Non-local case assignment and agreement relations in German?

(Meurers 1999)

Seminar on "Locality of grammatical relations"
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Linguistics 795/820, Spring Quarter 2003

Overview

- The empirical challenge: Subjects in fronted non-finite projections

- The failure of local case assignment

- The discovery of a lexical trigger: raising verbs

- Exploring the empirical domain:
  - Lexical triggers: Subject-to-subject and subject-to-object raising
  - Is it always the subject? A look at passives
  - Extending the domain further: Multiple raising verb occurrences

- Two theoretical interpretations:
  - Theory 1: All arguments are equal
  - Theory 2: Subjects are special

Subjects in fronted non-finite projections

Haider (1990) pointed out that under certain conditions it is possible in German to realize a subject as part of a fronted non-finite verbal constituent:

(1) *[Ein Fehler unterlaufen] ist ihr noch nie.*
    an$_N$ error crept-in is her still never.
    'So far she has never made a mistake.'

(2) *[Ein Außenseiter gewonnen] hat hier noch nie.*
    an$_N$ outsider won has here still never
    'An outsider has never won here yet.'

How does the subject realized as part of the fronted non-finite verbal constituent receive nominative case?

The failure of strictly local case assignment

The subject of the non-finite complement can appear in nominative (3) or accusative (4) case, depending on the verb selecting the fronted constituent.

(3) *[Ein Außenseiter gewinnen] wird hier nie.*
    an$_N$ outsider win will here never
    'An outsider will never win here'

(4) *[Einen Außenseiter gewinnen] läßt Gott hier nie.*
    an$_A$ outsider win lets god here never
    'God never lets an outsider win here.'

⇒ Case cannot be determined within the fronted constituent.

Empirical issues

I. Are grammatical relations other than case extended as well?

II. When do such apparently extended grammatical relations arise?

III. Is it always the subject that takes part in such extended relations?

Extended subject-verb agreement (cont.)

Real number and person agreement has to be captured (Höhle 1994, p. 5):

(7) a. [Der   Wein ausgegangen]   ist uns   diesmal   nicht.
    the$_{N,sg}$ wine come to an end is for us this time   not
    'This time we didn't finish the wine.'

  b. [Die   Argumente ausgegangen]   sind/*ist uns   diesmal   nicht.
    the$_{N,pl}$ arguments come to an end are   is for us this time   not
    'This time we had enough good arguments.'

⇒ Subject-verb agreement sometimes has to be ensured for subjects embedded in verbal complements, i.e., further than the local head domain.

Extended subject-verb agreement

(5) [Ein Außenseiter gewonnen] hat / *hast   / *haben hier noch nie.
    an outsider   won   has   have$_{2.sg}$ have$_{pl}$ here still never
    'An outsider has never won here yet.'

Default third person singular, as in subjectless constructions?

(6) Hier wurde / *wurden getanzt.
    here was   were   danced
    'Here people danced.'

The discovery of a lexical trigger

The construction appears to be restricted to raising verbs:

(8)   [Ein Außenseiter zu gewinnen] scheint hier eigentlich nie.
    an outsider   to win   seems here actually   never
    'An outsider never actually seems to win here.'

(9) * [Ein Außenseiter zu gewinnen] versuchte hier noch   nie.
    an outsider   to win   tried   here actually never
    'An outsider never actually tried to win here.'

The discovery of a lexical trigger (cont.)

Verbs with two readings only show extended case relations in raising reading:

(10) *[Ein Außenseiter zu gewinnen] versprach hier noch nie.*
    an outsider   to win   promised here still   never

    a. * 'An outsider never made a promise to win here.'
    b.   'It was never probable that an outsider wins here.'

(11) *[Ein Außenseiter zu gewinnen] drohte   hier noch nie.*
    an outsider   to win   threatened here still   never

    a. * 'An outsider never made a threat to win here.'
    b.   'There was never the danger of an outsider winning here.'

⇒ The case assignment relation is extended only for elements which could
   be raised by a raising predicate.

Case assignment in local domains and AcI verbs

Raising from subject to object establishes local grammatical relations for
the object in head domain of raising predicate:

(14) *Gott läßt [einen Außenseiter] hier nie   gewinnen.*
    god lets an_A outsider   here never win
    'God never lets an outsider win here.'

Raising from subject to object takes place for some representation of the
subject ('spirit') even when it is realized as part of the complement:

(15) *[Einen Außenseiter gewinnen] läßt Gott hier nie.*
    an_A outsider   win   lets god here never
    'God never lets an outsider win here.'

⇒ Case assignment remains a relation that is local to a head domain.

Case assignment in local domains and raising verbs

Raising from subject to subject establishes local grammatical relations for
the subject in head domain of raising predicate:

(12) *Hier wird [ein Außenseiter] nie   gewinnen.*
    here will an_N outsider   never win
    'An outsider will never win here'

Raising takes place for some representation of the subject ('spirit') even
when it is realized as part of the complement:

(13) *[Ein Außenseiter gewinnen] wird hier nie.*
    an_N outsider   win   will here never
    'An outsider will never win here'

⇒ Case assignment remains a relation that is local to a head domain.

