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## **Not another book on Verb Raising**

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## CHAPTER 6

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### Conclusion

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### 6.1 Summary and discussion

The main aim of this dissertation was to provide a principled account of the (limits to the) variation observed in verb clusters. I have argued that this variation is not coincidental, but follows from properties of the human linguistic system. Two types of variation were discussed in this dissertation: the order of verbs in a verb cluster, and the acceptability of non-verbal material inside the verb cluster. First, while many orders of verbs in a verb cluster are observed, certain orders never occur. For instance, many speakers of Dutch allow both the orders in (143a) and (143b), but the order in (143c) is never observed.

- (143) a. ...dat hij de wagen *moet*<sub>1</sub> *hebben*<sub>2</sub> *gemaakt*<sub>3</sub>.  
...that he the car must have made  
'...that he must have repaired the car.'
- b. ...dat hij de wagen *gemaakt*<sub>3</sub> *moet*<sub>1</sub> *hebben*<sub>2</sub>.  
...that he the car made must have
- c. \* ...dat hij de wagen *hebben*<sub>2</sub> *gemaakt*<sub>3</sub> *moet*<sub>1</sub>.  
...that he the car have made must

Secondly, while some non-verbal items can precede or interrupt the verb cluster, many non-verbal items can only precede the verb cluster. This is illustrated for West-Flemish in (144) and (145).

- (144) a. ...dat hij daarom **zacht** *moet praten*.  
...that he therefore quietly must talk  
'...that he therefore has to speak quietly.'

- b. ...dat hij daarom *moet zacht praten*  
 ...that he therefore must quietly talk
- (145) a. ...dat Jan morgen **zeker** *moet werken.*  
 ...that he tomorrow definitely must work  
 ‘...that he therefore definitely has to work.’
- b. \* ...dat Jan morgen *moet zeker werken.*  
 ...that he therefore must definitely work

I have argued that the observed variation in this domain can be explained by properties of human grammar. By carefully examining the patterns of microvariation in verb clusters, it became clear that a new approach to verb cluster formation is required. Previous approaches to verb clusters aimed at deriving the various orders that are observed in the language area, while excluding the orders that are not observed. Most of those approaches can derive the observed word orders, while also excluding the impossible word orders 2-1-3 and 2-3-1.

Crucially, a consideration of the geographic distribution of verb clusters unraveled some patterns in the orders that are possible. For instance, the 1-3-2 and 3-1-2 orders occur in grammars that have ascending (1-2), rather than descending (2-1), verb clusters. Secondly, the 1-3.PTCP-2 order is most common in the region where non-verbal material can interrupt the verb cluster. In previous approaches to verb cluster formation, these patterns would have to be assumed to be coincidental.

**Chapter 3** of this dissertation provided a principled explanation for the geographic patterns. It was argued that verb clusters in Dutch varieties are merged and linearized in fully ascending (1-2-3) or fully descending (3-2-1) orders. Other orders that are observed in the language area involve non-verbal material, namely adjectival participles, or nominal infinitives. As a result, this approach does not involve any unmotivated movements that are specific to verb clusters.

Support for this analysis came from (i) the interpretation of participles; and (ii) selectional requirements of the verbs. Both types of support were based on non-northern Dutch, as in northern Dutch only descending orders occur. The interpretation of participles indicate that such elements can behave like adjectives inside the verb cluster. This explains why both the 1-2 and 2-1 orders can co-occur in many varieties of Dutch. In the 1-2.PTCP order the participle is verbal, and in the 2.PTCP-1 order, the participle is adjectival. The adjectival participle precedes the main verb, just like other non-verbal complements in the language. Such an analysis corresponds to the interpretation of the sentences: the participle can only receive an adjectival interpretation in the 2.PTCP-1 order.

This analysis was extended to infinitives, which were also argued to be non-verbal in non-ascending verb clusters. This was supported by selectional requirements of verbs. Verbs such as *laten* ‘let’ which select verbal complements, but disallow non-verbal complements, do not allow verb orders that deviate

from fully ascending orders. This supports the idea that orders such as 3-1-2 involve a non-verbal 3. This order is only possible if the main verb selects a non-verbal complement.

