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Word order variation in Dutch and German verb clusters

Liesbeth Augustinus

HeadLex16 - 29 July, 2016

OUTLINE

- Introduction
- HPSG analysis of verb clusters
- Analysis of word order variation in verb clusters
- Conclusions

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omdat ik Marie een liedje heb horen zingen

CLUSTER FORMATION

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VERB CLUSTERS

DU … *dat hij dat boek moet$_1$ hebben$_2$ gevonden$_3$.*
… that he the book must have found
'… that he must have found the book.'

GE … *dass er das Buch finden$_3$ können$_2$ wird$_1$.*
… that he the book find can will
'… that he will be able to find the book.'

VERB CLUSTERS

DU … *dat hij dat boek moet$_1$ hebben$_2$ gevonden$_3$.*
… that he the book must have found
'… that he must have found the book.'

GE … *dass er das Buch finden$_3$ können$_2$ wird$_1$.*
… that he the book find can will
'… that he will be able to find the book.'

→Characteristic for Dutch and German

→Not in English

VERB CLUSTERS

DU … *dat hij dat boek heeft$_1$ kunnen$_2$ vinden$_3$.*
… that he the book has can find

GE … *dass er das Buch hat$_1$ finden$_3$ können$_2$.*
… that he the book has find can

‘… that he has been able to find the book.’

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VERB CLUSTERS

DU … *dat hij dat boek heeft$_1$ kunnen$_2$ /*gekund vinden$_3$.*
… that he the book has can.IPP/*can.PSP find

GE … *dass er das Buch hat$_1$ finden$_3$ können$_2$/*gekönnt.*
… that he the book has find can.IPP/*can.PSP

'… that he has been able to find the book.'

→ *Infinitivus pro Participio*
Ersatzinfinitiv, double infinitive

VERB CLUSTERS

DU ... *dat hij dat boek moet$_1$ hebben$_2$* ***gevonden$_3$***.
... that he the book must have found
'... that he must have found the book.'

... *dat hij dat boek moet$_1$* ***gevonden$_3$*** *hebben$_2$*.
... *dat hij dat boek* ***gevonden$_3$*** *moet$_1$ hebben$_2$*.

→ Word order variation without change of meaning

VERB CLUSTERS

GE … *dass er das Buch finden$_3$ können$_2$* ***wird$_1$.***

… that he the book find can will

'… that he will be able to find the book.'

… *dass er das Buch* ***wird$_1$*** *finden$_3$ können$_2$.*

? … *dass er das Buch finden$_3$* ***wird$_1$*** *können$_2$.*

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VERB CLUSTERS

≠ Word order variation with a change of meaning

Ik zag dat ***de hond de kat*** *achtervolgde.*

I saw that the dog the cat chased

'I saw that the dog chased the cat.'

Ik zag dat ***de kat de hond*** *achtervolgde.*

I saw that the cat the dog chased

'I saw that the cat chased the dog.'

VERB CLUSTERS

- In sum, Dutch and German both show
  - verb cluster formation
  - IPP effect
  - word order variation in verb clusters

- Dutch and German verb clusters differ with respect to
  - canonical word order (*ascending* vs *descending*)
  - attested word order variation
  - set of clustering verbs

An HPSG analysis of verb clusters

COMPLEMENT RAISING

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AN HPSG MODEL OF VERB CLUSTERS

- Link verbs to their non-verbal arguments
- Take into account word order variation
- Binary-branching trees

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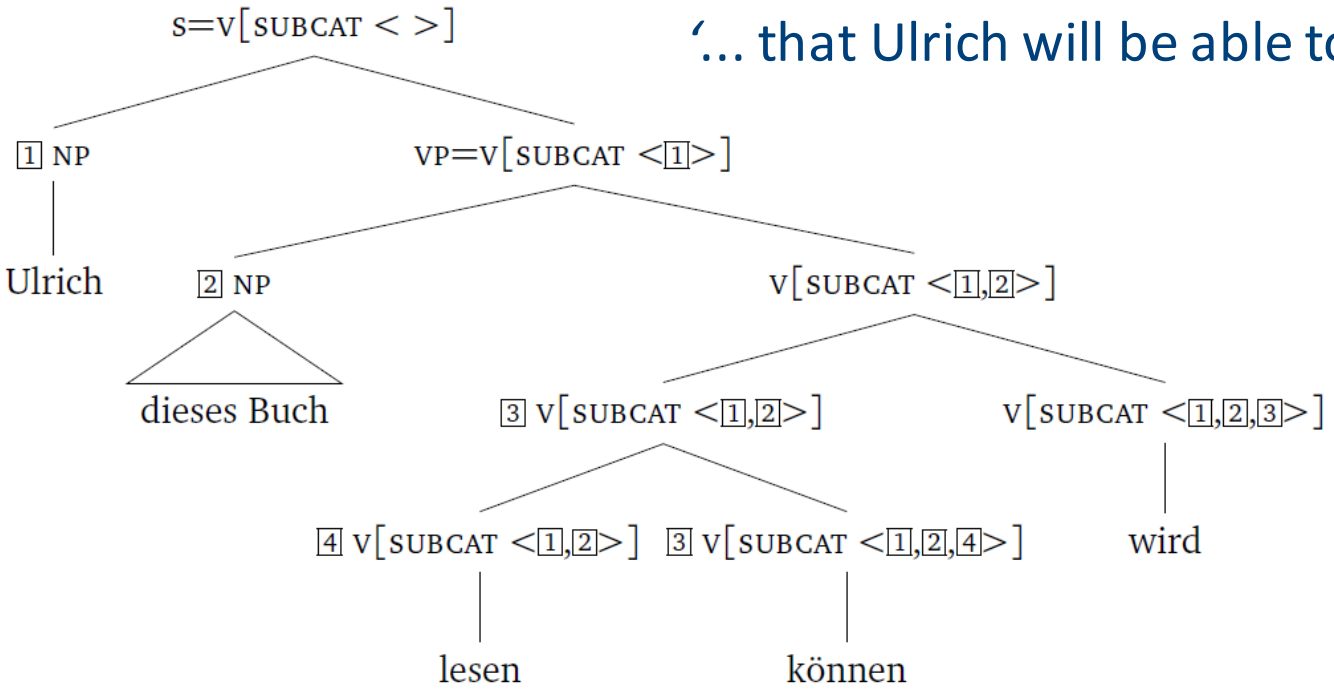
GENERALIZED RAISING

