

## Verb clusters and the grammar of the right-periphery

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### Abstract

This paper provides a new analysis of verb clusters in Dutch according to which word order variation in such clusters is explained by the same general syntactic principles that explain symmetries and asymmetries in the right-peripheral distribution of constituents other than verb phrases. The central principle is that extraposition, here taken to involve intraposition of an (extended) VP, is necessary to establish a predication relation between the intraposed (extended) VP and the “extraposed” constituent. Variation arises at PF where it is decided whether the intraposed constituent is spelled out in its base position or its landing site. Which spell-out options are chosen in a particular dialect is determined by language external factors. The analysis is applied to the data of three different types of verb clusters in 267 dialects of Dutch investigated for the Syntactic Atlas of the Dutch Dialects (SAND), and compared to other analyses of verb clusters.

### 1. Introduction

The Standard Dutch sentence in (1a) has three variants in the Dutch dialects, (1b-d). The other logically possible sentences (1,e,f) are categorically impossible.<sup>1</sup> There are dialects with one, two, three or even four of these variants.

- (1) a. Ik vind dat iedereen goed **moet kunnen zwemmen**. Standard Dutch  
I find that everyone well must.FIN can.INF swim.INF  
'In my opinion, everyone should be able to swim well.'
- b. Ik vind dat iedereen goed **moet zwemmen kunnen**. Eastern Dutch  
I find that everyone well must.FIN swim.INF can.INF
- c. Ik vind dat iedereen goed **zwemmen moet kunnen**. Eastern and central Dutch  
I find that everyone well swim.INF must.FIN can.INF
- d. Ik vind dat iedereen goed **zwemmen kunnen moet**. Northern Dutch  
I find that everyone well swim.INF can.INF must.FIN
- e. \*Ik vind dat iedereen goed **kunnen moet zwemmen**.  
I find that everyone well can.INF must.FIN swim.INF
- f. \*Ik vind dat iedereen goed **kunnen zwemmen moet**.  
I find that everyone well can.INF swim.INF must.FIN

Word order variation in verb clusters has received a lot of attention in the literature.<sup>2</sup> One reason is that word order variation in Dutch and its dialects is impossible in many

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<sup>1</sup> Cf. SAND Volume 2; Barbiers (2005).

<sup>2</sup> Cf. SAND Volume 2 for a recent overview and bibliography. This article is restricted to variation in Dutch, where Dutch is understood as Standard Dutch and all dialects of Dutch that were investigated for the SAND. See Wurmbrand (2006) for an extensive state-of-the-art article on word order in verb clusters in Germanic languages. See Koopman and Szabolcsi (2000) and Kiss and Van Riemsdijk (2004) for description and analysis of verb clusters in Germanic and Hungarian.

other syntactic domains. For example, there is no variation in the order of the five elements in the nominal group in (2).

- (2) de drie mooie rode tulpen  
the three nice red tulips

Word order variation in verb clusters is also intriguing from the perspective of the relation between form and meaning, because order difference usually corresponds to a difference in meaning.<sup>3</sup> For example, the prepositional construction in (3a) has a locative meaning whereas the postpositional construction in (3b) has a directional meaning. Since the words in the sentence are identical, this meaning difference must be due to word order. However, the variants in (1a-d) do not show any meaning difference despite the word order difference.

- (3) a. Jan loopt op de brug.  
John walks on the bridge  
b. Jan loopt de brug op.  
John walks onto the bridge

A syntactic analysis of verb clusters should satisfy the following requirements:

- (4) i. The analysis should not be construction specific, i.e. it should employ syntactic principles that also hold outside the domain of verb clusters.  
ii. The analysis should explain why word order variation is possible in verb clusters but not in other syntactic domains, e.g. nominal groups.  
iii. The analysis should explain why word order differences in verb clusters do not have consequences for semantic interpretation, while word order differences in other domain, e.g. prepositional phrases, do.  
iv. The analysis should explain why certain orders are categorically impossible.

This paper develops an analysis that satisfies these conditions. The first step is the identification of general principles that explain for non-verbal syntactic categories why certain types of constituents cannot occur in extraposition, i.e. in a position following the right-peripheral verb position, while others can. In the second step it is shown that the same principles underly word order variation in verb clusters. It is necessary to distinguish different types of verb cluster, as the word order properties depend on the kind of auxiliaries occurring in the cluster. Finally, this new perspective is compared to existing analysis of verb clusters. It is argued that the new analysis performs better on the criteria in (4).

## **2. Towards a grammar of the right-periphery**

### **2.1 Description of the right-periphery**

It is well-known that Dutch has at least two designated positions for verbs. The rule for verb placement can be formulated as in (5).<sup>4</sup>

- (5) Put all verbs at the end of the clause.

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<sup>3</sup> Cf. von Humboldt (1836).

<sup>4</sup> The debate as to whether there are one or two verb positions in the left-periphery of the clause (cf. Zwart 1993) is irrelevant for the purposes of this paper.

If a clause does not have a complementizer, put the finite verb in the position of the complementizer.

The rule is illustrated in (6). As the sentences in (1) show, in a clause which starts with a complementizer, all verbs line up at the end of the clause.

- (6) a. Als je honger hebt, eet dan wat.  
If you hunger have, eat then something  
'If you are hungry then eat something.'  
b. Heb je honger, eet dan wat.  
Have you hunger eat then something

We concentrate on the verb position at the right edge of the clause, henceforth  $V_{\text{right}}$ . At a descriptive level, the grammar of the right-periphery in Dutch is quite simple. There are clear and categorical rules for the position of different types of constituents relative to  $V_{\text{right}}$ . Table 1 provides an overview.

Table 1: Position of different constituent types relative to  $V_{right}$ .

Constituent type	Before $V_{right}$	After $V_{right}$
<b>Class 1: Only before <math>V_{right}</math></b>		
Subject	+ (omdat hij werkte) because he worked	- (*omdat werkte hij) because worked he
Direct Object	+ (toen ik Jan zag) when I John saw	- (*toen ik zag Jan) when I saw John
Indirect Object	+ (toen ik het Jan gaf) when I it John gave	- (*toen ik het gaf Jan) when I it gave John
Predicative complement	+ (toen hij wit werd) when he white became	- (*toen hij werd wit) when he became white
Resultative complement	+ (toen hij 't op tafel legde) when he it on table put	- (*toen hij het legde op tafel) when he it put on table
Manner adverb	+ (omdat hij 't goed oploste) because he it well solved	- (*omdat hij 't oploste goed) because he it solved well
Depictive	+ (omdat hij boos binnenkwam) because he angrily entered	- (*omdat hij binnenkwam boos) because he entered angrily
<b>Class 2: Before and after <math>V_{right}</math><sup>5</sup></b>		
Prepositional complement	+ (toen hij op die brief wachtte) when he for that letter waited	+ (toen hij wachtte op die brief) when he waited for that letter
Locative and other prepositional adverbials	+ (toen hij in de tuin een boek las) when he in the garden a book read	+ (toen hij een boek las in de tuin) when he a book read in the garden
Temporal adverb	+ (toen hij gisteren belde) when he yesterday called	+ (toen hij belde gisteren) when he called yesterday
Frequency adverb	+ (omdat hij meestal niet belde) because he usually not called	+ (omdat hij niet belde meestal) because he not called usually
Modal adverb	+ (omdat hij waarschijnlijk niet komt) because he probably not comes	+ (omdat hij niet komt waarschijnlijk) because he not comes probably
Bare infinitive	+ (omdat hij niet dansen kan) because he not dance can	+ (omdat hij niet kan dansen) because he not can dance
Past participle	+ (omdat hij gebeld heeft) because he called has	+ (omdat hij heeft gebeld) because he has called
<b>Class 3: Only after <math>V_{right}</math></b>		
<i>te</i> -‘to’ infinitive	- (*omdat hij niet te werken hoeft) because he not to work needs	+ (omdat hij niet hoeft te werken) because he not needs to work
Infinitival complement clauses	- (*omdat hij om te werken probeert) because he for to work tries	+ (omdat hij probeert om te werken) because he tries for to work
Finite complement clauses	- (*omdat hij dat hij wint denkt) because he that he wins thinks	+ (omdat hij denkt dat hij wint) because he thinks that he wins

<sup>5</sup> Comma intonation is irrelevant here. Cases in which a constituent cannot follow  $V_{rechts}$  do not improve with comma intonation. I will not try to answer the question here as to why certain types of adverbials seem to require comma intonation. I assume that in the grammatical cases of extraposition in table 1 the extraposed constituent is fully integrated in the syntactic structure of the clause.

It is the null hypothesis that the three classes of constituents in table 1 are natural classes. Although they look heterogeneous at first sight, the different types of constituents in class 1 must have a property A in common such that extraposition is impossible. The different constituents in class 2 must share a property B such that they can occur before and after  $V_{\text{right}}$ . The types of constituents in class 3 must have a property such that they can only follow  $V_{\text{right}}$ . Our task is now to identify these three properties and relate them to each other, in order to arrive at a general grammar for the right-periphery.

## 2.2 Extraposition als intraposition

The appearance of a constituent after  $V_{\text{right}}$  traditionally is called extraposition. This term implies that the base position of such a constituent is to the left of  $V_{\text{right}}$  and that the constituent moves rightward across the verb.<sup>6</sup> There is an alternative analysis according to which extraposition is the result of VP-intraposition.<sup>7</sup> It is not the “extraposed” constituent that moves, but an (extended) projection of the verb. In (7) this derivation is illustrated for PP Extraposition.

- (7) a. omdat hij [PP in de tuin] [VP een boek leest]  
 because he in the garden a book reads
- b. omdat hij [VP een boek leest] [PP in de tuin] [VP ~~een boek leest~~  
 because he a book reads in the garden a book reads

By assumption, the “extraposed” constituent, PP in (7b), must be a predicate of the intraposed VP. In section 5, I argue that this movement operation is necessary to establish the predication relation and hence, that it is obligatory. At this point, however, it is sufficient to assume that VP Intraposition as in (7) can only occur in a subject-predicate relation. In the sentences in (7) the PP is a predicate of the VP [een boek lezen], that is interpreted as its subject: the book reading event was in the garden. The notion of predication is thus extended here from the traditional relation between a verb and its subject to relations between other constituents, such as the relation between an adjunct and a VP.<sup>8</sup>

There are three restrictions on traditional subject-predicate relations.

