	barrel	263 – 53,89 %	18,33

As is shown in table (16a), less than 9 % (only 113 forms) of German's ambisyllabic consonants are voiced obstruents. In addition, most of the items which contain a voiced ambisyllabic obstruent appear to be loan words (103). A closer look at table (16) shows that only 10 of them are native forms. In sum, among all the forms that contain an ambisyllabic consonant, only 0,72 % are native words which exhibit a voiced obstruent. So, if those 10 words are let apart, German does not have any native voiced ambisyllabic obstruent. In other words, only sonorants and voiceless obstruents can be ambisyllabic. Why is that so? If ambisyllabicity is a predictable structure, why cannot voiced obstruents be ambisyllabic? If only voiceless obstruents and sonorants can be ambisyllabic, phonology has to account for it.

Going back to the vowels, it means that voiced obstruents always follow a long vowel (and are never preceded by a short vowel), whereas both long and short vowels are allowed before a voiceless consonant: whereas /ʊtV/ and /u:tV/ and /u:d(V)/ are attested (in *Mutter* ['mʊtɐ] 'mother', *Stute* ['ʃtu:tə] 'mare' and *Bude* ['bu:də] 'hut'), \*/ʊdV/ is not (\**Mudde* \*['mʊdə]).<sup>17</sup> There seems to be a relationship between the voice value of the consonant and the length of the vowel that precedes it. (17) provides a (provisory) concluding algorithm which can account for vowel length distribution in German (from a synchronic point of view).

## (17) Vowel length algorithm (surface forms; synchrony)



<sup>17</sup> As an anonymous reviewer noticed, *Widder* ['wɪdɐ] 'ram' exhibits such a pattern: it is one of the 123 exceptions that still survive...

<sup>18</sup> 'Final consonants' just refer to simple absolute final consonants. Final geminates pattern together with consonant clusters.

### 3.6 Conclusion

In this third section, I have listed some problems that exist in the standard analysis of vowel length distribution in German: the role of stress (which is often forgotten), the status of vowel length distinction (process vs. lexical property), the ambiguity of the \_\_ C # context, the problems that arise in the \_\_ C V environment and the relation between voicing and length.

The main problem of this last section was: why do the phonology of German need ambisyllabicity, and what are the limits of this concept? The answer to the first part of the question is not satisfying: ambisyllabicity has been proposed for German in order to explain vowel length distribution without using abstract concepts such as ‘phonetically simple (i.e. virtual) geminate’, which is also at first sight paradoxal.

As I tried to find out what the limits of this concept were, several things emerged:

(18)

- a. Ambisyllabicity has no external motivation (cf. (15a))
- b. Ambisyllabic consonants have the same effects as heterosyllabic clusters on the preceding vowel (they trigger its shortness) (cf. (15b))
- c. They are *never* affected by coda processes (cf. (15c))
- d. They come (most of them) from Middle High German geminates (cf. (15d))
- e. They are written as geminates in Modern Standard German (cf. (15e))

All those elements indicate that ambisyllabics are in fact phonological geminates (at least in German). These geminates never surface as such at the phonetic level because they are ‘forbidden’ in German. This idea – i.e. that ambisyllabic consonants have to be represented as geminate – is not new: it has already been proposed for Dutch for instance, in order to account for a very similar problem (Dutch short and long vowels are distributed in the same way as in German, see Van der Hulst 1985, Van der Hulst & Smith 1982). Van der Hulst underlines the fact that ambisyllabicity also involves an ‘improper bracketing’, which is inconvenient. The intervocalic consonant belongs simultaneously to two syllables: where should the syllable break be placed? He also concedes that if one posits that so-called ambisyllabic consonants are in fact geminates, the only claim one has to make is that geminates do ‘not receive the same interpretation in all languages’ (p. 61): *phonological* geminates are also *phonetic* geminates in Italian for instance, but it does not have to be the case in German, English and Dutch.

The last point I will repeat before I introduce another way to account for the German data, is that ambisyllabicity is unable to account for the *a priori* curious vowel length distribution in the \_\_ C # context, whereas, as mentioned in 3.4, the geminate alternative can provide an explanation for it.

#### 4. What the facts show – another analysis

Since the ambisyllabic analysis fails to account for German vowel length distribution, one can wonder where the problem precisely is. And the question which has – logically – to be asked,

and whose answer could be the key of the problem, is: where do ambisyllabic consonants come from?

The neo-grammarians approach was to say that modern ambisyllabics have three origins (see Burghauer 1891, Mettke 1993, Paul 1884, Paul et al. 1998). They come either (a) from an OHG / MHG cluster, or (b) from an OHG / MHG geminate, or (c) from simple consonants followed by certain endings (-er, -el, -en, -em), which are supposed to have (diachronically) triggered the shortness of the preceding vowel.<sup>19</sup> Examples are given under (19a.ii).<sup>20</sup>

(19) Ambisyllabicity: the origins

	Type	NHG	MHG	API	Gloss	Structure
a. Expected behaviour	i. NHG long	<i>du</i>	<i>dû</i>	'du:	You	F OS
		<i>froh</i>	<i>vrô</i>	'fχo:	Happy	
		<i>Biene</i>	<i>bine</i>	'bi:ne	Bee	I OS
		<i>Beere</i>	<i>bere</i>	'bɛ:ʁə	Berry	
	ii. NHG short	<i>Zimmer</i>	<i>zimber</i>	'tsmɐ	Room	I CS (cluster)
		<i>Imme</i>	<i>impe</i>	'mɛ	Bee	
		<i>Keller</i>	<i>keller</i>	'kɛlɐ	Cave	I CS (geminate)
		<i>Löffel</i>	<i>leffel</i>	'lœfəl	Spoon	
		<i>Koppel</i>	<i>kopel</i>	'kœpəl	Enclosure	I OS + /-el/
		<i>Zettel</i>	<i>zetel</i>	'tsɛtəl	Message	
		<i>Mutter</i>	<i>muoter</i>	'mʊtɐ	Mother	I OS + /-er/
		<i>immer</i>	<i>iemer</i>	'mɛ	Always	
		<i>müssen</i>	<i>müeZen</i>	'mʏsən	Must	I OS + /-en/
<i>Waffe</i>	<i>wâfen</i>	'vafə	Weapon			
b. Problems	i. NHG long	<i>haben</i>	<i>haben</i>	'hɑ:bən	(to) have	I OS + /-en/
		<i>Vater</i>	<i>vater</i>	'fɑ:tɐ	Father	I OS + /-er/
		<i>Hagel</i>	<i>hagel</i>	'hɑ:gəl	Hail	I OS + /-el/
	ii. NHG short	<i>Mitte</i>	<i>mite</i>	'mɪtə	Rent	I OS without any /-er/, /-el/, /-en/, /-em/
		<i>Granne</i>	<i>grane</i>	'gʁənə	Beard	
		<i>Wette</i>	<i>wete</i>	'wɛtə	bet(ting)	

In order to improve this diachronic analysis, I have added historical facts to the initial corpus: whenever possible (i.e. when they were available and for native words only), both Middle High and Old High German forms have been inserted.

It is a fact that most ambisyllabic consonants come from MHG / OHG clusters or geminates (see (19a.ii)). However, it appears that the generalisation (c) does not hold. If -er, -el, -en, and -em had triggered the shortness of the preceding vowel, words with a -er, -el, -en, or -em ending and a long (tonic) vowel should not exist; but they do (cf. (19b.i)). Vice-versa, words having anything but -er, -el, -en or -em in the post-tonic syllable should exhibit long (tonic) vowels, which is not the case either. ((19b.ii) gives a sample of forms whose vowels – short in NHG – were not followed by a syllable containing a relevant -er, -el, -en, or -em in MHG).

<sup>19</sup> 'Shortness' refers either to the fact that MHG long vowels have shortened or to the fact that MHG short vowels have not lengthened.

<sup>20</sup> In the last column of table (19), I use the following abbreviations: I stands for 'internal', F for 'final', CS for 'closed syllable' and OS for 'open syllable'.

I will leave the words in (19b.i) aside for the moment. What do the forms in (19a.ii) and (19b.ii) have in common? The answer is quite simple: in each case, the tonic vowel stands before an open syllable containing a schwa <e> [ə]. So it seems that the context (c) must be extended to the simple presence of schwa. Schwa is not a ‘normal’ vowel, as it cannot allow the preceding vowel to lengthen / remain long (the preceding vowel is short in NHG). If a tonic vowel stands in an open syllable preceding schwa, it is as if it were standing in a closed syllable. (20) opposes schwa to the other so-called ‘full’ vowels:

(20) Schwa vs. full vowel<sup>21</sup>

Following vowel	NHG	MHG	IPA	Gloss
a. Full vowel	<i>Brezel</i>	<i>brêzile</i>	ˈbʁe:tsəl	pretzel
	<i>Monat</i>	<i>mânô</i>	ˈmo:nat	month
	<i>Zwiebel</i>	<i>zwibolle</i>	ˈtʃvi:bəl	onion
b. Schwa	<i>immer</i>	<i>i(e)mer</i>	ˈimɐ	always
	<i>Rippe</i>	<i>ribe</i>	ˈʁɪpə	rib
	<i>Mutter</i>	<i>muoter</i>	ˈmutɐ	mother

(20) illustrates the fact that whereas full vowels allow the preceding vowel to be long in NHG (cf. (20a)), schwa does not (cf. (20b)). Hence the diachronic disjunction under (21): vowels are short in NHG if they were in a closed syllable in MHG, or in an open syllable followed by schwa.

## (21) Diachronic disjunction

$$V / \_ \left\{ \begin{array}{l} CC\# \\ C.CV \\ .C \text{ schwa} \end{array} \right\}^{22}$$

Schwa and nothing are the same. This disjunction has already been identified for German and Dutch, concerning the distribution of the velar nasal (see for instance Vennemann 1970 for German, Oostendorp 1995 and Trommelen 1983 for Dutch).<sup>23</sup>

This idea provides a way to account for (19a.ii) and (19b.ii). However, one problem still exists: what can be done with the (19b.i) class, which exposes words which have a long vowel, even though the following syllable contains a schwa? It appears that the words of this group (almost) all have a voiced intervocalic consonant. This could be pure coincidence. But in fact, the presence of a voiced consonant triggers the length of the preceding vowel (cf. (22)): only the words whose intervocalic consonant is voiceless in MHG can have a short vowel in NHG. To be more explicit, the presence of a voiceless consonant causes the preceding vowel to be short.

<sup>21</sup> It is however hard to make such a comparison, since NHG does not exhibit a lots of full vowels in stressless positions: in this precise environment, (almost) all vowels have already been reduced to schwa between OHG and MHG.

<sup>22</sup> V stands here for ‘short vowel’.

<sup>23</sup> I would have liked to show how it is possible to account for this, but I have no time to do it here.



## (22) Voicing and length

	Vowel length	Context	Voiced consonants				
			MHG	NHG	IPA	Gloss	Nber
a. Voiced consonants	i. Long	Final: __ C #	<i>ra/d/</i>	<i>Rad</i>	'ʁa:t	wheel	90
			<i>bahn</i>	<i>Bahn</i>	'ba:n	way	263
		Internal: __ C V	<i>sagen</i>	<i>sagen</i>	'za:gən	(to) say	397
			<i> hoeren</i>	<i>hören</i>	'høʁən	(to) hear	295
	ii. Short	Final: __ C #	<i>ha/b/</i>	<i>Haff</i>	'haf	lagoon	11
			<i>vol</i>	<i>voll</i>	'fəl	full	53
Internal: __ C V		<i>fluoder</i>	<i>Flunder</i>	'flundə	halibut	31	
		<i>teler</i>	<i>Teller</i>	'tɛlə	plate	90	
b. Voiceless consonants	i. Long	Final: __ C #	<i>ûf</i>	<i>auf</i>	'(?)auf	on	164
			<i>hof</i>	<i>Hof</i>	'ho:f	yard	
		Internal: __ C V	<i>itel</i>	<i>eitel</i>	'(?)aitəl	conceited	224
			<i>floeßen</i>	<i>flößen</i>	'flø:sən	(to) carry	
	ii. Short	Final: __ C #	<i>blat</i>	<i>Blatt</i>	'blat	sheet of paper	123
			<i>vluZ</i>	<i>Fluss</i>	'flus	river	
Internal: __ C V		<i>betelen</i>	<i>betteln</i>	'betəlɪn	(to) beg for	102	
		<i>lâZen</i>	<i>lassen</i>	'lasən	(to) let		

The items under (19b.i), which have a long vowel followed by a voiceless intervocalic consonant, and which do not conform to the generalisation made above, exhibit some special features. They:

- (23)
- a. either contain(ed) a diphthong (in NHG or in MHG), which, as shown in Caratini (2005), has to be treated separately from (long) monophthongs (MHG *itel*, *koufen*, *miete* > NHG *eitel* ['aitəl] 'conceited', *kaufen* ['kaufən] '(to) buy', *Miete* ['mi:tə] 'rent')
  - or b. had <h> as intervocalic consonant, but <h> has been lost between MHG and NHG (MHG *truhe* > NHG *Truhe* ['tχu:ə] 'chest')
  - or c. underwent a voice value change of the intervocalic consonant between MHG and NHG (MHG *kemenade* > NHG *Kemenate* [kemena:tə] 'attic room')
  - or d. have lost a final schwa, which placed the preceding vowel in a context where it has to be long ( \_\_ C #, cf. 3.3): MHD *geroete* > NHD *Gerät* [ge're:t] 'equipment'
  - e. Words like NHG *Vater* (< MHG *vater*) 'father' are not numerous (123, i.e. 3,17 % of the corpus, see Caratini 2005:605 for the complete list), but still have to be considered as exceptions.

The idea that the voicing of a consonant has an influence on the length of the preceding vowel is new in the phonology of German. However, it has already been mentioned in phonological analyses of Polish (see Scheer 2004), of Italian (Baroni & Vanelli 2000), and also, in *phonetic* descriptions of Norwegian, French or German (see Fintoft 1961 and Chen 1970 among





- (25)
- a. The place of stress: stressed vowels can be long but unstressed vowels cannot
  - b. The structure of the syllable which contains the vowel (open vs. closed)
  - c. The position of the syllable in the word (final vs. internal)
  - d. The identity of the following vowel (if applicable): full vowels trigger the length of the preceding vowel whereas schwa triggers its shortness
  - e. The voice value of the following (intervocalic) consonant (if applicable)<sup>25</sup>

In native items, stress is a lexical property – not something that can be derived synchronically – which alone is able to ‘allow’ vowels to be long: length is not possible without stress in German. In order to predict vowel length, one also has to know the structure of the (tonic) syllable: in closed syllables, vowels are short, whereas in open (tonic only) syllables vowels are long; length not being a derived but a lexical property of roots. As stated in (25c), one also needs to know the position of the syllable in the word: internal coda consonants are ‘real’ codas, whereas final (simple) consonants are never codas in German. The next important thing which has to be taken into account is the nature of the following vowel: full vowels allow the preceding vowel to be long, whereas schwa does not (it is always preceded by a short vowel). Of course, the voice value of a post-tonic intervocalic consonant is also very significant, since voicelessness triggers the shortness of the preceding vowel; and symmetrically, voiced obstruents are always preceded by long vowels.

I have to admit that there are still some exceptions to these generalisations, but only 123 items are left unaccounted for (see Caratini 2005:605 for the complete list). And even if they are a very small part of the corpus used in this work, they will have to be explained. I have briefly mentioned that diphthongs are a special object, and that it was the main cause of irregularities (MHG diphthongs never shorten, whatever the context in which they occurred). Therefore, NHG has diphthongs in internal closed syllables (e.g. NHG *seufzen* ‘(to) sigh’). However, I don’t know yet how to account for this, but I assume it must be due to the structural peculiarities of German diphthongs. The most curious thing is that this property is shared by NHG, MHG diphthongs on the one side and by one OHG diphthong on the other (namely <iu>). But OHG <iu> is supposed to correspond to a monophthong in MHG (cf. Paul & Al. 1998, Braune & Reiffenstein 2004). This monophthong seems however to have kept its diphthong ‘integrity-property’ (resistance to shortening) anyway.

A second point which remains to be explained is: why do voiced consonants have an influence on the length of the preceding vowel, and how does it precisely work? Even if this has already been noticed before, no *phonological* explanation has been given.

The third idea which also has to be studied is the status of schwa, and the representation it has to be conferred, given its special behaviour, in German as well as in other languages (Dutch, French...).

The last, and perhaps the most tempting project, will be to check if the prediction that ambisyllabic consonants are in fact geminates can be confirmed by a study of the dialects of German; and to try to apply this kind of analysis to other languages which exhibit similar length alternations (Dutch, maybe Norwegian, for instance...).

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<sup>25</sup> It is for instance a fact that, in German, the behaviour of strong verbs of the I and II classes can be accounted for using this voice-length correlation. Classes Ia and IIa exhibit a short vowel followed by a voiceless consonant (cf. *reiten* [aɪ] – *ritt* [ɪ] – *geritten* [ɪ] ‘(to) ride’ – ‘rode’ – ‘riden’ and *fließen* [i:] – *floss* [ɔ] – *geflossen* [ɔ] ‘(to) run (water)’ – ‘ran’ – ‘run’) in preterit forms and for the past participle, whereas verbs of the Ib and IIb class have a voiced consonant preceded by a long vowel (cf. *bleiben* [aɪ] – *blieb* [i:] – *geblieben* [i:] ‘(to) stay’ – ‘stayed’ – ‘stayed (past participle)’ and *biegen* [i:] – *bog* [o:] – *gebogen* [o:] ‘(to) bend’ – ‘bent’ – ‘bent (past participle)’).

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# Reducing computation at the interface with the Sensory-Motor Systems

## A derivational approach to (Chain) linearization

Gerardo Fernández-Salgueiro

In this paper I develop a derivational approach to linearization under a (version of the) level-free derivational approach to syntactic relations (Epstein et al. 1998; Epstein & Seely 2002, 2006). The approach I propose here differs from most approaches to linearization in that it does not rely on Kayne's (1994) Linear Correspondence Axiom (LCA), but rather on a more intrinsic property of the derivation, i.e., *order of Merge operations*. I will also illustrate some consequences of this approach for the linearization of chains, by taking Nunes's (1999, 2004) theory as a starting point.

### 1. Goals and outline

Most approaches to linearization in early minimalism (e.g., Chomsky 1995; Guimarães 1998; Nunes 1999, 2004; Richards 2001) rely on Kayne's (1994) notion of asymmetric c-command, a syntactic relation that is defined based on the representation of a tree structure, not on the step-by-step nature of the derivation. These approaches, therefore, independently of their internal coherence and/or predictive power, cannot be considered derivational, because they make use of Kayne's Linear Correspondence Axiom, which is clearly a representational notion (since it is in turn based on asymmetric c-command).<sup>1</sup> Richards (2001:2), for example, writes:

“I will assume that linearization is accomplished via Kayne's (1994) LCA. Spell-Out considers the set **A** of pairs of asymmetrically c-commanding XPs and X<sup>0</sup>'s *in the tree which the syntax gives it*, and generates from this a set of instructions for linearization.” (my emphasis, GF-S)

Similarly, Nunes (2004: 44), writes:

“[...] the operation *Linearize*, which I take to be the procedure that maps *a given syntactic structure into a sequence of terminals*, in compliance with the LCA.” (my emphasis, GF-S)

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<sup>1</sup> Notice that this is not a critique of Kayne's LCA itself, which is perfectly legitimate under a representational approach.

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As can be seen in these two quotes, it is assumed that Spell-Out/Linearize can generate a sequence of terminals by inspecting a syntactic tree and applying the LCA to it.

Another good example of how representational notions are used for linearization purposes is the following paragraph by Chomsky (1995: 340):

“The lowest  $Z$  that dominates  $q$  and  $m_1$  is  $L$ , which also dominates  $[m_2, m_1]$ . Therefore,  $q$  and  $[m_2, m_1]$  asymmetrically c-command  $r$  and  $S$ , however we interpret “disconnected”. What are the c-command relations within  $[m_2, m_1]$ ? As noted,  $m_1$  does not c-command anything.”

In sum, these approaches crucially depend on a *representation* of the hierarchical structure of a sentence.

More recently, there have also been several attempts to build derivational models of linearization, like Epstein et al. (1998) (see also Epstein and Seely 2002); Uriagereka 1999 and Pesetsky & Fox (to appear), which I discuss below.<sup>2</sup> Following this derivational trend, I am going to argue in this paper that the derivational property that the system uses to yield ordered strings of Lexical Items is *access to the order of application of Merge*, rather than (*asymmetric*) *c-command relations*, and explore the main consequences of such an approach.

The remainder of this paper is organized as follows: in section 2, I discuss the properties of the architecture of a level-free derivational syntax that I am assuming here. In section 3, I discuss the implications of assuming that it is order of application of Merge, rather than c-command, that yields linear order. In section 4, I formalize the approach I am developing here, and in section 5 I discuss the consequences of this approach for the linearization of Chains, which will also help understand what the differences might be between a representational and a derivational system. Finally, section is devoted to the conclusions and questions for further research.

## 2. *The architecture of a level-free syntax and departures from it*

### 2.1. *Interpretation of features at the interfaces*

Following the main ideas of Epstein et al. (1998), I am assuming here an architecture where there are no levels of representation (i.e., no PF or LF), and so the way that the Sensory-Motor Systems (SMS) and the Systems Of Thought (SOT) interpret the features on Lexical Items is by accessing the information provided by each Merge (or Move) operation. This is one of the fundamental distinctions between this approach and Chomsky’s (1995) early minimalism approach; the syntax does not provide the performance systems with a specific level of representation for them to interpret. Under this approach, the performance systems actually “look into” the operations that occur in a derivation and extract from such inspection the information that is relevant to them.

The question that immediately arises is *when* this information is accessed and *what kind of information* present in Merge can be accessed. Epstein et al.’s answer to this question is that *each* operation of Merge provides an instruction to the performance systems SOT and SMS when it applies. Let us refer to this as the *online* approach to interpretation.

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<sup>2</sup> Pesetsky and Fox (to appear) discuss different predictions that can be made by examining the output of linearization and the point(s) of the derivation where linearization applies. Their proposal does not commit to a specific approach to the mechanisms that underlie linearization.



We could also imagine an approach where that information is accessed by the performance systems at the end of the derivation. Let us call this hypothesis the *end-of-the-line* approach to interpretation. Notice that this *end-of-the-line* approach is different from the standard weak derivational approach of early minimalism with levels of representation LF and PF (Chomsky 1995) in that the performance systems still access the information provided by *each operation* of Merge, rather than the *structure* created by Merge (recall the quotes from section 1 above).

The table in (1) below illustrates four different possibilities, based on when the performance systems access the derivation (on-line vs. end-of-the-line) and whether there levels of representation or not (derivational vs. representational). Chomsky's (1995) early minimalist approach would be both *representational* and *end-of-the-line*. Conversely, the derivational approach of Epstein et al. (1998) would be *derivational* and *online*.

(1)

	<b>On-line</b>	<b>End-of-the-line</b>
<b>Derivational (No PF or LF)</b>	Output of each Merge	Output of each Merge
<b>Representational (PF &amp; LF)</b>	Not Possible	Tree structure created by Merge

## 2.2. Minimizing Bare Output Conditions

One of the foundational assumptions in the Minimalist Program is that SOT and SMS impose different Bare Output Conditions on the design of the Faculty of Language: SOT impose *hierarchy* and SMS impose *linearity*, and these conditions are understood to shape the way in which the Faculty of Language is designed; the Faculty of Language creates hierarchical structures through Merge, so that SOT can interpret the semantics of a derivation and then linearization applies to that hierarchical structure in order to provide a linear order of terminals that SMS can interpret.

Here I make an even more fundamental assumption about Bare Output Conditions: SOT require features with information about *meaning* and SMS require features with information about *sound*.<sup>3</sup> Accordingly, Lexical Items (and ultimately, linguistic expressions) display Semantic Features and Phonological Features (PhonFs).<sup>4</sup> The hierarchical and linear properties that linguistic expressions display are a consequence of the way the features of Lexical Items are manipulated by the computational system of FL, rather than Bare Output Conditions imposed by the interfaces.

This computational system takes Lexical Items and phrases (i.e., syntactic objects) and puts them together in the simplest way possible, in accordance with minimalist assumptions, by means of the operation Merge. I am assuming Merge cannot apply freely and there are actually two fundamental ways in which Merge is constrained:

<sup>3</sup> Notice that linearity/sound and hierarchy/meaning are *not* necessary correlations under 'virtual conceptual necessity', so we should aim at explaining/deducing them.

<sup>4</sup> Lexical Items also display Formal Features, such as Case Fs. Here I follow Nunes (1999, 2004) in assuming that Case Fs are not interpretable by any of the interfaces, and the syntax has to get rid of them in order for the derivation to be interpreted at the interfaces.

First, Merge is binary; it takes two syntactic objects and puts them together to form a larger unit.<sup>5</sup>

Second, Merge cannot apply freely (see Frampton & Guttman 2002; Collins 2002); in order for Merge to apply, one of the syntactic objects has to select the other. Accordingly, Lexical Items display Selectional Features (SelFs) by means of which one LI requires another LI or phrase to merge with it, and these SelFs are semantic in nature.<sup>6</sup> Verbs, for example, need to merge with a phrase that will be interpreted as its argument, a quantifier may select another phrase (like a PP or a relative clause) to function as its restrictor, etc.

PhonFs, conversely, never drive a Merge operation, which suggests that PhonFs are not relevant when Merge applies.<sup>7</sup>

### 2.3. Interpreting Merge

Given the above considerations about the nature of Merge, I would like to put forward the following hypothesis:

- (2) SOT interpret Merge operations when they apply (*online* approach); SMS interpret Merge operations at the end of the derivation (*end-of-the-line* approach).

If Merge applies in order to satisfy SelFs, which are semantic in nature, as I argued in the previous section, it makes sense to say that a given operation of Merge is interpreted by SOT at that point. Moreover, if Merge applies to two syntactic objects and this operation is interpreted by SOT when it applies, hierarchy in the grammar turns out to be the by-product of successive applications of (binary) Merge interpreted one by one by SOT. Under this view, hierarchy would no longer be a primitive, that is, a Bare Output Condition imposed by SOT.

There is also another reason for preferring this *online* approach to semantic interpretation. One of the features of human language is its constituency structure, which is defined on syntactic trees on the basis of dominance relations. This is clearly a *formal* definition of constituency structure, which cannot be maintained under a derivational approach, due to its representational nature. However, under the derivational approach we can adopt a *substantive* definition of constituency, which is based on the way that Semantic features are incrementally interpreted by the SOT interface.

To illustrate this, consider the beginning of the derivation for a sentence like *I love these movies*:

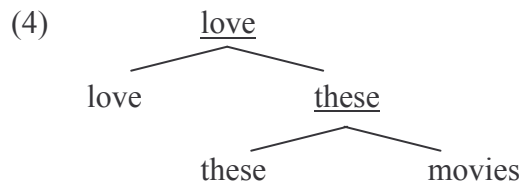
(3) <u>Merge Operation</u>	<u>Output of Merge</u>	<u>SOT interpretation</u>
1. (these, movies)⇒	{these, movies}⇒	[these movies]
2. (love, {these, movies})⇒	{love, {these, movies}}⇒	[love [these movies]]

Consider also a representational counterpart of (3). In this case, we would say that the following syntactic tree is created at step 2 above:

<sup>5</sup> I am abstracting away here from whether Merge also provides the output of the operation with a label, based on one of the syntactic objects that are merged (see Collins 2002).

<sup>6</sup> Sometimes Merge is also required by Formal Features, as in the case of functional heads.

<sup>7</sup> At most, PhonFs may require adjunction operations, as in the case of morphological requirements like stranded affixes, but they never drive Merge operations.



The hierarchical information that the tree in (4) provides is that [these movies] is a constituent and so is [love [these movies]], and also that [love movies] and [love these] are *not* constituents. Notice that in order to know this we need the representation of the syntactic tree and also an axiom that determines that *two or more elements form a constituent iff there is one node  $\alpha$  such that those and only those elements are dominated by  $\alpha$* .

Conversely, notice that given (3) above, the same predictions can be made by just considering what SOT *has* and *has not* interpreted. We do not need a syntactic tree, nor do we need an axiom that defines what counts and does not count as a constituent. We could state this derivational, interface-based definition of constituency as in (5) below:

- (5) A given set of Lexical Items  $\Sigma = \{LI_1, LI_2 \dots LI_n\}$  forms a constituent iff at some point in a derivation the Semantic features of only the Lexical Items in that set  $\Sigma$  have been interpreted by SOT.

As for SMS, recall that PhonFs never drive a Merge operation, as argued in the previous section. There are other types of operations that are related to sets of PhonFs, like morphological processes, although they are not restricted by constituency structure in the same way that syntactic operations are. All I am claiming here is that two or more Lexical Items (or rather, their PhonFs) do not need to form a constituent at all in order for some morpho-phonological operation to apply to them. Actually, adjacency seems to be a requirement, instead. “*Wanna* contraction”, for example, has applied to *want* and *to* in the sentence in (6) below although *want* and *to* were not merged together at any point:

- (6) I want to eat a sandwich  $\Rightarrow$  I wanna eat a sandwich  
 Merge Operations: Merge<sub>1</sub> (a, sandwich), Merge<sub>2</sub> (eat, {a, sandwich}), Merge<sub>3</sub> (to, {eat, {a, sandwich}}), Merge<sub>4</sub> (want, {to, {eat, {a, sandwich}}}) ...  
 (notice: no Merge<sub>n</sub> (want, to))

I am assuming here that, unlike SOT, SMS interprets the PhonFs of Lexical Items at the end of the derivation (recall the end-of-the-line approach). Notice how this relates to the central assumption in the Distributed Morphology framework (Halle & Marantz 1993) that PhonFs are inserted at the end of the derivation (i.e., late insertion). It also resembles the architecture proposed by Groat and O’Neil (1996) in which Spell-Out applies at the LF interface, that is, at the end of the derivation.

An important question that arises under this level-free approach is the status of Full Interpretation (FI), as a condition on the interfaces.<sup>8</sup> To the extent that the hypothesis about SOT-related information above is on the right track, FI seems to be restricted to SMS. If indeed SOT interprets the derivation as it proceeds, then some uninterpretable Feature on an LI, say Case-F on a DP, would make the output of the operation of Merge not interpretable.

<sup>8</sup> Notice that FI cannot be formulated as a condition on LF or PF representations, under this level-free approach.



Under this strong derivational approach to syntactic relations, then, it does not make sense to assume that FI holds for SOT. Conversely, it is widely assumed (see Chomsky 1995, 2000; Uriagereka 1998; Nunes 1999, 2004 and others) that dislocation is related to uninterpretable Fs (Case Fs on DPs for instance). If this is true, then FI seems to be relevant for SMS in the sense that only Lexical Items with just PhonFs can be interpreted. I return to the important relation between SMS and FI in section 5.

### 3. *Linear order derived from order of Merge*

Given the architectural assumptions made in the previous sections, I would like to propose the following linearization algorithm:

- (7) SMS interpret (the PhonFs of) Lexical Items in the opposite order in which Merge operations inserted them in the derivation.

Assuming (7), we can say that the linear order that a given expression displays is directly related to the order in which Lexical Items entered the derivation and not to the structural relations that hold among them. A welcome result of this approach is that it eliminates all the computation that applying Kayne's LCA to a syntactic tree involves. This is illustrated more clearly in section 5 below, when I discuss linearization of Chains.

An important question that arises under this strong derivational approach is: how is the information about order of Merge retained (Acrisio Pires, p.c.)? I consider three possibilities here:

(a) We can assume that the syntax is purely derivational and there is no representation of syntactic structure at all. If this is the case we would need the order of Merge operations, i.e., the information about what LI merged when, to be retained by some other mechanism. Under this view, there would be a separate component of the grammar that would have stack-like properties, Lexical Items would be pushed into a stack and then they would be interpreted "backwards" by SMS. While positing such a component would require justification, a very attractive property of this approach is that it would explain why Lexical Items are pronounced in the opposite order in which they enter the derivation. That would be the way in which Linearization works simply because the procedure has the standard and expected computational properties of stack-based algorithms in general.

(b) We can weaken the derivational approach and say that there actually is representation of syntactic structure, and the syntax makes use of it, but the interfaces can only interpret the output of Merge operations. In this case we would be making the non-trivial claim that the conditions regulating syntactic operations (say, c-command, economy, relativized minimality, etc.) and the conditions regulating interpretation of the features of Lexical Items by the interfaces are completely different in nature; the former would be defined based on representation of syntactic structure, while the latter would take into account basic properties of Merge.

(c) A final possibility, which relates to current assumptions in minimalism, is that there is representation of syntactic structure only up to the phase level, i.e., until  $v^*$  or Comp project (see Chomsky 2000, 2001), and then that representation is no longer available.

It is not necessary to commit to any of these approaches for the scope of this paper, given that they all share the feature that the performance systems can only interpret the output of Merge, which is the crucial feature for my approach to work. Exploring the exact conceptual

and empirical consequences of each of the above approaches is a task that I leave for further research.

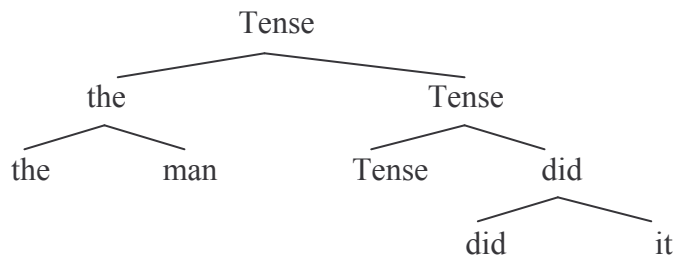
#### 4. *C-command vs. order of Merge*

It is been assumed since at least Chomsky (1995) that linear order is achieved through linearization of a hierarchical structure (with no linear order information) created by Merge. As pointed out in the introduction, most approaches to linearization rely on (asymmetric) c-command in order to yield a linear ordering (see Chomsky 1995; Guimarães 1998; Nunes 1999, 2004; Richards 2001 and others). A more derivational version of this approach is Epstein et al. (1998), where it is argued that c-command is not a primitive, but it can be derived from order of Merge. There have been two main “traditional” complications with the idea of using (asymmetric) c-command for linearization purposes.

The first one is the “symmetry at the right edge” problem. Under Bare Phrase Structure, when the first two Lexical Items merge in a derivation, there is no asymmetric c-command relation between them, so they cannot be linearized. I am not going to try to solve this problem here (see Chomsky 1995; Guimarães 1998; Epstein et al. 1998, and Moro 2000 for different solutions).

The second one is the “branching specifiers” problem. In order to illustrate this problem, take a simple sentence like (8) and its derivation (ignoring now subject movement for simplicity):

(8) the man did it



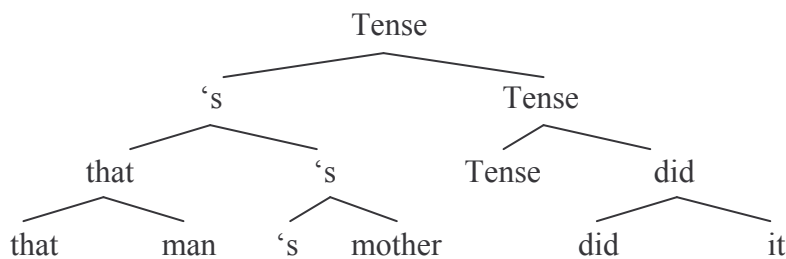
In order to build this syntactic tree, we need to assemble the syntactic object {the, man} and the syntactic object {Tense, {did, it}} in parallel workspaces, in order to get the correct constituency structure (see Uriagereka 1998). As can be seen, when there are branching specifiers, we have a situation in which some LI (say, *the*) can precede another LI (say, *did*) without c-commanding it. This is an obvious complication for any LCA-based approach to Linearization, and there have been several attempts to solve this problem.

Kayne (1994) proposes that specifiers are actually inserted in the derivation by adjunction. The result is that the adjoinee c-commands the element it adjoins to, given the segment/category distinction (see May 1985). This will allow the terminals inside the specifier to precede the rest of the structure.

Uriagereka (1999) proposes that branching specifiers are spelled out independently, hence the name of its approach: Multiple Spell-Out. Uriagereka assumes that there is a one-to-one correspondence between number of workspaces and number of applications of Spell-Out; if a syntactic object is built in a different workspace, it will automatically trigger a separate application of Spell-Out.

Here I also assume, like Uriagereka does, that specifiers are built in different workspaces. However, I argue that they are inserted in the derivation after heads and complements are assembled. The result is that specifiers are *always* inserted in the derivation after heads and complements are *regardless of their phrasal status*. The main piece of evidence for claiming that Merge operations in a workspace are ordered with respect to another actually comes from instances of ‘specifiers inside specifiers’. Consider in this respect the sentence in (9) and its derivation:

(9) that man’s mother did it



In this case, there have been three objects assembled independently in three workspaces: {that, man}, {'s, mother} and {Tense, {did, it}}. Notice that in order to get the correct constituency structure, the objects {that, man} and {'s, mother} obviously have to merge *before* the resulting object merges with {Tense, {did, it}}. This suggests that there is logical ordering between Merge operations in different workspaces (see Fernández-Salgueiro 2004 for more details regarding this proposal).

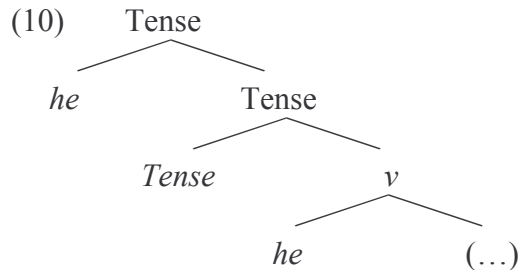
Under this approach, the problem pertaining to terminal elements inside specifiers that I pointed out above does not arise. In the tree in (8) above, for example, both *the* and *man* were inserted in the derivation after *did* and *it* were, so a linear order can be established by the algorithm in (7). In other words, under my approach there is indeed a relation (i.e., order of Merge) between the Lexical Items inside a branching specifier and the Lexical Items inside, say, a complement. This was not present in Kayne’s (1994) or Uriagereka’s (1999) proposals, which led to different complications for the linearization procedure.

It is important to point out, however, that I am not claiming that c-command should be eliminated from the system at all. If there is one fundamental relation that regulates syntactic operations, that is c-command, and the proposal here does not make any claim about the nature and/or conditions regulating such relations. In my proposal I seek to eliminate only *asymmetric* c-command, by arguing that it is not the relation that the system uses to yield linear order from hierarchical structure. As far as I know, *asymmetric* c-command has not been argued to play any other role in the system.

## 5. Phonetic realization of Chains

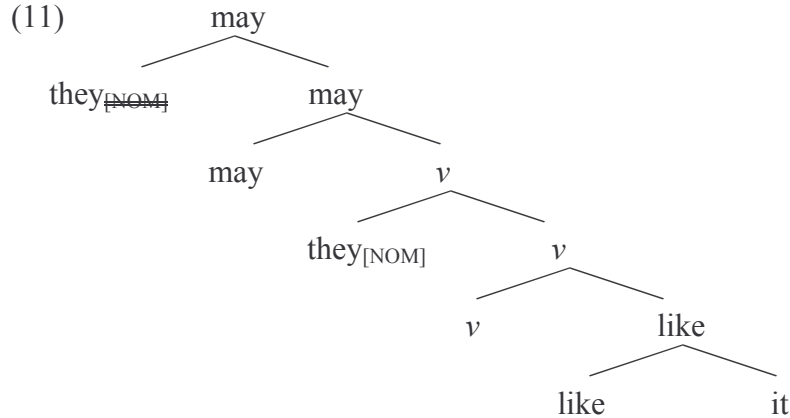
In this section I would like to discuss the implications of my approach for a theory of Chain linearization, and whether it makes any predictions which of the member(s) of a Chain is (are) interpreted by SMS. I am going to take here Nunes’s (1999, 2004) theory of linearization of Chains as a starting point.

Nunes's proposal crucially relies on the fact that *all* c-command relations among Lexical Items are computed in order to yield an ordered sequence of terminals. In order to illustrate this, consider the tree in (10):



When the LCA applies to this tree structure, it is unable to decide whether *he* precedes or follows *Tense*, since there is a c-command relation contradiction: *he* c-commands *Tense* but *he* is also c-commanded by *Tense* at the same time. In Kayne's terms, there two sets of ordered pairs that involve a contradiction:  $\langle he, Tense \rangle$  and  $\langle Tense, he \rangle$ . Nunes argues the LCA cannot assign a linear ordering unless one of the copies of *he* is deleted and hence not interpreted at the interface. Notice that for this contradiction (and eventual deletion of the lower copy of *he*) to occur, *all* c-command relation among (the upper) *he*, *Tense* and (the lower) *he* have to be computed. As I show here, my approach makes the same empirical prediction without necessitating the computation of all asymmetric c-command relations.

Let us consider a more concrete example. Consider the derivation for *they may like it*:



Before we continue, it is important to note that Nunes is assuming a Checking-based (not an Agree-based) approach to the deletion of uninterpretable Fs like Case Fs, and no Chain Uniformity Condition. Under his approach, only the upper copy of *they* has had its Case Fs deleted in (11). In my previous work (Fernández-Salgueiro 2005) I have argued that, even under an Agree-based approach, the lower copy of *they* does not get its Case Fs deleted; only the upper one does. For other approaches that claim Case checking to occur in a Spec-Head configuration see Rezac (2003); Müller (2004) and Epstein & Seely (2006).

Nunes's question is: why is the linearization output of (11) *they may like it* and not *\*they may they like it*, *\*may they like it* or *\*may like it*? Nunes's approach is going to provide a principled answer to this question based on economy considerations and (un)interpretability

of Fs at the SMS interface. He proposes that the minimum amount of deletion operations should be employed provided the result satisfies FI at PF.<sup>9</sup>

The first ungrammatical option, *\*they may they like it*, is ruled out independently by the LCA, as we saw at the beginning of this section (recall the discussion on example (10)). If we chose *\*may they like it*, we need two deletion operations, one which deletes the upper copy of *they* and another one which deletes the NOM-F of the lower copy of *they* (which has not been deleted in the course of the derivation). If *\*may like it* is chosen, we also need two operations, one which deletes the upper copy of *they* and another one which deletes the lower copy of *they*, together with its NOM-F. If we choose *they may like it*, though, only one deletion operation is necessary to make the structure linearizable, the one which deletes the lower copy of *they*. In sum, *they may like it* is the option with fewer deletion operations that satisfy FI at PF, i.e., it yields a PF representation with no uninterpretable Fs.<sup>10</sup>

As can be seen, Nunes provides an elegant explanation of why top-most copies are the ones that are generally pronounced. There are, however, a couple of conceptual problems with this approach. First, it is not clear how to calculate the number of deletion operations. What counts as *one* deletion operation? A syntactic node? A feature? A feature bundle?<sup>11</sup>

Second, the LCA seems to be unable to detect “differences” between the Lexical Items in their feature make-up (e.g., whether a Case F has been deleted or not). Then, when an LCA contradiction is encountered, Nunes allows “analysis” of the feature make-up of the Lexical Items that cause that linear order contradiction. In other words, when Linearization first applies, only PhonFs are visible. However, after the contradiction is detected, the whole feature make-up is visible and so are features like Case. This involves an architectural paradox, with features becoming invisible and then visible again as the derivation to PF proceeds.

I would like to rethink Nunes’s proposal in more derivational terms, by also relying on the (un)interpretability of Fs. I will show how these two problems do not arise under my derivational version of Nunes’s theory. I will start with an assumption that follows from the principle of FI: an LI cannot be interpreted by SMS if it contains uninterpretable material, that is, not just PhonFs.<sup>12</sup> I will try to show that the properties of the linearization of Chains will follow from these FI-based considerations alone.

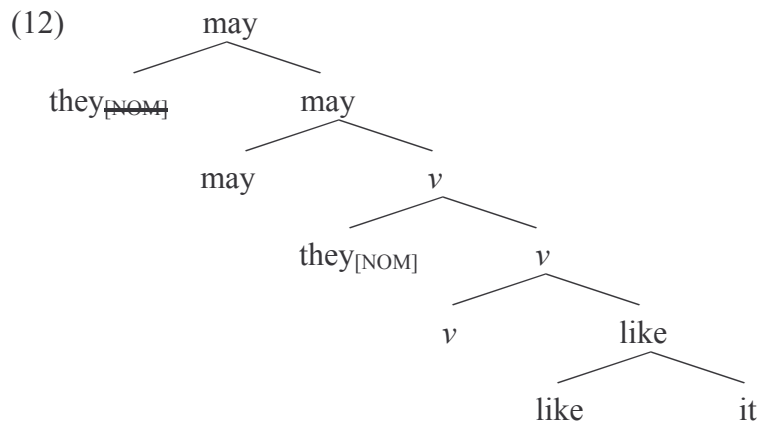
Following the algorithm in (7) discussed in section 3 above, SMS are going to interpret the PhonFs of Lexical Items in the reversed order in which they were merged. Accordingly, for the derivation in (11) above, repeated here as (12), the upper copy of *they* would be the first LI whose PhonFs are interpreted by SMS. As its NOM-F has been deleted, it is fully interpretable, and no problem arises here. Then the PhonFs of *may* are also interpreted by SMS with no problem, since its uninterpretable phi-Fs have been deleted. However, when SMS try to interpret the lower copy of *they*, an uninterpretable NOM-F is found. Given FI, the lower copy of *they* cannot be interpreted by SMS.

<sup>9</sup> Nunes assumes a weak derivational approach with levels of representation PF and LF.

<sup>10</sup> We can also think about this condition in terms of valued vs. unvalued features (Chomsky 2001). Lexical Items with valued formal features are interpretable by SMS, Lexical Items with unvalued formal features are not.

<sup>11</sup> I owe this critique to Sara Rosen (pc).

<sup>12</sup> Recall that in my approach FI does not apply to SOT. Semantic features are interpreted by SOT when they are merged, regardless of any UnFs an LI may display.



Notice that, under this approach, the upper copy of the chain is pronounced independently of the status of the other Lexical Items (and therefore, independently of the status of its original copy), so no further computation is needed to determine whether or when the upper copy is interpreted. Under this approach, SMS try to interpret each LI, independently of whether they were inserted by Merge or Move. In this respect, it is interesting to note that Move (internal Merge) has been usually defined as (at least some version of) a COPY+MERGE mechanism. The result is that (order of) Merge operations, regardless of whether they insert a copy of an LI or a new LI, provide SMS with PhonF information in the same way.

Moreover, the architectural paradox explained above does not arise. The whole feature make-up of an LI is visible when linearization applies. Under this approach, then, FI is a condition on *each* Merge operation; if an LI that contains UnFs is associated with a given operation of Merge, all that FI does is prevent that LI from being interpreted by SMS.

Besides the technical differences, then, both Nunes's approach and my approach predict that *all and only* Lexical Items without uninterpretable features are pronounced, and there is no reference whatsoever to which copy is the highest or the lowest, and so no stipulation that only the upper copy of a chain can be pronounced (as was the case with *trace* theory in GB). The main difference between Nunes's and my approach is that I am proposing that the decision of which copy to pronounce depends solely on interface conditions, while Nunes claims that economy of deletion operations also plays a role. To the extent that the problems with Nunes's proposal can be overcome, my approach to linearization seems to be more optimal.

## 6. Conclusions

In this paper I have developed a version of the level-free derivational approach to syntax, in which there is an asymmetry as to when Semantic features and PhonFs are interpreted by SOT and SMS, respectively. I have also explored some consequences of such an approach for the way we understand the architecture of FL.

I have also developed a derivational linearization procedure under this approach, one in which it is the logical order of Merge operations, rather than (asymmetric) c-command relations, that provides a sequence of terminals for a given derivation. It is important to notice that the approach developed here understands Linearization not as a rule, but rather, as an interpretive procedure. This approach should therefore be understood as an answer to the following question: how does SMS come up with a linear order of Lexical Items when it



inspects and looks into a derivation? I have shown that this derivational approach has rich empirical consequences for the linearization of Chains.

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## Connectivity in Markovian dependencies

Ángel J. Gallego

This paper explores the properties (and limits) of Merge, arguing, with Uriagereka (2005, forthcoming), that it is a natural reflection of the so-called “Chomsky Hierarchy”. Under that scenario, I focus on what the mechanisms current syntactic theory provides to study adjuncts are, the conclusion being that these dependents manifest two basic structural realizations: *bona fide* adjunction (however this must ultimately be captured –plausibly, through Chomsky’s 2004 pair-Merge) and modification from a specifier position in a cascade structure. As will be shown, the properties of both structural possibilities cannot be reduced nor unified, so different empirical predictions are made in each case.

### 1. Bare phrase structure

Since Chomsky (1995), X-bar theory algorithms like those in (1) are eliminated from the system due to economy and theory internal reasons.<sup>1</sup>

- (1) a.  $XP \rightarrow SPEC X'$   
b.  $X' \rightarrow X^{\circ} COM$

With the X-bar schemata gone, minimalism resorts to a Bare Phrase Structure (BPS) with the basic (though potentially unbounded) computational operation of Merge, which takes two syntactic objects (SO)<sup>2</sup> (say,  $\alpha$  and  $\beta$ ) and yields a bigger one,  $K$ , as depicted in (2).

- (2)  $K = \{\alpha, \beta\}$

What is  $K$ ? In the formulation of Chomsky (1995),  $K$  is supposed to adopt the form of (3), where  $\gamma$  encodes the category (or semantic type) of the resulting SO.

- (3)  $K = \{\gamma, \{\alpha, \beta\}\}$

---

<sup>1</sup> See Chomsky (1970) for the original formulation of X-bar theory. See Chametzky (2000) and Fukui (2001) for extensive review and discussion.

<sup>2</sup> I assume that both Lexical Items (LIs) and phrases (i.e., combinations of LIs) count as SOs.

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Chomsky (1995) calls  $\gamma$  ‘label’; at present there is no consensus as to whether BPS must make use of labels or not (see Boeckx 2002 for discussion)<sup>3</sup>, and although Chomsky (p.c.) points out that BPS is, in itself, independent of labels, he has also noted that these seem to be needed for computational reasons. In his own words:

“Each syntactic object generated contains information relevant for further computation. Optimally, that will be captured entirely in a single designated element, which should furthermore be identifiable with minimal search: its label, the element taken to be ‘projected’ in X-bar-theoretic systems. The label, which will invariably be a lexical item introduced by Merge, should be the sole probe for operations internal to the syntactic object, and the only element visible for further computation [...] Note that labels, or some counterpart, are the minimum of what is required, on the very weak assumption that at least some information about a syntactic object is needed for further computation, both for search within it and for its external role.”  
[Chomsky (2005a:14)]

By and far Collins (2002) is the most remarkable phrase structure proposal without labels, but although his system is label-free indeed, it can still be said to contain a residue of these symbols, the Locus. What is the Locus? Collins (2002) argues that it is an LI that needs to be ‘saturated’, the element that ‘selects’, the one which is ‘active’ during the computation. To understand this notion better, consider the Locus Principle in (4), taken from Collins (2002).

#### (4) **The Locus Principle**

Let X be a lexical item that has one or more probe/selectors. Suppose X is chosen from the lexical array and introduced into the derivation. Then the probe/selectors of X must be satisfied before any new unsaturated lexical items are chosen from the lexical array. Let us call X the Locus of the derivation.  
[Collins (2002:46)]

The formulation in (4) correctly captures the dynamic nature of Collins’ (2002) Locus, contrary to the representational status of labels: at every derivational stage there is only one Locus, while there can be many labels.

Before going on, some technical aspects of (4) should be clarified. This is the case of notions like Goal and Probe, which belong to the operation Chomsky (2000) associates to Case checking: Agree. Roughly put, Agree establishes a (long-distance) dependency between two syntactic objects for feature valuation purposes. This can be seen in (5).

(5) John loves Mary.

Under fairly standard assumptions, the DPs *John* and *Mary* are supposed to check their Case feature against the functional categories T and  $v^*$ .<sup>4</sup> The process, in essence, works like this: T and  $v^*$  have uninterpretable  $\phi$ -features which –Chomsky argues– enter the syntactic component unvalued, and hence act as a seeker (a Probe) looking for an element with which

<sup>3</sup> To the best of my knowledge, Moro (2000) is the first BSP-based account in which SOs are taken to be label-free. In particular, Moro (2000) provides robust empirical evidence that a variety of Small Clauses (those which he dubs ‘Bare Small Clauses’) do not project label. The same basic idea has been applied to adjuncts by Chametzky (2000), Hornstein et al. (2005), and Uriagereka (2003).

<sup>4</sup> See Chomsky (2005b) for slightly modified ideas on Case.

to Match and value its features (a Goal). As a result of that matching, the Probe gets its features valued and, in exchange, assigns Case to the Goal.<sup>5</sup>

To recap so far, it is easy to see a connection holding among Probe, Label, and Locus: these are just different names for the element which drives the computation. There is, though, a minor qualification to this parallelism: on derivational grounds, only Probe and Locus share the relevant ‘viral’ property (in Uriagereka’s 1998 sense) of triggering a scanning procedure.

In this paper I would like to defend the role of labels –much in the sense of Boeckx (2002) and Hornstein (2005)-, for which some arguments will be provided.<sup>6</sup> Meanwhile, let us go back to the basic operation of Merge, and, more particularly, to one aspect of its output: the label. As is well known, Chomsky (1995:244) contemplates the possibilities in (6).

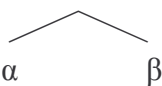
- (6) The label  $\gamma$  is...
- The intersection of  $\alpha$  and  $\beta$  (i.e.,  $\alpha \cap \beta$ ).
  - The union of  $\alpha$  and  $\beta$  (i.e.,  $\alpha \cup \beta$ ).
  - One or the other of  $\alpha$ ,  $\beta$ .

Arguably because he assumes a decompositional approach to syntactic categories in terms of  $[\pm N]$   $[\pm V]$  features (see Chomsky 1970, 1981), Chomsky (1995) rejects both (6a) and (6b), taking (6c) to be the correct outcome.<sup>7</sup> Merger of  $\alpha$  and  $\beta$  will then produce one of the two sets in (7), depending on what the label turns out to be:

- (7) a.  b. 

Note that first-Merge, as in (7), gives us the basic relation of “set-membership” (or “immediate containment”) and, applied twice, the relations “contain” and “term-of”. Adding “sisterhood” to the picture, “c-command” obtains.

From BPS it is also possible to derive the bar-levels of previous theories:  $X^0$ ,  $X'$ , and  $X''$ . Any LI is, unless qualified, both  $X^{\max}$  (a phrase) and  $X^{\min}$  (an LI or head): if it does not project, it is an  $X^{\max}$ , otherwise it is an  $X^{\min}$ . As for  $X'$ , it is eliminated from the system.<sup>8</sup> But note that there is a catch: for the system to be able to make these distinctions, labels (or some counterpart) are needed. We cannot know whether  $\beta$  is an LI or an XP in (8) without labels:

- (8) 

<sup>5</sup> Note that ‘valuation’ is the only thing syntax cares about; ‘interpretability’ (or its lack) is an interface issue, irrelevant for computation as such. See Pesetsky & Torrego (2004) for discussion.

<sup>6</sup> See Boeckx (2002) for a more detailed discussion of Collin’s (2002) proposal.

<sup>7</sup> The evidence in favor of (6c) is not strong. Consider the union case: it is not obvious that if N and V Merge, there is a problem, since, after all, we can have sets like (i), as noted by Norbert Hornstein (p.c.):

(i)  $\{+1, -1\}$

The question that (i) (and the merger of N and V, for that matter) raises is whether a set with 1 and -1 violates the Law of the Excluded Middle: A is B or A is not B. Formally:

(ii)  $A \vee \neg A$

<sup>8</sup> See Chomsky (1995) for discussion about invisibility of  $X'$ . Under strongly derivational models, like Epstein et al.’s (1998),  $X'$  could be taken as a residual  $X^{\max}$ .

Can the choice of the label be predicted? Chomsky has gone back and forth in this respect. In the 1995 and 2005b formulations, he seems to suggest that the label cannot be decided a priori: any SO undergoing Merge can project, but if the wrong choice is made, there will be a crash at the interfaces. Chomsky (2000), though, presents in passing a different view whereby Merge has an Agree-like nature: either  $\alpha$  or  $\beta$  acts as a Probe, and projects. A compatible view is put forward by Boeckx (2002), who regards labeling as a feature sharing operation (see Frampton & Gutmann 2000 and Pesetsky & Torrego 2004); in particular, Boeckx (2002), aiming at unifying Merge and Move, proposes that whenever two LI undergo Merge, one of their features must be matched and ‘percolate up’, as a result of intersection:

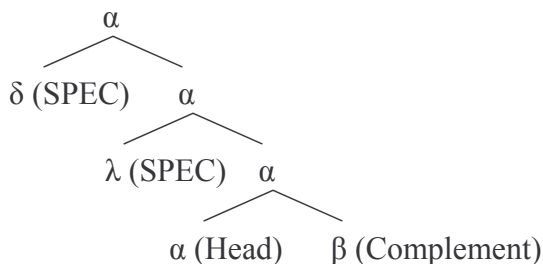
- (9) The label K of  $\{\alpha, \beta\}$  = The feature F shared in grouping  $\{\alpha, \beta\}$ .  
[from Boeckx (2002:21)]

As Boeckx (2002) notes, the mechanics of (9) are similar (if not identical) to both Attract-F and Agree of previous minimalism formulations. The problem about labelling noted by Chomsky (1995) does not arise if categorial features (e.g.,  $[\pm N]$  and  $[\pm V]$ ) are replaced by  $\phi$ -features (see Chomsky 2001 and Marantz 1997).<sup>9</sup>

Whatever the particular implementation, let us suppose Merge provides a label. This also allows us to derive the most local relation: the Head-to-Head one. Depending on the result of merging  $\alpha$  and  $\beta$ , one of the heads becomes what we call Complement, as we see in (10b):

- (10) a.   $\Rightarrow$  b. 

Is there any other relevant notion? Syntactic theory has devoted much attention to specifiers (SPECs). Under BPS, these result from all non-first-Merge labelled operations, as shown in (11):

- (11) 

As the reader may easily calculate, there is only one head and one complement per projection, but a potentially unbounded number of SPECs. That is an asymmetry. Also, note that for us to know that something is a SPEC, we must have labels: if no label projects when  $\alpha$  and  $\beta$  Merge in (11), we cannot know whether  $\lambda$  is a SPEC.

<sup>9</sup> This merely scratches the surface of Boeckx’s (2002) technical implementation. See Gallego (2007) for more detailed discussion of Boeckx’s (2002) proposal.



2000 for ample evidence that some Small Clauses lack a label; as for the merger of external arguments, perhaps Chomsky's 2005b reasoning may shed some light on why something must escape the  $v^*P$ .<sup>15</sup> I leave the technical details of this complex discussion here, with no additional useful comment. In section 4 I will go back to this issue, arguing that the same logic about instability in  $\{X(P), Y(P)\}$  structures can be extended to adjuncts.

The goal of this section was to introduce the elementary technical notions of BPS which should be borne in mind in the remainder of this paper. The discussion has focused on the status of labels within current theorizing. As Boeckx (2002), Chomsky (2005a) and specially Hornstein (2005) note, there are grounds to believe that no theory of grammar can eliminate labels. Labels naturally embody the notion of "constituent" and are therefore essential for structure building processes.<sup>16</sup> Thus, as Boeckx (2002) wisely notes, it is difficult to see how syntactic processes like VP topicalization (see (13a)), wh-movement (see (13b)) or VP ellipsis (see (13c)) could take place without labels, for these operations need to locate the relevant maximal/XP chunks that are going to be targeted.<sup>17</sup>

- (13) a. [<sub>VP</sub> Kiss Mary]<sub>i</sub>, John did t<sub>i</sub>  
 b. Which book<sub>i</sub> did John say Mary read t<sub>i</sub> ?  
 c. John called Peter, and Mary did Susan<sub>i</sub> call t<sub>i</sub>.

Virtually any operation targeting XPs needs to invoke labels, and the logic extends to Agree if  $\phi$ -features are encoded in labels.<sup>18</sup> The same seems to hold in the PF and LF wings of the grammar: if something like Kayne's (1994) LCA is correct, then labels are needed to calculate linear order.<sup>19</sup> As for LF, labels may also be useful to indicate semantic types.

Stronger conclusions can be drawn from Hornstein (2005), who argues that labels turn a complex SO into an atomic unit<sup>20</sup>, which can then be used for further 'concatenation' – actually, for Hornstein (2005), without labeling no hierarchical embedding would be possible. From the necessity of labels, Hornstein (2005) also derives the Extension Condition and endocentricity.

For the purposes of this section, we can stop here. I will go back to some questions raised by the necessity of labels in section 4, where I explore adjuncts.

## 2. The Chomsky Hierarchy

Up to this point, we have seen two varieties of Merge: external-Merge and internal-Merge. Technically, only the first variety is context free, being thus expressible by Phrase Structure Grammar algorithms like (14), where A is a non-terminal symbol, and  $\gamma$  stands for a string of terminal or non-terminal symbols.<sup>21</sup>

<sup>15</sup> See Alexiadou & Anagnostopoulou (2001).

<sup>16</sup> I disregard here any technical distinction between nodes and labels. See Chametzky (2000).

<sup>17</sup> Although along this paper I will tacitly assume that internal-Merge leaves a copy of the moved element, I will represent it by means of a trace. See section 3.

<sup>18</sup> This is explicitly stated by Chomsky (1995:268), who refers to the features of labels as "sublabels".

<sup>19</sup> See Richards (2001) for explorations of this view.

<sup>20</sup> See Uriagereka (2004) for a similar reasoning about the creation of complex SPECs.

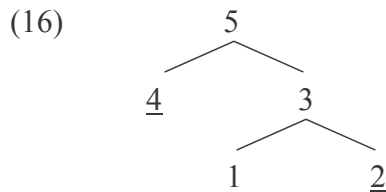
<sup>21</sup> A Phrase Structure Grammar (PSG) has four components: 1) a terminal vocabulary (a Lexicon); 2) a non-terminal vocabulary (the non-terminal symbols); 3) a set of rules; and 4) a starting symbol which is member of 2 (typically, the sentence node S). See Uriagereka (forthcoming) for relevant discussion.

$$(14) \quad A \rightarrow \gamma^{22}$$

The most remarkable property of context-free grammars is their ability to generate a system of rules such as (15a) or (15b), where the conversion process indicated in (14) affects A, regardless of the context in which it is found:

$$(15) \quad \begin{array}{l} \text{a. } PP \rightarrow P NP \\ \text{b. } NP \rightarrow N PP \end{array}$$

Notice that, given two simple rules like (15a) and (15b), we can have a potentially unbounded structure, since part of the output of (15b) is the input of (15a), which ensues an endless loop. This is, incidentally, one of the problems of context-free grammars: they overgenerate. A second –and perhaps more important– problem concerns the impossibility of expressing a long-distance relation between SOs; that is to say, (14) cannot capture a possible dependency between 4 and 2 bypassing 1 in (16).



