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# A MODULAR APPROACH TO GERMAN SYNTAX

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WARNING

This handout only contains definitions, rules and examples. It is not pretended that the stuff treated in the sequel be understandable without oral explanations. No motivation in favour of this approach is contained in the following notes.

## §.0 Some basic notions

The main categories are V(verb), N(noun), A(adjective), P(preposition), Adv(adverb).

0.1 The base of the grammar are the following context-free rules:

X → Y X

$$X \rightarrow X \cdot Y,$$

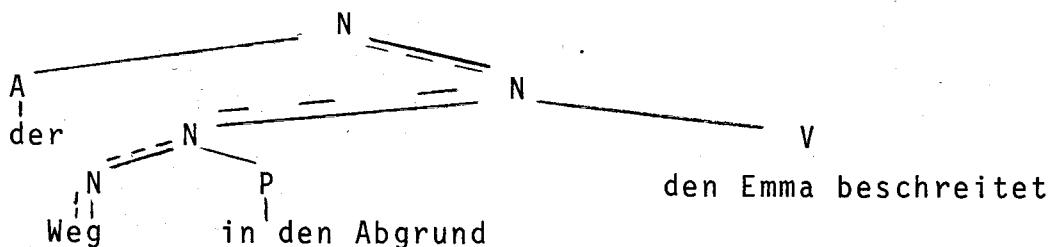
X and Y a main category.

0.2 Let  $X$  be any main category. An  $X$ -projection is a derivation of the following form:

$$x \rightarrow u_1 \quad xv_1 \rightarrow u_2 \quad xv_2 \rightarrow \dots \rightarrow u_n \quad xv_n \rightarrow u_n \text{ a } v_n,$$

where a is a terminal. A is a lexical head of the projection.

### Example:



--- is the projection line. Each constituent whose top is on the projection line is a head constituent.

0.3 Complex categories and rules. Let  $C$  be a set of primitive categories (in this paper,  $C = \{V, N, A, P, Adv\}$  ).

Let  $M$  be a set of primitive markers (for case, number, person government etc.) We define:

- a.  $B_{C,M} := \{<c, N> / c \in C, N \subseteq M\}$  is the set of all basic categories (with respect to  $C, M$ ).
- b.  $G_{C,M} := \{\text{gap}^i(b) / b \in B_C, M \& i \in \{r, l\}\}$  is the set of all gap markers (w.r.t.  $C, M$ ).
- c.  $V_N^{C,M} := \{<c, N> / c \in C \& N \subseteq M \cap G_{C,M}\}$  is the set of all complex categories (w.r. to  $C, M$ ). Call the elements of  $V_N^{C,M}$  nonterminals.
- d. Suppose  $V_T$  is a finite set which is 'new' with respect to the sets previously mentioned ( $V_T$  contains the 'terminals'). Then

$\langle \alpha, \beta \rangle$  is a context-free rule over  $\langle V_N^{C,M}, V_T \rangle$

iff  $\alpha \in V_N^{C,M}$  and  $\beta$  is a finite sequence of elements of  $V_N^{C,M} \cup V_T$ .

Notational conventions:

$\alpha \rightarrow \beta_1 \dots \beta_n := \langle \alpha, \langle \beta_1, \dots, \beta_n \rangle \rangle$ .

$A_N := \langle A, N \rangle$ , if  $\langle A, N \rangle \in V_N$

$A_N := A$ , if  $N = \{\alpha_1, \dots, \alpha_n\}$

$$\begin{bmatrix} \alpha_1 \\ \vdots \\ \alpha_n \end{bmatrix}$$

$A := A$

$M_1 \quad M_1 \cup M_2$

$M_2$

0.4 Filters. A filter (w.r.t.  $C, M$ ) is a subset of  $M \cup G_{C, M}$ .  
We denote a set of filters by  $F$ .

$$(F \subseteq P(M \cup G_{C, M}))$$

For  $f = \{\alpha_1, \dots, \alpha_n\}$ , we write

$$* \begin{bmatrix} \alpha_1 \\ \vdots \\ \alpha_n \end{bmatrix}$$

0.5 a. Call a (complex) nonterminal symbol  $\langle c, N \rangle$  admissible (w.r.t.  $F$ )

iff there is no  $f \in F$  s.t.  $f \subseteq N$ .

b. A complex context-free rule  $\alpha \rightarrow \beta_1 \dots \beta_n$  is admissible iff  $\alpha, \beta_1, \dots, \beta_n$  all are admissible.

0.5 Fusion of rules " + ". Let

$$\alpha = A_0 \rightarrow A_1 \dots A_n$$
$$N_0 \quad N_1 \quad N_n$$

$$\beta = B_0 \rightarrow B_1 \dots B_m$$
$$M_0 \quad M_1 \quad M_m$$

(complex) context-free rules.

1)  $\alpha + \beta$  is defined iff

- a.  $n = m$
- b.  $A_i = B_i$
- c.  $N_i \cap M_i = \emptyset$

for all  $i$ ,  $0 \leq i \leq n$ .

2) If  $\alpha + \beta$  is defined, then

$$\alpha + \beta = A_0 \rightarrow A_1 \dots A_n$$
$$N_0 \cup M_0 \quad N_1 \cup M_1 \quad N_n \cup M_n$$

The above definition concerns the fusion of arbitrary rules fulfilling certain formal conditions. But certain rules can be fused only with certain other rules 'they depend on'. We express this idea of dependency by appropriately indexing the rules. Each context-free rule is associated with an index-pair  $\langle i, j \rangle$ .

$i$  is the number-index of the rule and  $j$  is the dependency-index of the rule.