- (8) (i) Arguments cannot be predicates.  
 (ii) A predicate has exactly one subject.  
 (iii) Arguments can be subjects, predicates cannot.

A sentence like (9a) is impossible due to (8ii). The predicate *ziek* ‘sick’ can take *John* as its argument or *Mary*, but it cannot take both without additional syntactic means. The sentence in (9b) is impossible due to (8iii). The constituent *boos* ‘angry’ cannot be the subject of the predicate *vervelend* ‘annoying’, because *boos* ‘angry’ is a predicate itself. It requires an argument and cannot fill the argument position of *vervelend* ‘annoying’.<sup>9</sup>

<sup>6</sup> Cf. Koster (1974).

<sup>7</sup> Cf. Barbiers (1995, 2000a).

<sup>8</sup> Cf. Parsons (1990).

<sup>9</sup> I consider cases like *Onder het bed is gevaarlijk* ‘Under the bed is dangerous’ as ellipsis and hence as apparent exceptions (contra Neeleman 1997).

- (9) a. \*Jan Marie is ziek.  
       John Mary is sick  
       b. \*Boos is vervelend.  
           angry is annoying

It is notoriously difficult to provide a good definition of the notions argument and predicate, in particular when it concerns DPs. I will use the working definitions given in (10), which will do for present purposes but which obviously can be improved.

- (10) (i) Unsaturated (extended) projections of A, P, V and N are predicates.  
       (ii) Saturated (extended) projections of A, P, V and N are potential arguments.  
       (iii) DPs that receive a theta-role of a predicate are arguments.

### 2.3 Non-verbal constituents that may precede and follow $V_{\text{right}}$

The syntactic distribution of non-verbal constituents in class 2 follows from the assumptions above. Locative, temporal, frequency and modal adjuncts can all be analyzed as in (7). They are predicates of an (extended) projection of V and their base positions are to the left of  $V_{\text{right}}$ . They follow  $V_{\text{right}}$  after intraposition of VP.

For prepositional complements this is perhaps less evident because they are often taken to involve direct objects in disguise.<sup>10</sup> According to such an analysis the preposition is superfluous semantically and only present for syntactic reasons, e.g. to assign case to the DP contained in PP. This traditional analysis is problematic for various reasons. In the first place there are cases such as (11a,c) for which it is plausible that the PP is a predicate of the VP, given (11b,d). Secondly, the idea that the DP in a PP complement is in fact an argument of V is problematic for verbs that cannot take an internal argument when there is no preposition, such as *werken* ‘work’ in (11e,f). A lack of (abstract) accusative case for *het boek* ‘the book’ cannot explain the ungrammaticality of (11f), since accusative case is available in (11g). It cannot be assigned by *weg* ‘away’, as particles are not case assigners in Dutch. The contrast between (11e) and (11g) can be understood as following from the requirement that there must be a predicate to license the presence of an argument, *het boek* ‘the book’ in (11f,g). The monadic verb *werken* ‘work’ cannot do this, but the predicate *weg* ‘away’ can. If this is correct, then we must conclude that in cases like (11e) the preposition *aan* ‘to’ is the predicate that licenses *het boek* ‘the book’.

- (11) a. Jan wacht op zijn vader.  
       John waits for his father  
       b. Het wachten is op zijn vader.  
           the waiting is for his father  
       c. Jan praat over taalkunde.  
           John talks about linguistics  
       d. Het praatje ging over taalkunde.  
           the talk is about linguistics  
       e. Jan werkt aan het boek.  
           John works on the book  
       f. \*Jan werkt het boek.  
           John works the book

<sup>10</sup> Cf. Neeleman (1997), Schermer-Vermeer (2006).

- g. Jan werkt het boek weg.  
John works the book away  
'John gets rid of the book.'

In view of the syntactic distribution of PP complements and the facts in (11) I assume that PP complements are not arguments of the verb, but predicates of a projection of the verb. Prepositional dative complements also belong to the class of PP complements.

#### 2.4 Constituents that can only precede $V_{\text{right}}$

The constituent types in class 1 of table 1 are a natural class because the impossibility for them to occur in extraposition has the same cause. Their base positions are before  $V_{\text{right}}$  and they would only be able to occur after  $V_{\text{right}}$  as a result of VP-Intrapolation. VP-Intrapolation is blocked for every type of constituent within class 1 because there is no predication relation possible between the "extraposed" constituent and the intraposed VP.

Class 1 can be divided into three subclasses depending on the particular restriction on predication that is violated (cf. also (8)). The arguments form the first subclass. Subjects, object and indirect objects are all arguments of the verb. Arguments cannot be predicates and therefore VP Intrapolation is impossible.

In the second subclass we find predicative and resultative complements and depictives, also known as small clause predicates.<sup>11</sup> These all have their own DP-subjects. The predicative complement *boos* 'angry' is a predicate of the subject of the clause, *Jan*. The resultative complement *op tafel* 'on table' is a predicate of *de vaas* 'the vase', and the depictive *fluitend* 'whistling' in (12c) is a predicate of the subject *Jan*, possibly indirectly via a PRO-subject.<sup>12</sup> Since a predicate can only have one subject, VP Intrapolation is impossible in these cases.

- (12) a. Jan is boos.  
John is angry  
b. Jan zet de vaas op tafel.  
John put the vase on table  
c. Jan kwam fluitend binnen.  
John came whistling inside

The third group consists of low adjuncts such as manner adverbs. They are attached to a projection of the verb at a level at which this verb has not yet been combined with the direct object.<sup>13</sup> As (13a,b) shows the manner adverb *goed* 'well' must be adjacent to the main verb, the object *iets* 'something' cannot intervene. That is different for adverbs such as *gisteren* 'yesterday', that may precede and follow *iets* (13c,d).

- (13) a. Jan heeft iets goed bekeken.  
John has something well examined  
b. \*Jan heeft goed iets bekeken.  
John has well something examined

<sup>11</sup> Cf. Stowell (1981), Kayne (1984), Hoekstra (1988).

<sup>12</sup> Cf. Stowell (1981).

<sup>13</sup> Assuming a bottom up derivation starting with the main verb and uniform merge of constituents to the left of the verb.

- c. Jan heeft iets gisteren bekeken.  
John has something yesterday examined
- d. Jan heeft gisteren iets (goed) bekeken.  
John has yesterday something (well) examined

If we assume that first *goed* ‘well’ is attached to the verb and subsequently the direct object, then the projection of V to which *goed* ‘well’ is attached is unsaturated. That projection cannot undergo VP-Intrapolation, because only saturated constituents, i.e. arguments, can do that. This analysis abandons the traditional assumption that a direct object and a main verb are combined as sisters (after which the direct object and/or the verb can move such that adjacency is lost. We will not spell-out the arguments for this here.<sup>14</sup> It is not difficult to modify theta-theory or predication theory such that the direct object gets a theta-role from the verb despite the fact that a low adverb is intervening between them in the base structure. One option would be percolation of theta-roles.<sup>15</sup>

### 3. Verbal complements in the right-periphery

We now have a grammar of the right-periphery that explains the distribution of various types of non-verbal complements from the interaction between VP Intrapolation and restrictions on predication. Let us see what this grammar does for verbal complements. There are two types of complements that belong to class 2, the constituents that may occur before and after  $V_{\text{right}}$ : bare infinitives and participles. There are three types of complements that belong to class 3, constituents that can only occur after  $V_{\text{right}}$ : finite and infinitival complements clauses and *te*-‘to’-infinitives.

In previous work, I argue against the traditional view that clausal complements and nominal complements have the same syntactic status, i.e. the status of direct objects or sisters of the verb.<sup>16</sup> The proposal is there that a much simpler grammar would be one in which clausal complements are generated as righthand sisters of V, whereas nominal complements are generated to the left of the verb, as in the scheme in (14).<sup>17</sup> One advantage of this approach is that the differences and similarities between English and Dutch can be reduced to short leftward V movement to a position preceding all internal arguments (but not as high as T).

- (14) a.            V    CP  
      b.    DP   V

Let us assume that alle verbal complements are generated as righthand sisters of the selecting V. This gives us the base configurations in (15). Let us further assume that verbal complements can be VPs, IPs or CPs.<sup>18</sup>

- (15) a.    [V<sub>Aux</sub> [VP Participle]]  
      b.    [V<sub>Aux</sub> [VP Infinitive]]

<sup>14</sup> Cf. Barbiers (2000a).

<sup>15</sup> Cf. Neeleman (1994).

<sup>16</sup> Cf. Barbiers (2000a).

<sup>17</sup> I.e., in the Spec of the root R of the verb, in the spirit of Hale and Keyser (1993). Adopting an analysis of verbs of the type proposed in Hale and Keyser (1993) necessitates a further refinement of the VP Intrapolation account proposed here, an enterprise which I cannot undertake here for reasons of space and for the sake of simplicity.

<sup>18</sup> Presumably, finer distinctions are necessary; cf. Wurmbrand (2006).

- c. [V [TP *te*-infinitive]]
- d. [V [CP finite]]
- e. [V [CP non-finite]]

The grammar of the right-periphery that was developed in the previous sections now predicts that intraposition of a verbal complement (VP, IP or CP) is only possible if the selecting verb is a predicate of the verbal complement. This is only possible if the selecting verb does not have a subject itself and if the intraposed constituent is saturated so that it can act as a subject.