Extending the domain further with multiple raising verbs

(16) a. *[Ein Außenseiter gewonnen zu haben] scheint hier noch nie.*[1]
       an outsider   won   to have seems here still   never
       'An outsider seems never to have never won here yet.'

    b. *[Ein Außenseiter gewonnen] scheint hier noch nie   zu haben.*[1]
       an outsider   won   seems here still   never to have

(17) *[Der endgültige Vertrag unterzeichnet worden zu sein] scheint aber*
    the_N final   contract signed   been   to be   seems but
    erst nach langen Verhandlungen.
    only after long   negotiations
    'The final contract was only signed after long negotiations.'

⇒ *The distance between case assignment domain and case bearing*
   element grows as far as lexically mediated by raising relation.

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[1](Haider 1990)

Is it always the subject? A look at passives

The participle can be fronted together with the subject:

(18) [Zwei Männer erschossen] wurden während des Wochenendes.[2]
    two men   shot   were   during the weekend
    'Two men were shot during the weekend.'

(19) [Der Führerschein abgenommen] wurde einem Autofahrer am
    the$_N$ driving license taken away   was a$_D$ driver   on
    Samstag bei Bonn.
    Saturday near Bonn
    'On Saturday, the driving license of a driver was taken away close to Bonn.'

---

[2](Webelhuth 1985, p. 210, cited after Müller 1997, p. 23)

Possible passive analyses

A. past participle + object-to-subject raising auxiliary
   (Kathol 1994; Pollard 1994; Müller 1999)

B. passive participle + subject-to-subject raising auxiliary
   (Pollard and Sag 1987; Heinz and Matiasek 1994; Müller 2001b)
   (passive and past participle can be related, e.g., by a lexical rule)

Conclusions:

- Both analyses establish a raising relation, which is all we need for our analysis to go through.

- Analysis A postulates object-to-subject raising verbs. Not only subjects but also objects realized with a complement would have to be visible, i.e., in addition to subject spirits, object spirits exist and undergo raising.

Towards a theoretical interpretation

- A raising verb represents the NP raised from the verbal complement in a way which establishes the ordinary local grammatical relations such as case assignment and subject-verb agreement.

- This is even the case if the NP which could be raised is actually realized as part of the verbal complement.

  Raising then lifts the 'spirit' of the realized NP. A spirit needs to represent at least the case and agreement properties.

- What are the spirits that undergo raising?

  The raising relation in HPSG is a lexically established relation between subcategorization requirements.

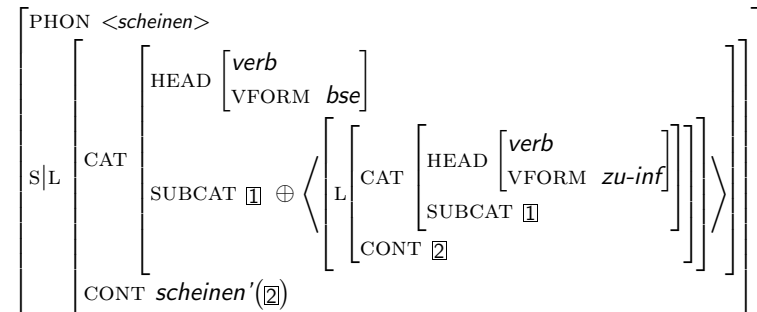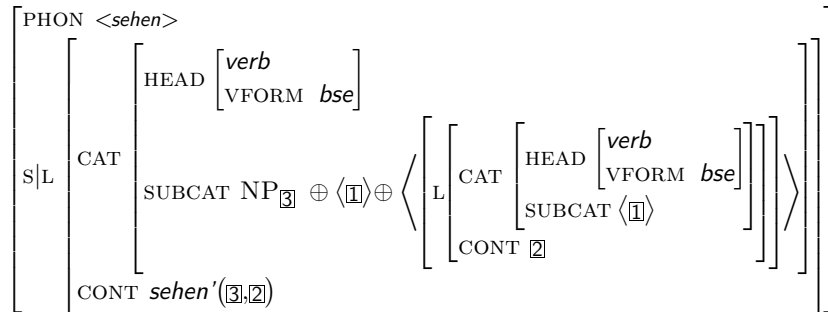 ⇒ Spirits are realized subcategorization requirements.

Subject-to-Subject Raising in HPSG

$$
\begin{bmatrix}
\text{PHON} \ \langle \textit{scheinen} \rangle \\
\text{S}|\text{L} \begin{bmatrix}
\text{CAT} \begin{bmatrix}
\text{HEAD} \begin{bmatrix} \textit{verb} \\ \text{VFORM} \ \textit{bse} \end{bmatrix} \\
\text{SUBCAT} \ \boxed{1} \oplus \left\langle \text{L} \begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD} \begin{bmatrix} \textit{verb} \\ \text{VFORM} \ \textit{zu-inf} \end{bmatrix} \\ \text{SUBCAT} \ \boxed{1} \end{bmatrix} \\ \text{CONT} \ \boxed{2} \end{bmatrix} \right\rangle
\end{bmatrix} \\
\text{CONT} \ \textit{scheinen'}(\boxed{2})
\end{bmatrix}
$$

- The subject valence requirement of the subject raising verb is identified with the subject of the verbal complement.

- The subject is not assigned a semantic role by the raising verb.

