Not another book on Verb Raising

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CHAPTER 3

Merging verb cluster variation[22,23]

3.1 Introduction

The previous chapter discussed a number of previous approaches to verb clusters. The approach taken here differs from most of the previous literature in at least three respects.

- First of all, this analysis takes dialect geography as a starting point. This chapter will concentrate on the variation observed at different locations to see if there are particular co-occurrence patterns that might help understand the phenomenon of verb clustering. This part of the chapter builds on Barbiers and Bennis (2010).
- Secondly, this chapter presents an analysis without movement operations, such as verb (projection) raising. The structure of verb clusters are analyzed in terms of three properties. (i) Verb clusters represent base-generated (i.e. externally merged) orders. (ii) The linearization within the

[22] This chapter is an adapted version of an article by Barbiers, Bennis, and Dros-Hendriks (forthcoming)

[23] Versions of this chapter have been presented at NWASV2 (Ghent, May 2016), Grote Taaldag (Utrecht, February 2016), Linguistic Variation in the Interaction between Internal and External Syntax (Utrecht, February 2016), Edisyn (Zürich, June 2015) and PLC (Philadelphia, March 2015), Penn Common Ground (Philadelphia, March 2015), MIT syntax square (Cambridge, February 2015), Yale Lunch talks (New Haven, February 2015), UConn Ling Lunch (Connecticut, February 2015), NYU Brown Bag (January 2015), Meertens Instituut T-lezing (Amsterdam, December 2014) and Comparative Syntax (Leiden, December 2014). I would like to thank those audiences for their helpful comments and questions. Furthermore, I am grateful to the reviewers of Linguistic Variation.

VP is unidirectional. As a consequence, only the 1-2-3 and 3-2-1 orders involve three-verb clusters. (iii) The categorial status of the elements involved in the cluster can vary. More specifically: verbs can be reanalyzed as adjectives or nouns. It will be argued that this is the case in the 1-3-2, 3-1-2 and 2-3-1 orders.

- Last but not least, section 3.7 will demonstrate that the intuitions speakers have of the various orders in verbal clusters, even with respect to cluster orders they don't produce themselves, correlate with the patterns observed within the Dutch speaking area. It will be argued that this must be due to their syntactic knowledge and cannot be due to familiarity with the various orders.

3.2 Verb cluster formation

Here, it is assumed that a verbal cluster is built through the operation of Merge. In a two-verb cluster, the projection of the main verb [$_{VP_2}$] is merged with an auxiliary verb [$_{V_1}$], thereby creating a verbal cluster [$_{VP_1}$]. However, Merge is not an operation that forces the auxiliary to be ordered with respect to the main verb. It thus allows both orders [$_{VP_1}$ V_1 VP_2] and [$_{VP_1}$ VP_2 V_1] to be formed. In order to account for the word order variation, one has to find subsidiary principles that determine the order within the verb cluster and that allow variation in word order to occur. In order to be able to determine what the properties of such principles are, the formation of more complex verb clusters should be considered.

Before going into a more detailed study of the data, this base-generation approach will briefly be compared with previous approaches from a more theoretical perspective. As discussed in chapter 2, there are lots of proposals around. Four major types of proposals were distinguished: a movement of the verb (projection) to the right or to the left (VP-intraposition), PF-movement approaches, and base-generation.

First, consider previous base-generation approaches, it was illustrated in chapter 2 that many of those analyses require some sort of mechanism to account for the observed 3-1-2 order, such as movement of V_3. It will be argued in this chapter that only the 1-2-3 and the 3-2-1 orders involve base-generated three-verb clusters. The 1-3-2, 3-1-2 and 2-3-1 orders involve a reanalysis of V_3 or [V_2-V_3] as nominal or adjectival. As a consequence, this approach does not involve any movements that are specific to verb clusters. A further advantage of the approach taken here comes from the 1-3-2 order. By analyzing 3 as non-verbal, it becomes possible to account for the fact that this order is particularly frequent in those areas where non-verbal material can interrupt the verb cluster. This geographic pattern will be the topic of section 3.6.

Another base-generation approach to verb clusters that has not been discussed yet, is presented by Williams (2003) and Bader and Schmid (2009). In

their approach, variation is found in the level and direction of selectional restrictions. For example, as Bader and Schmid demonstrate, the 3-1-2 order in *lesen hat wollen* 'read had want' can be derived by assuming that V_1, a tense auxiliary, selects V_2 to its right, while V_2, a modal auxiliary, selects V_3 to the left. The level of the selectional restrictions of V_2 is the node dominating V_1 and V_2. It is this node that selects V_3 to its left. While this approach hence does not require any unmotivated movements, it can also not account for the geographic co-occurrence patterns in the 1-3-2 order and interrupted verb clusters. Differently from Williams (2003) and Bader and Schmid (2009), I assume that the direction of selection does not differ for each verb type. Rather, it will be argued that the direction of linearization is uniform in the verbal domain.

The base-generation approach taken here is different from the movement approaches in various ways. First of all, the current approach does not require specific movement rules for the formation of verb clusters. In this perspective, movement is not involved in the building of verb clusters. There is no rule of Verb Raising in the sense of Evers (1975), or VP-intraposition in an antisymmetric system, or a rule of inversion that takes place at PF. The relevant structures are generated by the (successive) application of Merge. A recurrent problem for the syntactic movement approaches is the lack of motivation for these movements (cf. a.o. Chomsky (2001)).[24] There appear to be no triggers for movement, neither morphosyntactically nor semantically. Different orders in a cluster vary in the order of verbs only, not in the form or the interpretation of the cluster. There is no effect on pragmatics or scope either. Given that a minimalist approach to movement presupposes a trigger for the movement, often represented as feature checking, this causes a theoretical problem.[25]

A further argument for an account in which the verb cluster is base-generated through Merge is the fact that the whole cluster can be the object of nominalization, as in (40).

(40) het moeten$_1$ kunnen$_2$ eten$_3$ van een koekje
the must can eat of a cookie
'the obligation to be able to eat a cookie'

In a movement approach, the internal structure of a complex nominalization requires that these complex nouns are derived from syntactically derived clusters after movement. In this approach, the generated verb projection is only recategorized as a noun, as is the usual approach to the derivation of nominalizations.

[24] Exceptions are Barbiers (2005) and Barbiers (2008b), as was discussed in chapter 2. Both these papers are based on the set of SAND data also used for the current paper.

[25] Another point is the phenomenon of clause union, as first discussed in Evers (1975), currently known as restructuring. Evers argues that sentences with verb clusters behave as single clausal domains, rather than as a combination of several domains. According to him, there must be a rule like *Pruning*, that destroys the base-generated complex structure after moving the head (V) out of the clause by Verb Raising (see footnote 8 on page 14). In the Merge analysis, there is no complexity to begin with.

To conclude, there are no syntactic, semantic, morphological or pragmatic reasons to consider a verb cluster to be the result of a complex structure that is affected by V(P)-movement, or inversion. The verb cluster is the consequence of merging a verb with a verbal projection. As the verb cluster constitutes a complex verb, arguments of lower verbs can be selected by the entire verb cluster, see section 3.5.2.

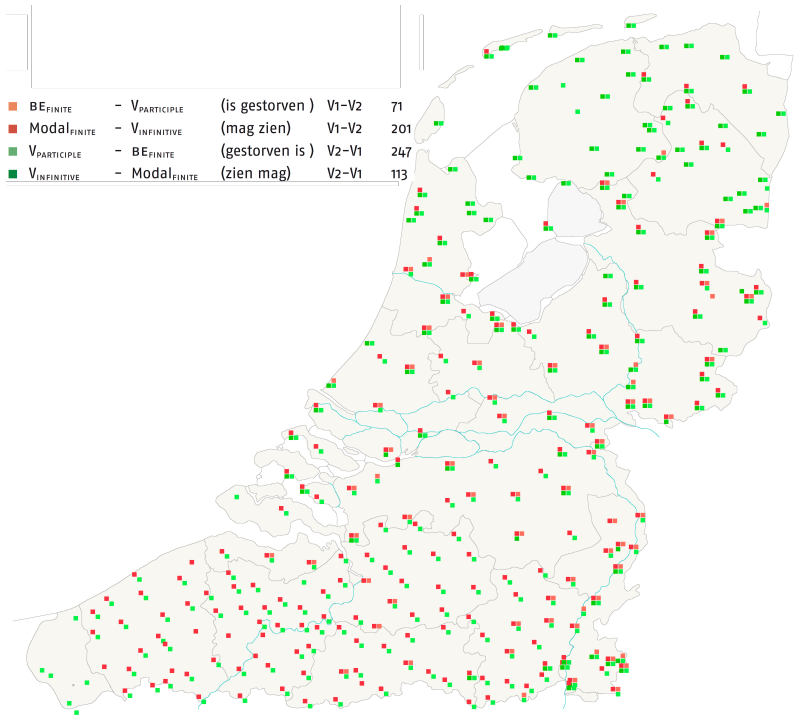
Two-verb clusters thus involve the binary merge of a verb with a verbal projection in narrow syntax. The result of this operation can be merged with another verb to construct a three-verb cluster. This operation does not force any specific ordering of the elements involved. The result of this process is linearized post-syntactically. it will be argued that restrictions on linearization prohibit the occurrence of certain verb orders. More specifically, it will be argued that linearization is unidirectional within a particular domain. As a consequence, only the 1-2-3 and 3-2-1 orders involve three-verb clusters.

3.3 Two-verb clusters

Let's turn to the variation in word order observed in verb clusters in Dutch. As chapter 2 discussed, even in the case of clusters in which the main verb is accompanied by one auxiliary verb, geographical differences are observed. As was indicated on Map 2.1 (repeated here), the main verb may either precede or follow the auxiliary, but there are clear patterns in distribution.

(41) a. ...ik vind dat jij het ook niet *mag zien* / *zien mag*.
...I find that you it also not may see / see may
'...I think that you should not see it either.'

b. Ze weet niet dat Marie gisteren *gestorven is* / *is gestorven*.
She knows not that Marie yesterday died is / is dies
'She does not know that Marie died yesterday.'



Map 2.1 (repeated): SAND-II map 16

In the northern part of the country, the order Main Verb - Auxiliary, or rather V_2-V_1, is predominant. In the southern part, a distinction is observed, which is related to the nature of V_1. If V_1 is a perfect auxiliary verb and the main verb a participle, the order is V_2-V_1, but if V_1 is a modal, the order is V_1-V_2. In the remainder of the language area the situation is somewhat unclear. Both geography and type of the auxiliary thus determine the distribution of word order.

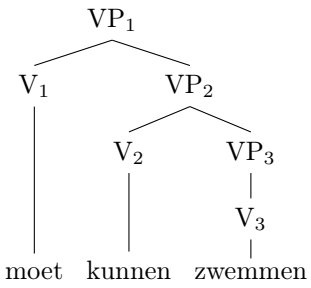
These orders can easily be derived by Merge, assuming that Merge does not imply a specific order within the complex constituent that is created. However, the different order possibilities across varieties of Dutch requires independent argumentation. In order to do so, more complex verb clusters need to be considered. There are SAND-data (SAND-II, Barbiers et al. 2008, chapter 1) for verb clusters with three verbs. These will be discussed in the next section.

3.4 Three-verb clusters

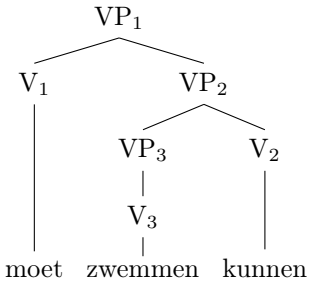
If Merge is taken to be the verb cluster building machine, the prediction arises for three-verb clusters that only four out of the logically possible six orderings can be generated. Let's look at the different possibilities. At first, the projection of the main verb [VP_3] is merged with the auxiliary verb that directly dominates

the main verb [V$_2$], either a modal or a perfect auxiliary. That is basically the situation as was established for verb clusters with two verbs. The [$_{VP_2}$ V$_2$ VP$_3$] and [$_{VP_2}$ VP$_3$ V$_2$] can be built. If one now merges another auxiliary verb, the highest one [V$_1$] – an auxiliary that selects the already built cluster –, four possible orders arise: [$_{VP_1}$ V$_1$ [$_{VP_2}$ V$_2$ VP$_3$]] - [$_{VP_1}$ [$_{VP_2}$ V$_2$ VP$_3$] V$_1$] and [$_{VP_1}$ V$_1$ [$_{VP_2}$ VP$_3$ V$_2$]] - [$_{VP_1}$ [$_{VP_2}$ VP$_3$ V$_2$] V$_1$]. In structure:

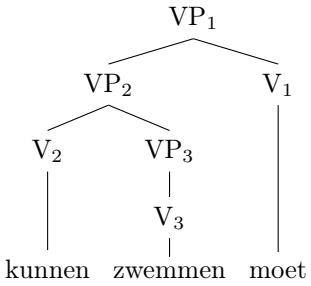
(42) a. = 1-2-3



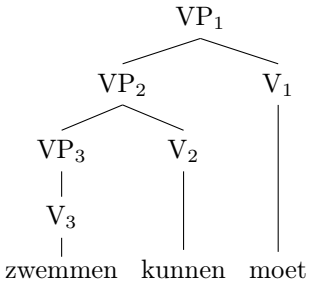
b. = 1-3-2



c. = 2-3-1



d. = 3-2-1



Given common assumptions about the operation of Merge, such as binarity, the

orders V_2-V_1-V_3 and V_3-V_1-V_2 cannot be generated through Merge. A structure in which V_1 breaks up the cluster $[_{VP_2}\ V_2\text{-}V_3]$ or $[_{VP_2}\ V_3\text{-}V_2]$ that was built in the first Merge operation cannot be generated. This leads to the prediction in (43).

(43) In three-verb clusters the orders V_2-V_1-V_3 and V_3-V_1-V_2 are impossible.

Let's now look at the empirical facts of verb clusters with three verbs in varieties of Dutch. Chapter 2 already discussed the geographic distribution of the various verb clusters. Here, these distributions will be discussed in more detail.