The context of all elements in (16) is formally well defined. However, with the limited apparatus of (14) we cannot express a connection between 4 and 2 ignoring 1, for this requires a context sensitive procedure.<sup>23</sup> For those familiar with the Minimalist Program, this type of (long-distance) dependency has been phrased in terms of Attract-F, Agree, and Move, and can be encoded by means of the algorithm in (17), where A is a terminal symbol, and  $\alpha$ ,  $\beta$ , and  $\gamma$  are sequences of terminal or non-terminal symbols:

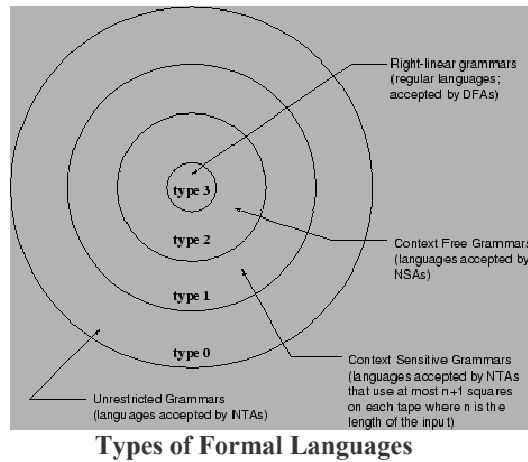
$$(17) \quad \alpha A \beta \rightarrow \alpha \gamma \beta$$

Context sensitivity follows, here, from the variables  $\alpha$  and  $\beta$ , which define A's "context", allowing us to know whether this element can be replaced by  $\gamma$ , as the rule dictates. Both context free and context sensitive rules were studied and classified by Chomsky fifty years ago in what is known as the "Chomsky Hierarchy":

<sup>22</sup> This type of algorithm is also known as "rewriting rule", and is a normal device of PSGs. In plain terms, what a rule like (14) does is transforming the string of symbols to the left into that to the right.

<sup>23</sup> Such procedure predicts the possibility of so-called intervention effects (in the sense of Rizzi 1990): if the relevant property shared by 4 and 2 is also possessed by 1, then 1 will interfere. As Sergio Balari (p.c.) makes me note, if there is no minimality scenario (say, if 4, 2, and 1 do not share any property), the operation I have alluded to is context-free, not context-sensitive; for instance, non-multiple wh-movement (e.g. Who<sub>i</sub> did John call t<sub>i</sub>?) is context-free.



**Type 0 → Recursive Languages**

Sets of formal objects of any computational complexity

**Type 1 → Context-sensitive Languages**

Sets of sets of sequences of symbols (i.e., chains)

**Type 2 → Context-free Languages**

Sets of sequences of symbols (i.e., phrases)

**Type 3 → Regular Languages**

Sequences of symbols.

(18) The Chomsky Hierarchy (see Chomsky 1956)

Uriagereka (2005, forthcoming) reinterprets the Chomsky Hierarchy in terms of memory, as indicated in (19):

- (19) a. Recursive grammars: unbounded memory.  
 b. Context-sensitive grammars: short term memory.  
 c. Context-free grammars: long term memory.  
 d. Regular grammars: no memory.

We have previously introduced the operations instantiating the types 1 and 2 of grammars (external-Merge and internal-Merge), but nothing has been said about types 0 and 3. Following Uriagereka (2005, forthcoming), I will assume that type 0 corresponds to the Turing Machine and is therefore out of the Faculty of Language.<sup>24, 25</sup> What about type 3? As a matter of simple logic, type 0 cannot run the same fate of type 3, since the Chomsky Hierarchy has an implicational nature: more complex levels presuppose simpler ones. (20) contains the rules that are typically associated to formal languages of type 3:

- (20) a.  $A \rightarrow \alpha \gamma$   
 b.  $A \rightarrow \gamma \beta$

The basic property of these rules is their memory restrictions: being incapable of keeping track of complex associations (i.e., phrases), regular rules can only operate with immediately adjacent elements, as happens in the case of Markovian chains.<sup>26</sup>

<sup>24</sup> The formal proof goes back to Chomsky (1963). I thank Sergio Balari for discussing this point with me.

<sup>25</sup> The term “machine” is not intended in the contemporary sense. Alan Turing used “machine” in the same way we nowadays use the term “program”.

<sup>26</sup> Or Markov Chain, in honor of the Russian mathematician Andrei Markov. These are sequences of symbols as such as ‘ $X_1, X_2, X_3, X_4, \dots$ ’ where whatever precedes a stage  $s$  depends on what happened in an immediately previous stage  $s - 1$ .

It is obvious that natural languages present phenomena which need more memory than that; what must be found out is whether they also present processes of the Markovian sort. The first claim can easily be tested in domains like thematic theory; consider (21):

(21) John ate the sandwich.

The question arises as to how we know that the relation between the DP *the sandwich* and the verb is different from that established between the DP *John* and the verb. Put another way: assuming that linear order is irrelevant, how do we choose between (22a) and (22b)?

(22) a. John  $\cap$  ate  $\cap$  the  $\cap$  sandwich  
 b. [John [ate [the [sandwich]]]]

(22b) has everything (22a) does, plus something else. This “something else” is phrase structure. Importantly for my concerns, only by means of this “something else” we can encode the fact that the relation between objects and verbs is more intimate than the one between subjects and verbs (see Hale & Keyser 2002; Harley 2003; Marantz 1984,1997; and Tenny 1994), which determines that it is the object that is interpreted as a /Theme/ –the element that “measures out” the event, in Tenny’s (1994) sense. Happily, in order to capture this more intimate relation between objects and verbs, the system must keep track of the fact that verbs and objects form a constituent which excludes the subject, and that requires phrase structure.

Let us now assess the second claim made above: given the implicational nature of the Chomsky Hierarchy, having formal languages of type 1 and 2 implies having formal languages of type 3 (i.e., Markovian processes). The ideal candidate to fulfill this type of operation is adjunction (see Chametzky 2000), which is formally represented as in (23):

(23)

$$\begin{array}{c} \text{XP}_2 \\ \diagdown \quad \diagup \\ \text{YP} \quad \text{XP}_1 \end{array}$$

In (23) YP is adjoined to XP. As can be seen, adjunction splits the XP category into two segments (XP<sub>1</sub> and XP<sub>2</sub>), the hallmark of May’s (1985) formulation, adopted by Chomsky (1986). Simplifying somewhat, (23) is designed to place the adjunct in a parallel dimension: by exploiting the category vs. segment category, adjuncts are immune to almost all the relevant structural relations one can think of (e.g., dominance, c-command, etc.). In Chomsky (2004) this “parallel plane” idea has been stated explicitly (see also Uriagereka 2003):

“We have so far assumed only the free symmetrical operation Merge, yielding syntactic objects that are sets, all binary: call them *simple*. The relations that come “free” (contain, c-command, etc.) are defined on simple structures. But it is an empirical fact that there is also an asymmetric operation of adjunction, which takes two objects  $\beta$  and  $\alpha$  and forms the ordered pair  $\langle \beta, \alpha \rangle$ ,  $\alpha$  adjoined to  $\beta$ . Set Merge and pair Merge are descendants of substitution and adjunction in earlier theories. Given the basic properties of adjunction, we might intuitively think of  $\alpha$  as attached to  $\beta$  on a separate plane, with  $\beta$  retaining all its properties on the primary plane, the simple structure.” [Chomsky (2004:117-118)]



As noted by many scholars (see Chametzky 2000; Boeckx 2003a, 2003b; Ernst 2002; Uriagereka 2003), Chomsky's (2004) words suggest that adjuncts have no syntax. This is surely consistent with most defining properties of adjuncts (e.g., they do not receive theta-roles, they do not check Case, they are islands, etc.) and with Chomsky's (2004) conceptual speculation that pair-Merge (the operation handling adjunction) exists by requirements imposed by the Intentional-Conceptual systems.

In the context of the present discussion, it is telling enough to remember that Chomsky (1995) claimed that adjuncts do not fit in the minimalist picture, for they do not seem to participate in any computational operation: an adjunction configuration is neither a thematic nor a checking one.<sup>27</sup>

“The problems related to XP adjunction are perhaps a case in point: they may not really belong to the system we are discussing here as we keep closely to the first of the two courses just outlined, the one that is concerned with Last Resort movement driven by feature checking within the  $N \rightarrow \lambda$  computation. It is within this core component of language that we find the striking properties highlighted by minimalist guidelines. It seems increasingly reasonable to distinguish this component of the language faculty.”  
[Chomsky (1995:325)]

Let us now return to the technical details of adjunction. As we have seen, adjunction is formalized by means of ordered pairs within minimalism. This is ontologically worrisome, for we need to postulate an independent operation for adjunction; if possible (it is obviously desirable), adjunction should just resort to set-Merge, the aforementioned asymmetry being perhaps a consequence of the lack of label. Actually, Chomsky's (2004:117) formulation does not seem to me to be far from this, as he says that “an adjunction construction is plainly not the projection of a head: for NP-adjuncts, for example, the constituent structure appears to be something like [NP XP]”. This possibility takes us back to Chomsky's (2005b) suggestion about unstable structures, which, interestingly, are compatible with what we see in any adjunction configuration within the  $v^*P$ : it is always the case that an XP (the adjunct) adjoins to YP (the VP).<sup>28</sup> The structure would therefore be something like [VP, XP] (by parity of reasoning with the nominal case pointed out by Chomsky 2004), so, formally, the whole structure would behave as a VP because the category which receives adjunction “retains all its properties”. This is reinforced by the data in (24), where adding adjuncts does not modify the category/type of the syntactic object which gets modified; thus, as noted by Hornstein et al. (2005), given that perfective *have* subcategorizes for a perfective *-en* marked V, adding an adjunct like *quickly* or *in the yard* does not change its selectional requirements:

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<sup>27</sup> Note that Chomsky's (1995, 2004) suggestions seem to point to the conclusion that adjuncts involve a more complex (parallel) structure. However, Norbert Hornstein (p.c.) and Wolfram Hinzen (p.c) make me note that there are grounds to believe that the opposite scenario is actually the correct one: arguments are more complex than adjuncts. Their observation makes sense in that it is adjuncts (not arguments, unless conjoined) that display a truly recursive nature; moreover, it is arguments (not adjuncts) that must invoke the notion of theta-role, undergoing a process of type-shifting which changes their status. True as this is, there is no a fortiori tension, for the idea that adjuncts are simpler than arguments is immediately captured by the analysis pursued here, where the former instantiate type 3 grammars, in Chomsky's (1956) terms.

<sup>28</sup> Under this formulation, Chomsky's (2004) original analysis is left basically intact, for adjuncts get transferred to the interfaces at the phase level, being in a configuration with the VP, the complement domain of the phase head  $v^*$ .

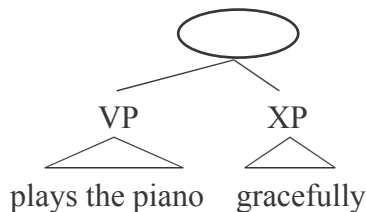
- (24) a. Has/\*is [<sub>VP</sub> eaten a bagel]  
 b. Has/\*is [<sub>VP</sub> [<sub>VP</sub> [<sub>VP</sub> eaten a bagel] quickly] in the yard]

This very point is clearly put by Uriagereka (2003):

“Labels are valid only if limited; an unbounded number of labels amounts to absence of generalization, or else a missed one [...] For labels to be useful, they must be very few, so that computational tasks are simplified [...] The result of the mere fact that adjunction to X is unbounded is clear: either we need an unbounded number of labels, or else each adjunction does not modify X’s character. In both cases, labelling would be useless.” [Uriagereka (2003:4)]

The idea is also sound within Boeckx’s (2002) proposal: in adjunction, XP and YP do not obviously share any feature, so no label can obtain. My own interpretation of the process is as in (25), where I exclude the external argument from the picture.<sup>29</sup>

(25)



What happens if no label can be decided in (25)? Chomsky (2005b) suggests that something must raise, due to formal instability. A more interesting observation was (originally, to my knowledge) made by Cedric Boeckx: if no label is projected in (25), the system cannot know whether the VP or the XP is a (complex) SPEC, and then an island (see Huang 1982 and Uriagereka 1999). Notice that the latter point depends on the correlation between “being a (complex) SPEC” and “being an island” –Uriagereka’s (1999) insight; but there are grounds to think otherwise, since, as noted by Uriagereka (1988) himself, postverbal subjects (which can be analyzed as bona fide SPECs) allow sub-extraction in some languages. Not everything is lost, luckily. We can still appeal to (25) in order to predict the extraction facts; as Norbert Hornstein (p.c.) notes, if something tries to move out of XP, a first logical step involves the creation of a SPEC with whatever the unlabeled node turns out to be, and right there we are stuck: we want to provide a SPEC-slot to the extracted element, but since there is no label, it is impossible.

Because it underscores the role of structure, a label-free analysis of adjuncts along these lines can account for some intriguing phenomena related to adjunction (which I will review in section 4) in an elegant fashion. In the preceding lines I have established a parallelism between the Chomsky Hierarchy and the three varieties of Merge entertained within BPS. Pair-Merge is undoubtedly the most interesting one, for it focuses on adjuncts –syntactic dependents showing a bunch of odd properties. I have also drawn a parallelism between Markovian syntax and adjuncts, but more needs to be said if we want it to be borne out, an issue I return to in section 4.

<sup>29</sup> In Gallego (2006, 2007) I brush up the implementation by taking Mateu’s (2002) decompositional analysis of adverbs, which I apply to all adjuncts.

### 3. Connectivity: possibilities and mechanisms

This section is devoted to study some empirical facts concerning adjuncts in the light of what I will call “connectivity”, a term I use to subsume any process that relates two structurally well defined positions in a given phrase marker. Many phenomena can be so defined (e.g., NPI licensing, scope dependencies, movement, and binding, to name but a few), and they tend to display an atypical behaviour when it comes to adjuncts. In this section I will restrict my attention to binding, going back to other kinds of connectivity in section 4.

To begin exploring binding, consider the sentence in (26):

(26) [CP [TP John’s sister<sub>i</sub> was [vP invited t<sub>i</sub> to the party]]]

In pre-minimalist models, the displacement operation in (26) was assumed to leave a designated symbol in the base-position after the DP *John’s sister* moved: a trace (which had to be further coindexed with and be c-commanded by the DP). This scenario changed in Chomsky (1993), where the copy theory of movement was revamped; basically put, the new idea (actually, old) was that movement leaves an exact copy of the moved element which is deleted at the phonological component due to economy reasons. The copy theory soon proved useful to account for some loose ends of binding, which from Chomsky (1993) on was taken to apply only at LF (the SEM component), allowing to dispense with the operation of reconstruction. So, in (27), the wh-phrase *what picture of herself* leaves a copy in the base position (occupied by the trace), allowing Principle-A to go through.

(27) [CP [What picture of herself<sub>k</sub>]<sub>i</sub> did Mary<sub>k</sub> lose t<sub>i</sub> ]?

Recall that the crucial aspect of reconstruction was its particular application at LF. That was problematic for various reasons; first, because it was evidence in support of the “level of representation” status of LF (as opposed to “component”; see Uriagereka forthcoming), and second, because it was an additional operation which implied the replacement of the trace. The copy theory provides an elegant alternative: since there is a copy, we do not need to put the moved element back to its base (first-Merge) position, all we have to care about is how much reconstruction we have. According to Chomsky (1993), economy factors dictate that only the restriction must reconstruct, the operator part of the moved element remaining upstairs, roughly as shown in (28):

(28) For [what x] Mary lost [x, picture of herself ]

This said, some questions rapidly arise. As I see things, the most intriguing one concerns the nature of reconstruction itself: is it always possible? Chomsky (1993) restricts reconstruction to A’-Movement, which, at one level, makes sense: A-Movement creates no interpretive import, whereas the two positions created by A’-Movement instantiate an operator-variable relation.<sup>30</sup> In this sense, Chomsky (1993:205) adduces the following data indicating no reconstruction effects in the case of A-Movement:

<sup>30</sup> See Abels (2003), Barss (2001), Boeckx (2001, 2003a), Chomsky (2005b), Epstein & Seely (2006), Lasnik (1999), and Takahashi (1994) for related issues.

- (29) a. [CP [TP [The claim that John<sub>i</sub> was asleep]<sub>j</sub> seems to him<sub>i</sub> [TP t<sub>j</sub> to be correct] ]]  
 b. \* I seem to him<sub>i</sub> to like John<sub>i</sub>

The important thing to note about (29a) is the lack of Principle C effects, contrary to what one would be led to expect given our previous discussion. Chomsky's (1993) examples are well-taken, but they do not cover the whole range of facts: as Boeckx (1999) notes, binding and NPI licensing *qua* reconstruction reappear when the moved element is an indefinite:

- (30) a. [CP [TP [Pictures of himself<sub>i</sub>]<sub>j</sub> seem to John<sub>i</sub> [TP t<sub>j</sub> to be ugly] ]]  
 b. [CP [TP [Pictures of any artist]<sub>j</sub> seem to no critics [TP t<sub>j</sub> to be revealing] ]]

The tension between (29) and (30) is not easy to solve. Boeckx (1999) suggests that binding effects in (30) arise on-line, at the point where the experiencer is merged and the subject has not moved yet.<sup>31</sup>

The data, viewed in isolation, are puzzling, and different explanations have been offered in the recent literature. Lasnik (1999), for instance, suggests that A-Movement leaves no copy, whereas Fox (2000) argues that it leaves a trace (in the pre-Chomsky 1993 sense). As Boeckx (2001) argues, the mystery vanishes the minute one pays attention to what the difference between traces left by A and A' movements was in the GB-framework: the former do not have their Case checked, the latter do. Boeckx (2001) highlights that asymmetry in order to claim that copies left by A-Movement are "infected" (see Uriagereka 1998), and therefore unable to feed the interpretive component for reconstruction purposes.

It remains to assess the precise mechanism which decides what copy is going to be interpreted in, say, a long-distance extraction case. Consider (31), where the anaphor *himself* can take both *John* and *Peter* as its antecedent:

- (31) Which picture of himself<sub>{i/j}</sub> did John<sub>i</sub> say that Peter<sub>j</sub> lost?

Assuming successive cyclic movement, the wh-phrase *which picture of himself* stops at SPEC-C of the embedded clause, as indicated in (32).<sup>32</sup>

- (32) [CP [Which picture of himself]<sub>-3</sub> did John say [CP t<sub>-2</sub> that Peter lost t<sub>-1</sub> ] ]?

Unless stipulated, everything we have said so far predicts that any copy left by A'-movement can be interpreted at LF. Example (31) supports this prediction, as the available readings indicate. If the first (lowest) trace is interpreted, *Peter* binds the anaphor; if it is the second (intermediate) one, then *John* does.<sup>33</sup>

So far so good. Let us now take this excursus about binding as a theoretical background and consider how it deals with adjunct phenomena. As those familiar with the relevant literature know, we should start by considering (33), taken from Lebeaux (1991):

<sup>31</sup> Note that this does not explain why reconstruction effects –even if they arise on-line– only affect indefinites. Boeckx (2001) does offer an explanation for this, arguing that reconstruction only affects indefinites because only these undergo a process of literal LF reconstruction (i.e., a full-fledged lowering operation at LF).

<sup>32</sup> More accurately, it stops at every edge (see Chomsky 2000, 2001, 2005b), including every SPEC-*v*\*. I put aside the issue of whether movement always target SPEC-*v*\* and SPEC-C. See Rackowski & Richards (2005).

<sup>33</sup> I am sweeping some problematic cases under the rug, like Chomsky's (1993) preference principle which separates Principle-A (cliticization at LF) from Principle-B and Principle-C.

- (33) a. [CP [Which claim [that John<sub>k</sub> made]]<sub>i</sub> did he<sub>k</sub> later deny t<sub>i</sub> ]?  
 b. \* [CP [Which claim [that John<sub>k</sub> likes Mary]]<sub>i</sub> did he<sub>k</sub> deny t<sub>i</sub> ]?

In (33) there is a puzzling asymmetry: *John* does not trigger a Principle-C effect in (33a), but it does in (33b). Why? Many proposals have been invoked to solve this asymmetry, which is known as anti-reconstruction. While some authors have argued that depth of embedding is the key (see van Riemsdijk & Williams 1981), some others have argued that what counts is the semantic nature of the displaced element (see Heycock 1995). In parallel to these approaches to reconstruction puzzles, Lebeaux's (1991) account appealed to the argument vs. adjunct distinction, suggesting that since the latter class of elements (but not the former) does not need to appear (in s-selection terms) in base structures, it can be late-merged as the derivation goes along by means of generalized transformations.<sup>34</sup> Chomsky (2004) agrees with the basic facts, but notes the problems late-insertion analyses pose to cyclicity and the Extension Condition, so he resorts to the parallel plane idea: this allows him to preserve a strong form of cyclicity, while tackling the Principle-C effect.

“Assume that like other operations, adjunction of  $\alpha$  to  $\beta$  applies cyclically.  $\beta$  behaves throughout as if it were in a simple structure formed by set Merge [...]. What about Condition (C) at SEM? When X c-commands  $\langle \alpha, \beta \rangle$ , does it also c-command  $\alpha$  and  $\beta$ ?  $\beta$  was introduced by set Merge, and before  $\alpha$  was adjoined to it, X c-commanded  $\beta$ . But the central property of adjunction of  $\alpha$  to  $\beta$  does not change the properties of  $\beta$ . For  $\beta$  to lose some property when  $\alpha$  adjoins to it would be a complication, an “imperfection”. The relation c-command (X,  $\beta$ ) is therefore not lost when  $\alpha$  is adjoined to  $\beta$ : accordingly, X still c-commands  $\beta$  in  $\langle \alpha, \beta \rangle$ , as before adjunction. But extension of c-command to the adjoined element  $\alpha$  would be a new operation, to be avoided unless empirically motivated. Happily, the empirical evidence disconfirms the complication.” [Chomsky (2004:118)]

As Chomsky (2004) notes, Principle-C effects show up in sentences like (34a) and (34b), but this does not affect Lebeaux's (1991) main observation –anti-reconstruction effects only arise in adjuncts which have been fronted.

- (34) a. \* He<sub>k</sub> did not like the claim that John<sub>k</sub> made.  
 b. He<sub>k</sub> asked [CP [which claim that John<sub>{\*k/j}</sub> made]]<sub>i</sub> he<sub>j</sub> denied t<sub>i</sub> ]

(34b) is more interesting than (34a), for it is related to (35), also from Lebeaux (1991):

- (35) a. [CP [Which paper that he<sub>j</sub> gave to Bresnan<sub>z</sub>]]<sub>i</sub> did every student<sub>j</sub> think that she<sub>z</sub> would like t<sub>i</sub> ]?  
 b. \* [CP [Which paper that he<sub>j</sub> gave to Bresnan<sub>z</sub>]]<sub>i</sub> did she<sub>z</sub> think that every student<sub>j</sub> would like t<sub>i</sub> ]?

In (35) we are dealing with both Principle C and variable binding. In (35a) the adjunct *that he gave to Bresnan*, contained within the wh-phrase headed by *which paper*, shows reconstruction effects in the SPEC-C position of *like*: from that position the pronoun *he* can

<sup>34</sup> See Stepanov (2001) for relevant discussion on late insertion of adjuncts.



be bound by *every student*, and still avoid the Principle C effect; in (35b), *every student* forces reconstruction in the base position, and this is fatal, due to Principle-C, not variable binding.

How does Chomsky's (2004) analysis account for the facts in (34) and (35)? He proposes a process of simplification (SIMPL) which is part of the Transfer operation applying at the phase level and restoring the normal structural relations (c-command, etc). Importantly, SIMPL is designed so that it can (but must not) dissociate PF and LF Transfer. That is, given any non-trivial chain, SIMPL can apply to one occurrence in the LF component and to another one in the PF component, thus explaining the facts in (35a), where Transfer effects are dissociated: in (35a), we spell-out (that is, Transfer to PF) the higher copy, whereas it is an intermediate one that gets shipped to LF for binding business.

“There is an operation SIMPL that converts  $\langle \alpha, \beta \rangle$  to  $\{\alpha, \beta\}$ ; in effect, it is part of  $\Sigma$ . Since SIMPL applies at the stage of the derivation at which Spell-Out S-O applies, it is also in effect part of S-O. We conclude, then, that it is part of the operation TRANSFER, which transfers the NS derivation (specifically, its last line) to both  $\Phi$  and  $\Sigma$ . Suppose SIMPL is optional [...] For overt movement [...] optionality of SIMPL will have no effect at the PHON level because S-O does not apply to the trace in any event. But it might have an effect at SEM. Thus in such structures as [(34b)], application of SIMPL to the trace (copy) yields reconstruction effects, obviated if SIMPL applies only where it must: at the phase where S-O applies.”  
[Chomsky (2004:118-119)]

This optional character of SIMPL also predicts the binding effect of sentences like (36), where it is the first (neither the last nor the intermediate one) copy which is simplified at LF.

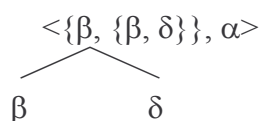
(36) [CP [Which papers [that he<sub>k</sub> wrote]]<sub>i</sub> did every linguist<sub>k</sub> publish t<sub>i</sub> ]?

The facts fall into place as far as something like SIMPL is available. The asymmetry between variable binding and Principle-C effects is also captured due to the optional nature of this operation. There is, however, the logical doubt of whether the same results can be achieved without the operations of pair-Merge and SIMPL; or, in other words, whether we can question (and in fact deny) the ontological different status of these operations without empirical loss. Perhaps this is too premature an issue to pose, but since it is minimalist in its spirit, it is not out of place. In the next section I will offer more data showing reconstruction effects of adjuncts, but this time I will provide really relevant data, for note that Lebeaux's (1991) examples are no true adjuncts: they are adjuncts within arguments, which does not allow us to test the empirical adequacy of the parallel plane idea.

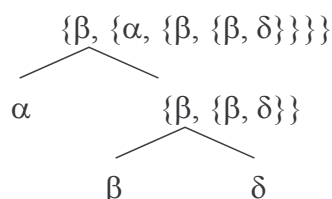
#### 4. Two types of adjuncts

The goal of this section is to test the validity of Uriagereka's (2005) claim that modification can be formally expressed through pair-Merge (bona fide adjunction) and set-Merge (adjuncts merged as SPECs in a cascade structure), as indicated in (37), where  $\alpha$  stands for the adjunct:

(37) a. True adjunction



b. Specification



The facts to be considered can be classified depending on the degree of connectivity adjuncts display. At first glance, it seems that the system differentiates adjuncts on linear order grounds: adjuncts to the right show less connectivity than adjuncts to the left. It is important to note, before exploring the data in more detail, that this left vs. right asymmetry is predicted to vanish in the case of covert processes if Chomsky's (2004) SIMPL is correct; that is, if processes like NPI licensing or binding operate at the boundaries of LF (see Chomsky 2004, 2005b for discussion), it is somewhat pointless to make a distinction like (37): at LF the structure in (37a) would have been simplified, being formally identical to that of (37b). My own judgment, though, is that such a covert analysis is not forced upon us, for if NPI licensing and binding obtain under Agree, then those processes can take place within Narrow Syntax.

Obviously, the distinction in (37), as such, says nothing about sub-extraction from within adjuncts (Huang's 1982 Adjunct Condition). These dependents, analyzed either as SPECs or as true adjuncts, block all kind of sub-extraction.<sup>35</sup>

(38) \*<sub>[CP [What books]<sub>i</sub> did John call Mary [<sub>becauseP</sub> because she had t<sub>i</sub> ]?</sub>

<sup>35</sup> As Juan Uriagereka (p.c.) notes, adjuncts of the sort studied by Browning (1987) allow sub-extraction:

- (i) Who
- <sub>i</sub>
- did you go there [to visit t
- <sub>i</sub>
- ]

I hasten to add that I have no good explanation for (i) at this point, but it is not unlikely that some reanalysis process can be blamed. I suspect, to be precise about it, that the sequence 'go to visit' can be treated as a complex verbal predicate (i.e., a periphrasis).

There are similar cases of acceptable sub-extraction in Spanish, like (ii) and (iii) (presumably, parasitic gap structures). As can be seen, sub-extraction is possible if the verb within the adjunct clause is inflected in subjunctive mood or non-inflected.

- (ii) \*¿Qué libro
- <sub>i</sub>
- compraste t
- <sub>i</sub>
- [
- <sub>porP</sub>
- porque Juan leyó t
- <sub>i</sub>
- ]? (Spanish)

What book bought-2SG for-that Juan read-3SG

'What book did you buy because Juan read?'

- (iii) ¿Qué libro
- <sub>i</sub>
- compraste t
- <sub>i</sub>
- [
- <sub>paraP</sub>
- para que Juan leyese t
- <sub>i</sub>
- ]? (Spanish)

What book bought-2SG to that Juan read-SUBJ-3SG

'What book did you buy for Juan to read?'

- (iv) ¿Qué libro
- <sub>i</sub>
- compraste t
- <sub>i</sub>
- [
- <sub>paraP</sub>
- para leer t
- <sub>i</sub>
- ]? (Spanish)

What book bought-2SG to to-read

'What book did you buy to read?'

The Dana Scully character of the X-Files series has provided me with the next intriguing datum, for which I have no explanation either:

- (v) La verdad
- <sub>i</sub>
- [
- <sub>CP</sub>
- [que
- <sub>i</sub>
- ] tanto hemos luchado [
- <sub>porP</sub>
- por descubrir t
- <sub>i</sub>
- ]] (Spanish)

The truth that so-much have-1PL fought to to-discover

'The truth we have fought so much to discover'

Curiously, if the quantifier *tanto* (Eng. *so much*) is dropped extraction is worse, perhaps indicating that the structures share some properties in common with result clauses.

- (vi) ??La verdad
- <sub>i</sub>
- [
- <sub>CP</sub>
- [que
- <sub>i</sub>
- ] hemos luchado [
- <sub>porP</sub>
- por descubrir t
- <sub>i</sub>
- ]] (Spanish)

The truth that have-2PL fought for to-discover

'The truth that we have fought to discover'



All other things being equal, an explanation for the Adjunct Condition should lie in the specifics of locality, about which there is no consensus. Reducing all proposals I am familiar with to two is a non-trivial cut, but I think it is fair to argue that there are two main views: sub-extraction is said to be impossible due either to phrase structure or to agreement facts. Let me elaborate: while some scholars argue that structural constraints rule sub-extraction (see Boeckx 2003a; Chomsky 2004; and Uriagereka 2003 for the parallel plane idea; Chomsky 2005b about locality problems with phase edges; and Uriagereka 1999 on the notion of command unit and Multiple Spell-out), others believe that the mechanics of Agree systems draw the line (see Boeckx 2003a; and Rackowski & Richards 2005). The possibility that something like Chomsky's Activity Condition is relevant here strikes me as an appealing one; in particular, it would be interesting if (39), or some variant, was the relevant principle.<sup>36</sup>

(39) **Activity Condition on Sub-extraction**

Only active elements (those that have not been assigned Case) are transparent to sub-extraction operations.

In the case of embedded CPs, which are not usually strong islands, there seems to be empirical evidence that Agree processes are complex (or “multiple”, in the sense of Hiraiwa 2001, 2005), since sub-extraction of *wh*-phrases requires for the Probe to previously Agree with the whole CP (see Boeckx 2003a; Rackowski & Richards 2005; and Uriagereka 2002). If we apply the same logic to adjuncts, the prediction is clear: due to the same reason that adjuncts project no label, adjuncts cannot be Goals for  $\phi$ -Probes. The question that immediately arises is whether adjuncts can establish a (long-distance) Probe-Goal dependency which does not need to invoke a Match-Agree procedure? This question, though, cannot be formulated if adjuncts are in a parallel plane, for then they do not enter into *c*-command relations; if, however, they are not (being a SPEC), we can formulate this question, and the Spanish data in (40) become extremely relevant in this respect.

- (40) a. ¿[Con cuál de sus<sub>z</sub> novias]<sub>i</sub> crees que va más al cine  
 with which of his girlfriends think-2SG that go-3SG more to-the cinema  
 todo guaperas<sub>z</sub> t<sub>i</sub> ?  
 every handsome-boy  
 ‘Which of his girlfriends do you think every good-looking-guy goes to the cinema with the most?’
- b. ¿[Para cuántos de sus<sub>z</sub> familiares]<sub>i</sub> ha comprado regalos cada  
 for how-many of his relatives have-3SG bought presents every  
 chico<sub>z</sub> t<sub>i</sub> ?  
 boy  
 ‘For how many of his relatives has every boy bought presents?’

---

<sup>36</sup> Again, this poses many questions which I cannot address due to space restrictions. See Gallego (2006, in progress) for more detailed discussion. Everything boils down to what being a “barrier” (or “opaque domain”) is. Obviously, being a SPEC alone will not do if the facts noted by Uriagereka (1988) and Chomsky (2005b) are correct (some SPECS allow sub-extraction). It remains to be discovered, then, whether the parallel plane and the Activity Condition accounts are independent from each other or are finally reducible to one.

- c. ¿[Por cuál de sus<sub>z</sub> crímenes]<sub>i</sub> ha sido encarcelado todo mafioso<sub>z</sub> t<sub>i</sub>?  
 gangster  
 ‘Which of his crimes do you think every gangster has been put into jail for?’

The examples in (40) show that true wh-adjuncts (those, which unlike Lebeaux’s 1991, are not within arguments) can reconstruct in a position lower than the external argument<sup>37</sup>, a conclusion incompatible with Chomsky’s (2004) analysis: being pair-Merged, adjuncts must be out-of-sight for any displacement operation.<sup>38, 39</sup>

Facts concerning scope are not so problematic. In principle, the analyses in (37) allow for scopal and non-scopal readings to obtain, but, as noted by Ernst (2000, 2002), sentences like those in (41) do not differ on truth-conditional grounds. Thus, in (41), the adjuncts *in the kitchen* and *hungrily* do not seem to scope over the VP-chunk they adjoin to.<sup>40, 41</sup>

- (41) a. Carol ate the fish hungrily in the kitchen.  
 b. Carol ate the fish in the kitchen hungrily.

The sentences in (41) get what I will call, in the spirit of Uriagereka (2003) and Martin & Uriagereka (2000), a Markovian reading, perfectly fitting with neo-Davidsonian treatments of adjuncts as predicates of the event (see Davidson 1967; Herburger 2000; and Parsons 1990):

- (42) [∃ e: eat (e) & Agent (Carol,e) & Theme (the fish,e) & hungrily (e) & in-the-kitchen (e)]

Notice that (42) can account for the entailment patterns of (43): (43a) entails both (43b) and (43c), which, together, they do not entail (43a) (see Parsons 1990).

<sup>37</sup> This constitutes a problem for accounts in which wh-adjuncts are base-generated in SPEC-C. See Boeckx (2003a:91-97) for relevant discussion.

<sup>38</sup> I owe this observation to Cedric Boeckx (p.c.).

<sup>39</sup> Noam Chomsky (p.c.) notes that the wh-constituents in (40) are not adjuncts, and can be analyzed as SPECS in a cascade structure à la Pesetsky (1995). This conclusion is identical and compatible to Uriagereka’s (2005), confirming the necessity for the duality of (37).

<sup>40</sup> Things are different in Cinque’s (1999) proposal, which, due to theory internal reasons, analyzes all VP adjuncts as SPECS in *v*\*P shells with massive “snowballing” movements. Cinque (1999:28) does provide, however, cases in which adjuncts display strong scope effects; note, crucially, that his examples contain quantified adjuncts, which surely blur the picture.

- (i) He attended classes every day of the week in a different university.  
*(every day of the week scopes over in a different university)*  
 (ii) He attended classes in each university on a different day of the week.  
*(in each university scopes over on a different day of the week)*

<sup>41</sup> In this respect, a reviewer is concerned about sequences like (i) and (ii), both of which contain adjuncts (relative clauses) displaying scope (embedding) properties:

- (i) \* [The man [the woman [the child knows] loves] comes]  
 (ii) [The man [the woman knows] comes]

I think neither (i) nor (ii) pose any problem for the scopeless nature of adjuncts, since, as we are about to see, adjuncts can also manifest scope effects. As for the particular contrast between (i) and (ii), I have nothing especially deep to say, other than it might follow from memory limitations –plausibly, when the pattern ‘The N that John V<sub>1</sub> V<sub>2</sub>’ is reached, computational restrictions would force the restatement of expressions in paratactic terms, as Chomsky (2005b, 2006) suggests.

- (43) a.  $[\exists e: \text{eat}(e) \ \& \ \text{Agent}(\text{Carol},e) \ \& \ \text{Theme}(\text{the fish},e) \ \& \ \text{hungrily}(e) \ \& \ \text{in-the-kitchen}(e)]$   
 b.  $[\exists e: \text{eat}(e) \ \& \ \text{Agent}(\text{Carol},e) \ \& \ \text{Theme}(\text{the fish},e) \ \& \ \text{hungrily}(e)]$   
 c.  $[\exists e: \text{eat}(e) \ \& \ \text{Agent}(\text{Carol},e) \ \& \ \text{Theme}(\text{the fish},e) \ \& \ \text{in-the-kitchen}(e)]$

All this does not mean that scope (non-Markovian) readings are impossible. (44), taken from Ernst (2000:353), receives precisely such a reading.

- (44) a. They run fast awkwardly, but run slowly smoothly.  
 b. They play soft well enough, but play loudly pretty poorly.

As Irurtzun & Gallego (2006) note, the semantics we want for this type of expressions is roughly that of conditionals. In our paper, we propose the semantics of (45), which should be read as follows: ‘all events of they running fast are events of they running fast awkwardly’.

- (45)  $[\forall e: \text{run}(e) \ \& \ \text{Agent}(\text{they},e) \ \& \ \text{fast}(e)] \ \text{awkwardly}(e)$

In Irurtzun & Gallego (2006) it is claimed that pair-Merge can be used to provide this non-Markovian reading too, but this is unlikely: it would not explain why the same operation can provide two different readings –there must be something formally different. Here I would like to propose that non-Markovian readings arise when adjuncts are merged as SPECs. To keep things simple, I will use the sentence in (46), which can receive both interpretations, as indicated in (47):

- (46) John works in Barcelona.

- (47) a.  $[\exists e: \text{work}(e) \ \& \ \text{Agent}(\text{John},e)] \ \text{in-Barcelona}(e)$  *Markovian Reading*  
 b.  $[\forall e: \text{work}(e) \ \& \ \text{Agent}(\text{John},e)] \ \text{in-Barcelona}(e)$  *Non-Markovian Reading*

Syntactically, I would like to argue that the non-Markovian reading arises if the adjunct *in Barcelona* is an outer-SPEC- $v^*$ , as indicated in (48).

- (48)  $[_{v^*P} [\text{in Barcelona}] [_{v^*P} \text{John} [_{v^*} v^* [_{VP} \text{work} ]]]]$

How is *in Barcelona* merged as a SPEC? <sup>42</sup> I will assess this point by the end of this section in a more detailed way, suffice it to say at this point that this merger is triggered by an EPP feature that  $v^*$  is endowed with (an edge feature, in Chomsky’s 2005b terms). I consider (48) as a structure with a semantic import on the outcome, similar, *mutatis mutandis*, to the case of Object Shift explored by Chomsky (2001) and to the analysis of focus developed by Irurtzun (2005).<sup>43</sup> Accordingly, my analysis of non-Markovian adjuncts presupposes a quantificational treatment which is consistent with the semantics advanced by Irurtzun & Gallego (2006).

<sup>42</sup> At first glance, there are two possible strategies: either *in Barcelona* is first-Merged as a SPEC or else it moves there from a true adjunction position? The latter possibility is barred if Probe-Goal dependencies need c-command to go through, as Cedric Boeckx (p.c.) makes me note, so I will assume the former. See Gallego (in progress) for discussion.

<sup>43</sup> See Belletti (2004) and Rizzi (1997) for related ideas in a different framework.

What about NPI licensing and binding? Consider NPI first. As noted by Uriagereka (2003), examples like (49) reinforce the hypothesis we started this section with: adjuncts to the right behave as true adjuncts; adjuncts to the left behave as SPECs:

- (49) a. \* [<sub>CP</sub> A priest<sub>i</sub> can <[<sub>v\*P</sub> t<sub>i</sub> tell *any* secret of confession] [under no circumstances]>]  
 b. [<sub>CP</sub> [Under no circumstances] can a priest tell *any* secret of confession]

In (49), only when placed to the left, the negative adjunct *under no circumstances* can c-command (and license) the NPI *any secret of confession*. What happens if it is the adjunct that contains an NPI (see Larson 2004; Marantz 2003; and Pesetsky 1995)? Surprisingly enough, we find the opposite pattern:

- (50) a. María no habló con Juan en ninguna biblioteca. (Spanish)  
 María not talked-3SG with Juan in any library  
 ‘María did not talk to Juan in any library’  
 b.<sup>79</sup>En ninguna biblioteca, María no habló con Juan. (Spanish)  
 In any library, María not talked-3SG with Juan  
 ‘In any library, María did not talk to Juan’

(50b) is expected: since no negative element c-commands the adjunct, the NPI is not licensed.<sup>44</sup> (50a) is unexpected, but assuming NPI licensing to operate at LF, a SIMPL based analysis could do. The same could be said about binding within adjuncts (see Pesetsky 1995):

- (51) a. He [<sub>v\*P</sub> <[cleaned every room]<sub>i</sub>] [for its<sub>i</sub> owner]>  
 b. She [<sub>v\*P</sub> <[gave a present to the children]<sub>i</sub>] [on each other<sub>i</sub>’s birthdays]>  
 c. A treat was [<sub>v\*P</sub> <[given to every pet]<sub>i</sub>] [by its<sub>i</sub> owner]>

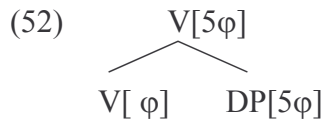
The binding effects in (51) can be analyzed in different ways: following work by Howard Lasnik, Chomsky (2005b) argues that objects always raise to a case checking position he identifies as SPEC-V from which they c-command into the adjunct after Transfer (when SIMPL has applied).<sup>45</sup> But do the facts in (51) necessarily follow from binding taking place at LF, as Chomsky (2005b) suggests, or can they be accommodated by treating adjuncts as SPECs? Note that we are facing the same paradox again and again: what decides whether modifiers are merged as true adjuncts (simplified at LF) or as SPECs? Here I would like to relate this issue to Boeckx’s (2002) labelling proposal. As the reader may recall, the gist of Boeckx’s (2002) analysis is that labels correspond to a feature shared by the SOs undergoing Merge. For the purposes of this paper I will assume that shared features reduce to two: EPP and  $\phi$ -features.<sup>46</sup> Things being so, the merger of a verb and its object (Probe and Goal respectively) would be possible due to the  $\phi$ -features they share, roughly as in (52).<sup>47</sup>

<sup>44</sup> The expression is not fully out for some speakers. I put aside the relation between (50b)’s degraded status and the topicalization of non-specific indefinite DPs.

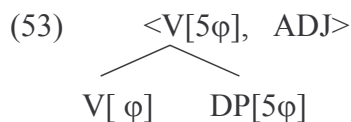
<sup>45</sup> I put aside the details of Larson’s (2004) analysis, which, in order to capture the NPI, binding, linear order and focus properties of adjuncts, assumes that adjuncts undergo Merge with the verb before arguments do.

<sup>46</sup> This does not exhaust Boeckx’s (2002) own typology, which includes  $\Phi$ ,  $\Theta$ , and Q features. I discuss those options in Gallego (2007).

<sup>47</sup> I take it, much in line with what is generally assumed ever since the Split INFL Hypothesis, that there are functional nodes containing bundles of  $\phi$ -features belonging to subject and object. With Chomsky (2005b), I assume that C and T contain subject  $\phi$ -features, whereas  $v^*$  and V do object  $\phi$ -features.



In (52) I assume that the  $\varphi$ -features of the verb are valued under Match-and-Agree with those of the object, and that the label (i.e., feature) which projects is that of the verb because it is the one that needs valuation –it is the Probe. In this way, we ensure that the resulting syntactic object has a verbal nature.<sup>48</sup> The same logic naturally extends to the merger of  $v^*$  and the external argument (which, as suggested by Chomsky 2005b, might give rise to an unlabeled structure). What about adjuncts? It is plausible enough that they do not share features with any SO, but if so, how must they be introduced? The duality of (37) can be translated by saying that adjuncts are merged by projecting no label at all (pair-Merge) or by projecting an EPP-induced label. The first possibility gives us a Match without Agree, in Boeckx’s (2002:29) system: “just like we find Match without Agree in cases of non-trivial chains (displacement), so we expect to find Match without Agree under basic concatenation operations”. I assume Boeckx’s (2002) proposal except for the Matching part –no feature can be matched in adjunction. Things being so, adjuncts would be introduced as in (53):



(53) seems to be able to explain the low level of connectivity of adjuncts to-the-right, but more is needed: we have seen empirical evidence suggesting that, whatever the ultimate reason, adjuncts can be merged as SPECs. I want to argue that in these cases, the label is EPP-driven,<sup>49</sup> as in merger operations with phase heads  $v^*$  and C in order to create outer-SPECs. In truth, there is no feature sharing in these cases either (unless we stipulate them, as in the cartographic project of Rizzi 1997 and his associates): the phase head is just endowed with an indiscriminate EPP feature acting as a Probe, and no feature of the Goal is matched (in plain English: it makes no sense to postulate a valued counterpart for the EPP) so I assume that one of the Probe’s features directly projects. The key question: which one? Here I will assume  $\varphi$ -features percolate in this case as well.<sup>50</sup>

<sup>48</sup> This endorses Chomsky’s (2001) and Boeckx’s (2002) idea that categorial features can be dispensed with (see Marantz 1997). The fact that the features which project are uninterpretable in the verb need not be a problem (see Chomsky 1995, 2000 for discussion about the projection of labels of uninterpretable  $\varphi$ -features) as long as we stick to the leading role of valuation (and not interpretability) within computation. See Pesetsky & Torrego (2004).

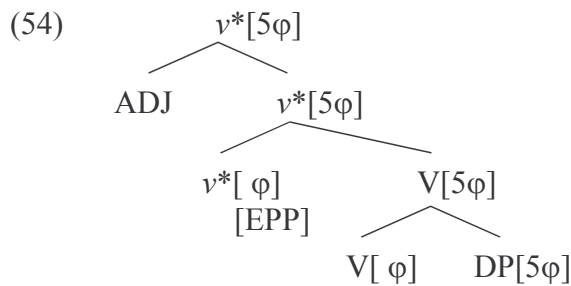
<sup>49</sup> This is actually Chomsky’s (2005b) claim, but while he generalizes an EPP-driven Merge, I restrict it to the creation of SPECs (in the sense of Chomsky 2000, 2001):

“For an LI to be able to enter into a computation, merging with some SO (and automatically satisfying SMT), it must have some property permitting this operation. A property of an LI is called a feature, so an LI has a feature that permits it to be merged. Call this the edge-feature (EF) of the LI. If an LI lacks EF, it can only be a full expression in itself; an interjection”.

[Chomsky (2005b:6)]

<sup>50</sup> In (54) I put aside the merger of the external argument.





Notice that, in (54), we are forced to assume that some property (some feature) of  $v^*$  projects: that is the only way of capturing the verbal nature of the entire syntactic object, as well as the fact that the ADJ is merged as a SPEC, occupying  $v^*$ 's edge. The process is similar in its spirit to Chomsky's (2001) analysis of Object Shift and the idea that semantic effects arise at phase edges, since in these cases the resulting configuration has semantic consequences too: binding, non-Markovian readings, and NPI licensing are possible only under (54). Granted, some cases of binding (51) and NPI licensing (50) go through without (54) if Agree processes can operate at LF (see Nissenbaum 2000 and Pesetsky 2000), but if Agree only operates during computation, then we do need (54) in all such cases.

Finally, something must be said about linear order. Martin & Uriagereka (2000) and Uriagereka (2003) discuss this point at length, noting the tension that Kayne's (1994) LCA creates when adjunction comes to the fore. They conclude that there are three possible solutions: a) LCA is wrong; b) LCA is not wrong, and there are massive "snowballing" movements (see Cinque 1999); c) no linear order can be decided by standard methods. Martin & Uriagereka (2000) endorse (c), building on the fact that adjuncts, when pair-Merged, do not enter into c-command relations, and Kayne's (1994) LCA becomes useless.<sup>51</sup>

By exploiting the notion of Numeration (see Chomsky 1995, 2000, 2001), Uriagereka (2003) suggests a dynamic activation procedure that derives linear order and scope effects. In this paper, I will assume Uriagereka's (2003) proposal, whose details are as follows:

(55) **Syntactic Activation**

A syntactic object SO is activated when it leaves a Numeration NUM and enters a derivational workspace  $D_{ws}$ .

(56) **Consequences of derivational activation**

A modifier's derivational activation directly determines its linear order and scope.

(55) and (56) are not principles, but rather particular assumptions about the nature of derivational dynamics. Together, (55) and (56) imply that if adjunct A is "activated" (that is, if adjunct A leaves the NUM, entering the derivation proper) before adjunct B, adjunct A precedes adjunct B, no more no less. This assumption does not have to be made in the case of arguments, for these can piggy-back on c-command relations created during the computation. In the case of bona fide adjuncts c-command is unavailable, so the system resorts to an internal device (activation timing) in order to yield the desired output.

<sup>51</sup> The problem could go away if SIMPL works as Chomsky (2004) argues. If c-command can be restored at the Transfer point (due to SIMPL), then PF and LF could piggy back on that information to create both scope effects and linear order. See Gallego (2006) for a dynamic account of linear order for pair-Merged adjuncts different from Uriagereka's (2003).

Adjuncts which are formally SPECs, on the other hand, do not need to run the same fate – Kayne’s (1994) LCA is enough. A red flag must be raised, nevertheless: even though linear order can be decided at PF, we are forced to assume that all arguments must abandon their first-Merge position (escaping from the VP; see Alexiadou & Anagnostopoulou 2001) before Transfer –that is the only way for adjuncts in SPEC-*v*\* to appear to-the-right.<sup>52</sup>

### 5. Conclusions

In the preceding lines I have explored some aspects of Bare Phrase Structure (BPS) from a minimalist point of view. Following Uriagereka (2005, forthcoming) I have assumed a connection between BPS and the Chomsky Hierarchy, paying special attention to the type 3 of grammars, which I have taken to embody Chomsky’s (2004) pair-Merge. From that onwards, I have focused on one of the most exciting and obscure aspects of current syntactic theory: adjuncts. It has been my intention to derive all the properties of these syntactic dependents from a notion which I consider as the backbone of contemporary syntactic theory: phrase structure. As we have seen, there is robust evidence suggesting a non-uniform treatment for adjuncts, as argued by Uriagereka (2005, forthcoming). This duality seems to me to be unavoidable, and suggests that Cinque’s (1999) analysis cannot be the whole history, as correctly noted by Boeckx (2003b):

“It is fair to say that adjuncts are not specifiers; they don’t behave on a par: Adjuncts iterate, specifiers, don’t; specifiers overwhelmingly surface on the left, many adjuncts on the right (in SVO languages); some specifiers allow for extractions, adjuncts never do; specifiers license anaphors, adjuncts never do. The list could go on and on. Specifiers and adjuncts just are two different species. Collapsing them structurally loses any hope to distinguish them.”

[Boeckx (2003b:98-99)]

It remains to be found out why things are this way. That is: it remains to “understand” why this duality (if correct) arises. I have sketched a solution that is consistent with the interface-driven nature of adjuncts (see Boeckx 2003b; Ernst 2002; Chomsky 2004): adjuncts are SPECs depending on an effect on the outcome.<sup>53</sup> Perhaps this is a premature (or even wrong) conclusion, but the hypothesis appears to be compatible with almost everything we have seen: adjuncts usually happen to be SPECs whenever some interface-driven process is at stake (e.g., feature valuation in cases of NPI and binding, and also quantificational structures when non-Markovian readings arise). The connection may be, to repeat, too hasty, but it is worth exploring inasmuch as it satisfies the leading intuition that syntax is an optimal solution to interface requirements.

<sup>52</sup> Obviously, nothing extra needs to be said for *wh*-moved or topicalized adjuncts –these are also SPECs.

<sup>53</sup> As Cedric Boeckx (p.c.) correctly points out, this formal ambivalence (pair-Merge vs. set-Merge as a SPEC in cascade) resembles the optional labeling mechanism for adjuncts discussed by Hornstein et al. (2005): although adjunction does not normally yield labels, these can be created for computational operations with an effect on the outcome (e.g., VP topicalization).



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## On directional readings of locative prepositions

Berit Gehrke

This paper discusses data from English, Dutch, and German and argues that these languages have no spatial prepositions that are lexically ambiguous between a locative and a directional reading. Rather, prepositions like *in*, *on*, *under* or *behind* always denote places and any meaning of directionality has to be licensed by other means. These means include additional directional prepositions, resultative verbs, certain movement operations, case and/or contextual or reference axes that will be discussed in detail in the course of the paper.

### 1. Introduction

This paper addresses the issue under which circumstances locative PPs can be interpreted directionally or as a constituting part of a directed motion event. For this purpose, I will concentrate on the locative prepositions *in*, *on*, *under*, and *behind* and their equivalents in three closely related languages, namely Dutch, English, and German.

It is generally assumed that the distinction between a locative and a directional meaning in the spatial domain manifests itself both in the semantics and the syntax of prepositions or prepositional phrases (PPs). The denotation of locative PPs can be treated as sets of Places (locations) in semantics, whereas directional PPs denote sets of Paths made up of Places (Jackendoff 1983; Zwarts 1997, 2005a; Zwarts & Winter 2000; Kracht 2005; among others). Syntactically, then, locative PPs are associated with Place structure, directional PPs with Path structure which embeds Place structure (van Riemsdijk 1978, 1990; Huybregts & van Riemsdijk 2002; Koopman 1997; Helmantel 2002; den Dikken 2003; Svenonius 2004; among others). A question that arises under this distinction is whether there are adpositions that are in principle (lexically) ambiguous between a directional and a locative reading and can thus license both Place and Path structure. I will argue for the three languages under discussion that this is not the case and that adpositions are either locative or directional.

A second issue to be addressed in this paper is a typological one. Talmy (1985, 2000) distinguishes between verb-framed and satellite-framed languages. According to this distinction, verb-framed languages (e.g. Romance, Semitic, Polynesian) have verbs that conflate motion and path semantics but any component of manner has to be expressed separately, for example in a subordinate clause, or is left out entirely:

- (1) Il est **entré** dans la chambre (**en dansant**). French  
 he is entered in the room (dansing)  
 ‘He entered the room (dancing).’

In contrast, verbs in satellite-framed languages (e.g. Germanic, Chinese) conflate manner and motion but do not encode path; paths are described by additional elements like PPs or particles, so-called satellites:

- (2) He **danced into** the room. English

A question that arises under this typology is whether there are any genuinely Germanic verbs that encode path and motion at the same time. I will argue that there are such verbs, and that the locative PPs under discussion can obtain a directional reading only due to the directional component provided by these verbs. An overview of the data will be given in section 2 with subsequent sections addressing semantic and syntactic issues raised during this data discussion.

## 2. Locative PPs in West Germanic

### 2.1. in and on

Experimental work by Thomas (2001, 2003) and Nikitina (2006) shows that English *in* and *on* cannot be understood directionally in all contexts. In particular, only certain verbs such as non-iterative *jump*, *throw*, *put*, *fall*, among others, henceforth *put*-verbs, can trigger a directional reading. For demonstration, I will use data with *in* but the same holds for *on*:

- (3) Oscar **jumped in** the lake. (locative / directional-goal)

(3) is ambiguous between a reading where Oscar jumped on a path which leads to a place inside the lake (directional-goal) and a reading where Oscar did one or more jumps (up and down) in one location, namely inside the lake (locative).

With manner of motion verbs (Levin 1993), i.e. motion verbs with a strong manner component like *crawl*, *walk*, *swim*, among others, henceforth *swim*-verbs, these prepositions only get a locative reading:

- (4) Oscar **swam in** the lake. (locative / \*directional)

(4) can only have the locative reading where Oscar swam around in the lake, but not the directional reading where he, for example, swims from a river into the lake.

Dutch *in* ‘in’ and *op* ‘on’ behave similarly:

- (5) a. Oskar **heeft / is in** het meer **gesprongen**. (locative / directional-goal)  
 Oskar has / is in the lake jumped  
 ‘Oskar jumped in the lake.’  
 b. Oskar **heeft / ?? is** in het meer **gezwommen**. (locative / ??directional)  
 Oskar has / is in the lake swum  
 ‘Oskar swam in the lake.’

Dutch motion verbs generally select different auxiliaries when they refer to a locative (manner of) motion (HAVE) or a directed motion (BE). (5) b. with the BE-auxiliary is out or at least heavily degraded, which shows that the *in*-PP cannot be understood directionally. This is different with directional PPs:

- (6) Oskar **\*heeft / is naar** het meer **gezwommen**. (\*locative / directional-goal)  
 Oskar has / is to the lake swum  
 ‘Oskar swam to the lake.’

Under certain conditions, English and Dutch *swim*-verbs in combination with *in* and *on/op* can be part of a directed motion event. In such cases, English makes use of the complex prepositions *into* and *onto*, where the locative prepositions *in* and *on* combine with the directional preposition *to*. Dutch uses *in* and *op* in postposition<sup>1</sup> (cf. van Riemsdijk 1978; Koopman 1997; den Dikken 2003):

- (7) a. English: Oscar swam **into** the lake. (\*locative / directional-goal)  
 b. Dutch: Oskar zwom het meer **in**.

Hence, the addition of a directional element *to* in English and a change in the syntactic structure in Dutch bring about a directional reading with *in* and *on*. The lexical semantics of these prepositions, however, still remains the same, as will be argued for in section 3.

In German, locative and directional readings of PPs headed by *in* ‘in’ or *auf* ‘on’ are distinguished by dative and accusative case on the DP inside the PP, respectively, independent of the verb type:

- (8) a. Oskar **schwamm im** See. (locative / \*directional)  
 Oskar swam in-the.DAT lake  
 ‘Oskar swam in the lake.’  
 b. Oskar **sprang im** See.  
 Oskar jumped in-the.DAT lake  
 ‘Oskar jumped in the lake.’

<sup>1</sup> Neither English nor German can use *in* and *on* as postpositions.



- (9) a. Oskar **schwamm in den** See. (\*locative / directional-goal)  
 Oskar swam in the.ACC lake  
 ‘Oskar swam into the lake.’  
 b. Oskar **sprang in den** See.  
 Oskar jumped in the.ACC lake  
 ‘Oskar jumped into the lake.’

Again, a directional reading has to be marked additionally, here by accusative case on the DP. The directional meanings involved are goal readings with the location denoted by the *in/on*-phrase being the ending-point or the final location of some movement along a path.

## 2.2. “under” and “behind”<sup>2</sup>

English *under* and *behind* are different from *in* and *on* in that they can be understood directionally also with *swim*-verbs. However, in combination with the particular verb classes there are two types of directional readings one obtains with *under* and *behind*. I follow Jackendoff’s (1983) three-way distinction of path elements into sources, goals and routes (see section 3.1). Sources are paths with a definite starting-point but no defined ending-point, goals are paths with an ending-point but without a defined starting-point, and routes are paths that traverse via some ground or reference object but that have no defined starting- or end-point. With *swim*-verbs, then, *under* and *behind* either get a locative or a directional-route reading, but never a directional-goal reading, which in turn is possible with *put*-verbs (in addition to the locative reading). Again, I will use data with *under* but the same holds for *behind*:

- (10) a. The boat **floated under** the bridge. (locative / directional-route)  
 b. He **kicked** the ball **under** the table. (locative / directional-goal)

Crucially, for the speakers I consulted<sup>3</sup>, the directional reading involved with the *swim*-verb *float* in (10a) is not one of the boat floating to a certain point under the bridge, so not to some goal, but rather floating from one side of the bridge to the other and thus describing the route or the trajectory of the boat. *Kick*, on the other hand, behaves like a *put*-verb, with which locative PPs can get a directional-goal interpretation.

German *unter* ‘under’ and *hinter* ‘behind’ have in common with *in* ‘in’ and *auf* ‘on’ that a directional-goal and a locative reading are distinguished by case on the DP inside the PP, again irrespective of the type of verb:

<sup>2</sup> In principle, one should expect other (projective) locative prepositions to behave similarly to *under* and *behind*, such as *between* (Dutch *tussen*, German *zwischen*) or *in front of* (Dutch *voor*, German *vor*).

<sup>3</sup> The speakers I consulted are speakers of British English. There seems to be a difference between British and American English here, since American English speakers generally seem to be more accepting when it comes to directional readings with locative PPs (Nikitina 2006; see also section 5).



- (11) a. Das Boot **trieb unter der** Brücke. (locative / \*goal / \*route)  
 the boat floated under the-bridge.DAT  
 ‘The boat floated under the bridge.’
- b. Das Boot **trieb unter die** Brücke. (\*locative / goal / \*route)  
 the boat floated under the-bridge.ACC  
 ‘The boat floated to under the bridge.’
- c. Das Boot **trieb unter der** Brücke **durch**. (\*locative / \*goal / route)  
 the boat floated under the-bridge.DAT through  
 ‘The boat floated via under the bridge.’

Example (11c) shows that a route reading arises with the dative and an additional postpositional element *durch* ‘through’ or (*ent*)*lang* ‘along’ (the latter is also possible with *hinter* ‘behind’). Without this postposition the PP can only be understood locatively if the DP inside it bears dative case.<sup>4</sup>

Dutch *onder* ‘under’ and *achter* ‘behind’ are different from their English counterparts in that they by themselves, i.e. as prepositions combined with *swim*-verbs, only have a locative reading:

- (12) a. Het vliegtuig **vloog onder** de brug. (locative / \*goal / \*route)  
 the plane flew under the bridge  
 ‘The plane flew under the bridge.’
- b. Het vliegtuig **vloog onder** de brug **door**. (\*locative / \*goal / route)  
 the plane flew under the bridge through  
 ‘The plane flew via under the bridge.’
- c. \*Het vliegtuig **vloog** de brug **onder**. (\*goal)  
 the plane flew the bridge under

Example (12b) shows that Dutch has in common with German that the addition of a postpositional element like *door* ‘through’ (or *langs* ‘along’) brings out a directional-route reading, whereas c. demonstrates that *onder* ‘under’ (just as *achter* ‘behind’) cannot be used in postposition to derive a goal reading.<sup>5</sup> A goal reading arises with the additional point preposition *tot* ‘until’ (13a) or with *put*-verbs (13b). In the latter case, the sentence with *onder* is again ambiguous between a locative and a goal reading:

<sup>4</sup> For some reason German *über* ‘over’ is different from *unter* ‘under’ in that it only gets a route but not a goal reading even with the accusative. Furthermore, *über* with an additional postpositional route element can also be used with an accusative DP for many speakers, although the dative is preferred. (see also den Dikken 2003; Zwarts 2005b; section 3.3)

<sup>5</sup> According to Helmantel (2002), the use of *onder* as a postposition is regionally restricted to Flanders and southern parts of the Netherlands. However, the Flemish speaker I consulted could not use it as a postposition at all and thus behaved like the other Dutch speakers.