… dass Ulrich dieses Buch lesen können wird.
… that Ulrich this book read can will
'… that Ulrich will be able to read this book.'



Hinrichs & Nakazawa (1989,1990,1994)

Argument inheritance or *generalized raising*

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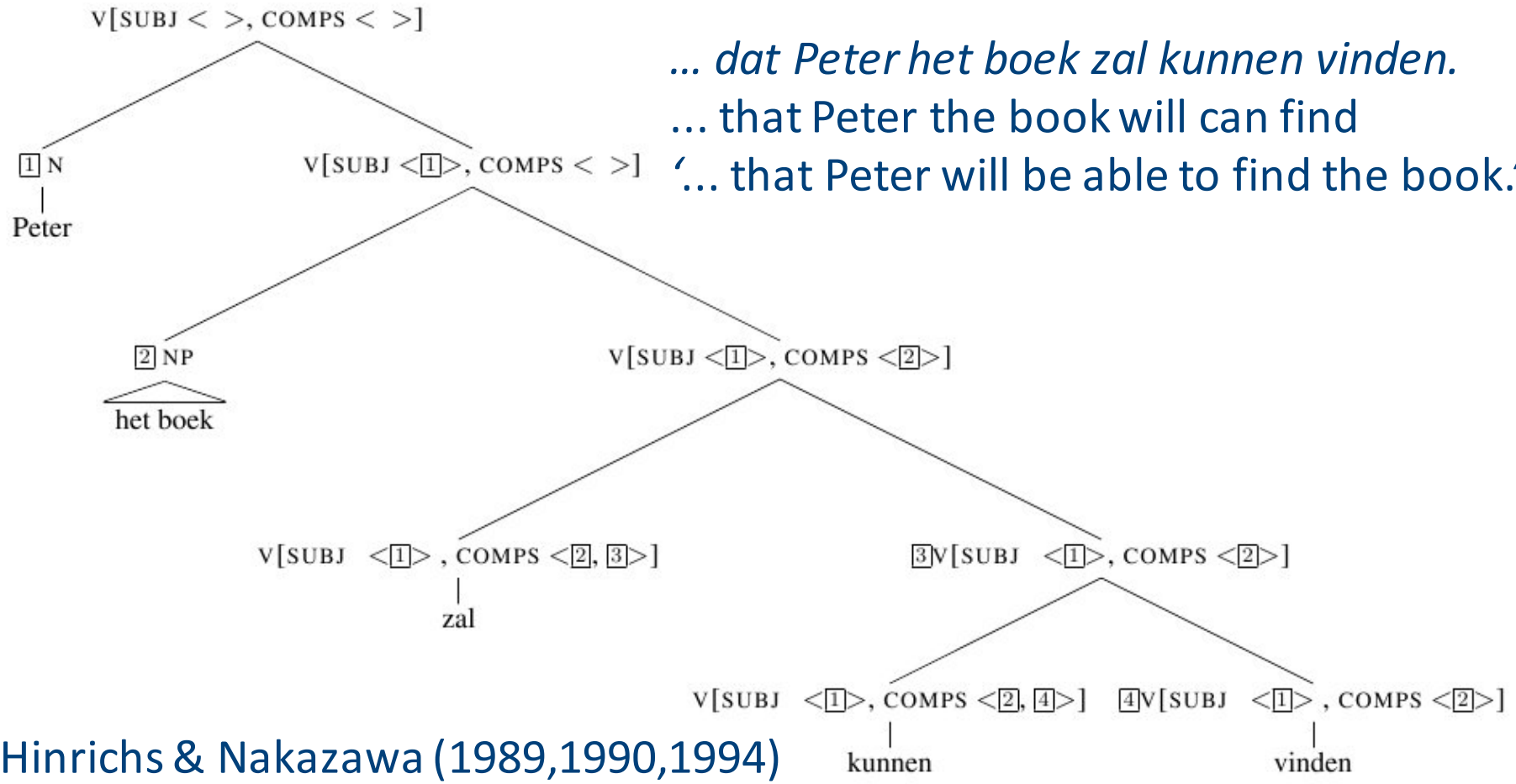
GENERALIZED RAISING



… dat Peter het boek zal kunnen vinden.
… that Peter the book will can find
'… that Peter will be able to find the book.'