It follows immediately that participles and bare infinitives can not only follow but also precede  $V_{\text{right}}$ .  $V_{\text{Aux}}$ , i.e. modal, aspectual and perfective auxiliaries do not take DP-subjects themselves, hence verbal constituents can be their subjects.<sup>19</sup> For verbal constituents to act as subjects they have to be saturated, i.e. they should not be predicates with open argument positions. This is the case under the traditional and plausible assumption that auxiliaries attach to VP after V has been combined with its arguments, as in (16). The restrictions on predication thus allow for VP Intraposition on the basis of the structures in (16) and as a result, the order of the two verbs may vary.

- (16) a. [V<sub>Aux</sub> [VP DP<sub>subject</sub> DP<sub>object</sub> Participle]] =>  
 [[VP DP<sub>subject</sub> DP<sub>object</sub> Participle] V<sub>Aux</sub> [~~VP DP<sub>subject</sub> DP<sub>object</sub> Participle~~]]
- b. [V<sub>Aux</sub> [VP DP<sub>subject</sub> DP<sub>object</sub> Infinitive]] =>  
 [[VP DP<sub>subject</sub> DP<sub>object</sub> Infinitive] V<sub>Aux</sub> [~~VP DP<sub>subject</sub> DP<sub>object</sub> Infinitive~~]]

The fact that CP-complements cannot occur to the left of the selecting verb also follows from the restrictions on predication. A verb that selects a CP-complement always has its own subject. Since an embedded subject cannot move to an argument position in the matrix clause across a CP-boundary, the matrix CP would end up as subjectless if it did not have its own subject, in violation of the general condition that every clause should have a subject.<sup>20</sup> The base configuration for CP-complements is given in (17). The presence of the matrix CP blocks intraposition of the CP-complement, because a predicate can only have one subject.

- (17) [VP [DP<sub>subject</sub> [V' V [CP ... ]]]]

The impossibility for *te*-‘to’-infinitivals (TPs) to occur in a position preceding  $V_{\text{right}}$  can be explained in a more or less similar way. It is commonly assumed that there are two types of *te*-‘to’-infinitival complements, raising complements and control complements.<sup>21</sup> In control complements the matrix verb and the embedded verb each have their own subject, the latter PRO. For control complements, the same reasoning holds as for CP-complements. The matrix verb has its own subject, which makes TP-Intraposition impossible (a predicate cannot have two subjects). The issue is more complicated for raising complements. In such cases, the matrix verb does not have its own subject, so that cannot block intraposition. Presumably, in such cases TP-Intraposition is blocked because in Dutch, *te*-‘to’-complements, as opposed to bare infinitives, cannot act as arguments, as is illustrated in (18).

<sup>19</sup> Cf. Barbiers (1995) for arguments and references concerning the claim that even root modals are raising verbs.

<sup>20</sup> In generative grammar this principle is known as the Extended Projection Principle (EPP).

<sup>21</sup> Rosenbaum (1967). Cf. Hornstein (2001) for recent discussion.

- (18) a. Schaatsen is leuk.  
           skate.INF is fun  
       b. \*Te schaatsen is leuk.  
           to skate is fun

It is not possible to explain here why *te*-‘to’-infinitives cannot be arguments, but (18) suggests that the observation is correct and thus that the impossibility of a *te*-‘to’-infinitive preceding  $V_{\text{right}}$  can be made to follow from the general grammar of the right-periphery.<sup>22</sup>

#### 4. No construction specificity

In the Introduction four requirements for an analysis of word order variation in verb clusters were formulated. In this section we ask whether the proposed analysis meets the first two requirements. The first requirement was that the analysis should not be construction specific, i.e. it should only use syntactic principles that also hold outside the domain of verb clusters. In section 3 word order variation in two-verb clusters is analyzed as the result of VP-Intrapolation. We have the base orders  $V_{\text{aux}}$ -Infinitive and  $V_{\text{aux}}$ -Participle and we have the derived orders Infinitive- $V_{\text{aux}}$  en Participle- $V_{\text{aux}}$ . In this way word order variation in verb clusters and the variation in the order of PP-complements and adjuncts w.r.t to the verb are completely parallel. Phrased differently, in the orders Infinitive- $V_{\text{aux}}$  en Participle- $V_{\text{aux}}$  the auxiliary has been “extrapolated” as a result of VP Intrapolation. Consequently the analysis of word order variation in verb clusters is not construction specific, satisfying requirement (4-i).

The second requirement (4-ii) is that the analysis should explain why this type of word order variation is not possible in other syntactic domains, e.g. nominal groups as in (19).

- (19) a. de drie rode tulpen  
           the three red tulips  
       b. \*de drie tulpen rode  
           the three tulips red  
       c. de drie [<sub>N</sub> tulpen] rode [<sub>N</sub> ~~tulpen~~]  
           the three tulips red tulips

The explanation is straightforward. The adjective in (19) is attached to a projection of N at a level at which N has not been saturated yet.<sup>23</sup> It is a common assumption that saturation of N takes place by attaching D, which happens after attachment of A.<sup>24</sup> The projection of N that has moved in (19c) is therefore a predicate, and a predicate cannot be a subject of an adjective. This explanation is parallel to the explanation of the impossibility to “extrapolate” low (manner) adverbs in the verbal domain. The prediction is that adverbs/adjectives that can attach to the nominal group after D has

<sup>22</sup> This test cannot be applied blindly to other types of constituents as this would diagnose participles as non-argumenten. Further research is necessary, also because cases like (17b) improve when auxiliaries and adjuncts are added: *Te moeten schaatsen midden in de zomer is leuk* ‘Having to skate in the middle of the summer is fun.’ German provides support for the correlation between VP Intrapolation and the possibility for *te*-‘to’ infinitivals to function as an argument: both are possible in German. For a possible explanation of this difference between German and Dutch (2000), see Koopman and Szabolcsi (2000).

<sup>23</sup> The precise level of attachment (N, N’, NP) is irrelevant for this point.

<sup>24</sup> Again assuming a bottom up generation of a DP structure, starting with the noun. Cf. Heim and Kratzer (1998) for saturation of N by attachment of D.

been merged, i.e., adverbs/adjectives that have a base position to the left of D, should be able to occur after the noun, just like higher adverbs (e.g. temporal and modal adverbs) in the verbal domain can follow the verb (cf. table 1). This prediction is born out.

- (20) a. Waarschijnlijk alleen Jan heeft de klap gehoord.  
 probably only John has the bang heard  
 ‘It was probably only John who heard the bang.’  
 b. Alleen Jan waarschijnlijk heeft de klap gehoord.  
 only John probably has the bang heard

### 5. The meaninglessness of word order differences in verb clusters

The third requirement was that the analysis should explain why word order differences in verb clusters do not have consequences for meaning while word order differences in other domains (e.g., PPs) usually do have such consequences.

In the preceding sections we have related the operation of (extended) VP-Intrapolation to predication. It was shown that the (im-)possibility of (extended) VP-Intrapolation follows from general restrictions on predication. To keep the argument simple, we have assumed that (extended) VP-Intrapolation is only possible if the intraposed constituent can be interpreted as the subject of the “extraposed” constituent.

If we adopt the stronger assumption that (extended) VP Intrapolation is not just possible under a predication relation but necessary to realize the predication relation in syntax, then we can understand why word order variation in verb clusters does not have consequences for semantic interpretation.<sup>25</sup> Let us briefly explain why (extended) VP Intrapolation is necessary to realize a predication relation. The relevant principle is given in (21) and applies to structures of the type [X [Y [Z]]].

#### (21) Principle of Semantic Interpretation

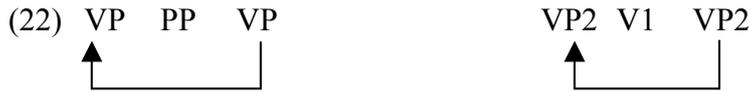
- (i) A node Y is a dyadic relation between the nodes X and Z if X immediately c-commands Y and Y immediately c-commands Z.  
 (ii) A node Y is a monadic predicate of a node X if Y is a dyadic relation between X and Z, and X and Z are formally identical.

The idea behind the principle in (21) is that the dyadic structure [X [Y [Z]]] is the syntactic atom for semantic interpretation, to be interpreted as “there is an Y-relation between X and Z. To express monadic predication such an atom must be reduced to a monadic structure. This reduction can be achieved by making X and Z formally identical. X and Z are formally identical if X is a copy of Z.<sup>26</sup> For example, in VP-Intrapolation contexts VP is moved to the left across PP. This yields a configuration that obeys the principle in (21-ii), such that PP must be interpreted as a monadic predicate of VP.<sup>27</sup> The same holds for VP-Intrapolation across V.

<sup>25</sup> This analysis and the principle in (21) was first proposed in Barbiers (1995)

<sup>26</sup> X and Z are also formally identical if Z is an inflection morpheme with a subset of the morphosyntactic features of X, or if Z is a pronoun which is coreferent with X. Cf. Barbiers (2000b) for binding theoretical consequences. In particular, it follows that strong reflexives exist to solve the contradictory requirement that the two arguments of a predicate should be identical to express reflexivity but distinct to express a dyadic relation.

<sup>27</sup> In addition to the PP being interpreted as a monadic predicate of VP, P is interpreted as a dyadic relation between the VP and the DP complement of P, according to the principle in (21). This is exactly the right result. Cf. Barbiers (1995) for further discussion.



Given the Principle of Semantic Interpretation in (21) we have to assume that (extended) VP Intraposition is obligatory in all cases for which we have claimed in the previous sections that it was possible. This means that in those cases “extraposition” should be obligatory. PP-adjuncts, PP-complements, bare infinitives and participles should all occur in a position following  $V_{right}$ . The fact that they can also occur before  $V_{right}$  can be captured if we assume that at the level of phonological interpretation (PF) the choice is made which copy is spelled out, the one in base position or the one in the landing site. This additional assumption is not construction specific either but has independent motivation and is quite generally accepted in the minimalist framework.<sup>28</sup> The derivation of PP “Extraposition” and two-verb clusters now looks as in (23).