Considering this approach, the co-occurrence patterns discussed above become almost trivial. For instance, the 1-3-2 and 3-1-2 orders are argued to be ascending orders with a non-verbal 3. It is hence not surprising that these orders occur in those varieties that have ascending verb clusters. Secondly, the 1-3.PTCP-2 order is argued to be an interrupted  $V_1$ - $V_2$  cluster with a non-verbal 3. Consequently, it is not surprising that the 1-3-2 order occurs in the region where verb clusters are often interrupted by non-verbal material.

This theory supports the idea that the variational patterns observed with verb clusters are not coincidental, but follow from properties of the human linguistic system. For instance, it was claimed that certain orders are never observed because the language system cannot derive them. This leads to the expectation that speakers will be able to distinguish between orders that are ungrammatical, and orders that can be derived but are not a part of their language variety. This expectation was borne out in an experiment in which I asked a large number of speakers distributed over the Dutch language area to rank all logically possible orders, including orders that are not a part of their own variety of Dutch. The results demonstrate that speakers indeed apply their syntactic knowledge to rank verb cluster orders that they do not use themselves. They find orders that cannot be derived by human grammars more acceptable than orders that can be derived, but are not a part of their language variety. Speakers thus seem aware of the ways in which languages can vary.

By assuming that human grammar provides clear limits on the extent to which languages can vary, it becomes much easier to explain why children can acquire any human language without problems, even though there is much variation in the properties of languages across the world. If the child makes use of grammar, (s)he will know that the potential properties of the mother language are not endless, but restricted.

According to current Minimalist theory (Chomsky 2005, 2007, 2008), it is not only the human language system that plays role in the shaping of human languages, but also two additional factors: experience (i.e. input from the environment), and principles not specific to the language system, which include principles of efficient computation. The fact that experience cannot account for the speakers' word order preferences in this domain was discussed in chapter 3. **Chapter 4** considered the possibility that the speakers' judgements are a result of properties of efficient computation. Many different types of language processing models were considered in that chapter. Most of these models assume that sentence processing is affected by the distance between words that are related to each other. For instance, it is often claimed that structures that have longer phrases embedded within them are harder to process (eg. Hawkins 1994). Hawkins discusses the observation that in English, center-embeddings

are ungrammatical when the embedded material is clausal, but not when the embedded material is an NP. This is illustrated in (82) (repeated here).

- (82) a. \*[Did [<sub>S</sub> that John failed his exam] [surprise Mary]]?  
           b. [Did [<sub>NP</sub> this fact] [surprise Mary]]?

According to Hawkins (1994), language processing occurs more rapidly and efficiently when constituents that belong together are closer to each other. The chapter investigated whether such principles (as well as others that are proposed in the literature) could have played a role in the comparative judgement task. Crucially, the chapter illustrated in depth that none of the existing processing models can account for the speakers' preferences.

The chapter went on to investigate whether the predictions based on those models improve when one takes the properties of human grammar into account. In such a system, the processing models do not have to account for all of the speakers' preferences. For instance, the fact that the 2-1-3 and the 2-3-1 orders are rated as bad, is already accounted for by the grammar. The only choice that might be affected by processing models would be a choice between orders that are syntactically and categorically equivalent, such as the choice between the 1-3-2 and the 3-1-2 orders. These orders both involve an ascending verb cluster with a non-verbal 3. The only difference seems to lie in the timing of merging the auxiliary. Potentially, the choice between these orders might be attributed to properties of processing preferences. Of these orders, the 3-1-2 order was judged to be more acceptable. The chapter discussed in detail that at least one implementation of Hawkins' (2004; 2014) processing model makes the correct prediction that the 3-1-2 order is easier to process than the 1-3-2 order. The results support the idea that the language processor only considers orders that are (i) possible in the language variety, and (ii) syntactically and categorically equivalent.

**Chapter 5** turned to discuss verb cluster interruption. The beginning of chapter 5 presented arguments in favor of a similar underlying structure for all types of non-verbal elements in the verb cluster. It was argued that auxiliaries that precede non-verbal material have not moved from a lower position. Extraction from DPs that precede the verb cluster does not lead to *freezing* effects, indicating that DPs can be base-generated in the position preceding the verb cluster. These facts support the claim that verb clusters are base-generated.