Subject-to-Object Raising in HPSG

$$
\begin{bmatrix}
\text{PHON} \ <sehen> \\
\text{S|L} \begin{bmatrix}
\text{CAT} \begin{bmatrix}
\text{HEAD} \begin{bmatrix} verb \\ \text{VFORM} \ bse \end{bmatrix} \\[2em]
\text{SUBCAT} \ \text{NP}_{\boxed{3}} \oplus \langle \boxed{1} \rangle \oplus \left\langle \begin{bmatrix} \text{L} \begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD} \begin{bmatrix} verb \\ \text{VFORM} \ bse \end{bmatrix} \\ \text{SUBCAT} \ \langle \boxed{1} \rangle \end{bmatrix} \\ \text{CONT} \ \boxed{2} \end{bmatrix} \end{bmatrix} \right\rangle \\[2em]
\text{CONT} \ sehen'(\boxed{3},\boxed{2})
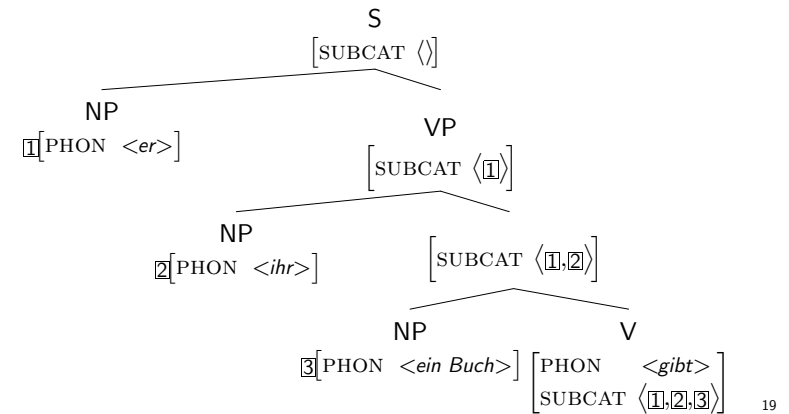\end{bmatrix}
\end{bmatrix}
$$

- The object valence requirement of the object raising verb is identified with the subject of the verbal complement.
- The object is not assigned a semantic role by the raising verb.
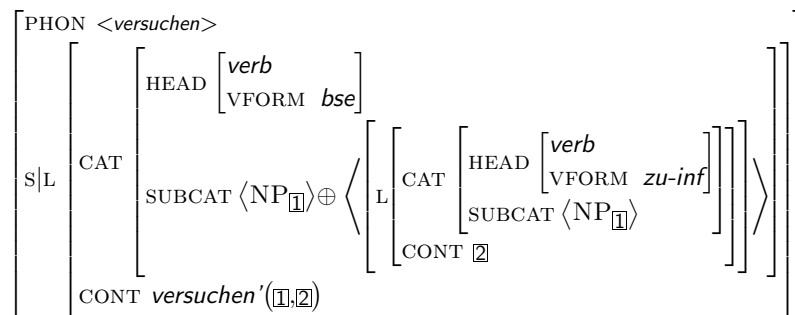
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Realization of valence requirements in HPSG

(20) *(daß) er ihr ein Buch gibt*
    that he her a book gives

19

Equi in HPSG

$$
\begin{bmatrix}
\text{PHON} \ <versuchen> \\
\text{S|L} \begin{bmatrix}
\text{CAT} \begin{bmatrix}
\text{HEAD} \begin{bmatrix} verb \\ \text{VFORM} \ bse \end{bmatrix} \\[2em]
\text{SUBCAT} \ \langle \text{NP}_{\boxed{1}} \rangle \oplus \left\langle \begin{bmatrix} \text{L} \begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD} \begin{bmatrix} verb \\ \text{VFORM} \ zu\text{-}inf \end{bmatrix} \\ \text{SUBCAT} \ \langle \text{NP}_{\boxed{1}} \rangle \end{bmatrix} \\ \text{CONT} \ \boxed{2} \end{bmatrix} \end{bmatrix} \right\rangle \\[2em]
\text{CONT} \ versuchen'(\boxed{1},\boxed{2})
\end{bmatrix}
\end{bmatrix}
$$

- Semantic co-indexing of the subject valence requirement of the subject control equi verb with the subject of the verbal complement.
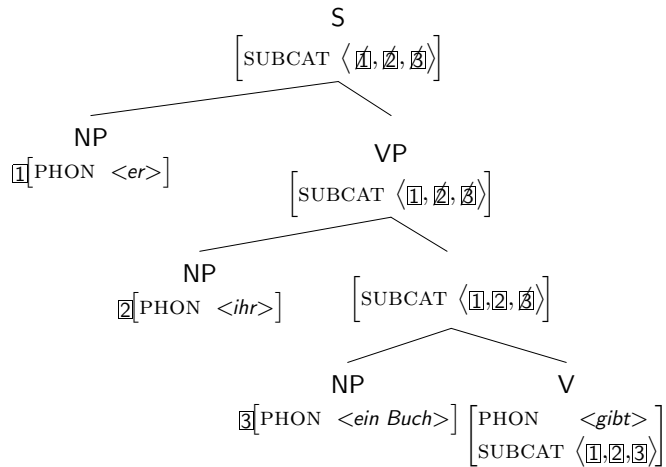- The subject is assigned a semantic role by the subject control equi verb.

18

Two ways of introducing spirits

- Idea 1: Subcategorization requirements are not eliminated from the SUBCAT list but only marked as realized.

- Idea 2: Subject are special and subject spirits arise only as a result of the special subject requirement encoding.