- (23) a. Syntax:  $PP \quad VP \implies VP \quad PP \quad VP$  (VP-Intraposition)  
 PF option 1: Spell-out higher copy  $\implies VP \quad PP \quad \cancel{VP}$  (geslapen in de tuin)  
 PF option 2: Spell-out lower copy  $\implies \cancel{VP} \quad PP \quad VP$  (in de tuin geslapen)
- b. Syntax:  $V_{aux} \quad VP \implies VP \quad V_{aux} \quad VP$  (VP-Intraposition)  
 PF option 1: Spell-out higher copy  $\implies VP \quad V_{aux} \quad \cancel{VP}$  (werken kan)  
 PF, optie 2: Spell-out lower copy  $\implies \cancel{VP} \quad V_{aux} \quad VP$  (kan werken)

According to the minimalist grammar model, after the syntactic module the derivation of a clause splits into two distinct modules, the module for semantic interpretation (LF) and the module for phonological interpretation (PF).<sup>29</sup> The decision at PF to spell-out the higher or the lower copy has no consequences for the interpretation at LF, because LF operates on the structure delivered by the syntactic module, i.e. with both copies of VP, as required to express monadic predication.

The question as to why word order differences in other domains, e.g. the PPs in (24), often do correspond to meaning differences can now partially be answered..

- (24) a. Jan loopt op de brug.  
 John walks on the bridge
- b. Jan loopt de brug op.  
 John walks onto the bridge

Suppose the derivation of the orders in (24) would be as in (25), with DP intraposing across P.

- (25) Syntax:  $P \quad DP \implies DP \quad P \quad DP$  (leftward movement of DP)  
 PF option 1: Spell-out higher copy  $\implies DP \quad P \quad \cancel{DP}$  (de brug op)  
 PF option 2: Spell-out lower copy  $\implies \cancel{DP} \quad P \quad DP$  (op de brug)

Suppose further that the conditions on this movement were identical to those on VP Intraposition: Leftward DP movement across P is only possible if P is a predicate of

<sup>28</sup> Cf. Bobaljik (2002).

<sup>29</sup> Cf. Chomsky (1995).

DP. According to the Principle of Semantic Interpretation in (20), the result of the movement in (25) is that P takes only one argument at LF (the DP), while P should be a relation between two arguments at LF. Put differently, the result of DP-movement across P is that P is interpreted as a monadic predicate, and that is in conflict with the lexical meaning of P, which is a relation between two entities. We can conclude from this that (25) cannot be the right analysis of the contrast in (24).<sup>30</sup>

## 6. Possible and impossible word orders in three-verb clusters

In the previous sections word order variation in verb clusters was analyzed in a way parallel to variation in the order of verbs and PPs. We will now compare more complex cases, i.e., three-verb clusters and multiple PP “Extrapolation”. This reveals some interesting similarities and differences.

### 6.1 Similarity between V-clusters and PP Extrapolation

We distinguish three types of verb clusters: (i) verb clusters consisting of a perfective auxiliary, a modal or aspectual auxiliary, and a main verb: *is gaan zwemmen* lit. is.FIN gone.INF/PCP swim.INF ‘went for a swim’ and *had kunnen roepen* lit. had.FIN can.INF call.INF ‘could have called’. For the word order variation in this cluster type it is irrelevant whether the second verb is a modal or an aspectual verb; (ii) verb clusters with two modals and a main verb: *moet kunnen zwemmen* ‘lit. must.FIN can.INF swim.INF ‘should be able to swim’; (iii) verb clusters with a modal, a perfective auxiliary and a main verb: *moet hebben gemaakt* lit. must.FIN have.INF made.PCP ‘must have made’. Let us compare the first cluster type with multiple PP “Extrapolation”. The data in (26) are from the SAND investigation of 267 dialects of Dutch and should be interpreted as follows. The orders 1-2-3, 1-3-2, 3-2-1 and 2-3-1 occur in dialects of Dutch. The orders 3-1-2 and 2-1-3 do not occur in any Dutch dialect. In view of the latter categorical restrictions it is reasonable to assume that all dialects have the same grammar for this syntactic domain. For differences between the dialects, cf. section 7.

- (26) a. dat hij is<sub>1</sub> gaan<sub>2</sub> zwemmen<sub>3</sub>  
that he is.FIN gone.INF/PCP swim.INF  
b. dat hij is<sub>1</sub> zwemmen<sub>3</sub> (ge-)gaan<sub>2</sub>  
that he is.FIN swim.INF gone.INF/PCP  
c. \*dat hij zwemmen<sub>3</sub> is<sub>1</sub> (ge-)gaan<sub>2</sub>  
that he swim.INF is.FIN gone.INF/PCP  
d. dat hij zwemmen<sub>3</sub> (ge-)gaan<sub>2</sub> is<sub>1</sub>  
that he swim.INF gone.INF/PCP is.FIN  
e. \*dat hij gaan<sub>2</sub> is<sub>1</sub> zwemmen<sub>3</sub>  
that he gone.INF/PCP is.FIN swim.INF  
f. dat hij gaan<sub>2</sub> zwemmen<sub>3</sub> is<sub>1</sub>  
that he gone.INF/PCP swim.INF is.FIN

Multiple PP “Extrapolation” yields exactly the same ordering possibilities:

- (27) a. toen je haar [op het perron]<sub>1</sub> [op haar wang]<sub>2</sub> kuste<sub>3</sub>  
when you her on the platform on her cheek kissed  
b. toen je haar [op het perron]<sub>1</sub> kuste<sub>3</sub> [op haar wang]<sub>2</sub>

<sup>30</sup> Cf. Koopman (1997), Den Dikken (2003) for possible analyses.

- when you her on the platform kissed on her cheek
- c. \*toen je haar kuste<sub>3</sub> [op het perron]<sub>1</sub> [op haar wang]<sub>2</sub>  
when you her kissed on the platform on her cheek
- d. toen je haar kuste<sub>3</sub> [op haar wang]<sub>2</sub> [op het perron]<sub>1</sub>  
when you her kissed on her cheek on the platform
- e. \*toen je haar [op haar wang]<sub>2</sub> [op het perron]<sub>1</sub> kuste<sub>3</sub>  
when you her on her cheek on the platform kissed
- f. toen je haar [op haar wang]<sub>2</sub> kuste<sub>3</sub> [op het perron]<sub>1</sub>  
when you her on the platform kissed on her cheek

These PP “Extrapolation”-facts follow directly from the VP-Intrapolation-analysis if we apply it cyclically. First, VP<sub>3</sub> moves to the left across PP<sub>2</sub>, then XP (the constituent that contains PP<sub>2</sub> and VP<sub>3</sub>) moves to the left across PP<sub>1</sub>.<sup>31</sup>

- (28) Step 1: Move VP<sub>3</sub> leftward:  
PP<sub>2</sub> VP<sub>3</sub> ==> VP<sub>3</sub> PP<sub>2</sub> VP<sub>3</sub>
- Step 2: Merge PP<sub>1</sub>: PP<sub>1</sub> [<sub>XP</sub> VP<sub>3</sub> PP<sub>2</sub> VP<sub>3</sub>]
- Step 3: Move the constituent [<sub>XP</sub> VP<sub>3</sub> PP<sub>2</sub> VP<sub>3</sub>] leftward  
PP<sub>1</sub> [<sub>XP</sub> VP<sub>3</sub> PP<sub>2</sub> VP<sub>3</sub>] ==> [<sub>XP</sub> VP<sub>3</sub> PP<sub>2</sub> VP<sub>3</sub>] PP<sub>1</sub> [<sub>XP</sub> VP<sub>3</sub> PP<sub>2</sub> VP<sub>3</sub>]

At LF we have the following spell-out options (strike through means: not spelled out):

- (29) (i) Spell every constituent out in its base position  
[<sub>XP</sub> ~~VP<sub>3</sub>-PP<sub>2</sub>-VP<sub>3</sub>]] PP<sub>1</sub> [<sub>XP</sub> ~~VP<sub>3</sub>~~ PP<sub>2</sub> VP<sub>3</sub>]  
Result: PP<sub>1</sub> PP<sub>2</sub> VP<sub>3</sub> (= 27a)~~
- (ii) Spell XP out in its base position, and VP<sub>3</sub> in its landing site  
[<sub>XP</sub> ~~VP<sub>3</sub>-PP<sub>2</sub>-VP<sub>3</sub>]] PP<sub>1</sub> [<sub>XP</sub> VP<sub>3</sub> PP<sub>2</sub> ~~VP<sub>3</sub>]]  
Result: PP<sub>1</sub> VP<sub>3</sub> PP<sub>2</sub> (= 27b)~~~~
- (iii) Spell XP out in its landing site, and VP<sub>3</sub> in its base position  
[<sub>XP</sub> ~~VP<sub>3</sub>~~ PP<sub>2</sub> VP<sub>3</sub>] PP<sub>1</sub> [<sub>XP</sub> ~~VP<sub>3</sub>-PP<sub>2</sub>-VP<sub>3</sub>]]  
Result: PP<sub>2</sub> VP<sub>3</sub> PP<sub>1</sub> (= 27f)~~
- (iv) Spell XP and VP<sub>3</sub> out in their landing sites  
[<sub>XP</sub> VP<sub>3</sub> PP<sub>2</sub> ~~VP<sub>3</sub>]] PP<sub>1</sub> [<sub>XP</sub> ~~VP<sub>3</sub>-PP<sub>2</sub>-VP<sub>3</sub>]]  
Result: VP<sub>3</sub> PP<sub>2</sub> PP<sub>1</sub> (= 27d)~~~~

The impossible order VP<sub>3</sub> PP<sub>1</sub> PP<sub>2</sub> (27c) would require that part of XP, i.e. VP<sub>3</sub>, is spelled out in the landing site of XP, and another part of XP, PP<sub>2</sub>, in the base position of XP. Something similar holds for the impossible order PP<sub>2</sub> PP<sub>1</sub> VP<sub>3</sub>: part of XP, PP<sub>2</sub> in this case, is spelled out in the landing site of XP, and another part of XP, VP<sub>3</sub>, is spelled out in the base position of XP. Both cases can be ruled out if we assume that partial spell-out at PF is, in principle, excluded. If it is decided that XP is spelled out in its base position following PP<sub>1</sub>, then PP<sub>2</sub> and VP<sub>3</sub> should also be spelled out in a position following PP<sub>1</sub>, as they are dominated by XP. In that case, there are still two options for VP<sub>3</sub>, spell-out before or after PP<sub>2</sub>. If XP is spelled out in its landing site, then PP<sub>2</sub> and VP<sub>3</sub>, being dominated by XP, should both precede PP<sub>1</sub>. Again, there are two spell-out options for VP<sub>3</sub>, before and after PP<sub>2</sub>. The condition on partial spell-out is summarized in (30).