Suppose, we are given a context-free rule  $r$  which is accompanied by the index pair  $\langle i, j \rangle$ . Then

$\langle i, r, j \rangle$

means that the  $i$ -th entry of the grammar contains the rule  $r$ , which depends on the rule found in the  $j$ -th entry. Certain rules have the index-pair  $\langle i, i \rangle$ . This means that the rule doesn't depend on any other rule. Suppose, we are given  $n$ -rules  $r_1, \dots, r_n$  which all depend on  $r_1$ , i.e. we have the following "block" of indexed rules

$\langle i_1, r_1, i_1 \rangle$

$\langle i_2, r_2, i_1 \rangle$

:

$\langle i_n, r_n, i_1 \rangle$

Suppose further that the operation  $+$  is defined for any two different rules of this block. Then we may fuse  $r_1, \dots, r_n$  to the complex rule

$r_1 + r_2 + \dots + r_n$

The following definitions make this idea precise.

0.6 Let  $R$  be a set of context-free rules over  $\langle V_N^C, M, V_T \rangle$ ,

and let  $I$  be a (finite) index-set.

Let  $g$  be a function from  $I$  onto  $R$  and let  $h$  be a function from  $I$  into  $I$ .

We define

$$R_{g,h} := \{ \langle i, g(i), h(i) \rangle : i \in I \}$$

Call  $R_{g,h}$  indexed rules (over  $V_N^{C,M}, V_T$ ).

If  $r = \langle i, g(i), h(i) \rangle$ , then

i is the number (or name) of r,  $g(i)$  is the context-free rule of r,  
 $h(i)$  is the dependency-index of r.

0.7 The system of rules generated by  $R_{g,h}$ . Suppose we are given a set  $R_{g,h}$  of indexed rules.

Then  $R_{g,h}^*$  is the smallest set such that (1) and (2) are fulfilled.

1. If  $\langle i, g(i), h(i) \rangle \in R_{g,h}$  and  $g(i)$  is an admissible rule  
then  $\langle i, g(i), h(i) \rangle \in R_{g,h}^*$ ,  
for any  $i \in I$ .

2. For any  $i, j, k, l \in I$ :

If  $\langle i, \alpha, j \rangle \in R_{g,h}^*, \langle k, \beta, l \rangle \in R_{g,h}^*$ ,  
 $i = l$  and  $\alpha + \beta$  is defined and admissible  
then  $\langle i, \alpha + \beta, j \rangle \in R_{g,h}^*$ .

Now, the system of rules generated by  $R_{g,h}$  is the following set

$$R_{g,h}^{**} :$$

$$R_{g,h}^{**} := \{ \alpha : \langle i, \alpha, i \rangle \in R_{g,h}^* \text{ for some } i \in I \} \cup$$

$$\{ \langle X_N, e \rangle : i \in [1, r], N \subseteq M, X \in C \},$$

$$[ \text{gap}_N^i(X) ]$$

where e is the empty symbol  $\in V_T^*$ .

0.8 Suppose we are given the above sets  $V_N^{C,M}, V_T, R_{g,h}^{**}$ .

Let  $\Sigma$  be a "distinguished" symbol of  $V_N^{C,M}$ .

Then  $G = \langle V_N^{C,M}, V_T, R_{g,h}^{**}, \Sigma \rangle$  is a context-free grammar.

It is obvious that a system of indexed rules together with  
none or some filters determine such a context-free grammar.  
This is the theory underlying our modular approach to German  
syntax.

## § 2. N - Projection

Base rules:

- N1:  $N \rightarrow A N$
- N2:  $N \rightarrow N V$
- N3:  $N \rightarrow V N$
- N4:  $N \rightarrow N P$
- N5:  $N \rightarrow N N$  (not treated)

### § 2.1. The rule $N \rightarrow A N$

- (N1-1)a.  $N \rightarrow A N$   
+phr +det
- b.  $N \rightarrow A N ; d(a)$   
 $\alpha \quad \alpha$   
 $\alpha = + \text{ strong}$
- c.  $N \rightarrow A N ; d(a)$   
 $\alpha \quad \beta$   
 $\alpha = + \text{ mass} \& \beta = +\text{mass}$   
or  
 $\alpha = - \text{ mass} \& \beta = \lambda$
- d.  $N \rightarrow A N ; d(a)$   
+art

Adjective inflection:

A  $\rightsquigarrow + \text{"strong" article (ein, kein)}$   
[+det]  
+\_strong  
[-art]

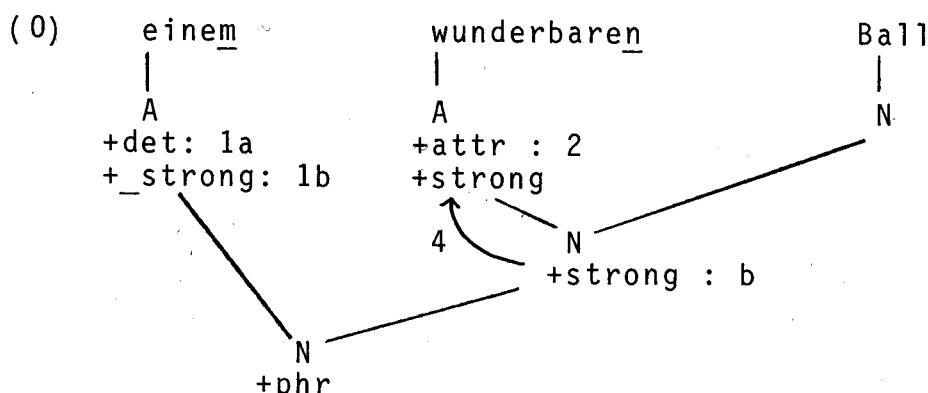
A  $\rightsquigarrow \text{strong adjective (altem Weine)}$   
[+det]  
+\_strong  
[-art]

A  $\rightsquigarrow - \text{strong article (der, jeder)}$   
[+det]  
-\_strong  
[-art]

A  
 [ +attr      ]      → mixed inflection  
 +strong

(ein alter Mann  
 eines alten Mannes )

A +pred       $\rightsquigarrow$       no inflection



(N1-2) N → A  
                  +attr

**Comment:**

det and attr are positional features. +det is the first constituent of the NP (: = [ N,+phr ] ). +attr is the "middle field" of the NP, the field between the det-position and the head of the NP.