Hinrichs & Nakazawa (1989,1990,1994)

Argument inheritance or *generalized raising* adapted to Dutch

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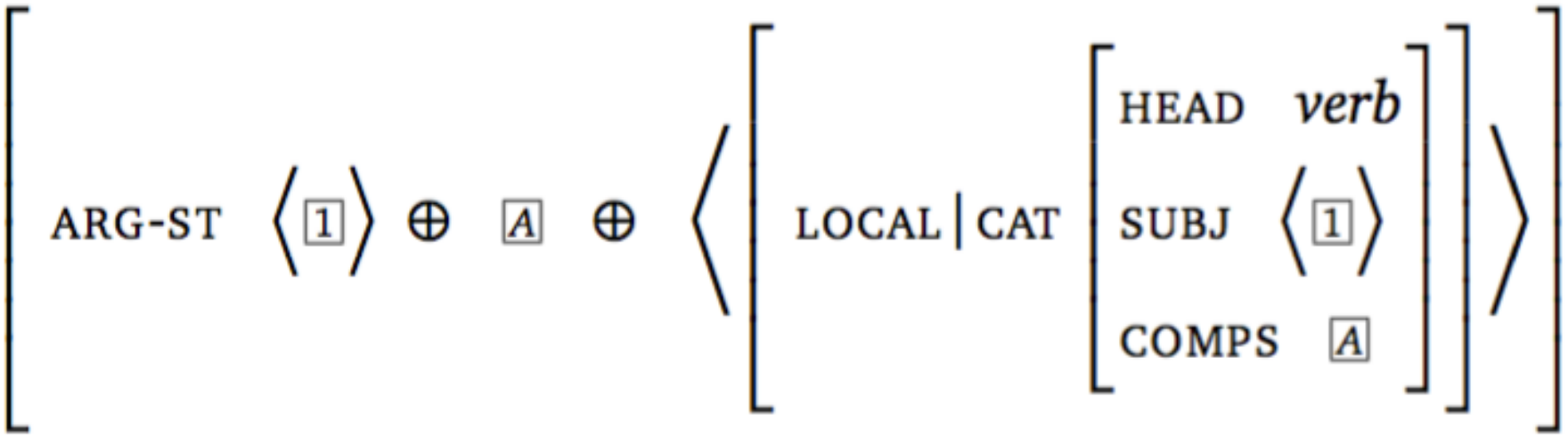
GENERALIZED RAISING



Hinrichs & Nakazawa (1989,1990,1994)

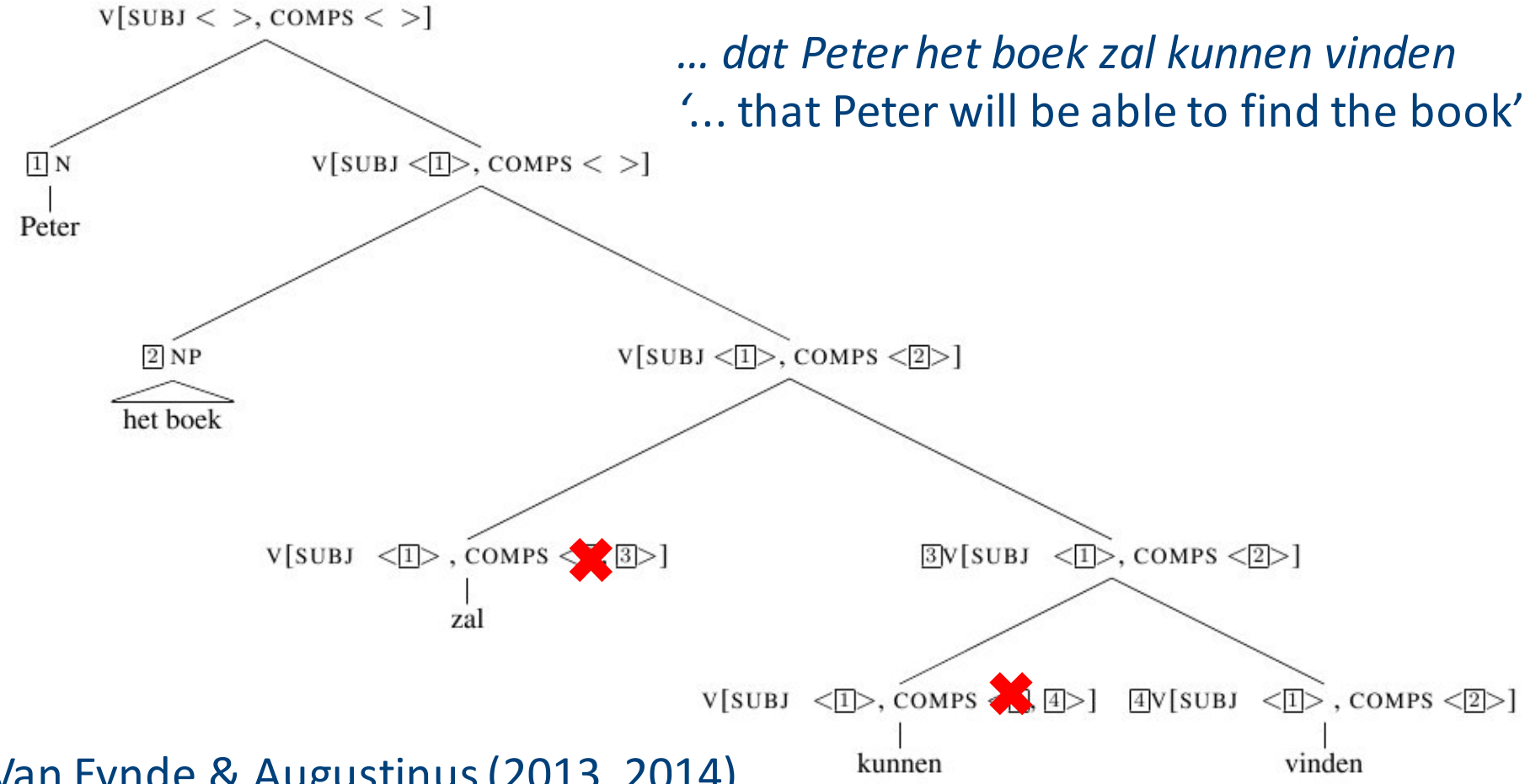
Argument inheritance or *generalized raising*