<sup>31</sup> As elsewhere in this paper, ‘move X’ means ‘copy and displace’.

(30) No Partial Spell-out (1<sup>st</sup> version)

- (i) If in a configuration  $XP_i \dots Y \dots XP_i$  the lower copy of  $XP$  is spelled out, then all elements dominated by  $XP$  will be spelled out in a position following  $Y$ .
- (ii) If in a configuration  $XP_i \dots Y \dots XP_i$  the higher copy of  $XP$  is spelled out, then all elements dominated by  $XP$  will be spelled out in a position preceding  $Y$ .

An identical analysis using cyclic VP-Intrapolation explains the word order possibilities for cluster type 1.<sup>32</sup> In the order  $is_1 \text{ gaan}_2 \text{ zwemmen}_3$  (26a), all constituents are spelled out in their base positions. In the order  $is_1 \text{ zwemmen}_3 (\text{ge-})\text{gaan}_2$  (26b) the constituent [zwemmen *gegaan*] is spelled out in its base position and within that constituent [zwemmen] is spelled out in its landing site. In the order  $\text{zwemmen}_3 (\text{ge-})\text{gaan}_2 is_1$  (26d) the constituent [zwemmen *gegaan*] is spelled out in its landing site and within that constituent [zwemmen] is also spelled out in its landing site. In the order  $\text{gaan}_2 \text{ zwemmen}_3 is_1$  (26f) the constituent [gaan *zwemmen*] is spelled out in its landing site and within that constituent [zwemmen] is spelled out in its base position. The orders  $\text{zwemmen}_3 is_1 (\text{ge-})\text{gaan}_2$  and  $\text{gaan}_2 is_1 \text{ zwemmen}_3$  are impossible because they violate No Partial Spell-out, which should be considered a structure preservation condition.

## 6.2 Two other types of verb clusters

If we take the two other types of clusters into consideration we find differences with multiple PP “Extrapolation”. Clusters of type 2 have the (im-)possible orders in (31). As was the case for cluster type 1, the data in (31) should be interpreted as generalizations over all 267 dialects of Dutch investigated in the SAND project.

- (31) a. Ik vind dat iedereen goed moet<sub>1</sub> kunnen<sub>2</sub> zwemmen<sub>3</sub>.  
I find that everyone well must.FIN can.INF swim.INF
- b. Ik vind dat iedereen goed moet<sub>1</sub> zwemmen<sub>3</sub> kunnen<sub>2</sub>.  
I find that everyone well must.FIN swim.INF can.INF
- c. Ik vind dat iedereen goed zwemmen<sub>3</sub> moet<sub>1</sub> kunnen<sub>2</sub>.  
I find that everyone well swim.INF must.FIN can.INF
- d. Ik vind dat iedereen goed zwemmen<sub>3</sub> kunnen<sub>2</sub> moet<sub>1</sub>.  
I find that everyone well swim.INF can.INF must.FIN
- e. \*Ik vind dat iedereen goed kunnen<sub>2</sub> moet<sub>1</sub> zwemmen<sub>3</sub>.  
I find that everyone well can.INF must.FIN swim.INF
- f. \*Ik vind dat iedereen goed kunnen<sub>2</sub> zwemmen<sub>3</sub> moet<sub>1</sub>.  
I find that everyone well can.INF swim.INF must.FIN

Cluster type 3 behaves as cluster type 2:

- (32) a. dat Jan de wagen voor vijf uur moet<sub>1</sub> hebben<sub>2</sub> gemaakt<sub>3</sub>.  
that John the car before five o'clock must.FIN have.INF made.PCP
- b. dat Jan de wagen voor vijf uur moet<sub>1</sub> gemaakt<sub>3</sub> hebben<sub>2</sub>.  
that John the car before five o'clock must.FIN made.PCP have.INF
- c. dat Jan de wagen voor vijf uur gemaakt<sub>3</sub> moet<sub>1</sub> hebben<sub>2</sub>.

<sup>32</sup> Cf. Broekhuis (1997) for an early attempt to establish a relation between verb clusters and PP Extrapolation on the basis of the VP-Intrapolation analysis proposed in Barbiers (1995).

- that John the car before five o'clock made.PCP must.FIN have.INF
- d. dat Jan de wagen voor vijf uur gemaakt<sub>3</sub> hebben<sub>2</sub> moet<sub>1</sub>.  
that John the car before five o'clock made.PCP have.INF must.FIN
- e. \*dat Jan de wagen voor vijf uur hebben<sub>2</sub> moet<sub>1</sub> gemaakt<sub>3</sub>.  
that John the car before five o'clock have.INF must.FIN made.PCP
- f. \*dat Jan de wagen voor vijf uur hebben<sub>2</sub> gemaakt<sub>3</sub> moet<sub>1</sub>.  
that John the car before five o'clock have.INF made.PCP must.FIN

The grammatical orders 1-2-3, 1-3-2 and 3-2-1 can be derived by cyclic VP Intraposition. The ungrammaticality of 2-1-3 follows directly from No Partial Spell-out. The question that should be answered is why these cluster types allow the order 3-1-2 and why they don't allow the order 2-3-1. Put differently, why is the order [zwemmen<sub>3</sub> moet<sub>1</sub> kunnen<sub>2</sub>] possible while the corresponding PP "Extraposition" order [kuste<sub>3</sub> [op het perron]<sub>1</sub> [op haar wang]<sub>2</sub>] is impossible, and why is the order [kunnen<sub>2</sub> zwemmen<sub>3</sub> moet<sub>1</sub>] impossible, while the parallel [[op haar wang]<sub>2</sub> kuste<sub>3</sub> [op het perron]<sub>1</sub>] is possible?

### 6.2.1 The order 2-3-1

Let us first consider the impossibility of the order 2-3-1 in clusters of type 2 and 3. In view of the analysis proposed so far, we are forced to assume that in these clusters the same VP-Intraposition operations apply as in multiple PP "Extraposition" and in clusters of type 1. The reason is that the predicative relations are identical in all of the verb clusters: V2 is a predicate of V3, and V1 is a predicate of the constituent [V2 V3]. The structure that is delivered to LF should encode these predication relations. This implies that the impossibility of 2-3-1 should follow from a PF-condition. The configuration 2-3-1 is derived, but cannot be spelled out. This reduces the issue to the question as to why clusters of type [gaan<sub>2</sub> zwemmen<sub>3</sub> is<sub>1</sub>] can be spelled out in this order but clusters of the type [kunnen<sub>2</sub> zwemmen<sub>3</sub> moet<sub>1</sub>] and [hebben<sub>2</sub> gemaakt<sub>3</sub> moet<sub>1</sub>] cannot.

The key difference seems to be the selectional relation between the two auxiliaries in a cluster. Modal auxiliaries select for an eventive predicate, in the unmarked case a main verb.<sup>33</sup> Modal and perfective auxiliaries are not eventive predicates themselves, they only modify eventive predicates. This means that in the cluster [modal<sub>1</sub> modal<sub>2</sub> main verb<sub>3</sub>], modal<sub>2</sub> cannot satisfy the selectional requirements of modal<sub>1</sub>. Main verb<sub>3</sub> should therefore satisfy the selectional restrictions of both modals, as presented schematically in (33). There is a selectional relation between modal<sub>1</sub> and main verb<sub>3</sub> and between modal<sub>2</sub> and main verb<sub>3</sub> but there is no selectional relation between modal<sub>1</sub> and modal<sub>2</sub>. In terms of features: an auxiliary with uEvent (i.e., an unvalued or uninterpretable event feature) requires a verb with the feature iEvent (i.e., an interpretable event feature).<sup>34</sup>

- (33) moet            kunnen        zwemmen  
      modal<sub>1</sub>        modal<sub>2</sub>        main verb<sub>3</sub>  
      uEvent        uEvent        iEvent

<sup>33</sup> In Barbiers (1995), construction such as *De fles moet leeg* 'the bottle must empty.A' are analyzed as cases of non-verbal complementation. If that is correct then the feature [eventive] is not restricted to verbs. This is plausible but requires further justification in future research.

<sup>34</sup> Cf. Chomsky (1995, 2001) for the notion of unvalued/uninterpretable feature.

In clusters of type 3 we also do not find a selectional relation between the first and the second auxiliary. The modal requires an eventive predicate but the perfective auxiliary is not eventive. At the same time, the perfective auxiliary requires a perfective verbal complement. Both selectional restrictions must be satisfied by the main verb, as depicted in (34).

(34)	moet	hebben	gemaakt
	modal <sub>1</sub>	aux <sub>2</sub>	main verb <sub>3</sub>
	uEvent	uPerf	iEvent
			iPerf

In clusters of type 1 there is a selectional relation between the first and the second auxiliary. The perfective auxiliary requires a perfective complement. The aspectual (or modal) second auxiliary arguably has a perfective interpretation and can fulfill the selectional requirement of the perfective auxiliary. We should make a distinction here between perfective interpretation and participial form. The relevant selectional restriction involves perfectivity. The morphology of the auxiliary that is dependent on a perfective auxiliary varies across the dialects of Dutch. There are north-eastern dialects in which this auxiliary appears as a participle, but in most cases it occurs as an infinitive, an instance of the well-known *Infinitivus pro Participio* effect. Despite their morphological shape these infinitival auxiliaries have a perfective interpretation, and this is what is relevant for the selectional requirements. The selectional relations in clusters of type 1 are depicted in (35). There is a selectional relation between aux<sub>1</sub> and asp<sub>2</sub>, and between asp<sub>2</sub> and main verb<sub>3</sub>.

