Deriving Binding Relations in German & English via Spanning & Horizons

GLAC-28: Spanning session

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Roadmap of this presentation

Objectives:
- To account for anaphoric co-reference possibilities (Principle A) without binding primitives
- To do this in the spirit of Rooryck & Vanden Wyngaerd (R&VW) (2011), but without relying on phase-based movement, accounting for Germanic languages beyond Dutch, starting w/ German & English
- We explore how this can be carried out in a Spanning-approach to spell-out and a Horizons-approach to locality & selective opacity
Principle A in German & English

(1) a. Die Großmutter läßt [vP die Katze sich auf den Kopf langen].
   the grandmother lets the cat REFL on the head reach
   ‘The grandmother lets the (female) cat grab her/herself on the head.’

   b. Martin hört nicht gern [DP Thorstens Geschichten über sich].
   M. hears not pleasantly T’s stories about REFL
   ‘Martin doesn’t like to hear Thorsten’s stories about him/himself.’

   Unlike in English, anaphors have long-distance binding possibilities in German
   (Lee-Schoenfeld 2004)

(2) The doctor showed the patient himself in the mirror.

   Co-reference w/ the higher antecedent is possible in English, but the closer
   one is preferred
(3) Der Arzt\textsubscript{i} zeigte den Patienten\textsubscript{j} sich\textsubscript{i/j} im Spiegel.

the doctor showed the patient(s) REFL in-the mirror

Reading #1: The doctor\textsubscript{M.SG.\textsubscript{i}} showed the patients\textsubscript{DAT.PL} himself\textsubscript{i}.

Reading #2: The doctor\textsubscript{M.SG.\textsubscript{i}} showed the patient\textsubscript{ACC.M.SG.\textsubscript{j}} himself\textsubscript{j} in the mirror.’

- When the first object is DAT-marked, as it is canonically, sich is subject-oriented
- **Object-conference** is only possible when the first object is ACC-marked (Lee-Schoenfeld & Twiner 2022)

(4) *[[Piet]\textsubscript{i}’s girlfriend] invited himself\textsubscript{i}.

- As expected, the anaphor must be c-commanded by its antecedent
Problem #1: Unlike Dutch *zich*, German *sich* does not alternate with inalienably-possessed DPs:

(5) Jan bezeert zich/zijn voet.
    J. hurts REFL/his foot
    ‘Jan hurts himself/his foot.’  
      [Dutch]

(6) Jan verletzt sich/*seinen Fuß.
    J. hurts REFL/his foot
    ‘Jan hurts himself/his foot.’  
      [German]

(7) Jan verletzt sich den Fuß.
    J. hurts REFL the foot
    ‘Jan hurts his foot (on a regular basis).’  
      [German]
As shown in (5)-(7), this analysis based on inalienable possession and unaccusativity does not work for German.
Problems w/ R&VW’s (2011) Derivational Approach

Problem #2: German *sich* cannot be equated with Dutch *zichzelf*. If *sich* must move to the closest phase-edge (*vP*) and immediately enter into a feature-valuing Agree relation, it can only co-refer with the highest DP in its c-command domain. This is counter to fact, as seen in (3), even in Dutch:

(9) Piet$_i$ vetrouwde Jan$_j$ zichzelf$_{i/j}$ toe.
    P. entrusted J. REFl PRT
    ‘Piet entrusted Jan with himself.’ [Dutch]

(10) R&VW 2011:144

\[
[vP_{DP3} \{P:3^*, N:sg^*, G:m^*\}] [vP_{DP2} \{P:3, N:sg, G:m\}] [vP_{DP1} \{P:3, N:sg, G:m\}]
\]
\[
zichzelf
\]
\[
Jan
\]
\[
Piet
\]
\[
[vP_{DP2} \{P:3, N:sg, G:m\}] V [DP3 \{P:3^*, N:sg^*, G:m^*\}] \]
\[
toevertrouwde
\]

- R&VW appeal to scrambling/adjunction to *vP*
  - In (10), *Jan* c-commands *Piet*, so *zichzelf* can only enter into an Agree-relation with *Jan*
  - The binding ambiguity is unaccounted for
Problems w/ R&VW’s (2011) Derivational Approach

(11) Der Arzt\textsubscript{i} zeigte den Patienten\textsubscript{j} sich\textsubscript{i/j} im Spiegel.