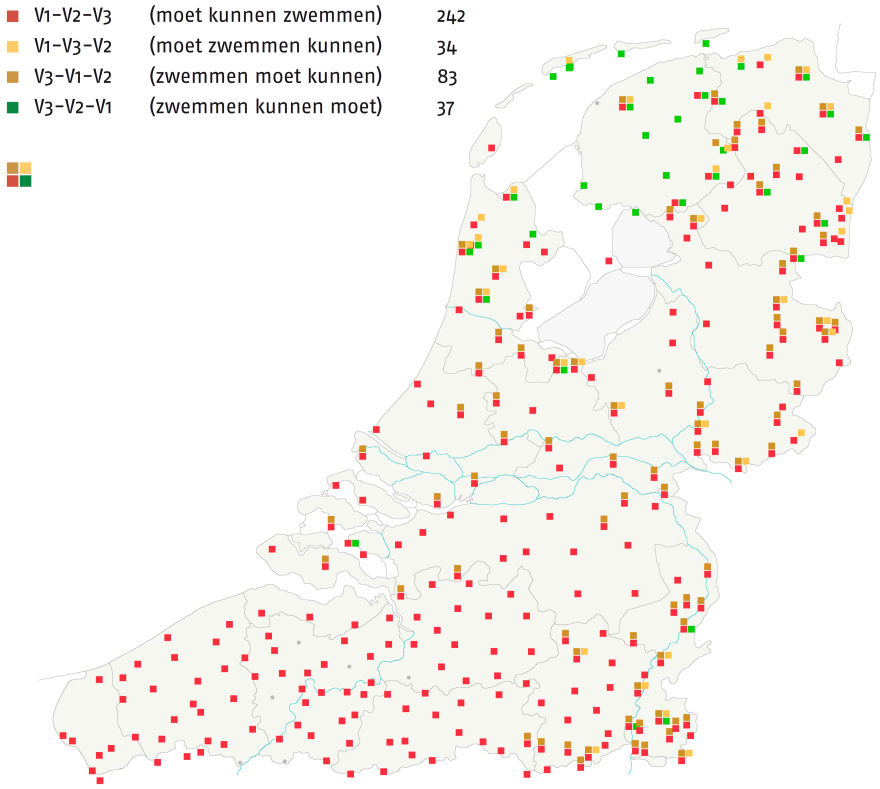
3.4.1 Clusters with two modal auxiliaries

The SAND-atlas contains a sentence with two modals and a main verb in a subordinate clause.

(44) Ik vind dat iedereen *moet*$_1$ *kunnen*$_2$ *zwemmen*$_3$.
I find that everyone must can swim
'I think that everybody should be able to swim.'

The geographical distribution of the orders that were found in the verbal cluster for this sentence were depicted on map 2.5 (repeated below).
The results are given in (45).

(45) i. V_2-V_1-V_3 is absent;
ii. V_2-V_3-V_1 is absent as well;
iii. V_1-V_2-V_3 is found in the whole language area with the exclusion of Friesland;
iv. V_3-V_2-V_1 is typical for the northern part of the language area and hardly occurs anywhere else;
v. V_3-V_1-V_2 is found throughout the Netherlands part of the language area, but never as the only order that is found in a particular location, almost always as a variant of the much more frequent V_1-V_2-V_3 order. One might call V_3-V_1-V_2 a secondary order;
vi. V_1-V_3-V_2 is the least frequent order that is found mostly along the eastern border. It is never found as the only available order. Most often it occurs in combination with both V_1-V_2-V_3 and V_3-V_1-V_2. One might call this a secondary order as well;
vii. There are many varieties that have 2, 3 and even 4 orders for this type of three-verb cluster.



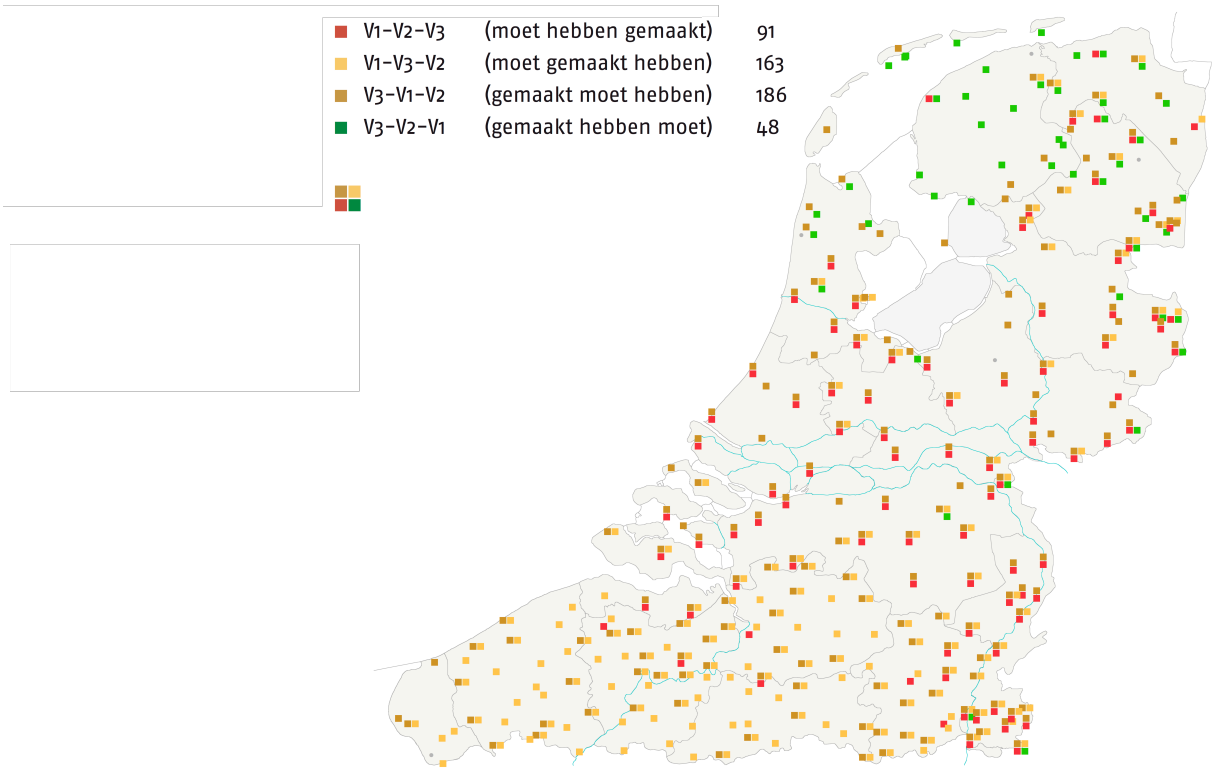
Map 2.5 (repeated): SAND-II map 17a

3.4.2 Clusters with a modal auxiliary and a perfect auxiliary

The sentence with a modal and a perfect auxiliary used as a test sentence in the SAND-project is given in (46).

(46) Ik vind dat Jan de wagen voor drie uur *moet*$_1$ *hebben*$_2$ *gemaakt*$_3$.
I find that Jan the car before three hour must have made
'I think that John must have repaired the car before three o'clock.'

The distribution of the orders in the verb cluster in (46) is given on map 2.2.



Map 2.2 (repeated): SAND-II map 17b

The distribution of verbs within the cluster with a modal verb that selects a perfect auxiliary and a main verb shows the properties in (47).

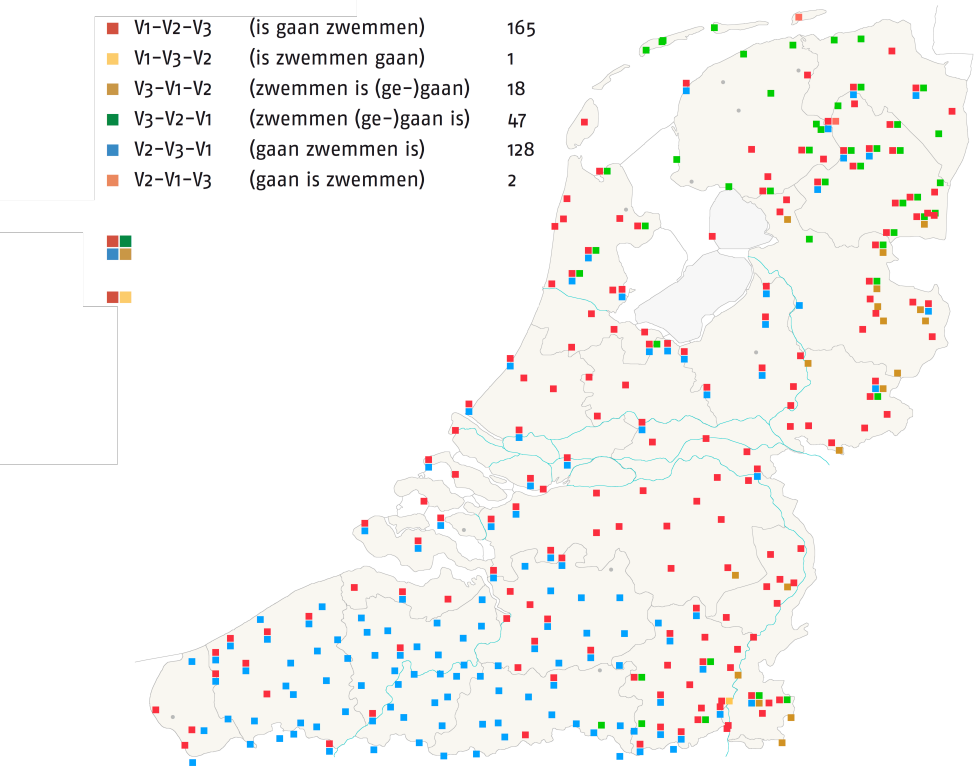
(47)
i. V_2-V_1-V_3 is absent;
ii. V_2-V_3-V_1 is absent as well;
iii. V_1-V_3-V_2 is the dominant order in the Belgian part of the language area;
iv. V_3-V_2-V_1 is the typical order in the northern part of the language area;
v. V_1-V_2-V_3 is restricted to the Netherlands part of the language area. It is never the only order in a particular location;
vi. V_3-V_1-V_2 is found in the whole language area except Friesland. It is the most frequent order and often occurs as the only order in specific varieties.

3.4.3 Clusters with a perfect auxiliary and an aspectual auxiliary

Section 3.4.2 presented the distribution of a cluster in which the modal verb selects a perfect auxiliary. Here the order is reversed, the perfect auxiliary selects a modal/aspectual auxiliary *gaan* 'go'. In the SAND-project, the sentence in (48) was used as a test sentence for this type of construction.[26]

(48) Ik weet dat hij is_1 $gaan_2$ $zwemmen_3$.
I know that he is go swim
'I know that he went swimming.'

The distribution of the orders in the verb cluster in (48) is given on map 3.1.



Map 3.1: SAND-II map 18a

The distribution of verbs within the cluster that consist out of a perfect auxiliary selecting an aspectual auxiliary and a main verb shows the properties in (49).

[26] As is well known, in this type of construction, Dutch has the infinitive *gaan* 'go' instead of the participle *gegaan* 'went', the so-called 'Infinitivus-Pro-Participio' effect, see section 3.5.3 for discussion.

(49) i. V_2-V_1-V_3 is absent;[27]
ii. V_3-V_1-V_2 occurs in 18 locations in the eastern part of the language area.[28]
iii. V_1-V_3-V_2 is absent as well;[29]
iv. V_1-V_2-V_3 is the most frequent order, in particular in the Netherlands part of the language area;
v. V_2-V_3-V_1 is an order that is found in the Belgian part of the language area in particular;
vi. V_3-V_2-V_1 is the dominant order in the northern part of the language area.

3.4.4 A comparison of the three types of 3-verb clusters

There are several conclusions that can be drawn from a comparison of the data in sections 3.4.1-3.4.3:

(50) i. V_2-V_1-V_3 does not occur;[30]
ii. V_1-V_2-V_3 occurs frequently in all three constructions, especially in the Netherlands area;
iii. V_3-V_2-V_1 is basically confined to the northern part of the language area. In that area it occurs in all three constructions;
iv. V_2-V_3-V_1 only appears in ASP_2-V_3-AUX_1 (section 3.4.3). It is excluded in the other two;
v. V_1-V_3-V_2 is frequent in MOD_1-V_3-AUX_2 (section 3.4.2), infrequent in MOD_1-V_3-MOD_2 (section 3.4.1), and absent in AUX_1-V_3-ASP_2 (section 3.4.3);
vi. V_3-V_1-V_2 is frequent inV_3-MOD_1-AUX_2 (section 3.4.2), occurs regularly in V_3-MOD_1-MOD_2 (section 3.4.1), and sporadically in V_3-AUX_1-ASP_2 (section 3.4.3).

3.5 The analysis of the order in the verb cluster

Below, an analysis will be presented of the empirical generalizations outlined above. It will be argued that these generalizations follow from properties of Merge in combination with parameters related to linearization, the categorial status of participles, and the categorial status of infinitives.

[27] As discussed in footnote 16 on page 23, the two occurrences on map 3.1 are interpreted as noise.
[28] Section 3.5.2 will come back to these occurrences.
[29] The single occurrence on map 3.1 is taken to be noise as well.
[30] As discussed in chapter 2, Salzmann (2013) discusses some instances of this order in Zürich German, but it is restricted to specific classes of verbs, namely perception verbs, benefactives and causatives. This suggests that these involve a different construction. These verbs were not tested in the SAND project, so this issue will not be discussed any further here.

3.5.1 The order 2-1-3 does not exist (50i)

The fact that the order V_2-V_1-V_3 does not occur in any of the constructions discussed above can be explained by the fact that this order cannot be derived, as was discussed in chapter 2. The fact that this order is impossible has been observed in the literature (Zwart 1996, a.o.). As discussed in section 2.4, most previous accounts of verb clusters are able to account for this.

3.5.2 The order 3-1-2 does not exist (50vi)

The current proposal excludes the order V_3-V_1-V_2. The reason that this order is impossible is similar to the exclusion of V_2-V_1-V_3: if one derives cluster orders through Merge, V_2 and V_3 have to be adjacent. The V-raising analysis predicts that this order exists if V_2 can move to V_1 without moving V_3. This is not an instance of a minimality violation. In the other approach, V_3-V_1-V_2 can be derived simply by moving VP_3 across V_2 and V_1.

Section 3.4 illustrated that the order V_3-V_1-V_2 indeed does occur in the three constructions discussed above, and quite frequently in two of these. This seems to be a serious problem. Either the base-generation approach adopted here needs to be abandoned, or these counterexamples need an explanation. It will be shown in this section that indeed the order V_3-V_1-V_2 does not exist and that apparent counterexamples should be analyzed as instances of different structures.

The order V_3-V_1-V_2 frequently occurs in the construction in which the main verb is a participle (section 3.4.2). With the exception of the northern provinces, this order can be found in the whole language area. It is well known that participles are ambiguous with respect to their categorial status. They show up in verbal or adjectival contexts. Participles appear in attributive position in noun phrases, in contrast to infinitival verbs. The noun phrase *de verslagen.*PTCP *vijand* 'the beaten enemy' is perfectly fine, but the noun phrase *de verslaan.*INF *vijand* 'the beat enemy' is ungrammatical.[31] In some cases there is an interpretative difference between adjectival and verbal participles (a.o. Kraak and Klooster 1968:149-159). A participle such as *geopend* can be interpreted as 'open' or 'has been opened'. In a verb cluster as in (51a, [V_2-V_1]), the participle indeed allows both meanings of *geopend*. However, in the other order (51b, [V_1-V_2]) the participle can only be interpreted as verbal, with the interpretation 'has been opened'.