## Examples

(1)	ein	<u>guter</u>	Vorschlag
	+det	+attr	.
	+ <u>strong</u>	+strong	

(2)	<u>lange gegorener</u>	<u>italienischer</u> Wein
	A	A
	+det	+attr
	+ <u>strong</u>	+ <u>strong</u>

(3) jeder    gute    Vorschlag  
+det       +weak  
+weak      +attr  
+weak : = - strong

(4) Ede ist schlau\_=

A  
+pred

Filters:

(F1): \* [ +det    ]  
          [ +attr    ]  
"det and attr are different positions"

(F2)    \* [ +det    ]  
          \*    -art  
          [ +sg    ]  
          - mass

(5) \* alter Mann gefällt mir

(N1-3)  $\frac{N}{\alpha} \rightarrow A \frac{N}{\alpha}$   
 $\alpha$  is +mass or a CF.  
"Percolation to the head"

(N1-4)  $\frac{N}{\alpha} \rightarrow A \frac{N}{\alpha}$   
 $\alpha$  is a case, a number, a gender or + strong.

"Percolation of these features to the modifier and the head"=  
agreement on these features"

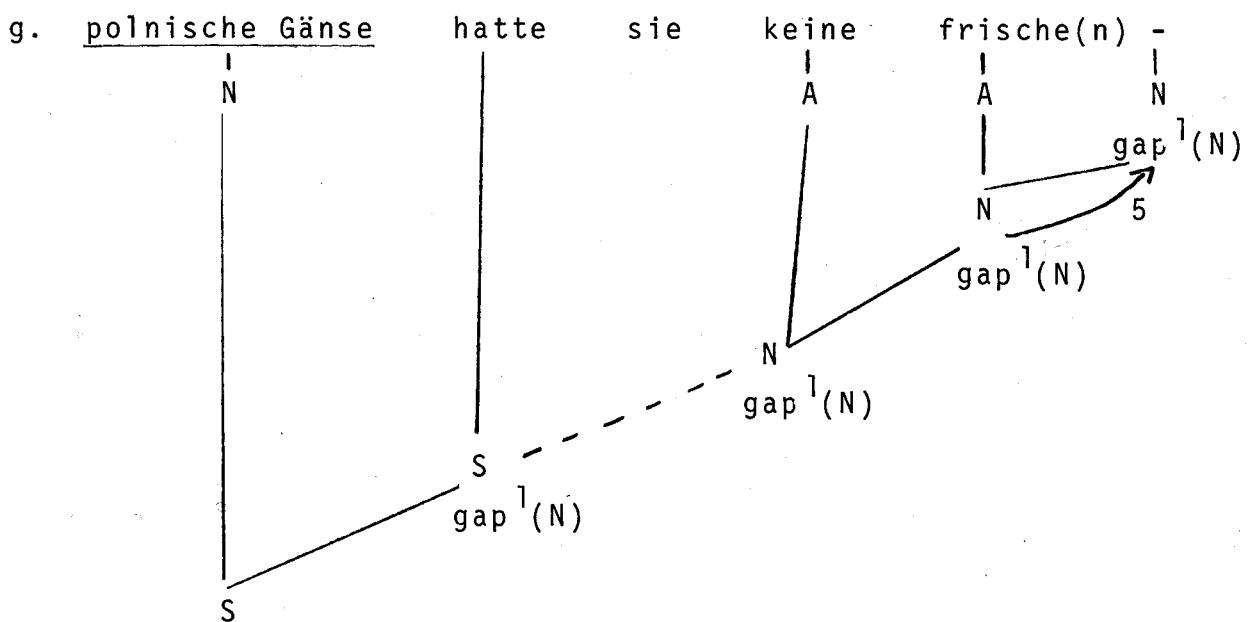
### Example:

(7)	jungem	italienischen	Weine
	A	A	N
+det : 1a		+strong : 4	+strong : 4
+_strong : 1b		+dat : 4	+dat : 4
+_mass : 1c		-pl : 4	-pl : 4
+dat : 4		+attr : 2	+mass : 3
-pl : 4			
male : 4			
		N	N
		+strong : 1b	+strong : 1b
		+mass : 1c	+mass : 1c
		+dat : 4	+dat : 4
		-pl : 4	-pl : 4
		+male : 4	+male : 4
	N		
	+phr		
	+dat		
	-pl		
	+male		

Left-extraction (topicalization) of a plural or mass head-phrase is permitted.

## Examples

- (8) a. Kinder hatte sie viele artige -  
b. Neuseeländischen Wein gab es nur schlechten -  
c. Geld habe ich kein(es) - (not fully explained)  
d. Neuseeländisches Lammfleisch waren etwa fünf Tonnen-vorhanden.  
e. ? Bücher waren alle - ausgeliehen (not explained)  
f. \* Freunde waren die - angekommen. (not explained)



$$(\underline{N1-6}) \quad N \quad \rightarrow \quad A \quad N$$

$$\text{gap}^r(\bar{S}) \quad \text{gap}^r(\bar{S})$$

Extrapolation of S from modifier position is permitted.