20

Idea 1: Marking-off realized valence requirements

$$
\begin{array}{c}
\text{S} \\
\left[\text{SUBCAT } \langle \boxed{1}, \boxed{2}, \boxed{3} \rangle\right]
\end{array}
$$

NP $\boxed{1}\left[\text{PHON } <er>\right]$

VP $\left[\text{SUBCAT } \langle \boxed{1}, \boxed{2}, \boxed{3} \rangle\right]$

NP $\boxed{2}\left[\text{PHON } <ihr>\right]$

$\left[\text{SUBCAT } \langle \boxed{1}, \boxed{2}, \boxed{3} \rangle\right]$

NP $\boxed{3}\left[\text{PHON } <ein\ Buch>\right]$

V $\begin{bmatrix}\text{PHON} & <gibt> \\ \text{SUBCAT} & \langle \boxed{1}, \boxed{2}, \boxed{3} \rangle\end{bmatrix}$

Traditional Subcategorization Principle

$$
\begin{bmatrix}\text{phrase} \\ \text{DTRS } \textit{head-struc}\end{bmatrix} \rightarrow
\begin{bmatrix}
\text{SYNSEM|LOC|CAT|SUBCAT} & \boxed{1} \\
\text{DTRS} & \begin{bmatrix}\text{HEAD-DTR|SYNSEM|LOC|CAT|SUBCAT } \boxed{1} \oplus \boxed{2} \\ \text{COMP-DTRS } \textit{synsems2signs}(\boxed{2})\end{bmatrix}
\end{bmatrix}
$$

$\textit{synsem2sign}(\langle\rangle) := \langle\rangle.$

$\textit{synsem2sign}\big(\langle \boxed{1} \mid \boxed{2} \rangle\big) := \big\langle[\text{SYNSEM } \boxed{1}]\mid \textit{synsem2sign}(\boxed{2})\big\rangle.$

Modified Subcategorization Principle

$$
\begin{bmatrix}\text{phrase} \\ \text{DTRS } \textit{head-struc}\end{bmatrix} \rightarrow
$$
$$
\begin{bmatrix}
\text{SYNSEM|LOC|CAT|SUBCAT} & \boxed{1} \oplus \textit{mark-realized}(\boxed{2}) \oplus \boxed{3} \\
\text{DTRS} & \begin{bmatrix}\text{HEAD-DTR|S|L|C|SUBCAT } (\boxed{1} \oplus \boxed{2}) \bigcirc \boxed{3}\,\textit{list}\big([\text{LOC } \textit{realized}]\big) \\ \text{COMP-DTRS } \textit{synsem2sign}(\boxed{2})\end{bmatrix}
\end{bmatrix}
$$

$\textit{mark-realized}(\langle\rangle) := \langle\rangle.$

$$
\textit{mark-realized}\left(\left\langle\begin{bmatrix}\text{LOC} & \begin{bmatrix}\textit{unrealized} \\ \text{CAT} & \boxed{1} \\ \text{CONT} & \boxed{2}\end{bmatrix} \\ \text{NONLOC} & \boxed{3}\end{bmatrix}\Big| \boxed{4}\right\rangle\right) := \left\langle\begin{bmatrix}\text{LOC} & \begin{bmatrix}\textit{realized} \\ \text{CAT} & \boxed{1} \\ \text{CONT} & \boxed{2}\end{bmatrix} \\ \text{NONLOC} & \boxed{3}\end{bmatrix}\Big| \textit{mark-realized}(\boxed{4})\right\rangle.
$$

Background for case assignment

A case agreeing floating quantifier shows that **subjects of controlled infinitival complements** are nominative (Höhle 1983; Müller 2001a):

(21) *Ich habe den Jungs geraten, im Abstand von wenigen Tagen einer /*
     I   have the boys advised in distance of few   days one$_N$
     einen nach dem anderen zu kündigen.
     one$_A$ after the other   to give notice

In AcI (raising) no floating quantifiers in nominative case possible:

(22) *Der Lehrer läßt die Jungs *einer / einen nach dem anderen vorsingen.*
     the teacher lets the boys   one$_N$ one$_A$ after the other   sing

(23) *[Die Jungs *einer / einen nach dem anderen vorsingen] läßt der Lehrer.*
     the boys   one$_N$ one$_A$ after the other   sing   lets the teacher

⇒ Unrealized subjects in non-finite projections must receive nominative.
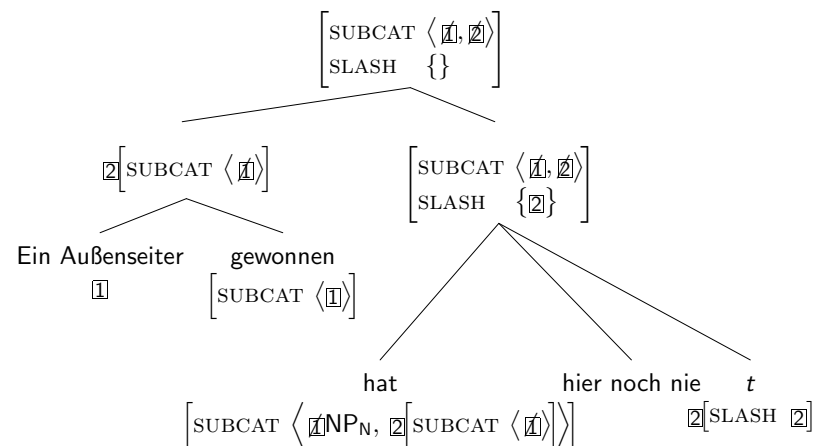
Case assignment (for verbal environments)

Nominative case assignment: In an utterance, the least oblique argument with structural case of each verb unless that argument is raised (= appears on the same subcat list as the verb) is assigned nominative case.