The acceptability of cluster interruption is affected by (i) the geographical location of the language variety, and (ii) the type of non-verbal element in the verbal cluster. First, West-Flemish varieties allow many more types of items to interrupt the verb cluster than Netherlandic Dutch varieties. Secondly, some items are much more acceptable inside the verb cluster than other items. For instance, in West-Flemish, lower adverbs, particularly manner adverbs, can interrupt as well as precede the verb cluster, while higher adverbs can only precede the verb cluster (see (145)). The chapter discussed at length how previous

approaches to verb clusters, which involve a movement of V(P)s at PF or in syntax, have problems accounting for these data.

Interestingly, the type of auxiliary had no effect on the acceptability of non-verbal material inside the verb cluster. The acceptability of higher adverbs inside the verb cluster did not improve with auxiliaries that are often presumed to be in a higher position. Auxiliaries such as *gaat* ‘will’ and *wil* ‘want’ are often argued to occupy a higher functional position in the clausal structure than root modals such as *moet* ‘must’. Nevertheless, the acceptability of adverbs such as *bijna* ‘almost’ and *altijd* ‘always’, did not improve with these auxiliaries. All of the following sentences were rated as ill-formed:

- (146) a. \*Ik weet dat Jan *moet bijna* werken.  
 I know that Jan must almost work  
 ‘I know that Jan almost has to work.’  
 b. \*Ik weet dat Jan *gaat bijna* werken.  
 I know that Jan goes almost work  
 ‘I know that Jan almost goes to work.’
- (147) a. \*Ik weet dat Jan *moet altijd* werken.  
 I know that Jan must always work  
 ‘I know that Jan always has to work.’  
 b. \*Ik weet dat Jan *wil altijd* werken.  
 I know that Jan wants always work  
 ‘I know that Jan always wants to work.’

These facts clearly underline the claim that all auxiliaries are generated in a low position in varieties of Dutch.

A particularly nice fact presented in chapter 5 is the discovery of a clear cut-off point for cluster interruption. I asked the West-Flemish informants to judge a variety of sentences that contained interrupted verb clusters by an adverb. Table 5.1 (repeated here) depicts the informants’ judgements for each interrupting adverb. The adverbs are depicted in the order that corresponds to Cinque’s (1999; 2006) hierarchy of functional projections.

Adverb		Score				
		<i>Sounds bad</i>	0	0	0	0
<i>helaas</i>	‘unfortunately’	●	0	0	0	0
<i>zeker</i>	‘definitely’	0	●	0	0	0
<i>straks</i>	‘later’	●	0	0	0	0
<i>misschien</i>	‘maybe’	●	0	0	0	0
<i>onvermijdelijk</i>	‘necessarily’	0	0	●	0	0
<i>gewoonlijk</i>	‘usually’	0	0	●	0	0
<i>nog steeds</i>	‘still’	●	0	0	0	0
<i>altijd</i>	‘always’	0	●	0	0	0
<i>bijna</i>	‘almost’	0	●	0	0	0
<i>verplicht</i>	‘obligatorily’	0	0	0	●	0
<i>volledig</i>	‘completely’	0	0	0	●	0
<i>zacht</i>	‘quietly’	0	0	0	0	●
<i>wijs</i>	‘wisely’	0	0	0	0	●

Table 5.1 (repeated): The acceptability of various adverbs inside the verb cluster

These results clearly demonstrate that adverbs that are lower in Cinque’s hierarchy are better interrupters. In a traditional clausal structure, one might take the modal adverb *verplicht* ‘obligatory’ to be positioned in the lexical domain (*vP*). This provides a clear cut-off point for cluster interruption in West-Flemish, which is clearly not a random position.

Subsequently, the chapter demonstrated that the cut-off point for cluster interruption lies lower in standard Dutch, where only elements that are part of the event or state denoted by the verb can interrupt the verb cluster. As for the area in between West-Flemish and Netherlandic Dutch, I suggested that this may be a transitional area.

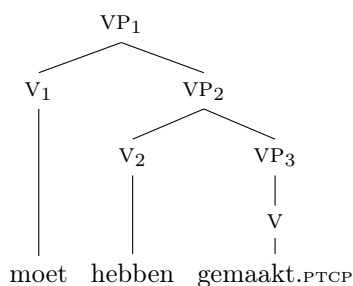
The theory presented in this dissertation can account for most of the properties of verb clusters that were left unaccounted for by previous theories of cluster formation, as discussed in **Chapter 2**.