(35)	is	gaan	zwemmen
	aux <sub>1</sub>	asp <sub>2</sub>	main verb <sub>3</sub>
	uPerf	iPerf	iEvent
		uEvent	

The conditions in (36) capture the spell-out options for the different verb clusters. The difference between cluster type 1 on the one hand and cluster types 2 and 3 follow from condition (36-iii).

(36) Spell-out conditions for verb clusters (first version)

In the VP Intraposition configuration:

[<sub>VP1</sub> [<sub>VP2</sub> [<sub>VP3</sub> V<sub>3</sub>] [V<sub>2</sub> [<sub>VP3</sub> V<sub>3</sub>]]] V<sub>1</sub> [<sub>VP2</sub> [<sub>VP3</sub> V<sub>3</sub>] [V<sub>2</sub> [<sub>VP3</sub> V<sub>3</sub>]]]

- (i) Spell-out a moved VP in its base position or in its landing site
- (ii) No partial spell-out
- (iii) PF-condition: VP<sub>2</sub> can only be spelled out in its landing site if VP<sub>2</sub> satisfies a selectional requirement of V<sub>1</sub>.

The next questions that need to be answered are why condition (iii) should exist, whether it is motivated independently, and why a PF-condition should be sensitive to semantically interpretable features. To answer these questions we have to compare the orders 3-2-1 and 2-3-1. Like 2-3-1, the order 3-2-1 is a case of spelling out VP<sub>2</sub> before V<sub>1</sub>, but here VP<sub>3</sub> is spelled out in its landing site, not in its base position.

- (37) a. 3-2-1: [VP1 [VP2 [VP3 V3] [V2 [~~VP3~~-V3]]] V1 [~~VP2~~-[~~VP3~~-V3]][V2 [~~VP3~~-V3]]]  
 b. 2-3-1: [VP1 [VP2 [~~VP3~~-V3] [V2 [VP3 V3]]] V1 [~~VP2~~-[~~VP3~~-V3]][V2 [~~VP3~~-V3]]]

The question can be reformulated as follows: Why is it that VP2 satisfies the selectional requirement of V1 in (37a), but not in (37b)? The relevant difference is that after the spell-out position has been chosen, VP3 and V2 in (37a) are in a head-spec relation, while in (37b) they are in a head-complement relation (cf. 38a,b).

We know independently that the features of an element in Spec are visible on the head, i.e. the iEvent of V3 is shared with V2 and therefore visible on VP2. In head-complement relations the features of the complement are not visible on the head.

- (38) a. 3-2-1: [VP1 [VP2 [VP3 V3<sub>iEvent</sub>] [V2<sub>uEvent</sub> [~~VP3~~-V3]]] V1<sub>uEvent</sub>  
 b. 2-3-1: [VP1 [VP2 [~~VP3~~-V3] [V2<sub>uEvent</sub> [VP3 V3<sub>iEvent</sub>]]] V1<sub>uEvent</sub>

Condition (36-iii) can now be reformulated as a real PF-condition:

- (36-iii) PF-condition (final version)  
 VP2 can only be spelled out in its landing site before V1 if there is head-spec agreement between VP2 en V1.

There are two configurations in which the specifier VP2 agrees with the head V1, namely (i) if VP2 values a feature of V1, and (ii) if there is head-spec agreement between VP3 and V2. The second case can be interpreted as a case of transitivity of head-spec agreement: If VP3 has a feature that can value V1 and V2, there is head-spec agreement between VP3 and V2, and VP2 is in a head-spec configuration with V1, then there is head-spec agreement between VP2 and V1.

This transitivity of head-spec agreement and the contrast with head-complement configurations is independently motivated in the domain of Wh-movement. If a Wh-element is embedded in a DP, this DP can only be moved if the Wh-element is in the specifier of DP so that the Wh-feature is visible on DP by head-spec agreement (39a). If the Wh-element is in a complement position within DP, there is no head-spec agreement, therefore the Wh-feature is not visible on DP and the DP cannot move (39b). Subextraction is needed (39c).<sup>35</sup> Parallel to VP2, the constituent [een boek van wie] (a book of whom) can be spelled out in its base position after movement. This is the case in multiple WH-questions such as (39d).

- (39) a. [Wiens boek] heb je [~~wiens boek~~] gelezen?  
 whose book have you whose book read  
 b. \*[Een boek van wie] heb je [~~een boek van wie~~] gelezen?  
 a book of whom have you a book of whom read  
 c. [Van wie] heb je [een boek ~~van wie~~] gelezen?  
 of who have you a book of who read  
 d. [~~Een boek van wie~~] Wie heeft [een boek van wie] gelezen?  
 a book of who have who has a book of who read

In clusters of type 1, the perfective auxiliary V1 has a feature [uPerfective] and its aspectual or modal complement VP2 has a feature [iPerfective]. After movement

<sup>35</sup> This means that the Wh-feature must be visible on the subextracted PP in (39c). This is not unexpected, given that negative and universal features are also visible on PP (cf. Barbiers 1995 for discussion). If P is taken to be an extended projection of DP, this is unproblematic.

of VP2 there is head-spec agreement between VP2 and V1, irrespective of the spell-out position of V3. There is no feature of V3 needed to make the selectional restriction visible.

### 6.2.2 The order 3-1-2

Clusters of type 2 and type 3 allow for a 3-1-2 order (zwemmen<sub>3</sub> moet<sub>1</sub> kunnen<sub>2</sub> lit. swim.INF must.FIN can.INF; gemaakt<sub>3</sub> moet<sub>1</sub> hebben<sub>2</sub> lit. made.PCP must.FIN have.INF), clusters of type 1 and multiple PP “Extrapolation” don’t (zwemmen<sub>3</sub> is<sub>1</sub> (ge-)gaan<sub>2</sub> lit. swim.INF is.FIN gone.INF/PCP; kuste<sub>3</sub> op-het-perron<sub>1</sub> op-haar-wang<sub>2</sub> lit. kissed on-the-platform on-her-cheek). This difference is related to a difference discussed in the previous section, the impossibility to spell-out 2-3-1 in clusters of type 2 and 3 and the availability of this spell-out option in clusters of type 1 and multiple PP “Extrapolation”. The problem was the lack of visible head-spec agreement between VP2 and V1 in clusters of type 2 and 3. There is, however, an agreement relation between VP3 and V1 in these types, for the features uEvent and iEvent. Spelling out V3 before V1 makes this relation visible. A slight reformulation of the spell-out conditions captures this.

#### (40) PF conditions on spell-out in verb clusters (final version)

In the VP-intrapolation configuration

[VP1 [VP2 [VP3 V3] [V2 [VP3 V3]]] V1 [VP2 [VP3 V3] [V2 [VP3 V3]]]

- (i) Spell-out a moved VP in its base position or in its landing site
- (ii) No partial spell-out
- (iii) VP2 can only be spelled out in its landing site if VP2 satisfies a selectional requirement of V1 (by a feature of V2 or by head-spec agreement with a feature of V3 in SpecVP2).
- (iv) If there is no head-spec agreement between VP2 and V1, V3 can be spelled out in SpecVP1 if this makes a head-spec agreement relation between V3 and V1 visible.

The relevant configurations are given in (41-43). In (41a) VP2 in its landing site does not agree with V1. Spell-out of V3 (zwemmen) in the landing site of VP2, leaving out V2 (kunnen) in this position, makes head-spec agreement between V3 and V1 visible. The same holds for (42a). The configurations (41b) and (42b) are excluded because V2 (*kunnen* and *hebben*) does not make a head-spec agreement relation visible. In (43) there is head-spec agreement between VP2 in its landing site and V1; therefore condition (40-iv) does not apply and the No partial spell-out condition (40-ii) wins.

- (41) a. Type 2: [[VP2 **kunnen** [zwemmen] [V1 moet [VP2 kunnen **zwemmen**]]]
- b. Type 2: \* [[VP2 kunnen **zwemmen**] [V1 moet [VP2 **kunnen** zwemmen]]]
- (42) a. Type 3: [[VP2 **hebben** gemaakt] [V1 moet [VP2 hebben **gemaakt**]]]
- b. Type 3: \* [VP2 hebben **gemaakt**] [V1 moet [VP2 **hebben** gemaakt]]]
- (43) a. Type 2: \* [[VP2 **gaan** zwemmen] [V1 is [VP2 gaan **zwemmen**]]]
- b. Type 2: \* [[VP2 gaan **zwemmen**] [V1 is [VP2 **zwemmen** zwemmen]]]

## 7. Impossible and unrealized orders

The analysis proposed in the previous sections explains which orders are possible and which orders are not for 267 dialects of Dutch. Put differently, the grammar developed defines the variation space for these dialects. That the grammar is the same for all dialects, does not mean that all dialects behave the same. There are dialects that exploit the whole variation space. For example, there are dialects that allow four orders for the cluster *moet kunnen zwemmen* lit. must.FIN can.INF swim.INF. Most dialects use only one or two of the possible orders per clustertype and the orders chosen shows clear geographic patterns.<sup>36</sup> For example, the 3-2-1 order *zwemmen kunnen moet* predominantly occurs in the northern part of the language area, the 1-3-2 order *moet zwemmen kunnen* primarily in the eastern part, and the 1-2-3 order *moet kunnen zwemmen* is most common in the rest of the language area. So far, no grammatical properties have been identified that correspond to these cross-dialectal differences.

The cross-dialectal differences can be captured by distinguishing between impossible and unrealized orders.<sup>37</sup> Some orders, such as 2-1-3, are impossible in all dialects of Dutch because the grammar excludes them. Unrealized orders are orders that are allowed by the grammar but that not all dialects use. Whether a speaker/dialect uses a particular possible order is determined by the linguistic environment during first language acquisition. A child that only hears 3-2-1 orders will use that order and leave the other possible orders unrealized.

