

Word order variation in Dutch and German verb clusters

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1 Introduction

In a subset of the West-Germanic languages, including Dutch and German, verbs tend to form a cluster in verb-final clauses, as in (1-2). In Dutch, the linear order of the verbs in a cluster canonically coincides with the order of selection, i.e. a verb canonically selects its verbal complement to the right, while German verb clusters typically appear as the mirror image.¹

- (1) DU ... dat hij dat boek moet₁ hebben₂ gevonden₃.
... that he that book must have found
'... that he must have found that book.'
- (2) GE ... dass er das Buch finden₃ können₂ wird₁.
... that he the book find can will
'... that he will be able to find the book.'

The literature on West Germanic verb clusters is abundant. Some influential lexicalist models of verb clusters in Dutch and German are Bresnan et al. (1982) and Kaplan & Zaenen (2003) for LFG and Hinrichs & Nakazawa (1994), Bouma & van Noord (1998), Kathol (2000), and Müller (2002) for HPSG.

In HPSG verb clusters are canonically modelled in terms of *argument inheritance*, i.e. the non-subject arguments of unsaturated verbal complements are treated in a similar fashion as raised subjects, cf. the lexical constraint in (5), after Hinrichs & Nakazawa (1994). If $\bar{\alpha}$ is an empty list, the constraint is similar to the one for subject raising proposed in Ginzburg & Sag (2000, 22).

In Van Eynde & Augustinus (2013) and Augustinus (2015) it is motivated that subject and complement raising are different phenomena.² While subject raising is modelled using the canonical lexical constraint, a phrasal constraint is employed for raised complements. The *Complement Raising Principle* (CRP) in (6) states that in a headed phrase, the *COMPS* list of the non-head daughter is added to the *COMPS* list of the mother.³ Cancellation of elements from the *COMPS* list is modelled in the definition of phrases of type *head-complement*. The constraint is given in (7), after Müller (2002, 16). As *head-complement phrase* is a subtype of *headed-phrase*, it follows that the *COMPS* list can expand and shrink at the same time. The application of (6) and (7) to (1) is illustrated in (8).⁴ In the argument inheritance approach Hinrichs-Nakazawa style, the unsaturated complement of *gevonden* 'found' would be shared with the selecting verbs *hebben* 'have' and *moet* 'must', but in the complement raising approach it is directly propagated to the mother node. Only the verbal complements appear on the *COMPS* lists of the selecting verbs. In this paper it will be illustrated that the CRP not only accurately links the verbs to their non-verbal complements, but also allows to model word order variation in verb clusters in a more elegant way compared to earlier proposals, i.e. as binary-branching structures in which the order of the nodes in the tree is similar to the linear order of the verbs in the cluster.

2 Word order variation

The examples in (3-4) illustrate that verb clusters show word order variation that does not entail a change in meaning.

¹The order of selection is indicated by means of indices; the least embedded verb is indicated as 1.

²Arguments against the lexical constraint in (5) include the occurrence of complement raising without subject raising, interaction with the binding principles and the passive lexical rule.

³The CRP is a phrasal constraint and is, hence, a very powerful mechanism. In order to avoid overgeneration, complement raising is blocked in CPs, V-initial VPs, and P-initial PPs. For a detailed discussion, see Augustinus (2015).

⁴Dutch and German verb clusters are canonically modelled using binary-branching tree structures, i.e. right-branching structures for Dutch and left-branching ones for German.

- (3) a. DU ... dat hij dat boek moet₁ gevonden₃ hebben₂.
 ... that he that book must found have
 b. DU ... dat hij dat boek gevonden₃ moet₁ hebben₂.
 ... that he that book found must have
 ‘... that he must have found that book.’
- (4) a. GE ... dass er das Buch wird₁ finden₃ können₂.
 ... that he the book will find can
 b. GE ... dass er das Buch finden₃ wird₁ können₂.
 ... that he the book find will can
 ‘... that he will be able to find the book.’

The languages not only differ with respect to the canonical word order in verb clusters, but also with respect to the types of word order variation that are allowed. In Standard Dutch, infinitives follow their selector, while participles can obtain a position to the right (1) or the left of their selecting verb (3). Standard German does not show any variation with respect to the position of the past participle, but in some constructions the auxiliaries *haben* ‘have’ or *werden* ‘will’ appear as the first verb of the cluster (4a). For *werden* the *auxiliary flip* or *Oberfeldumstellung* is optional in clusters with at least three verbs. *Haben* may appear in the *Oberfeldumstellung* if it selects a substitute infinitive (a.k.a. *Infinitivus Pro Participio* (IPP) or *Ersatzinfinitiv*), i.e. a construction in which an infinitive is selected by an auxiliary of the perfect. The *Oberfeldumstellung* is obligatory if the substitute infinitive is a modal verb. If perception verbs or the causative *lassen* ‘let’ appear as IPP, both the ‘flipped’ order and the regular descending word order are allowed (Duden, 2006, 480-481). In colloquial variants of German, the auxiliary may also appear in between the two infinitives (*Zwischenstellung*), as in (4b).