- (13) a. Het vliegtuig **vloog tot onder** de brug. (goal)  
 the plane flew until under the bridge  
 ‘The plane flew to/until under the bridge.’
- b. Hij **schopte** de bal **onder** de tafel. (locative / goal)  
 he kicked the ball under the table  
 ‘He kicked the ball under the table.’

### 2.3. Data summary

The empirical findings are summarised in (14).

- |                  |   |                  |
|------------------|---|------------------|
| (14) a. English: | <i>swim</i> -verbs + <i>in</i> / <i>on</i>                                | locative         |
|                  | <i>swim</i> -verbs + <i>under</i> / <i>behind</i>                         | locative / route |
|                  | <i>put</i> -verbs + <i>in</i> / <i>on</i> / <i>under</i> / <i>behind</i>  | locative / goal  |
| b. Dutch:        | <i>swim</i> -verbs + <i>in</i> / <i>op</i> / <i>onder</i> / <i>achter</i> | locative         |
|                  | <i>put</i> -verbs + <i>in</i> / <i>op</i> / <i>onder</i> / <i>achter</i>  | locative / goal  |
|                  | <i>onder</i> / <i>achter</i> + postposition                               | route            |
| c. German:       | <i>in</i> / <i>auf</i> / <i>unter</i> / <i>hinter</i> + dative case       | locative         |
|                  | <i>in</i> / <i>auf</i> / <i>unter</i> / <i>hinter</i> + accusative case   | goal             |
|                  | <i>unter</i> / <i>hinter</i> + postposition                               | route            |

In English and Dutch the availability of particular directional readings with locative prepositions depends on the verb class. Unless used with *put*-verbs, none of the English and Dutch locative prepositions can get a directional-goal reading. With *swim*-verbs the Dutch prepositions *onder* ‘under’, *achter* ‘behind’, *in* ‘in’, and *op* ‘on’ can only be interpreted locatively and any directional reading needs extra marking. This is done either by an additional postpositional route element to mark a route reading with *onder* and *achter* or using *in* and *op* in postposition to derive a goal reading. With English *in* and *on* in combination with *swim*-verbs, the addition of the directional preposition *to* is needed to express a directional-goal meaning. English *under* and *behind*, on the other hand, are ambiguous between a route and a locative reading with *swim*-verbs. German marks the distinction between goal and locative readings of PPs involving *in*, *on*, *under* and *behind* by accusative and dative case on the DP inside the PP irrespective of the verb class. A route reading with *under* and *behind* comes about with dative case and an additional postposition with a route meaning.

Hence, it seems that Dutch only has prepositions that are either locative or directional so that none of the prepositions discussed here are (lexically) ambiguous between a locative and a directional reading. English, on the other hand, seems to have prepositions that are ambiguous between a directional and a locative reading, namely *under* and *behind*. Crucially, though, the directional reading does not involve a goal a route reading.<sup>6</sup> The fact that the availability of a directional reading for *in* and *on/op* depends on the class of verbs is often not accounted for in the literature, where these prepositions are usually treated as ambiguous between a locative and a directional reading (e.g. Koopman 1997; Huybregts & van Riemsdijk 2002; den Dikken 2003). I will come back to this point in the next section.

<sup>6</sup> As will be discussed in more detail in subsequent sections, goals always need some extra marking either by some explicit goal element like a directional goal PP (involving for example *to*) or by “resultative” verbs that already integrate a goal (in the broad sense).

In addition, Talmy's typology of verb-framed vs. satellite-framed languages is not as clear-cut as sometimes suggested in the sense that there are genuinely Germanic verbs that seem to conflate motion and path, namely *put*-verbs. Even if this is still different from the motion and path conflation we find with verbs like *enter*, there is still some sense of directionality in these verbs. If there were no directional path-like component in these verbs, they could not be part of a directed motion event with purely locative PPs and no other satellite to express this path. That Talmy's typology is 'leaking' has also been noted by e.g. Stringer (2002) for French and Japanese, Beavers (2003) for Japanese, or Folli & Ramchand (2005) for Italian and English. For example, the latter argue that Italian prepositions are locative only. In that sense it could be that the main difference between Italian and English lies in the inventory of prepositions available: only English has directional PPs based on *to*. Folli & Ramchand furthermore show that Italian locative prepositions can be part of a directed motion event with certain verbs, which is reminiscent of the behaviour of *put*-verbs outlined in this section.

In the remaining part of this paper, I will address the following issues raised by the data discussed in this section. Section 3 investigates syntactic ways of deriving directional readings with *in* and *on/op* in English and Dutch as well as the case marking differences within German PPs. Section 4 will account for the difference between *put*-verbs and *swim*-verbs in terms of the event structure associated with these kinds of verbs. Finally, in section 5, I will assume that the difference between the English locative prepositions *under* and *behind*, on the one hand, and *in* and *on*, on the other, where only the former are able to licence a directional (route) reading with *swim*-verbs, is due to the (un)availability of contextual or reference axes with these prepositions.

### 3. The internal structure of PPs

This section addresses the cases in which a locative preposition can obtain a directional meaning due to additional elements or operations. In English, a directional P element like *to* can be added to a locative PP headed by *in* or *on*, in Dutch the corresponding locative prepositions can appear in postposition licensing a path reading, and in German a directional reading with all four locative prepositions *in* 'in', *auf* 'on', *unter* 'under', and *hinter* 'behind' arises if the DP inside the PP bears accusative case. I subsume all these cases under PP-internal syntax to set them apart from the PP-external syntax to be discussed in the next section.

#### 3.1. Places and Paths in syntax and semantics

The literature on the syntax of PPs usually assumes these to be internally complex with at least two hierarchically ordered functional projections to account for locative and directional readings (Koopman 1997; Helmantel 2002; Huybregts & van Riemsdijk 2002; den Dikken 2003; Svenonius 2004; among others). There is thus a general consensus for the following structure (give or take functional structure):

$$(15) \quad [\text{PathP} [\text{PlaceP} [\text{DP} ]]]$$

I do not commit myself to whether adpositions are lexical or functional in nature, since this is debated. For the sake of completeness, I will follow Huybregts & van Riemsdijk (2002) here

in assuming that Path and/or Place heads are functional projections in, for instance, the extended nominal projection, though nothing in this paper hinges on this issue. The structure in (15) also mirrors the conceptual structure of prepositional phrases as outlined in Jackendoff (1983) and subsequent work, which has formed the starting-point for many accounts of the semantics of spatial PPs.

Here, I follow the vector space semantic approach to prepositions outlined in Zwarts (1997, 2005a); Zwarts & Winter (2000)<sup>7</sup> (similar points have been made by Fong 1997; Kracht 2005; among others). In a vector space semantic approach, a locative PP like, for instance, *behind the house* is associated with the set of vectors that go from the house to points behind it. Thereby a location function (of type  $e(vt)$ ) derives sets of located vectors for locatives, mapping an e-type denotation of the reference object, the complement of P, which is the GROUND in Talmy's (1985) terms, to a vector that describes its location or dimension. Hence, PlaceP is semantically associated with a set of vectors.

The denotation of a directional PP, on the other hand, is treated as an algebraically structured set of paths (Zwarts 2005a):

- (16) A **path** is a function of type  $iv$  from the real interval  $[0,1] \subset \mathbf{R}$  (type  $i$ ) to vectors (type  $v$ ).

Directional prepositions map the reference object to a set of sequences of vectors (paths), where each of these sequences determines a potential change in position of the located object (the FIGURE according to Talmy 1985). Thus, a PathP denotes a set of sequences of vectors which constitutes a path.

Jackendoff (1983) uses the term *route* to refer to those Path functions that describe a route or a trajectory but not an (initial or final) end-point of the path. Such Path functions are associated with directional prepositions like *across*, *around*, *over*, *through*, *past*, *via* or *along*. In contrast, sources and goals specify where the path starts and ends, respectively. For example, Zwarts defines *into* as a transition from one phase to another:

- (17)  $[[ \text{into the house} ]]$  = {  $p$ : there is an interval  $I \subset [0,1]$  that includes 1 and that consists of all the indices  $i \in [0,1]$  for which  $p(i)$  is inside the house }

*To* and *onto* are defined in a parallel fashion where the result is AT and ON (instead of INSIDE), respectively. The denotations of the source prepositions *out of*, *from* and *off* are the reverse of the goal ones. A full list of these definitions is given in (18):

---

<sup>7</sup> For complete definitions, the reader is referred directly to Zwarts (2005:775f.) and Zwarts & Winter (2000:208ff.).

- (18) { **p**: there is an interval  $I \subset [0,1]$  including...  
 ... 0 and consisting of all the  $i \in [0,1]$  for which **p**( $i$ ) is at  $x$  } = [[ from  $x$  ]]  
 ... 0 and consisting of all the  $i \in [0,1]$  for which **p**( $i$ ) is on  $x$  } = [[ off  $x$  ]]  
 ... 0 and consisting of all the  $i \in [0,1]$  for which **p**( $i$ ) is in  $x$  } = [[ out of  $x$  ]]  
 ... 1 and consisting of all the  $i \in [0,1]$  for which **p**( $i$ ) is at  $x$  } = [[ to  $x$  ]]  
 ... 1 and consisting of all the  $i \in [0,1]$  for which **p**( $i$ ) is on  $x$  } = [[ onto  $x$  ]]  
 ... 1 and consisting of all the  $i \in [0,1]$  for which **p**( $i$ ) is in  $x$  } = [[ into  $x$  ]]

All of these prepositions have in common that they involve a two-stage structure, a negative and a positive phase. They all have exactly one positive phase that overlaps either with the starting point (0) or the ending point (1) (see also Fong's 1997 analysis in terms of phase quantification). The definitions furthermore indicate that they all involve some final location such as *at*, *on*, *in*  $x$ . These final locations can be syntactically represented as PlacePs that are embedded under PathPs as in (15).

### 3.2. English and Dutch

Given the syntactic and semantic assumptions outlined in section 3.1, we can now turn to the internal syntax and semantics of the West Germanic data discussed in section 2. For example, the English preposition *to* heads a PathP because a *to*-phrase denotes a path ending at the point denoted by the reference object, the DP inside the PP, which is the GROUND in Talmy's terms. The heads *in* or *on* of PlacePs embedded under a PathP headed by *to* move and incorporate into this Path<sup>o</sup> to form *into* and *onto* (cf. den Dikken 2003; Svenonius 2004):

- (19) [<sub>PathP</sub> [<sub>Path'</sub> *in<sub>i</sub>-to* [<sub>PlaceP</sub> [<sub>Place'</sub>  $t_i$  [<sub>DP</sub> *the room* ]]]]]]]

In doing so, these PlacePs denote a location which in turn is the result state or the end-point of the *to*-phrase. So semantically the *to*-phrase is a path which ends at the location denoted by the *in*-phrase (*in* DP).

In Dutch, on the other hand, the DP complements of PlacePs headed by *in*, *on* can move to Spec PathP (cf. den Dikken 2003), to identify or license the Path structure:

- (20) [<sub>PathP</sub> *de kamer<sub>i</sub>* [<sub>Path'</sub> [<sub>PlaceP</sub> [<sub>Place'</sub> *in* [ $t_i$  ]]]]]]]

Helmantel (2002) argues that this also has a semantic effect in that a DP in Spec PathP (DIRP there) receives a one-dimensional interpretation (in the sense of Verkuyl & Zwarts 1992). Only if an object is one-dimensional it can be interpreted as a path. In this context she discusses minimal pairs of the following type:

- (21) a. De man is **opde ladder** geklommen. (Helmantel 2002:73)  
 the man is on the ladder climbed  
 'The man has climbed onto the ladder.'  
 b. De man is **de ladder op** geklommen.  
 the man is the ladder on climbed  
 'The man has climbed up the ladder.'

Helmantel notes that the prepositional phrase *op de ladder* denotes a “location, namely the endpoint of the climbing”, whereas the DP *de ladder* in the postpositional phrase *de ladder op* is “not a location but rather functions as a path along which the climbing takes place” due to its being in the specifier of a directional phrase. She furthermore claims that any element in the specifier of a directional phrase has to be interpreted as a one-dimensional entity, a path, so that elements that cannot be construed as one-dimensional are banned from this position:

- (22) a. Jan stapt **op de kiezelsteen**. (Helmantel 2002:77)  
 Jan steps on the pebble  
 ‘Jan steps on the pebble.’  
 b. #Jan stapt de kiezelsteen op.  
 Jan steps the pebble on

With respect to the empirical discussion in section 2, then, Dutch *klimmen* ‘to climb’ and *stappen* ‘to step’ seem to be *put*-verbs since the whole sentence with a locative prepositional phrase involving *op* ‘on’ can still be interpreted directionally.

It is not clear, however, that all objects in postpositional phrases receive a path interpretation given the following case:

- (23) De man is **het dak op** geklommen.  
 the man is the roof on climbed  
 ‘The man has climbed onto the roof.’

This sentence is still acceptable if the roof is flat, but in that case *het dak* ‘the roof’ in the postpositional phrase is not really the path itself but the endpoint of the path. So the claim that any phrase in the specifier of a directional phrase has to receive a path interpretation is possibly too strong.

An open issue that arises in this context is why a similar incorporation of English *under* and *behind* into *to* to derive a goal interpretation is not possible. In this case, there could be some morphological or phonological constraints, given that *under* and *behind* are more complex or heavier than *in* and *on*, which could hinder their incorporating into *to*. Similarly, Dutch *onder* ‘under’ and *achter* ‘behind’ cannot appear in postposition to derive a directional goal reading.<sup>8</sup> However, this cannot be due to a morphological constraint since here, the DPs move and the prepositions do not incorporate. This cannot be a semantic constraint, either, since the particular DPs are in principle interpretable as paths and therefore should be able to occupy the specifier position of a directional phrase, if we follow Helmantel (2002). Furthermore, a goal reading is possible with these prepositions in other languages like German. I will leave this issue for future research.

### 3.3. Case inside German PPs

We saw that German makes a distinction between a directional and a locative reading of PPs headed by the prepositions discussed in section 2 by case on the DP inside the PP, namely accusative case for directional readings and dative case for locative readings. However, not all

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<sup>8</sup> But see footnote 5.



directional PPs require accusative case. For example, the goal and source prepositions *zu* ‘to’, *von* ‘from’ and *aus* ‘out’ all take dative case only. (24) provides a revised generalisation of the data discussed in Zwarts (2005b)<sup>9</sup>:

- (24) locative Ps + DAT: *bei* ‘at’; *an* ‘at, on’, *auf* ‘on’, *gegenüber* ‘across’, *hinter* ‘behind’, *in* ‘in’, *neben* ‘next to’, *über* ‘over’, *unter* ‘under’, *vor* ‘in front of’, *zwischen* ‘between’
- locative Ps + ACC: ---
- directional Ps + DAT: source: *aus* ‘out’, *von* ‘from’  
genuine goal: *nach* ‘to’, *zu* ‘to’
- directional Ps + ACC: genuine route: *durch* ‘through’, *um* ‘around’  
derived route: *über* ‘over’  
derived goal: *an*, *auf*, *gegen(über)*, *hinter*, *in*, *neben*,  
*unter*, *vor*, *zwischen*

The generalisations that we can draw from this with respect to case marking inside German spatial PPs is that dative case appears with all locatives and all those prepositions that are unambiguously source and goal, hence with all the “basic” ones.<sup>10</sup> Accusative case, on the other hand, appears with route prepositions and all directional PPs derived from locative ones; the only locative preposition that cannot appear with the accusative case and thus not derive directionality is *bei* ‘at’. I take this to be an idiosyncrasy though, since *an*, which also means ‘at’, behaves like all the other locatives in the ability to appear with the accusative to become directional. Almost all the derived meanings involve a goal reading with the sole exception of *über* ‘over’, which gets a route interpretation.<sup>11</sup>

Since accusative case thus appears in all cases where some directional reading is derived for otherwise locative PPs, it is worthwhile exploring the idea that it is a structural rather than a lexical case under these circumstances.<sup>12</sup> Den Dikken (2003) assumes both German accusative and dative case to be assigned by the functional heads PathP and PlaceP,

<sup>9</sup> Zwarts (2005b) wants to address only prepositions that (a) have a spatial meaning, and (b) govern either dative or accusative case. Hence, this should exclude prepositions that are not spatial, any non-spatial readings of particular prepositions, prepositions that govern the genitive case and finally (separable) prefixes. Therefore, I removed some items from his list. For example, *entgegen* + DAT ‘against’ is not a spatial preposition but means something like ‘in contrast to’, whereas the spatial ‘against’ is *gegen* + ACC. Whenever *entgegen* is spatial it is a separable prefix since a) under the spatial interpretation it cannot appear in preposition: \**entgegen dem Feind kommen* ‘against the-enemy.DAT come’ and b) it cannot combine with just any verb: \**Er stellte den Stuhl der Wand entgegen*. ‘He put the-chair.ACC the-wall.DAT against’ (rather: *Er stellte den Stuhl gegen die Wand*.) For a similar reason, I removed *außer* + DAT because it means ‘except for’ and not ‘outside’; the spatial meaning of ‘outside’ is rendered by *außerhalb* which governs the genitive and should therefore not be included at all. Finally, I left out *entlang*s because it governs both genitive and dative, where the genitive is a bit more archaic and the dative seems to take over due to the general loss of genitive in German. The leaving out of these three elements results in my own generalisations in (24).

<sup>10</sup> One could also think of treating goals and sources as points rather than paths. However, as argued for in Verkuyl & Zwarts (1992) and Zwarts (2005a), then goals and their source counterpart would have the same denotation in cases the ending and the starting points are the same (as in e.g. *to the house* and *from the house*), although they clearly denote different paths. Hence, if we treated goals and sources as mere points we would not include the directionality involved in these PPs (by an ordered set of indices or the like) and lose this distinction.

<sup>11</sup> See footnote 4 for why *über* ‘over’ is also different in other respects. It is interesting to note that Dutch *over* ‘over’ can appear in postposition, in contrast to *onder* ‘under’ or *achter* ‘behind’, and that in this position it gets a route but not a goal reading.

<sup>12</sup> The fact that accusative case also appears on all genuine route prepositions could indicate that these might be more complex as well.



respectively. For instance, the DP inside German PPs that involve *zu* ‘to’ bears dative case because the Place head, which is embedded under the PathP, is the closest to assign case to the DP. In directional contexts that trigger accusative case, on the other hand, as it is the case with the route prepositions and all those cases that involve what I have called derived directional meanings, he argues that there is no PlaceP available and that the DP complement of the PP is assigned accusative case by Path<sup>o</sup>.

However, at least from a semantic point of view this cannot be right. Especially the derived directional PPs (with the sole exception of PPs involving *über* ‘over’) clearly embed some kind of place since they denote the goal of some path which is a location. In general, it is not clear why the PlaceP would be lacking with some (directional) prepositions but not with others. Den Dikken’s account does not provide a theoretical explanation since it is not more than restating the facts in syntactic trees without giving any further motivation why the facts are the way they are.

I will put forward a different idea about accusative case inside German PPs, thereby drawing direct parallels to accusative case on objects. I take accusative case inside German PPs to be structural as well but do not make any claims about dative case.<sup>13</sup> According to Burzio’s generalization, there is a correlation according to which verbs without a specifier position are unable to assign structural case, or to put it in his terms:

- (25) a. A verb which lacks an external argument fails to assign accusative case.  
 b. A verb which fails to assign accusative case fails to  $\Theta$ -mark an external argument.  
 (Burzio 1986:178f./184)

This has been captured by employing a functional head *v* above VP which is responsible for both the accusative case on the internal argument and the introduction of some agent or causer in its specifier position.

Zwart (2005a,b) assumes that accusative case on objects signals the presence of a subject and a dependency between the subject and the predicate rather than between the predicate and its object:

- (26) The accusative marks dependency w.r.t. the subject, not w.r.t. the verb.  
 (Zwart 2005a)

He argues that the opposition between the structural cases nominative and accusative in morphology matches the syntactic difference between subjects and objects, in the sense that objects are hierarchically subordinated to subjects both in syntax and morphology and that also the predicate as a whole is dependent on the subject.

If we generalise Zwart’s (2005a,b) idea to accusative case inside German derived directional PPs the following picture emerges. Directional PPs can be seen as secondary, non-verbal predicates predicated over the Theme argument (e.g. Hoekstra 1984; Neeleman 1994). Under the circumstance that this secondary predication is accompanied by accusative case, then, we could assume that this case signals a dependency between the subject of the non-verbal predicate, which is in turn the internal argument of the VP, and this secondary predicate. Hence, this runs parallel to the relation between nominative subjects and verbal predicates containing a DP bearing accusative case. Accusative case is a structural case, then,

<sup>13</sup> Dative case inside German PPs might be just some kind of default case that shows up in cases where a DP needs case.

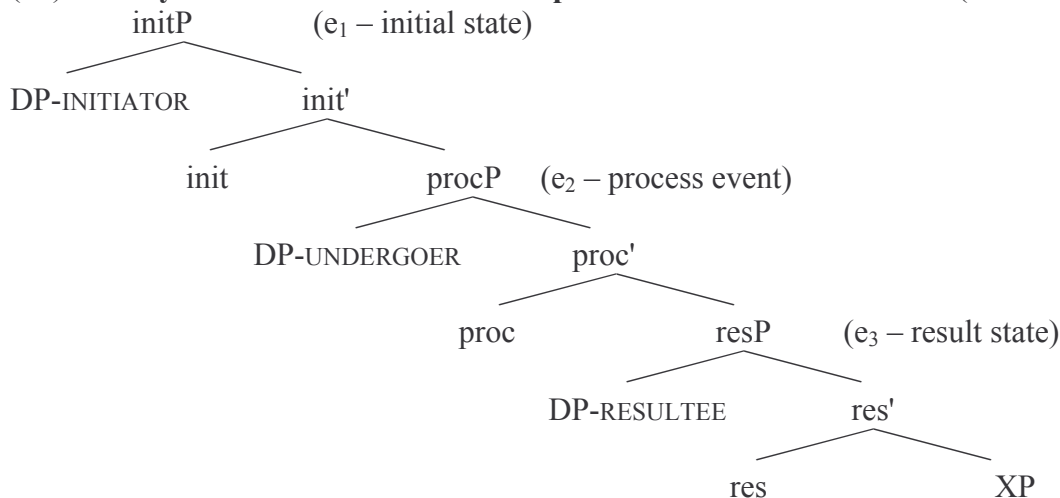
that appears on the internal argument within a predicate to signal the structural relationship between the external argument (the subject) and the predicate itself.

A problem that might arise in this context is that not all predications involve accusative case. For instance, *he is a teacher* is a predication but *a teacher* is not in the accusative case, at least not in languages that have morphological case as, for instance, in German, where this DP appears in the nominative case. However, it is not clear whether such examples really have a similar hierarchical structure as the kind of predicates discussed above. Furthermore, with the basic directional PPs involving *zu* ‘to’, *aus* ‘out’ and *von* ‘from’, the DP bears dative and not accusative case but these PPs are still secondary predicates over the internal argument of the VP. Hence, the proposal for accusative case inside PPs only goes in one direction in the sense that it accounts for the emergence of accusative case but not for its absence. The exact details of this analysis still need to be worked out.

#### 4. Event structure and Ps

In this section, I will address the difference between *put-* and *swim-*verbs and propose an account for this difference in terms of the event structure associated with these kinds of verbs. Ramchand (2005) proposes to decompose events into maximally three subevents, namely a state (the initial state), a process (the dynamic part) and another state (the result state):

#### (27) The syntax / semantics of the first phase (Ramchand 2005)



All dynamic verbs identify at least *procP*, since this is the dynamic part of each event. The causing subevent (*initP*) and the result state subevent (*resP*), however, are optional and not all verbs have the ability to identify these independently.

DPs in the specifier positions of *initP*, *procP* and *resP* have the interpretation of INITIATOR, UNDERGOER and RESULTEE (holder of the result state), respectively, where one and the same DP can appear in several of these positions. This is so because a verbal lexical item can be associated with more than one position simultaneously thereby identifying various subeventive heads at the same time. Here, Ramchand follows Starke (2001) in assuming that lexical items do not necessarily insert under a single terminal node but rather that elements can merge and project and then remerge at a later stage of the derivation.

Subevents are linked to one another by the “leads-to” relation, where in the maximal structure a state leads to a process which in turn leads to a state again. Following the notation of Hale & Keyser (1993), this relation is defined as follows:

- (28) **Principle of Event Composition** (Ramchand 2004:327)  
 If a head X which introduces an eventuality variable  $e_x$ , embeds a projection YP where Y introduces the eventuality variable  $e_y$ , then the structure is interpreted as  $e_x \rightarrow e_y$  ( $e_x$  ‘leads to’  $e_y$ ).

Hence, the interpretation of states in the event structure as either initial or result state depends on their position in the hierarchical structure, i.e. embedded under a process they are resultative but embedding a process they compose the initial state, which is the causative part of the event.

For example, a sentence like *Roberta threw the dead rat out (the door)* will have the structure of *Roberta causes the dead rat by throwing to be outside (the door)*, with *Roberta*, the causer of the whole event, in spec initP and with *the dead rat* simultaneously in Spec procP and Spec resP, since it is both undergoer of the process of throwing and resultee in the sense that it ends up outside the door. With Ramchand & Svenonius (2002), English particles like *out* are treated as particle phrases (prtPs) in complement of a result phrase (RP there) and with the direct object as the specifier of prtP:

- (29) Throw the dead rat out  
 a. [<sub>initP</sub> INITR throw-*init* [<sub>procP</sub> UNDRGR *t<sub>V</sub>* [<sub>resP</sub> RESTEE **out-res** [<sub>prtP</sub> **the rat** [<sub>prt</sub> *t<sub>prt</sub>* ]]]]]]  
 b. [<sub>initP</sub> INITR throw-*init* [<sub>procP</sub> UNDRGR *t<sub>V</sub>* [<sub>resP</sub> **the rat res** [<sub>prtP</sub> *t<sub>DP</sub>* [<sub>prt</sub> **out** ]]]]]]

In order to identify the result phrase, it is assumed for English that either the particle moves and incorporates into the head of this phrase (a.) or the object moves into its specifier, which then leads to particle shift word order (b.).

Different elements can supply a result state subevent. First, there are verbs that can identify resP in and by themselves such as *find*, semelfactive *jump*, among others. In addition, verbal particles in English (30) and certain (resultative) adjectives (31) can also provide the result state:

- (30) He ate **up** the chocolate.

- (31) He hammered the metal **flat**.

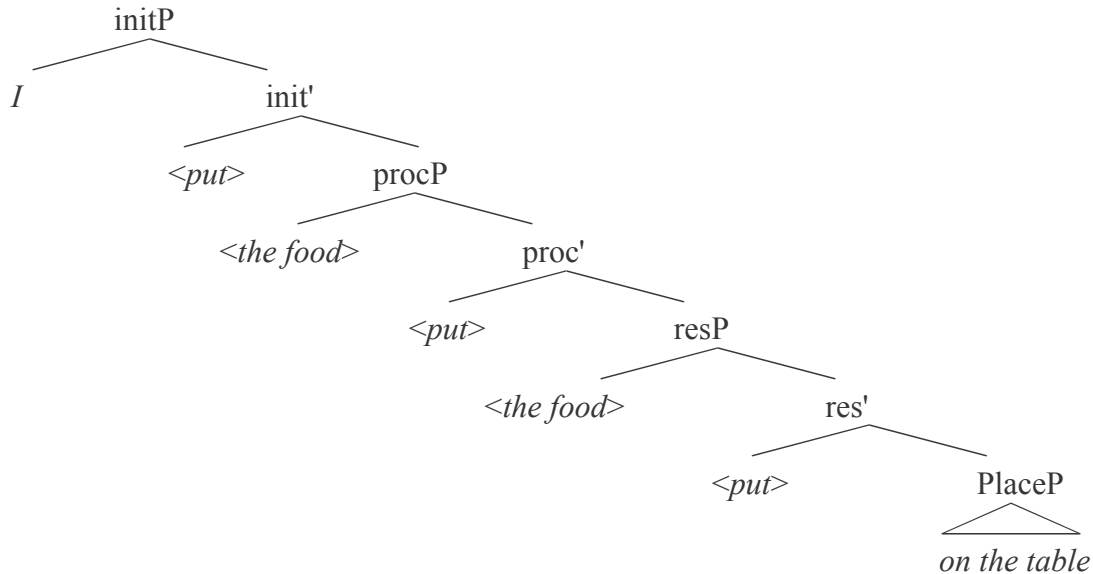
In cases where the event structure contains a result phrase, the event is telic, since resultativity entails telicity.<sup>14</sup>

Applying this framework to the Germanic data discussed in section 2, we get a natural explanation for the difference between *swim*-verbs and *put*-verbs. If *put*-verbs come with a

<sup>14</sup> There are other ways for a predicate to be telic in the sense that not all telic predicates contain a resP. Krifka (1989, 1998) argues for a homomorphic mapping between the domain of objects and the domain of events enabled by a certain kind of thematic relation (only with affected arguments) to derive inner aspectual properties of the event as a whole (similar also Verkuyl 1972, 1993). This idea can be generalised to other domains beside the nominal one so that there is a general homomorphic mapping between the event and any projected scale, along which some change takes place as it is the case in (33) (cf. Verkuyl & Zwarts 1992; Krifka 1998; Hay et al. 1999; Beavers forth.; Zwarts 2006). (see Gehrke forth. for discussion)

result state subevent, locative PPs (PlacePs) can modify this result state despite their lack of Path structure:

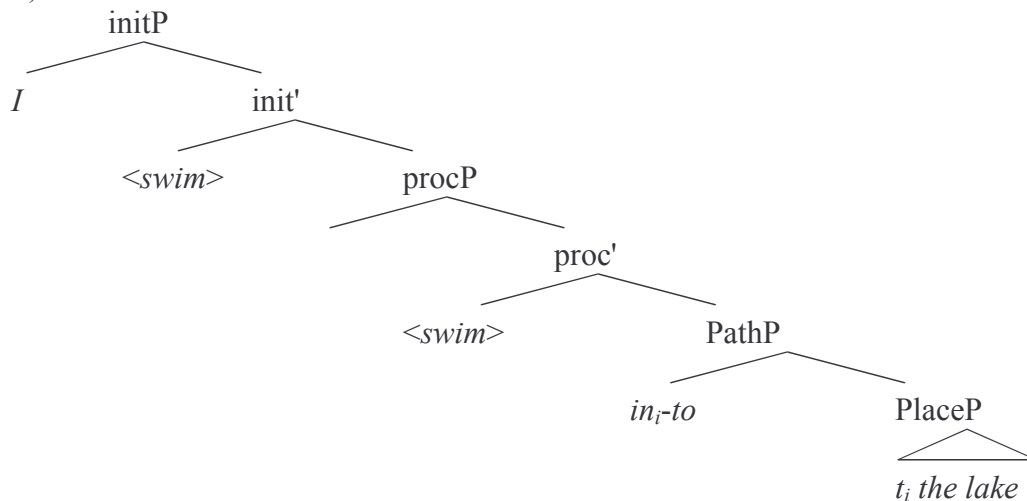
(32) *I put the food on the table.*



The meaning of directionality here is not associated with the PP itself but rather part of the verbal denotation.

*Swim*-verbs, on the other hand, cannot identify *resP*. In such cases, locative PPs (PlacePs) can only modify the whole event denoted by the VP unless some Path structure is licensed by other means as described in the previous section. For example, if a *swim*-verb is combined with an *into*-phrase, the composition results in a process denoted by *swim* which leads on path to a place inside the reference object:

(33) *I swam into the lake.*



This event is telic as well, but telicity here is not due the event structure containing a result phrase but to the process being bounded by the bounded directional path it combines with.

So the main claim here is, that the prepositions *in* and *on* – at least in the languages discussed in this paper – are not lexically ambiguous between a directional and a locative

reading. Rather, they are locative only, in the sense that any meaning of directionality is due to additional elements or operations. This goes directly against certain claims found in the literature. Huybregts & van Riemsdijk (2002), for example, argue that an English PP containing *on* is always ambiguous between a purely locative and a directional meaning. They support this claim by the fact that such a PP can also receive a directional reading in PP-with-NP constructions of the following type, without any additional element like e.g. a verb providing the meaning of directionality<sup>15</sup>:

(34) On the table with those plates! (Huybregts & van Riemsdijk 2002:13)

I do not think this is a valid argument. If PPs headed by *on* and the like were ambiguous between a directional and a locative reading they should be ambiguous in all contexts, irrespective of the environment they appear in. I showed in section 2, though, that these PPs in combination with *swim*-verbs can only denote Places in both Dutch and English. I can think of no reason why a motion verb should block a directional reading that should be freely available with these prepositions if they were lexically ambiguous. This in turn means that cases like (34) might involve some kind of verb ellipsis or some empty light verb of the *put*-type that enables the path reading. I will leave this for future research.

In sum, there are three ways in which VP-internal P elements can be related to the event structure. First, P elements can be particles identifying a result state subevent as in (29). Second, with motion events where the verb cannot identify a resultative subevent by itself, namely with *swim*-verbs, a directional PP can denote a path providing a scale along which the event is “measured out”.<sup>16</sup> Finally, with verbs that identify a resP subevent, namely *put*-verbs, a locative PP can further modify the result state VP-internally or more precisely, resP-internally. However, with motion verbs that do not come with a resP, i.e. *swim*-verbs, locative PPs headed by *in* and *on* cannot constitute a part of a directed motion event, since this reading only arises with locative PPs in case there is already a result state in the structure. Rather, these PPs are not VP-internal but modify the whole event denoted by the VP (see also Maienborn 2003 for a distinction between VP-internal and -external locatives).

### 5. Projective vs. non-projective locative prepositions

One remaining puzzle concerns the difference between English *under* and *behind*, on the one hand, and *in* and *on*, on the other. As was shown in section 2, *in* and *on* are not able to get a directional reading in isolation and this meaning has to be triggered either by a *put*-verb or by an additional directional element like *to*. *Under* and *behind*, on the other hand, can be ambiguous between a locative and a directional reading even with *swim*-verbs, in which case the directionality involves a route (but not a goal) reading. I will tentatively propose a

<sup>15</sup> Dutch seems to behave similarly and can use *in* (*on*) either in preposition or in postposition in such cases: *De gevangenis in met die crimineel!* (Helmantel 2002:35) and *In de gevangenis met die crimineel!* (Mirjam Rigterink p.c.), both meaning ‘In the prison with that criminal!’. Apparently, with the preposition one stresses the P and with the postposition one stresses *gevangenis*. For a possible semantic difference between such minimal pairs, see Helmantel (2002:72f.). In German, the DP inside the PP in these cases always bears accusative case, hence is marked for directionality.

<sup>16</sup> In the sense of Tenny (1994). If this scale is bounded, the event is telic; if it is unbounded, the event is atelic (see Hay et al. 1999; among others).

semantic account for these facts, again employing the vector space semantic approach of Zwarts (1997, 2005a) and Zwarts & Winter (2000).

Zwarts & Winter (2000) follow Jackendoff (1983) and others in differentiating between projective locative prepositions like *under* or *behind* and non-projective ones like *in*, *on* or *at*. Whereas a non-projective preposition requires only spatial knowledge about the location of FIGURE and GROUND (in the sense of Talmy 1985) with respect to one other, a projective locative preposition requires further information about directions from the reference object. The denotation of non-projective Ps is defined as a boundary vector on a set of points:

- (35) a.  $\mathbf{in}' = \lambda A. \lambda \mathbf{v}. \text{int}(\mathbf{v}, A)$  (Zwarts & Winter 2000:4)  
 b.  $\mathbf{at}' = \mathbf{on}' = \lambda A. \lambda \mathbf{v}. \text{ext}(\mathbf{v}, A) \wedge |\mathbf{v}| < r_0$   
 (with  $r_0 \approx 0$ ,  $A$  as a set of points, and  $\mathbf{v}$  as a boundary vector of  $A$ )

The definition of projective modifiers, on the other hand, additionally involves a certain axis modelled along the lines of three orthogonal unit vectors in the vector space  $V$  for *up*, *right* and *front*. The denotations of *under* and *behind* are as follows:

- (36) a.  $\mathbf{under}' = \lambda A. \lambda \mathbf{v}. \text{ext}(\mathbf{v}, A) \wedge c(-\text{up}, \mathbf{v}) > |\mathbf{v}_{\perp-\text{up}}|$  (Zwarts & Winter 2000:4)  
 b.  $\mathbf{behind}' = \lambda A. \lambda \mathbf{v}. \text{ext}(\mathbf{v}, A) \wedge c(-\text{front}, \mathbf{v}) > |\mathbf{v}_{\perp-\text{front}}|$

It is possible that this additional axis element in the definition of projective modifiers enables directional (route) readings with English *under* and *behind*. In these cases, the whole location under the bridge actually gets a one-dimensional path reading similar to the extent readings discussed in Gawron (2005) (see below). Non-projective prepositions, on the other hand, need additional structure to license a directional reading.

Contextual axes also play a role in other areas apart from projective prepositions. Gawron (2005), for example, convincingly argues for the need of a '*spatial axis*, an ordered set of collinear points that can serve as an *axis of change*' (Gawron 2005:5f.) to account for the difference between eventive and extent readings of extent verbs and degree achievements. This is demonstrated in the following examples:

- (37) a. The fog extended from London toward Paris. (ambiguous)  
 b. Fog gradually covered the city. (event reading only)  
 c. Fog covered the city for three hours. (extent reading only)  
 (Gawron 2005:1)

Example (37a) is ambiguous between a situation where fog literally moves from London into the direction of Paris and thus progresses in time (event reading), and a situation where the fog simultaneously covers the whole area between London and close to Paris irrespective of time (extent reading). Examples (37b) and (37c) are used to show that adverbials can disambiguate between these two readings. Thus, the extent reading does not involve any movement but there is still the need for some axis to describe change that is 'independent of time' as in the following example:



- (38) The boiling point of water drops 3 degrees Fahrenheit between sea level and 4000 feet. (Gawron 2005:6)

This example shows that there is a “functional dependence between altitude and boiling point” in the sense that the boiling point falls, as the altitude increases. Change with respect to time, then, is just a special case of functional change, ‘the existence of some correlation between two ordered domains’ (Gawron 2005:6).

Similarly, Fong (1997) uses some kind of perspectival or referential axis to account for the following set of data:

- (39) a. a bridge **into** San Francisco (Fong 1997:32f.)  
 b. a bridge **out of** San Francisco

In principle, these two PPs can be used to describe the same bridge, only that the perspective is switched since in the second case the axis points away from San Francisco. Hence, the existence of contextually provided spatial axes that, according to Gawron (2005), can function as an axis of change, is well motivated and could account for the fact that the English projective locative prepositions *under* and *behind* can have a directional reading.

One open issue remains though. Why can only English *under* and *behind* but not their Dutch counterparts obtain a directional (route) reading? Presumably, there is a division of labour in Dutch between the preposition *onder* ‘under (location)’ and the circumposition *onder ... door* ‘under (route)’ where English only has one element available, namely *under*.<sup>17</sup> A more syntactic approach would be that English can make use of silent elements similar to the Dutch postpositions *door* ‘through’ or *langs* ‘along’, whereas in Dutch these elements always have to be overtly expressed. Svenonius (2004), for example, argues for the existence of silent Path heads in cases where locative PPs can be directional as the following:

- (40) The boat **drifted beyond** the city limits. (Svenonius 2004:19)

He furthermore assumes that in such cases verbs of motion can license a null variant of *to* so that we obtain the following structure:

- (41) [<sub>PathP</sub> TO [<sub>PlaceP</sub> *beyond* [<sub>KP</sub> K [<sub>DP</sub> *the city limits* ]]]]

He also talks about cases where this empty head is associated with VIA as in *over the palace*:

- (42) [<sub>PathP</sub> VIA [<sub>PlaceP</sub> *over* [<sub>KP</sub> K [<sub>DP</sub> *the palace* ]]]] (Svenonius 2004:15)

So even though he offers these two possibilities of empty Path heads that are presumably licensed by “verbs expressing some kind of motion” he does not really make a general distinction between the kinds of verbs of motion that actually trigger a directional reading and those that do not. In addition, it is far from clear which type of empty head is actually involved in which case and how the licensing of empty Path heads is constrained in this system. As shown in section 2, not all verbs that express some kind of motion, can then license empty path heads but only *put*-verbs can (in contrast to *swim*-verbs). I furthermore

<sup>17</sup> A similar difference is discussed in Zwarts (2003), where English has only one preposition for different meanings of *around* whereas Dutch has the two prepositions *om* and *rond*.



argued in this section, that something similar to Svenonius' VIA head can be licensed by English projective prepositions even in the context of *swim*-verbs, so that the path element in these cases actually does not come from the verb but from the preposition itself.

Another problem with Svenonius' account is that a TO head should only be available in the context of *put*-verbs. However, the verb in (40) is quite similar to *float* which has been argued to be of the *swim*-type (recall (10)). Hence, the empty head here might be VIA rather than TO and this empty head is then licensed by the projective preposition *beyond*. This is supported by the following example:

- (43) The clouds **raced beyond** the city limits. (Svenonius 2004:20)

According to Svenonius, this sentence involves an empty TO head licensed by the verb of motion *to race*. According to my informants, however, this sentence involves a route rather than a goal reading in which case *to race* should be of the *swim*-type and the empty head is licensed by the projective preposition *beyond*. This cannot be the whole story, though, if we turn to the following example:

- (44) The race car **raced beyond** the finish line.

According to my informants, this sentence has a goal reading although the same verb and the same preposition are used.

So obviously, it is not always the case that only the verb class and the kind of preposition determine the availability of a particular empty path head, in contrast to what I have been arguing for throughout this whole paper. Properties of the DP denoting the FIGURE or the GROUND or even the general context might play a role as well. There also seems to be considerable speaker variation as to which verbs actually license which Path heads as speakers like Svenonius (American) seem to be much more permissive than my British informants. That something like this is going on is also evident when one compares the results of Nikitina (2006) who looked at American English to those of Thomas (2001, 2003) who investigated British English. What exactly is the difference here has to await further research.

## 6. Summary and outlook

This paper discussed the conditions, under which locative prepositional phrases headed by *in*, *on*, *under* or *behind* can be understood directionally in English, German and Dutch. It was shown that with these prepositions alone only *put*-verbs but not *swim*-verbs can license a directional reading. This has been accounted for in terms of the event structure associated with these verbs: *put*-verbs identify result phrases that can be modified by locative PPs, whereas *swim*-verbs do not, and locative PPs can only modify the entire event. In order to derive a goal reading with locative prepositions and *swim*-verbs, extra elements or operations are needed, such as additional goal phrases or certain kinds of movement to license a path structure. The combination of such process verbs with a Path then can lead to a telic event interpretation if the Path is bounded. In German, a directional reading arises with these PPs if the DP inside them bears accusative case. It was argued that accusative case on the DP within the PP signals a subject-predicate dependency in analogy to the relation between nominative subjects and verbal predicates containing accusative DPs. Finally, it was shown that English *under* and *behind* differ from *in* and *on* since they can be interpreted directionally also with

*swim*-verbs. To account for this, I proposed that the additional axis element in the definition of projective locatives like *under* or *behind* enables directional (route) readings in English. With non-projective Ps like *in* or *on*, however, directional readings have to be licensed by other means.

Hence, the questions addressed in the introduction have been answered in the following way. There are genuinely Germanic verbs that conflate path and motion. Second, the prepositions under discussion are not ambiguous between a directional and a locative reading. Rather there are purely locative prepositions or purely directional prepositions. In cases where PlacePs can be associated with directionality and thus with some path, this additional Path structure has to be licensed by movement, case, additional lexical items or the like. However, projective locative Ps in English seem to be able to license some path since their lexical semantics involves an additional axis that can serve as an axis of change.

Some open issues remained. For example, why can Dutch *onder* and *achter* not appear as postpositions? Why can English but not Dutch *under*- and *behind*-phrases obtain a directional reading? Is there a silent *through* with English *under/behind*? Do we want to make use of silent elements at all and if we do, what are the constraints on the availability of silent elements? What kind of verb is *race*, and is *beyond* different from *under/behind*? What is the role of the context in licensing directional readings, in other words, can other elements apart from the verb or the preposition enable a directional reading and thus license a path? These and other issues need to be addressed in future work.

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## Aspects on passives

Berit Gehrke and Nino Grillo

In this paper, we propose that movement of the consequent state of a structurally complex event to a discourse-related position right above  $vP$  is the fundamental characteristic of passive constructions. This assumption is supported not only by the semantics of passives but also by the fact that it provides a natural account of many of their syntactic properties some of which are left unaccounted for in previous approaches. More generally we give a principled explanation, based on the availability of a consequent state reading, of why some predicates do not form good passives. Psycholinguistic data provide further arguments to support our hypothesis.

### *1. Introduction*

Since early works in generative syntax (see Chomsky 1957) passivisation has been analysed as an operation on argument structure. Such analyses single out the most typical property of this construction, namely the inversion in the mapping of argument type and syntactic relation in actives and passives and especially the presence of the internal argument (the understood object) in the (syntactic) subject position and the demotion of the logical subject.

In this paper, we will defend a different perspective on passives, which puts the complex structure of events at the centre of this transformation and takes it to be responsible for determining not only the core properties but also the availability of passive formation. This change in perspective allows us to distinguish between predicates that can form good passives from those that cannot. We argue that passivisation is an operation on the event structure, more precisely a secondary predication referring to a transition into a consequent (result or inchoative) state. We propose that a semantic requirement, some kind of topicalisation, singles out this consequent state and assigns it a feature that will determine its movement to a discourse-related projection directly above  $vP$ . This projection is reminiscent of the low focal projection proposed by Belletti (2000). We support this claim by evidence from the syntactic and semantic properties of passives, some of which are unaccounted for in previous approaches.

The paper is structured as follows. Section 2 discusses previous approaches to passive formation and points out the main disadvantages of these. Section 3 outlines our own approach and argues that the position above  $vP$ , which the stative subevent moves to in



passive constructions, is needed independently also for actives, since it allows for the creation of a link between the atemporal complex event structure and the temporal and discourse domains of the clause. Empirical data as well as psycholinguistic data from comprehension patterns in agrammatic Broca's aphasics are provided in section 4 to support this analysis. Finally, section 5 concludes.

## 2. NP movement approaches to passives

Strong Crossover effects (1a), the availability of subject-controlled infinitival clauses (1b), and subject-oriented modifiers (1c), depictives (1d), binding (1e-f), and purpose-clauses (1g) provide strong empirical evidence for the assumption that the external argument is still present in verbal passives:<sup>1</sup>

- (1) a. \* They<sub>i</sub> were killed by themselves<sub>i</sub>.  
 b. The book was written to collect the money. (Manzini 1980)  
 c. The book was written deliberately. (Roeper 1983)  
 d. The book was written drunk. (Baker 1988)  
 e. Damaging testimony is always given about oneself in secret trials.  
 (Roberts 1987)  
 f. Such privileges should be kept to oneself. (Baker, Johnson & Roberts 1989)  
 g. The book was written on purpose.

On the basis of these observations, Baker et al. (1989), elaborating on Jaeggli (1986), propose that the passive participle morphology is the external argument in passives. More precisely the *-en* morpheme of passive participle is claimed to be a clitic base-generated in the IP head and later on in the derivation lowered down to adjoin to the verbal stem. This operation is claimed to "absorb" the case assignment capacity of the verb making it necessary, given theta theory and legibility requirements, for the internal argument to move to the subject position.

The positive side of such an analysis is that it allows us to derive the transformation of passives without having to make use of any special rule. With some fairly simple assumptions and the interaction of syntactic principles and parameters the transformation could be seen as a necessity. While recognising these merits, we think there are reasons to criticise these assumptions already at their base.

A first problem posed by this analysis is that it is not clear on which basis the passive participle morpheme should be distinguished from the active past participle, which it is homophonous to. Put differently, why should only the former but not the latter be analysed as a clitic? Here we will reject this assumption as unmotivated and show that under our analysis there is no need to establish such a distinction.

A second problem comes from the assumption that the external theta role is assigned to the passive morpheme. This poses a problem for the explanation of how the NP in the *by*-phrase (the logical subject) receives its theta role. As shown by Marantz (1984) and Roberts (1985), it is clear that this NP is not assigned its theta role by the preposition, but that it receives it compositionally from the VP. To solve this problem, Jaeggli (1986) proposes a (fairly complex) mechanism of theta transmission while Baker et al. (1989) assume that the NP in the

<sup>1</sup> This holds for eventive passives; stative passives behave differently cross-linguistically in that German, for instance, does not allow an external argument whereas Greek does (see Anagnostopoulou 2003; Kratzer 2000).

*by*-phrase receives its theta role from the clitic via a non-movement chain like the one found in clitic doubling.

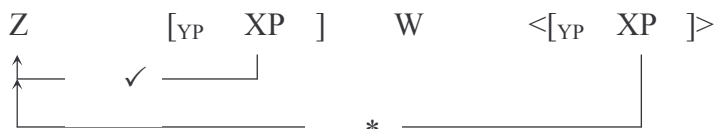
However, for reasons of economy of the system and uniformity we assume that there is a strict mapping between syntax and semantics along the lines of the Uniformity of Theta Assignment Hypothesis (UTAH) (Baker 1988). Then, both Jaeggli's (1986) and Baker et al.'s (1989) solutions are problematic since the external theta role in these two approaches is assigned in two different fashions in actives and passive constructions.

On the basis of the same arguments, Collins (2005) concludes that passive morphology does not absorb the external theta role or accusative case. Rather, the external theta role is assigned in Spec  $\nu$ P in line with UTAH and accusative case is checked by the *by*-phrase in Voice<sup>o</sup> directly above  $\nu$ P.

An immediate problem that arises from this account is one of locality. Under current assumptions, the movement of the internal argument over the external argument should raise a minimality effect. Collins provides the following solution to this problem. "Smuggling" of the VP over the  $\nu$ P makes the internal argument the closest to Spec TP allowing for its "promotion" to subjecthood without any violation of Relativised Minimality or its derivational counterpart. Smuggling is defined as follows:

(2) **Smuggling:**

Suppose a constituent YP contains XP. Furthermore, XP is inaccessible to Z because of the presence of W, some kind of intervener that blocks any syntactic relation between Z and XP. If YP moves to a position c-commanding W, we say that YP smuggles XP past W.



To derive the right word order, Collins argues that it is actually the participle which moves to the left of the *by*-phrase and that furthermore this movement is phrasal and thus drags along the internal argument.<sup>2</sup> Evidence supporting an XP-movement analysis over a head movement analysis comes from the following examples:

- (3) a. The coach summed up the argument.  
 b. The coach summed the argument up.  
 c. The argument was summed up by the coach.  
 d. \* The argument was summed by the coach up.
- (4) a. John was spoken to by Mary.  
 b. \* John was spoken by Mary to.

The examples in (3) show that, in English verb-particle constructions, the particle can appear before or after an internal argument. In the passive, however, only the order where the particle directly follows the participle is grammatical. Hence, the particle has to move along with the

<sup>2</sup> See Collins (2005) for arguments against alternative analyses in terms of right specifiers or extraposition of the *by*-phrase to the right.



participle which can be taken as evidence that more than just Part<sup>0</sup> moves in passive constructions. The examples in (4) make a similar point with respect to *to*-phrases.

Even though this account seemingly solves the locality issue, it raises several problems, the most severe of which is that it poses serious look-ahead problems. The computational system is supposed to be able to apply an operation with an unclear status in order for the internal argument to move to the subject position without violating minimality. This leads to several other problems such as the following:

- i. What is the status of smuggling in the theory?
- ii. Is smuggling movement? And if so how is it triggered, i.e. what is the trigger for this movement?
- iii. What are the limits of smuggling and more generally of look-ahead computations? Doesn't it massively over-generate? Can it be used to avoid other potential interveners, for example in A'-movement?
- iv. How do we explain sentences like (5), where passivisation applies independently from movement of the internal argument to the subject position?

(5) There was a man killed.

Given these questions and problems and the overall *ad hoc* flavour of this solution, we will leave Collins' proposal aside.

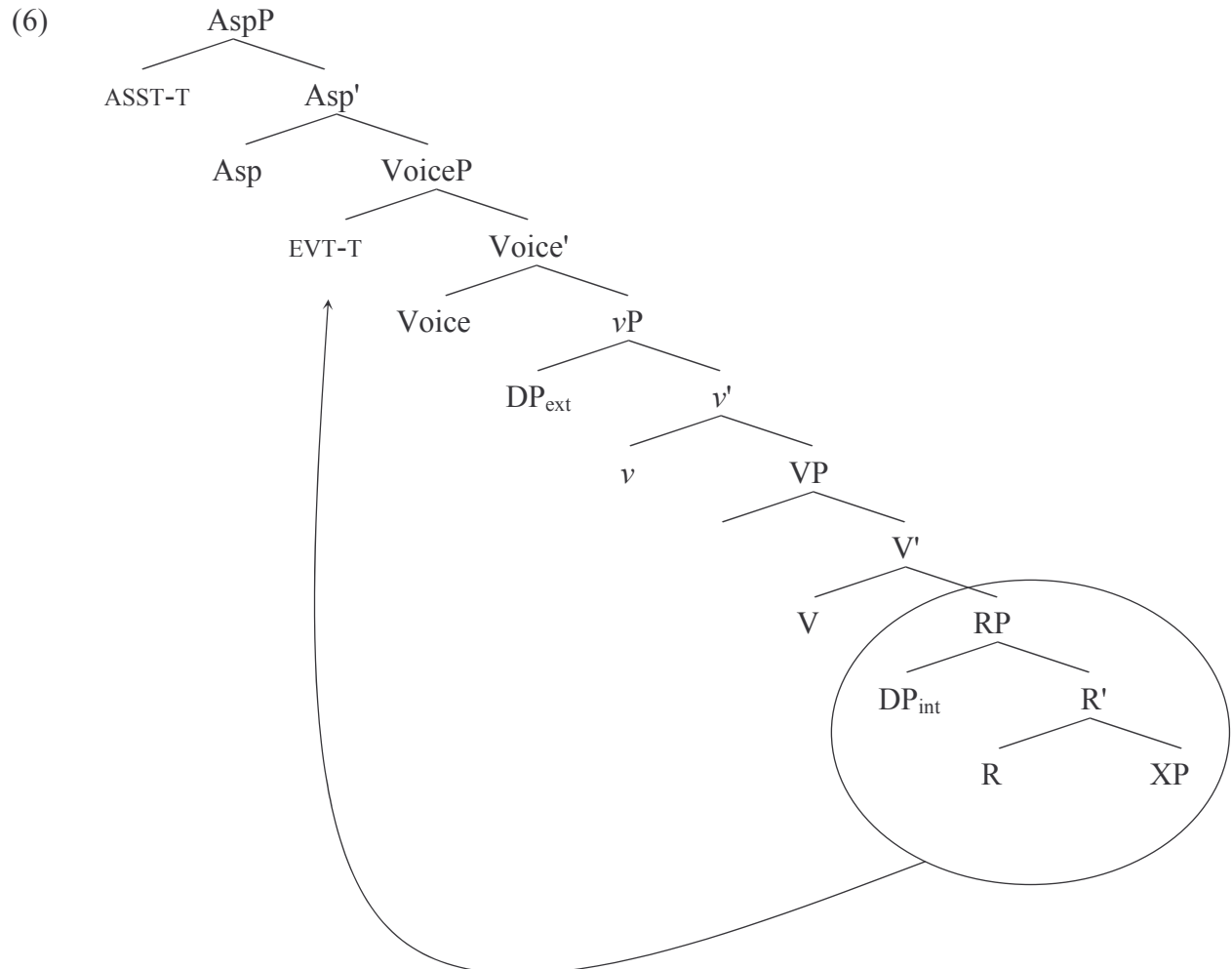
Nevertheless, we will see that the picture that emerges from the analysis we propose is similar in many, especially technical points to that of Collins and we will therefore refer to important observations of his work and integrate them in our approach in the remainder of the paper. However, we believe the approach developed here to be superior in that it does not pose any of the problems listed above. Furthermore, it solves the locality issue in a natural and less stipulative way. Finally, by shifting the perspective from argument structure to event structure it provides new predictions for and insights into the nature of passivisation.

### 3. The proposal

Grounding our analysis on the semantic and syntactic properties of passive sentences we propose that the promotion of a stative subevent of a complex event (RP in 6), see below for a more detailed characterisation of this projection) to a position above *v*P is a fundamental ingredient of the passive. Such a position is independently needed also for actives to form a basis for the event time that subsequently serves as the internal argument of Asp<sup>0</sup> (in the sense of Demirdache & Uribe-Etxebarria 2000). In passives, then, the event time falls within this stative subevent.

The syntactic tree in (6) exemplifies the proposal. The RP (a consequent state of the event), which contains the verb in its head and the internal argument in its Spec, moves to Spec VoiceP where it is assigned temporal properties. Voice is responsible for grounding the event time in a particular way. In the case of passives the event time is anchored in the RP subevent. The feature that triggers movement to VoiceP has two properties, a discourse-related and a quantificational one. The discourse-related part chooses the element of the complex event that needs to be singled out whereas the quantificational part makes it readable for the next phase.

Thus, the main job of this feature is to single out an element of the atemporal event structure and to enrich its semantics by introducing temporality, thereby making it available to the temporal domain (and ultimately the discourse domain) of the clause.



Contrary to Collins, this operation is completely independent from the promotion of the internal argument to subject position. This is supported by the fact that the internal argument does not necessarily land in Spec TP in passives. Under standard assumptions EPP requirements on T can be satisfied in two ways: movement of the closest argument to Spec TP or expletive insertion. We propose that the same options are available in passives. If EPP is satisfied via movement, the closest argument (the internal argument given prior RP movement) will be attracted. If EPP is satisfied by an expletive we obtain (5). Hence, we take RP movement to be the only necessary condition to define passivisation.

There are several important issues we will not address in the present paper, of which the exact status of the *by*-phrase and an account of accusative case “absorption” are surely the most important ones. Nevertheless, the similarities between the syntactic configurations that surface in Collins’ (2005) analysis and our own, though in many respects simply epiphenomenal,<sup>3</sup> allow us to make reference to that work and to provide a formal

<sup>3</sup> As we already pointed out, there are several problems with Collins’ *smuggling* approach. However, it is important to stress that the distance between his analysis and the present work lies also in the fundamentally traditional view that he pursues. In his explanation passivisation is still treated as an operation on the argument

characterisation of many aspects of passivisation left aside here. Collins' account of the status of short passives and the PRO nature of the external argument in these constructions as well as his formal explanation of case absorption or the status of the *by*-phrase can all be assumed here for the time being, even if some of them might need slight adaptation. For example, throughout this paper we follow Collins' analysis of the *by*-phrase as the head of VoiceP which is responsible for assigning case to the external argument.

In section 3.1 we make precise what it means for an event to be structurally complex and particularly focus on the formation of consequent states. In section 3.2 we argue for the existence of a projection above *v*P and below AspP that is needed to provide the event time which subsequently serves as the internal argument of AspP.

### 3.1. Decomposing the event

Following Moens & Steedman (1988), Pustejovsky (1991), Higginbotham (2000), Ramchand (2004), among others, we assume that events can be structurally complex and consist of several subevents. Pustejovsky, for example, argues that events can be of three different types, namely states, processes and transitions:

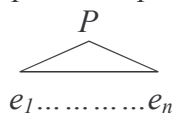
- (7) **State** (*S*): a single event, which is evaluated relative to no other event

Examples: *be sick, love, know*



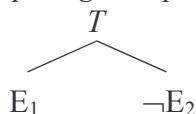
- (8) **Process** (*P*): a sequence of events identifying the same semantic expression

Examples: *run, push, drag*



- (9) **Transition** (*T*): an event identifying a semantic expression, which is evaluated relative to its opposition (with *E* as a variable for any event type)

Examples: *give, open, build, destroy*



The transition type is the one we are interested in here. This type has at least two subevents, namely a state/process and an opposite state/process with a transition from one to the other. Similarly, Moens & Steedman (1988) assume an event nucleus of preparatory process, culmination, and consequent state.

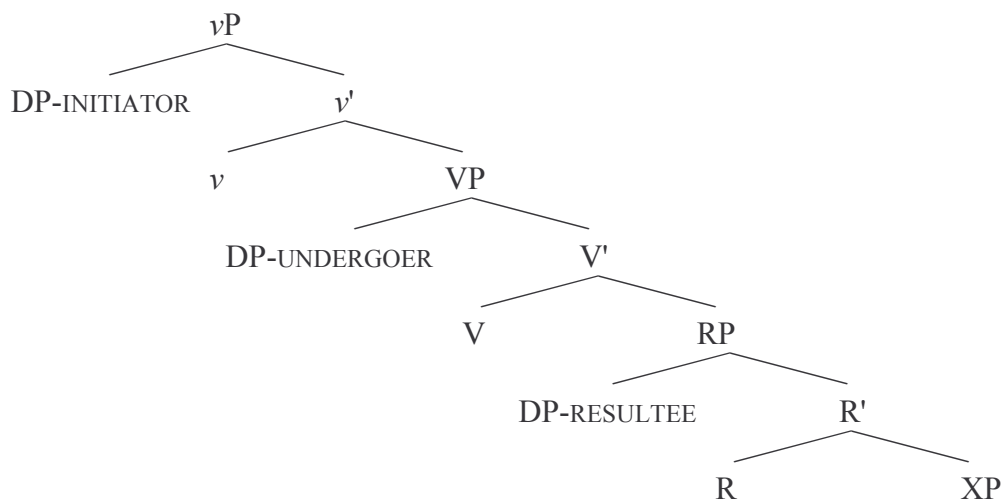
A more syntactic implementation of the decomposition of events is found in Ramchand (2004). She proposes to decompose events into maximally three subevents, namely a state

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structure and the whole mechanism of smuggling is motivated by the necessity to bring the internal argument closer to the subject position than the external argument. The novelty of the present approach is that we put event structure at the core of passivisation.

(the initial state,  $vP$ ), a process (the dynamic part, VP) and another state (the result state, RP) (10). All dynamic verbs identify at least VP, since this is the dynamic part of each event. The causing subevent ( $vP$ ) and the result state subevent (RP), however, are optional and not all verbs have the ability to identify these independently. DPs in the specifier positions of  $vP$ , VP and RP have the interpretation of INITIATOR, UNDERGOER and RESULTEE (holder of the result state), respectively, where one and the same DP can appear in several of these positions. This is so because a verbal lexical item can be associated with more than one position simultaneously thereby identifying various subeventive heads at the same time. Here, Ramchand follows Starke (2001) in assuming that lexical items do not necessarily insert under a single terminal node but rather that elements can merge and project and then remerge at a later stage of the derivation.