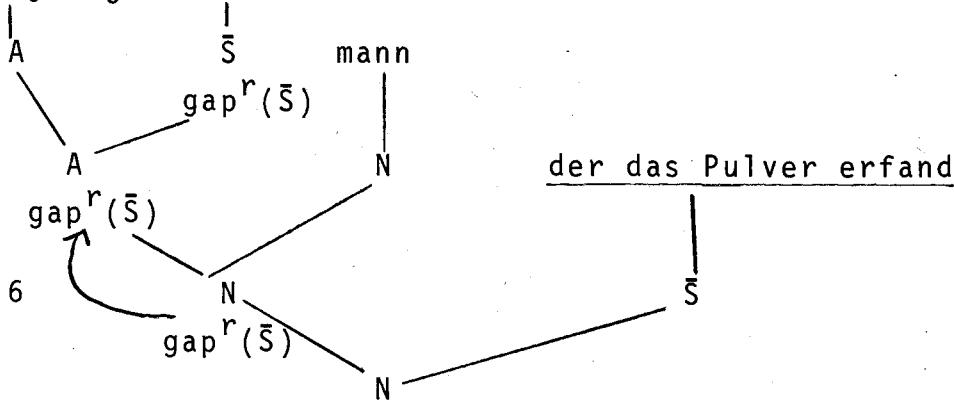
$$(\underline{N1-7}) \quad N \quad \xrightarrow{\quad} \quad A \quad N$$

$$\text{gap}^r(\bar{s}) \qquad \qquad \qquad \text{gap}^r(\bar{s})$$

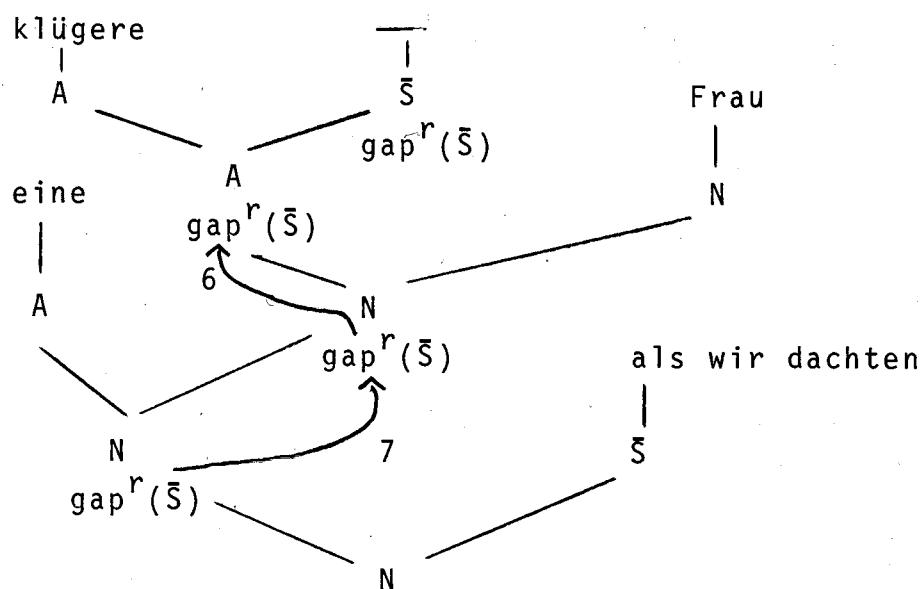
Extrapolation of  $\overline{S}$  out of head is permitted.

- (9) a. derjenige - Mann der das Pulver erfand  
b. eine klügere Frau als wir dachten

- (9) a. derjenige



(9) b.



### § 2.2 The rule $N \rightarrow N V$

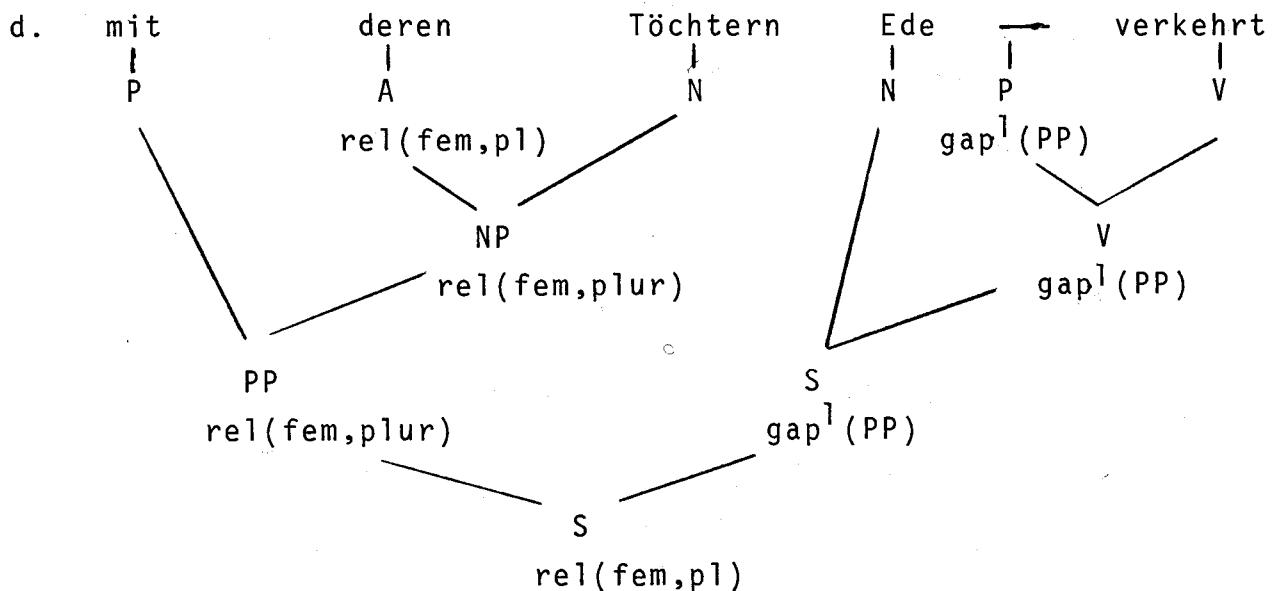
(N2-1) a.  $N \rightarrow N \quad S \quad ; d(a)$   
 $\alpha, \beta \quad \alpha, \beta \quad +rel(\alpha, \beta)$   
 $\alpha \text{ a gender, } \beta \text{ a number.}$