[31] Similarly, participles do appear in adverbial position, as in *de vijand zat verslagen op de grond* 'the enemy sat beaten on the ground', but infinitives do not. As opposed to bare infinitives, *to*-infinitives do occur in attributive positions in Dutch, as in *de te bellen kandidaten* 'lit. the to call candidates, the candidates that need to/can be called' showing that the presence of the infinitival marker *te* 'to' may correspond to a categorial difference (cf. Van Riemsdijk 1982; Bennis 1990).

(51) a. Hij zag dat de deur *geopend*$_2$ *is*$_1$.
He saw that the door opened is
'He saw that the door has been opened / is open.'

b. Hij zag dat de deur *is*$_1$ *geopend*$_2$.
'He saw that the door has been opened / *is open.'

c. de geopende deur
'the open door / the door that has been opened'

Participles in attributive position within nominal phrases allow both interpretations, as is demonstrated in (51c). Apparently an adjectival position of the participle allows a verbal, passive interpretation ('has been opened') and an adjectival, stative ('open') interpretation.[32] The fact that only the passive interpretation is available in (51b) can be accounted for by assuming that the participle in (51b) is verbal rather than adjectival, thereby excluding the stative interpretation ('open'). Given that both interpretations are available in (51a) one can conclude that the participle in cluster-initial position can be adjectival or verbal, just as in (51c). The difference in interpretation between (51a) and (51b) is thus related to a categorial difference. In (51a) the participle is or may be adjectival, whereas it has to be verbal in (51b). This is supported by restrictions on modification, e.g. the durative adverbial *de hele dag* 'the whole day' is possible with the adjectival variant of (51a) but not easily with the verbal variant in (15b).[33]

The adjectival properties of participles have also been observed for present participles by Bennis and Wehrmann (1990) and for past participles by Evers (2003); Koeneman et al. (2011) and others. Similarly to this proposal, Koeneman et al. (2011) argue that participles can be adjectival. They demonstrate that the participle *gestolen* 'stolen' in so-called *perfect doubling* constructions has to precede the other verbs, indicating that this participle has to be adjectival in such constructions.

(52) a. ...dat ik zijn fiets gestolen$_{3.\text{PCP}}$ gehad.$_{2\text{PCP}}$ heb$_1$. (South-
...that I his bike stolen had have
Eastern Dutch)

b. ...dat ik zijn fiets gestolen$_{3.\text{PCP}}$ heb$_1$ gehad$_{2.\text{PCP}}$.
...that I his bike stolen have had
'that I had stolen his bike.'

c. * ...dat ik zijn fiets heb$_1$ gehad$_{2.\text{PCP}}$ gestolen$_{3.\text{PCP}}$.
...that I his bike have had stolen

Koeneman et al. adopt the idea that participles can become adjectival through merger with an abstract adjectival head (cf. Lieber (1980); Bresnan (1982);

[32] This stative interpretation is known in the literature as a target state. Cf. Koeneman, Lekakou, and Barbiers 2011 for recent discussion, diagnostics and references.

[33] More precisely, there is coercion such that *de hele dag* in (51b) has a repetitive, not a durative interpretation, as expected.

Grimshaw (1990); Pesetsky (1995); Anagnostopoulou (2003), among others). Crucially, the participle has not lost its verbal properties.[34] If adjectival participles indeed retain their verbal properties, this can explain why they introduce an additional aspectual layer, different from regular adjectives:

(53) a. ...dat de wagen (*gisteren) [AP klaar] is.
...that the car (yesterday) done is

b. ...dat de wagen (gisteren) [AP [VP gemaakt$_2$]] is$_1$.
...that the car (yesterday) made is

The combination of the past adverb *gisteren* 'yesterday' and the present auxiliary *is* is ungrammatical. However, when the participle *gemaakt* 'made' is used, this combination becomes grammatical. This might be the result of the participle introducing its own aspectual layer. If adjectival participles have a verbal core, they are expected to exhibit both adjectival and verbal properties. On the other hand, the truly verbal participle in the 1-2 order is not predicted to exhibit purely adjectival properties.[35] Modification of the adjectival affix *on-*, which is a typical adjectival property, is indeed only acceptable in the order in which the participle precedes the other verb:

(54) het artikel mag worden geretourneerd mits de verpakking
the article may be returned if the package
<(on)geopend> is <(*on)geopend>.
<(un)opened> is <(*un)opened>

If participles are analyzed as being able to have an adjectival categorial status, an answer can be provided to the problem that V_3-V_1-V_2 is theoretically predicted not to occur. Non-verbal elements generally appear to the left of the verb in Dutch clauses since Dutch shows an OV-order. Participles that show up as initial elements in a verb cluster may then be taken to have an adjectival status. In section 3.3, two-verb clusters were discussed. It was demonstrated that the participle in front of the auxiliary verb is possible in the whole language area. Apparently, adjectival status of the participle is a common phenomenon in Dutch varieties. This would then lead one to expect that the order *participle*-V_1-V_2 will show up in the whole language area as well. This is indeed the case with the exception of the northern part of the language area. The north is

[34] An analysis in which participles can be adjectival implies that the verb *hebben* 'have' should also be able to take an adjectival complement. This is correct, as illustrated in (i). See Koeneman et al. 2011 for geographic and grammatical restrictions on this construction.

(i) ...dat Jan de hele dag het raam open had.
...that Jan the whole day the window open had
'...that Jan had the window open the whole day.'

[35] There is extensive literature on the verbal and adjectival properties of participles (Baker et al. 1989; Embick 2004; Kratzer 1994, 2000; Reinhart and Siloni 2005, among others). Since these involve different constructions, the diagnostics provided in those articles cannot automatically be applied to the cases at hand.

predicted to have the order *participle*-V_2-V_1 given that it strongly prefers V_2-V_1 to V_1-V_2. Moreover, it can be observed on map 2.2 that the order V_1-V_2-V_3 is accompanied by a participle-initial order in all locations.[36] In order to have both interpretive possibilities for the participle, the initial position must be available. The verbal status reduces the interpretive possibilities of the participle. Consequently, clusters with a participle in a cluster-final, verbal position are expected to constitute a subset of clusters with participles in a non-verbal position.

The V_3-V_1-V_2 order in this construction (section 3.4.2) is thus analyzed as an instance of the *participle.*A-V_1-V_2 order, and this order is consequently no longer a problem for the theory. If the verb is not adjectival but verbal, it will show up in the V_1-V_2-V_3 order as the rightmost element.[37]

There exists a strong preference for an adjectival status of the participle in the Belgian part of the language area, whereas the Dutch part shows an ambiguity in categorial status. For the northern area it is difficult to determine what the status of the participle is. In the order *participle*-V_2-V_1 the participle can be adjectival, as is the case in the rest of the language area, but it may also be a verb since the northern part of the language area has a general strategy in which the main verb is the initial element in the cluster. In all the constructions discussed above, the northern area shows a strong preference for V_3-V_2-V_1. Since there appears to be nothing wrong with generating the V_3-V_2-V_1 order through Merge, this is unproblematic (but see below).

In section 3.4.1 it was shown that the order V_3-V_1-V_2 is also highly frequent when the cluster contains two modal auxiliaries, as in *zwemmen moet kunnen* 'swim must can'. With respect to this construction, a similar logic as with the participles of section 3.4.2 is followed. This order can be attributed to the fact that the main verb does not show up as a verb but that it may optionally appear in a nominalized form. This leads to a structure of the type: [*nominalized VP*]-V_1-V_2.

An indication that such an analysis is on the right track is provided by the fact that the V_3-V_1-V_2 order is, as illustrated in section 3.4.1, a secondary order. The verb might but does not have to be reanalyzed as a nominal. If the construction *nominalization*-V_1-V_2 is found in a particular location, the order V_1-V_2-V_3 is available as well. Clusters with nominalized forms constitute a subset of clusters with verbal main verbs. Nouns appear to the left of verbs and, in most varieties of Dutch, main verbs appear to the right of the auxiliaries. It should be noted that the nominalization possibilities in three-verb clusters are geographically restricted. This possibility is found in the middle and eastern parts of the language area, but not in Belgium and Dutch Brabant. This issue

[36] V_3-V_2-V_1 in the north, V_3-V_1-V_2 in the rest of the language area, and V_1-V_3-V_2 in the Belgian part. The first two can be analyzed as adjectival participles. It will be demonstrated below that the same holds for the V_1-V_3-V_2 order.

[37] In many Highest Alemannic varieties, participles can receive adjectival inflection when they are not cluster-final (Brandner et al. 2015). As Brandner et al note, no definite conclusions can be drawn for the adjectival status of V_3 in 3-1-2 and 1-3-2 verb clusters.

will be discussed below (section 3.6.2).

An argument in favor of this analysis comes from the fact that in a sentence such as (44), the verb can be replaced by a pronoun. The sentence *Ik vind dat iedereen* ***dat*** *goed moet kunnen*, in which *zwemmen* 'swim' is replaced by the pronoun *dat* 'that', is fine. Such an analysis has been discussed in the literature before (cf. Den Besten and Broekhuis 1989; Evers 2008; Barbiers 2008b). If this is correct, it follows that the order V_3-V_1-V_2 is not a counterexample to this theory of verb clusters. Such an approach is supported by the facts in (55).

(55) a. Ik vind dat ik Jan moet$_1$ laten$_2$ slagen$_3$.
I think that I Jan must let succeed
'I think that I have to let Jan succeed.'

b. * Ik vind dat ik Jan slagen$_3$ moet$_1$ laten$_2$.[38]
I think that I Jan succeed must let

c. * Ik vind dat ik Jan dat moet$_1$ laten$_2$.[39]
I think that I Jan that must let

The sentence in (55a) is of the type discussed in section 3.4.1. However, the order V_3-V_1-V_2 is not available in this case, as shown in (55b). This can be accounted for by the fact that the causative verb *let* does not allow a (pro)nominal complement, as is shown in (55c). The causative auxiliary *laten* 'let' selects a verbal complement, which forces the infinitive *slagen* to appear as a verb to the right of *laten* (V_1-V_2-V_3). V_3-V_1-V_2 is unacceptable in this case because the infinitive shows up as a nominalization and thus violates the selection requirements of *laten*.

Section 3.4.3 has shown that the order V_3-V_1-V_2 also occurs with the cluster type *zwemmen is gegaan* 'swim is gone' (56a), be it sporadically (only 18 times

[38] Unfortunately, this sentence was not tested in the SAND project, so the unacceptability of this sentence is based on our judgements.

[39] Note that non-causative *laten* 'let' does allow a pronoun in this position:

(i) a. Laat dat.
Let that
'Do not do that.'

b. Ik vind dat ik dat moet laten.
I think that I that must let
'I think that I should not do that.'

c. Ik laat dat aan jou.
I let that to you
'I leave it up to you.'

In these examples, *let* is transitive, and does not have a causative interpretation. Since non-causative laten selects a nominal, rather than a verbal, complement, it is acceptable with the 3-1-2, not with the 1-2-3 order:

(ii) a. Ik vind dat Jan voortaan zwemmen$_3$ moet$_1$ laten$_2$.
I think that Jan henceforth swim must let
'I think that Jan henceforth must give up swimming.'

b. * Ik vind dat Jan voortaan moet$_1$ laten$_2$ zwemmen$_3$.
I think that Jan henceforth must let swim

in the east of the language area). This cluster type has a perfect auxiliary as the highest verb. The low frequency of V_3-V_1-V_2 here might be due to the aspectual auxiliary *gaan* 'go'. Like *laten* 'let' discussed above, *gaan* 'go' does not easily allow its verbal complement to be nominalized (56b), and therefore (56a) is highly marked and only seems to occur in transitional zones (see section 3.6.2).

(56) a. Ik denk dat Jan zwemmen$_3$ is$_1$ gegaan$_2$.
I think that Jan swim.INF is gone

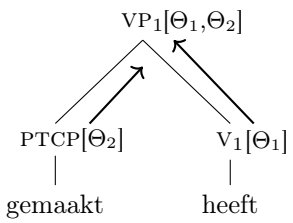
b. * Ik denk dat Jan dat is$_1$ gegaan$_2$.
I think that Jan that is gone

If aspectual *gaan* 'go' does not allow nominalization of its complement and if, as is the current claim, V_3-V_1-V_2 does not exist when V_3 is verbal, the order V_3-V_1-V_2 *zwemmen is gegaan* 'swim is gone' is expected to be completely impossible, but, as illustrated above, it occurs in 18 locations in the east of the language area. This seems to be a distinct construction, however, given that in many of these 18 locations the directional particle *heen* 'towards' occurs before the main verb (cf. SAND II, map 18b). This makes the construction similar to the standard Dutch construction *uit zwemmen is gegaan* 'lit. out swim.INF is gone', for which no alternative orderings are possible. In these constructions – *[heen zwemmen] is gegaan* and *[uit zwemmen] is gegaan* – *gaan* 'go' takes a PP-complement, which is the regular type of complement for the verb *gaan*.

It was demonstrated above that the two orders that cannot be generated through Merge do not occur in the varieties of Dutch: V_2-V_1-V_3 and V_3-V_1-V_2. In apparent cases of V_3-V_1-V_2, V_3 should be analyzed as adjectival when V_3 is a participle and as nominal when V_3 is an infinitive.

This analysis has important consequences for the selection of arguments in the sentence. I follow Neeleman and Weerman (1993) who argue that the theta-grid of a verb cluster is derived from the theta-grids of its parts, via percolation.[40] This means that in a 2.PCP-1 verb cluster, both V_1 and the participle can assign thematic roles. This is illustrated in (57), which is based on Neeleman and Weerman's example (34), p. 451.

(57)



Following the analysis presented here, DPs that precede the verb clusters are base-generated in that position. I will get back to this in chapter 5.

[40] This is also the standard analysis in HPSG-type approaches, see e.g. Augustinus (2015) and references cited therein.