(10) **The syntax / semantics of the first phase** (Ramchand 2004)



The first two subevents are linked to one another by the ‘leads-to’ relation, where in the maximal structure a state leads to a process which in turn leads to a state again. Following the notation of Hale & Keyser (1993), this relation is defined as follows:

(11) **Principle of Event Composition** (Ramchand 2004:327)

If a head X which introduces an eventuality variable  $e_x$ , embeds a projection YP where Y introduces the eventuality variable  $e_y$ , then the structure is interpreted as  $e_x \rightarrow e_y$  ( $e_x$  “leads to”  $e_y$ ).

In general, the interpretation of states in the event structure as either initial or result state depends on their position in the hierarchical structure, i.e., embedded under a process they are resultative but embedding a process they compose the initial state, which is the causative part of the event.

What all of these approaches have in common is that they assume an ontology which contains a transition into a state, which we will call consequent state, following Moens & Steedman (1988). We will furthermore follow Ramchand’s syntactic structure of decomposed events. However, even though we will use the label RP, the state that comes about after a transition is not necessarily a resultant state and consequently such events are not necessarily telic (under any semantic definition of telicity such as Krifka, 1998 or others). This is a crucial departure from Ramchand who assumes that the VP and RP subevents participate in telic pair

formation (in the sense of Higginbotham 2000) so that an event containing these two subevents will always be telic. Instead, we assume that RPs can also be derived states, which share properties with result states of telic predicates in the sense that they involve a semantics of coming into existence. This could be thought of in terms of Dowty's (1979) BECOME-operator, which has also been used to capture the semantics of change-of-state predicates.

Finally, we assume that the event structure itself is atemporal in nature in the sense that there are no times associated with any of the subevents. Moens & Steedman (1988), for example, argue that the basic components that make up an event (i.e., the subevents in our terms) are not connected via temporal relations but rather by contingency.<sup>4</sup> Therefore, there is also no immediate link between the (atemporal) event and the temporal domain of the clause. We will argue in the next section that this link has to be created at the boundary between vP (the atemporal event structure) and the TP/CP domain.

### 3.2. *Creating the link between the event structure and the temporal domain*

In this section, we argue that the position the participle in passive constructions moves to is independently needed, also for active sentences, to form a basis for the event time that subsequently serves as the internal argument of Asp<sup>0</sup> (in the sense of Demirdache & Uribe-Etxebarria 2000). In passives, the event time falls within the consequent state subevent which is why this subevent has to move.

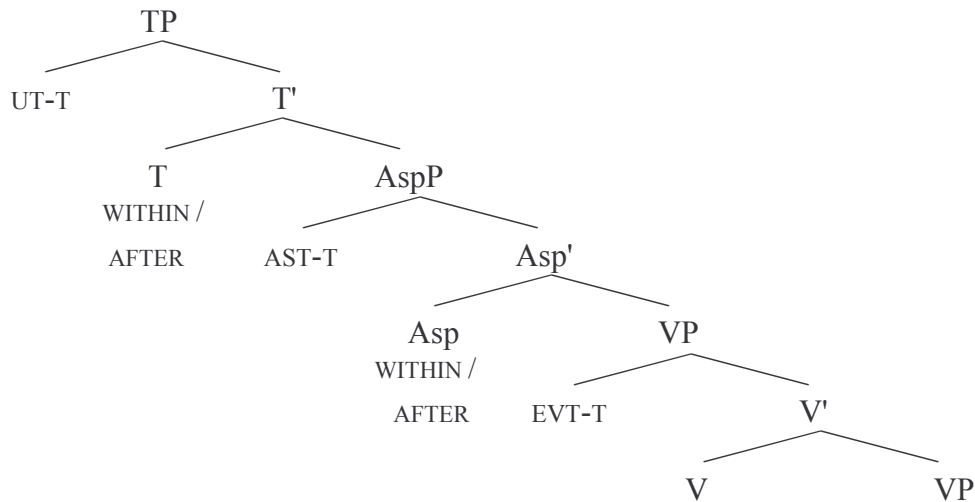
The syntax and semantics of tenses and aspects are commonly thought of as involving some reference to points or intervals in time (Partee 1984; Zagana 1990; Stowell 1996; Giorgi & Pianesi 1997; Demirdache & Uribe-Etxebarria 2000; among others). The point of departure for these accounts is usually Reichenbach (1947) who employs three temporal points, namely event time (E), speech time (S), and reference time (R). In his system, English simple tenses relate R to S with R before S with the past tense, R simultaneous to S with the present tense, and R after S with the future tense. English perfect tenses additionally express that E is before R.

Klein's (1994) model is similar to Reichenbach's but it uses intervals instead of points labelled event time (EV-T), assertion time (AST-T), and utterance time (UTT-T). Demirdache & Uribe-Etxebarria (2000) use Klein's terminology to capture the syntax of tenses and aspects in the following way:

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<sup>4</sup> See also Ramchand (2004). Recently, Zwarts (2006) argues for the need of an atemporal account for properties of events like, for instance, telicity in terms of generalised paths.

## (12) The syntax of Tense and Aspect in Demirdache &amp; Uribe-Etxebarria (2000)



In this framework, tenses and aspects are predicates that take temporal arguments (following Zagana 1990). An aspect head takes the event time as its internal argument and the assertion time as its external argument. With the imperfective aspect, the assertion time lies within the event time (WITHIN); with the perfective aspect, it lies after the event time (AFTER). Similarly, a tense head takes the assertion time as its internal argument and the utterance time as its external one. The utterance time can be placed WITHIN the assertion time (present), AFTER the assertion time (past) or BEFORE the assertion time (future) (the latter is argued for in Demirdache 2005).

In discussing a similar model, namely Stowell's (1996), Ramchand (2004) notes that there is a "crucial phase boundary between  $\nu$ P and the temporal phrase structural domain" which "requires the establishment of a relation between the extended event topology which makes no direct reference to times, and the actual time variable which is only introduced at Asp" (Ramchand 2004:333). In other words, there is no event time in her model since  $\nu$ P is crucially atemporal in nature. Rather, aspect introduces a time variable that is related to the event structure in a particular way.

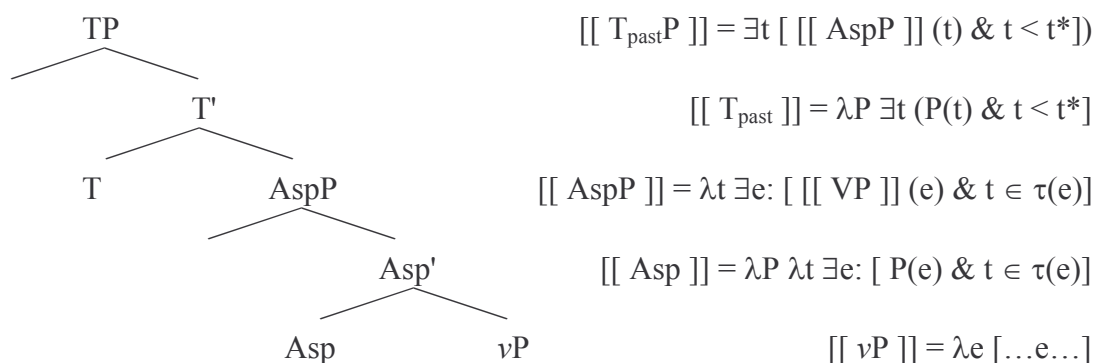
We can think of this time variable as being the counterpart to Demirdache & Uribe-Etxebarria's (2000) assertion time. Ramchand argues that the minimal denotation of Asp in the language she discusses in her paper, namely Russian, is the following (with  $\tau(e)$  as Krifka's 1998 temporal trace function):

$$(13) \llbracket \text{Asp} \rrbracket = \lambda P \lambda t \exists e: [ P(e) \ \& \ t \in \tau(e) ]$$

This means that, if there is no particular aspect head in Russian,<sup>5</sup>  $t$  (or the assertion time) falls somewhere within the entire time the event takes, which is provided by the temporal trace function.

The tree for Russian with this minimal denotation of Asp and the denotation of the other nodes involved is given in (14).

<sup>5</sup> Russian productively expresses grammatical imperfective and perfective aspect by verbal prefixes and suffixes (see Gehrke forth. for a discussion of this). However, this approach can also be carried over to other languages, even such languages that do not have a morphological category Aspect.

(14) **The syntax / semantics of Aspect and Tense in Russian** (Ramchand 2004)

To draw the parallel between this tree and Demirdache & Uribe-Etxebarria's (2000) in (12), we can think of utterance time and assertion time as the direct counterparts to Ramchand's (2004)  $t^*$  and  $t$ , respectively. The crucial difference between both models, however, is that the event time is not existent in Ramchand's approach but is more or less replaced by Krifka's (1998) temporal trace function.

A problem that arises for Ramchand (2004), then, is that it is still not clear which part of the complex event the temporal trace function actually picks out. Furthermore, there is no strict mapping between syntax and semantics since AspP seems to provide both the temporal trace function as well as the assertion time ( $t$  in Ramchand's approach).

To solve these problems, we propose to split Krifka's temporal trace function and the introduction of the assertion time. In addition, the event time is needed because Asp needs a temporal internal argument. We assume that this event time is provided by Voice at the point of transition from the atemporal domain of the event structure to the temporal one and that Voice relates the event time to the atemporal complex event structure as in (6).

In the following, we summarise the ingredients that we view necessary to account for the way the atemporal event structure is linked to the temporal domain.

- i. Events are complex and consist of atemporal subevents (Ramchand 2004).
- ii. Voice provides an additional landing site for the part of the event structure that the event time is related to, and in this way it recalls Belletti's (2000) low focus projection.
- iii. Aspect and Tense heads project argument structure with the relevant arguments utterance time,<sup>6</sup> assertion time, event time (Demirdache & Uribe-Etxebarria 2000).

These mechanisms are also needed for active sentences. We could think, then, that in the default case, nothing moves to the position above  $vP$  (or alternatively, the entire  $vP$  moves) and the event time is assigned locally. In other cases (e.g., where the event time has to be placed within a certain subevent) this subevent moves up. This could be the case if the perspective is on the process of an event rather than on its initial or final state (e.g. in the progressive). We will leave this for future research.

What is crucial for our approach to passives, then, is the additional landing site for the part of the event structure that the event time is related to. This could be thought of in terms of

<sup>6</sup> Or in any case, some reference time which in many cases is the utterance time. See Stowell (1996) for this point.



some quantificational phrase such as Borer's (2005) QP since it clearly involves some kind of quantification over events. Similarly, Arsenijević (2006) argues that verbal predicates have some functional projection that basically picks out that part of the complex event structure that something is asserted about. In any case, whatever is asserted about the event has to move up; in that sense it could also be the case that it is used to focalise some particular subevent. Hence, in the case of passives, the consequent state moves up to serve as a basis for the event time.

#### 4. Empirical evidence

##### 4.1. Consequent states in passive constructions

An important prediction that this analysis makes is that all passive constructions should display some kind of resultative semantics since they, as a rule, involve the movement of a consequent state subevent. This is straightforward in some of the examples provided by Collins (2005):

- (15) a. The argument was summed up by the coach. (= (3), Collins 2005)  
 b. \* The argument was summed by the coach up.  
 c. John was spoken to by Mary.  
 d. \* John was spoken by Mary to.

In these examples, RP moves taking along the particle in verb-particle constructions or a goal denoted by a *to*-phrase. This is accounted for if we follow Ramchand & Svenonius (2002). For example, a sentence like *Roberta threw the dead rat out* will have the structure of *Roberta causes the dead rat by throwing to be outside*, with *Roberta*, the causer of the whole event, in Spec  $\nu$ P and with *the dead rat* simultaneously in Spec VP and Spec RP, since it is both undergoer of the process of throwing and resultee in the sense that it ends up outside the door. With Ramchand & Svenonius (2002), English particles like *out* are treated as particle phrases (prtPs) in complement of the result phrase and with the direct object as the specifier of prtP:

- (16) Throw the dead rat out  
 $[_{\nu P} \text{ INTR throw-init } [_{\nu P} \text{ UNDRGR } t_V [_{\text{RP}} \text{ the rat } t_V [_{\text{prtP}} t_{\text{DP}} [_{\text{prt}} \text{ out } ]]]]]]$

In order to identify the result phrase, it is assumed for English that either the particle moves and incorporates into the head of this phrase or the object moves into its specifier, which then leads to particle shift word order (as in (16)). Hence, these elements are direct complements to RP and there is no way to move the whole RP over  $\nu$ P without moving the particle (or the *to*-phrase) along with it.

We can extend the same analysis to resultative secondary predicates:

- (17) a. The table was wiped clean by John. (Postal 2001)  
 b. ?? The table was wiped by John clean.  
 c. The metal was hammered flat by John.  
 d. ?? The metal was hammered by John flat.

Again, the resultative is in the complement position of RP and thus has to move together with it in passive constructions.

This analysis allows us to make important predictions with respect to which transitive predicates can form passives. Postal (2001), among others, shows that not all transitive verbs can form passives. Under our analysis it follows straightforwardly that transitive verbs involving telic predicates can form passives since they contain consequent states (18), whereas those involving atelic ones cannot (19):

- (18) a. The lion killed the antelope.  
 b. The antelope was killed (by the lion).  
 c. He put the card on the table.  
 d. The card was put on the table (by him).
- (19) a. This laptop weighed two kilos.  
 b. \* Two kilos were weighed (by this laptop).  
 c. This chair cost 50 euro.  
 d. \* 50 euro were costed (by this chair).

Transitive verbs like the ones in (19) never have a consequent state reading and can never be part of an event structure containing a transition into a state. Hence, passive formation is not possible with these verbs.

#### 4.2. *An apparent problem: passives involving stative predicates*

A potential problem for this account could be that a number of atelic predicates, that should not contain an RP under Ramchand's (2004) account, can still form passives. This is the case with predicates like *know*, *surround*, *own*, *believe*, among others:

- (20) a. The house is owned / surrounded by the army.  
 b. The answer / myth is known / believed by the pupils.

The availability of passivisation however is not a common property of stative predicates. The difference between predicates that are otherwise similar in their stative characteristic opens up a possible solution to this problem. Belletti & Rizzi (1988) show that there are three kinds of psych-verbs, namely the *fear*-type (*temere*), the *worry*-type (*preoccupare*) and the *appeal*-type (*piacere*). They give ample evidence for the fact that only *fear*-verbs can undergo verbal passivisation, whereas *worry*-verbs can only derive adjectival passives and *appeal*-verbs cannot form passives at all (examples from Reinhart 2002):

- (21) a. The news worried / surprised / excited Max.  
 b. Max was worried / surprised / excited (by the news).
- (22) a. The solution appeals to me / escapes me.  
 b. \* I am appealed / escaped (by the solution).

There is a clear intuitive difference between the class of stative predicates above and at least one class of psych-verbs (the *piacere/appeal* class): only the former can have an inchoative meaning of the state denoted by the verb so we can say, for instance, *Max got to know the answer/into a knowing state*, *Max got to own the house/into an owning state*. *Appeal*-verbs

cannot have this inchoative reading and we cannot have examples like *\*I got to escape the solution/into an escaping state*.

To put it in different terms, *know*-verbs allow a reading where the state denoted by the verb is a sort of consequent state, a state having come into existence, and this state is predicated over the internal argument and is thus a secondary predication. Passive formation, then, is possible if it involves promoting this kind of consequent state. *Appeal*-type verbs, on the other hand, cannot involve such a secondary predication and as a result cannot form passives.

As reported above, Belletti & Rizzi (1988) give ample evidence to support the claim that passives of *worry*-verbs are adjectival. The picture is more complex and deserves more careful examination once the *fear*-class is taken into account. The explanation cannot be extended to cover the availability of passives here in a straightforward way. There is, however, at least one piece of evidence that shows that passives of *fear*-type verbs are adjectival as well. Belletti & Rizzi show that the two auxiliaries that can be used to form passives, namely BE and COME / *venire*, can be used as a test to distinguish between adjectival and verbal passives. Whenever the COME auxiliary is present, the passive has to be verbal. In addition, the availability of adjectival morphology like the superlative suffix *-issimo* can be taken as a test to show that the passive is adjectival:

- (23) a. Gianni è / \*viene apprezzatissimo dai suoi concittadini.  
Gianni is comes appreciated-SUP by his fellow-citizens  
'Gianni is very appreciated by his fellow-citizens.'
- b. Questa scelta è / \*viene rispettata dalla maggior parte degli elettori.  
this choice is comes respected-SUP by-the bigger part of-the voters  
'This choice is very respected by the majority of the voters.'

The data show that the situation with these predicates is not so straightforward and their passivisability far from dismissing the present account. Only with the COME auxiliary the construction is undoubtedly a verbal passive. The fact that the semantic import of COME opens up the inchoative reading offers additional support for our claim that stative predicates can only form verbal passives if they can have an inchoative reading. In the case of psych-verbs this possibility is available only with the *fear*-type and only if the inchoative reading is obtained via the COME auxiliary.

Similarly, *love* is able to form passives:

- (24) a. Mary loved Max.  
b. Max was loved (by Mary).

Again, *love* can have an inchoative meaning with the inchoative ( $\approx$ consequent) state predicated over the internal argument so Max getting into the state of becoming loved.

4.3. *Ditransitives*

For some speakers of English there is an asymmetry between goals and benefactives when it comes to passive formation. Postal (2001) (citing Fillmore 1965), for instance, provides the examples of the type in (25):

- (25) a. A radio was sold to Mary.  
 b. Mary was sold a radio.  
 c. A radio was bought for Mary.  
 d. \* Mary was bought a radio.
- (26) a. John sold a radio to Mary.  
 b. John sold Mary a radio.  
 c. John bought a radio for Mary.  
 d. John bought Mary a radio.

Given that goals and benefactives behave alike in active constructions, as shown in (26), it is not clear how to account for this asymmetry under the traditional accounts of passives. Under our account, however, one could assume that for those speakers that do not allow benefactives to move to subject position in passives, only goals are part of RP and are thus dragged along when RP moves in passive constructions. Benefactives, on the other hand, appear somewhat higher in these speakers' grammar and it is even possible that they are just adjuncts for such speakers (but see Tungseth, 2006 for a different treatment).

4.4. *Floating Quantifiers*

A long-lasting problem for the analysis of Floating Quantifiers (at least since Sportiche 1988) comes from the observation that these are banned from the post-verbal position in passives, whereas both word orders are grammatical in the active counterparts:

- (27) a. John gave the boys both a good talking to.  
 b. John gave both the boys a good talking to.  
 c. The boys were both given a good talking to.  
 d. \* The boys were given both a good talking to.

This behaviour of Floating Qs is unexpected under previous approaches to passives, since then the Floating Q should be stranded in postverbal position where it is originally merged.

However, if there is additional movement of the RP, independent of any DP-movement to satisfy the EPP, the word order can be accounted for in the following way. The Floating Q moves together with the internal argument and the RP and remains stranded after the movement of the internal argument to Spec TP.<sup>7</sup>

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<sup>7</sup> Thanks to Ad Neeleman for suggesting to check these facts.

4.5. *Passive of existential constructions*

Additional evidence for the present analysis is provided by the behaviour of passives in the presence of *there*-expletives, as shown in (28):<sup>8</sup>

- (28) a. There was a man killed.  
 b. \* There was killed a man.

Given a traditional analysis of passives, it is not clear why the internal argument has to appear in preverbal position and why the postverbal position is ungrammatical. If we assume instead that in passive constructions the RP moves to some position above *v*P and furthermore that *kill* identifies RP with the internal argument appearing in Spec RP, the word order in *there*-passives is accounted for.

Our account assumes that regular passives involve two independent operations, first the movement of RP to form a basis for the event time and the second movement of a DP to Spec TP to satisfy the EPP. In *there*-constructions (both active and passive), then, this second movement does not take place but an expletive is inserted instead to satisfy the EPP. However, the first movement of RP still takes place in passive sentences since it is completely independent of the DP-movement to Spec TP.

As noted earlier, it is not clear how Collins (2005) could account for these data, since in his approach the participle moves in order to smuggle the internal argument and get it closer to SpecTP than the external argument. So in that sense, his approach is not much different from traditional accounts where the perspective really lies on the DP which in the end has to move to SpecTP. However, if there is no subsequent movement of a DP to SpecTP, the movement of the participle should also not take place in Collins' approach. This would predict the following word order with a *by*-phrase:

- (29) \*There was by the police a man killed.

We take the ungrammaticality of this example as additional evidence for our account where the RP movement in passive constructions is needed for reasons independent of the need to satisfy the EPP.<sup>9</sup>

4.6. *On PRO as the external argument of short passives*

Drawing an interesting parallel between the ability to assign null case of the complementiser *for* and the passive *by*, Collins (2005) proposes that PRO is the external argument in short passives. Baker et al. (1989) already attempted to define the external argument in short passives as being of the same kind as PRO. However, commenting on data like (30), they notice that while PRO can relate to the first person in infinitives, silent arguments in passives cannot:

<sup>8</sup> Thanks to Jutta Hartmann for pointing these facts out to us.

<sup>9</sup> There is cross-linguistic variation with respect to the word order in expletive passives. In French, for example, the internal argument has to follow the participle: *Il a été tué un homme* vs. *\*Il a été un homme tué* (but still: *\*Il a été tué par la police un homme* vs. *Il a été tué un homme par la police*). The present analysis can be extended to cover these facts by the natural assumption that also in this case French participles raise higher than English ones.

- (30) a. PRO to shave ourselves is fun.  
 b. \* Love letters were written to ourselves.

This fact is surprising considering that PRO and the silent argument of passives seem to share all other properties. For example, their nature of arbitrary pronouns explains their inability to bind a non-arbitrary pronominal.

Baker et al. (1989) do not have much to say about this fact and are obliged to stipulate that the two elements are different despite most evidence. We believe the present account could hint at a possible explanation for this problem. We could speculate that at least part of the inflectional field is present in infinitive clauses, namely some of the agreement features, and that furthermore the local relation between PRO and TP (or AgrS for that matter) can provide PRO with the relevant person feature in active sentences (say, via Agree for concreteness). In passives, however, given RP movement to Voice this option is not available since all the features in the TP are checked by the internal argument that intervenes between PRO in *v*P and the functional field.

In sum, there is ample evidence for an approach to passive formation that involves promoting the result state subevent. In the next and final sub-section, we discuss data from agrammatic Broca's aphasics that display a deficitarian comprehension pattern when it comes to passive sentences, among others. We believe that our approach to passive formation combined with the second author's general approach to this deficitarian comprehension pattern can account for these facts.

#### 4.7. *Comprehension patterns in agrammatic Broca's aphasics*

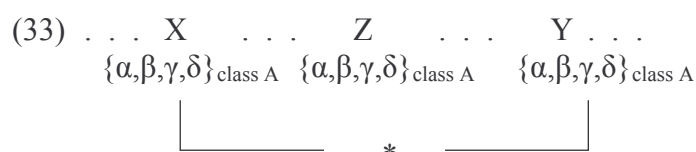
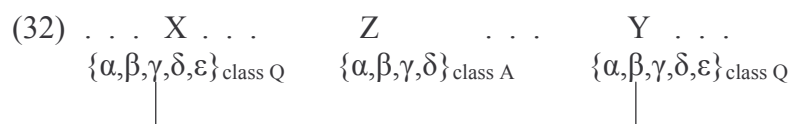
Additional evidence for the proposed analysis of passivisation comes from comprehension patterns in agrammatic Broca's aphasics. This population shows a selective comprehension problem in several areas. A summary of the main characteristics is given in (31).

- (31) **Agrammatic aphasia comprehension patterns** (Grodzinsky 2000, 2004; among others)

<b>Above Chance Performance</b>	<b>Chance Performance</b>
Subject relatives	Object relatives
Subject Clefts	Object Clefts
Actives	Passives
Adjectival Passives	Verbal Passives
Unaccusatives	Passives
SVO Hebrew Actives	OSV/OVS Hebrew Actives
Object Control	Subject Control
Unscrambled Object	Scrambled Object
...	...

Grillo (2005) argues that this selective comprehension problem is the consequence of minimality effects that arise when a dependency has to be built over an intervening element which shares part of its featural make-up with the goal. The main line of argumentation goes as follows.

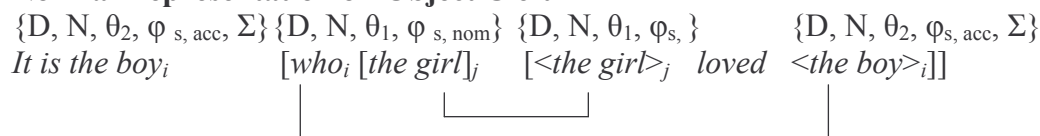
Grillo (2005) takes some recent developments of the Relativised Minimality (RM) approach to locality as a starting point (Rizzi 1990, 2004a; Starke 2001).<sup>10</sup> Given the structure in (32) in which every node is associated with a particular feature set, RM should permit the formation of a relation  $\Sigma$  between X and Y. The presence of the element  $\varepsilon$ , say, a feature changing the class of the set from Argumental to Quantificational, suffices for RM to see the difference between X and Z and therefore to authorise the movement of Y over Z.



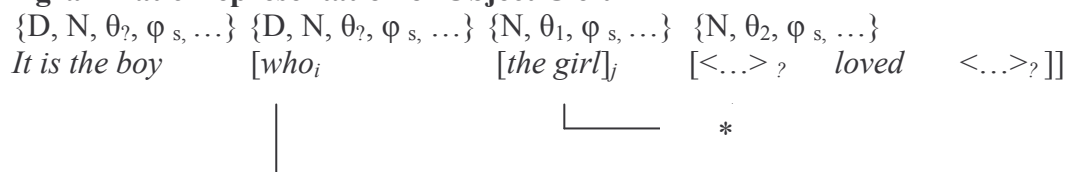
Given an impoverished structure as that in (33), RM fails to see any relevant distinction between X and Z and therefore disallows a relation between X and Y.

Our assumption is that agrammatic patients suffer from a limitation of their (syntactic) processing resources and therefore fail to maintain the activation of all the features normally associated with syntactic elements. Examples are provided in (34) and (35), where the feature  $\Sigma$ , which defines *<who>* as a member of the Operator's class and thus as distinct from the Argumental class to which *<the girl>* belongs, is present only in the normal representation.

(34) **Normal Representation of Object Cleft**



(35) **Agrammatic Representation of Object Cleft**



The impoverishment of the set of features leads to RM blocking chain formation: it is impossible to assign the correct theta role to each argument, which leads to poor comprehension.

This analysis correctly predicts a different pattern to arise with subject relatives, which are in fact correctly interpreted by agrammatic patients (see table in (31)). In these structures no DP intervenes between the moved constituent and its trace, hence no RM effects arise:

<sup>10</sup> Throughout, we use a representational approach to locality, but it should be clear that the account can easily be recast in derivational terms.



(36) It is the boy [who<sub>i</sub> [<the boy><sub>i</sub> loved the girl]]

□

The same analysis can easily be extended to cover the other asymmetries in (31). See Grillo (2005) for further discussion.

For our actual purposes, it is important to stress how the analysis sketched above interacts in a productive way with the present discussion of passivisation. We propose that agrammatic patients cannot maintain the activation of the discourse-related feature that triggers the movement of RP due to a limitation of their processing capacities.<sup>11</sup> Combining the two assumptions allows us to make the correct prediction that agrammatic comprehension of (eventive) passives with and without an overt *by*-phrase should be equally deficitarian whereas comprehension of unaccusatives and adjectival passives should not (see (31) and Grodzinsky 1999 and Piñango 1999, among others). Under our proposal only eventive passives involve movement of RP across *v*P, and this is independent of the overt presence of an external argument. Since *v*P has the external argument in its specifier (either overtly or covertly), a minimality effect between the moved RP and its trace arises.<sup>12</sup>

Hence, evidence from agrammatic Broca aphasia patients support our account of passivisation as involving the movement of the consequent state subevent to some projection right above *v*P. This movement is driven by some quantificational or discourse feature as was outlined in section 3.2.

### 5. Summary

In this paper we argued for a shift from an argument structure/DP perspective on passive formation to an analysis based on event structure. We showed that this shift provides a principled account for several syntactic and semantic properties of the passive construction, some of which remained unexplained under previous accounts. The general idea is implemented through movement of a consequent state (RP) to a discourse-related position at the edge of the *v*P phase. From this position the internal argument can further move to the subject position, though this is not a necessary feature of passivisation, as clearly indicated by *there*-expletive passives.

The tight relation between the availability of a consequent state and passivisation was highlighted by examples showing that the possibility to passivise a predicate depends on its event structure in a crucial way. Evidence from word order in constructions involving particle-verb constructions, secondary predicates, Floating Quantifiers, ditransitives, and *there*-expletives strengthened the idea that more than the internal argument moves in passives. Finally, the analysis proposed allowed us to make new predictions with respect to impoverished syntactic representation in agrammatic Broca's aphasia that turned out to be

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<sup>11</sup> This is supported by the general difficulty for this population in dealing with discourse-related and quantificational features (see Avrutin 2004). Note also that the present approach to deficitarian comprehension could in principle be extended to cover comprehension patterns of other populations such as children and normal adult speakers in stressful situations that seem to display similar deficits (see Avrutin 2000; Dick et al. 2001; among others).

<sup>12</sup> Another possibility would be to think about the minimality effect arising between the two subevents (*v*P and RP). We won't pursue this idea any further here.

correct, and unify the treatment of some of the most typical deficitarian comprehension patterns in this syndrome.

We used this account of passive formation as an example of a view on the syntax/semantics interface that employs the Principle of Compositionality in its strongest version where semantics can be directly read off syntax. Furthermore, we argued that the position RP moves to is independently needed also for active derivations. In general, the movement of (part of) the atemporal and structurally complex event is necessary to single out an element of the verbal domain (RP in the case of passives) and to enrich its semantics by introducing temporality, thus making it available to the temporal (and eventually to the discourse) domain.

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# Object shift and Pseudogapping in the Scandinavian languages

Kirsten Gengel

This paper introduces new data from Scandinavian in the discussion of the Pseudogapping phenomenon. It will be shown that data from Icelandic in particular rule out an analysis of Pseudogapping in terms of object shift, since only prepositional phrases seem to be allowed as Pseudogapping remnants. The proposal put forward in this paper is that the Scandinavian Pseudogapping derivation builds on Heavy Noun Phrase Shift, with special phonological requirements. More specifically, it is suggested that Scandinavian Pseudogapping patterns with the shift of indirect objects in English and with topicalisation in Serbo-Croatian.

## 1. Introduction

In this paper I present novel data from Scandinavian, namely Pseudogapping data from Icelandic and Norwegian. I discuss the implications of the situation in Icelandic for a general analysis of Pseudogapping and show that

- (i) the Object Shift analysis proposed by Lasnik (1995, a.o.) does not explain the distribution of Pseudogapping in the Scandinavian languages, and that
- (ii) an analysis in terms of Heavy Noun Phrase Shift or Focus Movement (as in Jayaseelan 1990 and Jayaseelan 2001) seems to give a better account of the empirical examples.

However, as an analysis in terms of Heavy *Noun* Phrase Shift is not entirely adequate to account for the observation that Pseudogapping only seems to occur with prepositional remnants, I propose that the extraposition of the PP in Scandinavian is subject to a phonological constraint like Inkelas and Zec's (1995) restriction on phonologically branching phrases.

The paper is organised as follows. In section 1, I outline the basic properties of Pseudogapping, and introduce the new data from Scandinavian. Section 2 gives a brief discussion of the Object Shift analysis proposed in Lasnik (1995) with regard to English and Scandinavian Pseudogapping. In section 3, the situation in Icelandic is considered more closely. I put forward a syntactic analysis in terms of Heavy Noun Phrase Shift to account for the Icelandic data. Section 5 discusses possible counterarguments against the Heavy Noun Phrase Shift approach, and shows how an analysis in terms of phonological phrasing could work. Section 6 concludes the paper.

### 1.1. Pseudogapping in English

The Pseudogapping construction (in (1)) is generally considered to be an instance of VP ellipsis, combining properties of both VP ellipsis (in (2)) and Gapping (in (3)).

- (1) Mary invited John, and Abby will \_ Tim.
- (2) Mary invited John, but Abby didn't.
- (3) Mary invited John, and Abby \_ Tim.

Like VP ellipsis, Pseudogapping has a finite auxiliary (*will*), and, like Gapping, a contrastive remnant (*Tim*). This *remnant* can take different forms: with verbs taking only one object, it can either be a direct object (as in (1) and (4)), or a prepositional object (as in (5)).<sup>1</sup>

- (4) Abby plays the piano better than her father does \_ the violin.
- (5) John gave more books to Susan than Tony did \_ to Sarah.

Until now, the Pseudogapping construction is only attested for English (and, perhaps, Korean, cf. fn. 2).<sup>2</sup> It occurs most often in spoken language (according to Levin 1986), and is found most commonly in comparative constructions, as in (4) to (6).

- (6) Mary invited John more often than Abby did \_ Tim.

Since Lasnik's (1995, 1999) work on Pseudogapping, it has been assumed that the Pseudogapping derivation employs a movement operation called object shift. Hence, if object shift in English is taken to be modelled on its counterpart in Scandinavian, we might expect Scandinavian to possess a Pseudogapping-like construction.

Instances of Pseudogapping can indeed be found in the Scandinavian languages, as a preliminary survey has shown.<sup>3</sup> Whilst Swedish does not allow Pseudogapping, Icelandic as well as two Mainland Scandinavian languages, namely Norwegian and Danish, does have a construction that is equivalent to English Pseudogapping.

The examples in (7) and (8) below illustrate Pseudogapping in Norwegian, and (9) and (10) show the Icelandic counterparts (with ' \_ ' indicating deleted material).<sup>4</sup>

<sup>1</sup> For verbs selecting more than one object (e.g. *give*) in the Scandinavian languages, the distinction between 'direct' and 'indirect' object will also play a role, which is neglected here.

<sup>2</sup> Kim (1997) provides a discussion of Korean Pseudogapping. However, the Korean Pseudogapping construction, as he describes it himself, patterns rather with English *VP ellipsis* in having an auxiliary and only a *single* remnant (either subject or object). Hence, pending further evidence to the contrary, I suggest that Korean Pseudogapping is a different phenomenon from English and Scandinavian Pseudogapping.

<sup>3</sup> The Norwegian examples were provided by Jorunn Hetland (p.c.); the Icelandic data goes back to Gunnar Hrafn Hrafnbjargarson (p.c.). Further data that support the empirical judgements above, but are not listed here, were provided by Arne Martinus Lindstad (Norwegian, p.c.), Øystein Nilsen (Norwegian, p.c.), and Torgrim Solstad, Catherine Fabricius-Hansen (Danish, p.c.) and Maria Melchior (Danish, p.c.), Anders Holmberg (Swedish, p.c.) and Ida Larsson (Swedish, p.c.), and Kjartan Ottósson (Icelandic, p.c.), and Nicole Déhé (Icelandic data on the double object construction).

<sup>4</sup> I have omitted the Danish examples here for ease of exposition, since they seem to follow the Norwegian pattern in all relevant respects.



(7) Prepositional Complements (*Norwegian*):

- a. Peter kan vente lenger på Mari enn Paul kan \_ på Kari.  
Peter can wait longer for Mari than Paul can \_ for Kari.  
'Peter can wait longer for Mari than Paul can for Kari.'
- b. Peter vil vente lenger på Mari enn Paul vil \_ på Kari.  
Peter will wait longer for Mari than Paul will for Kari.  
Peter will wait longer for Mari than Paul will for Kari.'
- c. Peter skal lese flere bøker for Mari enn Paul skal \_ for Kari.  
Peter shall read more books for Mari than Paul shall \_ for Kari.  
'Peter shall read more books for Mari than Paul shall for Kari.'
- d. Per har lest flere bøker for Kari enn Paul har \_ for Mari.  
Per has read more books for Kari than Paul has \_ for Mari.  
'Per has read more books for Kari than Paul has for Mari.'
- e. Per vil leke lenger med Mari enn Paul vil \_ med Kari.  
Per will(wants to) play longer with Mari than Paul will \_ with Kari.  
'Per will play longer with Mari than Paul will with Kari.'

(8) Dative Construction (*Norwegian*):

- a. \*Mary vil gi Susan mange penger og Paul [vil \_ Jane en bok].  
Mary will give Susan much money and Paul will \_ Jane a book.  
'Mary will give Susan much money, and Paul will Jane a book.'
- b. \*Mary vil gi mange penger til Susan og Paul [vil \_ en bok til Jane].  
Mary will give much money to Susan and Paul will \_ a book to Jane.  
'Mary will give much money to Susan, and Paul will a book to Jane.'
- c. Mary vil gi mange penger til Susan og Paul vil \_ til Jane.  
Mary will give much money to Susan and Paul will to Jane.  
'Mary will give much money to Susan, and Paul will to Jane.'<sup>5</sup>
- d. Mari vil gi flere bøker til Siri enn Pål vil \_ til Kari.  
*Mary will give more books to Siri than Paul will to Kari.*  
'Mary will give more books to Siri than Paul will to Kari.'
- e. \*Mari vil gi Siri flere bøker enn Pål vil \_ Kari.  
Mary will give Siri more books than Paul will Kari.  
'Mary will give Siri more books than Paul will Kari.'

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<sup>5</sup> (8c) is in sharp contrast to its counterparts with a single direct or indirect remnant, which were rated unacceptable. This also holds in the case of the usually more accepted comparative, cf. (8e) and (8f).



- f. \*Mari vil gi Siri flere bækur enn Páll vil \_ CDer.  
 Mary will give Siri more books than Paul will CDs.  
 ‘Mary will give Siri more books than Paul will CDs.’

(9) Prepositional Complements (*Icelandic*):

- a. Pétur hefur lesið fleiri bækur fyrir Kara-ACC en Páll hefur \_ fyrir María-ACC.  
 Peter has read more books for Kari than Paul has for Maria.  
 ‘Peter has read more books for Kari than Paul has for Maria.’
- b. (?)Pétur vill biða lengur eftir María en Páll vill \_ eftir Jóni.  
 Peter will(wants-to) wait longer after Maria than Paul wants after Jóni.  
 ‘Peter will wait longer for Maria than Paul will for John.’
- c. Pétur vill leika lengur við Maríu en Páll vill \_ við Jóni.  
 Peter wants-to play longer with Maria than Paul wants-to with John.  
 ‘Peter wants to play longer with Maria than Paul wants with John.’

(10) Dative Construction (*Icelandic*):

- a. María myndi skila fleiri bókum til Péturs en Páll myndi \_ til Jóns.  
 Maria will return more books to Peter than Paul will to John.  
 ‘Maria will return more books to Peter than Paul will to John.’
- b. ??María myndi skila fleiri bókum til Péturs en Páll myndi blöðum \_ til Jóns.<sup>6</sup>  
 Maria will return more books to Peter than Paul will newspapers to John.  
 ‘Maria will return more books to Peter than Paul will newspapers to John.’
- c. \*\*María myndi gefa Pétri fleiri bækur en Páll myndi \_ blöð.  
 Mary will give Peter more books than Paul will newspapers.  
 ‘Mary will give Peter more books than Paul will newspapers.’
- d. ??María myndi gefa Pétri fleiri bækur en Páll myndi \_ Jóni.  
 Mary will give Peter more books than Paul will John.  
 ‘Mary will give Peter more books than Paul will John.’

The Scandinavian data seem to obey the generalisation in (11).

(11) *Pseudogapping Remnant Generalisation*:

Scandinavian Pseudogapping only has prepositional remnants, i.e. prepositional phrases or a prepositional dative.

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<sup>6</sup> Presumably, the difference in acceptability is due to the double remnant. A reviewer points out that the (British) English counterparts of (8a), (8b), and (10b) are also unacceptable, at least for some speakers.

In contrast to Scandinavian (both Icelandic and Mainland Scandinavian), English permits a variety of remnants in Pseudogapping: direct objects (DO), indirect objects (IO), and prepositional complements (PP), as in (12). Interestingly, Levin (1986) pointed out that prepositional remnants are preferred and are considered more acceptable than non-prepositional remnants.

(12) Although John wouldn't give the book to Bill, he would \_ to Susan.<sup>7</sup>

This difference in the restrictiveness of possible remnants between the two groups of languages, as well as the common factor of preferring Pseudogapping with prepositional phrases (up to the exclusion of other remnants), should be accounted for.

The next section considers the predominant Pseudogapping analysis, the object shift analysis put forward by Lasnik (1995, 1999), and shows that especially under the point of view of explaining the distributional differences, the object shift analysis does not reply sufficiently to this question.

## 2. The object shift analysis

In recent years Pseudogapping has generally been considered to be a special instance of VP ellipsis and has been analysed accordingly. The common denominator of this approach is the assumption that the full VP is deleted, where the deletion process takes place after the Pseudogapping remnant has moved out of the VP. According to the analysis proposed by Lasnik (Lasnik 1995, 1999), in non-elliptical sentences in English, the verb raises in general, but in Pseudogapping, it stays *in situ* and is subsequently deleted with the VP.<sup>8</sup>

Lasnik's *object shift* analysis is sketched in (13):

(13) John invited Sarah, and Mary will [<sub>AgrOP</sub> Jane<sub>i</sub>] [<sub>VP</sub> invite ~~t<sub>i</sub>~~].



In Lasnik's analysis the object is moved to the specifier position of the an Agr<sub>O</sub> phrase. This movement is triggered by an EPP-*feature* for objects (Lasnik 1995,1999).<sup>9</sup>

### 2.1. English object shift vs. Scandinavian object shift

English object shift (as conceived by e.g. Johnson 1991 and Lasnik 1995, 1999), although modelled on the Scandinavian counterpart, differs from object shift in the Scandinavian languages in various ways. In this section, I focus on two specific properties by which the two

<sup>7</sup> Example taken from Takahashi 2003 (Handout, p.7).

<sup>8</sup> Whilst for English, neither generalised verb movement nor the lack of verb movement in the Pseudogapping case were standard assumptions then, in the current theoretical framework it is only the lack of verb movement to *v* in Pseudogapping that is unexpected.

<sup>9</sup> Other analyses also assume movement, which is implemented in a different fashion: either as rightward or leftward movement, e.g. *Heavy Noun Phrase Shift* (HNPS; Jayaseelan 1990), *focus movement* (Jayaseelan 2001) or *Dutch Scrambling* (Johnson 1997). Takahashi (2004) proposes a combination of HNPS and *Object Shift*.

types of object shift can be distinguished, since these two properties play a crucial role in the analysis of Pseudogapping.<sup>10</sup>

The first obvious difference between object shift of the English type and object shift of the Scandinavian type concerns the restrictions on the object undergoing object shift. While English object shift can target both direct objects and indirect objects (the distinction, in fact, often being obsolete due to the lack of overt case marking), as well as prepositional objects, and treats pronouns and full DPs alike, the Scandinavian languages show a more differentiated picture. The Mainland Scandinavian languages (Norwegian, Swedish, and Danish) differ from Insular Scandinavian (Icelandic, and, to some extent, Faroese) in that the first group allows pronouns to be shifted, but not full DPs. In Icelandic, on the other hand, both pronouns and full DPs can undergo object shift. In addition to this distinction between pronouns and full phrases, the Scandinavian object shift operation does not target prepositional objects.

The second difference between English and Scandinavian object shift that is of interest with respect to the Pseudogapping construction is a restriction with regard to the presence of an auxiliary verb in the sentence where an object should be shifted. Whereas English allows the object shift operation irrespective of the presence or absence of auxiliaries, in all Scandinavian languages, once an auxiliary is present in the sentence, object shift is blocked.

Since Pseudogapping occurs in both English and the Scandinavian languages, as shown above, the question arises which of the two types of object shift can account for the Scandinavian Pseudogapping examples. I will examine each of these object shift operations in turn.

## 2.2. *Analysing Scandinavian Pseudogapping with English object shift*

Given that the English object shift analysis accounts for the facts in English Pseudogapping, it would seem reasonable to extend it to Scandinavian Pseudogapping as well. An analysis in these terms would yield a cross-linguistically uniform analysis of Pseudogapping.

However, this extension is not without problems. A very preliminary and general argument against an analysis of Scandinavian Pseudogapping in terms of English object shift is the fact that the assumption of an object shift operation in English is not entirely uncontroversial. In the ‘standard’ analysis of English, object shift is not considered to be part of the English grammar. Following work on particle constructions (Johnson 1991), ECM constructions, and Pseudogapping (Lasnik 1995 and subsequent work), however, object shift has been introduced in the analysis of English (cf. also Chomsky 2001), though often conceived to be restricted to Pseudogapping (Fox & Pesetsky 2004, Takahashi 2004). Thus, given that the status of this operation is still under much debate, it seems desirable to make sure that all other possible analyses of Scandinavian Pseudogapping should be ruled out first.

A second concern with respect to Lasnik’s object shift analysis of Pseudogapping is the observation that Pseudogapping actually seems to differ from other cases where object shift is assumed in English, i.e. the ECM and particle shift cases. Pseudogapping, unlike the other two, displays a special prosodic structure (cf. Gengel 2006, a.o.) where the remnant seems to be contrastively focused. Although this property might be due to the ellipsis operation as such, it should nevertheless be accounted for. A uniform account of all three phenomena,

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<sup>10</sup> The arguments in this section draw from general arguments made in the literature (e.g. Johnson 1997, a.o.).

ECM structures, particle constructions, and Pseudogapping, does not predict these differences (see Gengel 2006 for an alternative approach).

The third and most important point left open in an analysis in terms of English object shift analysis, is the observation that Scandinavian Pseudogapping only permits prepositional phrases as remnants. This empirical circumstance is hard to explain under the Lasnik-style analysis outlined above, which does not distinguish between different types of objects. Hence, this analysis would vastly overgenerate in the case of Scandinavian Pseudogapping and could not exclude ungrammatical examples, unless a specific restriction that only holds for the Scandinavian languages is also called in.

These arguments, especially the last one, allow the conclusion that an analysis of Scandinavian Pseudogapping in terms of English object shift seems rather unlikely, if not impossible. The only advantage of the English object shift operation seems to be the insensitivity to the presence of auxiliaries, which is problematic for an analysis of Scandinavian Pseudogapping with Scandinavian object shift, as we will see in what follows.

### 2.3. Analysing Scandinavian Pseudogapping with Scandinavian object shift

The second obvious possibility of analysing Scandinavian Pseudogapping in terms of object shift is to make use of the object shift operation that is already available in the Scandinavian languages, i.e. Scandinavian object shift, illustrated in (14) with the double object construction in Icelandic. As is well-known, in Icelandic both weak pronouns and full DPs can be shifted: in (14), the indirect (dative) object (IO) has moved from its base position, in (14), both indirect and direct object are shifted. (14) shows that a direct object cannot be moved past an indirect object (but it can be shifted on its own, as illustrated in (15)).

- (14) a. *Ég skilaði ekki mannum bókinni.*  
 I returned not man-the-DAT book-the-DAT  
 b. *Ég skilaði mannum<sub>i</sub> ekki t<sub>i</sub> bókinni.*  
 I returned man-the-DAT not book-the-DAT  
 c. *Ég skilaði mannum<sub>i</sub> bókinni<sub>j</sub> ekki t<sub>i</sub> t<sub>j</sub>*  
 I returned the-man-DAT book-the-DAT not  
 d. *\*Ég skilaði bókinni<sub>j</sub> ekki mannum t<sub>j</sub>.*  
 I returned book-the-DAT not man-the-DAT  
 ‘I didn’t return the book to the man.’  
 (Thráinsson 2001:168)

- (15) a. *Jón las ekki bókina.*  
 John read not book-the-ACC  
 b. *Jón las bókina<sub>i</sub> ekki t<sub>i</sub>.*  
 John read book-the-ACC not  
 ‘John didn’t read the book.’  
 (Thráinsson 2001:164)

Unfortunately, an account of Pseudogapping in terms of Scandinavian object shift is not without problems either.

Firstly, as shown above, Pseudogapping in the Scandinavian languages only seems to occur with prepositional phrases as remnants (either a prepositional dative or various types of prepositional complements). As these PPs are full phrases (i.e. not pronouns) in all the Scandinavian languages that show Pseudogapping - Norwegian/Danish and Icelandic -, it is surprising that Norwegian and Danish should have Pseudogapping at all, since in Mainland Scandinavian, only weak pronouns can be shifted, never full DPs.<sup>1112</sup>

This observation actually gives rise to a second problematic fact for an analysis of Scandinavian Pseudogapping in terms of Scandinavian object shift, since Icelandic - which has object shift of full DPs - does not allow object shift of prepositional phrases, as shown by the ungrammatical example in

- (16) \*Jón talaði [<sub>PP</sub> við Maríu]<sub>i</sub> ekki t<sub>i</sub>.  
 John spoke with Mary not  
 ‘John didn’t speak to Mary.’  
 (Thráinsson 2001:151)

Following the generalisation above, however, Icelandic Pseudogapping is restricted to prepositional remnants. Hence, the Pseudogapping configuration in Icelandic could not possibly be derived via the ‘usual’ object shift operation.

The picture becomes even more complicated because other objects that are able to undergo object shift are not found in Pseudogapping, contrary to the expectations generated by the English examples.

But the Scandinavian object shift movement account is not only problematic with respect to the remnants that it can target, as opposed to the remnants that can empirically be found in Pseudogapping. The behaviour of verbs and auxiliaries also plays an important role with respect to the restrictions on Scandinavian object shift. Firstly, depending on which version of Holmberg’s Generalisation is adopted, the verb has to raise from its base position to a higher position in the clause, otherwise object shift is illicit. This poses a superficial problem for the Pseudogapping analysis, if we follow Lasnik (1995, 1999) in assuming that the verb does not raise in Pseudogapping. However, this problem does not persist, since the verb is deleted, i.e. no longer phonologically realised (cf. e.g. Anagnostopoulou 2004 for related discussion on phonologically null elements in object shift). Secondly, the only instance in which object shift is blocked in the Scandinavian languages is in the case of an overt element in T. Hence, an auxiliary always blocks the verb movement necessary for object shift – by definition, however, Pseudogapping always displays an overt auxiliary.

The question to be asked then, is then the following: If object shift is not a possible mechanism for the derivation of Pseudogapping in the Scandinavian languages, are there alternatives?

To answer this question, we will look at the situation in Icelandic in the next section.

<sup>11</sup> Preliminary tests seem to indicate that in Norwegian, Pseudogapping with pronominal remnants is actually ruled out.

<sup>12</sup> Elena Anagnostopoulou (p.c.) points out that there are Mainland Scandinavian dialects where object shift of full phrases is allowed.

### 3. Pseudogapping in Icelandic

In the previous section, we saw that object shift in either variant, the Scandinavian or the ‘English’ type, cannot give an appropriate account of the Scandinavian Pseudogapping examples. Hence, other movement options need to be explored. In this section, I will take Icelandic as a case study before I go on to show in section 4 that, on the basis of these data, a possible alternative to the object shift approach is an analysis in terms of Heavy Noun Phrase Shift (as in e.g. Jayaseelan 1990, Takahashi 2004), with some modifications.

The first striking point to note about Pseudogapping in Icelandic is that there seems to be a verb class specific difference. Whereas verbs that belong to the *gefa* class (‘give’) of verbs (classification according to Holmberg & Platzack 1995) don’t seem to allow Pseudogapping, verbs of the *skila/ræna* class (return/rob) (classification according to Holmberg & Platzack 1995) show Pseudogapping, as in (17).

- (17) *María myndi skila fleiri bókum til Péturs en Páll myndi til Jóns.*  
 Maria will return more books to Peter than Paul will to John.  
 ‘Maria will return more books to Peter than Paul will to John.’

As we examine the two verb classes in question, we will see that the occurrence of Pseudogapping is closely linked to the respective verb classes allowing the *to*-construction at all or not.

#### 3.1. Pseudogapping in the *gefa* verb class

The table below shows the main verbs of the *gefa* verb class (as classified by Holmberg & Platzack 1995). The two important verbs for our purposes here are *gefa* (‘to give’) and *senda* (‘to send’).

Verb	Meaning	Case of the IO	Case of the DO
<i>gefa</i>	<i>give</i>	<i>DAT</i>	<i>ACC</i>
<i>segja</i>	say (tell)	DAT	ACC
<i>senda</i>	<i>send</i>	<i>DAT</i>	<i>ACC</i>
<i>synja</i>	show	DAT	ACC

Two examples for the object distribution (i.e. accusative following dative) are given in (18) and (19) (examples taken from Holmberg & Platzack 1995:187).

- (18) *Jón gaf Ólafi bókina.*  
 Jon gave Olaf-DAT a-book-ACC  
 ‘John gave Olaf a book.’
- (19) *Hún sagði þeim sögu.*  
 She told them-DAT a-story-ACC  
 ‘She told them a story.’

Most ditransitive verbs in Mainland Scandinavian (and in English) show either the order DP > DP or DP > PP (i.e. either the double-object construction (DOC) or the *to*-construction).

In Icelandic, however, the *to*-construction is *not* permitted in the *gefa* verb class, as (20) and (21) show for the verb *gefa* ('to give'), and (22) and (23) for the verb *synja* ('to show') (all examples taken from Holmberg & Platzack 1995:188).

- (20) Ég gaf Jóni bókina.  
I gave John-DAT a-book-ACC.  
'I gave John a book.'
- (21) \*Ég gaf bókina til Jóns.  
I gave a-book-ACC to John.  
'I gave a book to John.'
- (22) Hún sýndi mér málverk sín.  
She showed me pictures her  
'She showed me her pictures.'
- (23) \*Hún sýndi málverk sín fyrir mig/til mín.  
She showed pictures her for me /to me.  
'She showed her pictures to me.'

The sentence in (23) also shows that other prepositions that would be plausible in the context in Icelandic are also ruled out.

In order to place indirect objects in sentence-final position, the *gefa* verb class can change the order of the objects from indirect object preceding direct object (IO > DO) to direct object preceding indirect object (DO > IO), thus employing *inversion* instead of a preposition.

The examples in (24) and (25) (taken from Collins/Thráinsson 1993:150) illustrate the two possible word orders.

- (24) Hann gaf konunginum ambáttina.  
He gave the-king-DAT the-maidservant-ACC.  
'He gave the king the maidservant.'
- (25) Hann gaf ambáttina konunginum.  
He gave the-maidservant-ACC the-king-DAT  
'He gave the maidservant to the king.'

Pseudogapping, as said above, does not occur in the *gefa* class ((26) - (28)).<sup>13</sup>

- (26) \*María myndi gefa Pétri fleiri bækur en Páll myndi Jóni blöð.  
Mary will give Peter more books than Paul will Joni newspapers.  
'Mary will give Peter more books than Paul will John newspapers.'

<sup>13</sup> (28) is attested marginally acceptable only by one speaker (as is (31)).



- (27) \*\*María myndi gefa Pétri fleiri bækur en Páll myndi blöð.  
 Mary will give Peter more books than Paul will newspapers.  
 ‘Mary will give Peter more books than Paul will newspapers.’
- (28) ??María myndi gefa Pétri fleiri bækur en Páll myndi Jóni.  
 Mary will give Peter more books than Paul will John.  
 ‘Mary will give Peter more books than Paul will John.’

Clearly, the absence of Pseudogapping in the *gefa* class does not yet point to a correlation between the occurrence of Pseudogapping and the general possibility of the *to*-construction. The Pseudogapping pattern with the verb *senda* looks very similar to the pattern above with *gefa* at first, as shown in (29) to (31).

- (29) \*María myndi senda Pétri fleiri bækur en Páll myndi Jóni blöð.  
 Mary will send Peter more books than Paul will John newspapers.  
 ‘Mary will send Peter more books than Paul will John newspapers.’
- (30) \*\*María myndi senda Pétri fleiri bækur en Páll myndi blöð.  
 Mary will send Peter more books than Paul will newspapers.  
 ‘Mary will send Peter more books than Paul will newspapers.’
- (31) ??María myndi senda Pétri fleiri bækur en Páll myndi Jóni.  
 Mary will send Peter more books than Paul will John.  
 ‘Mary will send Peter more books than Paul will John.’

However, contrary to Holmberg and Platzack’s (1995) generalisations, it seems that the verb *senda* allows the *to*-construction.<sup>14</sup>

Then, on the basis of my assumptions so far, Pseudogapping should be allowed (and fully grammatical) in this case. This prediction is borne out:

- (32) María myndi senda fleiri bækur til Péturs en Páll myndi til Jóns.  
 Mary will send more books to Peter than Paul will to John.  
 ‘Mary will send more books to Peter than Paul will to John.’

These data permit the conclusion that there is at least a very strong preference for the prepositional remnant in Pseudogapping (as indicated in the generalisation in (11)), and that there is indeed a correlation between a verb allowing the *to*-construction and the occurrence of this verb in Pseudogapping.

This hypothesis is corroborated by evidence from the *skila/ræna* class of verbs that allow the *to*-construction.

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<sup>14</sup> K. Ottósson (p.c.).

3.2. Pseudogapping in the *skila/ræna* verb class

The *skila/ræna* verb class shows a greater variation in case assignment, depending on the verb. This is illustrated in the table below.

Verb	Meaning	Case of the IO	Case of the DO
<i>skila</i>	<i>return</i>	<i>DAT</i>	<i>DAT</i>
<i>ræna</i>	rob	ACC	DAT
<i>óska</i>	wish	DAT	GEN
<i>leyna</i>	hide	ACC	DAT
<i>spyrja</i>	ask	ACC	GEN

Some examples with these verbs are shown in (33) and (34) (taken from Holmberg & Platzack 1995:188).

- (33) María skilaði mér bókinni minni.  
 Maria returned me-DAT the-book-DAT my-DAT  
 ‘Maria returned me my book.’

- (34) Þeir rændu Ólaf peningunum.  
 They robbed Olaf-ACC the-money-DAT  
 ‘They stole the money from Olaf.’

The *skila/ræna* class generally permits the *to*-construction, as is illustrated in (35) to (37) (from Holmberg & Platzack 1995:205).

- (35) Hún skilaði bókinni til Jóns.  
 She returned the-book to John.  
 ‘She returned the book to John.’
- (36) Þeir ætluðu að ræna veskinum af mér.  
 They intended to rob the-purse of me.  
 ‘They intended to steal my purse of me.’
- (37) Jón leyndi sannleikanum fyrir Maríu.  
 John concealed the-truth for(of) Maria.  
 ‘John concealed the truth from Maria.’

As shown in the introduction, Pseudogapping occurs with *skila*:

- (38) María myndi skila fleiri bókum til Péturs en Páll myndi til Jóns.  
 Maria will return more books to Peter than Paul will to John.  
 ‘Maria will return more books to Peter than Paul will to John.’

- (39) ??*María myndi skila fleiri bókum til Péturs en Páll myndi blöðum til Jóns.*  
 Maria will return more books to Peter than Paul will newspapers to John.  
 ‘Maria will return more books to Peter than Paul will newspapers to John.’
- (40) \**María myndi skila fleiri bókum til Péturs en Páll myndi blöðum.*  
 Maria will return more books to Peter than Paul will newspapers.  
 ‘Maria will return more books to Peter than Paul will newspapers.’

### 3.3. Evaluating the PP remnant generalisation

In this section, possible reasons for the PP remnant generalisation are examined. In particular, the question why the *to*-construction is allowed in one Icelandic verb class and not in the other is interesting. Holmberg & Platzack (1995) offer a comparison between the *to*-construction and the inverted double object construction. As these two constructions actually have a lot in common, it is astonishing that we should not find Pseudogapping with indirect remnants without prepositions in Scandinavian Pseudogapping, a question to which I will return shortly.

With respect to argument structure, Holmberg & Platzack (1995:207) point out that in the inverted double object construction, the dative IO is not a pure experiencer. Instead, it shares the thematic properties of a PP in the Mainland Scandinavian and English *to*-construction.

In their syntactic analysis of inversion in the *gefa* verbs, Holmberg & Platzack (1995:206f.) use the Falk/Holmberg hypothesis (Falk 1990 and Holmberg 1991), which assumes a base-generated structure as in (41) below for the inversion cases.

- (41) (Icelandic)<sup>15</sup>
- 
- hann sýndi bókasafni eð öllum stúdentum  
 he showed the-library all students

According to this structure, the inverted DOC should be treated as *to*-construction, without preposition but with morphological case and focus instead.

Moreover, the inverted structure seems to share some focal properties with the *to*-construction. Inversion takes place with indefinite and/or heavy indirect objects, though neither of these two characteristics seem to be crucial as such – the requirement for inversion seems to be that the indirect object is more focussed than the direct one (cf. Ottósson 1991, Holmberg & Platzack 1995 for examples).

<sup>15</sup> Holmberg&Platzack (1995:207).

The presence of the focus indicates the markedness of this word order, which can also be presupposed in the construction with the prepositional datives. There one might also assume that the *to*-phrase is emphasized by the mere choice of the dative construction (as opposed to unmarked word order IO>DO, which, presumably, displays no clear focal preference). Hence, morphological case (Dative) and focus together fulfil the same syntactic requirements as the preposition in the Mainland Scandinavian languages, without violating the verb's selectional properties (which the preposition would do). (Holmberg/Platzack 1995:207).

Despite these similarities, the *to*-construction is not possible with *gefa*-verbs. Given the above, this seems to be a matter of lexical representation rather than syntactic or prosodic requirement. As Holmberg & Platzack (1995:204) put it: 'the lexical representation of *gefa*-verbs ... requires an experiencer with a dative. A PP cannot have dative Case, hence cannot satisfy the lexical selection requirements of the verb.'

- (42) \*? Hún gaf bókina til Jóns.  
 She gave the-book to John.  
 'She gave the book to John.'  
 (Holmberg/Platzack 1995:204)

However, given that the *gefa* verbs have an indirect object in sentence-final position, the next question is why indirect remnants without prepositions should not occur in Icelandic Pseudogapping.

A first, selectional argument comes from the observation that the verbs of the *skila/ræna* verb class do not obligatorily assign case to the indirect object, which is optional. According to Holmberg & Platzack (1995:205), *skila*, as opposed to *gefa*, can occur without an indirect object (43).

- (43) a. Hún hefur ekki skilað bókinni.  
 She has not returned the-book.  
 'She hasn't returned the book.'  
 b. \*?Hún hefur ekki gefið bókina.<sup>16</sup>  
 She has not given the-book.  
 'She hasn't given the book.'  
 (Holmberg/Platzack 1995:205)

Due to this optionality, the experiencer argument can be realized as a PP.

This permits the assumption that in case the indirect object is mentioned at all, it may receive a certain amount of stress. This, however, is not the case in the canonical word order IO>DO, since there the accent may be expected to be rather on the sentence-final element, which is the direct object – that is, if there is any perceivable difference at all. The emphasis (or focus) on the indirect object, though, would naturally follow from the choice of the prepositional phrase, placed after the direct object.

In Pseudogapping, the sentence-final element (i.e. the remnant) displays a kind of inherent focus (stress) by its very nature, since it obligatorily contrasts with its antecedent. Hence, it may be appropriate to choose the prepositional phrase variant of word order in case the speaker wishes to place special emphasis on the indirect object in Pseudogapping.

<sup>16</sup> Note that this example is grammatical with 'give' in the sense of 'give away'. Holmberg&Platzack (1995) refer to Halldór Sigurðsson.