"The relative pronoun of the relative clause agrees in gender and number with the head"

#### Examples

- (10) a. der Weg nach Glarus, [den]<sub>N</sub> wir kennen  
 $+rel(male, sg)$
- b. die Dame, [welche zu kennen]<sub>V</sub>  
Ede die Ehre hat  
 $+rel(fem, sg)$
- c. das Auto, [dessen Bremsen]<sub>N</sub> quietschen  
 $+rel(neut, sg)$
- d. die Damen, [mit deren Töchtern]<sub>P</sub> Ede verkehrt  
 $+rel(fem, pl)$

Example



(N2- $\frac{1}{2}$ ) b.  $N \xrightarrow{\alpha} N \quad S \quad ; d(N2- \frac{1}{2} a)$

$\alpha$  is a case, a person, +phrase, or +mass

"Percolation of syntactic features to the head"

(N2-1) c.  $N \rightarrow N \quad S \quad ; d(a)$

$\gamma \quad \text{gap}^r(S \quad \text{rel}(\alpha, \beta)) \quad \gamma \quad \text{gap}^r(S \quad \text{rel}(\alpha, \beta))$

$\gamma = \lambda \quad \text{or} \quad \gamma = \text{gap}^1(N)$

Positive formulation of the complex NP-constraint. Only the whole relative clause can be extraposed. If the relative clause is extraposed, the head may be topicalized.

Example

(11) a. Die Frau haben wir [ -- ] gekannt, die  
ein Zebra melken konnte.

b. Die Frau haben wir [ — die ein Zebra melken konnte]  
gekannt

(N2-2) a. Sentential complements of nominals ;d(a)

$$\begin{array}{ccc} N \rightarrow N & V \\ \underline{\alpha} & \alpha \\ & \beta \\ \alpha = +da\beta & \& \beta = +<\!>_ \\ or \\ \alpha = +zu & \& \beta = +<\!nom>_ \end{array}$$

Examples

(12) a. das [ [Gefühl][daß man nicht verlassen ist]]  
N N S  
+daß daß

b. [ [das Gefühl][daß man nicht verlassen ist]]  
NP NP S  
+daß daß

Structural ambiguity!

c. die[[Kunst] [ein Zebra zu melken]]  
N N S  
zu zu

d. [ [die Kunst][ein Zebra zu melken]]  
NP NP S  
zu

(N2-2) b. like (N2-1)b. ;d(a)

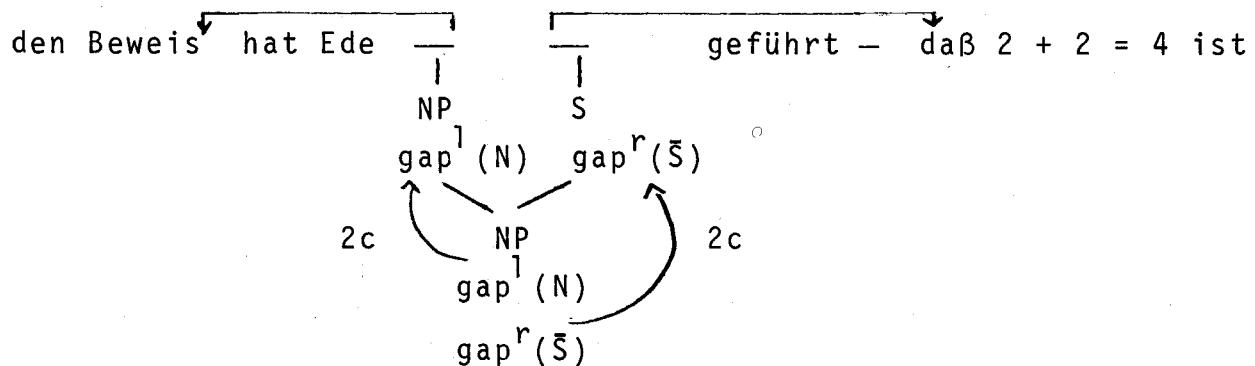
(N2-2) c.  $N \rightarrow N \quad V \quad ;d(a)$   
 $\text{gap}^r(\alpha^V, \beta) \quad \gamma \quad \text{gap}^r(\alpha^V, \beta)$   
 $\gamma = \lambda \quad \text{or} \quad \gamma = \text{gap}^1(N).$

Examples

(13) a. Die Kunst haben wir [ ] - [ ] erlernt ein  
 NP

Zebra zu melken

b. Den Beweis hat Ede [ ] - [ ] geführt daß 2 + 2  
 NP = 4 ist.