The distinction between realized and unrealized possible syntactic structures implies that syntactic structures are stored in linguistic memory. This seems to go against the assumption in much generative work that regular syntactic structures are not stored but generated. There are some reasons to doubt the correctness of this assumption, however.

In phonotaxis, the idea that phonotactic structures are both generated and stored is fully accepted. The phonotaxis of Dutch defines *terp* and *pert* as possible words and *rpet* as an impossible word. Of the two possible words *terp* and *pert*, only *terp* exists. This implies that *terp* is stored in the mental lexicon and *pert* is not.

Something similar holds for morphology. An example. The suffix *-tal* ‘-some’ and ordinal suffixes share the property that they can attach to numerals but not to *veel* ‘many’<sup>38</sup>: *viertal* ‘foursome’, *twintigtal* ‘twentysome’ \**veeltal* ‘manysome’, *vier-de* ‘fourth’, *twintig-ste* ‘twentieth’, \**veel-de*, \**veel-ste* ‘manyth’. The relevant requirement appears to be that the number expressed by the morphological stem must be specific enough. When *veel* ‘many’ gets a further specification by *zo* ‘so’, the ordinal suffix becomes possible: *zo-veel-ste* lit. so-many-th. We would expect that the same holds for the suffix *-tal* ‘-some’, but *zoveeltal* lit. so-many-some’ does not occur. The word *zoveeltal* can therefore be considered a possible but unrealized word. While *zoveelste* is stored in the mental lexicon, *zoveeltal* is not.

Both for phonotaxis and morphology it holds that the number of possible words generated by the system is infinite. The number of actually realized words is only a subset of those. There is no principled reason why this would not hold for the syntax. As a matter of fact, there are several recent generative proposals in which words are taken to be phrasal structures.<sup>39</sup> The conclusion is inescapable that syntactic structures can be stored in linguistic memory. Storage of syntactic structures does not make a

<sup>36</sup> Cf. Barbiers (2005) and SAND Volume 2, Barbiers et al. (2008) for a detailed description and maps.

<sup>37</sup> Cf. Barbiers (2005).

<sup>38</sup> Cf. Barbiers (2007).

<sup>39</sup> E.g. Hale and Keyser (1993) for verbs and Déchaine and Wiltschko (2002) for pronouns.

generative syntactic module superfluous, however, since it should be possible to generate new structures. The grammar model that we end up with here is compatible with recent insights that our linguistic competence is so robust because the on-line generation of structures runs in parallel with retrieval from linguistic memory.<sup>40</sup> The structures obtained by this procedures should match.

## 8. Comparison with other analyses

Finally, I will compare the analysis proposed in this paper with other analyses. Within the limits of this paper it is impossible to do justice to all existing analyses.<sup>41</sup> The discussion here is restricted to some logically conceivable analyses and they will be evaluated on the basis of the criteria in (4), repeated here as (44).

- (44) i. The analysis should not be construction specific, i.e. it should employ syntactic principles that also hold outside the domain of verb clusters.  
 ii. The analysis should explain why word order variation is possible in verb clusters but not in other syntactic domains, e.g. nominal groups.  
 iii. The analysis should explain why word order differences in verb clusters do not have consequences for semantic interpretation, while word order differences in other domains, e.g. prepositional phrases, do.  
 iv. The analysis should explain why certain orders are categorically impossible.

As we have seen in the previous sections, the central problem of word order variation in verb clusters is that one and the same hierarchical structure can be linearized in different ways. There is no disagreement in the literature on the hierarchical structure. For example, everyone agrees that in the hierarchical structure of the cluster *moet kunnen zwemmen*, the verb *zwemmen* (VP3) is embedded in the projection of *kunnen* (VP2) at that projection in turn is embedded in the projection of *moet* (VP1). There is independent evidence that this hierarchy is correct.<sup>42</sup>

- (45) [<sub>VP1</sub> moet [<sub>VP2</sub> kunnen [<sub>VP3</sub> zwemmen]]]  
 must.FIN can.INF swim.INF

There are many different ways to derive the different linear orders from one hierarchical structure. Let us see how they score on the given criteria.

### 8.1 Variation in the base structure

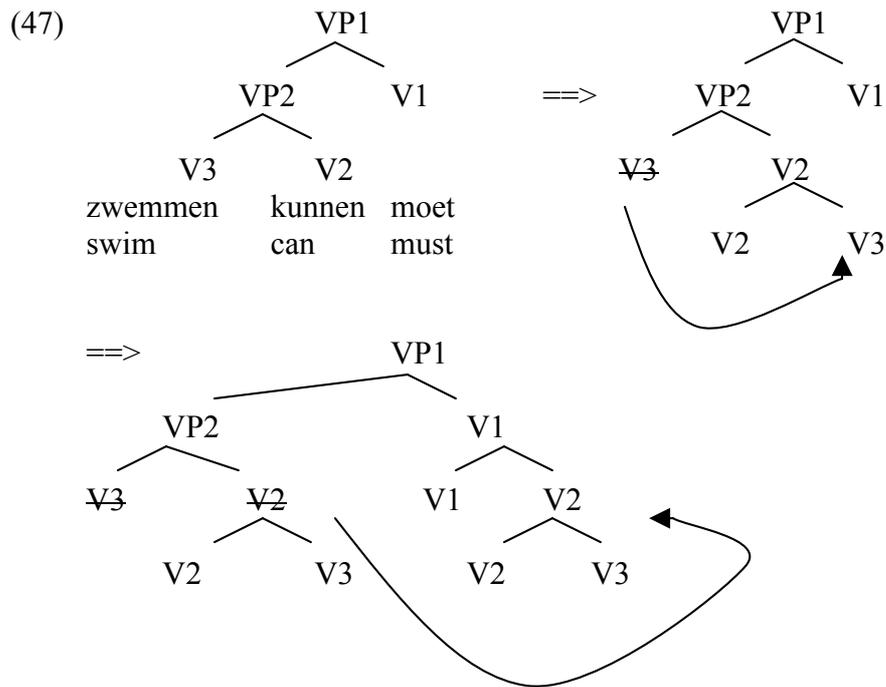
The simplest analysis conceivable is one in which the various orders are generated directly, i.e. without reordering operations. This is possible in a model in which the branching direction is free, i.e., a head can both precede and follow its complement. For three-verb clusters this gives the possibilities in (46).

<sup>40</sup> Cf. Nootboom et al. (2002).

<sup>41</sup> Cf. Wurmbrand (2006) for extensive discussion of alternative analyses and a bibliography.

<sup>42</sup> E.g., it is possible to front [*kunnen zwemmen*] and to strand [*moet*], but it is impossible to front [*moet kunnen*] and to strand [*zwemmen*]. This shows that [*kunnen zwemmen*] is a constituent but [*moet kunnen*] is not.





For the 3-1-2 order (*zwemmen moet kunnen* lit. swim.INF must.FIN can.INF)) movement of V2 to the right of V1 is sufficient. The order 1-3-2, however, cannot be derived with this combination of head movement and right adjunction without a violation of the head movement constraint, according to which it is not allowed to skip an intervening head.<sup>44</sup> To get 1-3-2, it would be necessary for V3 to skip V2 on its way to V1, followed by movement of V2 to V1. If we give up the restriction that in a verb cluster only heads can move then 1-3-2 can be derived: VP2 in the base structure in (47) must move to V1 and attach to the right of VP1. Another way of deriving 1-3-2 would be to allow left-adjunction. In that case V3 can attach to the left of V2 and [V3 V2] can subsequently move to the right of V1. The categorically impossible order 2-1-3 (*kunnen moet zwemmen* can.INF must.FIN swim.INF) is excluded by the head movement constraint as well. The impossibility of 2-3-1 (*kunnen zwemmen moet* lit. can.INF swim.INF must.FIN) must be stipulated for this type of cluster, e.g. by the requirement that when a movement cycle has started it should carry on.<sup>45</sup>

Like the previous one, this analysis does not meet the criteria in (44). We are dealing with construction specific, unmotivated and optional (i.e., dialect specific) movement operations and it is unclear why these operations can be without semantic effect.<sup>46</sup> The impossibility of 2-3-1 for clusters with two modals must be stipulated.

### 8.2.2 Leftward head movement

A leftward head movement analysis would start from a uniform head initial base structure. The derivation of the different orders in such an analysis is given in (48).

<sup>44</sup> Cf. Travis (1984).

<sup>45</sup> Cf. Den Besten and Broekhuis (1989) for an example of such a requirement.

<sup>46</sup> The only analysis that suggests a trigger for this type of movements is Bennis en Hoekstra (1989). They claim that the verbs must move because all verbs must be connected to Tense.

- |          |                         |    |  |               |                      |                     |
|----------|-------------------------|----|--|---------------|----------------------|---------------------|
| (48) (i) | V1                      | V2 | V3   |               | moet kunnen zwemmen  |                     |
| (ii)     | V1                      | V3 | V2   | <del>V3</del> | moet zwemmen kunnen  |                     |
| (iii)    | V3                      | V1 | <del>V3</del>                                  | V2            | <del>V3</del>        | zwemmen moet kunnen |
| (iv)     | [ <sub>VP2</sub> V2 V3] | V1 | [ <sub>VP2</sub> <del>V2</del> <del>V3</del> ] |               | *kunnen zwemmen moet |                     |
| (v)      | V2                      | V1 | <del>V2</del>                                  | V3            | *kunnen moet zwemmen |                     |
| (vi)     | [V3 V2 <del>V3</del> ]  | V1 | [ <del>V3</del> <del>V2</del> <del>V3</del> ]  |               | zwemmen kunnen moet  |                     |

Again, this is not a principled way to derive the possible orders and exclude the impossible one. The grammatical (48-iii) is a violation of the head movement constraint mentioned above. The order 2-3-1 (*kunnen zwemmen moet*; 48-iv) can only be derived by allowing VP-movement or by leaving the direction of adjunction free. It could be suggested that it is this what rules out 2-3-1, but that would make the grammaticality of this order for the two other types of cluster (cf. 6.1) a mystery.