Accusative case assignment: In an utterance, each of the more oblique arguments with structural case of each verb unless that argument is raised is assigned accusative case.

This is straightforwardly formalized in the *Relational Speciate Re-entrant Language* (*RSRL*) of Richter (1997, 1999, 2000) and Richter et al. (1999).

Analysis sketch for nominative case assignment

Formalizing nominative case assignment

a) In an utterance,
   unembedded-sign $\wedge$

b) the least oblique argument with structural case ($\boxed{3}$) of each verb ($\boxed{1}$)
$$\forall\,\boxed{1}$$
$$\boxed{1}\left[\text{L}|\text{C}\,\begin{bmatrix}\text{HEAD} \ \boxed{2}\textit{verb}\\ \text{SUBCAT}|\text{FIRST} \ \boxed{3}[\text{L}|\text{C}|\text{HEAD}|\text{CASE} \ \textit{struc}]\end{bmatrix}\right]\wedge$$

c) unless that argument is raised (= appears on same subcat list as verb),
$$\neg\exists\,\boxed{4}$$
$$\boxed{4}\left[\text{SUBCAT} \ \textit{member}(\boxed{3}) \wedge \textit{member}\left([\text{L}|\text{C}|\text{H} \ \boxed{2}]\right)\right]$$

d) is assigned nominative case.
$$\rightarrow \boxed{3}[\text{L}|\text{C}|\text{HEAD}|\text{CASE} \ \textit{nom}]$$

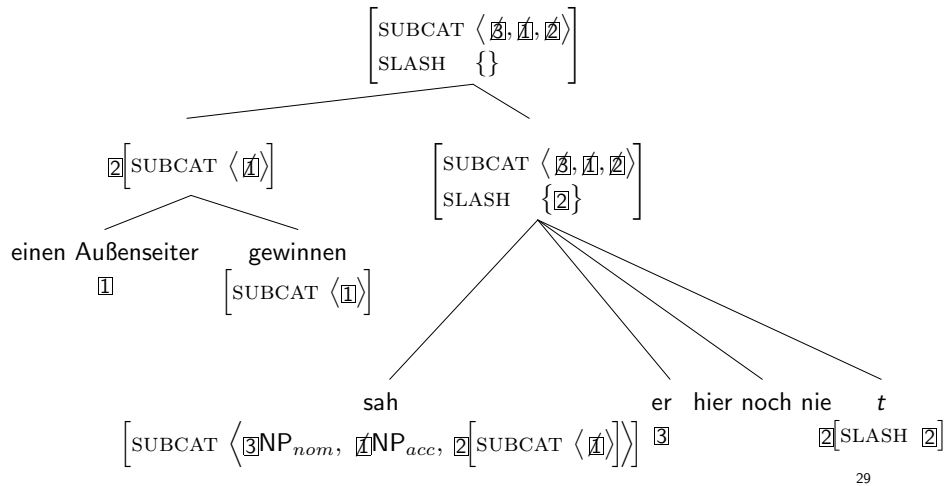## Formalizing accusative case assignment

a) In an utterance,
   unembedded-sign $\wedge$

b) each more oblique arguments with structural case ($\boxed{3}$) of each verb ($\boxed{1}$)
$$\forall\,\boxed{1}\,\forall\,\boxed{3}$$
$$\boxed{1}\left[\text{L}|\text{C}\,\begin{bmatrix}\text{HEAD} \ \boxed{2}\textit{verb}\\ \text{SUBCAT}|\text{REST} \ \textit{member}\left(\boxed{3}[\text{L}|\text{C}|\text{HEAD}|\text{CASE} \ \textit{struc}]\right)\end{bmatrix}\right]\wedge$$

c) unless that argument is raised (= appears on same subcat list as verb)
$$\neg\exists\,\boxed{4}$$
$$\boxed{4}\left[\text{SUBCAT} \ \textit{member}(\boxed{3}) \wedge \textit{member}\left([\text{L}|\text{C}|\text{HEAD} \ \boxed{2}]\right)\right]$$

d) is assigned accusative case.
$$\rightarrow \boxed{3}[\text{L}|\text{C}|\text{HEAD}|\text{CASE} \ \textit{acc}]$$

Analysis sketch for accusative case assignment

$$\begin{bmatrix} \text{SUBCAT} \ \langle \boxed{3}, \boxed{1}, \boxed{2} \rangle \\ \text{SLASH} \quad \{\} \end{bmatrix}$$

$\boxed{2}\begin{bmatrix}\text{SUBCAT } \langle \boxed{1} \rangle\end{bmatrix}$ $\begin{bmatrix} \text{SUBCAT} \ \langle \boxed{3}, \boxed{1}, \boxed{2} \rangle \\ \text{SLASH} \quad \{\boxed{2}\} \end{bmatrix}$

einen Außenseiter   gewinnen
$\boxed{1}$ $\begin{bmatrix}\text{SUBCAT } \langle \boxed{1} \rangle\end{bmatrix}$

sah   er hier noch nie t

$\begin{bmatrix}\text{SUBCAT } \langle \boxed{3}\text{NP}_{nom},\ \boxed{1}\text{NP}_{acc},\ \boxed{2}\begin{bmatrix}\text{SUBCAT } \langle \boxed{1} \rangle\end{bmatrix} \rangle\end{bmatrix}$ $\boxed{3}$ $\boxed{2}\begin{bmatrix}\text{SLASH } \boxed{2}\end{bmatrix}$