#### 4. Pseudogapping in Icelandic – an instance of Heavy Noun Phrase Shift?

It is a common assumption in the literature on Pseudogapping that the remnant always bears some kind of focus. This seems to be corroborated by the empirical observations made with respect to the markedness and information-structural properties of the remnant in the Icelandic Pseudogapping construction.

These information-structural properties of Pseudogapping have found their way into the literature on Pseudogapping with the assumption of either Heavy Noun Phrase Shift (cf. Jayaseelan 1990, Takahashi 2004) or focus movement (e.g. Jayaseelan 2001, Gengel 2006). Since Heavy Noun Phrase Shift (HNPS) is also found in Icelandic, independent of Pseudogapping, this section examines whether the movement that derives Pseudogapping could be HNPS.

##### 4.1. Deriving indirect object Pseudogapping remnants via HNPS

The *skila/ræna* verb class, which allows Pseudogapping, does not have the possibility to emphasize the indirect object by means of inversion. Hence, to focus the indirect object, a different mechanism is needed. In principle, there are two possible variants: movement of the direct object (DO) across the indirect object (IO) (as in (44)) or movement of the indirect object (IO) across the direct object (DO) (as in (45)).

(44)  $DO_i [IO > t_i]$

(45)  $[t_i > DO] IO.$

Since Icelandic displays Heavy Noun Phrase Shift (HNPS) constructions with constituents that are reasonably heavy, this phenomenon could be considered to be at play in the movement operations suggested above.

According to Ottósson (1991), however, we find an asymmetric behaviour of the objects with respect to Heavy Noun Phrase Shift, since HNPS of the direct object (DO) across the indirect object (IO) leads to ungrammaticality, as is illustrated with the anaphoric relations in (46).

- (46) a. ?Ég gaf unnustu sína<sub>i</sub> [piltinum sem hafði beðið óþreyjufullur í mörg ár]<sub>i</sub>.  
 I gave fiancée Refl-ACC the-boy-DAT who has waited impatiently for many years.  
 b. \*Ég gaf unnusta sínum<sub>i</sub> [stúlkuna sem allir strákanier voru á höttunum eftir]<sub>i</sub>.  
 I gave fiancé(masc) Refl-DAT the-girl-ACC who all boys „liked“  
 (cited in Holmberg/Platzack 1995:211)

In sharp contrast to this, the indirect object can be moved via HNPS across the direct object. The slight decrease in acceptability in the case of the indirect object that has undergone HNPS could potentially be on a par with the marginally possible indirect object remnant in Icelandic Pseudogapping (as in (47)). Recall that if Scandinavian object shift were responsible for this movement, we would expect the indirect object Pseudogapping remnant to be fully grammatical.

- (47) ??*María myndi senda Pétri fleiri bækur en Páll myndi Jóni.*  
 Mary will send Peter more books than Paul will John.  
 ‘Mary will send Peter more books than Paul will John.’

Hence, the status of the indirect object in Icelandic Pseudogapping seems to be closer to the status of indirect objects in HNPS constructions. Arguably, this is not a very strong argument for a HNPS analysis yet, but we will see that the picture becomes clearer with direct objects.

#### 4.2. Deriving direct object Pseudogapping remnants via HNPS

As shown by Ottósson’s examples in (48), the direct object does not undergo HNPS past the indirect object. This, at first sight, is an exact replication of the behaviour of direct objects in a Scandinavian object shift approach, as illustrated in (49).

- (48) a. ?*Ég gaf unnustu sína<sub>i</sub> [piltinum sem hafði beðið óþreyjufullur i mörg ár]<sub>i</sub>.*  
 I gave fiancée Refl-ACC the-boy-DAT who has waited impatiently for many years.  
 b. \**Ég gaf unnusta sínum<sub>i</sub> [stúlkuna sem allir strákanier voru á höttunum eftir]<sub>i</sub>.*  
 I gave fiancé(masc) Refl-DAT the-girl-ACC who all boys „liked“  
 (cited in Holmberg/Platzack 1995:211)
- (49) a. *Ég skilaði ekki manningum bókinni.*  
 I returned not man-the-DAT book-the-DAT  
 b. *Ég skilaði manningum<sub>i</sub> ekki t<sub>i</sub> bókinni.*  
 I returned man-the-DAT not book-the-DAT  
 c. *Ég skilaði manningum<sub>i</sub> bókinni<sub>j</sub> ekki t<sub>i</sub> t<sub>j</sub>*  
 I returned the-man-DAT book-the-DAT not  
 d. \**Ég skilaði bókinni<sub>j</sub> ekki manningum t<sub>j</sub>.*  
 I returned book-the-DAT not man-the-DAT  
 ‘I didn’t return the book to the man.’  
 (Thráinsson 2001:168)

However, again we find that the pattern diverges from object shift, since object shift can move a direct object in a simple transitive construction without problems (cf. (50)), whereas Pseudogapping is completely ungrammatical with direct object remnants, as in (51) and (52) below.

- (50) *Jón las bókina<sub>i</sub> ekki t<sub>i</sub>.*  
 John read book-the-ACC not  
 ‘John didn’t read the book.’  
 (Thráinsson 2001:164)
- (51) \*\**María myndi senda Pétri fleiri bækur en Páll myndi blöð.*  
 Mary will send Peter more books than Paul will newspapers.  
 ‘Mary will send Peter more books than Paul will newspapers.’

- (52) \*Pétur hefur lesið fleiri bækur en María hefur dagblöð.  
 Peter has read more books than Maria has newspapers.  
 ‘Peter has read more books than Maria has newspapers.’

If Ottósson’s observations are true, then HNPS of direct objects (DO) across indirect objects (IO) seems to be blocked. The Scrambling alternative that he proposed to explain the Icelandic inversion examples, however, is rejected by Holmberg & Platzack (1995:213) on the grounds of the comparison to German (where two base-generated structures for inverted and non-inverted structures are assumed as well).<sup>17</sup>

On the basis of the data provided above, we can draw the conclusion that an HNPS approach to Icelandic Pseudogapping gives a better account of the empirical data.

However, we still need to account for the fact why prepositional phrases do appear as Pseudogapping remnants, and are not ruled out along with the other two types of remnants, given that PPs are not normally associated with Heavy *Noun* Phrase Shift. This is the question I will discuss in the next section.

### 5. The proposed analysis: Beyond HNPS

This final section aims to shed light on the question whether prepositional remnants in Pseudogapping should be subsumed under the HNPS approach proposed above. I will argue that this is possible, but that there are also other factors that facilitate PP extraposition in these particular cases. To this end, I will begin with a discussion of the notion of ‘heaviness’.

#### 5.1. Heaviness and prominence: Arguments for PPs as remnants

Admitting HNPS into the equation necessarily entails the question of the *heaviness* of the Pseudogapping remnant. Jayaseelan (1990) based his HNPS account on the intuition that the remnant in Pseudogapping always has to be focused (the focus in question being contrastive focus). Hence, the remnant displays a sufficient amount of heaviness or prominence required for Heavy Noun Phrase Shift.<sup>18</sup>

However, this leaves us with the question why the only elements that seem to be able to be extraposed are PPs – for these, we cannot assume Heavy *Noun* Phrase Shift.

Among the decisive factors that generally seem to influence the choice of the *to*-construction instead of a regular double object construction, phonological and information-structural concerns factors play an important role, as pointed out in the literature on the dative alternation (cf. Levin & Rappaport-Hovav 2005 and the references cited therein).

As already mentioned above, the remnant in Pseudogapping is inherently emphasized. The conclusion one might draw from the distribution of Pseudogapping in Icelandic, Mainland

<sup>17</sup> An alternative explanation could be lying in the different structure of the DO complements and the prepositional complements, i.e. a direct complement could be affected by deletion more immediately because of constituent structure (V+DO). It is unclear, however, how this would extend to the English data, possibly giving rise to a PP adjunct analysis, for which, to my knowledge, there is no sufficient motivation yet.

<sup>18</sup> The observation made in the preliminary tests mentioned in footnote 11, namely that weak pronouns are strictly excluded as remnants in Pseudogapping, even in combination with a preposition, also lends indirect support to the assumption that heaviness plays a role.



Scandinavian, and English, is that the emphasis of the indirect object is preferably carried out in the phonologically more prominent *to*-construction. Put differently, in case the focus is to be on the indirect object, the sentence final position (naturally provided in the prepositional construction) and the phonologically more prominent element are employed together to achieve maximal effect. However, this notion of ‘phonological prominence’ is not without problems – it is hard to perceive the prepositional phrase as being phonologically more prominent in English, a point to which I will return shortly.<sup>19</sup>

Furthermore, the relative weight of constituents may be playing a role, too. Although this component seems to be less motivated for the cases above, there have been studies to the effect that the choice between the two structures in the dative alternation are also influenced by the “weight” or “heaviness” of the constituents (cf. Wasow (2002)).

On the information-structural level, the long-standing assumption that given material precedes new material seems to mirror the Pseudogapping facts very well – given that given material is deleted in the second conjunct. The second factor arising in Pseudogapping is the inherent contrastivity on the Pseudogapping remnant. Since the remnant is always contrasted to its counterpart in the antecedent clause, there is an obligatory ‘newness’. If, then, the remnant is to be contrasted, this could tie in with considerations of heaviness and prominence, leading to the preference of the DO>PP word order.

The question of givenness of constituents also establishes a link to the argument structure discussion outlined in the previous sections: Except for the verb “to give”, other verbs have a clear tendency towards allowing a ditransitive along with a monotransitive structure, e.g. the verb “to send” or “to return”. As shown above, the Icelandic counterparts of these verbs permit the Pseudogapping construction. This is possibly a further argument to add a prepositional phrase in case the non-obligatory argument is to be mentioned at all, and contrasted with respect to its antecedent.

### 5.2. Prosodic properties of PPs and the branching condition

In this section, I come back to the question of phonological prominence, as outlined in the section above. Generally, it seems to be the case that prepositional complements can undergo extraposition more easily than other complements (J. Hetland, p.c., and Hetland 1992). On the other hand, Inkelas & Zec (1990, 1995) observe that there are phenomena in which prosodic constraints seem to be placed on the ability of a constituent undergoing extraposition.

I will argue here that these two factors work together in the derivation of Scandinavian Pseudogapping.

Inkelas & Zec (1995) show that in (i) Heavy Noun Phrase Shift in English, and (ii) topicalisation in Serbo-Croatian, prosodic restrictions must be obeyed. In particular, they claim that in grammatical Heavy Noun Phrase Shift constructions, ‘the “shifted” noun phrase contains at least two phonological phrases, while any attempt to shift an NP consisting of only a single phonological phrase is judged ungrammatical’ (Inkelas & Zec 1995:546).

- (53) a. Mark showed to John [[some letters] [from Paris]]<sub>NP</sub>  
 b. \*Mark showed to John [[some letters]]<sub>NP</sub>

(Inkelas & Zec 1995:546, their example 24. Inner brackets symbolise the phonological phrases.)

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<sup>19</sup> Anna McNay (p.c.).

In Serbo-Croatian topicalisation, the same restrictions seem to hold (Inkelas & Zec 1995:546, their example 23):

- (54) a. [[Taj] [čovjek]]<sub>NP</sub> voleo-je Mariju  
           that man           loved-Aux Mary  
           ‘That man loved Mary.’
- b. \*[[Petar]]<sub>NP</sub>           voleo-je Mariju  
           Peter               loved-Aux Mary  
           ‘Peter loved Mary.’

Inkelas & Zec point out that in both cases, there is the requirement that the topic or the shifted NP must be a *branching phonological phrase*, i.e. the head of a phonological phrase must take a complement. This is borne out in [some letters] in (53), that branches out to the PP below, and, more clearly, in the topicalisation case in (54), where only DPs can be fronted (not NPs on their own).

That this correlation is not entirely coincidental can be shown with data from *Stylistic Fronting* in Icelandic. Holmberg (2000:448-449) points out that DPs and PPs undergo stylistic fronting, as illustrated in (55) and (56).

- (55) Flestir sem [í Ósló]<sub>i</sub> hafa verið t<sub>i</sub> hafa gengið eftir Karl Johan.  
       Most that in Oslo have been have walked along Karl Johan.  
       ‘Most of those that have been in Oslo have walked along Karl Johan street.’
- (56) Þeir sem [Þá erfiðu ákvörðun]<sub>i</sub> verða að taka t<sub>i</sub>  
       those that that hard decision must to take  
       ‘those who must take that hard decision’

In principle, nouns can also undergo stylistic fronting (Hrafnbjargarson 2004), but such examples are clearly marked, at least in the case where a noun only carries a definite article suffix, as in (57), and thus constitutes a non-branching phonological phrase.

- (57) ??Allir sem myndina<sub>i</sub> sáu t<sub>i</sub> voru hrifnir.  
       All that painting-the saw were impressed  
       ‘Everyone who saw the painting was impressed.’

The cases in which the noun phrase carries a definite article suffix are precisely the ones where Pseudogapping seems to be ruled out in Scandinavian, i.e. the cases with direct object, and indirect object without preposition. Thus, the combination of a more restricted version of HNPS (or rightward movement in the case of PPs), and a prosodic constraint on PPs seems to capture the empirical situation in Icelandic and Mainland Scandinavian Pseudogapping.

The open question that remains, of course, is whether a similar prosodic condition for English simply does not exist, since English allows extraposition of elements that are not phonological phrases but merely phonological words (e.g. bare plurals). The answer to this question requires a more thorough investigation of the prosodic structure of the two language groups in question, which I will leave for further research.

## 6. Conclusion

In this paper I have discussed Scandinavian Pseudogapping data. I have summarised the empirical findings in the generalisation in (11), which states that Scandinavian Pseudogapping only allows prepositional remnants in Pseudogapping. On the basis of this generalisation, I have argued that neither an analysis in terms of Scandinavian object shift nor an analysis in terms of ‘English’ object shift (as proposed by Lasnik (1995, 1999) for English Pseudogapping) can account for the Scandinavian data. The discussion of the Icelandic data in section 3 suggested that the Pseudogapping remnant generalisation is reflected in the different verb classes permitting the Pseudogapping construction. Furthermore, a correlation between Heavy Noun Phrase Shift and Pseudogapping was put forward to account for the lack of direct object remnants and indirect object remnants without preposition. In order to derive the grammatical status of the prepositional remnant, information structure has been considered, leading to an analysis that combines a restricted version of HNPS in the Scandinavian languages with a prosodic constraint on extraposition, the branching condition introduced by Inkelas & Zec (1990, 1995).

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## Interpretable features in vP-ellipsis: On the licensing head

Remus Gergel

The present article offers theoretical and empirical motivation for the licensing of verb-phrase ellipsis. It puts forth an interface-based generalization according to which a necessary condition in spelling out a phrasal ellipsis site in a minimalist taxonomy is derived from anchoring it to a formal and interpretable feature of the licensing head. Positive consequences of the modeling used are discussed drawing on various domains. The specifics of the proposal are developed for the clausal T(ense) head; it offers a unified analysis not only of transparent vPE cases involving temporality (*have/be* licensors), but also of apparent exotic licensors (English modals and Slovenian clitics), as well as some combined cases of licensing heads.

### 1. Introduction

The licensing process of verb phrase ellipsis (vPE; cf. (1)) surfaces as a clear requirement in elliptical sentences in languages such as Modern or Middle English.

- (1) a. I think we should try that little row row row your boat again.  
I think we **should** [<sub>vP</sub> \_ ] too. (MICASE)  
b. for he coupe not selle and undo his cloob as a womman **schulde** [<sub>vP</sub> \_ ] (PPCME2)  
because he could not sell and undo his clothes as a woman should

In cases like (1), the overt auxiliary head c-commanding the ellipsis site is typically taken to be the licensor.<sup>1</sup> In this connection, *licensing* means the term standardly used in the syntactic ellipsis literature, viz. the characterization of the configuration under which a vPE site occurs (cf., e.g., Johnson 2001 for an overview). Consequently, the present focus is *one* main necessary ingredient within the wider issue which can be formulated as: “What does it take to (vP-)elide?” – How come, for instance, ellipsis is a legitimate process in (1b) above or, for that matter, in (2) below, where well-noticed sloppy-identity readings obtain?

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<sup>1</sup> See, e.g., van Gelderen (2003) for a recent proposal on the structural position of the modals in earlier English; cf. Warner (1993); Gergel (2004) on the auxiliary status of the premodals and the issue of ellipsis.

- (2) Thought dead for four years, Chuck discovers that his fiancée (Helen Hunt) has moved on with **her** life and now he **must** [<sub>VP</sub> ~~move on with his life~~], too. (Filmforce.Ign.Com)

One apparent problem in such cases is that the antecedent and the corresponding (“reconstructed”) ellipsis site are not identical. A first step towards a solution to the more general question raised above is to acknowledge that there are two distinct processes involved. Thus, on the one hand, a strong line of research to the latter issue says that one condition on vPE necessitates the antecedent and the ellipsis site to stand in a parallelism relationship to one another, which is generally less strict than full identity, as, e.g., seen above and noticed in the literature. This condition may itself dovetail an entire set of various requirements, for which syntax-semantic formulations and their appropriate information-structural set-up have preoccupied much research from various perspectives (see, among many others, Rooth 1992; Fox 1999; Winkler 2005). Moreover, specialized conditions on the antecedent-ellipsis relationship have been designed to allow for sloppy identity, vehicle change and further surfacing mismatches while aiming to preserve parallelism (cf. Fiengo & May 1994; Hoji 2003).<sup>2</sup> On the other hand, however, vPE also depends on syntactic factors (Lobeck 1995; Johnson 2001; Merchant 2001), on the motivation of which I elaborate below. It is essential to distinguish between these two types of conditions – summarized in (3) and (4) – when one approaches the broader issue of what contributes to giving rise to (vP) ellipsis.<sup>3</sup>

- (3) vPE(PAR): An ellipsis site needs to be “parallel/isomorphic” to an antecedent vP.  
 (4) vPE(LIC): An ellipsis site needs an appropriate (local) syntactic configuration.

Beyond vPE(PAR), there is a large and interesting line of research, as mentioned. Though also intensely researched in the past, vPE(LIC) may appear from today’s perspective as a plain “condition” on the surfacing string; moreover, one which is still not well understood theoretically. The specific aim of this paper is to propose a specific kind of motivation for vPE(LIC). I am not concerned with vPE(PAR), but I will discuss where I think the two might interact in the theory of grammar assumed here and show some beneficial results under such assumptions. The main idea of the claim is schematically rendered in (5).

- (5)
- |          |                               |
|----------|-------------------------------|
| Licenser | ellipsis (/deaccenting site?) |
| [iT]     | vP                            |

The straightforward configuration in (5) says that a vPE site is constrained by ultimately interface-bound requirements not only with regard to the relationship to an antecedent, but that the c-commanding overt head itself also contains a formal and interpretable feature which is crucially in charge of licensing. Theoretically, I will therefore focus on features that are both formal and interpretable in MP parlance (Chomsky 1995, 2001), though the paper does

<sup>2</sup> Given that the relationship between antecedent and ellipsis is not what this paper focuses on (but rather what precisely is in charge within the head vPE is anchored to – licensing applying notably to *all* vPE cases), I don’t have anything interesting to say about cases without linguistic antecedents; see Pullum (2000); Merchant (2004), and the references there for issues relating to such cases.

<sup>3</sup> I thank Sigrid Beck for the perspicuous formulation.



not subscribe to the unidirectionality of the probe-goal relationship (for similar theoretical conclusions drawing on different empirical domains than ellipsis, see Zeijlstra 2004; von Stechow 2005, a.o.).

The remainder of the paper has the following structure: In section 2, I sketch the relevant insights from previous literature on licensing together with some of their problems. I suggest a remedy to some of the problems by capitalizing on the type of feature that is involved in licensing. In section 3, I develop the claim by going through apparently different subcases of vPE which display some of the relevant properties – i.e. “specialized” tempo-aspectual licensers, modals, clitics, and some combined licensers – and present evidence how tense features are involved in each of them. Section 4 explores some further related theoretical considerations; section 5 concludes the article.

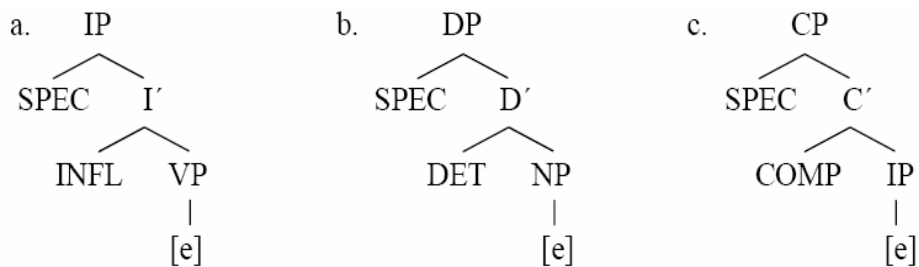
## 2. Basics of vPE(LIC)

To a large extent the stepchild of ellipsis research over the last decade, vPE(LIC) appears on a first take as a simple condition imposed on the relationship between a remnant (i.e. in the sense of an element with PF representation and not of a necessarily evacuated part of structure) and an ellipsis site. The first question one could raise is why not simply dispense with it, given that it is *prima facie* an additional requirement. One could perhaps imagine vPE(LIC) falling syntactically out of syntactic coordination constraints (cf., e.g., te Velde 2003), semantic givenness (Merchant 2001), or perhaps other mechanisms. Important as such conditions are in numerous aspects of ellipsis theory, it becomes crucial, however, not to confuse the two main types of conditions involved introduced in section 1. For instance, the impasse with the application of a coordination-based approach to vPE is a notorious issue on empirical grounds: unlike phenomena such as gapping or arguably stripping, vPE is by far not restricted to coordination and occurs in a significantly broader variety of syntactic environments (Hankamer 1979; Johnson 2001 a.o.). The element in the relevant auxiliary position, typically immediately c-commanding the deletion site (e.g., an auxiliary or a raised verb in some languages) is a prominent hallmark in the grammatical process of vPE. Consequently, this simple fact needs an account (even neglecting the question, for the moment, whether it should be derived from something else or not). It will also be clear that vPE(LIC) cannot by itself follow from the question of vPE(PAR), though the latter is an important necessary condition as mentioned above. Else we would also universally predict vPE sites wherever the parallelism conditions are met. Moreover, there are cases in which vPE becomes unacceptable even in languages which allow vPE, as is the case with at least some epistemic modals in English and other languages (cf. section 3.2). Therefore, something more than an “auxiliary-position” requirement has to be (i) properly stated within the grammar, (ii) refined accordingly; and (iii) ideally, explained.

Lobeck’s work (e.g., Lobeck 1993, 1995) figures most prominently among the previous approaches to the licensing question (cf. also in particular Zagana 1988). Consider, for the time being, (6).



## (6) VPE, NPE and sluicing (Lobeck 1993)



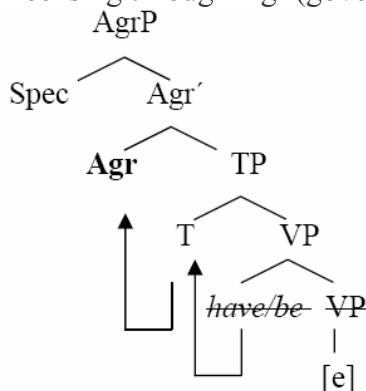
Equipped with the schema in (6), in which a “functional” element such as Infl, Det, or Comp governs a lexical phrasal ellipsis site, Lobeck proposes the well-known interesting generalization for the licensing of ellipsis processes of various sorts, viz. accounting for the familiar pattern in (7) which includes vPE, NP ellipsis and sluicing; cf. Lobeck (1993:789).<sup>4</sup>

- (7) a. Because Domingo couldn't, they asked Pavarotti to sing the part.  
 b. Although John's friends were late to the rally, Mary's arrived on time.  
 c. We want to invite someone, but we don't know who.

In Lobeck (1995:146), the further question what exactly governs and licenses vPE within a richer functional structure (Pollock's 1989 Split-Infl Hypothesis) is addressed. The answer offered, is Agr (and not T), though the role of tense is also interestingly discussed in a way to which I will return, and essentially offer evidence for, in the non-governmental framework. Capitalizing essentially on the agreement properties of (English) *be/have*, this line of argument (Lobeck 1995 and extensive previous work) is able to account for ellipsis in sentences such as (8) and proposes the phrase structure in (9).

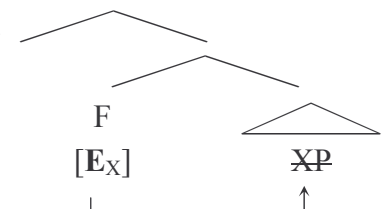
- (8) Mary has found a place to stay and John has \_ too.

## (9) Licensing through Agr (governing elided VP; Lobeck 1995)



<sup>4</sup> As Lobeck equally carefully shows, there are interesting exceptions to the neat general panorama according to which a functional Deg(ree) head allows its lexical complement to elide under government. For instance, under the common syntactic assumption that a functional Deg(ree) head dominates the adjective phrase (cf., e.g., Kennedy 1999 for an overview), the generalization does not go through since a Deg head does not license AP ellipsis; cf. also Merchant (2001) for discussion.

Lobeck (1999) adapts the licensing approach to initial versions of the minimalist framework and proposes feature-checking in a Spec-head relation. This line of argument is, however, refuted by Merchant (2001) mainly on theoretical grounds. With the GB framework no longer available (for independent reasons), the theoretical space becomes somewhat different. Clearly, both Lobeck's general thrust from the earlier work with regard to phrasal ellipsis as well as the idea of feature checking from the later work are not only valid points but at the heart of more recent takes on the issues. As a next step in pursuing the vPE(LIC) issue, one may understand the move towards feature checking as a general simplification of the theoretical apparatus from the government and binding framework towards the minimalist concerns: cf., e.g., López & Winkler (2000) and Merchant (2001).<sup>5</sup> Here, I will briefly introduce Merchant's approach, which follows Lobeck's line in its generality of coverage (cf. also Merchant 2004 and Johnson 2004 for discussion). In Merchant (2001) and related work, a feature called E is in charge of phrasal ellipsis: (10a). Its phonology consists in allowing the deletion of the complement of E, as in (10b), while its semantics is determined by E-givenness, cf. (10c), where a constituent  $\alpha$  is E-given iff there is a salient  $\beta$  such that the existential closure of  $\beta$  entails the existential closure of  $\alpha$  and vice versa.

- (10) a. 
- b. phonology of E:  $\phi TP \rightarrow \emptyset / E\_$
- c. semantics of E: E-givenness  
 $\llbracket E \rrbracket = \lambda p.p$ , where  $p$  is E-GIVEN

Thus, (10a) is a standard licensing configuration for phrasal ellipsis. The condition (10b) encapsulates the clear phonological effect of ellipsis, i.e. deletion. While (10c) is equally essential for vPE, it is somewhat harder, however, to see its predictive power on vPE licensing since it is a relationship between an antecedent and an ellipsis site. Although it is useful for many cases of vPE, as far as their antecedents go, it clearly refers to the parallelism condition rather than to licensing itself. The idea for our purposes is to keep the feature approach, but also to decompose the “ellipsis feature” E into more explanatory syntactic primitives with an impact that is able to capture cases of vPE licensing in particular. A good start and inspiring line of thought in this connection is Merchant's discussion of sluicing, where  $E_S$  (the sluicing variant of the E feature) is given a translation into more familiar features from the standard inventories of grammar (for instance, *wh*- and question-features in that case).

<sup>5</sup> A discussion of the co-licensing role of polarity is beyond present scope (see Laka 1990; López 1995; Depiante 2000; López & Winkler 2000). Notice, however, that polarity is compatible with an interpretability-based approach. There are three main ways how polarity could be approached in a theory pursuing it from the licensing perspective: The first venue would be that polarity is an independent licenser. At the same time, many cases of ellipsis licensed by polarity heads cross-linguistically may involve the stripping-style of ellipsis rather than vPE. A second possibility is that suggestions on the aspectualizing role of negation (see, e.g., Giannakidou 2000 for discussion) affect the relationship between the tempo-aspectual domain and polarity. This might support a hypothesis based on tempo-aspectuality, but it also has the complicating side of referring in its standard version to internal (*aktionsart*) rather than to external aspect. A third suggestion may be that polarity does not syntactically license vPE, but that it represents an effect of the focusing conditions holding between the ellipsis or deaccented site and the licenser; see Winkler (2005) for a discussion on the role of information structure in ellipsis under consideration of various types of focalization and Dvořák & Gergel (2004, in prog.) for some *verum* focus effects in Slovenian vPE, which is licensed by tense, as discussed in section 3.4.

Before doing something similar in spirit for vPE, let me mention a further problematic aspect of basing the weight of licensing on diacritics such as Agr or E alone. The way both Agr and E are understood in the pertinent works making use of them for ellipsis is as non-interpretable features at LF. In a (phase-based) minimalist framework they will standardly not survive further than up to the next strong-phase level. However, as is well known, (a) antecedent-ellipsis relationships are a matter of fact in most productive patterns of vPE (cf., e.g., Rooth 1992; Pullum 2000; Merchant 2004); and (b) they are not clause-, and hence not phase-bounded (cf. Hardt 1993, Lobeck 1995, a.o.). Sentences of the types in (11) exemplify this through distant as well as cross and split antecedents.

- (11) a. We had to make as many shapes as we could \_ . (H. Hamilton, *Speckled People*)  
 b. He doesn't want to have to fight a war, but he's resigned to the fact that he just might \_ and understands the reality of it. (*Daily Mississippian*, Feb./19/2003)  
 c. I cooperated and the police said they'd note it in the report.  
 No, you didn't \_ , and no, they won't \_ . They will note that you lied. Frequently.  
 (forum.freeadvice.com: Unusual Marijuana Possession Charge)  
 d. Sally should take out the dog for a walk and Bob should do the dishes, but neither of them must \_ .

Such sentences are well familiar in their patterns from the ellipsis literature (cf. especially Hardt 1993 for relevant discussion) even though the role of the modals is typically not considered. What they show in the present connection are at least two problematic facets for standard theories. First, they remind us of pronominal properties of ellipsis, into which I cannot go in more detail here (cf. Hardt & Romero 2002 and references on a discourse-based application to this end and see Wasow 1979; Winkler 2005; Gergel 2005 for suggestions on how to reconcile pronominal properties of ellipsis with deletion-approaches). Second, they show that we arrive at a paradoxical situation with the approaches considered so far: by the time antecedent and vPE site should have been matched, the local feature which in some models is precisely introduced to thoughtfully take care of the antecedent-ellipsis relationship will have long been erased from the derivation, thus precluding the two sites from being compositionally matched with one another. Plainly put, the question is: how does the local head/feature putatively know that it has a green light (with respect to an appropriate antecedent) to effectively license deletion if it cannot connect to anything beyond the phase? For concreteness, we may assume a derivational bottom-up account of ellipsis at this juncture (cf. Fox 1995 for evidence), but the problem arises in a left-to-right model as well, as in probably also other systems that assume some version of phases or, for that matter, related locality concepts, but preclude the information from passing through (*qua* non-interpretable).<sup>6</sup>

As an alternative venue in view of such problems, I suggest that the licenser be interpretable. More specifically, I propose the hypothesis in (12).

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<sup>6</sup> A processing-based (“left-to-right”) model might circumnavigate the problem for those cases in which the antecedent precedes the ellipsis but, alas, vPE is well known not to care about precedence (modulo the Backwards Anaphora Constraint, of course). Since I am not concerned with processing, I will not engage into the issue further, but once the problem with preceding ellipsis is overcome, extensions in the spirit of Phillips (2003) and more specifically Murguía (2004) might bring further insight and ideally decide the relationship of the two types of approaches to one another.

- (12) Interpretability Hypothesis (IH):
- (i) A grammaticalized licenser is defined within  $C_{HL}$  in terms of interface-legibility conditions;
  - (ii) The set of potential licensers for phrasal (vP) ellipsis is a subset of the formal and interpretable features within the clause;
  - (iii) vPE in English and perhaps other languages is licensed through formal [T].

While part (12i) yields what I take to be a general condition for syntactically bound ellipsis, parts (12ii-iii) are the specific application of the hypothesis to vPE (with possible extensions to other cases of surface anaphora). In the next section, I motivate this view from different case studies focusing mostly on vPE in English. Before doing so, let's mention one further theoretical benefit of changing E through an interpretable feature. As is well known, once vPE(PAR) and vPE(LIC) hold, vPE is in most cases optional. If E is to agree or check in any sense with the vP domain, it is dependent on the very condition that vPE takes place in order for it to be eliminated. This requirement is plausible, E being an ellipsis feature, but it seems also somewhat circular. On the other hand, [T], which will invariably be present in the syntax of an English derivation, will be able to check uninterpretable Tense on v, and will not depend on it – thus yielding precisely the optional character (as far as narrow syntax goes) of vPE.

A slightly technical note in this connection is that one can maintain the view of the feature on v (rather than on vP) entering the relationship with T. *Prima facie* this might strike one as odd since received wisdom has it that one of the key features of vPE is precisely its phrasal nature. On closer inspection, however, the view has advantages, and, counter to appearances, it does not forfeit phrasal integrity, as we will see in a moment. Notice first that also from a morphological point of view it is easiest to assume that in English it is the verb that checks (is probed by) Tense. Now syntactically, the phrasal nature of vPE can indeed also be obtained. More specifically: On a first try, some version of head-to-phrase percolation might perhaps be stipulated to also resolve the dilemma, not an uncommon mechanism from other domains. Notice, however, that recent findings through which the phrasal nature of vPE is independently obtained (cf. in particular Johnson 2004, 2005) can in effect derive the result of phrasal integrity. While discussing the full-scale focus-projecting approach and its motivation at length here would take us to far afield, we may note that its net effect consists in projecting the silenced site from within, crucially from v. Combining syntactic properties with the argument projecting approach (cf. Selkirk 1984 and related work), Johnson's focus-projection results in particular support the conclusion that a(n arguably parametric) head v derivationally produces the elided phrase, i.e. vPE.<sup>7</sup>

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<sup>7</sup> A final and further-going question that one could raise is whether the projecting approach cannot substitute the licensing approach altogether. While having one mechanism (say, the one based on argument projection alone) would be cheaper and hence more attractive than two, on the distributional and theoretical considerations I have been able to check so far, this does not seem to be a warranted conclusion, however. On the minimalist assumptions discussed, there would be a reason to anchor vPE sites to interpretability in a derivation. Perhaps not less compelling is the empirical evidence for licensing: vPE sites in languages like English appear under the scope of (grammaticalized) licensing auxiliaries only (cf. also Johnson 2001; cf., e.g., Gergel 2004 on quantitative and qualitative results for Middle English, where modulo certain shifts in the auxiliary system compared to ModE, a striking synchronic uniformity of the licensing class also obtains). Further evidence is that, conversely, even in languages like (Modern) English, sites that *lack* an appropriate licenser are not felicitous. A possible probing case are, e.g., bare-infinitives, i.e. infinitives without the functional layer on top of the vPs. English is standardly thought to have such (at least impoverished) structures in the complement positions of perception verbs. Returning to ellipsis theory and (its) economy, if the elegant v-based approach were also a sufficient condition, then *\*Mary saw [John leave the house] but they claimed Bill saw [John leave the house]*

### 3. Analysis of licenser types

In this section, I consider four environments for licenser types of vPE which are different on the surface and show how the interpretability hypothesis introduced in the previous section applies to them. I will argue that although agreement may naturally surface from morphological facts of a given language and share the syntactic locus of licensing, what matters for vPE licensing are not Agr-projections in a syntactic sense, but projecting [T].

The choice of licensers is guided by the fact that the proposal is based on morphosyntactic but also semantically interpretable properties of the licensers. That means that while we have gained a good deal of insight about the morphosyntax of ellipsis licensing from the point of view of licensers that can, to a large extent, unselectively re-merge to the relevant positions in the Infl domain in various languages (cf. McCloskey 1991; Ngonyani 1996, among others, for insightful discussion), additional evidence is needed for an argument which tries to tease apart the possible contributions of agreement or tense. The verb-movement type of vPE is in most cases compatible with both candidates since the verbs in point usually show various agreement patterns in conjunction with tense inflection. Such cases do not make a T-analysis less likely, but do not favor it either over an Agr account. Therefore, the idea will be to look at temporal licensers in general and then at such licensers which make an Agr-based analysis unlikely. Conversely, we will test for potential counterexamples to the present claim; more specifically, by searching for cases which seem to favor an analysis based on non-interpretable, e.g., Agr-elements alone.

#### 3.1 Extensional licensers

An immediate case to check is whether lexical elements which represent tempo-aspectual markers in a given language ever develop into licensers of vPE. Given perhaps certain typological tendencies of auxiliaries to develop into bound morphemes or to cliticize (cf., e.g., Heine 1993 for further discussion of some of the typological issues), let alone the cross-linguistic quirks of vPE, one might, ironically, end up not finding evidence of this first relevant type. It turns out, however, that, for instance, English or Portuguese allow tempo-aspectual auxiliaries to license vPE; cf. (13) and (14), cf., e.g., Cyrino & Matos (2002) on the latter case whose data and analysis I borrow here for illustration.

- (13) a. Of course, I've heard all the rumors, so I suppose you have \_ too.  
 b. Abdellah is taking the train to Marseille and Rana is \_ too.
- (14) a. A Ana já tinha lido o livro à irmã mas a Paula não tinha \_.  
 the Ana already had read the book to-the sister but the Paula not had  
 'Ana had already read the book to her sister but Paula had not'  
 b. O João é simpático para todas as pessoas e a Ana também é \_.  
 the João is nice for all the people and the Ana too is  
 'João is nice to everybody and Ana is, too.'

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should be expected to produce the right silenced site. For the time being, I conclude that while the projecting approach fills in an essential (theoretical) gap and crucially explains the internal syntax of vPE, licensing is, I believe, still needed to account for its external anchoring into the remnant structure and perhaps (trans-)sentential grammar.



For English, with which I am mainly concerned, let me clarify the background a little.<sup>8</sup> While I assume that Modern English modals are essentially first-merged in T (see the qualifications below) and thus distinct from English aspectual auxiliaries, I assume with Emonds (1994) that *have* and *be*, based both on morphological and syntactic motivation, are not full verbs (i.e., on this point in departure in particular from the classical view going back to Emonds 1970). They are first-merged in a projection distinct from Tense and structurally equivalent to Aspect (cf., e.g., van Gelderen 2003; Gergel 2004). From this position they can undergo movement under the well-known appropriate conditions. Further, I follow Demirdache & Uribe-Etxebarria (2000, 2004) on the view that aspect is syntactically an embedded type of lower tense with the properties of an ordering predicate. Thereby aspectual heads have the same type of feature encoded; in short, T.

A note on the putative “meaningless” character of *have* and *be* is in order here. Although *have* and *be* may perhaps be considered “light” in terms of theta-roles, they are not meaningless in terms of their semantics *pace* their grammaticalization history and shifts. First, they form minimal pairs in terms of their meaning as pointed out, e.g., by Kayne (1993). If the elements of such pairs mean different things, then at least one of them cannot be vacuous. Second, and more importantly here, they typically are precisely carriers of the grammaticalized tense and aspect information of a sentence. With this in mind, a further clarification pertains to the point that vPE in English is licensed at the position of first-merge in the case of *have* and *be*, as also in the further cases studied below. Of course, this is not natural necessity; cf. in particular some of the cases in the languages in which a full verb raises to the relevant functional projection and licenses vPE. But for English at least, the first-merge position even coincides with the relevant licensing position. While a lot more could be said with regard to the morphosyntax of *have* and *be*, for present purposes suffice it to say that in the standard cases they can be linked to T in terms of licensing.

Let’s try an initial evaluation of the licensing account so far. While the types of licensers considered in this section are to some extent naturally expected to carry temporal features, they are at the same time prone to two potential objections. A first possible counterargument may be that the evidence thus far is not entirely illuminating since we took the elements that developed into the lexical elements which can carry temporality as free morphemes to illustrate the point on temporality. While that was a first necessary step, we then need further evidence. Moreover, another potentially blurring point regarding the nature of the relevant features involved is that *have* and *be* could also be argued to be compatible with an agreement-based analysis in view of their morphology.<sup>9</sup>

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<sup>8</sup> While I concentrate on English in the paper, for the licensing issue in Portuguese, I adopt, in essence, the analysis of Cyrino & Matos, as mentioned. According to these authors, vPE is licensed by Tense in European Portuguese and (lower) Aspect projections in Brazilian Portuguese. As is well known a number of potentially interfering syntactic processes are different in Portuguese from English. See below for some relevant remarks to the present course and concerns.

<sup>9</sup> A reviewer raises the issue whether *have* and *be* are actual counterevidence to the T-based approach precisely due to the properties I had mentioned above. While *have/be* have been sketched because they represent an important licenser class, what is probably crucial here is that they do not offer *sufficient* evidence for a projecting T feature. In my simple-minded understanding of the logic at stake, compatibility does not generally exclude one of the terms involved. In more words: carrying both morphological agreement and tense morphology (none of them quite regular incidentally, as we know; cf. *has*≠/*have*/+/s/ and *had*≠/*have*/+/ed/), it may be perhaps even motivated at some level to posit both agreement and tense *features* on such auxiliaries. But solely because they might have both features does not mean that tense and agreement should be assumed as two syntactic (licensing) projections resulting out of such single lexical items. Much less does it mean that if we project any of them, then tense is the wrong projection. Economy of Projection for one thing might even make it unlikely that isomorphism is involved, i.e. that each single feature on a lexical item should have its own

### 3.2 Intensional licensers: The case of the English modals

The English modals are traditionally taken to lack tense properties altogether. I claim in this section that, on closer inspection, they have active T features and that it is precisely these features that are in charge of vPE. In order to do so, we will need to outline a few basic notions of modality at the syntax-semantics interface.

In view of the concerns expressed at the end of section 3.1, it is worth considering the case of the English modals since they lost productive temporal inflection and entirely escape an agreement-based system (Roberts 1985). However, they usually make for fairly acceptable vPE licensers. Let's also note that a putative bleaching counterargument as the one mentioned in section 3.1 would have even less force with the modals, which are clearly not "meaningless" in any way. Though the modals underwent a process of grammaticalization and they are arguably thematically light, they have a straightforward high-type semantics (cf. von Stechow 1994 for a clearly-taken point on bleaching from a formal semantic point of view). Before getting to the syntactic proposals relevant for the modals, let's note that the background semantic assumptions are the standard modal ones elaborated on, e.g., in Kratzer (1991). Moreover, we can consider the hypothesis (to be qualified below) that the relevant factors for modal semantics (essentially, modal base and modal force) also map one-to-one in relevant respects to the syntactic structure of English; cf. Butler (2003); Gergel (2003) for further discussion within proposals inspired by Cinque (1999) and Cormack & Smith (2002). Butler discusses interesting evidence at the syntax-semantics interface stemming from domains such as the scope of quantifiers (cf. also von Stechow & Iatridou (2003), though from a different perspective) and some of the better-known quirks of the English modals, e.g., with respect to the scope of negation. Here, I will discuss evidence from ellipsis together with some of its problematic aspects and a potential solution, but to place the discussion on a concrete footing, let's next see what a phrase-structural representation taking semantic differences into account might look like. If one only restricts oneself to the syntactically often invoked distinction between epistemic and root modality (modal base) and the universal vs. existential difference (modal force), a tree mapping such distinctions between syntax and semantics could, on the basis of the mutual c-command relations and their transitive property, have the representations in (15), as proposed in Butler (2003).<sup>10</sup>

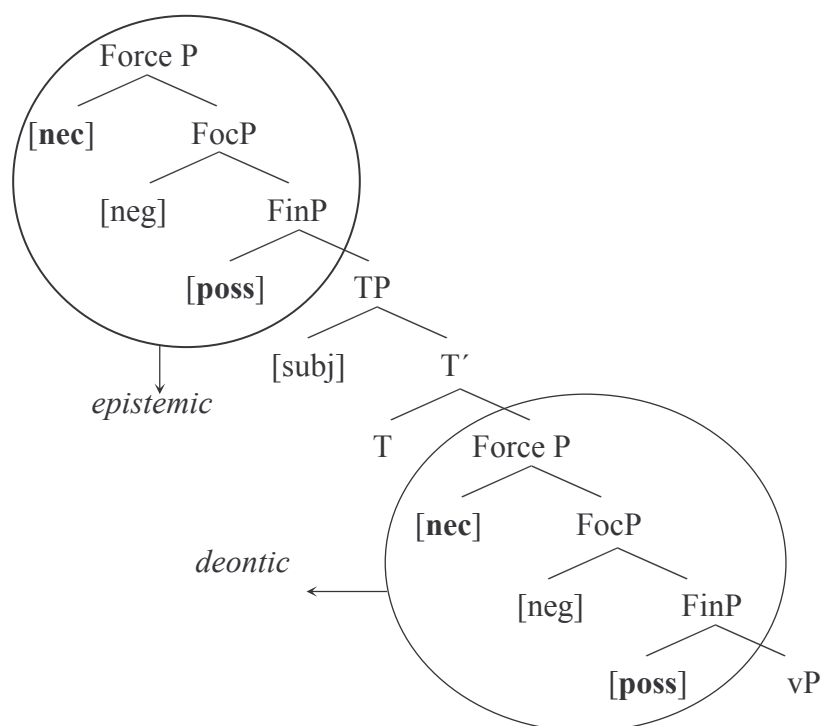
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projection, unless there are compelling syntactic reasons to assume several projections (cf., e.g., Rambow & Santorini 1995; Hegarty 2005). For present purposes, suffice it to note that *have/be* provide some initial evidence for the role of tempo-aspectuality. I defer a closer decision of ruling out Agr as an empirically motivated projection to the next section when considering the present-day English modals, which will make the Agr-based system empirically entirely unmotivated (not carrying any agreement affixes) (in addition to the theoretical worries expressed against Agr in this paper and which, if on the right track, hold for all licensers).

<sup>10</sup> Ellipsis data support the core insight of this proposal, as we will see. A simplification necessary from the point of view of ellipsis will also be proposed below.



(15) Modal syntax: cf. Butler (2003:988)



A diagram as in (15) would make available four main syntactic positions for modals. In Butler's original proposal the four individual projections, ForceP and FinP (as well as the intercalated FocP in each domain) are based on the assumption that they reflect information-structure; their particular labels can be ignored for our purposes (see Drubig 2003, forth. on a pertinent syntactic discussion on information structure). What we will consider more closely are the relative positions of the modals to one another (pair-wise). In Butler's proposal, the emerging structure in terms of the relative position of the modal heads is interesting in a number of respects. In particular, it is symmetric in that necessity c-commands possibility both in the epistemic and the root area of the clause and that epistemic modality c-commands deontic modality. While I am going to simplify the structure momentarily, of major interest next is the question whether, and how, the information contained in such a four-fold structure of the English modals might relate to vPE in the language.

A first observation in this respect is that an apparent condition that we can call the epistemic restriction, in its origins going back to Ross (1969), applies at least to some modals in English and to modals in some other languages (McDowell 1987; Depiante 2000; Drubig 2001); cf. (16) and (17).

(16) \* Bob must wash his car every day and Peter must \_ too. (\*on the epistemic reading)

(17) \* The president must have been at the meeting and the vice president must \_ too.

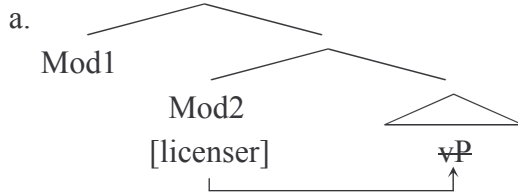
A first approximating account we can give for this kind of output is that if epistemic modals are first-merged structurally higher than modals on their root readings and in particular higher than the relevant licensing position for vPE, then the ellipsis site is not properly licensed, hence the arising problems in acceptability.

In this connection, a second note is in order, however. At least some epistemic possibility modals behave differently with regard to vPE (Gergel 2003). Although speaker judgments are not always stable, for many speakers relative judgments as in (18) and (19) obtain and attested examples as in (20) and (21) with possibility modals (sometimes including the linguistic literature which is, however, not specifically focusing on ellipsis, as in (20)) allow epistemic readings.

- (18) a. \* Mary must be a successful student, and they say Frances must too.  
 b. ? Mary may be a successful student, and they say Frances may too.
- (19) a. \* Mary must have fallen from the old ladder and Peter must too.  
 b. ? Mary may have fallen from the old ladder and Peter may too.
- (20) a. John will fly to London and Mary may \_ too. (Boskovic 1994: 280)  
 b. She might have been watching television more often than he might.  
 (cf. Radford 1997:110)
- (21) “You have to be a real masochist to want to direct,” he says with a smile. But Fearheiley does, and Smith might\_ , too. (*Gazette.Net*, Maryland, 08/29/2002)

Sentences such as the ones above may indicate that the involved epistemic possibility modals are better licensers than epistemic necessity modals. Both observations gathered so far then seem at first to support the structure in (15) - namely, in a more fine-grained fashion on top of the traditional epistemic/root distinction, which we have previously seen confirmed from ellipsis through the epistemic restriction. Recall in this connection that necessity modals have been independently argued to be structurally higher than possibility modals (this is a point in which, e.g., Butler 2003 diverges from Cinque 1999, who also assumes distinctions between necessity and possibility, but not in the epistemic domain). However, the pertinent question here is: what might be a possible implementation for ellipsis of the interesting structure? On closer inspection, we run into an impasse from the perspective of ellipsis if we try to make the structural suspicions more specific with regard to licensing. There are two main problems for a largely articulated structure as the one presented above. The first issue is that such a structure is incompatible with the simplest possible feature-based approach to ellipsis. In order to make it work, various additional stipulations would be needed. The second technical problem is that licensing itself does not follow structurally from a structure as in (15) in any obvious way. In particular, there is no metric available which would predict that under such structural assumptions, say, epistemic necessity is just below the acceptability threshold and epistemic possibility should be somewhere above it. In order to cope with the licensing issue while at the same time maintaining the essential observational insight of some of the Cinqueian approaches for English, I propose a simpler structure, as given in (22a), and explicated in (22b).

(22) Modal vPE licensing – simplified phrase structure



b.

	First merge	Scope position	[+T] marking
Deontic <i>must</i>	Mod 2	Mod1	+
Deontic <i>may</i>	Mod 2	Mod 2	+
Epistemic <i>must</i>	Mod 1	Mod 1	*
Epistemic <i>may</i>	Mod 2	Mod 1	+

I use the labels Mod1 and Mod2 simply for expository reasons to refer to the distinction between two modal heads. Mod2 is in fact equal to a projecting temporal feature and thus to the head T. While having modals in T is anything but news, merging a specific subset of the modals in T becomes substantive in the present argument. I propose that it is precisely the fact that the English modals reanalyzed to T (and at least some of the epistemic modals apparently even beyond T “up the tree”) that turns them into the kind of vPE licensers they are (not) today. The structure in (22a) accounts for the kind of modal distinctions we have considered in this section, as illustrated in (22b). Further interpretable and hence potentially licensing material can be merged to the derivation if available in the starting numeration or subarray (see section 3.3 on one illustration of this possibility). However, the same general schema seems to hold. In the case of the modals, we thus capture the four-fold information in the simple two-projection system (Mod2 equaling T is a further reduction). The more crucial difference from the vantage point of the vPE(LIC) condition consists in the fact that we have an initial tool to account for vPE, namely by anchoring directly to the feature of the licensing head. This straightforward syntactic difference in the structure proposed from the perspective of ellipsis is that we capitalize on properties both of the operations move and merge. For instance, while in the grammaticalized system of English epistemic possibility is merged low and scopes high via move, epistemic necessity will scope high via first-merge. In this vein, the account matches the data inspected above. Moreover, notice that this kind of syntactic behavior of the modals seems to be corroborated by further evidence. I refer the reader especially to Butler (2003) for the relative differences obtaining on the basis of scope. What is of further interest here, however, are the differences in morphosyntactic temporal features. First, while the English modals have no agreement properties, and do not regularly inflect for tense, they are nonetheless interestingly temporally active (i.e. roughly in line with Stowell 2004a, b and von Stechow 2005, and diverging from some of the descriptions of the modals as tenseless; cf. Abusch 1997 for discussion). The difference is that the temporal feature is located on the modals themselves instead of being located on a higher head as is standardly assumed for lexical verbs. Second, the difference in vPE licensing (where epistemic possibility modals such as *might* or *could* show better results in the relevant grammaticalized contexts compared to epistemic *must*) matches the difference in residual morphological alternation. Recall in this connection that *must* does not alternate morphologically in Modern English. The alternations, in the cases in which they exist, are, however, well-known to be active in further contexts –in particular in sequence of tense (SOT) environments, in which a superordinate past predicate can occur with a morphologically past form such as *might* and

*could* standing in for *may* and *can*, respectively. Stowell (2004, 2005), moreover, argues that the modals show temporal effects in further contexts. Consider, for instances, cases of intensional embedding under attitude predicates in which a simultaneous reading can obtain, as in (23), taken from Stowell (2004).

- (23) a. Sam **might** say that he lived in Paris.  
 b. Sam **could** claim that he knew the answer.

Examples such as (23) are then evidence to some extent mirroring the more familiar SOT effects. While in SOT the embedded modal morphologically agrees with the higher predicate, here the reversed situation obtains. Both facts show the morphological transparency of residually tensed modals. At this juncture, a further note is in order for deontic necessity, however. Deontic necessity is, in general, a valid licenser of vPE sites in English (for a simple example, consider, e.g., (16) above on a deontic interpretation). It is, however, no news that deontic modality can independently license temporal relations; cf. (24) and (25).

(24) Sue may leave the conference before it ends.

(25) Jack must take the *Unión* bus to Bilbao.

The point is that deontic modals on possibility and necessity readings typically induce future orientation of the “event time” (in Stowell’s sense) or, alternatively,  $t > t_0$  obtains for the truth conditions of the vP (e.g., in a system along Kratzer’s 1998 analysis of tense). I assume here that a semantic feature has grammaticalized into a formal one, e.g., in the sense of Zeijlstra (2006), perhaps a recurrent situation in many cases in which vPE(LIC) obtains.

To summarize, in this subsection I have capitalized on some of the distinctions between the modals of English and have argued that a system in which a licenser along the lines of (interpretable) T plays the main role accounts for the main data in intensional contexts as well, thus adding to the extensional licensers and the previous theoretical considerations. The general idea of the proposal developed so far is that the relevant modals similarly to the other types of licensers (though possibly different in a number of other respects) have in common, and with respect to vPE operate on the basis of, the same types of interpretable features.<sup>11</sup>

### 3.3 Co-licensing

As we saw that modals which encode morphosyntactic properties of tense may have a tendency to be better licensers even on epistemic readings, we next turn to another case in which the restriction on epistemicity seems to be suspended in the sense that epistemicity and ellipsis sites can co-occur. As we will see, however, this apparent contradiction to more traditional beliefs on epistemicity can also be derived from the properties of licensing. More specifically, a co-licenser element which contains a [T] feature can still license vPE. A typical example in point is given in (26).

(26) Jane must have solved the ellipsis puzzle and John must have \_ too.

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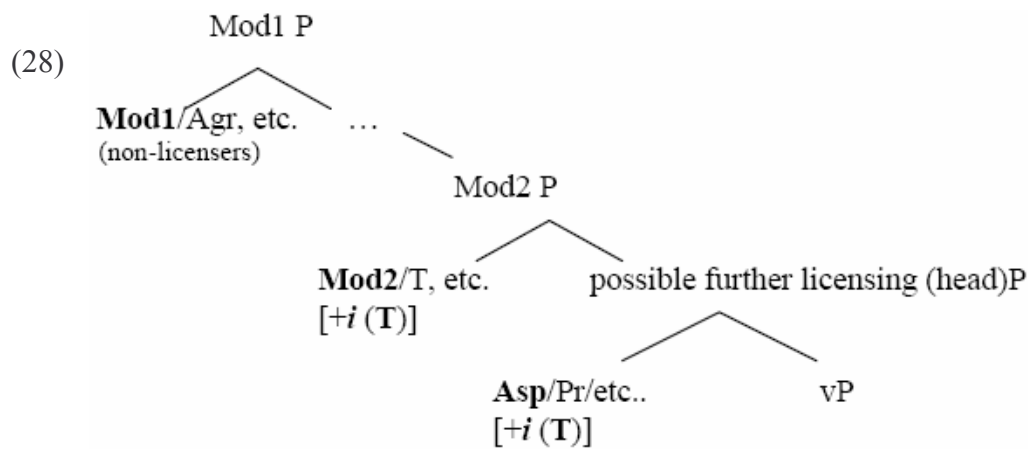
<sup>11</sup> An example from the movie *The Green Mile* pointed out to me by Luis Vicente illustrates the similar licensing behavior of modals and in a nearly parallel fashion; cf. (i) (I gloss over the interesting issues of morphological (non)identity here; cf., e.g., Lasnik (1995) for discussion.)

(i) Rogue guard - You can't do this to me! Big guard - Oh yes! We can \_ and we are \_!

Examples that include co-licensing *have* or *be* can be easily multiplied and judgments are even stronger in this case that they allow epistemic readings. The interaction between intensional and extensional licensers in co-licensed cases thus is explained in that merging [T] elements licenses an otherwise infelicitous vPE site. The epistemic restriction on vPE, while interesting evidence for the role epistemicity arguably in a subset of the singly licensed configurations, thus becomes a secondary factor in such examples not because, e.g., one and the same epistemic modal becomes all of a sudden different in this context, but because there is a co-licenser containing [T], namely *have*. The informal condition given in (27) accounts for this fact and suggests a structure along the lines of (28).

(27) Co-licensed vPE:

With tempo-aspectual *have/be* merged, the epistemic restriction becomes irrelevant.



While I hope so much may seem straightforward, I conclude the subsection with a further-going observation. The account has concentrated on the clearest cases of grammaticalized modal base and force (epistemic vs. deontic and universal vs. existential force). Notice that licensing conditions from past alethic-counterfactual modals in irrealis contexts, i.e. on the morphosyntactic side of the issue in contexts which include a past modal and *have* interestingly constitute a different type of modality. An example in point is (29), from Stowell (2004a).

(29) The Dodgers might have won the game.

Such specific environments are ambiguous between an epistemic and a counterfactual reading in English (Condoravdi 2001; Stowell 2004a, b). To the extent that speakers accept such sentences under elliptical contexts, they require, again, most typically the co-licensed type of vPE. In particular, with the support of *have* the counterfactual readings, which are distinct from both the epistemic and the root ones, are also licensed.<sup>12</sup>

(30) Agassi might have won his game and Graff might have \_ too.

<sup>12</sup> Notice that while this observation accounts for the counterfactual cases containing *have*, I do not have a simple syntactic solution at this point for what I take to be the ungrammatical status of past counterfactual cases without the support of the tempo-aspectual auxiliary. They seem to behave differently from the genuine epistemic ones in various respects though.

## 3.4 Licensing “clitics”

This section analyzes a case which on first appearances might seem to be an even more problematic one for the Interpretability Hypothesis if it turns out to be a true vPE licenser class: clitics. I discuss a situation which has precisely this appearance, but at the same time, drawing on Dvořák & Gergel (2004), I argue that it does not constitute a problem for the IH once more closely considered; the particular case rather offers interesting support for it.

Clitic pronouns are a classical case of grammaticalization if not the one most easily expected to develop into a vPE-licenser class. There are two main reasons for this negative expectation. One is that clitics simply do not carry stress whereas vPE-licensers in most cases do.<sup>13</sup> The second reason has to do with the fact that on traditional accounts, clitics and especially pronominal clitics may be well expected to enter uninterpretable projections such as Agr. Thereby, finding a case of clitics that in addition licenses vPE is interesting since it poses a potential problem for interpretability. While such observations seem to control for a number of languages, a different situation obtains for Slovenian where a type of ellipsis exists which is licensed by what under unmarked circumstances are the atonic pronouns in the rich inflectional paradigms of the language (see Dvořák 2003; Dvořák & Gergel 2004). In the next part of this section, I briefly introduce the relevant construction in the context of ellipsis, I argue that it is vPE and finally show that it conforms to the IH.

Various (South) Slavic languages allow various types of vPE. A common one is known to involve an auxiliary or a verb in the Infl-domain. In addition, pronominal clitics can surface in the inflectional domain together with the element occupying the Infl-domain, followed by a rule of deletion such as vPE (Stjepanović 1998). A typical configuration for such facts is given in (31).

(31) [Aux + Cl.(Sequence) [ vPE ]]

Since prosodic or syntactic encliticization to licensing material is a possibility, we seem to have a case similar to the previous ones, with an auxiliary crucially involved, in which we could next embark on trying to tease various Infl-related contributions apart. However, this is not the route we shall take next. We can, instead, consider an alternative pattern of vPE also arising in Slovenian. Slovenian conforms to the schema above, but in addition, many of its dialects show a type of vPE that seems to apply in a different manner. In particular, it seems to involve an additional licensing property in that sole pronominal object “clitics” can license elliptical processes, as shown in the mini-dialogue in (32).<sup>14</sup>

(32) A:	A	<b>ga</b>	vídiš?	B:	<b>Ga</b> _ . / *Jò.
	Q-compl	cl.3.ACC.SG.M	see.2.SG		CL.3.ACC.SG.M/F
	‘Do you see him?’				‘I do <del>see him</del> /I do see her’

In (32), a clitic object can be used to license an elliptical structure. A rather strong identity usually holds between antecedent and ellipsis site in such cases: for instance, the gender

<sup>13</sup> Some of the cases that are often neglected stem from multiple auxiliary sequences in which not the licenser but rather a higher auxiliary sometimes carries stress. However, one way to account for such cases is through the rule of *have*-encliticization (Selkirk 1984, Drubig forth.).

<sup>14</sup> All Slovenian data stem from joint work with Bostjan Dvořák (Dvořák & Gergel 2004, in prog.). I also thank Luka Crnic and Boban Arsenijević for their comments on relevant data from Slovenian and Serbo-Croatian, respectively.



contrast illustrated in the same example (32) for comparison, much along the lines of a pseudogapping-style construction, is not acceptable.<sup>15</sup>

Beyond the close match in terms of the antecedent-ellipsis relationship, there are further pieces of evidence to support the view that what is at stake are vPE sites. While the full analysis is beyond present scope, let me mention that both embedding and cross-utterance application of clitic-licensed ellipsis are possible, that no “flanking” of the elided material is necessary (in stark contrast with gapping), and that some extractions are allowed; cf. above and (33)-(34) below.

- (33) A: A ga poznáš?  
 Q-COMPL CL.3.ACC.M.SG know.2.SG  
 ‘Do you know him?’  
 B: Míslim, da gà.  
 think.1.sg, that cl.3.ACC.M.SG  
 ‘I think I do\_’

- (34) A: A ne poznaš Omanovih?  
 Q NEG know.2.SG the Omans  
 ‘Don't you know the Omans?’  
 B: Ne. Kdó pa JIH?  
 no who PART CL.3.ACC.PL  
 ‘No (I don't). Who does\_?’