(N2-3) a. Extrapolation

$$N \rightarrow N \quad V \\ \text{gap}^r(V) \quad \alpha, \beta \\ \alpha, \beta$$

$\alpha = <\!\!>$  &  $\beta \in \{ +\text{daß}, +\text{als}, +\text{wie}, +\text{rel}(\alpha_1, \alpha_2), \dots \}$   
 or

$\alpha = <\!\!\text{nom}\!\!>$  and  $\beta$  is +zu.

Since this rule introduces a gap, it is a 'movement-rule'.

(N2-3) b. Percolation to the head.

(depends on (a))

$$N \xrightarrow{\gamma} N \quad V \\ \gamma \quad \gamma$$

$\gamma$  is a syntactic marker or a  $\text{gap}^r$ -marker, if  $\beta \neq +\text{rel}(\alpha_1, \alpha_2)$ .

In case  $\beta = +\text{rel}(\alpha_1, \alpha_2)$ ,  $\gamma$  may not be  $\text{gap}^r(S)$  with  
 $\delta \in \{ +\text{rel}(\alpha_i, \alpha_j), +\text{als}, +\text{wie} \}$ .

## Examples

- (14) a. Weil eine Nachricht — aus Moskau gekommen ist, daß Walesa zum König gewählt worden ist.

b. Er hat die Kunst — erlernt, ein Zebra zu melken.

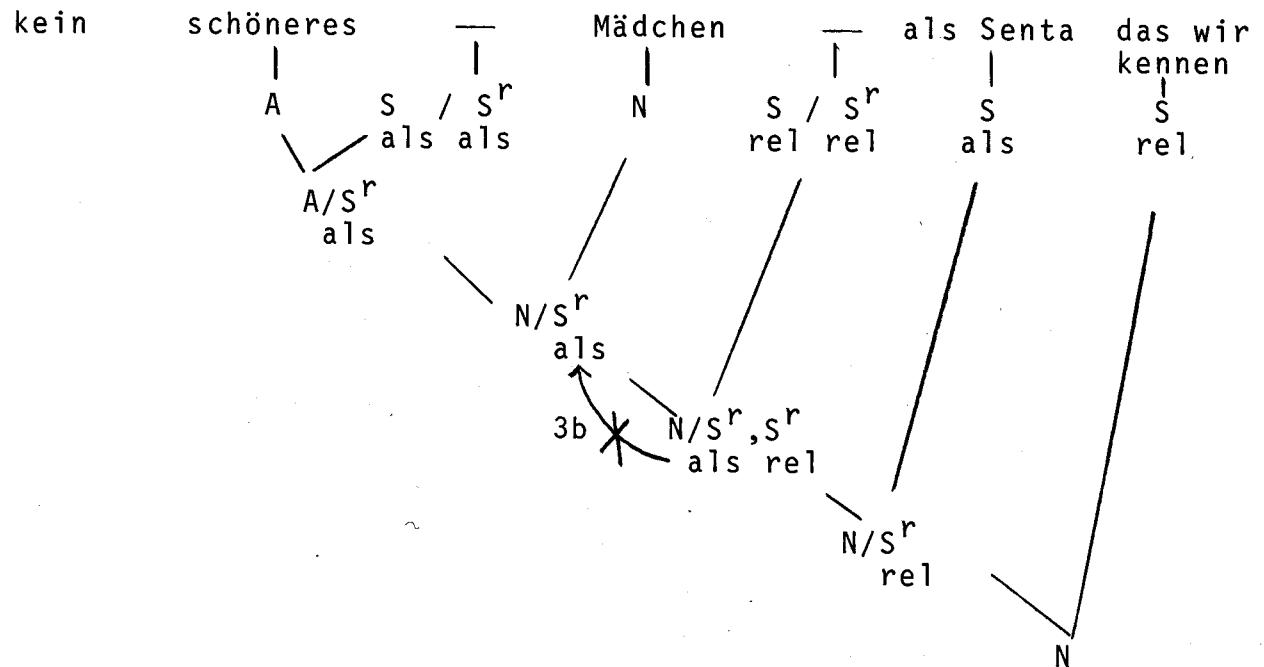
c. Wir haben ihn dem Herrn — vorgestellt, mit dessen Töchtern zu verkehren Ede die Ehre hat.

d\* Er hat die Kunst ein Zebra — erlernt, zu melken.

e. Es gibt kein schöneres — Mädchen das wir kennen als Senta

f. Es gibt kein schöneres — Mädchen — als Senta das wir kennen

(14) f.



(N3-4) a. Sentential "correlate"

$$\left[ \begin{array}{c} N \\ +\alpha, \beta \\ \text{gap}_r(X) \end{array} \right] \rightarrow \left[ \begin{array}{c} N \\ +es_k \\ \text{gap}_r(X) \end{array} \right]$$