29

A lexical entry with argument attraction

The subject-control equi verb *versuchen* (*try*) is optionally coherent, i.e., it can attract the arguments of its verbal complement:

$$\begin{bmatrix} \text{PHON } <versuchen> \\ \text{S}|\text{L}\begin{bmatrix} \text{CAT}\begin{bmatrix} \text{HEAD}\begin{bmatrix}verb \\ \text{VFORM } bse\end{bmatrix} \\ \text{SUBCAT } \langle\text{NP}_{\boxed{1}}\rangle \oplus \boxed{2} \oplus \left\langle \begin{bmatrix} \text{L}\begin{bmatrix}\text{CAT}\begin{bmatrix}\text{HEAD}\begin{bmatrix}verb \\ \text{VFORM } zu\text{-}inf\end{bmatrix} \\ \text{SUBCAT }\langle\text{NP}_{\boxed{1}}|\boxed{2}\rangle\end{bmatrix} \\ \text{CONT } \boxed{3}\end{bmatrix}\end{bmatrix} \right\rangle \end{bmatrix} \\ \text{CONT } versuchen'(\boxed{1},\boxed{3}) \end{bmatrix}\end{bmatrix}$$

31
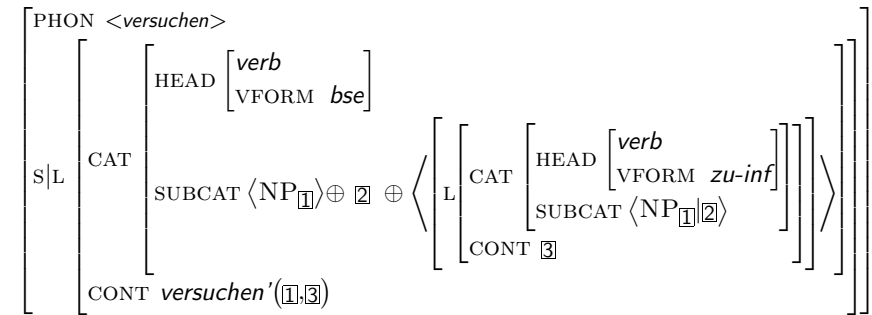
Problems with idea 1 of introducing spirits

- Introducing spirits for all dependents is overkill: If one adopts a passive analysis with a passive participle, only subject spirits are needed.

- In a theory with argument attraction verbs, having spirits of all dependents makes the wrong prediction for the so-called remote passive:

(24) a. *[*Der / Den Wagen zu reparieren] wurde lange Zeit versucht.*
        the$_N$ the$_A$ car   to repair   was   long time tried
    b. *[Der / Den Wagen zu reparieren versucht] wurde lange Zeit.*
        the$_N$ the$_A$ car   to repair   tried   was   long time

30

Idea 2: Introducing only subject spirits
How should the subject be represented?

- Pollard and Sag (1994, ch. 9) follow Borsley (1987, 1989) in proposing distinct valence attributes for subjects and complements.

- Alternative idea to re-use the DESIGNATED-ARGUMENT needed for the analysis of passives (Heinz and Matiasek 1994; Haider 1985) fails since different from the passive we need to include subjects of ergative verbs.

- For German, Pollard (1996) and Kiss (1995) suggest to encode the subject requirement of non-finite verbs separate from the other requirements (since the subject of a non-finite verb supposedly can never be realized).

32

Representing the subject requirement

- Properties of the proposal in Kiss (1995):
  - SUBJ a *head* feature, never realizable
  - A finitivization lexical rule derives finite from non-finite verbs, adding the subject to the realizable dependents.

- Evaluation based on our isse:
  - subject visibility nicely captured by SUBJ as head attribute
  - too restrictive: subjects of non-finite verbs *can* sometimes be realized

- Revisions:
  - subjects of non-finite verbs can sometimes be realized
  - mark subject in *head* attribute SUBJ as to whether it is realized

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Allowing non-finite verbs to realize the subject
Subject Integration Lexical Rule

$$
\begin{bmatrix}
word \\
\text{S|L|C} \begin{bmatrix}
\text{HEAD} & \begin{bmatrix} verb \\ \text{VFORM} \ \neg fin \\ \text{SUBJ} \quad \boxed{1} \end{bmatrix} \\
\text{SUBCAT} \ \boxed{2}
\end{bmatrix}
\end{bmatrix}
\mapsto
\begin{bmatrix}
\text{S|L|C} \begin{bmatrix}
\text{HEAD|SUBJ} \ mark\text{-}realized(\boxed{1}) \\
\text{SUBCAT} \quad \boxed{1} \oplus \boxed{2}
\end{bmatrix}
\end{bmatrix}
$$

The application domain of the rule can be restricted further, as soon as the relevant factors are determined.