- All varieties of Dutch display various orders across verb types, except for many Frisian varieties, where only the 3-2-1 order is observed. It was argued that Frisian verb clusters are linearized in a different direction, leading to descending verb clusters in this region. As a consequence, the direction of linearization of verbal and non-verbal material is the same in these varieties: both verbal and non-verbal complements precede their selecting verb. In Dutch varieties, however, non-verbal items are linearized before their selecting verb, and verbal items are linearized after their selecting verb. As a result, three different orders can be derived in Dutch grammars. First, a three-verb cluster will lead to the 1-2-3 order, as in (148a). Secondly, a two-verb cluster in which a non-verbal 3 precedes the verb cluster will lead to the 3-1-2 order, as in (148b). Thirdly, a two-verb

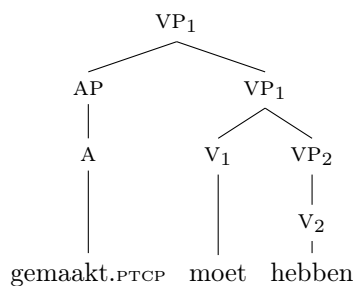


cluster in which the non-verbal 3 interrupts the verb cluster (in a similar vein as particles) will lead to the 1-3-2 order, as in (148c). In Frisian grammars, however, the 3-2-1 order arises in each case. This is illustrated in the corresponding examples in (149).