Reading #1: The doctor\textsubscript{M.SG.\textsubscript{i}} showed the patients\textsubscript{DAT.PL} himself\textsubscript{i} in the mirror.
Reading #2: The doctor\textsubscript{M.SG.\textsubscript{i}} showed the patient\textsubscript{ACC.M.SG.\textsubscript{j}} himself\textsubscript{j} in the mirror.’

- To allow for object co-reference, case marking of the objects must be ACC $\not\rightarrow$ DAT, despite DAT $\not\rightarrow$ ACC being canonical
- Co-references possibilities of sich must interfere with each other during the derivation, otherwise, non-canonical case-marking could not be forced
- Feature valuation of anaphors cannot be limited to an Agree-relation with the closest c-commanding DP
Problem #3: English self-anaphors (complex reflexives), when moved and adjoined to vP, should be able to enter into an Agree relation with both DPs of a Saxon Genitive construction, because neither DP c-commands the other, but this is counter to fact:

b. R&VW 2011:142
Problems w/ R&VW’s (2011) Derivational Approach

- More generally, any derivational binding approach relying on movement of anaphors runs into problems - we know this from coordinate structures.
- Movement from just one conjunct violates basic principles of coordinate structures, yet the anaphor in (13) is grammatical:

(13) She$_i$ washed herself$_i$/*her$_i$ and him.

(Bruening 2021: 429)
Interim Conclusions

- Neither German nor English (nor Dutch!) co-reference possibilities can be neatly captured via anaphoric movement to phase-edges.
- A new (non-phase-based) solution for locality / selective opacity is needed.
- Instead of relying on movement and phases, we suggest a probing-upward + Horizons approach.
Selective Opacity

Observation: The notion of uniform strong phases (vP & CP) is too strong

Token evidence: A’-movement in German

- Finite clauses in German allow wh-movement out of them, but block relativization
- V2 clauses are transparent to wh-movement that lands inside a higher V2 clause, but opaque to wh-movement that targets a higher V-final clause

Hypothesis: We need to address the notion of selective opacity in a uniform and consistent way
Examples of selective opacity (Keine 2020: 8)

(14)  \textit{Finite V-final clauses in German}

\begin{enumerate}
\item a. \textit{Wen} \textit{i} \textit{hat er gesagt [dass Maria} \textit{_i} \textit{gesehen hat]}
   \textit{who.acc has he said that Maria seen has}
   \textit{‘Who did he say that Maria saw?’}
   
   b. *\textit{eine Frau [die} \textit{i} \textit{er gesagt hat [dass Maria} \textit{_i} \textit{gesehen hat]}
   \textit{a woman who.acc he said has that Maria seen has}
   \textit{\textit{Intended: ‘a woman who he said that Maria saw’}}
\end{enumerate}

(15) \textit{V2 clauses in German}

\begin{enumerate}
\item a. \textit{[CP Wen} \textit{i} \textit{meint er [CP hat Maria} \textit{_i} \textit{gesehen]}}
   \textit{who.acc thinks he has Maria seen}
   \textit{‘Who does he think that saw Maria?’}
   
   b. *\textit{Ich weiß nicht [CP wen} \textit{i} \textit{er meint [CP hat Maria} \textit{_i} \textit{gesehen]}}
   \textit{I know not who.acc he thinks has Maria seen}
   \textit{\textit{Intended: ‘I don’t know who he think that Maria saw.’}}
\end{enumerate}
Defining Selective Opacity

(16) **Selective Opacity**
A syntactic domain $\Delta$ is selectively opaque to an operation $\alpha$ if $\Delta$ is opaque to $\alpha$, but transparent to some other operation $\beta$.
(Keine 2020: 2)

- Keine (2020) explores how Selective Opacity can be used to model “long-distance" movement and agreement in a formal and consistent way
- **Our proposal:** We extend Keine’s proposal to cases of anaphoric binding in German & English
(17) **Horizons:** if a probe [*F*] has some category feature $\delta$ as its horizon ([*F*] $\models \delta$), then [*F*]-initiated search domain terminates at a $\delta$-bearing node X. As a consequence, all elements dominated by X are outside of [*F*]’s search space.