Allowing finite verbs to realize the subject
Finitivization Lexical Rule[3]

$$
\begin{bmatrix}
word \\
\text{PHON} \ \boxed{1} \\
\text{S|L|C} \begin{bmatrix}
\text{HEAD} & \begin{bmatrix} verb \\ \text{VFORM} \ bse \\ \text{SUBJ} \quad \boxed{2} \end{bmatrix} \\
\text{SUBCAT} \ \boxed{3}
\end{bmatrix}
\end{bmatrix}
\mapsto
\begin{bmatrix}
\text{PHON} \ bse2fin(\boxed{1},\boxed{2}) \\
\text{S|L|C} \begin{bmatrix}
\text{HEAD} & \begin{bmatrix} \text{VFORM} \ fin \\ \text{SUBJ} \quad \boxed{2} \end{bmatrix} \\
\text{SUBCAT} \ \boxed{2} \oplus \boxed{3}
\end{bmatrix}
\end{bmatrix}
$$

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[3]The lexical rules presented here and in the following are intended as relations between classes of words, i.e., description level lexical rules (Meurers 1995, 2001).
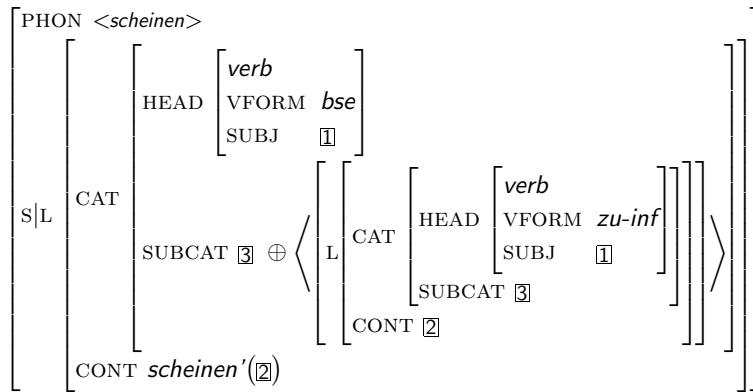

Revised Traditional Subcategorization Principle

$$
\begin{bmatrix}
phrase \\
\text{DTRS} \ head\text{-}struc
\end{bmatrix}
\rightarrow
$$

$$
\begin{bmatrix}
\text{SYNSEM|LOC|CAT|SUBCAT} \ \boxed{1} \\
\text{DTRS} \begin{bmatrix}
\text{HEAD-DTR|SYNSEM|LOC|CAT|SUBCAT} \ (\boxed{1} \oplus \boxed{2}) \ \bigcirc \ list\big(\big[\text{LOC} \ realized\big]\big) \\
\text{COMP-DTRS} \ synsems2signs(\boxed{2})
\end{bmatrix}
\end{bmatrix}
$$

Revised subject-to-subject raising entry

$$
\left[
\begin{array}{l}
\text{PHON } \langle \textit{scheinen} \rangle \\[4pt]
\text{S|L}
\left[
\begin{array}{l}
\text{CAT}
\left[
\begin{array}{l}
\text{HEAD}
\left[
\begin{array}{ll}
\textit{verb} \\
\text{VFORM} & \textit{bse} \\
\text{SUBJ} & \boxed{1}
\end{array}
\right] \\[10pt]
\text{SUBCAT } \boxed{3} \oplus
\left\langle
\left[
\text{L}
\left[
\begin{array}{l}
\text{CAT}
\left[
\begin{array}{l}
\text{HEAD}
\left[
\begin{array}{ll}
\textit{verb} \\
\text{VFORM} & \textit{zu-inf} \\
\text{SUBJ} & \boxed{1}
\end{array}
\right] \\
\text{SUBCAT } \boxed{3}
\end{array}
\right] \\
\text{CONT } \boxed{2}
\end{array}
\right]
\right]
\right\rangle
\end{array}
\right] \\[30pt]
\text{CONT } \textit{scheinen'}(\boxed{2})
\end{array}
\right]
\end{array}
\right]
$$

37
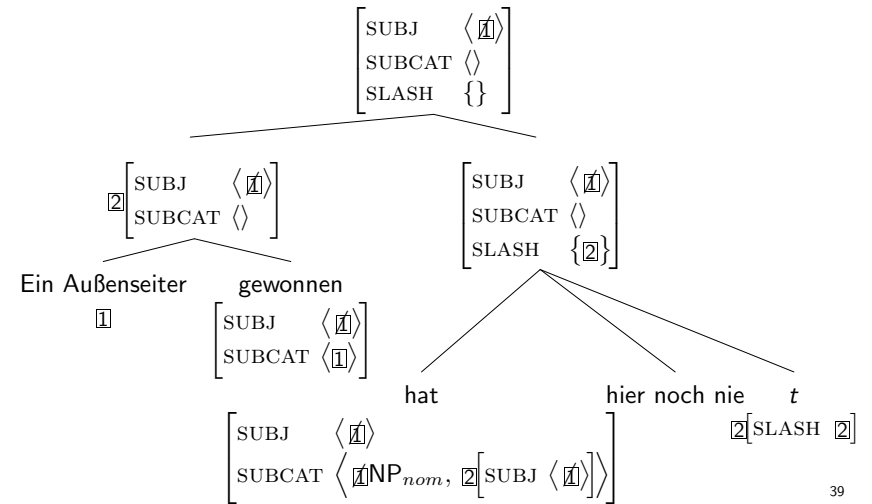
Revised subject-to-object raising entry