While constructions like (3a) and (4a) pose no problem for a binary-branching treatment of verb clusters, the constructions in (3b) and (4b) do, as the selecting verb does not appear next to its complement. In order to account for all linearization possibilities, Bouma & van Noord (1998) analyse verb clusters as flat tree structures. The downside of their approach is that they need additional features and complex word order constraints in order to avoid overgeneration compared to binary-branching analyses. Kathol (2000) tackles the problem in a different way. He employs an additional feature in order to model the linear order of verb clusters, i.e. the $\text{DOM}(\text{AIN})$ feature. The order of the elements in DOM may differ from the order of the elements of the tree structure. In what follows, it will be illustrated that, if one adopts the CRP, Dutch and German verb clusters can be modelled in a binary-branching analysis, in which the linear order of the verbs in the cluster is similar to the order in which they appear in the phrase structure tree.

3 The analysis

Word order variation within verb clusters can be modelled by means of the feature $\text{G}(\text{O})\text{V}(\text{ERN})\text{OR}$, following Kathol (2000) and Bouma & van Noord (1998). GVOR is a head feature (9).⁵ Its possible values are presented in (10).

3.1 Dutch

Infinitival complements in Dutch have the feature $[\text{GVOR} \leftarrow]$, indicating that their governor appears to the left. Past participles have an underspecified value *dir* for GVOR , accounting for the variation in (1) and (3). The constraints are given in (11).⁶

Since GVOR is a head feature, its value is shared between the mother and the head daughter, correctly accounting for the word order in (3a), as illustrated in (12).⁷ The GVOR value of the past participle is

⁵In Bouma & van Noord (1998) GVOR is not a head feature. As they employ a flat analysis of verb clusters, the value of GVOR need not be shared with the mother node.

⁶Kathol (2000, 200) analyses all Dutch verbal complements as $[\text{GVOR} \textit{dir}]$, but that would generate ungrammatical orders.

⁷Finite verbs in V-final clauses are part of the verb cluster and specified $[\text{GVOR} \leftarrow]$, as the complementizer is in the first pole; finite verbs in V-initial clauses are not a part of the cluster and are specified $[\text{GVOR} \textit{dir}]$, as they are the head of the phrase.

contextually resolved from *dir* to \rightarrow , allowing for selection on the left of *hebben* ‘have’. The verb *hebben* is specified as $[GVOR \leftarrow]$. As *GVOR* is a head feature, it is shared between *hebben* and the phrase *gevonden hebben*, correctly accounting for the fact that the governing finite verb *moet* ‘must’ appears to the left.

Constructions in which the participle occurs more to the left in the cluster, as in (3b), can be dealt with in a similar way. As there is no restriction on the type of complements that can be raised, the verb cluster can be analysed as one in which the past participle is raised, cf. (13). *Hebben* ‘have’ selects a subject and a participial complement. Its *GVOR* feature is specified \leftarrow , as its selector has to appear to its left. *Moet* ‘must’ selects the unsaturated verb *hebben*, whose *COMPS* list is shared with the *COMPS* list of the phrase *moet hebben*, according to the CRP. Similarly to other raised complements (if any), a raised past participle occurs to the left of its selector. This correctly accounts for the fact that only past participles can be raised (at least in Standard and colloquial Dutch). Since raising involves selection to the left, complement raising of infinitival complements is blocked by the requirement that they appear to the right of their selector, i.e. they have the feature $[GVOR \leftarrow]$ in their lexical entry. This blocks the occurrence of verb clusters like **zingen₃ zal₁ willen₂* ‘sing will want’.

3.2 German

In German, non-finite complements (both participial and infinitival) have the feature $[GVOR \rightarrow]$, as the selecting verb canonically appears to the right (2). In constructions with Oberfeldumstellung (4a), the selecting verb appears to the left of its complement. This can be modelled by means of a constraint on the lexical entries of the verbs that trigger the construction, i.e. the auxiliaries *haben* and *werden*. The constraint for the constructions in which Oberfeldumstellung is optional is given in (14).⁸ The *GVOR* feature is underspecified for the infinitival complement.⁹ In addition, the infinitival complement needs to be phrasal, which is indicated by the feature $[LEX -]$.¹⁰ In this way, two-verb clusters of the type auxiliary-infinitive are excluded (e.g. **will lesen* ‘wants to read’).