GENERALIZED RAISING

$$\left[\text{ARG-ST}\ \left\langle \boxed{1} \right\rangle \oplus \boxed{A} \oplus \left\langle \left[\text{LOCAL}\,|\,\text{CAT}\ \left[\begin{array}{ll}\text{HEAD} & \textit{verb}\\ \text{SUBJ} & \left\langle \boxed{1} \right\rangle\\ \text{COMPS} & \boxed{A}\end{array}\right]\right] \right\rangle\right]$$

Problematic, at least for Dutch!

COMPLEMENT RAISING



… dat Peter het boek zal kunnen vinden
'… that Peter will be able to find the book'

Van Eynde & Augustinus (2013, 2014)
Augustinus (2015)

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COMPLEMENT RAISING

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

Constraint on headed phrases → very powerful!

- Not in P-initial PPs
- Not in V-initial VPs
- Not in CPs

COMPLEMENT RAISING

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

Result: The COMPS list can shrink and expand at the same time if combined with the regular head-complement rule

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

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An HPSG analysis of verb clusters

WORD ORDER VARIATION

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WORD ORDER VARIATION

- **Canonical word order**
  - Dutch: ascending
    e.g. *zal*$_1$ *kunnen*$_2$ *lezen*$_3$ (will.FIN can.INF read.INF)
  - German: descending
    e.g. *lesen*$_3$ *können*$_2$ *wird*$_1$ (read.INF can.INF will.FIN)

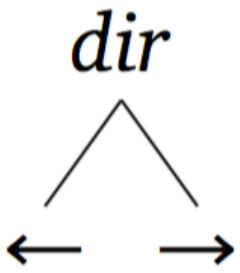
- But: **variation in linear order**
  - Dutch: position of past participle is variable
  - German: position of the finite verb is variable

- Modelled with **G(O)V(ERN)OR feature**
  cf. Kathol (2000), Bouma & Van Noord (1998)
  ~ FLIP in Hinrichs & Nakazawa (1994)

WORD ORDER VARIATION

- G(O)V(ERN)OR indicates the direction of the selector

$$head: \left[\text{GVOR} \quad dir \right]$$



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WORD ORDER VARIATION: Dutch

- Infinitival complements: [GVOR ←]

- Past participles: [GVOR *dir*]

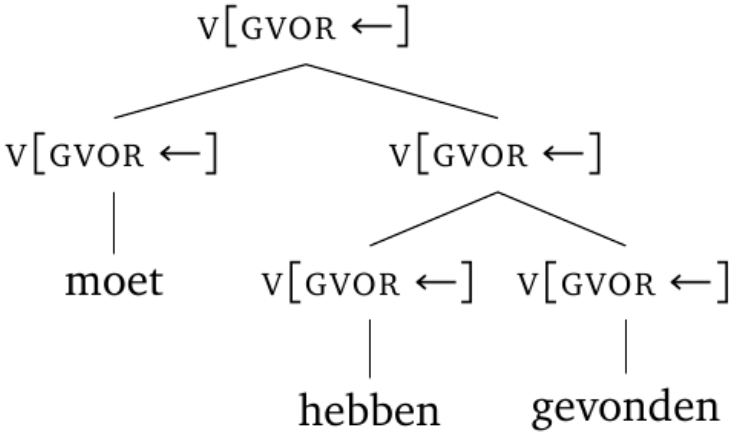
$$\left[\text{SS}\,|\,\text{LOC}\,|\,\text{CAT}\,|\,\text{HEAD}\left[\begin{array}{ll}\textit{verb} & \\ \text{VFORM} & \textit{inf} \\ \text{GVOR} & \leftarrow\end{array}\right]\right]$$

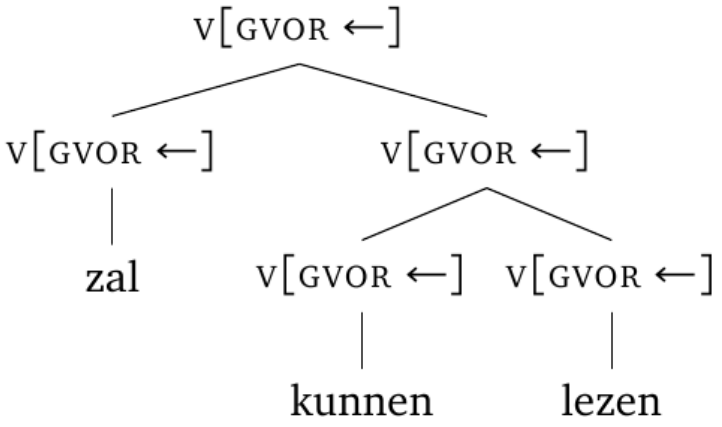
$$\left[\text{SS}\,|\,\text{LOC}\,|\,\text{CAT}\,|\,\text{HEAD}\left[\begin{array}{ll}\textit{verb} & \\ \text{VFORM} & \textit{psp} \\ \text{GVOR} & \textit{dir}\end{array}\right]\right]$$

WORD ORDER VARIATION: Dutch

The canonical cases (1-2-3)