where

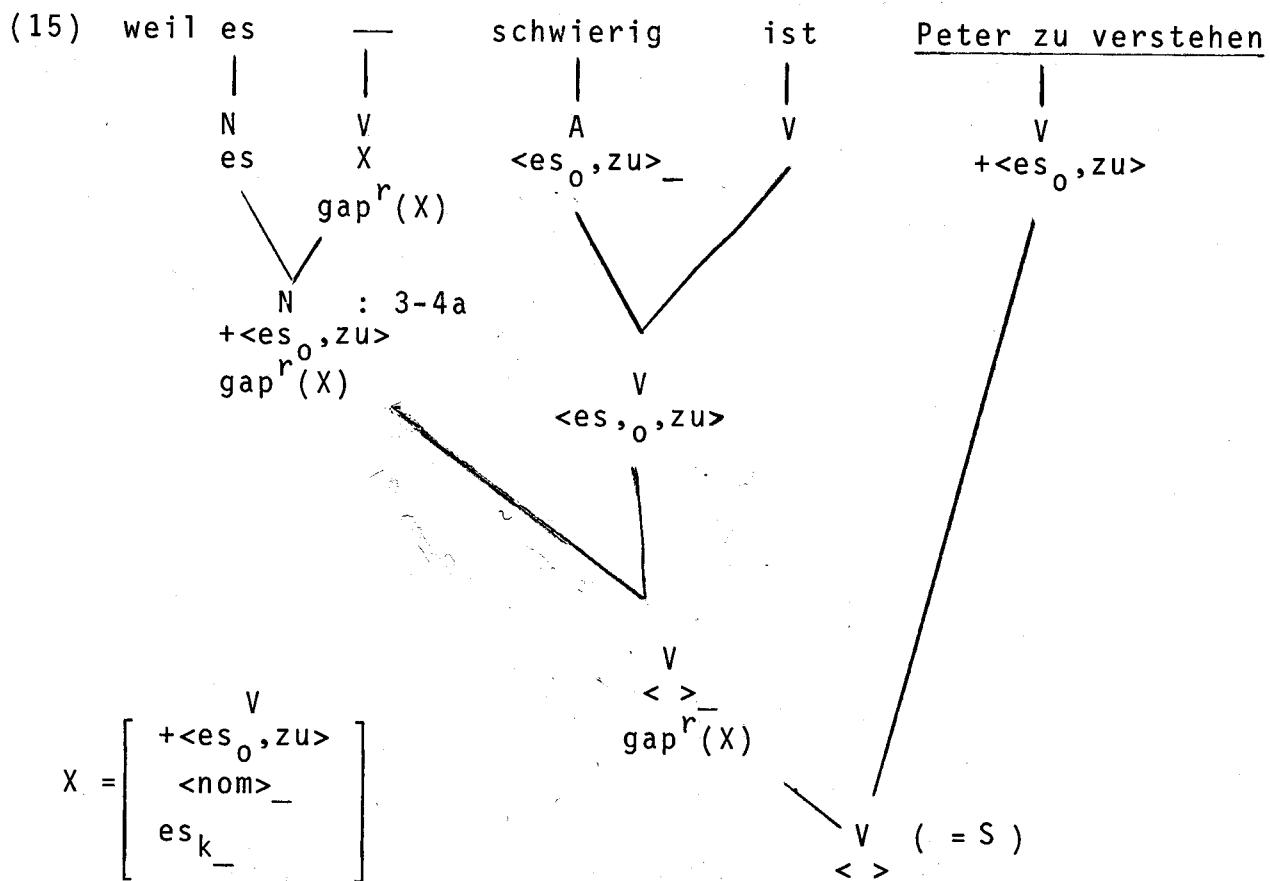
$X = \left[ \begin{array}{c} V \\ +\alpha \\ \beta \\ es_k \end{array} \right]$  and

$$\left[ \begin{array}{c} +\alpha \\ \beta \\ es_k \end{array} \right]$$

$\alpha \in \{<es_0, \text{zu}>, <es_F, \text{zu}>, <\text{zu}>\}$  &  $\beta = <\text{nom}>$   
or

$\alpha \in \{<es_0, \text{daß}>, <es_F, \text{daß}>, <\text{daß}>\}$  &  $\beta = <>$

Example:



(N3-4) b. (depends on (a) )

$$\begin{array}{ccc} N & \rightarrow & N \\ \text{gap}^1(X) & & \text{gap}^1(X) \end{array}$$

(16) a. Es  $\overset{4 \text{ b}}{\downarrow}$  ist  $\boxed{\quad}$   $\overset{4 \text{ a}}{\downarrow}$  schwierig — Peter zu verstehen.

b. \* $\overset{*}{\downarrow}$  Es ist — Peter zu verstehen schwierig —

c. \*Peter zu verstehen ist es — schwierig —

### § 2.3 The rule $N \rightarrow V N$

(N3-1) a.  $\begin{array}{ccc} N & \rightarrow & V \\ +\text{phr} & & +\text{det} \end{array}$

(N3-1) b. (depends on (a) )

$$\begin{array}{ccc} N & \rightarrow & V \\ & & +\text{strong} \end{array} \quad \begin{array}{c} N \\ +\text{strong} \end{array}$$

(N3-1) c. (depends on (a) )

$$\begin{array}{ccc} N & \rightarrow & V \\ & & +\text{mass} \end{array} \quad \begin{array}{c} N \\ +\text{mass} \end{array}$$

(N3-1) d. (depends on (a) )

$$\begin{array}{ccc} N & \rightarrow & V \\ & & -\text{art} \end{array} \quad \begin{array}{c} N \\ \end{array}$$

(17) a. [lange gegorenem] italienischen Wein

$$\begin{array}{c} V \\ +\text{det} \\ -\text{art} \\ +\text{strong} \end{array}$$

b. dem [lange gegorenen] Wein

$$\begin{array}{c} V \\ +\text{attr} \\ -\text{strong} \end{array}$$

(N3-2)    N → V                N  
                  +attr

(N3-3)    N → V                N  
                  α                α  
                  α = +mass or α is a CF.

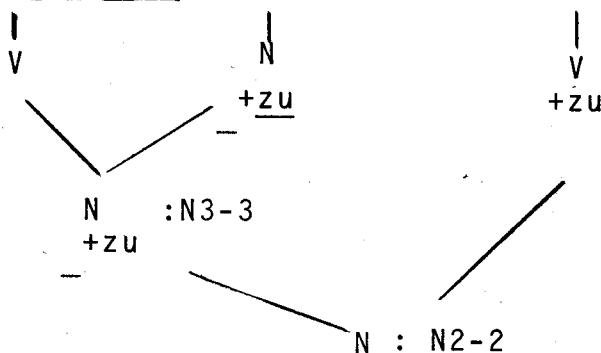
(N3-4)    N → V                N  
                  α                α  
                  α is a case, a number, a gender or + strong.