$$
\left[
\begin{array}{l}
\text{PHON } \langle \textit{sehen} \rangle \\[4pt]
\text{S|L}
\left[
\begin{array}{l}
\text{HEAD}
\left[
\begin{array}{ll}
\textit{verb} \\
\text{VFORM} & \textit{bse} \\
\text{SUBJ} & \langle \text{NP}_{\boxed{1}} \rangle
\end{array}
\right] \\[16pt]
\text{SUBCAT } \boxed{2} \oplus \boxed{3} \oplus
\left\langle
\left[
\text{L}
\left[
\begin{array}{l}
\text{CAT}
\left[
\begin{array}{l}
\text{HEAD}
\left[
\begin{array}{ll}
\textit{verb} \\
\text{VFORM} & \textit{bse} \\
\text{SUBJ} & \boxed{2}
\end{array}
\right] \\
\text{SUBCAT } \boxed{3}
\end{array}
\right] \\
\text{CONT } \boxed{4}
\end{array}
\right]
\right]
\right\rangle \\[30pt]
\text{CONT } \textit{sehen'}(\boxed{1},\boxed{4})
\end{array}
\right]
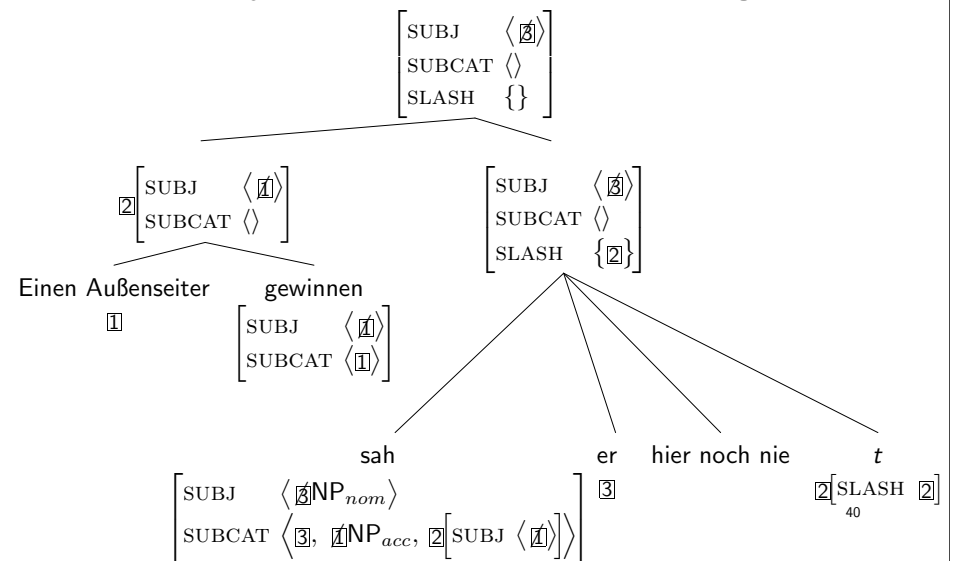\end{array}
\right]
$$

38

Revised analysis sketch for nominative case assignment

39
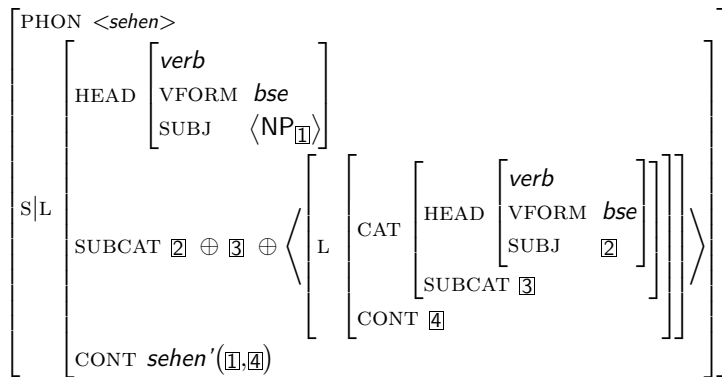
Revised analysis sketch for accusative case assignment

40

What information should be represented by a spirit?

- Having spirits be entire synsem objects is empirically undermotivated (only evidence for case and subject-verb agreement).

- It is also problematic for the theory of non-finite complements:

  - Since the entire subject synsem is always visible, an equi verb can in principle refer to the index of an already realized subject.
  - Why does this case never arise empirically (spirits are restricted to raising contexts)?

- How about reducing the representation of spirits to syntactic information?

Outlook: Reducing sprits to syntactic information

- To obtain a reduced, syntactic representation for spirits, one has to separate subject verb agreement from the semantic index. Kathol (1999) convincingly argued on independent empirical grounds that such an AGR attribute should be introduced.

- By making sure a reduced representation can never be realized, this ideally would also eliminate the need for explicitly marking synsems as realized.

- The reduced representation would, however, have to serve like an ordinary synsem with respect to being raised so that case and agreement can be established by the standard local mechanisms.

- How much information needs to be present for raising in general?

Summary

- Subjects in German sometimes appear as part of a fronted non-finite projection when selected by a raising predicate.

- Case assignment and subject-verb agreement is established between the realized subject and the highest verb it could be raised to.

  - Raising takes place even for NPs realized as part of the complement. → raising of spirits
  - Ordinary local case assignment and agreement is sufficient then.

- Two options worked out:

  - spirits arise for all dependents by modified Subcat Principle
  - only subject spirits by changing subject representation and integration

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46

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47