- *Moet*$_1$ *hebben*$_2$ *gevonden*$_3$ (must.FIN have.INF find.PSP)
- *Zal*$_1$ *kunnen*$_2$ *lezen*$_3$ (will.FIN can.INF read.INF)





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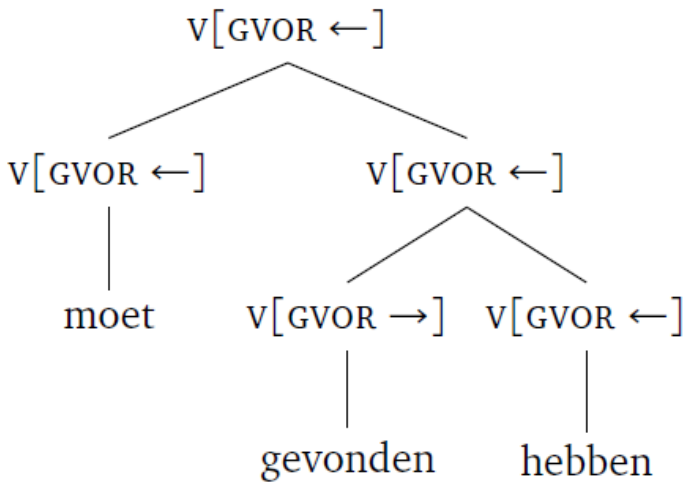
WORD ORDER VARIATION: Dutch

Participle in the middle (1-3-2)

- *Moet*$_1$ *gevonden*$_3$ *hebben*$_2$ (must.FIN find.PSP have.INF)
- **zal*$_1$ *lezen*$_3$ *kunnen*$_2$ (will.FIN read.INF can.INF)
  → ruled out because *lezen* has [GVOR←]



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WORD ORDER VARIATION: German

- In most constructions:
  infinitival complements: [GVOR →]

- Past participles: [GVOR →]

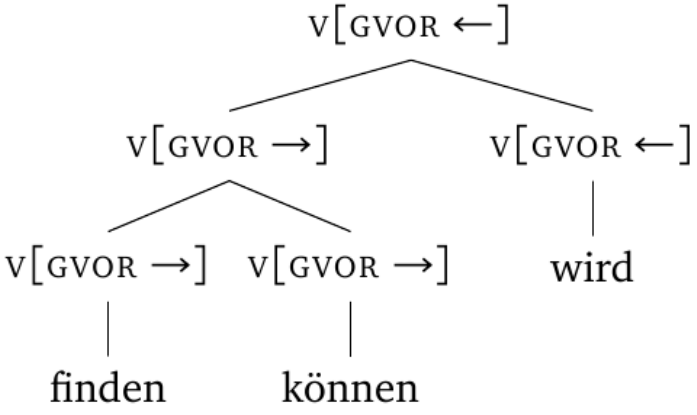
$$\begin{bmatrix} \text{SS}\,|\,\text{LOC}\,|\,\text{CAT}\,|\,\text{HEAD} & \begin{bmatrix} \textit{verb} & \\ \text{VFORM} & \textit{inf} \\ \text{GVOR} & \rightarrow \end{bmatrix} \end{bmatrix}$$

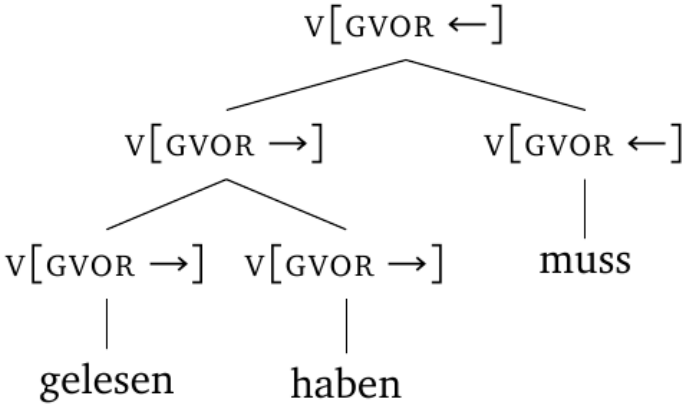
$$\begin{bmatrix} \text{SS}\,|\,\text{LOC}\,|\,\text{CAT}\,|\,\text{HEAD} & \begin{bmatrix} \textit{verb} & \\ \text{VFORM} & \textit{psp} \\ \text{GVOR} & \rightarrow \end{bmatrix} \end{bmatrix}$$

WORD ORDER VARIATION: German

The canonical cases (3-2-1)

- *Finden*$_3$ *können*$_2$ *wird*$_1$ (find.INF can.INF will.FIN)
- *Gelesen*$_3$ *haben*$_2$ *muss*$_1$ (read.PSP have.INF must.FIN)





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WORD ORDER VARIATION: German

The canonical cases (3-2-1)

- *Finden*$_3$ *können*$_2$ *wird*$_1$ (find.INF can.INF will.FIN)
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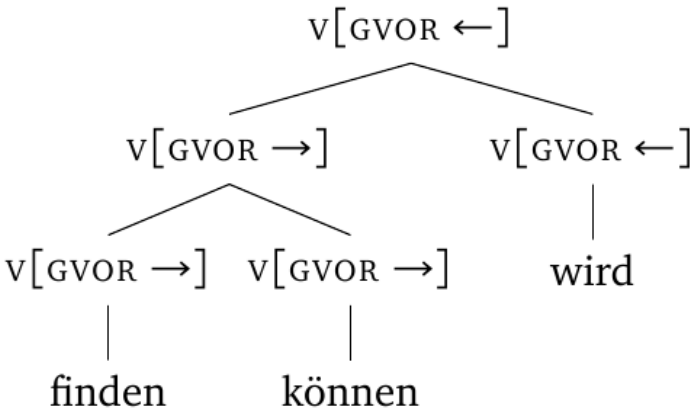