The *GVOR* value is underspecified in the lexical entry of the infinitive *können* ‘can’, but the tree representations in (15) illustrate how it is contextually resolved. The construction in (15a) presents the canonical descending word order (2), while the construction in (15b) is an instance of Oberfeldumstellung (4a).

The Zwischenstellung in (4b) can be modelled in a binary-branching way as a combination of Oberfeldumstellung and complement raising. The application of the constraints in (6) and (14) to (4b) results in the tree structure in (16). *Wird* selects *können* to the right, so *können* is specified as $[GVOR \leftarrow]$ as a result of the Oberfeldumstellung constraint in (14). *Können* selects *finden* as its infinitival complement, but *finden* is raised in a similar way as the Dutch past participle in (12). The unsaturated verbal complement of *können* (4) is shared with its mother node, according to the CRP. The example illustrates that it is possible to analyse word order variation in German without differentiating between representations for the phrase structure level and the word order level.

4 Conclusion

This paper presented how the most common types of word order variation in Dutch and German verb clusters can be accounted for in a binary-branching model. Following Bouma & van Noord (1998) and Kathol (2000), the *GVOR* feature is used to model word order. While the lexical specification of this feature and the application of the CRP is sufficient to model the variation in Dutch verb clusters containing a participle, an additional constraint is needed in order to model the German Oberfeldumstellung and Zwischenstellung.

⁸Note that for colloquial Dutch a similar constraint is needed for the auxiliaries *hebben* ‘have’ and *zijn* ‘be’. In some varieties, the 2-3-1 order occurs in addition to the canonical 1-2-3 order in IPP constructions, e.g. *dat hij het boek kunnen₂ vinden₃ heeft₁* ‘that he was able to find the book’. Such constructions are in fact the mirror image of the German Oberfeldumstellung.

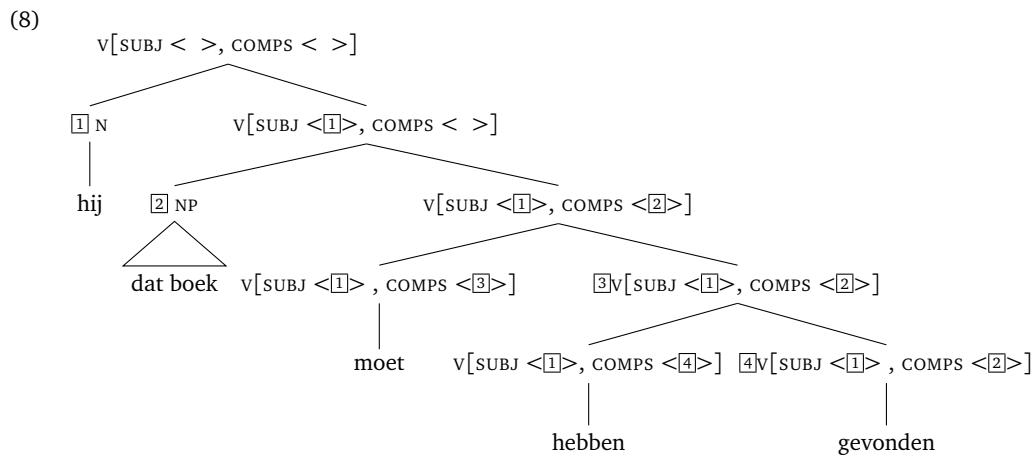
⁹Constructions in which Oberfeldumstellung is obligatory, the verbal complement should have the feature $[GVOR \leftarrow]$. This is the case for modal verbs if they appear in IPP constructions.

¹⁰The only purpose of the *LEX* feature in this analysis is to indicate whether a complement needs to be lexical ($[LEX +]$) or phrasal ($[LEX -]$).

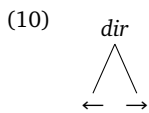
$$(5) \left[\text{ARG-ST } \langle \boxed{1} \rangle \oplus \boxed{A} \oplus \left\langle \left[\text{LOCAL} \mid \text{CAT} \begin{bmatrix} \text{HEAD } \textit{verb} \\ \text{SUBJ } \langle \boxed{1} \rangle \\ \text{COMPS } \boxed{A} \end{bmatrix} \right] \right\rangle \right]$$

$$(6) \textit{hd-ph} \Rightarrow \begin{bmatrix} \text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \mid \text{COMPS } \boxed{A} \oplus \boxed{B} \\ \text{HD-DTR} \mid \text{SS} \mid \text{LOC} \mid \text{CAT} \mid \text{COMPS } \boxed{A} \\ \text{NONHD-DTR} \mid \text{SS} \mid \text{LOC} \mid \text{CAT} \mid \text{COMPS } \boxed{B} \end{bmatrix}$$