The movement operations in (48) raise, just like (47), the question as to why they happen, why some dialects have them while others don't, why such variation does not occur in other syntactic domains, and why the various movements do not have semantic consequences.

In addition, Koopman and Szabolcsi (2000) correctly note that the distribution of verb particles is problematic in this account. As is well known, a verb particle in Dutch can be stranded in its base position (49a,b) when the finite verb moves to the V2 position. If V2 and verb movement in verb clusters both involve head movement, the particle should be strandable in verb clusters too. The result is strongly ungrammatical, however (49c). The analysis with rightward head movement is superior in this respect, as (49d) shows.

- (49) a. Als Jan de appel op eet, (dan ...)  
if John the apple up eats, then...
- b. Eet Jan de appel op ~~eet~~, (dan ...)  
eats John the apple up eat then
- c. \*Als Jan de appel eten moet op ~~eten~~, (dan ...)  
if John the apple eat must up eat then ...
- d. Als Jan de appel op ~~eten~~ moet eten, (dan ...)  
if John the apple up eat must eat then

The distribution of particles in the verb cluster is playing an important role in the debate on verb clusters.<sup>47</sup> For Dutch, the generalization is that, regardless of the order of the verbs in the cluster, the particle should always precede the main verb.

One or more verbs can intervene between the particle and the main verb, which in the 1-2-3 order gives rise to the following options.

- (50) a. dat Jan de wedstrijd moet kunnen uit lopen  
that John the race must can out run
- b. dat Jan de wedstrijd moet uit kunnen lopen  
that John the race must out can run
- c. dat Jan de wedstrijd uit moet kunnen lopen  
that John the race out must can run

<sup>47</sup> Cf. Koopman and Szabolcsi (2000) and Vicente (2007) for recent discussion.

In an analysis with leftward movement the particle must be able to move independently to derive (50b,c). In an analysis with rightward movement, the particle must be stranded (50c) or move together with the main verb (50a). For (50b) a more complex analysis is required that uses both right- and left-adjunction (the latter for the particle) and that violates the head movement constraint:

- (51) uit lopen kunnen moet ==> ~~uit~~ lopen uit kunnen moet  
~~uit~~ lopen uit kunnen moet ==> ~~uit~~ ~~lopen~~ uit kunnen lopen moet  
~~uit~~ ~~lopen~~ uit kunnen lopen moet ==>  
~~uit~~ ~~lopen~~ [~~uit~~ ~~kunnen~~ ~~lopen~~] moet [uit kunnen lopen]

In VP-movement analyses the particle must be able to move independently as well, either as a head or as a maximal projection. It is unclear why particle movement takes place. Since it is optional it is hard to provide an explanation in terms of licensing or feature checking.

### 8.2.3 VP-movement

For VP-movement there are two options as well. The first is a uniform head final base structure with rightward VP-movement.<sup>48</sup> Examples of such derivations are given in (52) and (54). In (52), the arguments and modifiers are scrambled out of the VP first before VP moves to the right and attaches to the higher VP. Such scrambling is independently needed for arguments (53a), but it is not clear that this is also true for particles and low adverbs (53b). It is also not clear why such scrambling and VP-movement occur in the first place. Again, we have a construction-specific analysis that does not explain why these operations are impossible in other domains.

- (52) [<sub>VP</sub> het probleem goed oplossen] moet ==>  
the problem well solve must  
het probleem goed [<sub>VP</sub> ~~het probleem goed~~ oplossen] moet  
the problem well the problem well solve must  
het probleem goed [<sub>VP</sub> ~~het probleem goed~~ oplossen] moet [<sub>VP</sub> ~~het probleem goed~~  
the problem well the proble well solve must the problem well  
oplossen]  
solve
- (53) a. [<sub>VP</sub> ~~het probleem~~ oplossen] zal Jan het probleem wel.  
the problem solve will John the problem certainly  
b. \* [~~Goed~~ oplossen] zal Jan het probleem wel goed.  
well solve will John the problem certainly well  
c. \* [~~Op~~ eten] zal Jan de appel wel op.  
up eat will John the apple up

In (54), the argument is not scrambled out of the VP before VP movement. In the resulting order the verb cluster is interrupted by the argument, an option that is available in many Flemish dialects, not only for arguments but also for low adverbs.<sup>49</sup> If both options are combined within one derivation we get the so called third construction, illustrated in (55).<sup>50</sup>

<sup>48</sup> Cf. Den Besten and Broekhuis (1992).

<sup>49</sup> Cf. SAND Volume 2 for the geographic distribution of cluster interruption and references.

<sup>50</sup> E.g., Den Besten and Broekhuis (1992), among others.

- (54) dat Jan [<sub>VP</sub> een boek lezen] moet ==>  
 that John a book read must  
 dat Jan [~~<sub>VP</sub> een boek lezen~~] moet [<sub>VP</sub> een boek lezen]  
 that John a book read must a book read
- (55) dat Ed [<sub>VP</sub> Ann een boek te geven] probeert ==>  
 that Ed Ann a book to give tries  
 dat Ed Ann [~~<sub>VP</sub> Ann een boek te geven~~] probeert [<sub>VP</sub> Ann een boek te geven]  
 that Ed Ann Ann a book to give tries Ann a book to give

With a uniform head initial structure and leftward VP-movement the problems are the mirror image of the previous account. To derive the Flemish cluster interruption order the interrupting constituents must remain in situ. In the varieties of Dutch in which clusters without a *te*-‘to’ infinitive cannot be interrupted by arguments or adjuncts, such constituents must be scrambled out of the cluster at some point of the derivation.<sup>51</sup>

If scrambling can precede VP-movement then this opens up the possibility that all V-movement is in fact remnant VP-movement where all constituents are evacuated from VP prior to VP-movement.<sup>52</sup> This type of analysis faces the same problems regarding the criteria in (44) as the other movement analyses. An important disadvantage of this type of analysis is that the categorical impossibility of the 2-1-3 does not follow directly from the analysis but has to be stipulated. The 2-1-3 order in (56) is derived by first moving VP3 out of VP2 and then moving the remnant VP2 across V1.

- (56) [<sub>VP1</sub> V1 [<sub>VP2</sub> V2 [<sub>VP3</sub> V3]]] ==>  
 [<sub>VP1</sub> V1 [[<sub>VP3</sub> V3] [<sub>VP2</sub> V2 [<sub>VP3</sub> ~~V3~~]]] ==>  
 [[<sub>VP2</sub> V2 [<sub>VP3</sub> ~~V3~~] [<sub>VP1</sub> V1 [[<sub>VP3</sub> V3] [<sub>VP2</sub> ~~V2~~ [<sub>VP3</sub> ~~V3~~]]]]]

In several of the analyses discussed above including the newly proposed one the impossibility of 2-1-3 follows without any stipulation.

### 8.3 Another PF-analysis

In the analyses described in 8.1 and 8.2, word order variation in verb clusters is the result of variation in the branching direction in the base structure and variation in movement of V or VP in syntax. There are also analyses in which the variation arises at the level of phonological interpretation (PF).<sup>53</sup> The crucial ingredients of such analyses are reanalysis (two verbs that are not one constituent in the base are reanalyzed as one constituent) and flipping two constituents that are dominated by the same node. An advantage of this type of analysis is that the reordering operations take place at PF such that they do not have consequences for the semantics. However, this type of analysis is also construction specific and the trigger of the reordering operations is unclear. Like in the analysis proposed in this paper, PF restrictions are needed to capture restriction in word order variation.

<sup>51</sup> Cf. Zwart (1993) and Broekhuis (1997), among many others.

<sup>52</sup> E.g. Koopman and Szabolcsi (2000).

<sup>53</sup> E.g. Haegeman and Van Riemsdijk (1986).

## 9. Conclusion

The existing analyses of word order variation in verb clusters are hard to evaluate because most of the central theoretical assumptions are subject to debate, in particular since Kayne (1994).<sup>54</sup> Are verb clusters underlyingly head final, head initial or both?; Is movement to the left, to the right, or both?; Does movement involve heads, maximal projections, or both?; Is remnant movement generally available? Most of the analyse types discussed in this paper are rich enough to capture the attested word order variation, although often not without stipulations that are in need of independent support. All anayses discussed have the problem that it is unclear why reordering operations take place, why they are possible or necessary in one language variety but not in another, and why similar reordering operations are not available in other syntactic domains. All analyses of verb clusters that make use of movement at the level of syntax should explain why such movements do not have consequences at LF. Only base generation analysis, the PF reordering analysis and the analysis proposed in this paper explain why word order variation in verb clusters does not have consequences for semantic interpretation.

The analysis proposed in this paper has the following advantages. The properties of verb clusters are derived from a general grammar of the right-periphery that explains the (im-)possibility of extraposition of constituents of various categories from the (im-)possibility of VP-Intrapolition. The (im-)possibility of VP-Intrapolition in turn follows from generally accepted properties of predication: a predicate cannot be an argument itself, a predicate can have only one subject, an argument cannot be a predicate. These properties also explain the word order (im-)possibilities in nominal groups.

VP-Intrapolition has a clear trigger, it is necessary to realize predication relations syntactically. It therefore applies obligatorily in the syntactic component of the grammar; at this level, dialects do not differ from each other. Intrapolition constructions such as verb clusters and PP “Extraposition” show word order variation because after intrapolition, PF provides the independently motivated option to spell-out the intrapolited constituent in its base position or in its landing site. Because PF and LF cannot see each other, these spell-out differences do not have consequences for semantic interpretation.

In this way, the grammar of Dutch defines the variation space. Which of the word order options a dialect actually uses depends on language-external factors. This makes it necessary to make a distinction within the class of non-occurring orders between grammatically impossible orders and possible orders that are unrealized.

Future research must show if the proposed analysis can be maintained when tested against more complex phenomena such as particle placement and other types of cluster interruption, and corss-linguistic differences in the extrapolition of constituents.

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<sup>54</sup> Cf. Wurmbrand (2006) for a similar conclusion.

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