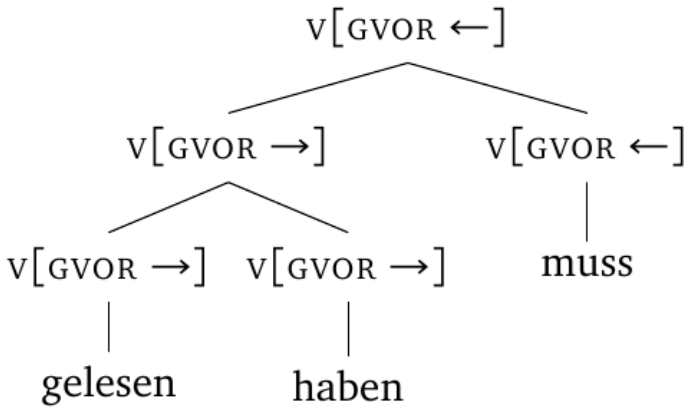

- * *Haben*$_2$ *gelesen*$_3$ *muss*$_1$
  → No equivalent to Dutch 1-3-2

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WORD ORDER VARIATION: Aux Flip

Auxiliary flip *(Oberfeldumstellung)*

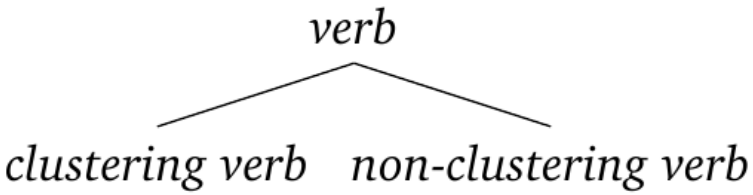
- GE *wird*$_1$ *finden*$_3$ *können*$_2$ (will.FIN find.INF can.INF)
- DU *kunnen*$_2$ *lezen*$_3$ *heeft*$_1$ (can.IPP read.INF have.FIN)

- [GVOR →] for German and [GVOR ←] for Dutch infinitival complements is too strict, but [GVOR *dir*] would overgenerate!

WORD ORDER VARIATION: Aux Flip

- **Clustering verbs**
  Verbs which can select another verb in a verb cluster

- GE ***wird***$_1$ *finden*$_3$ ***können***$_2$ (will.FIN find.INF can.INF)
- DU ***kunnen***$_2$ *lezen*$_3$ ***heeft***$_1$ (can.IPP read.INF have.FIN)



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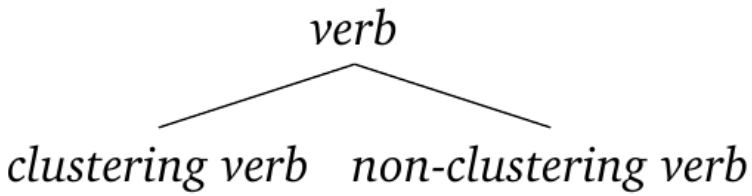
WORD ORDER VARIATION: Aux Flip

- **Clustering verbs**
  Verbs which can select another verb in a verb cluster



- **German**

$$\left[\text{SS}\,|\,\text{LOC}\,|\,\text{CAT}\,|\,\text{HEAD}\left[\begin{array}{ll}\textit{clst verb} & \\ \text{VFORM} & \textit{inf} \\ \text{GVOR} & \textit{dir}\end{array}\right]\right] \quad \left[\text{SS}\,|\,\text{LOC}\,|\,\text{CAT}\,|\,\text{HEAD}\left[\begin{array}{ll}\textit{non-clst verb} & \\ \text{VFORM} & \textit{inf} \\ \text{GVOR} & \rightarrow\end{array}\right]\right]$$

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WORD ORDER VARIATION: Aux Flip

Auxiliary flip *(Oberfeldumstellung)*

- GE *wird*$_1$ *finden*$_3$ *können*$_2$ (will.FIN find.INF can.INF)
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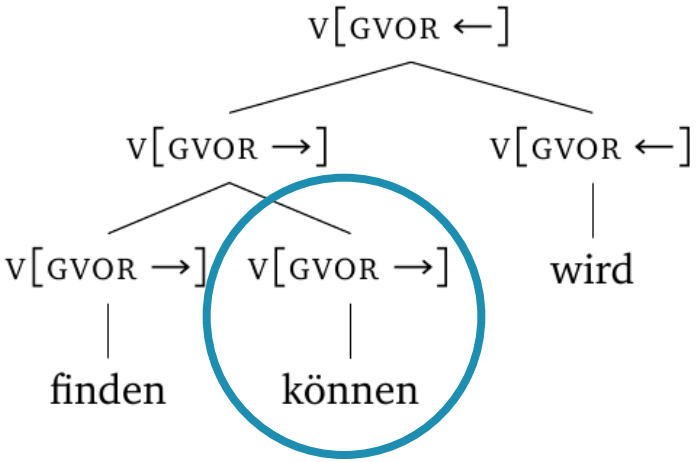