The additional licensing process of the apparent sole clitic element, however, is determined by a temporal restriction of the construction. This type of ellipsis makes a clear selectional restriction in that it requires a tense node involving the present and excluding the past. Moreover, there is a shift in the accenting properties of the originally weak pronouns for licensing purposes; clearly, in such a context, the term clitic can only be used for expository purposes (the point being to distinguish them from the full counterparts, which are paradigmatically distinct in the lexicon of the language). Moreover, the apparently outlandish behavior is corroborated by evidence from independent contexts, in which the clitic carries stress and acquires an additional pragmatic function, as in (33).

- (35) A GÀ vidiš?  
 Q-compl cl.3.ACC.SG.M see.2.SG  
 ‘Do you really see him?’

We can conclude that the construction is vPE. For further diagnostics, I refer the reader to Dvořák & Gergel (2004, in prog.). For present purposes, it is the temporal restriction which becomes relevant. Following the analysis mentioned, we may note that the tempo-aspectual restriction interestingly influences interpretative properties in larger contexts. In addition to the examples above, this is illustrated in particular also by the contrast between (36) and (37).

<sup>15</sup> Variation in the identity condition of the licensing pronouns is, however, possible in some other contexts (see Dvořák & Gergel, in prog.).

- (36) Včeraj me ni zeblo, danes PA.  
 yesterday CL.1.P.SG.GEN NEG.AUX.3.SG frozen, today PRT  
 ‘Yesterday I did not freeze, today I did.’
- (37) Včeraj me ni zeblo, danes pa ME.  
 yesterday CL.1.P.SG.GEN NEG.AUX.3.SG frozen, today PRT CL.1.P.ACC  
 ‘Yesterday I did not freeze, today I do.’ (non available reading: today I did)

Thus, no temporal requirement is necessary in the stripping-style example in which a particle licenses the contrast to ‘today’ and simply copies the tense of the antecedent, as in (36). In (37), which is a clitic-based vPE site, however, the interpretation paralleling the past tense of the antecedent is precluded and the ellipsis site is interpreted in the present, in contrast to the antecedent.

To sum up, the case of Slovenian clitic-based vPE then offers support for a theory of ellipsis based on interpretable features and on temporal features in particular.

#### 4. Outlook

I next discuss further connections - including some problematic ones - of the ellipsis licensing mechanism proposed here as well as potential consequences of the hypothesis of vPE(LIC) based on interpretability with regard to some theoretical issues.

##### 4.1 Look aside

This subsection notes two further-going theoretical issues in the context of what I have argued above with regard to vPE, namely the possible relationship to *pro* theory and the problematic status of nonfinite ellipsis in English.

The first issue concerns the assumed similarity in earlier theories between, e.g., empty subjects and vPE. In the research on licensing based on government, ellipsis types such as vPE and null elements like *pro* followed virtually the same principles of licensing and identification. The question whether this remains a consistent interpretation under minimalist assumptions has to my knowledge not been addressed.<sup>16</sup> While a discussion of null subjects is beyond my scope, I sketch in what follows one possible logical space for further exploring the connection given that most post-GB account of ellipsis do not address the similarity discussed by earlier theories. Holmberg (2005) insightfully synthesizes in his analysis of null arguments the following scenarios for the fate of *pro* in Minimalism.

Either (A) the licensing head (taken to be Agr for *pro*) is taken as interpretable; or (B) *pro* itself is referentially fully specified and values the licensing head’s features. Holmberg argues for (B) on the basis of Finnish data. In this connection, an independent interpretability issue arises for the licensing of *pro*, which is at the core of Holmberg’s approach: “The traditional view of the null subject as *pro* identified by Agr (the  $\phi$ -features of I) cannot be maintained in a theory where Agr is uninterpretable” (Holmberg 2005:533). For vPE, the empirical situation is different in that the functional element that we have seen to empirically be in charge of vPE (i.e. T) is interpretable by definition and the licensed entity is syntactically fully specified.

<sup>16</sup> This may be justified on a theoretical basis since the tools are no longer available, but it is less satisfactory if one loses the empirical coverage of the earlier theory.

“Fully specified”, however, does not amount to the same requirements in the case of null arguments (features) as in the case of elided vPs (articulate internal structure). The distinctions between vPE and *pro* thus come as no surprise since variable binding, trace hosting within ellipsis sites, and further well-known tests, reveal full-fledged structure in VPE but not in *pro*. Therefore, the differences in this respect also hold when potential *pro*-forms in the propositional domain are considered for a more appropriate comparison (such as *so* in English, which, e.g., does not admit extraction; Johnson 2001). A further difference consists in the fact that the tense information itself is syntactically and semantically not standardly assumed to be present within the vP; cf., e.g., von Stechow (2005) for further discussion of semantically vacuous tense morphology on the verb itself. To summarize then for present purposes, on the assumptions and the argumentation made so far, I cannot argue for a direct parallelism between null arguments and vP ellipsis with respect to the mechanisms under which they are licensed. Whether the two display more interesting (say, complementary distribution) patterns than the suggestion *ex negativo* that I am lead to give here, or whether the mechanisms are partitioned differently simply because of the differences between what is at stake in each case (e.g.,  $\phi$ -features vs. a fully structured category) is for further research to say.

The next question I would like to raise, is whether the interpretability hypothesis can extend to the (im)possibility of ellipsis under non-finite licensers. If the tense proposals in the spirit of Stowell (1982) and Martin (2001) are correct, at least some infinitives might have tense. Consequently, on the simplest hypothesis, one might be tempted to conclude that precisely those infinitives should also be licensers of vPE. However, there is evidence that such a proposal for non-finites may not correlate entirely, e.g., with the acceptability of vPE under infinitival *to*, which is extremely fickle (see Valmala 1996; Johnson 2001; Baltin & Barrett 2002 for discussion). The problem regarding infinitive ellipsis seem to arise, however, not only if one wanted to extend the present account, but under any other one as well, as far as I know. A first question in this connection is, of course, whether what we see is really vPE both with respect to distributional properties and even to category. For instance, various alternatives to the classical base-generation of *to* in T are available. If, say, *to* is structurally higher (or lower) than T, the follow-up issue would be whether the site licensed by it is correspondingly also something different from a vPE site. Notice that even if we put structural qualms aside and assume that ellipsis under non-finite elements is exactly of the size and the same in nature as a bona-fide vPE site with the licenser in a position parallel to Infl, various other differences obtain, in particular with respect to the behavior in island contexts. In such contexts, a well-known clash obtains between finite and non-finite ellipsis (Johnson 2001). A further interfering issue is the question whether tense is available in infinitives at all (Wurmbrand 2006). Finally and in connection to the latter point, one can speculate whether non-finite ellipsis is guided by the same mechanisms as finite vPE. This is not a particularly neat consequence at first sight, but the distribution in English and perhaps other languages might possibly enforce the conclusion empirically. On a further note, we can mention that cross-linguistically, even within types of ellipsis that are licensed by finite elements, establishing whether they are well-behaved vPE sites is not always an easy task. For instance, a language such as German seems to have a deficient T node at most (cf. Haider 1997; Sternefeld 2004) and no bona-fide process of syntactically governed vPE (Winkler 2005). It can nonetheless interestingly exhibit phenomena resembling vPE, which are perhaps governed by different, discourse-bound factors (cf. once again Winkler 2005 for recent relevant discussion). Given that for non-finites a number of parameters would first need to be clarified, before being able to decide whether interpretability in the formal syntactic sense is

the appropriate tool to be tested, non-finitely licensed ellipsis will have to await further research.

#### 4.2 Look through

In this subsection, I consider two main extensions of the feature-based approach advocated above. As a preliminary, I take note of the issue in the taxonomy of the features involved in ellipsis. If T is indeed the licenser, and T is without a doubt an interpretable and formal feature at least in English, then we have a situation with an interpretable probe. This is not standard, but since further evidence which questions the unidirectionality of the probe-goal mechanism has been suggested, I will leave the model-theoretical question aside and rather consider it as an empirical issue.<sup>17</sup> In various cases, such as clitics, negative concord, and tense, the argument has been put forth (independently of ellipsis) that “inverse” configurations with respect to the standard way of the probe-goal relationship is thought of (cf., e.g., Nash & Rouveret 2002; Zeijlstra 2004, 2006; von Stechow 2005).

If the interpretability (T-based) approach is on the right track, one consequence may perhaps be the following *Chameleon-Hypothesis*, when one considers issues of vPE beyond licensing. In particular, it does not seem unlikely that T has double module access in the computation.

(38) *CH*: T has access both to  $C_{HL}$  and the LF/syntax of its complement.

A simplified *CH*-scenario, where  $vP_A$  is the relevant antecedent verb phrase and  $vP_E$  is the verb phrase to be elided, could run along the following lines. Assume that we arrived at a step  $n$  in a (not necessarily conjoined) derivation  $D$  in which  $vP_A$  has been computed phases away.  $vP_A$  is at this point out of computational memory for the syntactic component, but it is, however, available at LF, e.g., in the standard sense of compositionally built semantics. After being merged,  $vP_E$  will be reachable for immediately following computations, with its domain still accessible to T (Chomsky 2001:14); a condition such as PIC becomes relevant only at a node  $Z \geq C$ , i.e. at the next strong phase. A theoretical way to recognize that  $vP_A$  and  $vP_E$  are isomorphic - if not identical - is via the LF level. Once  $vPE(PAR)$  has been established, the interpretable feature T in English and some other languages syntactically licenses the null-spellout of  $vP_E$ .

On a final note, let's consider an additional argument why a grammaticalized T may be in charge of vPE in many cases, which potentially has to do with the nature of T and of vPE. Besides the fact that T is the main exponent of an interpretable and formal feature in languages like English and the empirical and theoretical evidence related to vPE directly, consider the higher-predicate syntactic shape of T (cf., e.g., Stowell 1996) and the mechanism of vPE together with its link to deaccenting (Tancredi 1992; Fox 1999; Winkler 2005 a.o.). On the assumption that T is a structurally higher syntactic predicate, more accurately a clause-level two-place relation (Zagona 1990; Stowell 1995; Demirdache & Uribe-Etxebarria 2000), this parallelism further accounts for the cases in which the T-element is stressed and the vP can be deaccented or elided. On such theories, the syntax of tense is essentially the same as the syntax of a transitive verb or preposition; the function of the T node is to order an external argument (e.g., utterance time) with respect to an internal argument (e.g., event time).

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<sup>17</sup> We may also note that theoretically the system would also have one assumption less if a probe were not necessarily uninterpretable.

Cases of accent retraction from the auxiliary position may have independent information structural and sometimes syntactic co-licensing reasons; cf. Winkler (2000, 2005) for further discussion. While other languages allow the extreme case of deaccenting with the structurally lower predicates, namely in the case of the complements selected by V (object drop), English only allows deaccenting (and no deletion) in such cases (with a few exceptions) cf. (39); out of the two predicates, it moreover only allows deletion with the complement of the higher predicate (i.e. thus deletion of the complement of T).

- (39) Has John read Slaughterhouse Five?
- a. No, John doesn't READ books. (e.g. *verum* deaccenting; cf. Cresswell 2000)
  - b. Yes he HAS. (vPE)

While English does not belong to the set of languages that allow a syntactic process of object drop, it does allow deaccenting in *verum* contexts and both deaccenting and ellipsis in the case of the complements of T. To the extent that one adheres to the theory of tense as a predicate, this provides possible additional motivation to the licensing role of tense.

### 5. Conclusion

To summarize, the paper has considered the issue of licensing fully structured vPE sites in some grammars no longer assuming typical GB tools. The goal was to go one step further beyond stating the (otherwise interesting) conclusion that ellipsis is deletion. In particular, it consisted in searching for the necessary generalization and the appropriate factors that determine licensing as well as in deciding which conditions they should satisfy, where they may be derived from in the grammar and why. The specific course taken was to consider cases of vPE as grammaticalized in different contexts and test whether and how temporal dependencies were present in the cases of vPE licensing.

I hope to have shown that vPE(LIC) by itself is a straightforward (and for now not eliminable) necessary condition. A note of caution at the same time is that it is not doing the work of, but under minimalist assumptions rather enabling, possibly more complex computations involved in ellipsis. The emerging result found was that vPE licensing is a process occurring in syntax, which is, however, fully motivated at the interfaces, and that interpretability of a formal (more specifically here, temporal) feature is a necessary ingredient for the licensing phenomenon.

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## The Independence of Case and Inner Aspect

Jonathan E. MacDonald

This paper argues that case and inner aspect are independent syntactic relations. In particular I argue that there is no direct syntactic relation between the appearance of accusative case on the direct object and a telic interpretation of a predicate. I argue that accusative case is an Agree relation with  $v^{\circ}$  and aspect is an Agree relation with  $Asp^{\circ}$ , an aspectual head between  $vP$  and  $VP$  responsible for syntactically instantiating a mapping from the object to the event. Passives, unaccusatives and statives provide support for this conclusion. This conclusion has consequences for the structure of Finnish, which has been put forth as a language that manifests a direct syntactic relation between case and aspect. I provide an analysis in which there is no direct syntactic relation between case and aspect in Finnish.

### 1. Introduction

This paper focuses on the relation between inner aspect and case. Several authors assume that there is a direct syntactic relation between the presence of accusative case on the internal argument and a telic interpretation of a predicate (Borer 1994, 2005; Kratzer 2004; Ramchand 1997; Ritter & Rosen 1998, 2000; Schmitt 1996), often assuming that accusative case is determined by an aspectual projection (Borer 1994, 2005; Kratzer 2004; Schmitt 1996; Svenonius 2001). As an example of data often put forth as evidence for such a direct syntactic relation, consider the sentences from Finnish in (1).<sup>1</sup>

- (1) a. Maija luki **kirjan** \*tunnin.  
M. read.PST **book.ACC** hour.ACC  
'Maija read (all) the book for an hour.'  
b. Maija luki **kirjaa** tunnin.  
M. read.PST **book.PART** hour.ACC  
'Maija read the book for an hour.'

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<sup>1</sup> Examples in (1) taken from Heinämäki (1984).

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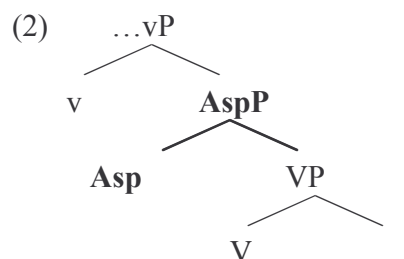
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Observe that in (1a) the internal argument is in accusative case and the predicate is telic, as evidenced by the incompatibility of the durative phrase (e.g. *tunnin* ‘for an hour’). Observe in (1b) that the internal argument is in partitive case and the predicate is atelic, as evidenced by the compatibility of the durative phrase. These data suggest a direct relation between the appearance of accusative case on an internal argument and a telic interpretation of a predicate. In this paper I argue that case and aspect are independent syntactic relations.<sup>2</sup> Accusative case is an Agree relation with  $v^\circ$  (Chomsky 2001) while aspect is an Agree relation with  $Asp^\circ$ .

The paper is organized in the following way: In section 2, I argue for the existence of an aspectual head (AspP) between  $vP$  and VP that syntactically instantiates an object-to-event mapping via an Agree relation with an NP; I conclude that aspect is a relation with  $Asp^\circ$ . I provide evidence from passives, unaccusatives and statives to support this conclusion. In section 3, I offer an account of the Finnish data from (1); I argue that partitive case is assigned by a null  $X^\circ$ . The presence of this extra structure blocks the Agree relation between the NP in partitive and  $Asp^\circ$  resulting in an atelic interpretation of the predicate. In section 4, I briefly recap the discussion and conclude the paper.

## 2. Aspect is a Relation with $Asp^\circ$

In this section I argue for the existence of an aspectual projection (AspP) between  $vP$  and VP (see also Travis 1991). This structure is illustrated in (2). The aspectual interpretations and distributions of bare plurals (BPs) and mass nouns (MNs) provide evidence for this aspectual projection.



Observe standard data that have been put forth as evidence that BPs and MNs elicit the same aspectual interpretation of the predicate (3).

<sup>2</sup> This paper deals with **inner aspect** and not **outer aspect**. Inner aspect can be differentiated minimally from outer aspect in the following two ways: a) the nature of the internal argument can affect the telicity of the predicate in inner aspect (That is, there is an object-to-event mapping. See also Krifka 1989 and Verkuyl 1972.), as illustrated in (i-ii), while this is not the case for outer aspect, as illustrated in (iii): (i) *John ate cake for an hour/#in an hour.* (ii) *John ate a cake #for an hour/in an hour.* (iii) *John was eating (a) cake for an hour/#in an hour when...* b) Outer aspect in English has an overt morphological manifestation in the form of *ing* and *be* (e.g. *was eat-**ing*** in (iii)); inner aspect has no such overt morphological manifestations. See Smith (1991) for more details on the differences between inner and out aspect. Throughout this paper, a reference to aspect is a reference to inner aspect only.

- (3) a. Darrel ate **a cake** in three minutes/#for an hour.  
 b. Darrel ate **cake/cakes** # in three minutes/for an hour.

When the internal argument is *quantized* (Krifka 1989) or describes a *specific quantity of A* (Verkuyl 1972) as in (3a), the predicate describes an event interpreted as telic. As such, the time span adverbial is compatible<sup>3</sup> and the durative phrase is incompatible<sup>4</sup> (Dowty 1979; Borer 2005 among others). In contrast, when the internal argument is *cumulative* (Krifka 1989) or does not describe a *specific quantity of A* (Verkuyl 1972), the predicate describes an event interpreted as atelic, as in (3b); the inverse patterns of compatibility with the durative phrase and time span adverbial result. BPs and MNs seem to elicit the same interpretation of the predicate.

Contrary to what the data in (3) seem to show and contrary to many assumptions (Borer 2005; Dowty 1979; Pustejovsky 1991 among others), BPs and MNs do not elicit the same aspectual interpretation of a predicate. Observe in (4) that BPs are compatible with a time span adverbial under a particular interpretation, while MNs are not.<sup>5</sup>

- (4) a. Darrel ate **cakes** in three minutes (for an hour straight).  
 b. #Darrel ate **cake** in three minutes (for an hour straight).

Under an interpretation in which for each cake Darrel ate, he ate it in three minutes for an hour straight, the time span adverbial is compatible with the BP in (4a). No such interpretation is available for the MN in (4b); in fact, the MN is not compatible with the time span adverbial. Time span adverbials are compatible with telic predicates (Dowty 1979 among others); as such, in the presence of a BP, the predicate is interpreted as telic. More specifically, a BP elicits a type of telic iterative interpretation in which one cake after another is eaten; I refer to this type of telic interpretation as a **Sequence of Similar Events (SSE)** interpretation. No such interpretation is available for a MN (4b). In contrast to BPs, MNs elicit an atelic interpretation of the predicate. Thus, MNs and BPs have distinct aspectual interpretations. Consider the ditransitive construction in (5).

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<sup>3</sup> I am only concerned with an interpretation of the time span adverbial that picks out the end of the event described by the predicate. I assume that the time span essentially expresses that a certain amount of time passes before the end of the event takes place. The time span can also target the beginning of the event as well (Dowty 1979) in which case it expresses that a certain amount of time passes before the event begins. Telic predicates describe events that are interpreted as being complete, or as having an end. Atelic predicates described events that are interpreted as being incomplete, or minimally, as lacking an end.

<sup>4</sup> The brute incompatibility of a durative phrase with a telic predicate is a simplification of the facts. Note that an iterative interpretation results in the following telic predicate: *John spotted a plane for an hour*. A plane can be spotted over and over; the durative forces an iterative interpretation of the predicate. In (3a) the durative is incompatible with the telic predicate because the nature of the action expressed by the verb is such that the internal object cannot undergo this action more than once; a cake cannot be eaten over and over. See MacDonald (2006) for more details and references.

<sup>5</sup> Filip (1999), referencing Fillmore and Kay (1993), observes a similar fact about the following datum: *Pat built houses (\*) in six months*. She notes that it is "acceptable if it has a generic (habitual) interpretation...whereby each [building event] is associated with a different house whose construction took six months." (ibid:66). (4) above shows us that under an episodic interpretation, the time span adverbial is compatible with a BP as well, resulting in a type of iterative interpretation.

- (5) a. Darrel carried **chairs** into a bedroom in ten minutes (for an hour straight).  
 b. #Darrel carried **sand** into a bedroom in ten minutes (for an hour straight).

In (5a) there is a BP direct object and the time span adverbial is compatible as expected. The BP elicits an SSE interpretation in which one chair after another was carried into the bedroom in ten minutes for an hour straight. No such interpretation is available for the MN. The MN, as expected, elicits only an atelic interpretation of the predicate. Consider BPs and MNs as the complements of a goal preposition (6).<sup>6</sup>

- (6) a. Darrel carried the chair into **bedrooms** for an hour.  
 b. Darrel carried the chair onto **asphalt** for an hour.

The BP elicits an SSE interpretation in which the chair was carried into one bedroom after another for an hour. The MN does not elicit an atelic interpretation; the only interpretation available is one in which the chair was carried onto asphalt, then back off, and back on again for an hour. This is a type of telic iterative interpretation, although not a sequence of similar events (SSE) interpretation, but a sequence of identical events, in which the same object participates in the event repeatedly. Thus, when a MN is the complement of a goal preposition the only interpretation available is a telic interpretation, not an atelic interpretation. Note furthermore, that the time span adverbial is compatible both with the BP and MN complement of a goal preposition, as illustrated in (7a-b) respectively.

- (7) a. Darrel carried the chair into **bedrooms** in ten minutes (for an hour straight).  
 b. Darrel carried the chair onto **asphalt** in ten minutes (for an hour straight).

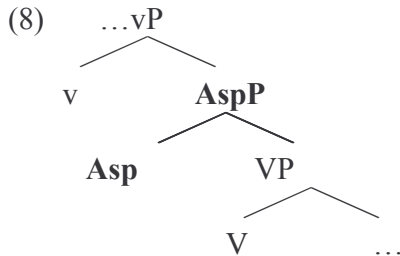
Although a bit pragmatically odd because the same chair undergoes the action expressed by the verb in each of the iterated events, the sentences in (7) are fine with the time span adverbial in conjunction with the durative phrase. Moreover, if we remove the durative from (7b) the sentence is perfectly natural, further showing that a MN complement of a goal preposition does not elicit an atelic interpretation of the predicate. BPs and MNs have distinct aspectual distributions.

In order to account for the distinct aspectual interpretations and distributions of BPs and MNs, I claim that there is an aspectual head (AspP) between vP and VP with which BPs and MNs establish distinct relations (8).

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<sup>6</sup> Note that what I refer to as a goal preposition is a preposition that typically expresses that a goal is reached, e.g. *to*, *into*, *onto*. These prepositions induce a telic interpretation when surfacing with a transitive activity (but see footnote 8). I do not consider a preposition such as *toward* or *at* (on the non-location interpretation of *at*) a ‘goal’ preposition per se, as no goal is actually reached; I consider them ‘directional’ prepositions. This is only a matter of terminology. Nevertheless, note that directional prepositions do not induce telicity when they surface with a transitive activity: *John pushed the car (toward/at the building) for an hour/#in an hour*.





I claim that BPs move to Spec, AspP and MNs Agree with Asp°. The most immediate expectation of this proposal is that neither BP nor MN external arguments can affect the aspectual interpretation of the predicate in the relevant ways (see Tenny 1987 for the same conclusion), because they are structurally higher than AspP. This expectation is shown to be borne out in (9-10).

- (9) a. **Wildlife** ate a sheep                    in ten minutes/#for ten minutes.  
       b. **Livestock** destroyed the barn        in ten minutes/#for ten minutes.
- (10) a. **Bears** ate a sheep                    in ten minutes (#for an hour straight).  
        b. **Animals** destroyed the barn        in ten minutes (#for an hour straight).

Observe in (9) that the MN external argument does not elicit an atelic interpretation of the predicate, as indicated by the incompatibility of the durative phrase and the compatibility of the time span adverbial (cf. 3). Additionally, the BP in (10) does not elicit an SSE interpretation. (10a) does not mean that a bear ate a sheep in ten minutes and then another bear ate a sheep in ten minutes, and so on for an hour straight. BP and MN external arguments cannot establish the necessary kind of relation with AspP in order to elicit the relevant respective interpretations because they are structurally higher than AspP.

Let us consider the movement account of BPs in more detail. I assume that BPs are existential quantifiers and in order to elicit an SSE interpretation, they must bind a variable inside a syntactic domain of aspectual interpretation defined as everything dominated by AspP.<sup>7</sup> Thus, they must originate from a position below AspP and move to a position above AspP. Evidence for the movement of BPs comes from what I consider to be an island for BP movement in (11).

- (11) a. #Milo destroyed a row of **houses**        for an hour.  
       b. #Milo ate a box of **cookies**            for an hour.

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<sup>7</sup> MacDonald (2006) argues for a domain of aspectual interpretation in which only elements within this domain can contribute to the aspectual interpretation of a predicate. He puts forth as evidence the inability of location prepositions (in contrast to goal prepositions) to affect the telicity of the predicate, the inability of external arguments (as seen above in 9-10) to affect the telicity of the predicate, and he adopts arguments from Hay, Kennedy, and Levin (1999) that show that the predicate CAUSE that introduces external arguments does not affect the telicity of the predicate either. All of these elements are structurally higher than AspP, and as such are outside the domain of aspectual interpretation.

The BPs in (11) do not elicit an SSE interpretation. Thus, (11a) does not mean that Milo destroyed one house, then another and so on for an hour. Likewise, (11b) does not mean that Milo ate one cookie then another and so on for an hour. The lack of an SSE interpretation can be explained if we assume that the complex NPs in (11) do not allow the BP to move out; as the BP cannot move out it cannot move to Spec,AspP and elicit the SSE interpretation. Let us consider the Agree account of MNs in more detail.

I claim that the Agree relation with Asp<sup>o</sup> is the syntactic instantiation of the object-to-event mapping well-known in studies on inner aspect (Verkuyl 1972; Krifka 1989). The object-to-event mapping occurs when a property of the internal argument affects the telicity of the entire predicate. Consider the example in (12).

- (12) a. Bud drank **a pitcher of beer** # for ten minutes/in ten minutes.  
 b. Bud drank **beer** for ten minutes/#in ten minutes.

The noun phrase in (12a) *a pitcher of beer* has a property that elicits a telic interpretation of the predicate, resulting in the incompatibility of the durative phrase and the compatibility of the time span adverbial. The noun phrase in (12b) *beer* has a property that elicits an atelic interpretation of the predicate, resulting in the compatibility of the durative phrase and the incompatibility of the time span adverbial. This is the object-to-event mapping.

I refer to the property of an internal argument NP that participates in this object-to-event mapping as a [q] feature ([q] for *quantized* (Krifka 1989) and for *specific quantity of A* (Verkuyl 1972)). If the NP that Agrees with and values Asp<sup>o</sup> is [+q] the predicate can be interpreted as telic.<sup>8</sup> If the NP that Agrees with and values Asp<sup>o</sup> is [-q] (e.g. a MN), the predicate will be interpreted as atelic.<sup>9</sup> The Agree relation captures a local relation that an NP has with the verb phrase in which the core aspectual interpretation of the predicate is affected. The core aspectual interpretation of a predicate is the basic telic/atelic distinction. This local relation, and its affect on the core interpretation of the predicate, is intuitively parallel to the local relation between a

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<sup>8</sup> I say *can be interpreted as telic* because of the existence of transitive activity predicates in which the [+/-q] feature of the internal argument does not affect the aspectual interpretation of the predicate: *John pushed the car/stereo equipment for an hour/#in an hour*. Although note that when a goal phrase is added, these predicates behave exactly like the predicates in (12): *John pushed the car into the garage #for an hour/in an hour*. *John pushed stereo equipment into the garage for an hour/#in an hour*. MacDonald (2006) argues that the goal phrase here adds a property that the predicates in (12) already possess. This property is similar in spirit with to the null telic morpheme of Snyder (1995). Transitive activities project AspP, but the object-to-event mapping is irrelevant without this extra property. Further discussion of these predicates takes us well beyond the focus of the present paper, thus I direct the reader to MacDonald (2006) for a full syntactic account of these predicates and the relevance of this extra property for deriving a syntactic typology of aspectual predicates types.

<sup>9</sup> Some have put forth a sentence such as *John found water in ten minutes/#for ten minutes*. as an example of a predicate that takes a MN (i.e. a [-q]NP) internal argument but yet still surfaces as telic. MacDonald (2006) argues that a sentence like this falls into a class of predicates he calls *psych-achievements* in which the surface subject is actually derived from a position below AspP and higher than the surface direct object. This predicts that the argument that Agrees with Asp<sup>o</sup>, and enters into the object-to-event mapping, is the derive subject. Observe that in the presence of a MN subject the durative phrase improves: *Wildlife found the body of water for an hour*. Also a BP subject elicits an SSE interpretation as well: *Animals found the body of water for an hour*. See MacDonald (2006) for other arguments supporting this analysis of these data.

verb and its complement. When the complement of the verb varies, the core meaning of the predicate varies as well (Marantz 1984). Examples that show this are given in (13).<sup>10</sup>

- (13) a. take a book from the shelf  
 b. take a bus to New York  
 c. take a nap  
 d. take an aspirin  
 e. take a letter in shorthand

I conclude, therefore, that Agree with Asp<sup>o</sup> is the syntactic instantiation of the object-to-event mapping; aspect is an Agree relation with Asp<sup>o</sup>.

Assuming this conclusion to be correct, and assuming that accusative case is an Agree relation with v<sup>o</sup> (Chomsky 2001), it follows straightforwardly that aspect and case are independent syntactic relations. If this line of reasoning is correct, we expect the possibility of establishing either of these relations independently of the other. That is, for example, we expect to observe cases in which there is an object-to-event mapping without the presence of accusative case. Passive constructions show that this expectation is met (14-15).

- (14) a. **A bottle of beer** was drunk # for an hour.  
 b. **Beer** was drunk for an hour.  
 c. **Bottles of beer** were drunk in three minutes (for an hour straight).
- (15) a. **A stereo** was destroyed # for an hour.  
 b. **Stereo equipment** was destroyed for an hour.  
 c. **Stereos** were destroyed in three minutes (for an hour straight).

The derived subjects of passives are in nominative case; accusative is not available (14-15). In the (a) examples, the subjects are [+q]NPs and the predicate is telic. In the (b) examples the subjects are [-q]NPs and the predicate is atelic. There is no accusative case, yet there is an object-to-event mapping. Furthermore, in the (c) examples, the subject is a BP and the result is an SSE interpretation. These facts suggest that AspP is present in the syntax although accusative case is not available. We find the same pattern with the derived nominative subjects of unaccusatives (16-17).<sup>11</sup>

- (16) a. **A window** broke # for an hour.  
 b. **Glass** broke for an hour.  
 c. **Windows** broke for an hour.

<sup>10</sup> Examples taken from Kratzer (1996).

<sup>11</sup> Note that the time span adverbial is odd even with the BPs in (16c) and (17c). This is a result of the time span adverbial only being able to target the beginning of the event in achievements; unaccusatives behave like achievements. This is not counterevidence to the claim that BP derived subjects of unaccusatives elicit an SSE interpretation.

- (17) a. **A keg** arrived # for an hour.  
 b. **Beer** arrived for an hour.  
 c. **Kegs** arrived for an hour.

These data suggest that a telic interpretation of a predicate is not dependent on the presence of accusative case. More technically, the presence of AspP in the syntax is not dependent on the presence of accusative case. Stative predicates provide data that suggest the presence of accusative case is not dependent on the presence of AspP either. Consider the stative predicates in (18-19).

- (18) a. John loved **a woman/wildlife** for a year/#in an year.  
 b. John owned **a car/stereo equipment** for a year/#in a year.
- (19) a. John loved **books** for a year/#in a year.  
 b. John owned **cars** for a year/#in a year.

(18) shows that the alternation between a [+q]NP and a [-q]NP does not affect the telicity of a predicate. There is no object-to-event mapping with statives, and yet accusative case is available. (19) shows that a BP with a stative does not elicit an SSE interpretation. These facts suggest that statives do not project AspP (see MacDonald 2006 for this conclusion).<sup>12</sup> If statives lack AspP, this explains the patterns from (18-19) straightforwardly; BPs and MNs cannot establish the relevant relation with AspP because it is not present in the syntax. If this is the correct account of the syntax of stative predicates, then the data in (18-19) provide evidence that the presence of the accusative case is not dependent on the presence of AspP in the syntax.

We have seen that the presence of accusative case is not dependent on the presence of AspP, and that the presence of AspP is not dependent on the presence of accusative case. Case and aspect are independent syntactic relations. Aspect is an Agree relation with Asp<sup>o</sup> and accusative case is an Agree relation with v<sup>o</sup>.

### 3. Case and Aspect in Finnish

Let us reconsider the Finnish data from (1), repeated below in (20) for convenience, in the light of the conclusions drawn from the previous section on case and aspect.

- (20) a. Maija luki kirjan \*tunnin.  
 M. read.PST book.ACC hour.ACC  
 ‘Maija read (all) the book for an hour.’
- b. Maija luki kirjaa tunnin.  
 M. read.PST book.PART hour.ACC  
 ‘Maija read the book for an hour.’

<sup>12</sup> MacDonald (2006) provides other arguments for the lack of the presence of AspP in statives, related to the inability of goal prepositions to create a telic interpretation out of a stative (vs. a transitive activities; see footnote 8), and the inability of stative predicates to participate in the *do so* construction (in contrast to eventives).

If there were a direct relation between case and aspect in Finnish, as the data in (20) seem to suggest, we would not expect the same behavior from Finnish passives, unaccusatives and statives that we saw from English passives, unaccusatives and statives above. That is, we do not expect to find nominative subjects of passives and unaccusatives in Finnish that are interpreted as telic, and we do not expect to find stative predicates whose internal argument receives accusative case. Consider first passives and unaccusatives in (21-22) respectively.

- (21) a. Hän luki **kirjan**.<sup>13</sup>  
 s/he read.PST **book.ACC**  
 ‘S/he read the book (and finished it).’  
 b. **Kirja** luettiin.  
**book.NOM** was.read  
 ‘The book was read (and finished).’
- (22) a. Vieraat saapuivat.<sup>14</sup>  
 guests-NOM arrived  
 ‘The guests arrived.’  
 b. Karhu-t kuol-i-vat.  
 bear.PL.NOM die.PST.3PL  
 ‘The bears died.’

(21a) is the active form of the verb *read* in Finnish and as the translation indicates, the predicate is telic. Observe that when passivized, the derived subject appears with nominative case. In (22), both of the derived subjects of the unaccusative verbs surface with nominative, and as the translations indicate, they receive a definite interpretation, typical of a telic predicate. Consider the stative predicates in (23).<sup>15</sup>

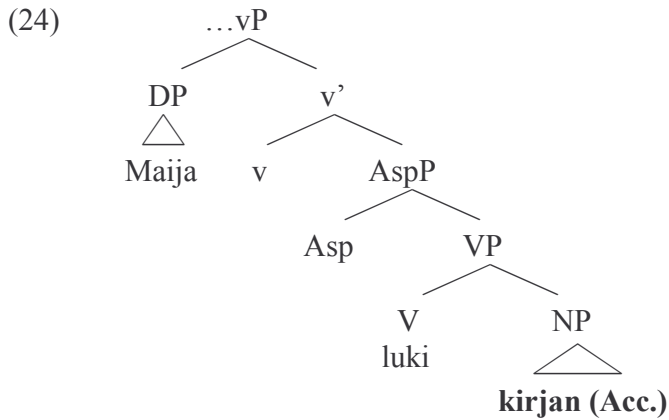
- (23) a. Omist-it nämä talo-t vuode-n / (\*vuode-ssa)  
 own.2SG these.ACC house.PL.ACC year.ACC year.INESS  
 ‘You owned these houses for a year (\*in an year).’  
 b. Tunnen hänet hyvin epätäydellisesti.  
 I.know her.ACC very incompletely  
 ‘I know her very incompletely.’

Just as occurs in English, stative predicates in Finnish take internal arguments that surface in accusative case. Finnish passives, unaccusatives and statives pattern with English passives, unaccusatives and statives. This is unexpected for a language in which there might be a direct syntactic dependency between the appearance of accusative case on the internal argument and a telic interpretation of a predicate. Therefore, I conclude that in Finnish, there is no direct syntactic relation between case and aspect. We must now explain the facts from (20). To do so, I propose the structure in (24) for the *telic-accusative* utterances in Finnish.

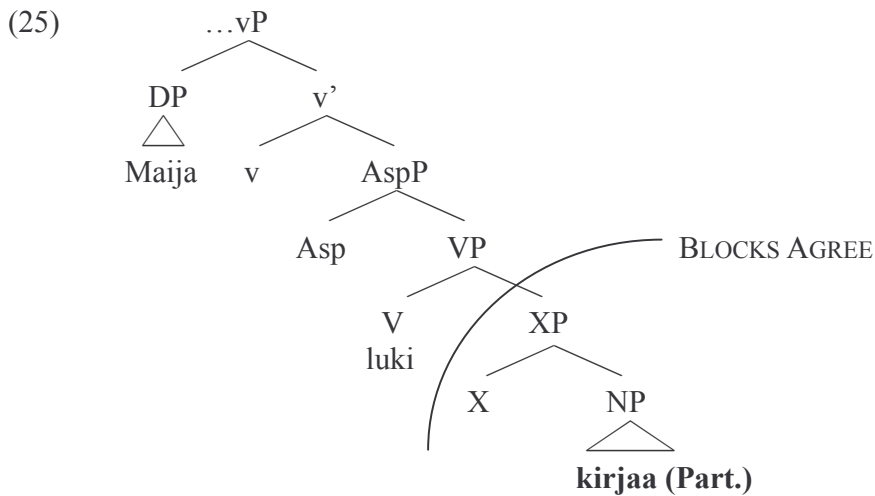
<sup>13</sup> Examples in (21) taken from Pereltsvaig (2000).

<sup>14</sup> Example in (22a) taken from Heinämäki (1984). Example in (22b) taken from Kiparsky (1998).

<sup>15</sup> The example in (23a) is from Kiparsky (1998:283). The example in (23b) is from Heinämäki (1984:165)



I assume that accusative case results from Agree with  $v^\circ$  (Chomsky 2001). In the structure in (24) the internal argument can freely Agree with  $v^\circ$ . Given the structural proximity of  $v^\circ$  to  $\text{Asp}^\circ$ , there is no syntactic reason why the internal argument cannot Agree with  $\text{Asp}^\circ$  as well. Thus, I assume that when accusative case appears on the internal argument, the internal argument NP can Agree with  $\text{Asp}^\circ$  and does so, valuing it such that the predicate is interpreted as telic. The structure I propose for the *atelic-partitive* constructions of Finnish is given in (25).



I claim that the argument in partitive is the complement of a null  $X^\circ$  that is in turn a complement of the verb.<sup>16</sup> I assume that this null  $X^\circ$  is responsible for partitive case on *kirjaa*. With respect to aspect, I assume that the null XP blocks Agree with  $\text{Asp}^\circ$ . Minimally, the NP *kirjaa* does not Agree with  $v^\circ$ , otherwise it would surface with accusative case; thus, it is likely that it cannot

<sup>16</sup> Schmitt (1996) makes a similar proposal, assuming that  $X^\circ$  here is  $P^\circ$ , although she still assumes a significant relation between case and aspect. Kratzer (2004) suggests that there may be an unpronounced D head responsible for partitive because partitive surfaces DP internally (from Kratzer 2004:400, bolding mine):

i) *Ammu-i-n kaksi karhu-a.*  
shoot.PAST.1SG two.ACC bear.PART



Agree with  $\text{Asp}^\circ$  either. I claim that the extra structure blocks these Agree relations, and the result is an atelic interpretation of the predicate. Consider utterances in English that have a similar structural configuration with the same aspectual result (26).<sup>17</sup>

- (26) a. John complained to his boss for an hour.  
b. Fred talked to his buddy for an hour.

The NPs *boss* and *buddy* are [+q] NPs. If they could Agree with  $\text{Asp}^\circ$ , we would expect a telic interpretation of the predicate. It seems that they cannot Agree with  $\text{Asp}^\circ$ ; the result is an atelic interpretation of the predicate. Observe another fact surrounding the data in (26); they cannot take internal arguments, regardless of the presence of the goal phrase. This is illustrated in (27).

- (27) a. John complained (\*his pay) to his boss.  
b. Fred talked (\*the story) to his buddy.

Given that no direct object can be present in the sentences in (27), and the NP complements of the goal preposition cannot Agree with  $\text{Asp}^\circ$ , I conclude that there is no NP that Agrees with  $\text{Asp}^\circ$  at all in these constructions. If no NP Agrees with  $\text{Asp}^\circ$ , I assume that  $\text{Asp}^\circ$  receives a default value such that the predicate is interpreted as atelic. Observe that when there is no internal argument present in English, the predicate is interpreted as atelic (28).<sup>18</sup>

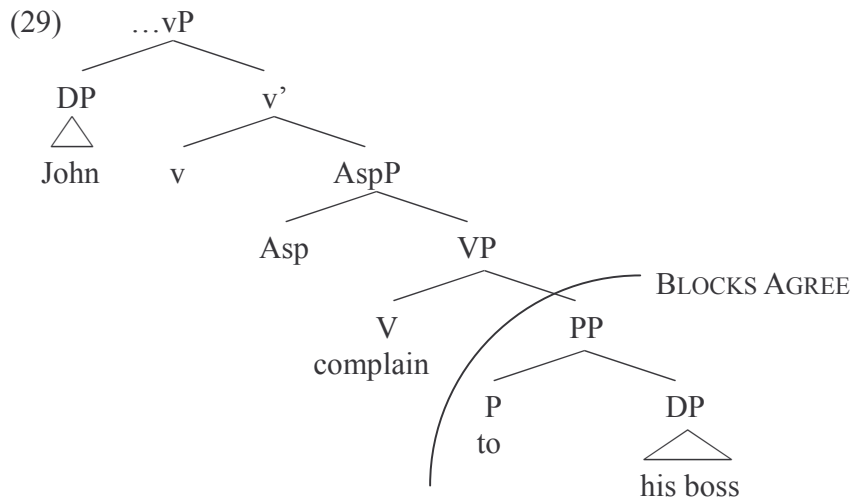
- (28) a. John ate for an hour.  
b. John danced for an hour.

I conclude that the overt preposition has the same blocking effect as the null  $X^\circ$  in the Finnish partitive constructions and I propose the structure in (29) to account for the English sentences in (26).

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<sup>17</sup> Thanks to Bill McClure for pointing these data out to me and for a discussion of them as well.

<sup>18</sup> The lack of an internal argument with a resulting atelic interpretation of the predicate is widely observed (see Borer 2005; Dowty 1979; Filip 1999; Verkuyl 1972 among others).



The parallel syntactic configuration resulting in the same aspectual effect lends support to the proposal that the overt PP in English and the null XP in Finnish blocks Agree with Asp°.

Given these patterns, I conclude that the extra structure in Finnish is responsible for the atelic interpretation of the predicate. I also assume that this extra structure is the source of partitive case as well. This entails that partitive case in Finnish is not structural (cf. Borer 2005). What we expect then, is that an NP that is in partitive can remain in partitive even after movement. Passive-active pairs and unaccusatives show that this expectation is met. They are illustrated in (30-31) respectively.

- (30) a. Hän luki **kirjaa**.<sup>19</sup>  
s/he read.PST **book.PART**  
'S/he read the book (for a while).'
- b. **Kirjaa** luettiin.  
**book.PART** was.read  
'The book was read (for a while).'
- (31) a. **Vieraita** saapuivat.<sup>20</sup>  
**guests.PART** arrived  
'Guests arrived.'
- b. **Karrhu-j-a** kuol-i  
**bear.PLPART** die.pst-3SG  
'Bears died.'

The derived subjects of passives and unaccusatives in Finnish can remain in partitive. This suggests that partitive is a non-structural case and lends further support to the structure in (25) proposed to account for the Finnish partitive construction.

<sup>19</sup> Example in (30) taken from Pereltsvaig (2000).

<sup>20</sup> Example in (31a) taken from Heinämäki (1984). Example in (31b) taken from Kiparsky (1998).

#### 4. Recap and Conclusions

In this paper I have argued that case and aspect are independent syntactic relations. Case is an Agree relation with  $v^{\circ}$  (Chomsky 2001) and aspect is an Agree relation with  $Asp^{\circ}$ . This conclusion does not entail that there is no syntactic relation at all between case and aspect, just that there is no direct syntactic relation. For if we assume that the presence of accusative case indicates a specific syntactic position in the verb phrase, then the presence of accusative case on a particular argument can indicate which argument is in this syntactic position. Given that the argument in this syntactic position enters into the object-to-event mapping with the predicate, albeit via a relation with a distinct head, accusative case can at best indirectly indicate which argument enters into an object-to-event mapping. However, as we saw above, the object-to-event mapping can still be present even though accusative case is not, and vice versa. Thus while there is an indirect relation between the presence of accusative case and the argument that participates in the object-to-event mapping, case and aspect are still independent syntactic relations.

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## On the lack of a (PF) phase in non-finite clausal complements

Franc Marušič

Slovenian non-finite complementation appears to be a good testing ground for determining the structural properties of non-finite complement clauses. In the first part of the paper, five arguments based on Slovenian data support the claim that non-finite complements do not have the CP node. Not having a CP means not constituting a phase, which is what the second part of the paper is about. In it, several arguments are used to show that the top projection of non-finite clausal complements spells-out to LF and thus constitutes an LF phase, while at the same time it does not spell-out to PF. That is, non-finite clausal complements lack PF independence but at the same time do not show any such phasal deficiency at the LF interface.

### 1. Introduction

Control constructions, or more generally non-finite clausal complements, differ from finite clauses in a number of ways. They typically do not have an overt subject, the embedded clause typically does not have a complementizer, and the embedded verb typically lacks tense morphology.<sup>1</sup>

According to the standard analysis of control structures from Chomsky (1995), given in (1), the embedded clause is a CP with a [-finite] TP as the complement of C. The subject of the embedded clause is PRO, which is controlled by an antecedent in the matrix clause.

(1) [CP[TP John<sub>i</sub> [VP hopes [CP[TP PRO<sub>i</sub> to [VP get the tickets]]]]]]

In this paper I argue for a slightly impoverished structure of non-finite complement clauses. In particular, I claim that the complement clause does not have the CP

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<sup>1</sup> I say only “typically”, rather than categorically, because of the supposed cases of backward control (e.g. in Tsez, Polinsky & Potsdam 2001), because of non-finite complementizers (e.g. in Dutch), and because of certain infinitives in various Latin tenses.

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projection.<sup>2</sup> Without a CP projection to block A-movement out of the embedded clause, the door opens for a movement analysis of control ala Hornstein (1999, 2001). I further claim that the topmost projection of the embedded non-finite clause maps to a proposition at LF and is thus the projection that constitutes an LF phase. At the same time, the topmost projection does not behave as an independent unit at the PF interface and is thus not the projection that spells-out to PF.

In section 2, I go over five arguments supporting my claim: scrambling (2.1), clitic climbing (2.2), multiple *wh*-movement (2.3), partial *wh*-movement (2.4), and genitive of negation (2.5). In section 3, I discuss the phasal composition of Slovenian non-finite complements, with arguments for the presence of an LF phase and the lack of a PF phase.

## 2. Arguments against the CP in Slovenian non-finite clausal complementation

In Slovenian, finite and non-finite clauses differ in a number of ways. The next five subsections go over several syntactic phenomena, all of which point to a structural difference between finite and non-finite clauses, and in addition suggest that non-finite clausal complements do not have the CP or the topmost phasal projection.

### 2.1 Scrambling

Bošković (1997) discusses scrambling from finite and non-finite clauses in Serbo-Croatian and concludes that unlike finite clauses, non-finite clausal complements do not have the CP projection since scrambling out of them does not trigger weak cross-over (WCO). Here I will present a similar argument based on Slovenian.

Like Serbo-Croatian, Slovenian allows scrambling from both finite and non-finite clauses. Since the embedded finite clause has a CP, the scrambled DP must cross the CP to reach its final landing site in front of the matrix clause. The final landing site of long-distance scrambling from inside a finite clause should be an A'-position, since movement from an A'- to an A-position is excluded under the Chain Uniformity Principle, and movement over CP (i.e. over a strong phase node) requires an intermediate stop in SpecCP (Chomsky 2001). The final landing site of such scrambling is thus comparable to that of *wh*-movement. The prediction follows that the scrambled DP should be subject to WCO, and this is exactly what we find. The scrambled DP in (2a) patterns with the *wh*-movement in (2b); *njegov* 'his' in the matrix subject cannot co-refer with the fronted XP.

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<sup>2</sup> The distinction between different classes of non-finite clause taking verbs is largely ignored in this paper. The reader is directed to Marušič (2005) for some discussion. I assume a simple distinction between verbs taking finite and verbs taking non-finite clausal complements, avoiding (for the most part) the use of restructuring and/or raising verbs since these have already been shown to exhibit monoclausal phenomena (Wurmbrand 2001, Cinque 2004) and thus to lack CP. I restrict this discussion to Slovenian, though the main observation should in principle generalize at least to languages without a complementizer in obligatory control infinitives.



- (2) a. Janeza<sub>i</sub> je njegov<sub>j/\*i</sub> oče reku, da se boji \_\_ .  
 J<sub>GEN</sub> aux his father said that refl fear  
 ‘John<sub>i</sub>, his<sub>i</sub> father said he fears.’
- b. Koga<sub>i</sub> je njegov<sub>j/\*i</sub> oče reku, da se boji \_\_ ?  
 whom aux his father said that refl fear  
 ‘Whom<sub>i</sub> did his<sub>j/\*i</sub> father said that he fears?’

Given the pattern observed above, if non-finite clausal complements also have an intermediate CP, we would expect long distance scrambling out of non-finite clauses to show WCO effects. With an intermediate CP, all movements would have to go through its SpecCP. SpecCP is an A'-position and every movement through an intermediate A'-position should end in an A'-position. Therefore, with an intermediate CP projection, we would predict that just like scrambling out of embedded finite clauses, scrambling out of embedded non-finite clauses would also trigger WCO violations.

This prediction, however, is not borne out in the Slovenian data. In contrast to scrambling out of finite clauses, scrambling out of non-finite clauses does not induce WCO, as shown in (3). Since scrambling does not trigger WCO, we can conclude that the final landing site is not an A'-position, and so the context for WCO does not arise. This further means there is no intermediate A'-projection between the two clauses that would prevent the DP from the lower clause to move to an A-position inside the matrix clause. No such position means no CP node.

- (3) Janeza<sub>i</sub> je njegov<sub>i</sub> oče sklenil odpeljati v šolo.  
 Janez aux his dad decided drive<sub>INF</sub> to school  
 ‘His<sub>i</sub> father decided to drive John<sub>i</sub> to school.’

In sum, the non-finite clausal complement behaves as if it contains no CP.<sup>3,4</sup>

The same test can be applied in other kinds of non-finite clauses. Restructuring constructions are claimed to involve a highly deficient clausal complement or even a monoclausal structure (Wurmbrand 2001, Cinque 2004), and should thus show the same behavior as ‘decide’ in (3). Examples (4) and (5) below show that this is indeed the case with complements to modals and aspectuals. The absence of WCO is observed also in object control constructions, which—because of the internal argument on the matrix verb—cannot be simply monoclausal sentences with ‘order’/‘convince’ as a functional verb (cf. Cinque 2004), (6).

<sup>3</sup> Note that *wh*-extraction out of non-finite clauses does not trigger WCO in Slovenian. In this respect nonfinite complementation parallels non-embedded *wh*-movement — there is no WCO with *wh*-movement in monoclausal sentences.

<sup>4</sup> The difference between finite and non-finite clauses with respect to WCO is even clearer if the pronominal possessor is a *pro*.

- (4) Janeza<sub>i</sub> mora njegov<sub>i</sub> oče naučit manir.  
 J<sub>ACC</sub> must his father teach<sub>INF</sub> good manners  
 ‘His father must teach Janez how to behave.’
- (5) Janeza<sub>i</sub> je njegov<sub>i</sub> oče začel pošiljat po čike.  
 J<sub>ACC</sub> aux his father began send<sub>INF</sub> for cigarettes  
 ‘His father began to send Janez for cigarettes.’
- (6) a. Janeza<sub>i</sub> je njegova<sub>i</sub> mama ukazala Meti pripeljati nazaj čistega.  
 J<sub>ACC</sub> aux his mother ordered M<sub>DAT</sub>bring<sub>INF</sub> back clean  
 ‘His mother ordered Meta to bring Janez back clean.’  
 b. Petru<sub>i</sub> je njegov<sub>i</sub> oče prepričal Meto dati darilo.  
 P<sub>DAT</sub> aux his father convince M<sub>ACC</sub>give gift  
 ‘His<sub>i</sub> father convinced Meta to give a gift to Peter.’

The absence of WCO effects is not a direct consequence of non-finiteness of the complement but rather the result of the type of scrambling, and of the type of the structure that the scrambled element moves over. The landing site of the scrambled DP in (3)-(6) is not an A'-position,<sup>5</sup> as shown by the lack of WCO. The final landing site is also clearly outside of the embedded clause. The only way out of the embedded clause and across the putative CP is through its A'-specifier position; however, movements from A'-to A-positions are not allowed. Therefore I conclude that there is no CP between the two clauses in (3)-(6).

## 2.2 Climbing of Pronominal Clitics

Above I have used different versions of scrambling from embedded clauses to argue for the lack of a CP projection between the matrix predicate and the embedded non-finite clause. This section makes the same argument based on the behaviour of pronominal clitic climbing.

Slovenian clitics are located in the second position (so-called “Wackernagel position”), following the first (syntactic) constituent of the clause. Slovenian second position clitics are typically analyzed as heads adjoining to the clause initial functional head – C (Golden & Sheppard 2000). As shown in (7), clitics cannot leave a finite embedded CP. They adjoin to the complementizer, which can also be seen as the first constituent (element) of the embedded clause, satisfying the requirement for the clitics to be in the second position.

- (7) Res **sem se** (\***ji ga**) naveličal, da \*(**ji ga**) nonstop hvalim.<sup>6</sup>  
 really aux refl her him got tired that her him nonstop praise  
 ‘I got really tired of constantly praising him to her.’

<sup>5</sup> This kind of explanation might not be valid within the current minimalism, but the facts remain the same. Non-finite clauses are crucially different from finite ones with respect to WCO.

<sup>6</sup> In this section clitics are written in *boldface*.

It is important to note that the presence of the complementizer is not decisive for the positioning of the clitics in the embedded clause. That clitics need not attach to the overt complementizer is shown in (8), where the clitics follow the *wh*-word in the SpecCP. A null complementizer in Slovenian finite clauses is allowed only with a *wh*-word in the specifier position, so that clitics either follow the *wh*-word or the complementizer. In either case, they remain inside the CP, adjoined to C.

- (8) Vid **ji je** povedal, kaj **so mu** froci kupili za razbito šipo.  
 Vid her aux told what aux him kids buy for broken glass  
 ‘Vid told her what the kids bought him because of the broken window.’

Given these points, the prediction is clear. If non-finite clauses contained a CP projection, we would expect the pronominal clitics to adjoin to its C head just as they do in embedded finite clauses. This is not what we find. In non-finite clauses, clitics behave differently; they can (though need not) freely climb out of the embedded clause to join the clitic cluster of the matrix clause, as shown in (9). This is exactly what we would expect if non-finite clauses do not have a CP node and therefore do not constitute a phase/phrase for clitics to cluster. Without the CP node in non-finite clauses, we maintain the generalization that clitics cluster within the first CP phrase/phase available.<sup>7</sup>

- (9) Res **sem ji ga** sklenil [ PRO opisati    i   j    ]  
 really aux her him decide describe<sub>INF</sub>  
 ‘I really decided to try to describe him to her.’

If non-finite clause do lack the CP, we have to explain how come clitics can stay inside the non-finite clause. The fact that climbing is optional could suggest that there is a CP in non-finite clauses and that sometimes a clitic can climb over it. This kind of option is actually unavailable, since the clitic inside the embedded clause does not have to adjoin to the edge projection of the embedded clause. There is actually no single position inside the embedded clause where the pronominal clitic has to stay. As shown in (10), the pronominal clitics from inside the embedded non-finite clause can be placed between any two syntactic elements between their base and their final landing position.

- (10) a. Včeraj **jo je** sklenil jutri počasi odpeljati proti domu.  
 Yesterday her aux decide tomorrow slowly drive<sub>INF</sub> towards home  
 ‘Yesterday, he decided to slowly take her home tomorrow.’  
 b. Včeraj **je** sklenil **jo** jutri počasi odpeljati proti domu.  
 c. Včeraj **je** sklenil jutri **jo** počasi odpeljati proti domu.  
 d.?Včeraj **je** sklenil jutri počasi **jo** odpeljati proti domu.  
 e. Včeraj **je** sklenil jutri počasi odpeljati **jo** proti domu.

<sup>7</sup> See Golden (2003) for an extended discussion and a multitude of clitic climbing data in Slovenian.

The data in (10) actually represent a problem for the syntactic account adopted here. If clitics indeed adjoin to  $C^0$  in finite clauses, how can they remain inside a non-finite clause? The clitics in (10) do not seem to be forced to attach to any specific syntactic position. But if there is no specific syntactic position, where are they?<sup>8</sup>

In Marušič (2002, 2007), I argue for a prosodic analysis of Slovenian clitic placement. Following that and similar proposals made for clitic placement in other languages (Anderson 2000, Roberts 1997 for Pashto, Broadwell 2000 for Zapotec, O'Connor 2002 for Serbo-Croatian), I suggest that clitics are positioned in the phonological component of the grammar in the second position of the relevant clausal prosodic phrase. Assuming Chomsky (2001, 2004), phonological phrases can be seen as a prosodic reflex of phases in the syntactic derivation. Since CP is a phase, but not TP, clitics represent a way to test the presence or absence of the CP projection.

Following this kind of “phonological” analysis, clitics can climb out of non-finite clauses because there is no strong CP phase between the two clauses that would force the clitics to remain in the lower prosodic phrase.

As I have shown, the specific clitic analysis adopted in the initial part of this section was not crucial for the argument. Whichever analysis one assumes, the data point consistently to the lack of a CP projection or, more to the point, the lack of a (PF) phase.

### 2.3 Multiple *wh*-movement

Slovenian is a multiple *wh*-movement language. Like Serbo-Croatian and Bulgarian, it fronts all *wh*-words in a sentence. However, it differs from Bulgarian (Rudin 1988) in that it does not respect superiority: as shown in (11), any *wh*-word can be placed in first position. Like Serbo-Croatian, Slovenian also allows the *wh*-word cluster to be split up by clitics. The *wh*-word that follows the two clitics in (12a) is thus also taken to be fronted. Also worth noting is that multiple *wh*-fronting is not obligatory in Slovenian, (12b).

- (11) a. Koga kdo toži?  
 whom who sues  
 ‘Who is suing whom?’
- (12) a. Kdo **mu je** kaj povedal?  
 who him aux what told  
 ‘Who told him what?’  
 b. Kdo **mu je** povedal kaj?  
 Who him aux told what

Like Serbo-Croatian (and unlike Bulgarian), Slovenian does not allow multiple long distance *wh*-movement. Only one *wh*-word can move out of an embedded finite clause

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<sup>8</sup> Bošković (2001) actually concludes the same and proposes a syntactic answer to this question. Though I do not think that his solution is on the right track, I cannot go into this issue here.

(13). This restriction is supposedly correlated with the fact that *wh*-words can be separated by clitics, adverbs and parentheticals (Rudin 1988). According to Rudin, only the first *wh*-word is moved to the SpecCP, which is why only one *wh*-word can move from the embedded CP to the matrix CP.

- (13) \*Kaj je komu silil Vid Petra, da naj da \_\_\_ ?  
 what aux whom forced Vid Peter that ptcl give \_\_\_ ?  
 ‘What did Vid forced Peter to give to whom?’

If non-finite clauses have a CP projection just like finite clauses, we would predict that just like finite clauses, non-finites will also disallow multiple long distance *wh*-movement. This is not what we find: multiple *wh*-movement out of Slovenian non-finite clauses is clearly available, (14). This suggests that non-finite clauses do not have the same structure as finite clauses do. In particular, assuming Rudin's analysis of multiple *wh*-movement, this shows that non-finite clauses do not have the CP projection, i.e., the node that prevents multiple *wh*-movement out of finite clauses. Although the judgments are not clear for every non-finite clausal complement selecting verb, the sentences in (14) are nevertheless certainly grammatical.

- (14) a. Komu si kaj pozabil dati?  
 Whom<sub>DAT</sub> aux what<sub>ACC</sub> forgot give  
 ‘Whom did you forget to give what?’  
 b. Komu si koga sklenil predstaviti?  
 Whom<sub>DAT</sub> aux who<sub>ACC</sub> decide introduce  
 ‘Who did you decide to introduce to whom?’  
 c.?Kaj si kdaj Petri včeraj ukazal [prinesti \_\_\_ na mizo \_\_\_ ]?  
 what<sub>ACC</sub> aux when Petra yesterday order bring<sub>INF</sub> to table  
 ‘What did you order Petra to bring to the table when?’

From the observation that multiple *wh*-movement is impossible out of finite clauses but possible (to some degree) in non-finite clauses, one can naturally conclude that non-finite clauses lack the structure that prevents multiple *wh*-movements out of finite clauses. Following Rudin (1988), the relevant structure is the CP projection.<sup>9</sup>

#### 2.4 Genitive of negation

Like many (and perhaps all) Slavic languages, Slovenian displays some version of genitive of negation – the object in a negated sentence receives genitive case instead of the accusative (cf. Orešnik 2001), (15).

<sup>9</sup> An immediate question comes to mind: can there be *wh*-words between the matrix and the embedded nonfinite clause? If so, in what position could they be, especially if there is really no CP between the two clauses. I put this question aside for now and return to it in section 2.5.

- (15) a. Slavko je kupil Meti bicikel.  
 S<sub>NOM</sub> aux bought M<sub>DAT</sub> bike<sub>ACC</sub>  
 ‘Slavko bought Meta a bike.’  
 b. Slavko ni kupil Meti bicikla.  
 S<sub>NOM</sub> aux<sub>NEG</sub> bought M<sub>DAT</sub> bike<sub>GEN</sub>  
 ‘Slavko didn’t buy Meta a bike.’

Objects inside finite clausal complements with matrix-clause negation, however, cannot appear in genitive case, (16). Regardless of the exact mechanism of genitive case assignment, for which many analyses have been proposed (e.g. Kim 2003, Bailyn 2004) and about which there is considerable disagreement, the fact that the effect of negation is blocked in embedded clauses is most naturally correlated with the CP projection and the phase that it creates. Being a phase, the CP blocks agree, and without this long distance relation, genitive cannot be licensed inside the embedded clause.<sup>10</sup>

- (16) Slavko ni sklenil, da bo Meti kupil bicikel / \*bicikla  
 S<sub>NOM</sub> aux<sub>NEG</sub> decided that will M<sub>DAT</sub> bought bike<sub>ACC</sub> bike<sub>GEN</sub>  
 ‘Slavko didn’t decide that he will buy Meta a bike.’