3.5.3 The order 2-3-1 does not exist (50iv)

There is another obvious candidate to remove from the set of possible orders in the verb cluster. It concerns the order V_2-V_3-V_1. This order could have been generated through Merge by merging the verb projection VP_3 with V_2 in a cluster [$_{VP2}$ V_2-VP_3] and then linearize this cluster to the left of V_1: [$_{VP1}$ [$_{VP2}$ V_2-VP_3] V_1]. However, the order only occurs in one of the three constructions under discussion, as in (58). It shows up in 128 locations throughout the language area, predominantly in the Belgian provinces East-Flanders and Antwerp. This order is absent in the other two constructions under discussion, as is demonstrated in (59).

(58) Ik weet dat hij gaan$_2$ zwemmen$_3$ is$_1$.
I know that he go swim is
'I know that he went for a swim.'

(59) a. * Ik vind dat iedereen kunnen$_2$ zwemmen$_3$ moet$_1$.
I think that everyone can swim must

b. * Jan weet dat hij voor drie uur de wagen hebben$_2$
Jan knows that he before three o' clock the car
gemaakt$_3$ moet$_1$.
have made must

The systematic absence of V_2-V_3-V_1 in the constructions in (59) might be taken to be non-structural. However, it seems plausible to take the perspective that the absence of this order in (59) is not a fact to be explained from a sociolinguistic perspective exclusively. The absence of this order can be given a structural explanation. There are three possibilities. One may consider clusters with a perfect auxiliary V_1 to have a structural property that allows the order V_2-V_3-V_1 to be generated only in this case. One may take V_2-V_3-V_1 to be generally possible and look for structural reasons why it must be absent in the two constructions in (59). Or one may find a reason why this order in the sentence in (58) is only superficially an instance of V_2-V_3-V_1. Here, the last approach will be taken. It will be argued that the sentence in (58) does not really count as an instance of V_2-V_3-V_1.

The construction is different from the other two in that the highest verb (V_1) is a perfect auxiliary. This auxiliary selects a participle. However, there is no verbal element that is morphologically recognizable as a participle. One might have expected ***gegaan*** *zwemmen is*, in which case V_2 morphologically shows up as a participle. The fact that an expected participle shows up as an infinitive is a well-studied phenomenon in the literature on verb clusters (cf. Wurmbrand 2006, 2017 for an overview). It is called the Infinitivus-Pro-Participio or IPP-effect. It is not the current aim to explain the IPP-effect, hence the exact formulation of the IPP-effect is not at issue. It seems that V_2 is no longer available for V_1 to govern the assignment of participial morphology after

V_2 has been merged with V_3. Not V_2 (*gaan*) is the participle, but the cluster [*gaan zwemmen*]. One might then take the IPP-effect to be caused by the fact that there is no possibility to assign participial morphology to a syntactically complex cluster.

Whatever the precise formulation of the IPP-effect, V_2-V_3 in the V_2-V_3-V_1 construction is taken here to constitute a participle. It was illustrated above (section 3.5.2) that participles are ambiguous in their categorial status. They can have an adjectival status in all varieties of Dutch and be verbal in a substantial number of varieties. The categorial status has consequences for the position of the participle, to the right of the perfective auxiliary if the participle is verbal, to the left if it is adjectival. The V_2-V_3-V_1 order may thus be taken to be an instance of a complex adjectival participle followed by the verb *be*, as in [[V_2-V_3]$_{ADJ}$ V_1]. The cluster V_2-V_3 is generated by Merge in the usual way and is categorized as an adjectival complex, in a way similar to the formation of adjectival participles in general. As a consequence, the adjectival complex occupies a position to the left of *be*.[41]

The participle does not necessarily have an adjectival status, it may also appear as verbal. If the complex participle in this construction is verbal, the complex is expected to be linearized to the right of the governing perfect auxiliary. This leads to the verb cluster V_1-V_2-V_3, which is indeed an alternative option in most of the language area.

Importantly, if this analysis of V_2-V_3-V_1 is correct, the expectation arises that there is a geographic correlation with other constructions involving participles. Earlier (maps 2.1 and 2.2) it was demonstrated that the orders V_1-$V_{2.PTCP}$ and V_1-$V_{2.AUX}$-$V_{3.PTCP}$ show up in the whole language area except the northern part, and predominantly in the Netherlands part of the language area. This is precisely the geographic distribution observed in the construction $V_{1.AUX}$-V_2-V_3 (*is gaan zwemmen*). Apparently the southern varieties have a preference for adjectival participles, and this preference clearly shows up in three constructions under discussion here: V_2-V_1, V_2-V_3-V_1 with $V_{1.AUX}$, and V_3-V_1-V_2 with $V_{2.AUX}$ (see section 3.6.1 for an analysis of V_1-V_3-V_2). The northern part has a different preference. The decreasing V_2-V_1 and V_3-V_2-V_1 order is preferred in all constructions there. In those cases the adjectival / verbal status of the participle is not relevant with respect to its linear position. In both cases the participle will appear to the left of the selecting verb.

The next fact to be explained is the lack of the V_2-V_3-V_1 order (with the hierarchical structure [[V_2 [V_3]] V_1]) in clusters with two modals (cf. 23a). The 2-3-1 order cannot arise if V_2 and V_3 are verbal, as merging V_1 to V_2-V_3 will be necessarily followed by uniform linearization yielding V_1-V_2-V_3. This means that in the order 2-3-1 the element 2, the element 3, or both 2 and 3 would have to be nominal. V_2-N_3-V_1 is impossible, however, as non-verbal elements in Dutch may not follow the verb that they are selected by (see also Zwart 1996). This

[41] See also (Hinterhölzl 2006:85), who similarly argues that IPP complements in the 2-3-1 order are participle phrases that have moved into the specifier of the selecting auxiliary.

makes the V_2-non-verbal element-V_1 order ill-formed for the same reason as for instance the order *bellen op moet* 'call up must'. N_2-V_3-V_1 is impossible too, as nouns cannot select verb phrases in Dutch. Finally, N_2-N_3-V_1 is impossible because nouns cannot select other noun phrases either.[42] A similar reasoning holds for (59b), with 3=participle. Element 3 cannot be verbal or adjectival when element 2 is nominal, as nouns do not select adjectives or verbs as their complements. [43]

3.5.4 The orders 1-2-3 and 3-2-1

In addition to the 'impossible orders' V_2-V_1-V_3 and V_3-V_1-V_2, the preceding section demonstrated that the order V_2-V_3-V_1 is not a possible verb cluster either. Three 3-verb orders still require an account. The different maps illustrate that the V_1-V_2-V_3 and V_3-V_2-V_1 orders do occur in all constructions, whereas the V_1-V_3-V_2 is only found on maps 2.5 and 2.2. The sentences in (60) provide relevant examples of V_1-V_3-V_2.

[42] Pseudopartitives such as *een emmer kersen* 'a bucket (of) cherries' at first sight seem to contradict this generalization. Apparently a noun may select a noun phrase, but only in the case in which the first noun can be interpreted as an indication of quantity (measure phrase) with respect to its nominal complement (Bennis 1979, among others). Bennis demonstrates that nouns that are not quantificational by themselves are interpreted as quantificational in that position:

(i) a. een zee Amerikanen
a sea Americans
'many Americans'

b. een regen protesten
a rain protests
'many protests'

Such a quantifying interpretation seems impossible with auxiliary verbs, which makes an N-N-V construction impossible. Crucially, there are no other cases in the grammar of Dutch in which a noun can directly select a noun phrase, cf. *een boek *(van) Jan* 'a book of Jan'.

[43] A reviewer mentioned that there is nothing that rules out building a complex VP, then adding a nominalizer or adjectival head and finally V_1, yielding the 2-3-1 order. Indeed, this should in principle be allowed when V_1 is a modal, considering the fact that modal verbs allow nominal complements in Dutch, as in (i).

(i) a. ...dat Jan een koekje moet.
...that Jan een cookie must

b. ...dat Jan dat moet.
...that Jan that must

It is not entirely clear why a nominal [V_2-V_3] complex would not be possible in the case of *kunnen zwemmen moet* 'can swim must'. As for *hebben gemaakt moet* 'have made must', the participial morphology might affect the possibility of analyzing [V_2-V_3] as nominal.

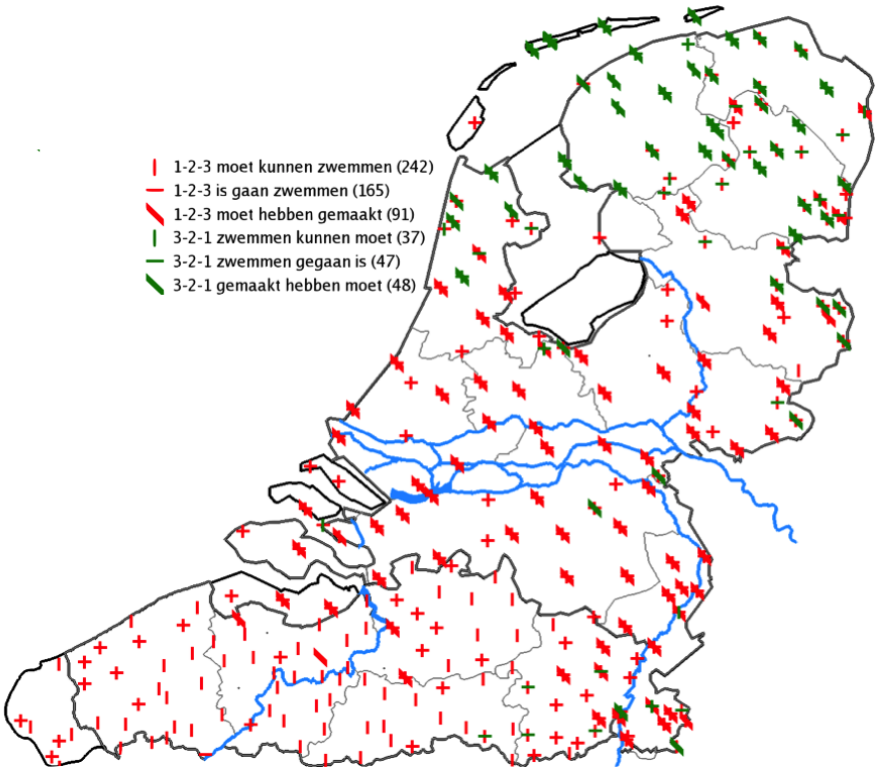
(60) a. Ik vind dat iedereen *moet*$_1$ *zwemmen*$_3$ *kunnen*$_2$.
I think that everyone must swim can

b. Jan weet dat hij voor drie uur de wagen *moet*$_1$ *gemaakt*$_3$ *hebben*$_2$.
Jan knows that he before three o'clock the car must made have

c. * Ik weet dat hij *is*$_1$ *zwemmen*$_3$ *gaan*$_2$.
I know that he is swim go

In section 3.6, it will be argued that the order V_1-V_3-V_2 does not exist and that (60a) and (60b) have to be analyzed as instances of V_1 – non-verbal material – V_2. If it can be shown that this is the correct analysis for the V_1-V_3-V_2 orders in (60a) and (60b), a simple picture arises. Only the strict ascending order V_1-V_2-V_3 and the descending order V_3-V_2-V_1 can be base-generated. Moreover, there is no optionality in the process since the two orders are in complementary distribution geographically. This is shown on map 3.2, in which the two orders are compared. On this map, the distribution of the two remaining orders in the three constructions are compared together.[44]

[44] In Pauwels' (1953) study on two-verb clusters, the descending order was marked green and the ascending one red. Since then, the descending order is called 'the green order' and the ascending one 'the red order' in the literature on Dutch verb clusters.



Map 3.2: 1-2-3 vs. 3-2-1

I would like to argue that there are two different grammars for the formation of verb clusters: a northern, descending grammar that gives rise to V_3-V_2-V_1 and an ascending grammar V_1-V_2-V_3 for the rest of the language area. There is some overlap in the transition zone between the two areas and along the border with the German language area but that is to be expected. The remaining order variation is explained by independent principles, which are related to the categorial status of elements in the cluster: the adjectival/verbal status of participles (in combination with the IPP-effect) and the verbal/nominal status of the infinitival main verb.

A question that remains is how to account for the difference between the two grammars. It seems to be the case that the linearization of a merged structure is unidirectional in a particular domain in a particular language.[45] This gives rise to uniform ascending or descending orders within the verbal domain. It was argued above that Merge itself does not involve direction. It just consists of the combination of two, potentially complex, nodes. A way to approach this difference is then to posit a principle of the type in (61). This principle applies

[45] Williams (2003) and Bader and Schmid (2009) also argue that languages can differ in the direction in which verbs can take their complements. Differently from us, they argue that each verb type can have a different direction of selection.

post-syntactically. If the syntactic module is variation free, a central hypothesis in the Minimalist Program, then the principle should apply at the level of spell-out, PF (which includes the level of Morphology). It makes sense to keep this operation outside syntax proper.[46]

(61) A grammar shows unidirectional linearization in a particular grammatical domain.

In the V-domain, Dutch varieties and Northern Dutch varieties differ in that Dutch varieties have leftward-linearization (the auxiliary (V_1) is linearized to the left of the projection of the main verb (VP_2), which leads to the main verb final order V_1-V_2) and Northern Dutch has rightward-linearization (the auxiliary is linearized to the right of the main verb: V_2-V_1). However, Dutch and Northern Dutch are SOV languages. This implies that in these languages/varieties the object is linearized to the left of the verb (OV). This implies that within the VP domain Northern Dutch is exactly the opposite of English, in which the object is linearized to the right of the verb (VO) and the auxiliary to the left of the main verb (AUX-V). This is shown in (62).

(62) a. Ik denk dat Jan gisteren$_6$ met een roos$_5$ zijn vrouw$_4$ verrassen$_3$ willen$_2$ heeft$_1$ [northern Dutch]
b. I think that Jan has$_1$ wanted$_2$ to surprise$_3$ his wife$_4$ with a rose$_5$ yesterday$_6$.

Dutch is in between Northern Dutch and English in this respect. The linearization of object and verb shows the Northern Dutch order and the linearization of auxiliary and verb shows the English order. The consecutive domains each may have their own direction of linearization. This may lead to different directions in different domains, as appears to be the case in Northern Dutch and English, but not in Dutch which has leftward-linearization in both domains. In all cases, linearization is unidirectional within a domain. In the next section, it will be demonstrated that the Dutch situation with uniform leftward-linearization leads to interesting consequences.

3.6 The order 1-3-2

3.6.1 Participles

In section 3.5.2, participles in Dutch were argued to be ambiguous in having a verbal or adjectival categorial status. It was argued that a verbal categorial status gives rise to the order V_1-V_2-*participle*$_{V3}$ in (63a), whereas an adjectival participle is ordered to the left of the verbs, and thus leads to the order *participle*$_A$-V_1-V_2 as in (63b). The northern order is *participle*-V_2-V_1 in (63c).