(Keine 2020: 24)

- Since anaphors probe upward (Schäfer 2012: 238), instead of "all elements dominated by X", it needs to be all elements dominating X (the Horizon-defining head) that are outside the probe’s search space.
  - Keine (2020: Ch.2) looks at Hindi reciprocal binding (A-movement)

**What this means for our approach to binding:**

- Horizons replace (strong) phases for our metric of measuring locality
- To account for the difference between the German and English binding possibilities in (1a-b), the Horizon for anaphoric Agree relations in German would be CP, while it would be vP and DP in English
(18) **Span:** An n-tuple of heads \(< X_n, ..., X_1 >\) is a span in a syntactic structure \(S\), iff \(X_{n-1} P\) is the complement of \(X_n\) in \(S\).
(Blix 2021: 7)

(19) **Exhaustive Lexicalization Principle:** Every syntactic feature must be lexicalized.
(Fábregas 2007: 167)

(20) **Superset Principle:** In case a syntactic span does not have an identical match in the lexical repertoire, select an exponent which contains a superset of the features present in the syntactic span.
(adapted from Fábregas & Putnam 2020: 40)
The function of the nominal layers

DP

D

indexicality
(saturates argument via identity function)

φ

ClassP

bound variable anaphora
(saturates argument via choice function)

Class

classification
(restricts argument)

nP

categorization
(saturates argument)

n

N

semantic field restriction
(restricts predicate via Part-Of relation)
Following Déchaine & Wiltschko (2017: 69)

The distribution of reflexives in the nominal spine

```
DP
  D
  X-self
    (English)
  Φ
    se
      (French)
  ClassP
    Class
      zvi-
        (Shona)
    nP
      n
        -iso
          (Plains Cree)
      N
        inalienable N
          (Halkomelem)
```
Reflexives as lexical spans

Following D&W (2017):

- Categorization arises from the association of sound-meaning \( \langle \pi, \Sigma \rangle \)
- Bundles with the syntactic spine \( (\kappa) \)
- Semantic interpretation: \( \lambda x \lambda y[R(x,y)], y = f(x) \),

German offers 2 possibilities for lexicalizing \textit{sich}:

- Case assignment via projection
- \( \textit{sich}_1 \equiv \langle K \langle \kappa_\phi \langle \pi_{se}, \Sigma_{\text{REFL}} \rangle \rangle \rangle \) [SE-anaphor/clitic]
- \( \textit{sich}_2 \equiv \langle K \langle \kappa_D \langle \pi_{se}, \Sigma_{\text{REFL}} \rangle \rangle \rangle \) [SELF-anaphor/*logophoric]
A Horizons-based account of Principle A

Let’s return to some key contrastive data:

(21) a. Die Großmutter lässt [vP die Katze sich auf den Kopf langen].
   the grandmother lets the cat REFL on the head reach
   ‘The grandmother lets the (female) cat grab her/herself on the head.’

   b. Martin hört nicht gern [DP Thorstens Geschichten über M.]
      hears not pleasantly T’s stories about
      REFL
      ‘Martin doesn’t like to hear Thorsten’s stories about him/himself.’

(22) The doctor showed the patient himself in the mirror.

- English: Needs a ‘close’ antecedent
  - [*/φ*] ≡ v/DP

- German: The antecedent can look further
  - [*/φ*] ≡ CP
Horizons have implications for the distribution of phases
Keine (2020) provides evidence for the (continued) need for successive-cyclicity
Keine (2020) defends the notion of CP-phases (see, e.g., Chs. 4 & 5), based on both successive cyclicality and selective opacity effects
  ...but he argues that the classification of vP as a phase is “not easily compatible with the horizons system” (p. 31)
Keine’s claim: There are no clause-internal phases
We can support this proposal:

- Status of \( \nu P \) as a phase is highly questionable – What determines whether it is defective or intact?
- Status of DP as a phase is equally questionable – Is DP categorically a phase or must Spec,DP be filled?
- PP is also not a clear-cut case – P needs to be tied to a thematic interpretation, but this purportedly holds irrespective of what it is an argument or adjunct.
- Are argument-PPs and adjunct-PPs merged in the same identical structure position?

Clause-internal phases cause as many problems as they attempt to solve.
Conclusion

- Horizons offers a fresh reassessment of anaphoric co-reference possibilities
- Horizons replace clause-internal phases of measure of locality
- **Open question:** Can Horizons be subsumed under (some/the) notion of spans?
Thanks!