Since this effect presumably derives from the presence of the CP node (or the strong phase it creates), we would predict that if non-finite complements have a CP, they should also block the licensing of genitive of negation. This is not what we find. As shown in (17), genitive of negation *is* licensed in non-finite clauses embedded under a matrix clause with sentential negation.

- (17) a. Slavko še ni sklenil kupiti Meti bicikla.  
 S<sub>NOM</sub> yet aux<sub>NEG</sub> decide buy<sub>INF</sub> M<sub>DAT</sub> bike<sub>GEN</sub>  
 ‘Stane hasn’t decided yet to buy Meta a bike.’  
 b. Petra Meti ni zapovedala kupiti avtomobila.  
 Petra Meta<sub>DAT</sub> aux<sub>NEG</sub> order buy<sub>INF</sub> car<sub>GEN</sub>  
 ‘Petra didn’t order Meta to buy a car.’

Again, we can reason from the absence of an effect predicted to exist in the presence of a CP. Since this effect is missing, non-finite complementation must lack a CP node.<sup>11</sup>

### 2.5 Partial *wh*-movement

Slovenian exhibits the so-called partial *wh*-movement, as shown in (18). As extensively discussed by Fanselow (2003), in these constructions the base generated *wh*-word only

<sup>10</sup> Assuming that the negative feature of the Slovenian C (or Laka’s 1990  $\Sigma$ ) cannot be licensed by the upper negation, or cannot license the lower genitive of negation.

<sup>11</sup> See Witkoś (2003) for a more developed argument against the CP using similar facts in Polish.



moves part of the way towards its scope position, while in the specifiers of CPs in between the *wh*-word and the highest [+Q]-marked CP, the default *wh*-word is inserted, i.e., the *wh*-expletive. The Slovenian default *wh*-word is *kaj* ‘what’. The complementizer following the *wh*-word is optional in Slovenian.

- (18) Kaj praviš, kdo (da) je prišel?  
 What say<sub>2P,Sg</sub> who (that) aux came?  
 ‘Who do you say came?’

If non-finite clauses really had a CP projection, we would also expect them to allow partial *wh*-movement. This is not observed, though. As shown in (19), partial *wh*-movement is not available with embedded non-finite clauses. This again shows that the lower clause does not have a CP projection where the *wh*-word could be located. Only “full” *wh*-movement is possible out of non-finite embedded clauses, (20).<sup>12</sup>

- (19) a. \*Kaj ti Janez ukazuje, koga udariti?  
 What you Janez order who hit<sub>INF</sub>  
 ‘Who did Janez order you to hit?’  
 b. \*Kaj je Janez pozabil, koga pozdraviti?  
 What aux Janez forget, whom salute<sub>INF</sub>  
 ‘Who did Janez forget to say hello to?’  
 (20) Koga ti Janez ukazuje udariti?  
 Whom you Janez order hit<sub>INF</sub>  
 ‘Who did Janez order you to hit?’

Examples (19) are not forbidden because of selectional restrictions on the verb. In Partial movement constructions, the lower CP is not marked [+Q], and both verbs allow also a [+Q] CP complement, as shown in (21).

- (21) a. Janez ukazuje, koga moramo udariti.  
 Janez order who must<sub>3P,Pl,Pres</sub> hit<sub>INF</sub>  
 ‘Janez is ordering whom we have to hit.’  
 b. Janez je pozabil, koga je hotel pozdraviti.  
 Janez aux forget, whom aux want salute<sub>INF</sub>  
 ‘Janez forgot who he wanted to say hello to.’

According to this analysis, (19) are out because obligatory control non-finite clauses do not have a CP projection. An even better illustration of the structural differences between finite and non-finite clauses is observed in examples with multiple embedding, (21). When both the embedded and the doubly embedded clause are finite, the *wh*-expletive shows up in the upper two SpecCP positions. As shown in (22), the intermediate SpecCP

<sup>12</sup> There seem to be certain disagreement among speakers with respect to the judgements in this section. This is not surprising since partial movement is in itself a very marginal construction.

between the *wh*-word and the CP where the *wh*-word takes scope cannot be empty (cf. Fanselow 2003 for similar facts in German).

(21) Kaj nam je Vid ukazal, kaj moramo reči, koga je Meta ljubila?  
 what us aux Vid ordered what must say<sub>INF</sub>whom aux Meta loved  
 ‘Who did Vid order us that we must say that Meta loved?’

(22) \*Kaj je Vid mislil, da je Črt rekel, koga da je Meta ljubila?  
 what aux Vid thought that aux Črt say whom that aux Meta loved  
 ‘Who did Vid think that Črt said that Meta loved?’

In case the first embedded clause is non-finite and the lowest one finite, partial *wh*-movement leaves the *wh*-word in the SpecCP of the finite clause, but there is no intermediate *wh*-expletive between the matrix and the non-finite clause, (23). Since partial *wh*-movement cannot skip an intermediate SpecCP, as shown in (22), the lack of the intermediate *wh*-expletive in non-finite clauses again suggests the lack of a CP projection.

(23) Kaj nam je Vid ukazal(\*kaj) reči, koga da je Meta ljubila?  
 what us aux Vid ordered what say<sub>INF</sub> whom that aux Meta loved  
 ‘Who did Vid order us to say that Meta loved?’

The same restrictions on partial *wh*-movement out of non-finite clausal complements exists also in German and Hungarian, as observed by Fanselow (2003). Fanselow relates this restriction to the fact that German does not allow *wh*-headed infinitival clauses, (24). Fanselow makes the following generalization: (p19, [W7]) “The CP related to a WP [= *wh*P] must be a syntactically legal indirect question.”

(24) a. \*Was glaubst Du [wen eingeladen zu haben]? (Fanselow 2003, (66))  
 what believe you whom invited to have  
 b. Wen glaubst du eingeladen zu haben?  
 what believe you invited to have  
 ‘Who do you believe to have invited?’  
 c. \*Ich frage mich [wen eingeladen zu müssen].  
 I ask myself who invite to must  
 ‘I wonder who to invite.’

The generalization seems to work for German, but it does not work for Hungarian and Slovenian. Slovenian allows *wh*-headed infinitives as the ones given in (25).

(25) a. Pozabil sem, kaj reči.  
 forgot aux what say<sub>INF</sub>  
 ‘I forgot what to say.’

- b. Odločil sem se, kje zgraditi hišo.  
 decided aux refl where build<sub>INF</sub> house  
 ‘I decided where to build the house.’

These kinds of examples are very different from ordinary non-finite complements. Following Hornstein (1999, 2001), I claim these sentences do not involve obligatory control and are therefore substantially different. Only obligatory control constructions are a result of movement (according to Hornstein 2001) and only for those the existence of a CP represents a problem.

The Slovenian *wh*-initial infinitives, given in (26), all involve non-obligatory control. These sentences crucially involve an embedded [+Q] CP. They also differ in that they appear with verbs that do not select for (non-*wh*-initial) non-finite clauses.

- (26) a. Pokazal sem mu kje (mora) pristati. vs. \*Pokazal sem mu pristati  
 I showed him where (he must) to land. \*I showed him to land  
 (only if: showed how to)
- b. Ugotovil je kje prestopiti vs. \*ugotovil sem prestopiti  
 He found out where to change \*He found out to change
- c. Vem kaj početi vs. \*Vem početi.  
 I know what to do \*I know to do

These apparent non-finite clauses behave differently from true non-finite clauses in several respects. Unlike non-*wh*-initial non-finite clauses, these examples with apparent, *wh*-initial non-finites do not exhibit the properties that suggest a lack of the CP projection. Clitics cannot climb out of such clauses, (27), and matrix negation cannot license genitive of negation in them, (28).

- (27) a. \*Ukazal mi ji je [ kaj reči \_\_\_ ].  
 ordered me her aux what say<sub>INF</sub>  
 ‘He ordered me what to tell her.’<sup>13</sup>

- (28) Robi se še ni odločil kje kupiti hišo / \*hiše  
 Robi refl yet not decided where buy house<sub>ACC</sub> house<sub>GEN</sub>  
 ‘Robi hasn’t decided yet, where to buy a house.’

These kinds of sentences behave differently also with respect to scrambling. Scrambling out of apparent, *wh*-initial non-finite clauses is impossible, (29a). The explanation here does not have to do only with the presence of a CP since scrambling out of finite clauses is available in Slovenian as shown in (29c). Unlike scrambling from an embedded finite clause, scrambling out of an embedded question is bad, (29b). The unavailability of scrambling in (29a) is therefore probably due to its SpecCP being filled (with a *wh*-word), not simply to its presence.

<sup>13</sup> (27) is good on an irrelevant reading where the *wh*-word is read as an indefinite pronoun (‘something’).

- (29) a. \*Janeza se je Peter odločil, kdaj naučiti manir.  
       Janez<sub>ACC</sub> refl aux Peter decided when teach<sub>INF</sub> manners  
 b. \*Janeza se je Peter odločil, kdaj mora naučiti manir.  
       Janez<sub>ACC</sub> refl aux Peter decided when must teach<sub>INF</sub> manners  
 c. Janeza se je Peter odločil, da mora naučiti manir.  
       Janez<sub>ACC</sub> refl aux Peter decided that must teach<sub>INF</sub> manners  
       ‘Peter decided (that he has) to teach Janez how to behave.’

This section has again shown that non-finite clausal complements lack a certain structural position that finite clausal complements possess. Non-finite clauses in general do not allow partial *wh*-movement. In particular, obligatory control constructions cannot exhibit partial *wh*-movement because they do not have the intermediate CP where the *wh*-word would land. By contrast, non-obligatory control constructions, which have a CP, crucially involve a [+Q]-marked C, which prevents the [+wh] feature to undergo further movement.

### 3. Phasal Composition of non-finite complementation

So far, we have established that non-finite clausal complements lack the CP projection. Without the CP projection these constructions lack a strong phase between the two clauses. Now I will show that non-finite clausal complements nevertheless constitute a phase, but that this is not a complete phase at which structure is simultaneously spelled-out to both interfaces. In particular, I will show that this phase only spells-out to the LF interface and that it is thus an instance of an LF-only phase. I will show that this chunk of structure constitutes a semantic unit but at the same time does not form a prosodic unit, and was therefore not spelled-out to PF at the same time. I will also go over the arguments from section 2 and explain that the kind of structural deficiency they argue for can be understood with non-simultaneous phases. In particular, I will show that they only argue for the lack of a PF phase rather than the lack of a general, PF-and-LF strong phase. Thus it will be shown that the data in this paper argue for the existence of non-simultaneous phases.

#### 3.1 LF phasehood

Just like finite clausal complements, non-finite clausal complements denote propositions. Propositions are supposed to be the LF reality of phases. Non-finite clausal complements are opaque/intensional — an indefinite inside a non-finite clausal complement can have a non-specific interpretation, a non-denoting term in such structure would not yield falsity of the entire sentence, etc. (all these properties are obviously related to the semantic type of the non-finite TP). For example, there need not be any specific Finn that Vid decided to marry for (30a) to be true — Vid simply decided that he will marry a Finn, but does not yet know whom—and (30b), with a non-denoting term in its complement, is not

necessarily false. Similar examples can be given for every other type of non-finite complementation.

- (30) a. Vid se je sklenil poročiti z eno Finko.  
 Vid refl aux decided marry<sub>INF</sub> with a Fin  
 ‘Vid decided to marry a Finn.’  
 b. Vid se je sklenil poročiti z vampirko.  
 Vid refl aux decided marry<sub>INF</sub> with vampire  
 ‘Vid decided to marry a female vampire.’

We can also find supporting evidence for the claim that there is an LF phase under the matrix verb if we check the interpretation of universal quantifiers inside the embedded non-finite clause. The scope position of a (universal) quantifier is commonly taken to indicate the edge of an (LF) phase. If quantifier raising is a syntactic movement, and if it can indeed cross phase boundaries, then it has to go through phase edges; so if a quantifier can be interpreted in a specific position, this position is a phase edge to which the quantifier moved in order to be accessible for future movements (for a discussion of quantifier raising see Marušič 2005). In order to see whether a projection is a phase, we should thus check if quantifiers can be understood inside the scope of the matrix verb (cf. Legate 2001, 2003, Sauerland 2003, among others).

As shown in (31a), the universal quantifier can be understood inside the scope of the matrix verb, since the sentence (also) has the interpretation under which Vid forgot to close all the windows, but did remember to close some. And even more revealingly, (31b) (also) has the interpretation under which Črt decided that he will leave all the windows open. In this last case, the universal quantifier gets scope in between the matrix verb and negation (his decision is about every window, not about each individual one).

- (31) a. Vid je pozabil zapret vsa okna. *forgot > ∀*  
 Vid aux forgot close<sub>INF</sub> all windows  
 ‘Vid forgot to close all windows.’  
 b. Črt se je odločil ne zapret vsako okno. *decide > ∀ > not*  
 Črt refl aux decided not close<sub>INF</sub> every window  
 ‘Črt decided not to close every window.’

The interpretation with the universal quantifier of (31b) is inside the scope of the matrix verb but outside the scope of negation shows that the quantifier can be interpreted in the embedded SpecTP, the phase edge of the lower non-finite clause. We get similar results when we take a look at the inverse scope linking cases in (32).

- (32) Odloču se je neupoštevati vse s tremi vrstami težav  
 decide refl aux disregard<sub>INF</sub> all with three kinds problems  
 ‘He decided to disregard everyone with three kinds of problems.’

(32) can be understood in the following way: he decided that for three kinds of problems,

he will disregard everyone who has them. The quantifier from inside the object DP is thus interpreted higher than negation but still lower than the matrix verb. The fact that the two quantifiers from the object DP ('all', 'three') are not interpreted one next to the other is not surprising following Sauerland's (2005) analysis.

More facts like this can be added. We can avoid the  $vP$  phase if we use an unaccusative verb in the non-finite complement. In this case the quantifier must be put in an adjunct position. Regardless of the lack of  $vP$ , a quantifier can still be interpreted inside the scope of the matrix verb, as in (33). Since there is supposedly no other phase (assuming an adjunct by itself is not a phase), the non-finite clause has to be the LF phase where the quantifier gets interpreted.

- (33) Meta je ukazala Petru priti na vse koncerte.  
 Meta aux ordered Peter arrive<sub>INF</sub> on all concerts  
 'Meta ordered Peter to arrive to all concerts.' *order* >  $\forall$

In addition, if the lower clause consists of more than just the embedded VP and  $vP$  (as it must be the case since it can contain negation, as in (31b) then it makes perfect sense to include all the functional projections of the lower clause in the semantic computation of the lower clause, rather than in the computation of the matrix clause. As mentioned above, the entire complement clause expresses a proposition regardless of the type of verb inside the complement clause. Even if the latter contains an unaccusative verb, which does not have a  $vP$  phase, the complement semantically still corresponds to a proposition, and is as such a perfect candidate for an LF spell-out unit. This means that some projection bigger than the embedded  $vP$  and smaller than the matrix verb is spelled-out to LF.

An additional argument for the presence of an LF phase can be constructed. If, following Urribe-Excebarria (1994), negative polarity items (NPIs) are licensed at LF, then the presence of the negative operator in the main clause could license a NPI that is in the embedded clause if there is no LF spell-out in between the two clauses. If, on the other hand, the lower clause is spelled-out to LF, then the NPI could not be licensed by the matrix negative operator, since its trigger is not transferred to LF in the same phase.<sup>14</sup> As shown in (34), *počnega groša* 'broken grosh' is an NPI licensed by a local negative operator. It is ok in (34b) and (34d), where the negation appears within the same clause. It is out in (34a) and (34c) where there is no negation within the same clause.

- (34) a. \*Imam (tudi) počen groš.  
       have also broken grosh<sub>ACC</sub>  
       'I don't have a red cent.'  
       b. Janez mu ni dal (tudi) počnega groša.  
       Janez him not gave also broken grosh<sub>GEN</sub>  
       'Janez hasn't given him a red cent.'  
       c. \*Peter ni vedu, da ima (tudi) počen groš.  
       Peter not knew that has also broken grosh<sub>ACC</sub>

<sup>14</sup> This argument was suggested to me by the reviewer.



- d. Peter ni vedu, da Metka nima (tudi) počenega groša.  
 Peter not knew that Metka not-has also broken grosh<sub>GEN</sub>  
 ‘Peter didn’t know that Metka doesn’t even have a red cent.’

Just like this NPI is not allowed in the finite clausal complements, when they do not contain a clausal negation, it is also out in non-finite clauses without a negative operator, as shown in (35).

- (35) a.\*Peter mu ni branil plačati (tudi) počenega groša.  
 Peter him not forbid pay also broken grosh<sub>GEN</sub>  
 ‘Peter didn’t forbid him to pay even a broken grosh.’  
 b.\*Peter ni prepričal Metke plačat taksistu (tudi) počenega groša.  
 Peter not convinced Metka pay taxi-driver also broken grosh<sub>GEN</sub>  
 ‘Peter didn’t convince Metka to pay the taxi driver even a red cent.’

Genitive of negation is licensed in non-finite clauses under matrix negation, as discussed in section 2.5, yet as seen in (35b) genitive of negation is not enough to license NPI. Obviously, genitive of negation is not an NPI.

Although we showed in section 2 that we do not have a CP projection in between the two clauses, and would thus not expect any phase separating the two clauses, we now found LF evidence for a phase. Bobaljik & Wurmbrand (2005) claim that verbs taking a non-finite clausal complement induce agreement domains, which are also loci of quantifier interpretation (in an earlier version of their paper they called them ‘LF-only phases’). Regardless of where the phasehood comes from (whether phases are induced as in Bobaljik and Wurmbrand 2005, slided as in Gallego 2006, or derived by some other mechanism), the crucial question now is whether we can find also PF evidence for a phase in this area; in principle, one could pursue the idea that (some) structures smaller than CPs and larger than vPs should be included among (complete) strong phases. In the next subsection I will look at PF phase diagnostics and try to show that these LF phases do not have the properties of PF phases.

I am assuming a structure with more than just the core projections CP-TP-vP. Thus, when I say that the top projection of non-finite clauses is TP I am not claiming that the complement of T in non-finite clauses gets spelled-out to LF, but rather that there is some projection in that area which serves as the edge and whose complement gets spelled-out to LF. Vagueness serves the purpose of simplicity of explanation.

### *3.2 PF phasehood*

As was shown in section 2, non-finite embedded clauses do not have a CP projection. At several points it was argued that this in fact means there is no phase. Since the previous subsection argued that there is an LF phase in between the two clauses, I will now turn to the phonological properties of non-finite complements and try to present evidence for the lack of a PF phase.

Assuming a phonological positioning of clitics, clitics move to the second position inside the relevant prosodic unit. Since clitics can climb out of non-finite clauses, there can be no PF boundary between the two clauses that would block their fronting. But we should be looking at clearer facts. Matushansky (2003), following Legate (2001, 2003), proposes three types of diagnostics for PF phases: *isolability*, *movement*, and *nuclear stress rule application*.

A PF phase, the point at which structure is sent to the PF component, should be the locus of the Nuclear stress rule application (cf. Cinque 1993). Nuclear stress rule is a phonological rule that gives the nuclear stress to the rightmost lexical element in the structure. It is reasonable to assume that it applies to structure when it is shipped to PF, that is, at every phase. Every PF phase would thus bring in another application of the nuclear stress rule. The combination of a matrix clause and a finite clausal complement seems to have two intonational phrases, with a pause in between the two clauses and two main stresses on the rightmost lexical word of every clause, as shown in (36a) (the sentences have to be pronounced with neutral intonation for this to be observable). This is not the case in non-finite complementation where the entire sentence is most naturally pronounced as a single intonational phrase with only one main sentential stress, (36b,c).

- (36) a. Peter je včeraj rekel, da bo prišel na zabavo **sam**.  
 Peter aux yesterday said that will come to party alone  
 ‘Peter said yesterday that he will come to the party alone.’  
 b. Peter je včeraj sklenil prit na zabavo **sam**.  
 Peter aux yesterday decided come<sub>INF</sub> to party alone  
 ‘Peter yesterday decided to come to the party alone.’  
 c. Peter je Meti ukazal prit danes nam na **zabavo**.  
 Peter aux Meta ordered come<sub>INF</sub> today to us to party  
 ‘Peter yesterday decided to come today to us for a party.’

If a phrase is a phase, then it should also have the freedom to be movable. In particular, it should participate in various types of movements.<sup>15</sup> Matushansky (2003) concludes that according to this diagnostic, TP is not a PF phase. In particular, TP does not participate in “movement-like structures that may not involve purely syntactic movement” (Matushansky 2003, p.10). As shown in (37a), CP can be extraposed, but TP cannot (37b). Similarly, (37c) shows that TP cannot be topic left-dislocated, while CP and DP can be. The same is true of pseudo-clefting, as shown in (37d). ((37) from Matushansky 2003, her (19), (20), (23))

- (37) a. It surprised Ron [<sub>CP</sub> that Hermione was interested in someone else].  
 b.\*It surprised Ron [<sub>TP</sub>Hermione (to) be interested in someone else].  
 c.\*[Hermione (to) be interested in Viktor], who could imagine **it**.  
 d.\*What Goneril seemed was [<sub>TP</sub>to fear King Lear].

<sup>15</sup> Most obviously, it should be allowed to be PF-moved around the sentence, but since it is not entirely clear what PF movements are, I’ll simply follow Matushansky and her findings.

Additionally, the Slovenian sentences with non-finite complement clauses allow a kind of multiple scrambling. The kind of word reordering shown in (38) is only allowed within a sentence/clause. Normally, only one element can scramble over a finite CP, and in case more than one element scrambles, they have to form some sort of a constituent and appear leftmost. Thus, (39d), with the fronted constituent following the matrix subject, (39e), with two elements from the embedded clause with the intervening matrix subject, and (39f) with a fronted non-constituent are all bad. No such restrictions hold for reorderings within a single clause.

- (38) Medota je že včeraj po gozdu brez puške iskal Vid.  
 Bear aux already yesterday around forest without gun search Vid  
 ‘Vid looked for a bear around the forest with no gun already yesterday.’
- (39) a. Janez pravi, da je Meta pozabla it včeraj domov  
 Janez says that aux Meta forgot go<sub>INF</sub> yesterday home  
 ‘Janez says that Meta forgot to go home yesterday.’  
 b. Domov, pravi Janez, da je Meta pozabla it včeraj.  
 home says Janez that aux Meta forgot go<sub>INF</sub> yesterday  
 c. Pozabla it domov, pravi Janez, da je Meta včeraj.  
 forgot go<sub>INF</sub> home says Janez that aux Meta yesterday  
 d.\*Janez pozabla it domov, pravi, da je Meta včeraj.  
 Janez forgot go<sub>INF</sub> home says that aux Meta yesterday  
 e.\*Domov Janez včeraj, pravi, da je Meta pozabla it.  
 home Janez yesterday says that aux Meta forgot go<sub>INF</sub>  
 f.\*Meta domov Janez pravi, da je včeraj pozabla it.  
 Meta home Janez says that aux yesterday forgot go<sub>INF</sub>

What is obvious is that the kind of reordering from (38) is not available in (39). This reordering (multiple scrambling) is, on the other hand, available in non-finite complementation basically to the same degree as in simple monoclausal sentences – anything can appear anywhere.<sup>16</sup>

(40a) is the basic sentence with the neutral word order. The embedded clause (written in bold) follows the matrix verb. All the other examples in (40) have scrambled word order, but the difference between them is just stylistic.

- (40) a. Peter je včeraj v gostilni pozabil **povabit Vida na žur**.  
 P<sub>NOM</sub> aux yesterday in pub forgot invite<sub>INF</sub> V<sub>ACC</sub> to party  
 ‘Yesterday in the pub, Peter forgot to invite Vid to the party.’  
 b. **Vida** je Peter **na žur** včeraj v gostilni **povabit** pozabil.  
 V<sub>ACC</sub> aux P<sub>NOM</sub> to party yesterday in pub invite<sub>INF</sub> forgot  
 c. **Na žur** je **Vida** Peter včeraj v gostilni **povabit** pozabil.  
 to party aux V<sub>ACC</sub> P<sub>NOM</sub> yesterday in pub invite<sub>INF</sub> forgot

<sup>16</sup> I am not using any adverbs in these cases, since these have a more fixed ordering among themselves.

- d. **Na žur** je Peter **Vida** včeraj v gostilni **povabit** pozabil.  
 to part aux P<sub>NOM</sub> V<sub>ACC</sub> yesterday in pub invite<sub>INF</sub> forgot
- e. **Vida** je **nažur** Peter včeraj v gostilni **povabit** pozabil.  
 V<sub>ACC</sub> aux to party P<sub>NOM</sub> yesterday in pub invite<sub>INF</sub> forgot
- f. Peter je **povabit Vida nažur** včeraj v gostilni pozabil.  
 P<sub>NOM</sub> aux invite<sub>INF</sub> V<sub>ACC</sub> to party yesterday in pub forget
- g. **Povabit** je **Vida nažur** Peter včeraj v gostilni pozabil.  
 invite<sub>INF</sub> aux V<sub>ACC</sub> to party P<sub>NOM</sub> yesterday in pub forget
- h. **Povabit** je **Vida** Peter **nažur** včeraj v gostilni pozabil.  
 invite<sub>INF</sub> aux V<sub>ACC</sub> P<sub>NOM</sub> to party yesterday in pub forget
- i. **Povabit** je Peter **nažur** včeraj v gostilni pozabil **Vida**.  
 invite<sub>INF</sub> aux P<sub>NOM</sub> to party yesterday in pub forget V<sub>ACC</sub>
- j. **Povabit** je Peter včeraj v gostilni pozabil **Vida nažur**.  
 invite<sub>INF</sub> aux P<sub>NOM</sub> yesterday in pub forget V<sub>ACC</sub> to party
- ...

This largely unconstrained reordering is semantically (=truth-conditionally) vacuous, as shown in (41) (more about this multiple scrambling is said in Marušič 2005), where the pronoun can be bound by the originally c-commanding quantifier regardless of where the pronoun ends up being scrambled to, even if it is pronounced in a position that should in principle be c-commanding the quantifier (that is, if this reordering is syntactic). This multiple scrambling is similarly insensitive to principle C (as shown in Marušič 2005).

- (41) a. [Vsak bolan otrok]<sub>i</sub> je ukazal sestri **prinest kosilo v njegovo<sub>i</sub> sobo**.  
 Every sick child aux convinced sister bring<sub>INF</sub> lunch in his room  
 'Every sick child ordered his sister to bring lunch to his room.'
- b. **Kosilo** je ukazal sestri **v njegovo<sub>i</sub> sobo prinest** [vsak bolan otrok]<sub>i</sub>.  
 c. **V njegovo<sub>i</sub> sobo** je sestri **kosilo ukazal prinest** [vsak bolan otrok]<sub>i</sub>.  
 d. **V njegovo<sub>i</sub> sobo** je [vsak bolan otrok]<sub>i</sub> sestri **kosilo prinest ukazal**.
- ...

This multiple scrambling/reordering cannot be a case of simple syntactic left dislocation, or else we would expect this to be available out of non-finite clauses as well, in particular, we would expect sentences (39d,e) to be acceptable, on a par with the comparable (40d) and (40f). But this is not the case.

These kinds of movements are acceptable only with special intonation and are subject to total reconstruction. Following Sauerland & Elbourne (2002) (also Aoun & Benmamoun 1998), who claim that only PF movements totally reconstruct, I conclude that this multiple scrambling is not syntactic but rather an instance of PF movement. If it is PF movement, it is most reasonably limited to a PF unit, and since PF units are created by PF phases, we can conclude that there is no PF phase in between the two clauses in non-finite complementation. If that is the case, then Slovenian non-finite clauses do not spell-out to PF at the same point where they spell-out to LF.

Finally, Matushansky (2003) also discusses isolability as a potential diagnostic for PF phases. If a certain phrase can be pronounced alone, outside of its proper place in the



the beginning of the relevant prosodic unit. If there is no intermediate PF spell-out between the embedded and the matrix clause, clitics can search for a relevant host all the way up to the matrix second position.

If clitic climbing turns out to be a syntactic process, it should clearly involve modifying the LF spell-out. But clitic climbing (actually even clitic fronting within a single clause) has absolutely no effect on interpretation (reflexives get bound regardless of their relative position with respect to the subject, pronouns get bound by a quantifier as soon as a quantifier c-commands their original position). Thus, if clitic climbing is really syntactic, it should be operating with PF related features. If this is the case, it does not matter how many LF phases occur in between their original position and their final landing site. What matters is that there is no PF boundary, i.e. no PF phase.

As mentioned in 2.2, clitic climbing out of non-finite clauses is optional in Slovenian. Clitics can but need not climb. An example was given in that section, more are given in (44-45). In addition to being optional, clitic climbing does not have a fixed landing site in non-finite clausal complementation. Clitics can remain inside the original clause or they can come in-between nearly any two words between the original and the final position, whether inside the matrix clause or the complement clause. If clitic climbing is really prosodic, then this clearly shows that there is no clear single prosodic break between the matrix and the embedded clause. The position of the clitics has effects on the intonation: clitics have to follow a prosodic break. This prosodic break can be placed anywhere. If there is no clear prosodic break, there are no clear prosodic units, which means that there are no PF spell-out positions. (# in (44b) signifies a longer pause after the auxiliary clitic, without which the sentence is ungrammatical.)

- (44) a. Peter **jo je** spet sklenil [ jutri začet [ pisat]].  
 Peter her aux again decide tomorrow begin[ write  
 ‘Peter again decided to start writing it tomorrow.’
- b. ?Peter **je # jo** spet sklenil [ jutri začet [ pisat]].
- c. Peter **je** spet **jo** sklenil [ jutri začet [ pisat]].
- d. Peter **je** spet sklenil [**jo** jutri začet [ pisat]].
- e. Peter **je** spet sklenil [ jutri **jo** začet [ pisat]].
- f. Peter **je** spet sklenil [ jutri začet [**jo**pisat]].
- g. \*Peter **je** spet sklenil [ jutri začet [ pisat **jo**]].
- (45) a. On **jo je** hotel nehati hoteti videvati vsak dan.  
 he her aux want stop<sub>INF</sub> want<sub>INF</sub> see<sub>INF</sub> every day  
 ‘He wanted to stop wanting to see her every day.’ (Golden 2003)
- b. On **je** hotel **jo** nehati hoteti videvati vsak dan.
- c. On **je** hotel nehati **jo** hoteti videvati vsak dan.
- d. On **je** hotel nehati hoteti **jo** videvati vsak dan.
- e. On **je** hotel nehati hoteti videvati **jo** vsak dan.



### 3.3.3 Multiple *wh*-movement

Multiple *wh*-movement is not obligatory in Slovenian, and the fronted *wh*-words do not form a syntactic unit. One might speculate, therefore, that it does not occur for a syntactic reason. Since it is optional, it also does not have any effect on the interpretation. Assuming all *wh*-words eventually must front to their scope position, an LF-only phase cannot block them, since they can always covertly move over it. But a PF phase could block their overt movement. Optionality and the lack of interpretative effects already suggest that multiple *wh*-movement is an instance of PF movement. If this is indeed the case, the fact that multiple *wh*-movement is allowed from non-finite complement clauses suggests that there is no PF phase that would prevent it. But regardless of its movement-type, the existence of an intervening LF phase does not play any role, so the argument from section 2.3 still stands.

### 3.3.4 Genitive of negation

At this point, it is not yet clear what exactly licenses the genitive of negation, so one can only speculate as to what goes on in this case of long distance licensing. As shown earlier, NPIs are not licensed in embedded non-finite clauses, so that the fact that genitive of negation is licensed suggests that genitive of negation is not an NPI, and that it is not licensed at LF. Case can be naturally seen as a PF condition, it is not important for LF, but it is read by the PF interface. If case (in particular NOM and ACC) is further assigned by (PF) phase edges, it can only be assigned to an element within the same phase. Genitive case is of course different from both NOM and ACC in that it is not assigned by any phase edge. But genitive case is still a case, and as such important for PF and unimportant for the LF interface. If it works at least partially like other cases, then it is important that case does not get separated from its licensor by a PF phase. Genitive of negation is licensed by negation, and if negation is located in the matrix clause while the nominal is in the embedded clause, then following our logic, there should not be any PF phase intervening, while LF phases do not appear to be important. The proposed phasal composition is thus consistent with the argument.

### 3.3.5 Partial *wh*-movement

As analyzed by Cheng (2000), partial *wh*-movement is the phonological spell-out of the WH-feature that moved through the CP. As claimed in this chapter, there is no CP between the matrix and the embedded clause, so there should not be any WH-feature. Again, the presence of an LF phase should not affect the *wh*-movement since *wh*-words can move over multiple LF phases (in fact they *have to* move to their scope position regardless of their actual location). So even though the WH-feature plausibly moves through the intermediate LF-phase edge position, nothing forces it to be spelled out as the *wh*-expletive, no more than it is forced to be spelled-out in the *v*P phase edge when it moves through it. *Wh*-expletives seem to be restricted to CPs, and since there is no CP

between the two clauses, there cannot be any *wh*-expletive. The actual phasal composition does not affect the validity of the argument.

#### 4. Conclusion

Although I was brief, I have tried to explain why the proposed phasal composition does not affect the arguments presented, and in addition, how some of the same arguments can be viewed as arguments for non-simultaneous phases.

Allowing non-simultaneous spell-out means that we can explain both Total Reconstruction and Quantifier Raising in purely derivational terms without any backsteps such as deletion of a higher or lower copy. Total Reconstruction turns out to be a case of syntactic movement of an item that has been previously spelled out to Logical Form (LF), while Quantifier Raising involves syntactic movement of an item that has been previously spelled out to Phonetic Form (PF). That is, of a situation just contrary to the one observed in non-finite complementation. As explained in Marušič (2005), DP is a phase spelling-out only to PF. All this and more is explained in all relevant detail in Marušič (2005).

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# SIMPLy Malayalam Participials

Rosmin Mathew

This paper analyses three different, though morphologically similar types of constructions, which employ the “participial” form of the verb. The participial marker *-a* is analysed as having the feature description [iφ unvalued]. The differences between these constructions are traced to the differences in the strategies employed to value *-a*. Also, the possibility of an interpretable but unvalued feature surviving at the end of a derivation is explored as a logical possibility of the Pesetsky and Torrego (2004) system.

## 1. Introduction

This paper looks into nominal modification in Malayalam, a Dravidian language spoken in India. The language has a basic SOV word order. The interesting fact about Malayalam is that, instead of adjectives, it makes elaborate use of relative clause (RelC)-like structures for nominal modification. As Hany Babu (1997) has rightly pointed out, even the few ‘adjectives’ the language has are morphologically similar to RelC-like structures.

(1) jo:n kan-unn-**a** kutti  
John see-PRE-A child  
“The child whom John sees”

(2) velu-TT-**a** patti  
white-PST-A dog  
“White dog”

However, unlike canonical RelCs, these constructions do not have a discernible relative pronoun<sup>1</sup>. The *-a* morpheme that appears on the verb has been treated as a participial marker by Asher and Kumari (1996), henceforth A&K. Due to these facts, this paper starts out by looking at these as Participial constructions, employing the basic definition that a participial is a verb that is used to modify a noun. Participials are treated in Minimalist framework (Chomsky 2004) as lacking person feature (a defective T) which makes it impossible for a participial to assign Nominative Case and thus to license a nominal in the subject position. The construction we

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<sup>1</sup> *-a* is not a pronominal form in Malayalam.

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examine here, then, does not belong to the category of participials either, because the Subject of the clause can appear in these constructions (1). Hence, the term “participial relative clauses” (PrtRelCs), a term used by A&K, will be retained in this paper to refer to the construction under study.

## 2. Constructions

The participial is formed by suffixing the morpheme *-a* to the verb inflected for past/non-past time references. Like any RelCs, PrtRelCs in Malayalam can modify any argument and always precede the head noun. A noun can be modified by a series of PrtRelCs.

### (3) *Unergative*

- a. kutti innale raatri o:d-i  
child yesterday night run.PST  
‘The child ran last night’
- b. [innale raatri o:d-i- (y)a] kutti  
yesterday night run.PST.A child  
‘The child who ran last night (lit., ran child)’

### (4) *Unaccusative*

- a. kappal mung-i  
ship sink.PST  
‘The ship sank’
- b. mung-i-(y)a kappal  
sink.PST.A ship  
‘The ship that sunk (lit., sunken ship)’

### (5) *Agent and patient/theme of transitives*

- a. kutti pu:cca- ye kan-unnu  
child cat.ACC see.PRS  
‘The child sees the cat’
- b. [kutti kan-nunn-a] puucca  
child see.PRS.A cat  
‘The cat which the child see (lit., the child seen cat)’
- c. puucca-ye kan-nunn-a kutti  
cat.ACC see.PRS.A child  
‘The child who sees the cat (lit., cat-seeing child)’

### (6) *Arguments of ditransitives*

- a. jo:n me:ri-kku pasu-wine kodu-TTu  
John.NOM Mary.DAT cow.ACC give.PST  
‘John gave a cow to Mary’
- b. me:ri-kku pasu-wine kodu-tt-a jo:n  
Mary.DAT cow.ACC give.PST.A John  
‘John who gave a cow to Mary’
- c. jo:n pasuwine kodutt-a me:ri

- John.NOM cow.ACC give.PST.A Mary  
 ‘Mary to whom John gave a cow’
- d. jo:n me:ri-kku kodutt-a pasu  
 John.NOM Mary.DAT give.PST.A cow  
 ‘The cow which John gave to Mary’

Like any RelCs, one common feature of all the examples above is that the argument that has been turned into the head noun is absent from the clause. Interestingly, there is a second type of similar constructions where the presence of all the arguments is mandatory i.e., there is no gap within the RelC. These are termed “headless RelCs” by A&K. Elsewhere in the literature they are known as nominalised sentences with *-du* as the nominaliser. For the purposes of this paper, we can call them Type I and Type II.

- (7) a. jo:n me:ri-kku pasu-wine kodu-TT-a-du  
 John Mary.DAT cow.ACC give.PST.A.SG.NEUT.  
 ‘That John gave a cow to Mary’
- b. jo:n me:ri-kku pasu-wine kodu-TT-a-van  
 John Mary.DAT cow.ACC give.PST.A.SG.MASC.  
 ‘That John gave a cow to Mary’
- c. jo:n me:ri-kku pasu-wine kodu-TTu enn-a-du<sup>2</sup>  
 John Mary.DAT cow.ACC give.PST COMP.A.SG.NEUT.  
 ‘That John gave a cow to Mary’

Another difference between the two types is that only clauses of Type II (which do not have any gap) can be used in cleft constructions. Type I PrtRelCs allows quantifiers, demonstratives and other PrtRelCs to intervene between itself and the head noun. This is absolutely forbidden in the case of Type II. Also, the presence of the complimentiser *ennu* is ungrammatical in type I constructions.

- (8) a. jo:n a:nu me:ri-kku pasu-wine kodu-TT-a-du  
 John be Mary.DAT cow.ACC give.PST.A.SG.NEUT  
 ‘It is John who gave a cow to Mary’
- b. \* jo:n a:nu me:ri-kku kodutt-a pasu  
 John be Mary.DAT give.PST.A cow  
 ‘It is John who gave a cow to Mary’
- c. \* jo:n me:ri-kku kodu-TTu enn-a pasu  
 John Mary.DAT give.PST COMP.A cow  
 ‘The cow that John gave to Mary’
- d. jo:n me:ri-kku kodu-TT-a a: randu pasukkal  
 John Mary.DAT give.PST.A that two cows  
 ‘Those two cows that John gave Mary’
- e. \* jo:n-um ja:kk-um me:ri-kku pasu-wine kodu-TT-a-randa-van  
 John-and Jack-and Mary.DAT cow.ACC give.PST.A-two-SG.MASC  
 ‘That John and Jack gave a cow to Mary’

<sup>2</sup> Only Sg.Neut. can be used with the complimentiser.



### 3. What does *-a* do?

Before going in detail into the structure of these two types of *PrtRelCs*, it would be helpful to look into the common feature in all these examples – the suffix *-a*. As mentioned earlier, this is called “participial marker” by A&K. This morpheme is suffixed to the verb inflected for Tense/Aspect/Mood, as shown in the examples above. The defining feature of this morpheme is that it has to be obligatorily succeeded by a nominal element. This can be achieved in two ways: (i) the *PrtRelC* precedes a full-fledged nominal element or (ii) a morpheme denoting the values of  $\phi$ -feature set can be suffixed to *-a*.

- (9) a. kan-unn-**a** kutti  
 see.PRS.A child  
 ‘The child who sees’  
 b. kan-unn-**a-van**  
 see.PRS.A.SG.MASC  
 ‘One who sees’  
 c. kan-unn-**a** \*(kutti)  
 see.PRS.A child  
 ‘The child who sees’

This, in other words, means that *-a* has some feature that seeks validation from a nominal element, which calls for a closer look at the features associated with it. The concepts developed by Pesetsky & Torrego (2004) –henceforth P&T- provide the theoretical basis for this closer examination of the feature composition of *-a*. Departing from the Derivation by Phase/Minimalist Inquiries (Chomsky 1999, 2000) perception of features as interpretable vs. uninterpretable, P&T argue that features can be both [+/- interpretable] and [+/- valued]. This leads to the following four-way distinction:

- (10)  $uF$  *val* uninterpretable, valued       $iF$  *val* interpretable, valued  
 $uF$  [] uninterpretable, unvalued       $iF$  [] interpretable, unvalued

Agree is redefined in this system as a sharing of features.

- (11) *Agree (feature sharing version)*  
 a. An unvalued feature  $F$  (a probe) on a head  $H$  at syntactic location  $\alpha$  ( $F_\alpha$ ) scans its command domain for another instance of  $F$  (a goal) at location  $\beta$  ( $F_\beta$ ) with which to Agree.  
 b. Replace  $F_\alpha$  with  $F_\beta$ , so that the same feature is present in both locations.  
 c. When Agree applies between a probe feature  $F$  at a syntactic location  $\alpha$  and a goal location  $\beta$ , the output is a single feature  $F$  shared by two locations.

Any unvalued feature can, in this system, act as the probe. Returning to the case at hand, the feature description that would fit *-a* is [ $i\phi$  unvalued], which acts as a probe to get valued. Pesetsky (2005) has, in fact, argued that the C-layer of *RelCs* has unvalued  $\phi$ -features. It differs from declarative *C* (but resembles adjectives) in lacking valued  $\phi$ -features of its own. This is exactly what happens in the case of *PrtRelCs* in Malayalam; *-a* is the morphological manifestation of [ $i\phi$  unvalued]. If the unvalued  $\phi$ -features remain unvalued, the derivation crashes as the ungrammaticality of (9c) shows. This further explains the inability of so-called adjectives in Malayalam to appear in positions where, for example, English type adjectives can

appear. Malayalam adjectives, as mentioned earlier, are morphologically similar to PrtRelCs in that all of them carry the *-a* suffix. They broadly belong to two categories: root plus *-a* (12a) or frozen forms of PrtRelCs (12b).

- (12) a.   nal(l)-a pe:na  
           good    pen  
           ‘Good pen’  
       b.   karu-tt-a   pe:na  
           black.PST.A pen  
           “Black pen”

Neither of these classes can be used without a nominal succeeding it. When these are used in the complement position of copular constructions, just like the examples of Type II PrtRelCs that we saw in (8a), (8b), and (9), these adjectives appear with morphemes denoting Number and Gender suffixed to them.

- (13) a.   idu   valiy-a   mi:n a:nu  
           this   big       fish   be  
           ‘This is big fish’  
       b. \*   mi:n   valiy-a   a:nu  
           fish   big       be  
           ‘Fish is big’  
       c.   mi:n   valiy-a-du   a:nu  
           fish   big.ASg.Neut. be  
           ‘Fish is big’

These facts can be explained only if *-a* has a feature description [*i*φ unvalued] that acts as a probe that seeks valuation. Moreover, Malayalam explicitly shows the resemblance between adjectives and RelCs that Pesetsky (2005) talks about by using the same morpheme *-a* in both the cases. The argument above is further substantiated by what is known in the literature as the “future participle”. A&K notes that PrtRelCs can appear in Past, Present and Future tenses. While the past and present participles take the participial marker *-a*, the future relative participle is homophonous with the future participle form *-um*. Even though this participle is morphologically in future tense, the reading is mostly of a generic nature. An example is given below.

- (14) pu:       virī-yum       ka:lam  
       flower   bloom-FUT   time  
       ‘The time when flowers (will) bloom’

A&K further note that “this future participle is, however, very rarely used, particularly in the spoken language, reference to future time in a relative clause usually indicated by a present tense participle.” Apart from the fact that the use of the future participle is not all productive in the language, the restrictions on the already minimal use of this construction are of interest here. As we have seen in the beginning of this paper, a Type I PrtRelC can be used to modify any argument and a series of Type I PrtRelCs can be used to modify the same noun. However, this is not at all true as far as the future participle is concerned. Also, these constructions cannot appear in Type II PrtRelC or modify Proper nouns.

- (15) a. \* jo:n ka:n-um kutti

- John see.FUT child  
‘The child whom John will see’
- b. jo:n va:ngi-ya me:ri vitt-a vi:du  
John bought.A Mary sold.A house  
‘The house that John bought and Mary sold’
- c. \* pu: viri-yum puzha ozhug-um ka:lam  
flower bloom.FUT river flow.FUT time  
‘The time when flowers will bloom and river will flow’
- d. \* jo:n ka:n-um-du  
John see.FUT.SG.NEUT  
‘That which John will see’
- e. \* jo:n ka:n-um me:ri  
John see.FUT Mary  
‘Mary whom John will see’

These facts will follow straightforwardly if we take the absence of *-a* into account. There is no unvalued element which can act as a probe in these constructions and hence the difference.

#### 4. Analysis

The analysis pursued in this paper is based on the framework given in Chomsky (2001, 2004)<sup>3</sup>. Specifically, Type I *PrtRelCs* are pair-merged structures while Type II *PrtRelCs* are not. *Set-Merge* takes two objects  $\alpha$  and  $\beta$  and creates the set  $\{\alpha, \beta\}$ . The asymmetric operation of adjunction takes two objects  $\beta$  and  $\alpha$  and forms the ordered pair  $\langle \alpha, \beta \rangle$ ,  $\alpha$  adjoined to  $\beta$  (Chomsky 2004). This is the operation *Pair-Merge*. The adjoined element  $\alpha$  is spelt out where  $\beta$  is. A pair-merged element is not visible to the *Narrow Syntax (NS)*, so  $\beta$  (to which  $\alpha$  is adjoined) behaves in the *NS* as if it were a simple structure. The operation *SIMPL* converts the ordered pair  $\langle \alpha, \beta \rangle$  to  $\{\alpha, \beta\}$ . As Chomsky (2004) argues, “since *SIMPL* applies at the point of the derivation at which *Spell-Out* applies, it is also in effect part of *Spell-Out* [...] that is part of the operation *TRANSFER*”. Overt and covert movement is, then, defined on the basis of the ordering of *TRANSFER* and *Move*. For covert movement *TRANSFER* is ordered before *Move*.

Recall that we sub-divided the constructions classified under *PrtRelCs* into two types – Type I and Type II. Type I *PrtRelCs* can be stacked (15b), have a gap in the clause (3-6), can let quantifiers and other *PrtRelCs* intervene before the head noun (cf. 8d) and do not instantiate suffixation of bare number/gender marking. Type II *PrtRelCs*, on the other hand, cannot be stacked, do not permit gaps (cf. 8a, b), do not allow any element to intervene between the clause and the head noun (cf. 8e), and can be valued by bare number/gender markers (cf. 8a).<sup>4</sup> Thus, of the two types, it is Type I that is similar to *Relative Clauses*.

<sup>3</sup> Notice that, unlike Pesetsky (2005), the analysis pursued here is not a raising analysis.

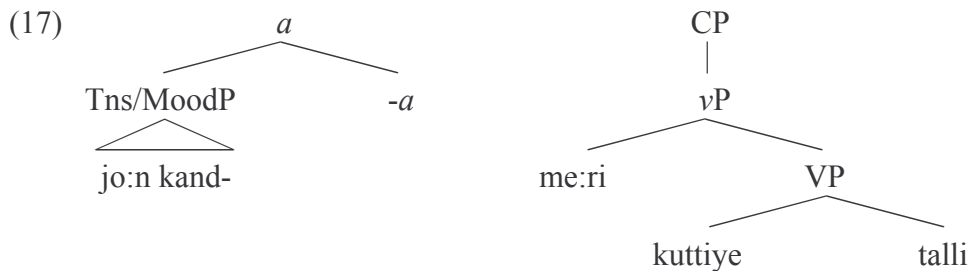
<sup>4</sup> Malayalam is a language which is said to have only two persons: first and second. The so-called third person is derived by combining distal/proximal demonstrative and the morpheme that denotes number and gender. The morpheme *a* is the distal marker and *i* is the proximal one. The following morphemes, in this sense, function as number/gender markers.

- |      |          |         |          |          |               |                   |
|------|----------|---------|----------|----------|---------------|-------------------|
| (i)  | an       | al      | du       | ar       | va            |                   |
|      | MASC.SG. | FEM.SG. | NEUT.SG. | HUMAN.PL | NON-HUMAN.PL. |                   |
| (ii) | a-van    | a-val   | a-du     |          | iii) i-van    | i-val i-du        |
|      | he       | she     | it       | (distal) | he            | she it (proximal) |

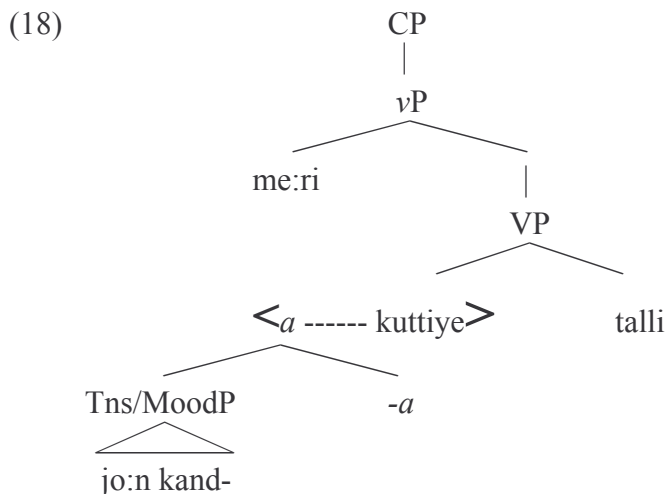
4.1 Type I *PrtRelCs*

Adopting the standard adjunction analysis for *RelCs* (Chomsky 1977), I take them to be pair-merged to the head noun. Assuming parallel computation, the matrix clause and the *PrtRelC* are built in parallel.

- (16) jo:n kan-d-a kutti-ye me:ri talli  
 John see.PST.A child Mary slapped  
 ‘Mary slapped the child whom John saw’



By the time a strong phase is reached and Spell-Out is to be applied, all the syntactic objects (SO) in the work space have to be turned into a unique SO, with all other SOs integrated into the matrix SO through applications of Merge. A type I *PrtRelCs* lacks full argument structure and hence counts as a weak phase. Therefore, the strong phase in the workspace is the matrix CP. Once the derivation reaches the matrix CP, Spell-Out/TRANSFER has to apply. However, the *PrtRelC* still has unvalued  $\phi$ -features, survival of which can result in a deviant derivation. Therefore, the *PrtRelC* is pair-merged to the head noun *kutti* in the matrix clause by the time the strong phase is reached.



The operation SIMPL applies at TRANSFER, simplifying the pair-merged structure  $\langle \alpha, \beta \rangle$  into  $\{ \alpha, \beta \}$ . The unvalued features are valued at this point and the derivation converges.

An interesting fact about Type I *PrtRelCs* is that, unlike their English-type counterparts, they allow for wide scope of *wh*-elements inside the participial clause. Consider the following English example.

(19) ?? You saw the man who killed whom?

In (19), the embedded *wh*- element does not get a wide scope interpretation at all; the sentence with a *wh*- element inside the RelC is, in fact, ungrammatical. However, Malayalam tells a different story, where RelCs with an embedded *wh*- are not only grammatical, but receive only a wide scope interpretation.

- (20) A: ni: a:re konn-a a:le kandu?  
 you who.ACC killed.A person.ACC saw  
 ‘You saw the person that killed who?’
- B: me:ri-ye.  
 Mary.ACC  
 ‘Mary’
- B’: nja:n me:riye konn-a a:l-e kandu  
 I Mary.ACC killed.A person.ACC saw  
 ‘I saw the person who killed Mary’

I deviated from subscribing to a raising analysis of RelCs because it is unclear how wide scope can be obtained in this type of analysis. On the contrary, a pair-merge analysis of RelCs directly provides an explanation for wide-scope of *wh*- elements embedded in PrtRelCs. Malayalam is a *wh*- *in situ* language, which means that movement of *wh*- elements to their scope positions is covert. This, in turn, suggests that Malayalam is a language that orders Move after TRANSFER. The implication of this conclusion for a pair-merged structure is that Move applies only *after* the pair-merged SO is integrated into the matrix clause by SIMPL. This leaves the *wh*- element inside the PrtRelC amenable for extraction, resulting in an obligatory wide-scope reading.

#### 4.2 Type II PrtRelCs

As opposed to Type I PrtRelCs, Type II clauses do not resemble relative clauses at all. The most important characteristic of these clauses is that the  $\phi$ -features of *-a* are valued by suffixing the gender/number markers. In fact, these markers appear exactly the way they appear in subject-verb agreement contexts. Though Malayalam does not show subject-verb agreement in finite clauses, its sister languages in the Dravidian family (e.g., Tamil) do exhibit overt agreement.

In Type II PrtRelCs, there seems to be at least one case of overt agreement. This is the one mentioned in (8) earlier, and reproduced below as (21). This case can also be interpreted as a copula-less sentence to mean *John is someone who gave Mary a cow*. Only the subject can be clefted in this construction.

- (21) a. jo:n me:ri-kku pasu-wine kodu-TT-a-van  
 John Mary.DAT cow.ACC give.PST.A.SG.MASC  
 ‘It is John who gave Mary a cow’
- b. jo:n a:nu me:ri-kku pasu-wine kodu-TT-a-van  
 John be Mary.DAT cow.ACC give.PST.A.SG.MASC  
 ‘It is John who gave a cow to Mary’
- c. \* me:ri-kku a:nu jo:n pasu-wine kodu-TT-a-van  
 Mary.DAT be John cow.ACC give.PST.A.SG.MASC  
 ‘It is to Mary that John gave a cow’

This paradigm suggests that the valuation of the  $\phi$ -features of *-a* is carried out by the subject. The marker *-a* acts as a probe and the subject moves higher to value its features. This explains why it is ungrammatical to place any element before the subject in these constructions – an unexpected restriction given the high degree of scrambling that the language exhibits.

- (22) \* innale jo:n vann-a-van a:nu  
 yesterday John came.A.SG.MASC be  
 ‘It is John that came yesterday’

The construction becomes grammatical once the adverb is placed after the subject.

- (23) jo:n innale vann-a-van a:nu  
 John yesterday came.A.SG.MASC be  
 ‘It is John that came yesterday’

The *-du* form of Type II PrtRelCs (cf. 8a), on the other hand, behaves differently from the above one. As mentioned elsewhere, it is this construction that is widely used for clefting. In this construction, any element in the PrtRelCs can be brought to be the focus of the cleft. Example (8a) is reproduced below as (24a), along with other examples that show that any element inside the *-du* clause can be clefted.

- (24) a. jo:n me:ri-kku pasu-wine kodu-TT-**a-du**  
 John Mary.DAT cow.ACC give.PST.A.SG.NEUT  
 ‘That John gave a cow to Mary’  
 b. jo:n a:nu me:ri-kku pasu-wine kodu-TT-**a-du**  
 John be Mary.DAT cow.ACC give.PST.A.SG.NEUT  
 ‘It is John who gave a cow to Mary’  
 c. me:ri-kku a:nu jo:n pasu-wine kodu-TT-**a-du**  
 Mary.DAT be John cow.ACC give.PST.A.SG.NEUT  
 ‘It is to Mary that John gave a cow’  
 d. jo:n me:ri-kku pasu-wine kodu-TT-**a-du** a:nu  
 John Mary.DAT cow.ACC give.PST.A.SG.NEUT be  
 ‘John did give a cow to Mary’

More over, *-du* clauses do not ban other elements from preceding the subject. Thus, a sentence like (25) is perfectly grammatical as opposed to (22).

- (25) innale jo:n vann-a-du a:nu  
 yesterday John came.A.NG.NEUT be  
 ‘It is John that came yesterday’

It appears from these data that there is no movement of any element to a higher position to value *-a*. Therefore, *-du* is to be considered as the default valuation of the  $\phi$ -features *-a*. In fact this is not a strange operation for Dravidian languages. Tamil, which has an overt agreement system, provides evidence for default agreement when the arguments are unavailable for agreement.

- (26) avan- $\phi$  niRaiya cinimaa naTikarkaL-ai terint-irunt-aan  
 he.NOM many cinema actors.ACC knew.has.PST.SG.MASC  
 ‘He knew/has known many cinema actors’



However, in the presence of a dative subject, the verb agrees with the object. In these cases, the object surfaces with nominative case (marked with a  $\emptyset$  morpheme), and not with the regular accusative.

- (27) niRaiya cinimaa naTikarkaL- $\emptyset$  avan-ukku terint-iru-nt-aarkaL  
 many cinema actors.NOM he.DAT knew.has.PST.PL  
 ‘Many cinema actors were known/have been known to him’

When both the subject and the object carry case markings, the verb surfaces with default agreement. Such default agreement is always singular neuter.

- (28) avan-ukku niRaiya cinimaa naTikarkaL-ai(t) terint-iru-nt-a-du  
 he.DAT many cinema actors.ACC knew.has.PAST.SG.NEUT  
 ‘Many cinema actors were known/have been known to him’

It is this option of default valuation of agreement that the Type II clauses exercise to value the  $\phi$ -features on *-a*. Recall that *-a* corresponds to the feature description [*i*F unvalued]. A derivation can crash if an uninterpretable feature survives at the interfaces. But, under P&T’s system, it is possible for an interpretable feature to remain unvalued. Since the feature is interpretable, it is unlikely that the derivation would crash, although the presence of unvalued features may result in a deviant derivation. The easiest solution would be to take *-a* as having a default value, that is to say, to assign a uniform value to all the interpretable but unvalued occurrences of a feature. This is exactly what I have claimed happens in the examples above. The unvalued but interpretable  $\phi$ -features on *-a* are assigned the default value singular neuter, which is spelled out as *-du*.

### 5. Conclusion

Three seemingly different construction types in Malayalam –adjectives, RelCs and nominalised sentences– have been given a uniform explanation. All these constructions are headed by a morpheme with the feature description [*i* $\phi$  unvalued]. The constructions differ on the strategies employed to value this element. Also, the analysis brings to light an interesting consequence of P&T’s proposal of four-way distinction of the feature system –namely, cases where an interpretable feature remains unvalued. The solution given here is based on the assumption that only uninterpretable features make a derivation crash. By virtue of the fact that they are interpretable, unvalued interpretable features can be assigned a default value.

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**The development of head movement**  
The rise of verb-initial word order in Old Irish

Glenda Newton

This paper considers the interaction of morphology and syntax in the development of head movement, specifically in the development of V-to-C movement in Old Irish. Building on the philological insight that the development of the Old Irish double system of verbal inflection is connected to the rise in verb-initial word order, a new account of the development of the Old Irish verbal system is proposed, which combines insights from Celtic philology and ideas from minimalist syntax.

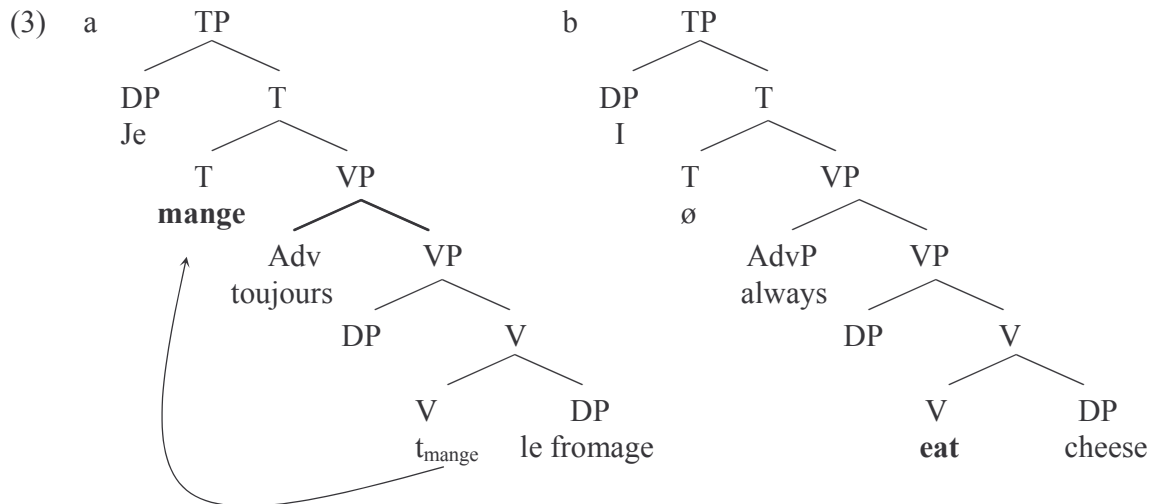
*1. Introduction: verb movement and morphology*

It is well known that different languages show different word order patterns. Let us take for example English and French. In English, as shown in examples (1a) and (1b), the verb and object must be linearly adjacent, no adverbs can intervene. In French, as in example (2), on the other hand, this is not the case, and adverbs can appear between the verb and the object.

- (1) a. I **always** eat cheese  
b. \* I eat **always** cheese
- (2) a. Je mange **toujours** le fromage  
I eat always the cheese  
b. \* Je **toujours** mange le fromage  
I always eat the cheese

Within generative syntax it is argued that these differences in word order patterns are a result of different movement operations. The difference in verb position in the examples above can be explained in generative terms if we assume that negation and the relevant class of adverbs (so-called VP-adverbs) have a set position in the clause, marking the left edge of the verb phrase (VP). In French, the verb moves out of the VP to the T(ense) position and so appears to the left of VP adverbs and negation. In English, however, the verb does not move to T. It remains in its base

position within the VP and so appears to the right of VP adverbs and negation. The difference in movement operations can be seen in the trees in (3) below.



Such differences in movement operations are often linked to differences in inflectional morphology. In the case of verb movement, for example, it has been widely observed that if a language has rich verbal inflection, marking tense or subject agreement, it will also have V-to-T movement (Roberts 1985; Pollock 1989). If we consider the examples in (4), it seems that this generalisation holds for English and French. The French present tense forms in (4a-b) shows rich subject agreement inflection. The only agreement inflection shown by the English present tense forms in (4c-e) is the third singular marker *-s*.<sup>1</sup>

- (4) a. Je mange **toujours** le fromage  
 b. Nous mangeons **toujours** le fromage  
 c. I **always** eat cheese  
 d. He **always** eats cheese  
 e. We **always** eat cheese

It should be noted, however, that this correlation between verb movement and verbal morphology only holds one way. There are many languages that have V-to-T movement in the absence of rich morphology. Given in (5) is an example from the Celtic language Manx. The verb appears in first position, preceding the subject and so must have moved from the VP, however, the verb shows no person agreement, having the same form in both the third singular and the third plural.