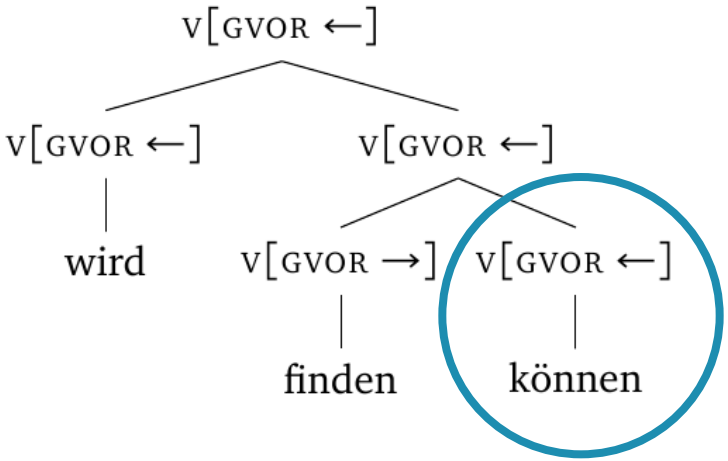

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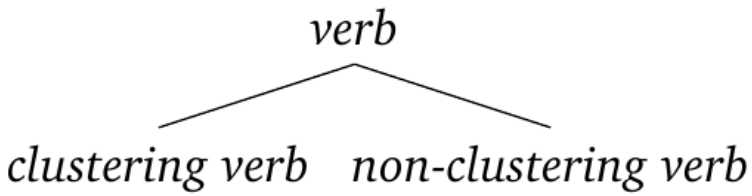
WORD ORDER VARIATION: Aux Flip

- **Clustering verbs**
  Verbs which can select another verb in a verb cluster



- **Dutch**

$$\left[\text{SS}\,|\,\text{LOC}\,|\,\text{CAT}\,|\,\text{HEAD}\left[\begin{array}{ll}\textit{clst verb} & \\ \text{VFORM} & \textit{inf} \\ \text{GVOR} & \textit{dir}\end{array}\right]\right] \qquad \left[\text{SS}\,|\,\text{LOC}\,|\,\text{CAT}\,|\,\text{HEAD}\left[\begin{array}{ll}\textit{non-clst verb} & \\ \text{VFORM} & \textit{inf} \\ \text{GVOR} & \leftarrow\end{array}\right]\right]$$

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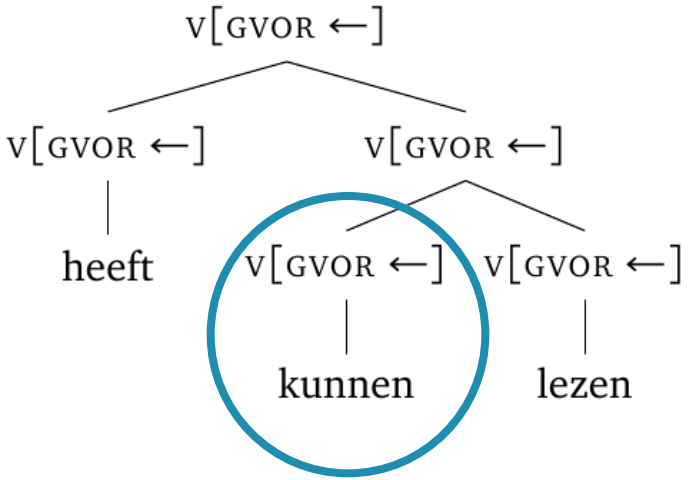
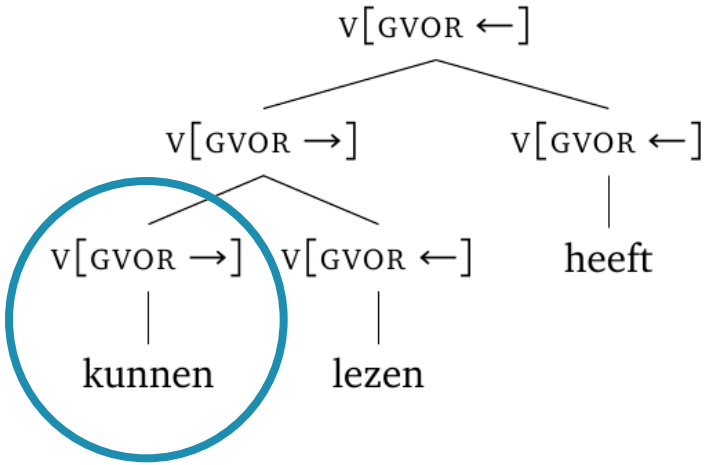
WORD ORDER VARIATION: Aux Flip

Auxiliary flip *(Oberfeldumstellung)*

- GE *wird*$_1$ *finden*$_3$ *können*$_2$ (will.FIN find.INF can.INF)
- DU *kunnen*$_2$ *lezen*$_3$ *heeft*$_1$ (can.IPP read.INF have.FIN)





- Only in IPP-constructions, only in colloquial varieties of Dutch

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WORD ORDER VARIATION: 3-1-2

- **What about 3-1-2 constructions?**

- DU *gevonden*$_3$ *moet*$_1$ *hebben*$_2$ (find.PSP must.FIN have.INF)
- GE *finden*$_3$ *wird*$_1$ *können*$_2$ (find.INF will.FIN can.INF)

→ Main verb is not adjacent to its selector

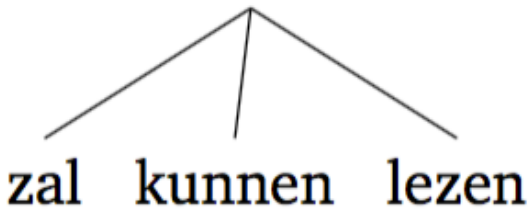
→ *Zwischenstellung*

→ Problematic for binary-branching approaches

WORD ORDER VARIATION: 3-1-2

- **What about 3-1-2 constructions?**

- Bouma & Van Noord (1998): flat tree structures



+ More flexible w.r.t. word order variation
- Additional features and constraints required to prevent overgeneration