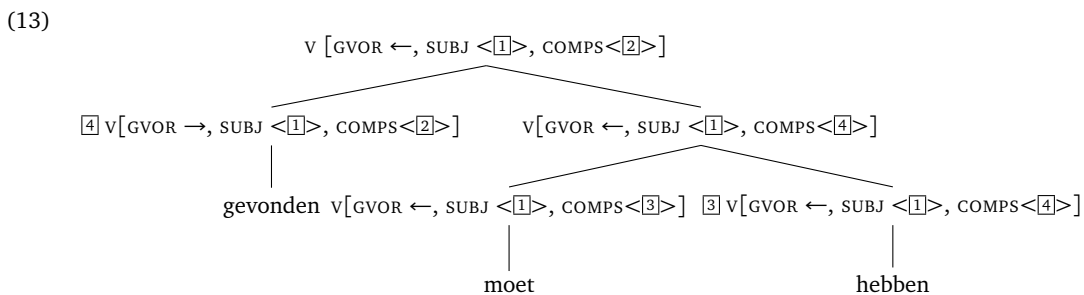
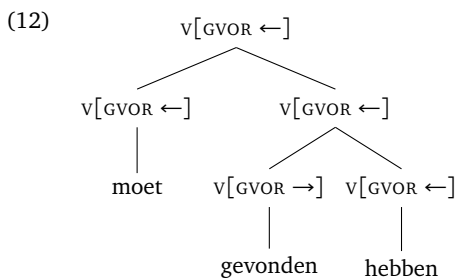
$$(7) \textit{hd-comp-ph} \Rightarrow \begin{bmatrix} \text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \mid \text{COMPS } \boxed{A} \\ \text{HD-DTR} \mid \text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \mid \text{COMPS } \boxed{A} \oplus \langle \boxed{1} \rangle \\ \text{NONHD-DTR} \mid \text{SS} \mid \boxed{1} \textit{synsem} \end{bmatrix}$$

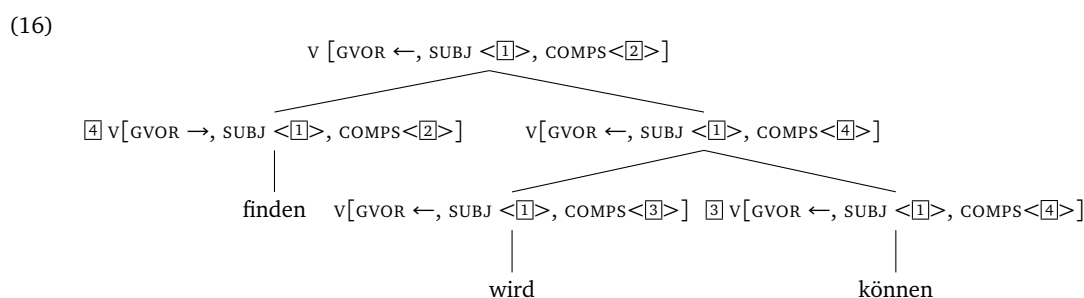
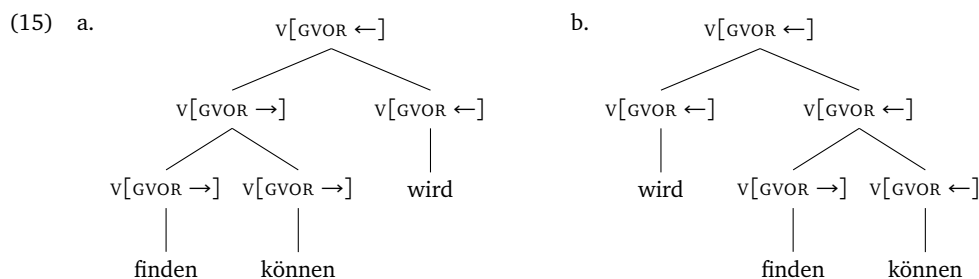
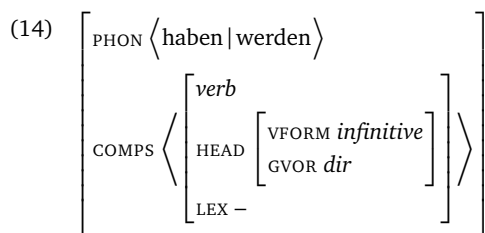


(9) *head*: [GVOR *dir*]



(11) a. $\left[\text{SS} \mid \text{LOC} \mid \text{CAT} \mid \text{HEAD} \begin{bmatrix} \textit{verb} \\ \text{VFORM } \textit{inf} \\ \text{GVOR } \leftarrow \end{bmatrix} \right]$ b. $\left[\text{SS} \mid \text{LOC} \mid \text{CAT} \mid \text{HEAD} \begin{bmatrix} \textit{verb} \\ \text{VFORM } \textit{psp} \\ \text{GVOR } \textit{dir} \end{bmatrix} \right]$





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