[46] Approaches in which verb cluster variation is assumed to be solely a PF phenomenon were discussed in chapter 2.

However, the order V_1-*participle*-V_2 (63d) occurs quite often as well, especially in the southern part of the language area (see map 2.2).

(63) a. ...dat hij de wagen voor drie uur *moet*$_1$ *hebben*$_2$ *gemaakt*$_3$
[V_1-V_2-PTCP] (verbal participle)
b. ...dat hij de wagen voor drie uur *gemaakt*$_3$ *moet*$_1$ *hebben*$_2$
[PTCP-V_1-V_2] (adjectival participle)
c. ...dat hij de wagen voor drie uur *gemaakt*$_3$ *hebben*$_2$ *moet*$_1$
[PTCP-V_2-V_1] (verbal or adjectival participle in northern varieties)
d. ...dat hij de wagen voor drie uur *moet*$_1$ *gemaakt*$_3$ *hebben*$_2$
[V_1-PTCP-V_2]
...that he the car before three o'clock {must have made}

Given the fact that the participle can be adjectival or verbal, there are two ways to explain the occurrence of the order V_1-*participle*-V_2 in (63d). Either this order is a problem for the approach taken here, since the order V_1-V_3-V_2 is predicted not to occur since it involves non-uniform linearization, in violation of the parameter in (61). Or adjectival participles need to be able to be merged in between the two verbs. The latter approach is preferable since it is directly supported by the behavior of other non-verbal material within the verb cluster, such as particles, as will be shown below.

The fact that verb clusters can be interrupted by particles has received a lot of attention in the literature. Varieties of Dutch differ with respect to the amount and the nature of the material they allow to appear within a verb cluster. Most varieties allow verb particles to appear in the cluster, as is shown in (64). These particles may be prepositional, adjectival or adverbial in nature.

(64) a. Ik vind dat Jan Marie *moet*$_1$ **op** *bellen*$_2$. [PTCL=P]
I find that Jan Marie must up call
'I think that Jan should call Marie.'
b. Ik vind dat Jan die mug *moet*$_1$ **dood** *meppen*$_2$. [PTCL=ADJ]
I find the Jan that mosquito must dead beat
'I think that Jan should kill that mosquito.'
c. Ik vind dat Jan die valse hond *moet*$_1$ **weg** *jagen*$_2$. [PTCL=ADV]
I find that Jan that mean dog must away chase
'I think that Jan should chase away that mean dog.'

The elements in boldface are generally called *verb particles*. This label is just a way to describe a class of elements that together with the main verb forms a complex verbal predicate. There is no evidence for a syntactic category of the type Particle. There is no compelling evidence to consider particles as verbal prefixes either. Particles can be separated from the main verb in verb-cluster constructions and must be separated in clauses with Verb Second. Moreover, they appear outside verbal inflection, as in the case of participles in which the particle shows up in front of the inflectional prefix *ge-*. For sentence (64a) this is shown in (65).

(65) a. Jan belt Marie **op**. – *Jan **op**belt Marie
Jan calls Marie up *Jan up-calls Mary

b. Ik vind dat Jan Marie **op** *moet*$_1$ *bellen*$_2$.
I find that Jan Marie up must call

c. Ik vind dat Jan Marie *moet*$_1$ *hebben*$_2$ **op**-*gebeld*$_3$/ **ge***op**beld*.
I find that Jan Marie must have up-called *PREF-up-called

Often these particles are closely connected to the verb interpretatively. There are even particle-verb combinations that do not exist without a particle, such as *op-juinen* 'encourage', *op-peppen* 'encourage', *op-ruien* 'provoke' *op-hitsen* 'provoke' etc. *Juinen, peppen, ruien* and *hitsen* do not exist as verbs in present day Dutch. The close relationship between verbs and particles has led various linguists to analyze particles as part of the verbs. They are often called 'separable compound verbs'.

A problem for this perspective is that lexical items that are less clearly selected by the verb can also behave as particles. Examples are given in (66).

(66) a. Ik vind dat Jan de hele dag *moet*$_1$ **door** *werken*$_2$.
I find that Jan the whole day must on work
'I think that Jan must work on the whole day through.'

b. Ik vind dat Jan de mug *moet*$_1$ **dood** *meppen*$_2$.
I find that Jan the mosquito must dead beat
'I think that Jan should kill the mosquito.'

It is not evident that *door-werken* and *dood-meppen* should be considered as complex verbs in the lexicon. *Door* in (66a) is an aspectual adverb, which can generally be added to action verbs, *dood* in (66b) is a secondary predicate with a resultative interpretation.

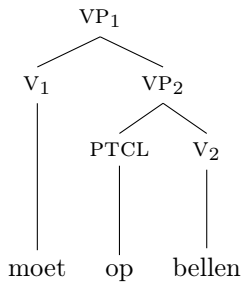
The literature on Dutch particles is vast. The analyses can roughly be divided into lexical approaches in which verb and particle are part of a lexical verb (a.o. Neeleman and Weerman 1993; Neeleman 1994), syntactic approaches in which particles are generated as separate items in the VP (a.o. Hoekstra et al. 1987; Bennis 1991; Den Dikken 1995a), and hybrid proposals in which the particle-verb combination constitutes a syntactically complex word (Booij 2002; Blom 2005). All three approaches have theoretical and empirical problems. Particles will not be discussed in detail in this chapter. It will just be established that these items may easily be incorporated in a verb cluster in all Dutch varieties. This is also evident from the SAND (SAND II, maps 31a/b). Chapter 5 returns to this construction.

The analysis of particle incorporation is straightforward in this framework. A verb projection may take (an) auxiliary verb(s) to create a cluster that is interpreted as a complex predicate. The verb (projection) may also select a particle to build a complex predicate. The particle may be a lexical item that belongs to the representation in the lexicon, and then cause semantic intransparency and idiomaticity of the particle-verb combination, but it may

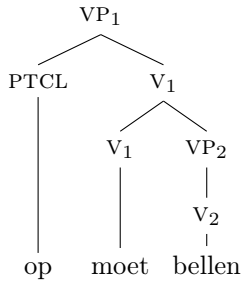
also be non-idiomatic and transparent, as long as the particle participates in the formation of the predicate. Consequently, situations arise in which an auxiliary verb and a particle are both available for Merge with the main verb. The fact that Dutch shows leftward-linearization (AUX-V and OV) for verbal as well as non-verbal material leads to different order possibilities. Either one first merges the particle and then the auxiliary, or one does it the other way around. In the first case, a complex predicate of the type *moet op bellen* 'must up call' is built, and in the second case, a complex predicate of the type *op moet bellen* 'up must call' is built. No movement is involved. No incorporation of the particle – the syntactic particle perspective – and no excorporation of the particle in a lexical approach.

The current syntactic analysis predicts indeterminacy, and that is what we find. There are no semantic consequences, there are no triggers for movement, the two structures in (67) are simply merged.

(67) a.



b.



The fact that these two structures only differ in the order in which the particle and the auxiliary are merged to the left of the main verb correlates with the fact that these structures are syntactically and semantically fully equivalent. Just as was argued for the different orders of verbs in verb clusters, the position of the particle within the verbal cluster does not seem to matter interpretatively.

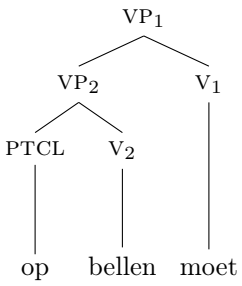
This approach is similar to Bader et al. (2009) (based on Bader and Schmid 2009), who argue that particles may freely appear in any position in a verb cluster as long as it complies with the direction of selection.[47] See also Bennis

[47] But see section 3.2 for some differences with this approach.

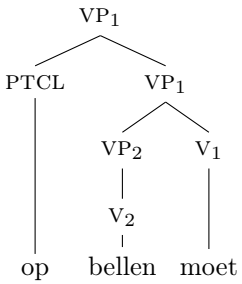
(1992), who argues that as long as particles are left-adjoined, they can occur anywhere in the cluster.

In northern varieties the auxiliaries are linearized to the right of the main verb (V-AUX) and non-verbal material is linearized to the left (OV). Particles are thus expected not to be observed within the verb cluster and that is indeed the case. The word order in those varieties is *op bellen moet* and the two orders of Merge give rise to the same surface order. This is demonstrated in (68).

(68) a.



b.



In light of this discussion, reconsider the verb cluster order V_1-V_3-V_2. Particles and adjectival participles are both non-verbal elements in the predicate and they are expected to behave in the same way. Nothing specific for participles in medial position is needed. The derivation of (63d) is similar to the derivation of particle interruption in (67a). This is shown in the structure in (69b). The structures in (69) correspond to the sentences in (63), from the beginning of this section, repeated here for convenience.

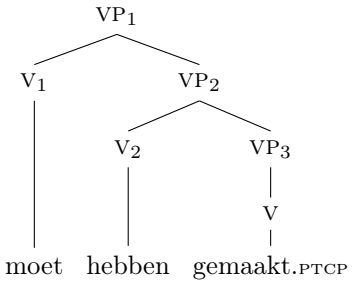
(63) a. ...dat hij de wagen voor drie uur *moet*$_1$ *hebben*$_2$ *gemaakt*$_3$
[V_1-V_2-PTCP] (verbal participle)

b. ...dat hij de wagen voor drie uur *gemaakt*$_3$ *moet*$_1$ *hebben*$_2$
[PTCP-V_1-V_2] (adjectival participle)

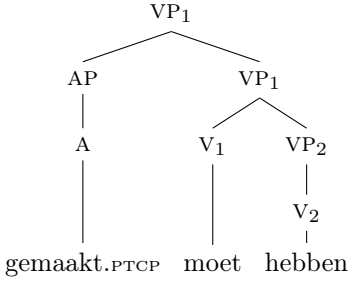
c. ...dat hij de wagen voor drie uur *gemaakt*$_3$ *hebben*$_2$ *moet*$_1$
[PTCP-V_2-V_1] (verbal or adjectival participle in northern varieties)

d. ...dat hij de wagen voor drie uur *moet*$_1$ *gemaakt*$_3$ *hebben*$_2$
[V_1-PTCP-V_2]
'...that he the car before three o'clock {must have made}'

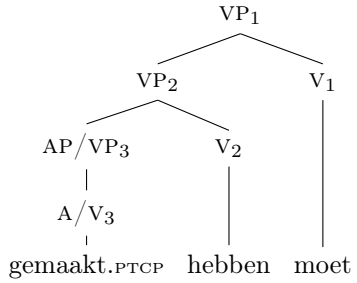
(69) a. = 1-2-3



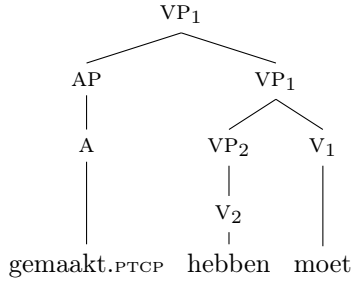
b. = 3-1-2

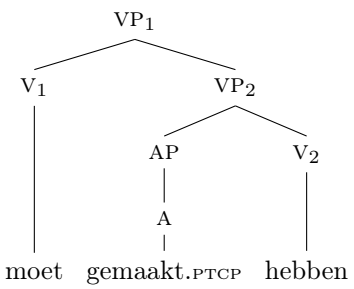


c1. = 3-2-1



c2. = 3-2-1



d. 

= 1-3-2

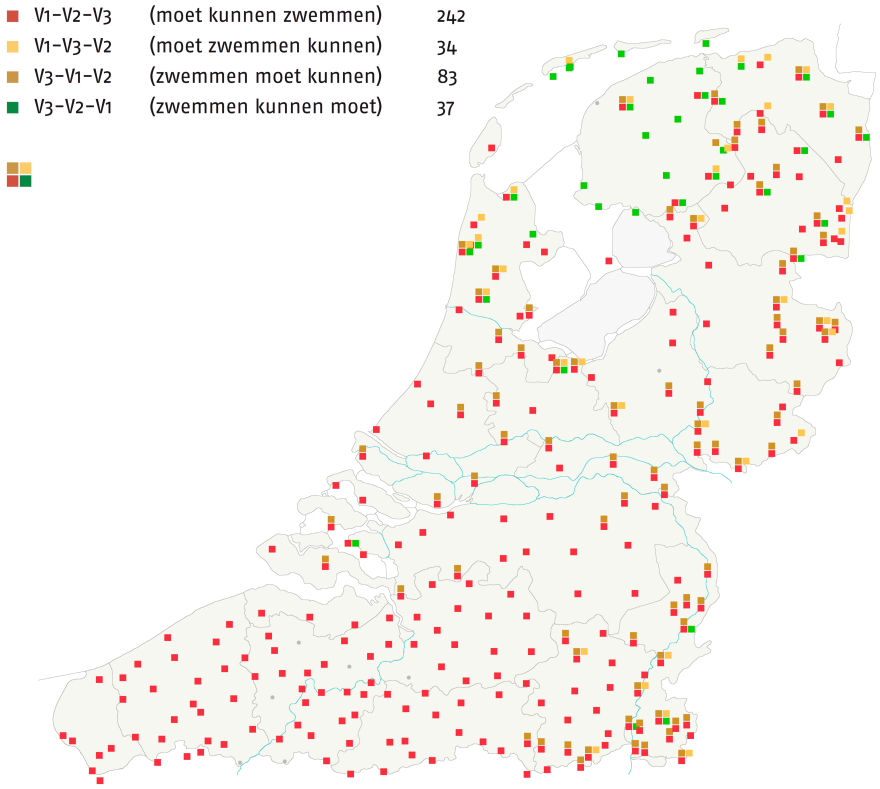
An analysis that assumes the participle to be non-verbal in the 1-3.PTCP-2 order can account for the fact that this order is most common in the southern part of the language area. This is the area where non-verbal material, such as full noun phrases, are acceptable within the verb cluster (SAND-II, map 2.3.1.7).[48]

Map 2.2 (see section 3.4.2) illustrates that the Belgian part of the language area behaves special with respect to participles. There are hardly any instances of V_1-V_2-V_3 (63a). As demonstrated in section 3.5.3, this follows from the fact that these varieties have a strong preference to take participles as non-verbal, adjectival elements, either in cluster initial position (63b) or, preferably, in cluster medial position (63d). The remainder of the language area has verbal participles in addition to non-verbal participles, with a preference for cluster-initial participles.

3.6.2 Nominalization

In section 3.5.4, it was argued that V_1-V_3-V_2 is not a possible order. There were two apparent instances of this order. The first one concerns sentences in which V_3 shows up as a participle. As discussed above, there is ample evidence that a participial V_3 can have an adjectival status, and as such, may occur within the verb cluster (cf. section 3.6.1), in particular in the southern part of the language area. This leaves the explanation of the case in which the V_3 shows up as an infinitival. The relevant map (map 2.5) is repeated below for convenience.