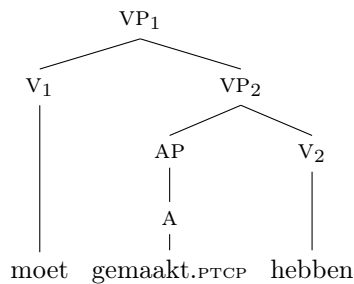
(148) a. = 1-2-3



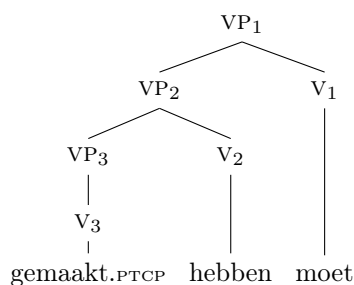
b. = 3-1-2

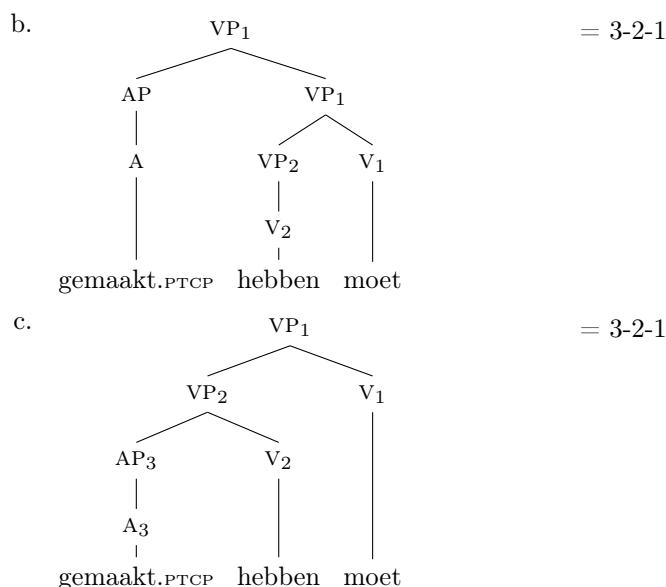


c. = 1-3-2



(149) a. = 3-2-1





- The distribution of verb cluster orders depends on the types of verbs involved. This can be attributed to the categorial status of those verbs. For instance, data from two-verb clusters indicate that Flemish varieties have little categorial ambiguity in verb clusters. When 2 is an infinitive, these varieties only allow ascending 1-2 orders. This indicates that bare infinitives are never nominalized inside the verb cluster. On the other hand, when 2 is a participle, these varieties prefer 2-1 orders. This indicates that participles are never verbal. Following these assumptions, the 3-1-2 and the 1-3-2 orders are expected to be ill-formed when 3 is an infinitive, while the 1-2-3 order is expected to be ill-formed when 3 is a participle. These predictions are borne out.
- The word order variation in these languages contrasts with a rigid ordering in the nominal domain. This issue is partly solved in this theory. The categorial ambiguity of participle and infinitives can explain why varieties allow two orders with these verbs; they allow 3-1-2 orders when 3 is non-verbal, and 1-2-3 orders when 3 is verbal. However, it cannot explain why both the 1-3-2 and the 3-1-2 orders can co-occur within a single variety. Why is the order of Merge free in this respect?
- The 1-3.PTCP-2 order, particle incorporation and verb cluster interruption show similar geographic distributions. This fact is attributed to the claim that the 1-3-2 order involves a non-verbal 3. In this sense, all these types of constructions are of the type  $V_1$ -X- $V_2$ .
- The 1-3.INF-2 order occurs only in border varieties as a secondary order. This was attributed to the claim that this order should not be possible

in Dutch grammars, since no variety of Dutch has both nominalized infinitives in the verb cluster, and allows nominal items to interrupt the verb cluster. Nominalized infinitives in the verb cluster are not observed in Flemish varieties, while cluster interruption by nominal items is rare outside of Flanders.

The fact that the 1-3.<sub>INF</sub>-2 order occurs in border varieties, was argued 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.

- The acceptability of non-verbal material inside the verb cluster seems to be a West-Flemish phenomenon. Its acceptability decreases geographically in moving from West-Flanders to the north. This issue was attributed to the fact that the cut-off point for cluster interruption is structurally higher in West-Flemish than in Netherlandic Dutch. It was suggested that the gradual decline of cluster interruption from West-Flanders to the Netherlands indicates that the intermediate varieties are in transition from one type of language to another.

Note that the theory presented here deviates from previous theories of cluster formation in three ways. First, it is assumed that only the 1-2-3 and the 3-2-1 orders represent three-verb clusters. Secondly, it is argued that these two orders are base-generated, and do not involve movement operations. Thirdly, it is assumed that the other observed orders involve non-verbal material. Crucially, the first and the third assumptions could be added to previous theories of cluster formation as well. For instance: a theory that assumes all varieties of Dutch and Frisian to have a fixed underlying right-branching (1-2-3) order might assume that v/VP-movement is all or nothing (leading to only 3-2-1 and 1-2-3 orders). The other orders that are observed contain non-verbal material. This will lead to many of the same predictions as the approach taken here. Such a theory still requires movements or operations that are specific to the derivation of verb clusters. This is not required in a base-generation approach, as the two ‘real’ three-verb clusters can be base-generated. Occam’s razor makes the base-generation approach conceptually more attractive. However, if one prefers to maintain Kayne’s (1994) antisymmetry theory, and argue that all syntactic structures are uniform, this could be a potential approach.<sup>100</sup>

## 6.2 Theoretical contributions

This dissertation contributes to the theory of cluster formation by providing a detailed overview of the limits of variation concerning cluster interruption

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<sup>100</sup> Note that cluster interruption by adverbs would still be problematic in such an approach.

in West-Flemish. I have presented a number of findings that have not been discussed before.