WORD ORDER VARIATION: 3-1-2

- **What about 3-1-2 constructions?**

- Kathol (2000): domain feature to model linear order

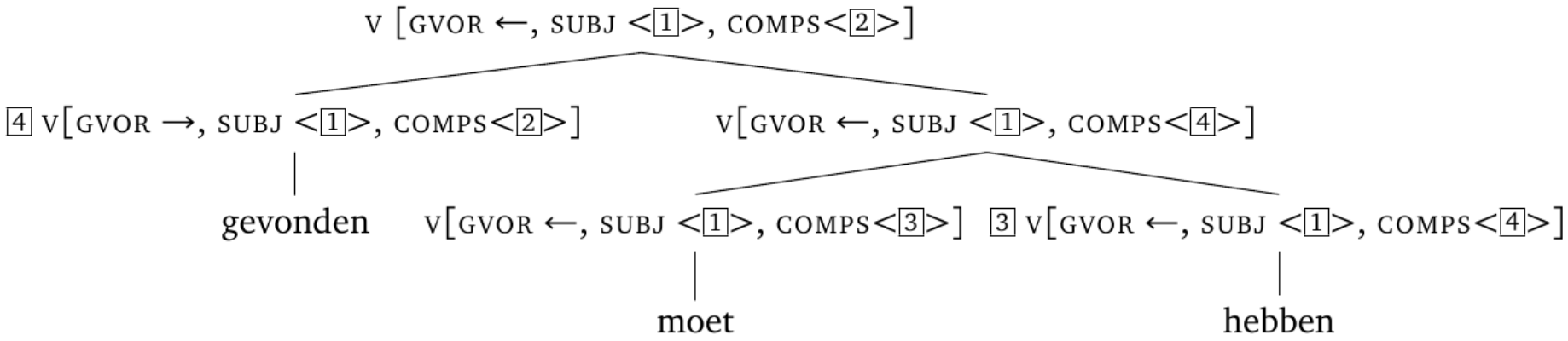
$$\left[\text{DOM}\left\langle\left[\langle \textit{finden}\rangle,\ \text{GVOR}\ \rightarrow\right],\left[\langle \textit{wird}\rangle\right],\left[\langle \textit{können}\rangle,\ \text{GVOR}\ \leftarrow\right]\right\rangle\right]$$

→ Phrase structure is not surface-oriented

WORD ORDER VARIATION: 3-1-2

- **What about 3-1-2 constructions?**

- Augustinus (2015): Dutch 3-1-2 as another instance of complement raising
  e.g. *gevonden*$_3$ *moet*$_1$ *hebben*$_2$ (find.PSP must.FIN have.INF)



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WORD ORDER VARIATION: 3-1-2

- **What about 3-1-2 constructions?**

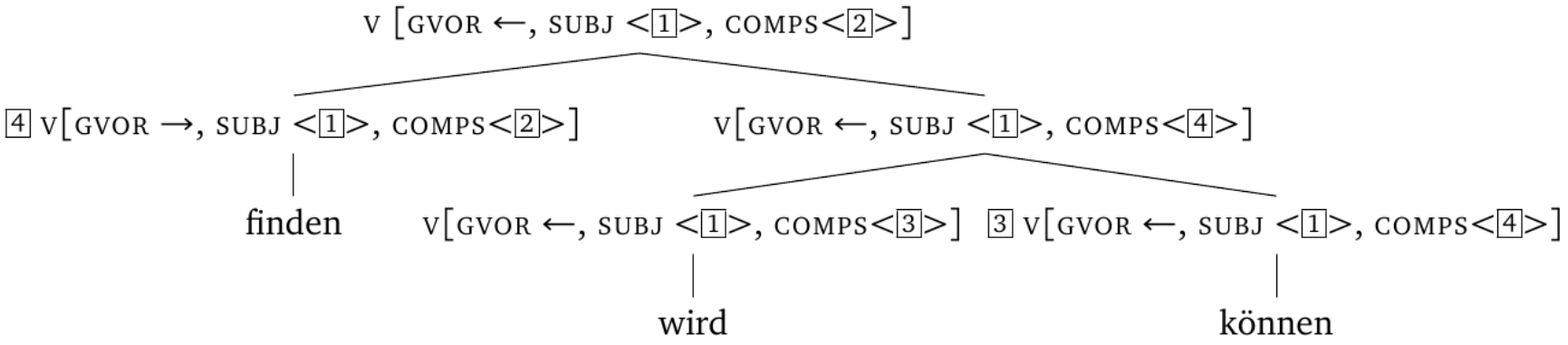
- Augustinus (2015): Dutch 3-1-2 as another instance of complement raising

  → 3 can only be a past participle, as participles are [GVOR *dir*]
  → constructions of the type *$lezen_3$ zal_1 $kunnen_2$ (read.INF will.FIN can.INF) are correctly ruled out ruled out because *lezen* has [GVOR ←]

WORD ORDER VARIATION: 3-1-2

- **What about 3-1-2 constructions?**

- Extension to German 3-1-2: combining complement raising with *Oberfeldumstellung*



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CONCLUSION

- HPSG analysis of verb clusters
- Taking into account word order variation
- Binary branching
- Combination of *complement raising* and linearization constraints (using GVOR)
- Accounts for the variation attested in Dutch and German verb clusters

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Thanks for your attention!

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