[48] Cluster interruption will be discussed further in chapter 5.



Map 2.5 (repeated): SAND-II map 17a

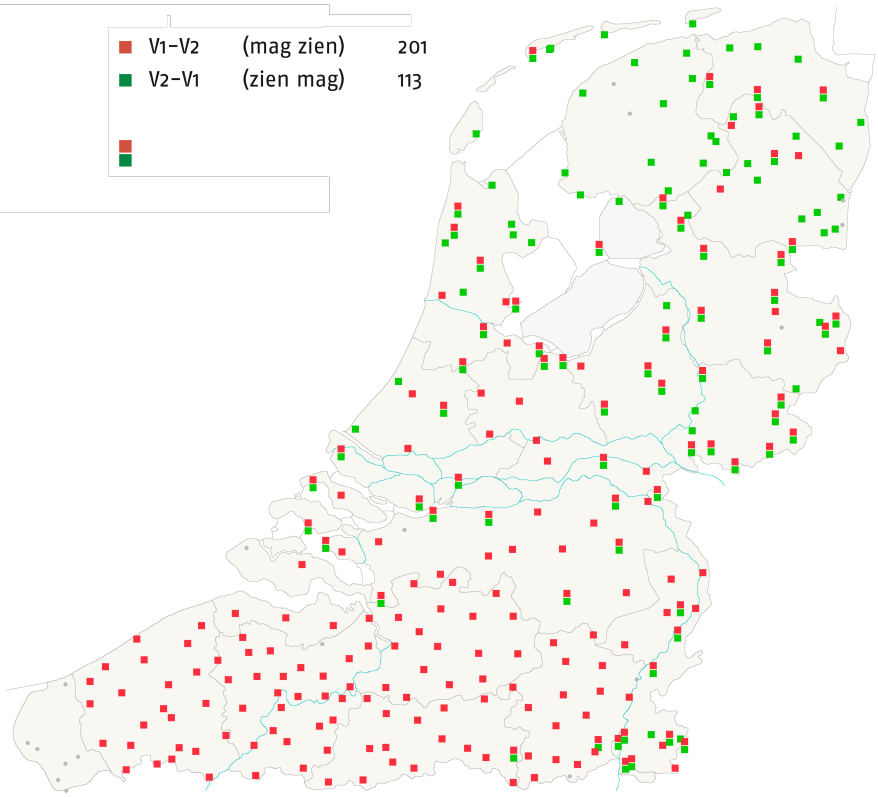
The V$_3$-V$_2$-V$_1$ order in the north and the most frequent V$_1$-V$_2$-V$_3$ order in the rest of the language area are as predicted by this theory. For the other two orders, this cluster type V$_1$-V$_3$-V$_2$ (n=34) appears in an almost perfect subset of V$_3$-V$_1$-V$_2$ varieties (n=83), which again is a subset of V$_1$-V$_2$-V$_3$ (n=242). The V$_3$-V$_1$-V$_2$ and V$_1$-V$_3$-V$_2$ orders show up in the eastern/middle part of the language area and in the border area between the northern V$_3$-V$_2$-V$_1$-varieties and the V$_1$-V$_2$-V$_3$-varieties. It was argued in section 3.5.2 that there is evidence that infinitives may acquire a nominal categorial status. If that is correct, these nominalized infinitives appear to the left of the verbs in the V$_3$-V$_1$-V$_2$ order, which is the usual position of nominal phrases (OV-order).

However, the V$_3$-V$_1$-V$_2$ order does not occur in Flanders and Brabant. Apparently, Flemish and Brabantish varieties do not easily allow nominalized verbs in these syntactic contexts. They resist the optional process of recategorization. The rest of the varieties allows nominal infinitives, and some of these varieties appear with the infinitive in cluster medial position. It thus seem that recategorization of infinitives as bare nominal phrases is possible in principle, but restricted geographically.

This analysis immediately predicts the distribution of orders in two-verb

clusters with a modal and an infinitive. In section 3.2, it was illustrated that two-verb clusters with a modal and an infinitive have geographically determined order possibilities. The sentence that has been tested in the SAND is the sentence in (70). The results are on map 3.3.

(70) Niemand mag het zien, dus ik vind dat jij het ook niet [*mag zien*]
nobody may see it, so I find that you it also not may see
/ [*zien mag*].
/ see may
'Nobody is allowed to see it, so I think you are not allowed either.'



Map 3.3: SAND II-15b

The northern varieties are V_2-V_1-varieties, as predicted by their direction of linearization. The southern varieties spoken in Flanders and Brabant are V_1-V_2 uniformly and the varieties in the east and the middle have two possibilities, either V_1-V_2 or V_2-V_1. This can be explained by arguing that all the varieties except the northern ones organize their two-verb clusters as V_1-V_2, and that Flemish and Brabantish varieties resist recategorization of V_2 as a nominal infinitive. The eastern and middle varieties have two available orders, whereas the

north and the south have only one, V_2-V_1 and V_1-V_2 respectively. The V_2-V_1 order is predicted to be marked with respect to the V_1-V_2 order in the varieties that allow the two variants. This indeed appears to be the case. First of all, in non-northern varieties the order V_1-V_2 is attested in almost every dialect, suggesting that the possibility of nominalization is a secondary option. Moreover, the sentences in (55) illustrated that some auxiliary verbs (e.g. *laten* 'let') do not easily allow nominal complements. The order V_2-V_1 is thus predicted to be marked in non-northern varieties if V_1 is *laten*. This is indeed the case, as is demonstrated in (71b).

(71) a. Ik denk dat ik Jan [*laat*$_1$ *zingen*$_2$]
I think that I Jan let sing

b. ?? Ik denk dat ik Jan [*zingen*$_2$ *laat*$_1$]
I think that I Jan sing let

Although there are no dialect data bearing on this construction available in the SAND, it appears to be the case that (71b) is unacceptable in Standard Dutch.

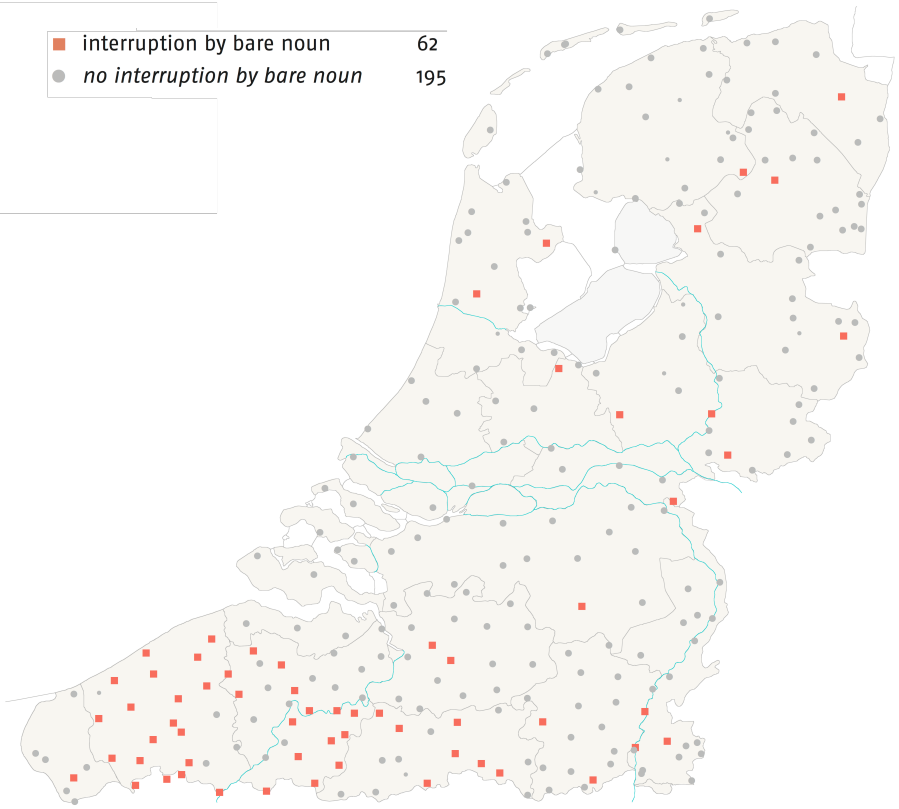
Given the argumentation here, one may expect these nominalized infinitives to appear as non-verbal cluster interrupters as well, just as participles (or particles etc.), giving rise to the order: V_1-*nominal infinitive*-V_2, as in (72a).

(72) a. Ik vind dat iedereen *moet*$_1$ *zwemmen*$_3$ *kunnen*$_2$.
I think that everyone must swim can

b. Jan weet dat hij voor drie uur de wagen *moet*$_1$ *gemaakt*$_3$ *hebben*$_2$.
Jan knows that he before three o' clock the car must made have

c. * Ik weet dat hij *is*$_1$ *zwemmen*$_3$ *gaan*$_2$.
I know that he is swim go

However, in the construction V_1-X-V_2 the X can be a particle in 175 varieties (SAND II 31b), a participle in 163 varieties (SAND II-17b / map 2.2), but a nominal infinitive only 35 times. This can be attributed to two causes. First, as argued above, infinitives cannot show up as bare nominal phrases in this type of context in Brabantish and Flemish varieties. Consequently, the 1-3.INF-2 is not expected to occur in those varieties that allow cluster interruption most easily. Secondly, nouns usually do not interrupt the verb cluster in non-Flemish Dutch varieties, as illustrated in map 3.4. As a result, the occurrence of 1-3.INF-2 is also expected to be rare in these varieties of Dutch.



Map 3.4: SAND-II map 28a

The 1-3.INF-2 order is thus expected to be almost absent in varieties of Dutch, which is not the case. As map 2.5 illustrates, this order occurs in 34 locations at the border areas between the northern V_3-V_2-V_1-varieties and the V_1-V_2-V_3-varieties and at the border between the Dutch and the German varieties. This will be assumed here to be a transitional phenomenon. This can explain the fact that this order is not restricted to a certain dialect group, such as Limburgish Dutch, but can be found across different dialect groups, and within those groups only in border varieties. If such an approach is correct, the question arises how the grammars of varieties in these transitional areas can be characterized. A first possibility would be that transitional varieties allow both orders of the neighboring dialect areas, e.g. if the latter allow V_1-V_2-V_3 and V_3-V_2-V_1 respectively, both V_1-V_2-V_3 and V_3-V_2-V_1 should occur in the transitional varieties. This would be a case of what Chambers and Trudgill (1998) call mixed dialect varieties. However, this cannot be the explanation for the occurrence of V_1-V_3-V_2 (with V_3 = infinitive) in transitional areas between V_1-V_2-V_3 and V_3-V_2-V_1 areas. The V_1-V_3-V_2 order is expected only to show up in transitional areas if the neighboring areas would also have V_1-V_3-V_2. Map 2.5 shows that this is not the case for the transition zone in North-Holland between Frisian (V_3-V_2-

V_1) and Hollandic (V_1-V_2-V_3) and for the transition zone between Frisian and Low-Saxon (V_1-V_2-V_3) in the north east. For the transition zone between the Dutch and German language area there is less data, as detailed information about the word orders that are possible in the western varieties of the German language area is currently missing, although the V_1-V_3-V_2 order appears to be possible in at least some German varieties. Restricting the discussion to Standard German, the situation is the same as in the Netherlandic transition areas just mentioned: the neighboring areas have V_1-V_2-V_3 and V_3-V_2-V_1 respectively, while the transitional varieties have one or both of these orders, and in addition the V_1-V_3-V_2 order.

These facts suggest that the V_1-V_3-V_2 with V_3 an infinitive is restricted to transitional varieties, and these varieties could be called fudged varieties, following Chambers and Trudgill (1998), in that they combine two grammatical properties of the neighboring areas into a distinct, transition-specific construction. They appear to combine leftward and rightward linearization in the verb cluster domain.[49]

3.6.3 Summary of 1-3-2

It was argued that cluster interruption interferes with verb cluster building in those varieties of Dutch that linearize verb clusters and VPs in the same direction. In non-northern varieties linearization takes place to the left in both instances (AUX-V and OV). Non-verbal predicative elements may be merged before or after merging an auxiliary. This process provides the structures and the orders that are attested in varieties of Dutch. It creates a verb cluster through Merge. This is all narrow syntax has to say about verb clusters and cluster interruption.

For cluster interruption by non-verbal material, it was argued that there are three interrelated issues that determine the different patterns of cluster interruption in varieties of Dutch:

[49] More research is needed for verb clusters in German varieties. The syntactic approach presented in this chapter does not immediately predict the 1-3-2 order to occur in German varieties, since German has a descending 3-2-1 order. The same applies to the 3-1-2 order, which can also be found in some varieties of German according to Schmid and Vogel (2004) and Wurmbrand (2015). There are a few possible ways to account for these data.
One possibility is that these varieties have a different direction of linearization. Bader and Schmid (2009) argue that modal verbs in these varieties have a different direction of selection in these varieties, leading to 1-3-2.MOD and 3-1-2.MOD. This would contradict the claim that linearization is uniform in a single domain. Another possibility is that a verb movement has taken place in those languages. This hence requires further investigation.
Note, however, that the Flemish and Dutch data clearly indicate that co-occurrence patterns are not coincidental and require an account. It should be clear, therefore, that data from German varieties should not entail a dismissal of the approach taken here, but rather a further extension of the analysis. As far as I am aware, there is currently no approach that accounts for the co-occurrence patterns in all Germanic varieties. Such an approach minimally requires a systematic overview of the variation in the order of verbs across the entire language area. This issue will not be discussed further, since it is not the current aim to provide an analysis of the variation in verb clusters across all Germanic varieties.

i. Participles have an ambiguous categorial status: verbal or adjectival. In Belgian Dutch the adjectival status is strongly preferred;

ii. Infinitives may be nominalized, except in Flemish and Brabantish varieties;

iii. Cluster interruption is most frequent in the southwest of the language area.

It follows that the Belgian Dutch and the northern varieties show a rather clear picture. In the northern varieties there are strict V_3-V_2-V_1 / V_2-V_1 orders in verb clusters and rare cluster interruption (V_1-V_3-V_2). In the south, participles are adjectival (V_3-V_1-V_2 / V_2-V_1) and infinitives verbal (V_1-V_2-V_3 / V_1-V_2), and these varieties often have the possibility of cluster interruption (V_1-V_3-V_2). The picture for the rest of the language area is more complicated due to the optionality with respect to the categorial status of participles (adjectival/verbal) and infinitives (verbal/nominal).