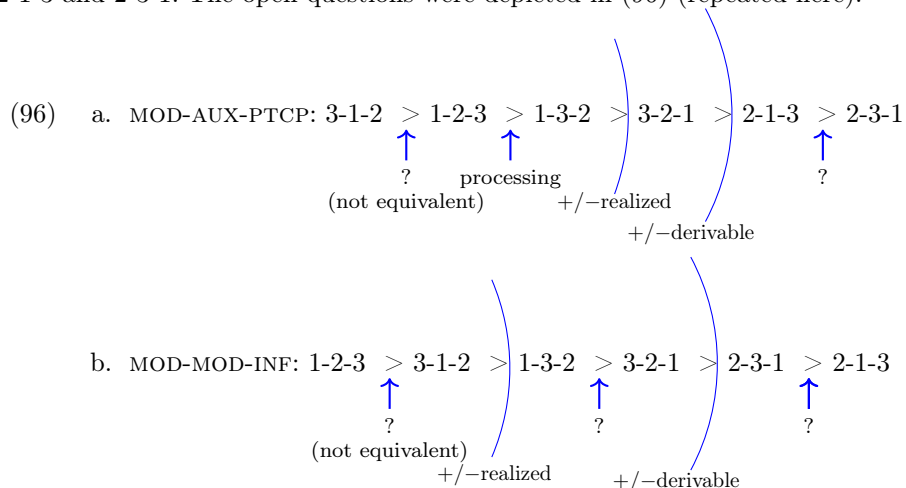
1. The geographic distribution of verb clusters provide insight in their grammatical properties. The results from chapter 3 demonstrate that the geographic distribution of different verb cluster orders are not random, but systematic, and can be given a principled explanation. In this way, geographic co-occurrence patterns helped unravel the phenomenon of verb clustering.
2. Speakers can distinguish ungrammatical word orders from orders that can occur in language varieties different from their own. It was argued in chapter 3 that this capacity is best explained by properties of grammar.
3. General properties of information processing cannot account for the speakers' preferred word orders on their own. However, when the grammatical properties of verb clusters are taken into account, processing preferences make much better predictions. This provides another strong argument for a generative approach to syntactic variation.
4. Verb clusters are base-generated in a low position. Chapter 5 has demonstrated that there is a clear difference in the acceptability of cluster interruptions by different types of adverbs; adverbs that are generally assumed to be merged in a lower structural position are much more acceptable than adverbs that are assumed to occupy a higher structural position. For auxiliaries, however, no such effect was observed. Auxiliaries that are generally assumed to occupy a high position do not allow more cluster interruptions than lower auxiliaries. This suggests that all auxiliaries are generated in the same (low) position.
5. There is a clear cut-off point for cluster interruption in the syntactic structure. In West-Flemish, this cut-off point lies around *vP*; elements that are merged within this projection can interrupt the verb cluster.
6. The limits to cluster interruption in Netherlandic Dutch varieties no longer pose a problem for theories of cluster formation. This can be attributed to a lower cut-off point for the Merge of auxiliaries in these varieties than in West-Flemish varieties. In this sense, all varieties of Dutch have syntactically similar properties. This theory hence does not require (i) positing a restriction to verb projection raising to non-projecting heads, or (ii) variable landing sites for non-verbal items.

### 6.3 Prospects for future research

There were a number of issues raised in this dissertation that lead to interesting questions, which can be investigated further.

The first issue relates to the results of the comparative judgement task. Chapter 3 argued that a large part of the speakers' rankings could be explained by grammatical properties: namely the fact that speakers judged orders that are grammatical, but unrealized in their variety, better than orders that are ungrammatical. Subsequently, chapter 4 argued that properties of language processing might have affected speakers' ranking of orders that are (i) possible in their language variety, and (ii) syntactically and categorically equivalent.

Now, a large part of the results are accounted for. However, as discussed in section 4.4, some results remain unexplained. For instance, it is unclear how the informants made a choice between the 3-1-2 and 1-2-3 orders. Nor is it clear how the speakers evaluated orders that are not part of their grammar, namely 2-1-3 and 2-3-1. The open questions were depicted in (96) (repeated here).



The results of the comparative judgement task raised another interesting question for future research. The dissertation mainly focussed on the variational patterns observed in varieties of Dutch and Frisian. The order variation observed in German varieties was only discussed briefly at the end of chapter 3. It would be particularly interesting to ask speakers of German varieties to rank the different verb cluster orders. However, this first requires detailed information of all orders that can occur in all German varieties, in order to investigate the influence of the speakers' experience with other varieties.

A further issue that is open for future research is the fact that the  $V_1$ -X- $V_2$  and the X- $V_1$ - $V_2$  orders can co-occur within a single variety. Such free orderings are not observed in other domains. For instance, modifiers in compound nouns always precede the compound. This is illustrated in (150).

- (150) a. rood-vlees-soep  
 red-meat-soup  
 'soup with red meat'

- b. rood soep-vlees  
red soup-meat  
'red meat that is meant for soup'
- c. \*soep-rood-vlees  
soup-red-meat

A final issue raised in this dissertation that leads to many interesting questions for future research relates to the cut-off point for cluster interruption. Chapter 5 argued that the varieties spoken in the areas in between West-Flanders and the Netherlands are undergoing a transition from one language type to another. The cut-off point for cluster-interruption in those varieties should hence lie in between the West-Flemish and Netherlandic Dutch cut-off points. Future research should investigate whether each of those varieties have a clear structural cut-off point, such as VP, or whether they display more messy behavior.