<sup>1</sup> Biberauer & Roberts (2005) argue that in some cases V-to-T movement may correlate with rich tense inflection rather than agreement inflection. Although in written French subject agreement is clearly marked on the verb, in spoken French few of these distinctions are pronounced. However, French has more tense distinctions than English (and the other Germanic languages), therefore Biberauer and Roberts argue that it is this tense morphology rather than subject agreement which triggers V-to-T movement in this case.

- (5) a. Haink eh gys e vooijer hene  
 came he to his people own  
 ‘He came to his own people’ (NE ch1v11)
- b. As haink ad gys Ean  
 and came they to John  
 ‘And they came to John’ (NE ch3v26)

Under current theoretical assumptions, rich inflectional morphology cannot be said to directly cause verb movement in the syntax. According to the minimalist programme (Chomsky 1995, 2000, 2001) movement is motivated by abstract syntactic features, such as EPP features, or in more recent work, edge features (Chomsky 2005). In addition if we assume a theory such as Distributed Morphology (Halle & Marantz 1993), whereby phonological features are inserted only at the point of spell out, the rich inflectional morphology will not be present in the derivation until the syntactic movement processes are complete. If the morphological information is not present in the syntax, it cannot cause movement (see Bobaljik 2002).<sup>2</sup>

An alternative view of the correlation between morphology and verb movement is that, although it plays no role in synchronic syntactic processes, rich inflectional morphology may act as a cue for the acquisition of verb movement. Dresher & Kaye (1990) argue that during language acquisition, in order to set their parameters, children look for specific pieces of evidence in the linguistic data. For each parameter, Universal Grammar (UG) provides a cue, a specific piece of structure that the children must find in the linguistic data in order to set that parameter positively. Lightfoot (1999) applies this cue-based approach to parameter setting to syntax. He argues that children set the verb-second (V2) parameter positively if they hear sufficient evidence of some constituent other than the subject appearing in front of the verb. The crucial evidence for a child learning Dutch are sentences such as those given in (6b), (6c) and (6d), where an object (*vele studenten*), a prepositional phrase (*in Amsterdam*) or an adverb (*vaak*) precedes the verb (*zagen*) and the subject (*wij*).

- (6) a. Wij zagen vele studenten in Amsterdam  
 We saw many students in Amsterdam
- b. Vele studenten zagen wij in Amsterdam  
 Many students saw we in Amsterdam
- c. In Amsterdam zagen wij vele studenten  
 In Amsterdam saw we many students
- d. Vaak zagen wij vele studenten in Amsterdam  
 Often saw we many students in Amsterdam’

(Lightfoot 1999:151)

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<sup>2</sup> If, as argued by Bobaljik & Thráinsson (1998), languages with rich inflectional morphology store these inflections as separate lexical items, and separate lexical items constitute independent syntactic feature bundles, then rich inflection may be detected by the syntax, even within a Distributed Morphology approach.

V-to-T movement can similarly be cued by syntactic evidence. If the child encounters sufficient examples where the verb appears to the left of VP-adverbs or negation this will enable her to set the V-to-T movement parameter positively.

The correlation between morphology and verb movement shown in the examples in (3) above could be explained if inflectional morphology is taken to be a cue for the acquisition of V-to-T movement. If the verb is consistently found with inflections that are associated with a particular functional head, this can be taken as evidence that the verb has moved to this functional position. Children acquiring French will encounter verbs with rich inflectional morphology, and so will set their V-to-T parameter positively. English children, on the other hand, will not encounter such morphology and so will not set the V-to-T parameter positively.

If both morphological and syntactic cues play a role in the acquisition of V-to-T movement, it is necessary to determine how they interact. The morphological cue is by no means necessary for the acquisition of V-to-T movement, as shown by languages such as Manx, which have no verbal inflection. This means that rich inflections cannot be the only evidence taken into account during acquisition. More problematically, all the languages that show rich inflection also satisfy the syntactic cue for V-to-T movement, with the verb appearing to the left of VP-adverbs and, in some cases, negation.<sup>3</sup> There are no known examples where V-to-T movement is acquired on the basis of morphological evidence alone. It seems most likely, in the case of V-to-T movement at least, that the morphological evidence simply reinforces the syntactic evidence, making the evidence for the parameter setting more robust.

The correlation between verb movement and agreement morphology is also present in the diachronic data. It has often been observed that the loss of morphology leads to a loss of movement (see Roberts 1985; Pollock 1989; Vikner 1997; Rohrbacher 1997). However, V-to-T movement is not lost as soon as the relevant morphology is lost. V-to-T movement can clearly be retained on the basis of syntactic evidence. In other words, it does not seem that the loss of verbal morphology directly causes the loss of verb movement; it is simply a contributing factor.

Although it seems to be the case that verb movement and morphology are in some way related, it is by no means clear what exactly this relationship is and how it should be formulated. This paper aims to shed some light on this issue by considering it from a different perspective. Instead of V-to-T movement, the focus here is on V-to-C movement and rather than examining the loss of verb movement, this paper looks at how it might develop and how this is related to the development of new morphology. Section 2 provides an introduction to the Old Irish verbal system, an existing generative analysis of these data and an influential philological account that has attempted to explain how the system developed. Section 3 combines the philological accounts with minimalist syntax to provide a new account of this development, whereby the development of V-to-C movement is shown to be linked to the development of new C-oriented verbal morphology. Section 4 concludes the paper.

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<sup>3</sup> Negation can only be a cue for V-to-T movement if the language in question expresses it as a VP adjunct. Luis Vicente (p.c.) points out that negation in Spanish and Italian appears in a high position above TP, and so cannot be a cue for V-to-T movement. This is also the case for Modern Irish.



## 2. The Old Irish verbal system

Old Irish (OIr) differs from other Indo-European (IE) languages in two main respects. First, as can be seen in the examples in (7) OIr has unmarked verb-initial word order. Secondly, OIr has a double system of verbal inflection. This means that the verb's morphological ending differs depending on the position of the verb in the clause. When the verb is in absolute initial position it has absolute inflection, as shown in (7a). When the verb is preceded by a conjunct particle (e.g. a negative or interrogative particle) it has conjunct inflection, as in (7b).<sup>4</sup>

- (7) a **Berid**                    in fer    in claideb  
      carries.3SG.ABS    the man the sword  
      'The man carries the sword'  
   b Ní **beir**                    in fer    in claideb  
      NEG carries.3SG.CONJ the man the sword  
      'The man doesn't carry the sword'

Verb-initial order is rare within the IE language family, especially outside of the Celtic branch, and the double system of verbal inflection is virtually unique to OIr.<sup>5</sup> The rarity of these features within IE, especially within the older IE languages, means that neither feature is reconstructed for Proto-Indo-European. However, OIr is clearly an IE language (see Fortson 2004 for a summary of the evidence) and so both of these features must have developed from the PIE verbal system. It has been proposed within the philological literature that the development of the double system of verbal inflection is related to the development of verb-initial order (Watkins 1963; McCone 1979; Sims-Williams 1984). A link has also been drawn synchronically between these two features. Before we consider how the verbal system developed, let us examine how the OIr data can be accounted for within minimalist syntax.

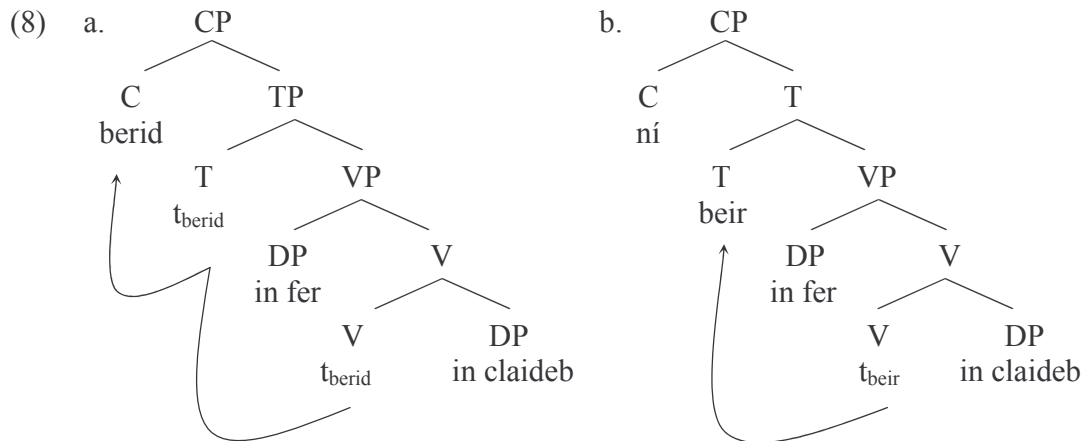
## 2.1 A synchronic account: Carnie, Harley &amp; Pyatt (2000)

Carnie, Harley & Pyatt (2000 – CHP) argue that the difference between absolute and conjunct inflection reflects a difference in syntactic position. CHP argue that OIr has a filled C requirement. When there is a negative, interrogative, or any other conjunct particle, this fills the C position and so the verb only moves as far as T. When no conjunct particle is merged in C, the verb is forced to move to this position as a result of the filled C requirement. Under this view,

<sup>4</sup> In addition to these simple verbs, OIr also has a large number of compound verbs, which consist of a simple verb compounded with one or more preverbs (particles etymologically related to prepositions). Compound verbs also show different forms depending on their position in the clause, with the stem rather than the ending showing the alternation. In absolute initial position the verb is deuterotonic, *do-beir* 'gives'. When preceded by a particle the verb is prototonic, *ní tabair* 'does not give'. The development of compound verbs will not be dealt with in this paper due to restrictions of space. For more details see Newton (in progress).

<sup>5</sup> There are traces of an absolute/conjunct distinction in Old Welsh. However, there is no longer a fully functional system as is found in OIr (see Evans 1964:118–9; Rodway 1998).

absolute inflection can be seen as a realisation of some kind of C feature on the verb, which is only present when the verb has moved to C.<sup>6</sup> The difference is shown schematically in the trees in (8) below, which represent the examples in (7):



CHP provide two main pieces of evidence to support this analysis, namely object pronouns and relative verbal forms. Object pronouns in OIr are enclitic and appear in second position. When the verb is in absolute initial position, the pronoun is suffixed to it. When the verb is preceded by a conjunct particle, the pronoun is infixed between the conjunct particle and the verb. This is shown in (9) below:

- (9) a. beirth-i  
 carries.3SG.ABS-it  
 ‘Carries it’ (Ml 42b7)
- b. Ní-m charat-sa  
 NEG-me loves.3PL.CONJ-EMPH.1SG  
 ‘They do not love me’ (Wb 5c6)

CHP argue that the object pronoun has a fixed position in the clause and marks the left edge of the TP. Therefore, as simple verbs precede the pronoun they must be in C.

CHP’s second argument comes from special relative verbal forms. One way to mark the relative in OIr is for the verb to have a special relative form, as shown in (10) below, where the non-relative form would be *gaibid*.<sup>7</sup>

- (10) is oinfer gaibes búaid  
 is one.man seizes.3SG.REL victory  
 ‘It is one man who seizes victory’ (Wb 11a4)

<sup>6</sup> Although CHP’s analysis accounts well for simple verbs, compound verbs are more problematic. See Newton (2005) and Adger (forthcoming) for details.

<sup>7</sup> See also example (18a) in section 3.1 below.

Relative marking is typically linked to the C position due to the similarity between relatives and interrogatives (Chomsky 1977). Therefore, the fact that only verbs in absolute initial position show these relative endings suggests that only simple verbs in absolute initial position are in the C position.

Although CHP's analysis is not problem-free (see Newton 2005, Adger forthcoming for details), for the remainder of this paper, it will be assumed, following CHP, that verbs in absolute position in OIr are in the C-position, and so OIr has V-to-C movement.

## 2.2 A philological account: the particle theory

Having established that a connection can be drawn synchronically between the position of the verb in OIr and its inflection, we will now go on to examine how these two features can be linked diachronically. There have been various accounts proposed for the development of the double system of inflection (see Russell 1995:49–55 and references therein). For the purposes of this paper we will focus on one of the most successful – the particle theory.

The main phonological difference between absolute and conjunct forms of the verb is that absolute forms are longer than conjunct. This can be seen in the paradigm of the verb *berid* 'carries' given in (11) below.

(11)	<b>Absolute</b>	<b>Conjunct</b>
	1sg <i>biru</i>	-biur
	2sg <i>biri</i>	-bir
	3sg <i>berid</i>	-beir
	1pl <i>bermai</i>	-beram
	2pl <i>beirthe</i>	-berid
	3pl <i>berait</i>	-berat

In the singular forms the absolute has an extra syllable. In the 1st and 2nd plural the absolute and conjunct have the same number of syllables, but the forms differ as the absolute has retained a final syllable, which the conjunct form has lost. Conversely, the absolute form has lost an internal syllable through syncope, which the conjunct form has retained (e.g. 1pl absolute *\*beromos>berØmai* vs. 1pl conjunct *\*beromos>beramØ*).

Cowgill (1975) proposes that the OIr conjunct forms developed from the PIE forms after the process of *\*i*-apocope, which deleted /i/ when it was word final, i.e. adjacent to a word boundary, as in (12):

(12)	<i>*bhereti&gt;*bheret&gt;-beir</i> 'carries.CONJ'
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The phonological form of the absolute endings can be explained if this process did not occur and the \*-i was preserved, as in (12).<sup>8</sup>

(13) \*bhereti>berid ‘carries. ABS’

Cowgill argues that the final \*-i was preserved due to the presence of an enclitic particle of the form \*es. The enclitic formed a phonological word with the verb, meaning that the final /i/ was no longer adjacent to a word boundary, and so the process of \*i-apocope could not apply. As this particle was enclitic it appeared in second position in accordance with Wackernagel’s Law (Wackernagel 1892). When the verb was in absolute initial position, the particle appeared in second position and so was suffixed to it, preventing apocope. When some other element was in initial position, for example a negative or interrogative particle, or some other conjunct particle, the particle cliticized to this and not to the verb. Therefore, when the verb was non-initial the final \*-i of the verb was subject to apocope, giving the paradigm in (10).

The particle theory accounts well for the phonological shape of the absolute and conjunct endings (although see McCone 1979, 1985 for arguments against it) and for the distribution of the forms. However, the particle theory has two major problems. First, Cowgill provides no plausible etymology for his particle \*es. Secondly, although the particle theory relies on the fact that the verb was in initial position, it offers no explanation as to how it got there. These problems are not insurmountable. By combining Cowgill’s particle theory with generative syntax we can solve these problems and provide a complete theory of the development of absolute and conjunct inflection.

### 3 The development of V-to-C movement

In section 2.1 it was argued, following Carnie, Harley & Pyatt (2000) that when the verb is in absolute initial position in OIr it is in the C position. Therefore, OIr has V-to-C movement. PIE, on the other hand, is generally reconstructed as a verb-final language (Fortson 2004:142). This suggests that the verb did not leave the VP, and so there was no V-to-C or V-to-T movement. However, the early IE languages do show some examples of verb-initial orders. In example (14a) from Vedic Sanskrit, the verb *átārisur* ‘cross’ is in initial position, preceding the subject. In (14b) from Homeric Greek, the verb *erētuseie* ‘curb’ of the second clause appears in initial position.

- (14) a. \* átārisur bharatṃ gavyáva<sub>c</sub> sám  
 cross Bharata cow-seeking together  
 ‘The cow-seeking Bharatas have crossed over’ (RV 3.33.12a/Hale 1995:193)
- b. \* êe cholon pauseien erētuseie te thumon  
 or wrath check curb and spirit.ACC  
 ‘Or he should check his wrath and curb his spirit’ (Il 1,192)

<sup>8</sup> Cowgill’s \*i-apocope was an early change. A further process of apocope, which affected all final syllables, occurred in the fifth century. It is this process of apocope which is shown in (11) and (12), where \*bheret>-beir and \*bhereti>berid. The retention of the final \*i in the absolute form meant that the /t/ was intervocalic. This provided the phonological conditions for lenition of /t/>/θ/ (spelled ‘d’). The presence of the final \*i also affected the vowel of the preceding syllable causing it to raise from /e/>/i/. See McCone 1996 for more details of these changes.

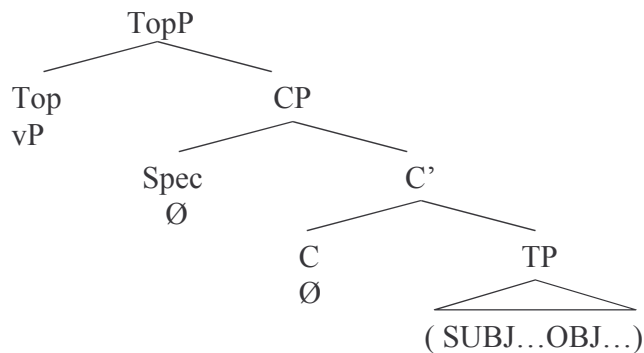
Examples such as these provide evidence that verb-initial orders should be reconstructed for PIE (Watkins 1977). However, there is an important difference between verb-initial orders in OIr and in other IE languages: verb-initial order in OIr is unmarked whereas fronting the verb in the other early IE languages seems to have a pragmatic or discourse effect. In the other IE languages, verb-initial orders are stylistically marked. Watkins (1963) observes that fronting the verb in these early IE languages had the same pragmatic effect as fronting a nominal.

‘For in such other Indo-European languages, where the normal position of the verb is sentence final [i.e. not OIr – GEN], any element, subject, object, prepositional phrase, etc. may be placed in the initial position for stylistic emphasis; the placing of the finite verb itself in this initial position is simply another case of the same emphasis.’  
(Watkins 1963: 5)

If fronting the verb has the same stylistic effect as fronting any other constituent we would expect verb fronting to target the same position and be a result of the same process as any other type of pragmatic fronting.

Hale (1987) argues that pragmatic fronting in Vedic Sanskrit involves movement of a phrasal category (an XP) to the specifier position of a topicalisation phrase (TopP) in left periphery of the clause (cf. Rizzi 1997). If, following Hale, we extend this analysis to PIE, then verb-initial orders in PIE should be analysed as movement of the whole verb phrase to Spec-TopP. This is shown in (15) below.<sup>9,10</sup>

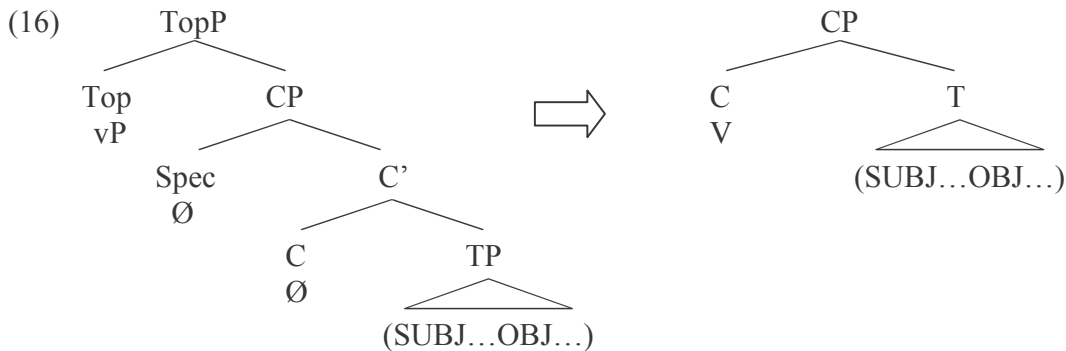
(15)



<sup>9</sup> A question that arises here is whether it is just the lexical VP that is fronted, or the whole vP. This issue is not relevant to the analysis presented in this paper, and so will not be discussed further (see Newton in progress for further details). For the remainder of the paper it will be assumed that it is the vP rather than the VP that fronts.

<sup>10</sup> Although the CP is empty in the tree in (15) there is good evidence for postulating two separate projections in the left periphery for the early IE languages. Hale (1987, 1995) observes that in Vedic topicalised elements appear to the left of interrogative and relative pronouns. From this he proposes that there must be two projections in the left periphery, a CP for hosting interrogative and relative pronouns, and a higher topicalisation phrase for topicalised constituents. See Newton (forthcoming) for further details.

So, the development of verb-initial order in OIr, viewed in the philological literature as the generalisation of a stylistically marked PIE order, can be described in generative terms as a reanalysis, whereby pragmatically motivated vP movement is reanalysed as grammatically motivated V-to-C movement. This is shown schematically in (16).



Having provided an account of how verb-initial order could have developed in OIr, we still need as explanation as to why this change should have taken place. Under the generative view, syntactic change is the result of children acquiring a different grammar from their parents. Roberts & Roussou (2003) argue that during language acquisition children postulate the simplest grammar consistent with the evidence they encounter. Roberts & Roussou define simplicity in the following way:

- (17) 'A structural representation R for a substring of input text S is simpler than an alternative representation R' iff R contains fewer formal feature syncretisms than R'.'  
(Roberts & Roussou 2003:219)

An XP will contain more internal structure, and therefore more formal features than a single head. On the assumption that when an element is moved it is copied and remerged higher in the structure, the movement of an XP will involve the duplication of more features, and so make the structure more complex than the movement of a head. As a result, moving an XP is more costly than moving a head. When children are acquiring their grammar, then, if the evidence is ambiguous, they will analyse a moved element as a moved head rather than a moved XP.<sup>11</sup>

The crucial point to note is that although the reanalysis is motivated by the simplicity metric, it will only take place if the evidence is ambiguous between vP and verb movement. In order for this to be the case there are certain conditions that must be met. These conditions are listed below:

- (18) a. The C position must contain no phonologically overt element that will prevent the learner reanalysing the fronted verb in the Topic position as a C element.  
b. The specifier of CP must be empty. It must contain no phonologically overt material.  
c. Pragmatic vP-fronting must be sufficiently frequent.  
d. Pragmatic vP-fronting must be of a remnant rather than a full vP.

<sup>11</sup> See also van Gelderen's (2005) Spec to Head Principle: 'be a head rather than a phrase'.





Both of these types of relative marking can be shown to have developed from an uninflected, enclitic relative particle of the form *\*io* (see Watkins 1963; McCone 1980 for details). However, the etymology of this particle is not entirely clear. McCone (1980) argues that this relative pronoun developed from a connective particle, cognate with Hittite *ya*. However, this seems to ignore the similarity in form between the proposed Celtic form *\*io* and the inflected PIE form *\*io-*. A possible alternative is that the inflected PIE relative became grammaticalised in Celtic, changing from an inflected relative pronoun in Spec-CP to an uninflected relative marker appearing in the C head (see van Gelderen 2005 for a similar proposal on the development of *that* in English). We will leave this issue for further research. Whatever the origins of the Celtic uninflected relative marker, as discussed in section 2.1 above, relative marking is a property of C. Therefore, it seems likely that wherever this particle came from, by the pre-OIr period it would have appeared in the C position.

To summarise this section, it has been argued that PIE had no complementizers and so condition (18a) was met. On the other hand, condition (18b) was not met in PIE as, based on evidence from the non-Celtic early IE languages, it had an inflected relative pronoun that would have appeared in Spec-CP. It seems that this inflected relative pronoun was lost in Celtic and so in pre-OIr Spec-CP would have been empty and condition (18b) would have been satisfied. However, in place of the relative pronoun it seems that pre-OIr had an uninflected relative particle *\*io* and that this was most likely associated with the C position. By the pre-OIr period, then, condition (18b) was met, as Spec-CP was empty, but condition (18a) was not, as C had become filled. At this stage the reanalysis cannot have taken place. Some other change must have occurred to allow the reanalysis to take place. We will return to this issue below. For now, let us go onto conditions (18c)–(e) as listed above.

### 3.2 Pragmatic verb fronting

In section 2.2 above it was argued that there were two major problems with the particle theory: first no etymology was given for the particle *\*es*; secondly there was no explanation for the increase in verb fronting. Schrijver (1994, 1997) provides a possible solution for the first problem. Schrijver argues that the particle *\*es* can be shown to have developed from particle of the form *\*eti*, a main clause connective cognate with Latin *et*.<sup>17</sup> For this particle to have had such a significant effect on the morphology of the verb it must have been very common. Schrijver observes that in the early IE languages there is a tendency to use a particle to express the link between clauses overtly. Watkins (1963) observes that in Hittite the connective *nu* is found at the beginning of almost every clause. Watkins also gives an example from Archaic Latin that shows extensive use of the connective *-que*. Schrijver (1997) also proposed that in Middle Welsh the connective *ac* joins almost every clause. If this was also the case in OIr or its predecessor, then we have a possible explanation for why this particle came to be used so frequently that it could have affected the verbal inflections.

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<sup>17</sup> Of course, unlike the Celtic particle *\*es*, Latin *et* is not enclitic and appears in clause initial position. Therefore, an explanation as to how the IE predecessor to these particles changed from an initial position particle to a second position enclitic is necessary. Such an account is provided by Schrijver (1994, 1997).

It seems, however, that using a connective was not the only way that the connection between clauses could be marked. Dressler (1969) argues that fronting the verb in the early IE languages could have a cataphoric or anaphoric effect linking two clauses together. Such an occurrence of verb fronting is seen in the example from Homeric Greek in (14b) above, repeated as (20) below. The main verb of the second clause *erêtuseie* ‘curb’ is fronted to the beginning of the clause in order to mark the connection between the two clauses.

- (20) êe cholon pauseien erêtuseie te thumon.  
 Or wrath.ACC check curb and spirit.ACC  
 ‘Or he should check his wrath and curb his spirit’ (Il 1, 192)

The example in (20) is particularly interesting because it shows that it was possible to use both strategies for clause linking together. Not only is the verb fronted in the second clause, but there is also a connective particle *te* in second position. In order for the connective particle *\*eti* to have become verbal morphology this must have also been the case in pre-OIr. One way to explain this development in pre-OIr is that, like the Hittite connective *nu*, the particle *\*eti* became used so frequently that it was bleached of its connective meaning. As a result of this bleaching there was an increase in vP fronting to TopP in order to reassert the link between clauses. As vP initial clauses increased in frequency, this led to further bleaching of vP fronting, causing the connective force to be lost and the fronted verb to become susceptible to reanalysis

To sum up this section, it seems that both problems with the particle theory can be overcome if we adopt Schrijver’s etymology for the particle *\*es*. Building on the idea that the link between clauses had to be overtly marked in pre-OIr, we have an explanation as to why the clitic particle *\*es* was so prolific, and also why there was an increase in frequency of verb fronting. In this section we have provided a possible explanation for how conditions (18c) and (18e) were met, namely why there was an increase in vP fronting, and how this vP fronting became bleached of its stylistic function. In the next section we will discuss condition (18d).

### 3.3 Remnant vP fronting

Condition (18d) for the reanalysis of vP fronting as V-to-C movement is that the fronted vP must be a remnant rather than a full vP. If the subject and the object do not move out of the vP before it is raised, then they will all appear in the left periphery, thus providing clear evidence to the learner that it is the whole vP that has raised and not just the verb. In Vedic Sanskrit we find examples of this kind, such as those in (21) where the verb and the object seem to have been fronted together. This supports the hypothesis that verb fronting in the other early IE languages involves fronting of more than just the verb.

- (21) a. \* gāvā, gotrām udásĒijo yád aṅgira,  
 cows.GEN.PL herd.ACC.SG up-released when Angiras.VOC.SG  
 ‘When you released the herd of cows, O Angiras’ (RV 2.23.18b/(84) Hale 1995:194)

- b. \* hári indrasya ní cikāya ká svit  
 steed ACC.PL of indra perceived who.NOM.SG EMPH  
 ‘Who has perceived the two steeds of Indra’ (RV 10.114.9d/(12) Hale 1987:42)

However, in most cases of verb-initial word order in the early IE languages, only the verb appears at the beginning of the clause. This suggests that vP fronting in the early IE languages, and therefore in PIE, involves fronting of a remnant vP. From what we know of the syntax of PIE this seems a reasonable suggestion. PIE and OIr are both null subject languages and pronoun objects appear as second-position clitics. Whenever the subject and object are pronouns then, the vP will contain only the verb. Another point to bear in mind is that word order in the early IE languages was very variable. This variability can be accounted for if we assume that there are many pragmatically or stylistically motivated movement processes. If the early IE languages, and by hypothesis PIE involved many movement processes, it does not seem unreasonable to suggest that the object and subject would have moved out of the vP, for either stylistic or grammatical reasons.

### 3.4 The status of the sentential clitics

To sum up the situation so far, we have argued that the Spec-CP position of the clause in pre-OIr was empty due to the lack of inflected relative pronouns. However, the C position could be filled by the enclitic relative marker *\*io*. We have also proposed that the combination vP+\*eti appears at beginning of almost every (main) clause, as a way of expressing the link between clauses. Following Hale (1987, 1995) it has been argued that the fronted vP appears in the Spec-TopP position, however, we have not yet determined the exact position of the clitic connective particle *\*eti*.

Hale (1995) argues that in Vedic and PIE connective clitics are placed by prosodic inversion (Halpern 1995). The connective clitics are adjoined to the left of the second conjunct during the syntax. Then, if no appropriate phonological host is provided by the syntax, the clitics move to the right of the initial prosodic word during the phonology so that they have a phonological host to their left. The evidence Hale provides for this is that in Vedic Sanskrit and Greek, as shown in example (22), connective clitics appear between topicalised phrases in TopP and relative or wh-phrases in Spec-CP. This means that in the early IE languages and PIE the connective clitics cannot be in the C position.

- (22) stúta~ ca yus tvā vārdhanti mahé ṛdhase nĕmīya  
 praise-songs and which you increase great giving heroism  
 ‘And which praise-songs fortify you for great giving and heroism’  
 (RV 8.2.29ab/Hale 1995: 266)



### 3.5 From clitic to affix

In order for condition (1) to be met and the fronted vP to be reanalysed as V-to-C movement, the particle in C must change in status from a clitic to an affix. This type of change, from clitic to affix, is a common case of grammaticalisation (see Hopper & Traugott 1993). In spite of the fact that this type of change is so common, little work has been done to show exactly how it proceeds. Before we can determine whether a clitic has become an affix we need a clear idea about what the distinction between a clitic and an affix is. Zwicky & Pullum (1983:504–5) provide criteria for making this distinction:

- (24) a. Clitics can exhibit a low degree of selection with respect to their hosts, while affixes can exhibit a high degree of selection with respect to their stems  
 b. Arbitrary gaps in the set of combinations are more characteristic of affixed words than of clitic groups  
 c. Morphophonological idiosyncrasies are more characteristic of affixed words than of clitic groups  
 d. Semantic idiosyncrasies are more characteristic of affixed words than of clitic groups  
 e. Syntactic rules can affect affixed words, but cannot affect clitic groups  
 f. Clitics can attach to material already containing clitics, but affixes cannot.

These criteria, as set out by Zwicky & Pullum, are designed to help the linguist determine whether a grammatical entity is a clitic or an affix. Fuss (2004) proposes that children might use something similar during language acquisition to determine whether a certain element should be analysed as a clitic or an affix. Let us relate this idea to OIr.

In section 2.3 it was argued that the main motivation behind the existence of this particle *\*es* was to explain the lack of *\*i*-apocope in verbs in initial position. The fact that this particle prevented apocope does not provide any evidence as to whether it is a clitic or an affix. Apocope is a phonological process and so takes place in the phonological component where a fronted vP and a clitic make up a single phonological word in the same way as a verb and an affix. However, after this apocope has taken place, verbs that appear with *\*eti* have a different stem to verbs without *\*eti*. The verbal form that appears with *\*eti* will have a final *\*-i*, whereas the forms that do not occur with *\*eti* will not have this *\*-i*, as it will have been apocopated. This means that after apocope the particle *\*eti* appears to condition a stem alternation. According to Zwicky & Pullum's condition (24c) above, this is a property of affixes and not clitics. In addition, due to the frequency of remnant vP fronting, the *\*eti* particle virtually always appears with a verb. Appearing consistently with the same type of host, according to Zwicky & Pullum's condition (24a) is again a property of affixes rather than clitics. On the basis of this evidence, then, children reanalyse *\*eti* particle as an affix.

Affixes attach to heads, and not to phrases, therefore the change from vP fronting to V-to-C movement cannot have occurred after the change in the status of the particle. Similarly, the reanalysis of the fronted vP as V-to-C movement cannot have taken place before the reanalysis of the clitics as affixes, because at that point the C position would have been filled and blocked the reanalysis. Therefore, it seems that the two changes must have been simultaneous. V-to-C movement in OIr developed at the same time as the first stage of the development of absolute morphology, namely the reanalysis of a clause marking clitic as a verbal affix.



#### 4. Conclusion

This paper has proposed a new account of the development of absolute and conjunct inflection in OIr. By combining Cowgill's particle theory with ideas from generative syntax the major objections to the particle theory have been overcome and a full account of how the double system of verbal inflection and verb-initial word order developed has been provided. The development of head movement in OIr as described here seems to be intrinsically linked to a morphological development. V-to-C movement in OIr develops in conjunction with C-related morphology. Viewed in terms of a cue-based theory of acquisition, V-to-C movement developed in conjunction with a morphological cue.

What is important here is that, although the development of V-to-C movement in OIr can be linked to the development of a morphological cue, this link does not seem to be causal. The morphological change is one of a number of changes that were necessary for vP fronting to be reanalysed as V-to-C movement. Furthermore, although the morphological development was necessary for the development of V-to-C movement in OIr, this is not always the case. Verb-second (V2) in Germanic involves verb movement to the C position (den Besten 1977) however, there is no V2 specific morphological marking.

Although the morphological change did not cause the syntactic change, this does not rule out the possibility that the new morphology, linking the initial verb to the C position, may act as a cue for the acquisition of V-to-C movement for subsequent generations. It was argued in section 1 that in the case of V-to-T movement the status of inflectional morphology during language acquisition is not clear as it cannot be shown that V-to-T movement is ever acquired on the basis of morphology alone without the presence of a syntactic cue. If it can be shown that the C-based morphology is the only relevant evidence used in the acquisition of V-to-C movement in OIr, then we have clear evidence that morphology does play a role in the acquisition of verb movement. For this to be the case there must be no relevant syntactic trigger that marks verb movement in OIr as V-to-C movement rather than V-to-T movement.

As discussed in section 1, Lightfoot (1999) proposes that V-to-C movement in V2 languages is acquired on the basis of syntactic evidence. However OIr is clearly not V2, so this syntactic cue cannot be at play here. Let us consider some further possibilities. The first possible cue for V-to-C movement could be clauses where the verb precedes the subject. However, this cannot be a sufficient cue for the acquisition of V-to-C movement as the verb precedes the subject in Modern Irish and Welsh, but the verb only moves as high as T in these languages (McCloskey 1996; Roberts 2005)

The second option is that children could use the evidence from the position of object clitic pronouns to determine where the verb moves to. As discussed in section 2.1, this is an important diagnostic used by Carnie, Harley & Pyatt (2000). It is unclear, however, how much use is made of clitic pronouns during language acquisition. Clitic pronouns appear in a variety of positions and it seems that they can be positioned in a number of ways, syntactically or phonologically. This suggests that they would not be reliable as a cue for the position of the verb. Of course, this needs to be verified by acquisition studies.

The third possibility is that children use evidence that the verb is in complementary distribution with the complementizer or other elements that fill C. It was argued above that pre-



OIr had no complementizers, other than the clause marking particles *\*eti* and *\*io* that were reanalysed as verbal affixes. However, by the time OIr is attested it clearly does have complementizers. Newton (forthcoming) argues that complementizers seem to have developed fairly recently in the history of OIr, shortly before the first attested texts. Newton (in progress) argues that the OIr complementizers developed at the same time as V-to-C movement, as part of the reanalysis of elements in Spec-TopP as C heads. If this is the case, then it seems that, like V-to-T movement, V-to-C movement is not cued by morphology alone and we still have no conclusive evidence for the role of morphology as an independent cue in the acquisition of verb movement.

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#### Abbreviations

- I *Iliad* (translated by A. T. Murray (1999). Harvard University Press, London)  
 MI Milan Glosses (W Stokes & J Strachan (ed.) (1987). *Thesaurus Palaeohibernicus*. Dublin)  
 NE *Yn Sushtal Scruiit liorish yn Noo Ean (St John's Gospel)* (1936). The British and Foreign Bible Society, London.  
 RV *Rig Veda* (T. Aufrecht (ed.) (1877). *Die Hymnen des Rigveda*. Marcus, Bonn)  
 Wb Würzburg Glosses (W Stokes & J Strachan (ed.) (1987). *Thesaurus Palaeohibernicus*. Dublin)

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# Plurality, Implicatures and Events

Eytan Zweig

This paper presents a semantics for bare plurals in English, in their indefinite reading. It focuses on an old problem - dependent plurality - from a new perspective, bringing it together with recent work on the semantics of plurality in non-dependency contexts (Krifka 2003; Sauerland 2003; Sauerland et al. 2005). In doing so, it shows that there is no need for a separate mechanism for dependent plurality; rather, a plurality implicature can account for the behavior of bare plurals in all environments. A formalization of this implicature will be suggested, building on work by Schein (1993).

## 1. Introduction

While much of the work on bare plurals in English has focused on the fact that they often denote kinds, they also have a second reading where they denote indefinites. However, ever since Chomsky (1975), it has been known that taking this reading to be simply the plural counterpart of the singular indefinite cannot be the full story. Instead, bare plural noun phrases that fall in the scope of another plural get a reading that is unexpected if they simply meant ‘more than 1 N’. This phenomenon has been named **dependent plurality** by de Mey (1981). The dependent plurality reading is demonstrated in the following sentence pair:

- (1) a. Male lions have a mane.  
b.  $\forall x[\text{LION}(x) \rightarrow \exists y[|y| \geq 1 \ \& \ \text{MANE}(y) \ \& \ \text{HAS}(x)(y)]]$
- (2) a. Male lions have manes.  
b.  $\# \forall x[\text{LION}(x) \rightarrow \exists y[|y| > 1 \ \& \ \text{MANES}(y) \ \& \ \text{HAS}(x)(y)]]$

Abstracting away from issues of genericity, (1a) corresponds to the logical form in (1b). By analogy, (2a) may be expected to have the logical form in (2b) - i.e., if something is a lion, it has (a plurality of) manes. Clearly, however, this is not the case. Instead, speakers of English uniformly take (2a) to be true, even though they know that no lion possesses more than one mane.

At the same time, contrary to Chomsky's original proposal, it is not the case that the dependent plural can be treated as a purely morphological plural that is semantically identical to the singular. For example:

- (3) Ten students live in New York boroughs.  
 (4) Ten students live in a New York borough.

(3) is a case of dependent plurality, as it can be true if there are ten students, each of which has only a single dwelling place which is in one of the New York boroughs – for example, if five of them live in Manhattan and five in Brooklyn. Replacing the object with a singular DP (4) results in a sentence that is also true in such a scenario. However, if all the ten students in question live in the same borough (for instance, Manhattan) (3) would not be judged true, unlike (4).

Informally speaking, a sentence has a dependent plural reading when it contains a plural NP that can be interpreted as if it were singular within the scope of another plural element in the sentence; yet at the same time, there must be more than one thing which it refers to overall.

## 2. *Are dependent plurals cumulative readings?*

A well-known phenomenon that seems to be closely related to dependent plurality is the existence of cumulative readings, such as familiar from numerical indefinites:

- (5) a. Three women gave birth to five babies.  
       b. *A total of 3 women gave birth to babies, and a total of 5 babies were born.*  
 (6) a. Ten judges presided over a thousand cases last year.  
       b. *A total of 10 judges presided over cases, and a total of 1000 cases were presided over.*

This has been the basic line of inquiry taken by de Mey (1981), Roberts (1990) and Beck (2000), among others. While these works disagree on how to implement cumulativity (in fact, Roberts (1990) seeks to assimilate the phenomenon of cumulativity itself into collective readings), they all share the insight that dependent plurality and cumulativity are very similar. This can be easily demonstrated by the following minimal pair:

- (7) Three women gave birth to babies.  
 (8) Three women gave birth to more than one baby.

The most natural reading of (7) is a dependent plural reading, while (8) is most readily understood with a cumulative reading (as opposed to the reading in which each of the women had at least twins, which is also available but less salient). Both seem to mean the same thing. Taking into account the fact that (8) seems to be an explicit spellout of the 'more than 1 N' reading that the bare plural is otherwise expected to have, it is not surprising that it is tempting to take cumulative and dependent readings to be manifestations of the same phenomenon.

Indeed, there is large overlap in the environments in which both dependent plural and cumulative readings are possible. In such environments, it could well be that the cumulativity mechanism also gives rise to the dependent plural readings. However, dependent plural readings are possible in environments where cumulative readings are not possible for numerical indefinites.

One such environment is in the scope of the quantifiers *most* and *all*. In both the following pairs, the first sentence lacks a cumulative reading but the second sentence allows for a dependent plural reading:

- (9) a. Most students read thirty papers.  $\nRightarrow$   
*Most students read at least 1 paper, and a total of 30 papers were read overall.*
- b. Most students read papers.  $\Rightarrow$   
*Most students read at least 1 paper, and more than 1 paper was read overall.*
- (10) a. All the students read thirty papers.  $\nRightarrow$   
*All the students read at least 1 paper and a total of 30 papers were read overall.*
- b. All the students read papers.  $\Rightarrow$   
*All the students read at least 1 paper and more than 1 paper was read overall.*

A second environment in which dependent plural readings can be found but cumulative readings do not exist is when the other plural denoting element in the sentence is not a quantified DP but rather an adverbial. (11b) (adapted from de Mey 1981) is an example of a dependent reading with an adverbial element; (11a) does not have a parallel cumulative reading. (12b) and (12a) show the same for a locative adverbial:

- (11) a. Three trains leave every day to Amsterdam from this station.  $\nRightarrow$   
*At least 1 train leaves every day, and a total of 3 trains is involved overall.*
- b. Trains leave every day to Amsterdam from this station.  $\Rightarrow$   
*At least 1 train leaves every day, and more than 1 train is involved overall.*
- (12) a. Three king sized beds can be found in every room.  $\nRightarrow$   
*At least 1 bed in every room, and a total of 3 beds is involved overall.*
- b. King sized beds can be found in every room.  $\Rightarrow$   
*At least 1 bed in every room, and more than 1 bed is involved overall.*

The availability of dependent plurals in environments in which cumulative readings do not seem to be an option shows that the former cannot simply be a sub-case of the latter. Therefore, some other account must be provided for the availability of dependent plural readings.

### 3. The overall plurality requirement

A second approach to dependent plurality in the literature, which dates back to Chomsky (1975) and has had more recent incarnations in Kamp & Reyle (1993) and Spector (2003) accounts for dependent plurality by claiming that the bare plural in the relevant sentences is semantically identical to the singular, except in that it is obligatorily low-scope. This approach gives the right distributive behavior, but does not explain the overall plurality requirement.



To see if such a theory can serve as the basis of an explanation of dependent plurality, then, it is necessary to understand the plurality requirement.

(4) above already showed that dependent plurals may carry an overall plurality requirement. It is easy to find many more such examples:

- (13)
- a. My friends own German cars.  $\Rightarrow$   
*More than 1 car is owned overall*
  - b. The men saw beautiful women.  $\Rightarrow$   
*More than 1 woman was seen overall*
  - c. Three students were reading linguistic books.  $\Rightarrow$   
*More than 1 book was read overall*
  - d. The children enjoyed seeing whales.  $\Rightarrow$   
*More than 1 whale was seen overall*
  - e. Exactly ten rabbits hid behind bushes.  $\Rightarrow$   
*More than 1 bush hid rabbits overall*
  - f. John usually rides taxis to work.  $\Rightarrow$   
*More than 1 taxi is involved overall*
  - g. Comets grace our night sky every decade  $\Rightarrow$   
*More than 1 comet shows up overall*

However, there are sentences that contain bare plurals that allow singular distribution, but do not feature such a requirement:

- (14)
- a. Few men ate apples  $\nRightarrow$   
*more than 1 apple was eaten overall*
  - b. Israel's olympic team almost never won medals  $\nRightarrow$   
*more than 1 medal was won overall*
  - c. You must consult relevant articles.  $\nRightarrow$   
*more than 1 article overall must be consulted*
  - d. If my opponents crash into trees, I will win the ski race.  $\nRightarrow$   
*more than 1 tree must be crashed into overall for me to win*
  - e. Do all your friends like cooking shows?  
# No, they all like 'The Frugal Gourmet'.  
Yes, they all like 'The Frugal Gourmet'.

These environments, in which the plurality requirement does not apply, are hardly unfamiliar. In the same environments, conversational implicatures are similarly absent. Taking two well-known examples of conversational implicatures, numerals normally carry an 'exactly' implicature, while *some* typically implies 'not all':

- (15) Most men saw three movies  $\Rightarrow_{impl}$   
*Most men saw exactly 3 movies.*
- (16) Most men saw some movies  $\Rightarrow_{impl}$   
*Most men saw some but not all of the movies.*

However, in the same environments as listed above, conventional implicatures are not available:

- (17) a. Few men ate three apples.  $\nrightarrow_{impl}$   
*Few men ate exactly 3 apples.*
- b. Israel's olympic team almost never won three medals.  $\nrightarrow_{impl}$   
*Israel's olympic team almost never won exactly 3 medals.*
- c. You must consult three relevant articles.  $\nrightarrow_{impl}$   
*You must consult exactly 3 relevant articles.*
- d. You must consult some relevant articles.  $\nrightarrow_{impl}$   
*You must consult some (but not all) of the relevant articles.*
- e. If my opponents crash into two trees, I will win the ski race.  $\nrightarrow_{impl}$   
*If my opponents crash into exactly 2 trees, I will win the ski race.*
- f. Do all your friends like two cooking shows?  
 # No, some of them like more than two.  
 Yes, and some of them even like more than two.
- g. Did those men share some pizzas?  
 # No, they shared all of the pizzas.  
 Yes, they shared all of the pizzas.

A further similarity between conversational implicatures and the plurality requirement is that, even in upwards entailing environments, they can be canceled when the pragmatic conditions are appropriate:

- (18) [FBI investigator:] Some suspects live in big cities, perhaps even all of them.
- (19) [FBI investigator:] All the suspects live in big cities, perhaps even the same big city.

Also, conversational implicatures and the plurality requirement of dependent plurals both hold in non-monotone environments:

- (20) Exactly three guests ate steaks.  $\Rightarrow_{impl}$   
*More than 1 steak was eaten overall*
- (21) Exactly three guests ate two steaks.  $\Rightarrow_{impl}$   
*Exactly 3 guests ate exactly 2 steaks.*

I propose, then, that the plurality requirement falls under the umbrella of generalized conversational implicature. Note that this is a descriptive claim, independent of the particulars of how conversational implicatures are best accounted for.

In summary, it seems that dependent plurality is best accounted for as follows:

- (22) Bare plurals have a number-neutral denotation similar to that of indefinite singulars, except that they also come with a plurality implicature.

A possible question in this point is how does the 'more than 1 N' reading that plurals are intuitively taken to have fit into the picture? Given (22), it becomes apparent that it does not exist as a separate reading. If bare plurals were ambiguous between a number-neutral and a

‘more than 1 N’ reading, then, when embedded under negation they should also allow for a ‘not more than 1 N’ reading in addition to the ‘no N’ reading - but as discussed above, this reading is unavailable. The same holds for other downwards-entailing environments. On the other hand, in upwards and non-monotone environments, satisfying the truth conditions for a putative ‘more than 1 N’ reading would also automatically satisfy the truth conditions for the number neutral + plurality implicature reading. Thus, since we independently know we need the latter reading, there is no reason to posit ambiguity.

#### 4. *Number-neutral bare plurals outside dependent plurality*

So far, I have shown that dependent plurals provide empirical support to the idea that bare plurals are in some sense number-neutral. Further support for this position can be found in recent work that makes similar proposals based on evidence outside the context of dependent plurals.

Both Krifka (2003) and Sauerland et al. (2005) discuss cases in which there is only one plural in a sentence, and show that in environments similar to the ones outlined in the previous section, bare plurals do not seem to evoke a plurality requirement:

(23) John doesn't own small cars.

(23) clearly does not mean ‘John does not own more than one car’, and is false if John owns a single small car.

While Krifka (2003) is mainly concerned with aspects of bare plurals that go beyond the concerns of this paper (such as kind readings), the discussion in Sauerland et al. (2005), like the present work, uses an implicature to explain why plurals in sentences such as (24) cannot be used to express singular reference:

(24) John owns small cars.

The nature of the implicature proposed by Sauerland et al. however, is different than the one argued for here. According to Sauerland and his co-authors, the plural and singular are identical in truth-conditional meaning, but the singular presupposes that it refers only to a singular atomic entity, while the plural carries no presuppositions. Furthermore, they claim that competing morphemes interact based on a pragmatic principle called *maximize presupposition*, which was first introduced in Heim (1991). This principle says that when choosing between two morphemes, the one whose stronger presuppositions can be satisfied must be chosen. Since only the singular is argued to have a presupposition, this means that if the singular can be used, it must be used. Which means that if the plural was used, a conversational implicature arises that the singular could not have been used in that context.

While this seems to work well in the sentences that involve one plural, this makes the wrong predictions for dependent plural cases where singulars are often also appropriate:

(25) Most of my friends own a nice car.

(26) Most of my friends own nice cars.

In a situation where most of my friends only own a single car (and the others own no cars at all), (25) is appropriate; therefore, Sauerland et. al's reasoning predicts that (26) should be unavailable. However, both are perfectly fine in this context, ruling out an explanation by lexical blocking.

On the other hand, the approach taken by the present paper, wherein the number-neutral plural is supplemented by an implicature of a total plurality, rather than of non-local singularity, can account for the single plural data as well. (24) can be paraphrased as below:

(27) John owns at least 1 small car, and more than 1 small car is owned overall.

Since there is no quantification in this sentence that can result in a plural amount of cars except the cars actually owned by John, the plurality implicature means that John owns several cars.

### 5. Formulating the plurality condition

We have seen that the plurality requirement of bare plurals is best thought of as a conversational implicature, and that this works both in cases where there is another plural present (i.e., dependent plurals), and in cases where the bare plural is alone. What remains is to state what the implicature actually is.

Even though we have shown that dependent plurality is not the same phenomenon as cumulativity, we can still make use of ideas that originated in the study of the latter phenomenon. Specifically, Schein (1993) accounts for (some) cumulative readings by decomposing their meanings into a conjunction, which can be represented as below:

(5a) Three women gave birth to five babies.

(28) Three women gave birth to babies, and five babies were born *therein*

Of interest to us is the element *therein*. This is a definite description over events, that refers back to the events in the first conjunct:<sup>1</sup>

(29) *therein* =<sub>def</sub> In the relevant second-order event that contains the plural element.

We can make use of a similar element to formulate the plurality condition. Assuming, following Carlson (1980), that bare plurals will not undergo QR, we arrive at the following LF:

(30) a. My friends have big heads.  
 b. *assertion*:  $\exists E \forall x [\text{MY FRIEND}(x) \rightarrow \exists e \in E [x \text{ has 1 or more big heads in } e]]$   
*implicature*: |**big heads therein**| > 1

The same condition gives the right truth conditions even if there is only one plural in the sentence:

(31) a. John owns expensive cars.

<sup>1</sup>Schein models this analysis after E-type analyses of donkey anaphora.

- b. *assertion*:  $\exists E[\exists e \in E[j \text{ owns 1 or more expensive cars in } e]]$   
*implicature*:  $|\mathbf{expensive\ cars\ therein}| > \mathbf{1}$

Similarly, it accounts for cases where a quantifying adverb is involved:<sup>2</sup>

- (32) a. John frequently reads horror novels.  
 b. *assertion*:  $\exists E[\text{FREQUENT}(E) \ \& \ \forall e \in E[j \text{ reads 1 or more horror novels in } e]]$   
*implicature*:  $|\mathbf{horror\ novels\ therein}| > \mathbf{1}$

In a downwards entailing environment, the assertion follows the similar model, but the implicature will be suppressed:

- (33) a. My friends didn't eat tacos.  
 b. *assertion*:  $\exists E\forall x[\text{MY FRIEND}(x) \rightarrow \neg\exists e \in E[x \text{ ate 1 or more tacos in } e]]$   
*implicature*: *none*

### 5.1. Intervention effects

However, the story provided above is not sufficient, for there is one additional aspect of the plurality condition which has not yet been discussed - it is subject to intervention effects.

To see this, it is necessary to look at a sentence where more factors are in play:

- (34) All the boys gave a girl flowers.

Our discussion so far, taking the plurals to be number neutral and the plurality implicature to apply at a sentential level, results in the reading (35), which is not a reading of (34):

- (35) # *All the boys are such that each gave (at least) 1 girl (at least) 1 flower, and more than one flower was given overall*

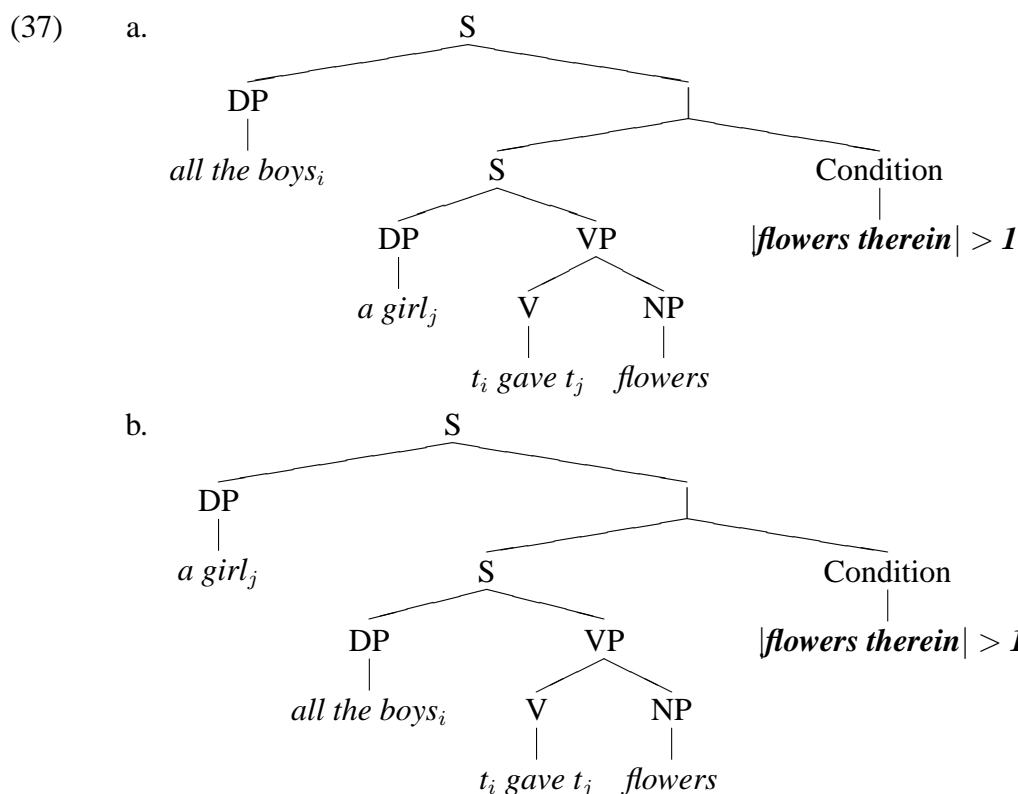
Instead, the two readings of (34) are as follows:

- (36) a. *All the boys are such that each gave (at least) 1 girl (at least) 2 flowers*  
 b. *There is (at least) 1 girl such that all the boys each gave her (at least) 1 flower*

The plurality implicature here seems to apply at an intermediate level, schematized in the two structures below:

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<sup>2</sup>This LF should not be taken as any form of theory of adverbial quantification, but should be considered a very rough approximation. I'm assuming that any such theory would have to provide a structure similar in the relevant ways.



Thus, intermediate quantifiers seem to create domains for the plurality implicature.

Schein (1993) argues on independent grounds that DPs that undergo QR are followed by quantification over events.<sup>3,4</sup>

We get the following LFs for the sentence in its two readings (36a) and (36b) respectively:

- (38) a.  $\exists E_1 \forall x [\text{BOY}(x) \rightarrow \exists e_1 \in E_1 [\text{AG}(e_1)(x) \ \& \ \exists E_2 \subseteq E_1 \exists y [\text{GIRL}(y) \ \& \ \exists e_2 \in E_2 [e_2 \leq e_1 \ \& \ \text{TO}(e_2)(y) \ \& \ \text{GAVE A FLOWER}(e_2)]]]]]$
- b.  $\exists E_1 \exists x [\text{GIRL}(x) \ \& \ \exists e_1 \in E_1 [\text{TO}(e_1)(x) \ \& \ \exists E_2 \subseteq E_1 \forall y [\text{BOY}(y) \rightarrow \exists e_2 \in E_2 [e_2 \leq e_1 \ \& \ \text{AG}(e_2)(y) \ \& \ \text{GAVE A FLOWER}(e_2)]]]]]$

Each sentence has two second-order variables over events within it,  $E_1$  and  $E_2$ . This is important to solving the problem of providing the correct readings to this sentence. To see this, note that in both cases, it is possible to account for the intervention effects if the plural amount of flowers is required to be present in the (complex) event described by  $E_2$ . In other words,  $E_2$  contains the relevant domain for the plurality effect - in (38a),  $E_2$  is the events of giving a girl one or more flowers for each boy. in (38b),  $E_2$  stands for the total event of receiving flowers from a boy, for the girl in question.

<sup>3</sup>The discussion that follows is a drastic oversimplification of Schein's proposals and fails to do it justice. A full implementation of Schein's system would also produce the correct results, but is beyond the scope of this paper.

<sup>4</sup>For the sake of simplicity, I am assuming that wide-scope indefinites undergo QR. This is probably incorrect. However, whatever mechanism is used to provide wide-scope readings for indefinites must be coupled with the event structure given below (see Schein (1993)), whether or not it is QR.

This creates a potential problem, as now the definition of the implicature must change to refer to  $E_2$ . And if there were extra levels of embedding, it would need to refer to the lowermost event variable containing the bare plural. This is an unwelcome result, as it seems to indicate that which implicatures arise follows from how deeply embedded the bare plural is, which is not how implicatures are taken to operate.

There is a way out of this dilemma. By definition,  $E_1$  is a superset of all the  $E_2$ s. Since a superset cannot contain less than its subset, if  $E_2$  contains a plurality of flowers, so will  $E_1$ . Note that this inference only holds if  $E_2$  is not in a downwards entailing environment, since then  $E_2$  could be a statement about what events are *not* part of  $E_1$  rather than those that are. However, if  $E_2$  is in a downwards entailing environment, the plurality implicature will not arise, and thus the failure of the inference is of no importance. In other words, in all environments in which the plurality implicature will arise, if there is more than one member of a nominal element  $\alpha$  involved in the most deeply embedded event, then there will be more than one involved in all events it is a part of.

Thus, all that is necessary is just a minimal modification to our plurality condition. Instead of using a definite description *therein* which means ‘In the relevant 2nd-order event’, we need a variant *therein'*, as follows:

(39) *therein'* =<sub>def</sub> In all the relevant second-order events that contain the plural element.

Using *therein'* in the implicature will make no difference for sentences (30)-(32), since they only contain one relevant second-order event each. For the two readings of (34), it will ensure that a plurality is present in the embedded events, as well as the matrix event, resulting in the correct readings.

Note that this entire problem may be potentially avoided if plurality implicatures are calculate locally, as was suggested for scalar implicatures in Chierchia (2002). I will not explore this possibility in this paper.

## 6. *Dependent plural readings and de re*

A challenge to the view presented in this paper comes from Partee (1985). Partee’s paper discusses dependent plurals, but is not actually about plurality. As such, she does not directly address the issues mentioned above. What she is concerned with is a counter-example to the well-known observation in Carlson (1980) that bare plurals obligatorily have *de dicto* readings when embedded under an attitude verb. She shows that in dependent plural contexts, bare plurals can receive *de re* readings. In doing so, she presents a potential problem to the claim that dependent and non-dependent bare plurals are in fact the same.

For example, she presents the following three-way contrast:

- (40) a. Miles wants to meet a policeman. ( $\checkmark$  *de dicto*/ $\checkmark$  *de re*)  
 b. Miles wants to meet policemen. ( $\checkmark$  *de dicto*/\**de re*)  
 c. All the boys want to meet policemen. ( $\checkmark$  *de dicto*/ $\checkmark$  *de re*)

The first two sentences above are from Carlson (1980). While the singular (40a) has both *de dicto* and *de re* readings, the bare plural in (40b) does not. Partee adds the third sentence. It has



a dependent reading, under which each boy wants to meet a specific policeman; this is a *de re* reading.

This data poses two potential problems to this paper. As mentioned above, the first problem is that my analysis denies special status to dependent plural readings as opposed to bare plurals in other contexts. But Partee's observation seems to make a distinction between the two. It seems to me, however, that Carlson's claim is in itself incorrect. While it is true that in many bare plural cases in non-dependent contexts *de re* readings are difficult to find, it is nonetheless possible to do so, as in the following discussion:

- (41) *In a video rental store*  
 Little boy: So, what movies do you want to get?  
 Little girl: How about *Alien*? Or *Silence of the Lambs*? Or *American Pie*?  
 Little boy: Mom! Mary wants to see R-rated movies!

In (41), *R-rated movies* is a bare plural in a non-dependent context, yet the little boy's claim could clearly be taken to be about his sister's desire to see the actual movies on the list she just provided, as opposed to a general desire to see movies in a certain category. Thus, it seems that the problem Partee identified for Carlson does not hinge on the presence of a dependent plural reading.

However, Partee's observation is still potentially problematic to the analysis given above since I have been assuming, following Carlson, that bare plurals can only take narrow scope. Fully addressing this issue is beyond the scope of the present discussion; however, it is worth noting that there does not seem to be any evidence that bare plurals can scope over other quantificational elements. This suggests that the scope with regard to intensional operators and with regard to quantification/negation are not obtained by the same scoping mechanism (see Farkas (1997) for a proposal on how this might work).

## 7. Conclusion

This paper has shown that dependent plurals provide valuable empirical insight to the study of the semantics of bare plurals. To fully account for the behavior of these readings, including the disappearance of the plurality condition in certain environments and the intervention effects, it is necessary to split the semantic contribution of bare plurals into two: a number neutral existential statement, and a plurality implicature. The explication of this implicature was given in terms of definite description of events. While this exploration of dependent plurality and its consequences is only a preliminary step in establishing a compositional semantics of plurality, it is an important step as it unifies the semantics for bare plurals that accounts both for the dependent readings, and for the readings that the plurals get when there are no other plurals in the sentence. Thus, it gets us one step closer to a fully general account of the contribution of the plural morpheme.

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