The variation in the order of verbs are thus described with the following three parameters.

(73) Three parameters for variation in Dutch verb clusters[50]

I. A dialect is uniformly {descending/ascending} in the linearization of verbs.

II. A dialect {does/does not} have verbal participles.

III. A dialect {does/does not} have nominalized infinitives in verb cluster constructions.

3.7 Verb cluster intuitions

Support for the grammatical approach comes from a recent experiment, where I tested the intuitions of native speakers of different varieties of Dutch in order to see whether they have systematic judgements about the acceptability of different verb cluster orders, including the orders that do not occur in their own language variety. The goal of this experiment is to test the structural approach to the order in verb clusters developed above.

Theoretically, there are three ways for speakers to judge orders in verb clusters. First, it might be the case that the preferred ordering in a specific language area fully determines the grammaticality judgements. Speakers are

[50] In recent work, Van Craenenbroeck (2017) provides a quantitative-statistical analysis of the two- and three-verb clusters of Dutch varieties found in the SAND-data. He investigates which of many conceivable parameters can best explain the observed variation. Although his approach is different from the approach taken here in several respects, the results of his parameter system come close to the analysis developed so far.

confronted systematically with a particular order in their dialect and thus take this order to be the norm. The rest of the orders are all unacceptable given that they do not belong to the input of these speakers.

Second, speakers are aware that other varieties allow different orders. Their judgement is not only determined by the order they are confronted with in their own dialect, but is also related to the orders they are confronted with in neighboring varieties. These varieties will then be judged to be acceptable as well. I will thus observe geographic patterns in the results.

Third, speakers maintain knowledge of the grammatical system. The speaker is equipped with the linearization parameter, which forces him/her to make a choice based on positive evidence. The same is true for the other two parameters in (73). In the case of verb clusters, this perspective leads to the expectation that speakers will be able to distinguish between possible orders, i.e. orders that can be generated by the grammatical system, and impossible ones.[51] They thus would judge possible orders, even those that do not occur in their dialect, neighboring varieties, or the standard language, to be systematically better than impossible orders. This implies for instance that a speaker of northern Dutch would judge V_1-V_3-V_2 (the southern order of the construction discussed in 3.6.1: *moet gemaakt hebben*) to be systematically better than the impossible order V_2-V_1-V_3 (*hebben moet gemaakt*), although both orders do not occur in the northern part of the language area.

The preceding sections demonstrated that there are compelling arguments to take verb clusters to be structurally restricted from a theoretical-linguistic perspective. In this section, I construct another argument for a structural approach to verb clusters: the intuition of the native speaker.

3.7.1 Method

The research in this part of the chapter deviates from the research in the SAND-project methodologically. I am not so much interested in the judgements of native speakers on the grammaticality of their own language variety, but rather in their judgements of non-native orders. For three-verb clusters, this implies that the judgements for the six logically possible orders were tested. The speakers were provided with these six orders in a written questionnaire, using standard Dutch. More importantly, speakers were not asked to provide absolute judgements with yes/no-answers, but to rank the six possible orders with respect to their relative acceptability. In this approach, I avoided judgements which reflect their own dialect order only. The crucial question is whether the ranking of the six orders would reflect the underlying system or something else.

The experiment consisted of two rounds. The sentences presented were similar to sentences that were tested in the SAND-research: *Ik vind dat iedereen* ***moet kunnen zwemmen*** ('I think that everyone should be able to swim'; cf. (44))

[51] Cf. Barbiers (2005).

and *Jan weet dat hij voor drie uur de wagen* ***moet hebben gemaakt*** ('Jan knows that he must have repaired the car before three o'clock'; cf. (46)). In each round the informants were presented with six sentences that differed in the order of verbs in the verb cluster only. They had to rank these sentences in relation to each other. The informants were told that the sentences presented should not receive special emphasis or focus. They were asked to rank the sentences in a ranking from 1 to 6, even if they considered sentences to be fully unacceptable. Ties were not allowed. Each completed item on a questionnaire received a score: 1 for the sentence with the highest ranking and 6 for the lowest ranking. On the basis of these scores it was possible to calculate the mean score for each item by aggregating the scores provided by the respondents.

The test was sent to the Meertens Panel on the internet. The Meertens Panel consists of a group of voluntary respondents of the Meertens Institute. They regularly participate in research by answering digital questionnaires. The respondents are at least 16 years old and live across the entire Dutch language area. 1629 respondents participated in the verb-cluster experiment. Seven respondents were excluded because they were not living in Flanders or the Netherlands at the time of the test. Related to the fact that the Meertens Institute is a Dutch research institute, the respondents were mainly from the Netherlands part of the language area. Among the respondents there were speakers of a large number of different varieties.

3.7.2 Scores for verb cluster orders

Figure 3.1 depicts the results of the experiment introduced above in section 3.7.1 for the cluster types *moet kunnen zwemmen* and *moet hebben gemaakt*.

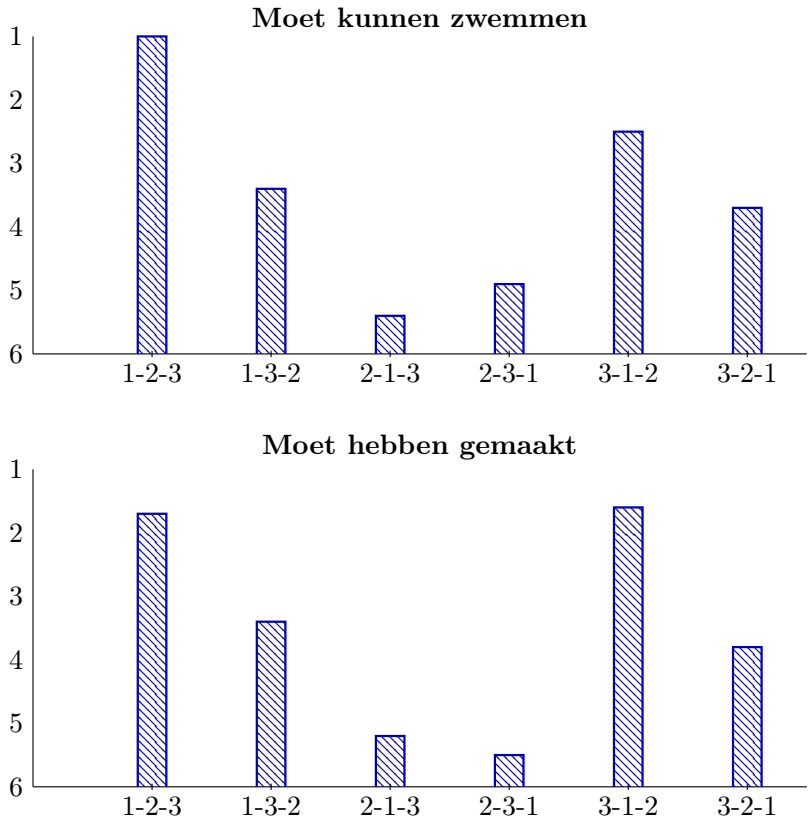


Figure 3.1: Meertens Panel results

How can the rankings in figure 3.1 be explained? For the cluster type *moet kunnen zwemmen* 'must can swim' the ranking indicates that almost all speakers of Dutch accept the order V_1-V_2-V_3 as the most acceptable one. As was illustrated on Map 2.5 in section 3.4.1, this order is available in the whole language area, with the exception of the northern varieties. The non-occurring orders V_2-V_1-V_3 and V_2-V_3-V_1 are judged to be the worst orders in the ranking (between 5 and 6). The northern Dutch V_3-V_2-V_1 order is ranked in the middle. Although the verbs can be uniformly linearized in this order, it is not the order of linearization that is found in most of the language area. The V_3-V_1-V_2 order requires nominalization of the lowest verb. The high ranking of V_3-V_1-V_2 (ranked 2nd) can be explained if one assumes that the respondents are aware of this possibility without necessarily using this order in their language.[52]

[52] The order observed in the rankings is strikingly similar to the order of frequency that is found in the language area on Map 2.5. This chapter will not discuss the relationship between the rankings discussed in this section and the frequency in which a particular order is found in the language area (as indicated on the maps in the SAND). This issue is left for further research.

The cluster type *moet hebben gemaakt* 'must have made' (Map 2.2 in section 3.4.2) shows a slightly different ranking. In this case the orders V_1-V_2-V_3 and V_3-V_1-V_2 compete for the first position. Given that all varieties allow participles to have an adjectival status (see section 3.5.2), the relatively high ranking of V_3-V_1-V_2 is as expected. It is interesting to observe that the order V_3-V_1-V_2 has a higher score in the participial construction (between 1 and 2) than in the nominalization construction (between 2 and 3). This may follow from the fact that nominalization of the lowest verb (V_3) is marked compared with the unmarked categorization of participles as adjectival. Again, the non-occurring orders V_2-V_1-V_3 and V_2-V_3-V_1 are ranked lowest, between 5 and 6.

In the next subsections it will be argued that the ranking patterns are best understood as reflecting the grammatical knowledge of the Meertens Panel respondents (section 3.7.4). This explanation is superior to alternative explanations which are based on familiarity with word orders that occur in the Dutch language area (section 3.7.3).

3.7.3 Familiarity

Suppose that the grammar did not impose restrictions on the possible orders within a verb cluster, such that all six orders would be equally well-formed grammatically. The rankings shown in figure 3.1 could then be due to familiarity. Let's first look at the cluster type *moet kunnen zwemmen*. One might formulate the hypothesis in (74).

(74) Familiarity hypothesis (to be rejected)
The more frequent a cluster occurs in the linguistic environment of a speaker, the higher it will be ranked.

The hypothesis in (74) predicts that the rankings should relate to the frequency of occurrence of the various orders in language use. It leads one to expect that the linguistic environment of an individual informant of the Meertens Panel will influence his/her ranking, e.g. informants living in the northern part of the language area, where they often hear V_3-V_2-V_1, should rank this order higher than informants from the southern part where this order is very uncommon. Figure 3.2 shows that this expectation is wrong.

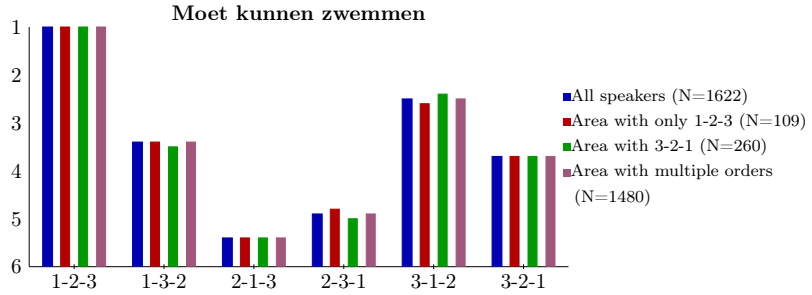


Figure 3.2: Influence of linguistic environment on rankings *moet kunnen zwemmen*

The Meertens Panel includes both dialect speakers and non-dialect speakers, a state of affairs that could have blurred the picture. However, removing the dialect speakers from the analysis does not make any difference, as figure 3 shows.[53]

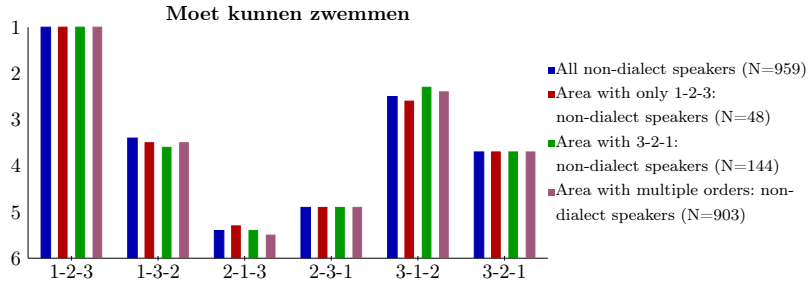


Figure 3.3: Influence of linguistic environment on rankings non-dialect speakers *moet kunnen zwemmen*

An alternative hypothesis, related to the issue of familiarity, would be that figure 3.3 simply reflects Standard Dutch judgements. This would explain the high rankings of the two orders that occur in Standard Dutch: V_1-V_2-V_3 and V_3-V_1-V_2. The fact that the non-occurring orders (V_2-V_1-V_3 and V_2-V_3-V_1) are judged to be significantly worse than the orders V_3-V_2-V_1 (northern Dutch) and V_1-V_3-V_2 (eastern varieties) remains unexplained under this view.

The situation with the other cluster type, *moet hebben gemaakt*, is very similar. Here the linguistic environment does not have a substantial influence on the rankings either, as figures 3.4 and 3.5 show, again supporting the conclusion that familiarity is not able to explain the observed rankings.

[53] The diagram only showing the ranking patterns of the dialect speakers (not given here), is very similar to figure 3.3. This requires further analysis, however, as this set of respondents is heterogeneous (different varieties) and the proportions of speakers of the various varieties should be taken into account.

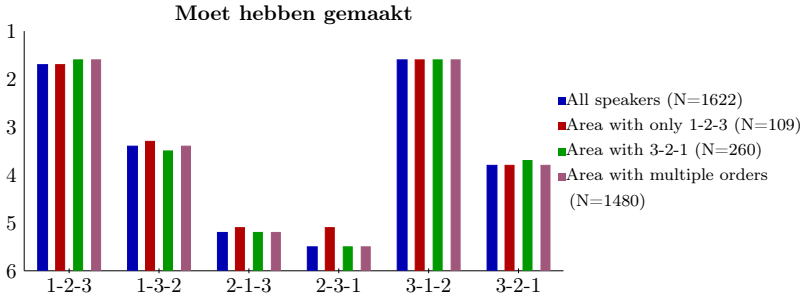


Figure 3.4: Influence of linguistic environment on rankings *moet hebben gemaakt*

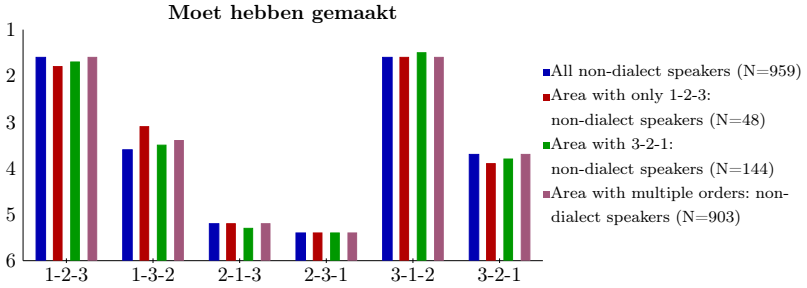


Figure 3.5: Influence of linguistic environment on rankings non-dialect speakers *moet hebben gemaakt*

I conclude that an explanation that is solely based on the linguistic environment of the speaker (familiarity) does not provide a satisfactory account of the rankings provided by the Meertens Panel (figures 3.1-3.5). The hypothesis in (74) turns out to be wrong. These rankings should receive a different explanation.

3.7.4 Grammar

As was argued at the beginning of this section, the grammaticality-judgement rankings are expected to dissociate impossible from possible orders if the ranking order was based on implicit knowledge of the grammatical system. In particular with respect to orders the respondents do not use themselves, their judgements are expected to be based on their grammatical knowledge.

3.7.5 2-3-1 and 2-1-3

As illustrated in section 3.7.2, the non-occurring orders V_2-V_3-V_1 and V_2-V_1-V_3 are judged to be worst in the ranking experiment. They both receive an average ranking between 5 and 6. This ranking is only possible if respondents take these sentences to be bad consistently. In the current system these orders cannot be derived through Merge since it was argued that Merge is binary and

the linearization is unidirectional within the V-domain. They also cannot be derived by changing the categorial status of the participle or the infinitive. Due to the OV-nature of Dutch, those changes would give rise to orders in which V_3 is the leftmost element in the cluster.[54] Language users are expected to have tacit knowledge of these grammatical conditions. They use binary Merge and they know that the verb cluster must be linearized unidirectionally. These two orders are thus expected to receive the lowest rankings. As is clear from Figures 3.2 and 3.4, there is a substantial distance between the two impossible orders and the orders that are found in the verb clusters under discussion. This appears to imply that the judgements of native speakers confirm the theory for this part of the experiment. They provide their ranking on the basis of their grammar.

3.7.6 1-2-3 and 3-2-1

The current approach predicts that the orders V_1-V_2-V_3 and V_3-V_2-V_1 are fully grammatical. This corresponds with the ranking for V_1-V_2-V_3, but the ranking of V_3-V_2-V_1 is considerably lower than the ranking of V_1-V_2-V_3 (cf. fig. 1). The choice between these two orders is determined by a grammatical parameter: unidirectionality in the V-domain can be leftward or rightward. The Meertens Panel respondents (in particular the non-dialect speakers) all accept the rightward setting of this parameter. They rank V_1-V_2-V_3 as the best order. If one assumes that the parameter is part of the tacit grammatical knowledge of speakers of Dutch, the respondents should also know that V_3-V_2-V_1 is an option, be it in most cases not a realized option in their own language variety. The lower ranking of V_3-V_2-V_1 can be attributed to the difference between [possible, realized] for V_1-V_2-V_3 and, in most cases, [possible, non-realized] for V_3-V_2-V_1, i.e. the respondents know that only V_1-V_2-V_3 is part of the standard language. The choice between the two might thus be based on the interference of the standard language. On the other hand, the substantial difference between V_1-V_2-V_3/V_3-V_2-V_1 [possible] on the one hand and V_2-V_1-V_3/V_2-V_3-V_1 [impossible] on the other is solely due to grammaticality.

3.7.7 3-1-2 and 1-3-2

In this approach, the order V_3-V_1-V_2 involves nominalization of the main verb in the case of *zwemmen moet kunnen* (ranking 2.5 in figure 3.1; cf. also figures 3.2 and 3.3) and an adjectival participle in the case of *gemaakt moet hebben* (ranking 1.6 in figure 3.1, cf. also figures 3.4 and 3.5). Both categorial processes involve grammatical parameters (cf. 23 II, III), so these orders are correctly predicted to be ranked higher than the impossible V_2-V_3-V_1 and V_2-V_1-V_3. The fact that the order V_3-V_1-V_2 with *moet kunnen zwemmen* is ranked considerably lower than the V_1-V_2-V_3 order suggests that the parameter [±nominalization]

[54] The order V_1-V_3-V_2 will be discussed below.

cuts right across varieties of Dutch including standard varieties. Map 2.5 seems to support this idea. The somewhat lower ranking of the V_1-V_3-V_2 order with these verbs is also expected, as this order is impossible in the standard language and only occurs in transitional areas. The fact that this order is ranked higher than the truly ungrammatical 2-1-3 and 2-3-1 orders seems to indicate that speakers know that this order can in principle be derived.

The ranking of the order V_3-V_1-V_2 with *moet hebben gemaakt* is about as high as the ranking of V_1-V_2-V_3 (1.6 and 1.7 respectively). This is consistent with the observation that all varieties of Dutch can have adjectival participles (cf. map 2.2). So again, the rankings are based on grammatical availability [possible] together with being part of the standard language [realized]. The intermediate ranking of V_1-V_3-V_2 – rank 3.4 for this cluster type (figure 3.1) – indicates that interruption by a participle is less acceptable than the order in which this element precedes the verb cluster. This might again follow from interference of the standard language, as this order is not a part of the standard language.

3.8 Summary & conclusion

3.8.1 Summary

This chapter has shown that the word order variation in verb clusters in the Dutch language area as found in SAND Volume II can be reduced to two truly verbal orders: V_1-V_2-V_3 and V_3-V_2-V_1. In the V_3-V_1-V_2 and the V_1-V_3-V_2 cluster, the main verb (V_3) is not verbal but adjectival (in the case of a participle) or nominal (in the case of an infinitive). This approach can account for the geographic distribution of these orders.

Support for the adjectival status of participles in the 3-1-2 order came from the interpretation of these sentences. Support for the adjectival status of participles in the 1-3-2 order came from the geographic co-occurrence patterns with interruptions by other non-verbal material. Support for the nominal status of infinitives in the 3-1-2 order came inter alia from the order of verb clusters with the causative verb *let*. This verb does not allow nominal complements and the 3.INF-1-2 order is indeed unacceptable with this verb cluster.

The order V_2-V_3-V_1 is exceptional in that it is only possible if V_2 and V_3 form a non-verbal cluster. The order V_2-V_1-V_3 is unattested. Table 3.1 summarizes the analysis for each ordering.

Order	**Ascending linearization**	**Descending linearization**	**3 = non-verbal**	**[V2-V3] is a morphological unit**	**3 = non-verbal and interrupts the cluster**
1-2-3	+	-	-	-	-
3-2-1	-	+	(+)	-	-
3-1-2	+	-	+	-	-
1-3-2	+	-	+	-	+
2-3-1	+	-	-	+	-
2-1-3	-	-	-	-	-

Table 3.1: Summary of the analysis

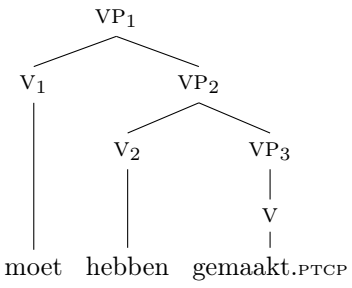
The order 1-3-2 with 3=participle arises in varieties that allow interruption of the cluster, primarily Flemish varieties. If 3=infinitive in the 1-3-2 order, this does not involve cluster interruption, as Flemish varieties do not allow nominalization of infinitives in this syntactic environment, and the Dutch varieties that allow 1-3.INF-2 do not allow cluster interruption by nouns. The 1-3.INF-2 order was argued to be a transitional phenomenon. The order 2-1-3 cannot be generated by Merge at all. The order 2-3-1 is only possible for 2.MOD-3.V-1.AUX because in that case 2 and 3 form a unit showing morphological agreement (IPP). In the order 3-1-2, 3=adjectival if it is a participle and 3=nominal if it is an infinitive.

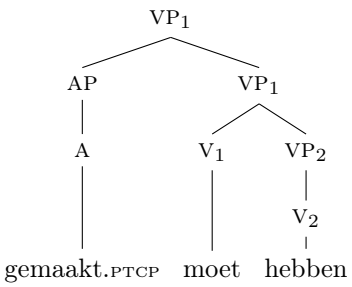
This theory provides an account for many of the properties of verb clusters that were discussed in chapter 2. These will be discussed here.

- All varieties of Dutch display various orders across verb types, except for many northern varieties, where only the 3-2-1 order is observed.

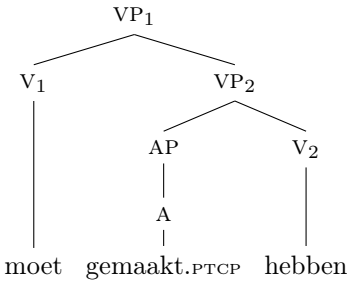
  This can be attributed to the fact that in northern variaties, the direction of linearization of verbal and non-verbal material is the same, while in Dutch, non-verbal items are linearized before their selecting verb, while verbal items are linearized after their selecting verb. This leads to three possible orders in Dutch varieties (see (75)), but only one in northern varieties (see (76)).

(75) a. = 1-2-3

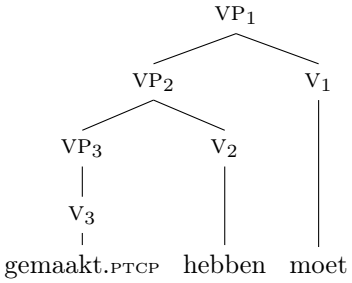


b. 

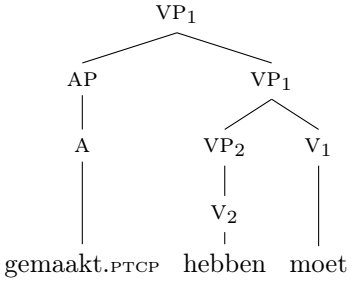
= 3-1-2

c. 

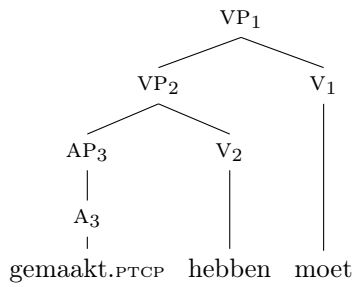
= 1-3-2

(76) a. 

= 3-2-1

b. 

= 3-2-1

c. 

= 3-2-1

- The distribution of verb cluster orders depends on the types of verbs involved. The 1-3-2 order is, for instance, very common when V_3 is a participle (especially in Flanders), but rare when V_3 is an infinitive.

  The 1-3-2 order is argued to involve a non-verbal 3. As a consequence this order can only be derived if V_3 can be reanalyzed as adjectival or nominal, and if these items can interrupt the verb cluster. In Flemish varieties, it seems that participles are only adjectival in verb clusters (as supported by the rarity of the 1-2 order when 2 is a participle). In other Dutch varieties, participles can be both adjectival and verbal. Additionally, the interruption possibilities of adjectival participles seems similar to the interruption possibilities of particles. This can account for the fact that the 1-3-2 order is common (especially in Flanders).

  As for infinitives, it seems that these cannot be nominalized within verb clusters in Flemish varieties (as supported by the lack of the 2-1 order when 2 is an infinitive). As a consequence, neither the 1-3-2, nor the 3-1-2 order is expected to occur in these varieties when 3 is an infinitive. In most remaining Dutch varieties, however, nominal elements cannot interrupt the verb cluster. The 1-3-2 order is thus expected to be rare in the entire language area. This can account for the fact that the 1-3.INF-2 occurs only in border varieties as a secondary order. It was argued in this chapter that the occurrence of this order might be a transitional phenomenon.

  Another example of the fact that the observed orders are dependent on the types of verbs involved is that the 2-3-1 order can only be found when V_1 is a perfect auxiliary. This order was argued to involve a [VP_2-VP_3] complex that is reanalyzed as a participle. This thus requires a perfective V_1, which selects a participle. This can account for the fact that this order is only observed when V_1 is a perfective auxiliary. However, the question that remains is why other auxiliaries do not force such a reanalyzed cluster. This issue was raised in footnote 43 on page 64.

- The 1-3.PTCP-2 order, particle incorporation and verb cluster interruption show similar geographic distributions. This fact almost becomes trivial in this analysis, since all these orders involve a non-verbal, interrupting item.

Two properties remain. First, the fact that the word order variation in these languages contrast with a rigid ordering in the nominal domain can only partly be solved. Since infinitives and participles are categorially ambiguous, this automatically leads to order variation, as non-verbal items have a different position in the clausal structure than verbs. However, this theory cannot explain why both 1-3-2 and 3-1-2 orders can co-occur. Chapters 4 and 5 return to this issue.

Chapter 5 also returns to the fact that the acceptability of non-verbal material inside the verb cluster is a West-Flemish phenomenon. Its acceptability decreases geographically in moving from West-Flanders to the north.

3.8.2 Conclusion

With the help of the geographic distribution of the various orders, it was argued in this chapter that an explanation of variation in verb clusters is best captured in terms of an analysis that takes Merge to be the operation that builds verbal clusters. In contrast to most other analyses, no movement operations are involved. The three, partly independently motivated, parameters below are responsible for the superficially huge variation in the Dutch language area.

I. A dialect is uniformly {descending/ascending} in the linearization of verbs.

II. A dialect {does/does not} have verbal participles.

III. A dialect {does/does not} have nominalized infinitives in "verb" clusters.

This analysis is supported by geographical correlations between cluster orderings and the occurrence of particles inside a cluster. For example, in the Dutch varieties in Belgium the cluster order V_1-PTCP$_3$-V_2 is quite frequent, which follows from the strong preference in that area for participles to be adjectival and the fact that most of these varieties allow cluster interruption by particles. This analysis does not require movement operations to derive such constructions.

The fact that both verb cluster formation and interruption by particles can be seen as instances of the same process corroborates the theory presented here. The only syntactic rule involved is Merge; no construction-specific rules or conditions are required. The fact that the order of the verbs and the particles in the cluster does not appear to give rise to different semantic or pragmatic interpretations strengthens this approach. For the cluster types under discussion here, *verb raising* and *verb projection raising* can be removed from the syntax of Dutch without having to introduce new rules or conditions. The only thing that is needed is the assumption that linearization within a domain is unidirectional. The crucial step involves the possibility for Merge to create verb clusters.

To support this analysis, the geographic SAND data was compared to the results of a ranking experiment in which respondents from the whole Dutch

language area had to provide a relative ranking of the six logically possible word orders in three-verb clusters. The most important feature of this experiment was that the respondents had to give judgements on word orders that do not always occur in their own language varieties. Strikingly, the rankings of the respondents shows a strong convergence, independent from the dialect area they live in, and thus independent of the dominant cluster order corresponding to that region. This makes it strongly unlikely that their judgements have to do with familiarity. Hence, the rankings cannot be exclusively explained in terms of familiarity or frequency of use.

The next chapter will discuss the hypothesis that the speakers' rankings are a result of general properties of information processing. It will become clear that such properties cannot account for the ranking without taking grammar into account. This further supports the syntactic account proposed in this chapter.