(N3-5)    N → V                N  
                  [<nom>]    +A  
                  [      α      ]  
  
 $\alpha \in \left\{ \begin{array}{l} \lambda \\ -+passiv \\ -+sein \\ -+state-pass. \end{array} \right\}$

### Examples

- (18)a. ein das Buch sorgfältig gelesen habender Knecht ( $\alpha = \lambda$ )
- b. der Maria nicht haben ausstehen könnende Ede ( $\alpha = \lambda$ )
- c. die gestohlenen Liebesbriefe ( $\alpha = _+pass.$ )
- d. der von uns verprügelte Ede ( $\alpha = _+passiv$ )
- e. der zu spät angekommene Zug ( $\alpha = _+sein$ )
- f. der erschrockene Zuschauer ( $\alpha = _+sein$ )
- g. der ausgeschlafene Bürovorsteher ( $\alpha = _+state-passiv$ )
- h. der an Karl gerichtete Brief ( $\alpha = _+state-passiv$ )

(19) Maxens kaum verhehlte Lust ein Eis zu schlecken



### Gap-Percolation

(N3-6)  $\frac{N}{gap^r(X)} \rightarrow \frac{V}{gap^r(X)}$

+mass  $\in R$  or +plural  $\in R$

(N3-7)  $\frac{N}{gap^r(X)} \rightarrow \frac{V}{gap^r(X)}$

### Examples

(20) a. [Athenische Schiffe]  $\overset{3-6}{\downarrow}$  lagen [längst verfaulte  $\_$ ]  
+plur  
am Strand

b. [Quark]  $\overset{3-6}{\downarrow}$  hatte sie [frisch gemachten  $\_$ ]  
+mass

c. Wein  $\overset{3-6}{\downarrow}$  verkaufte er nur frisch  
gegorenen  $\_$   $\_$

e. ein besser  $\overset{3-7}{\downarrow}$  geschriebenes Buch  $\overset{\downarrow}{v}$  als wir gedacht hatten

#### § 2.4 The rule $N \rightarrow N P$

(N4-1) a.  $N \quad N \quad P$   
                  +phr

(N4-1) b. (depends on (a))

$N \rightarrow N \quad P$   
       $\alpha \quad +\beta$   
 $\alpha = \_ +\beta \quad \text{or } \alpha = \lambda$   
 $\beta$  is a preposition-marker.

(N4-1) c. (depends on (a))

$N \rightarrow N \quad P$   
       $\alpha \quad \alpha$   
 $\alpha$  is a syntactic marker.

#### Examples

(21)a. [ [ alle Straßen] [ nach Konstanz] ] [ über Singen]  
NP NPPP

b. [ alle [[Straßen [nach Konstanz]] PP über Singen]]  
NP NN PP PP

c. [ [ alle Straßen][ nach [Konstanz [ über Singen]]]]  
NP NPP N PP

d. [ alle [Straßen [ nach [Konstanz [ über Singen]]]]]  
NP N PP N PP

Structural ambiguity!

#### Gap-percolation

PPs are islands in German. Therefore no gap-marker can percolate through a PP. The following rules cover some rather marginal cases of extractions from NP:

(N4-2)  $N \rightarrow N \quad P$   
       $\text{gap}^1(N) \quad \text{gap}^1(N)$   
                  R            R  
      +mass  $\in R$  or +plural  $\in R$ .

(N4-3)  $N \rightarrow N \quad P$   
       $\text{gap}^1(X) \quad \text{gap}^1(X)$

(22) Von David haben wir [jedes Buch —] gelesen.  
                                  N

4-2

(22)a. [Whisky]    gab es [ — mit Soda]—  
      N            NP  
      +mass

b. ?[Schiffe]    Tagen [ — ohne Masten] am Gestade —  
      N            NP  
      +plur

The following N-projection rules are not treated:

N → N    Adv

(23)    der Mann dort

N → N    N

(24) [[Des Dichters] Lied] erfreut das Gemüt.  
      NP          NP

### § 3. V - Projection

Possibilities:

V1 : V → N    V

V2 : V → A    V

V3 : V → P    V

V4 : V → Adv V

V5 : V → V    V

#### § 3.1 The rule V → N V

(V1-1) a. V → N    V  
          +phr

(V1-1) b. (depends on (a) )

V    →    N            V  
CF\_    +α            CF^α\_

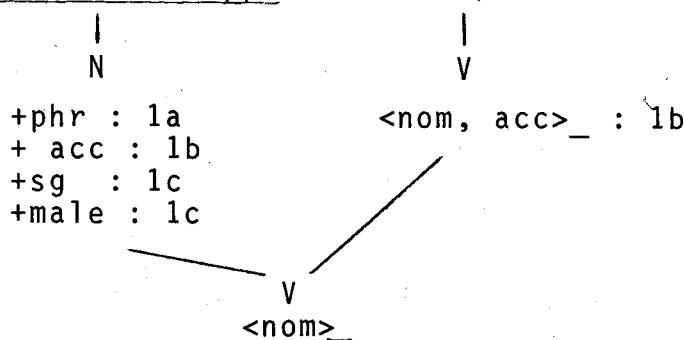
α is a case ≠ nom or a complement-marker.

(V1-1) c. (depends on (a) )

V    →    N            V  
          α  
α is a number or a gender

Examples

(25) Ede einen Teller Suppe



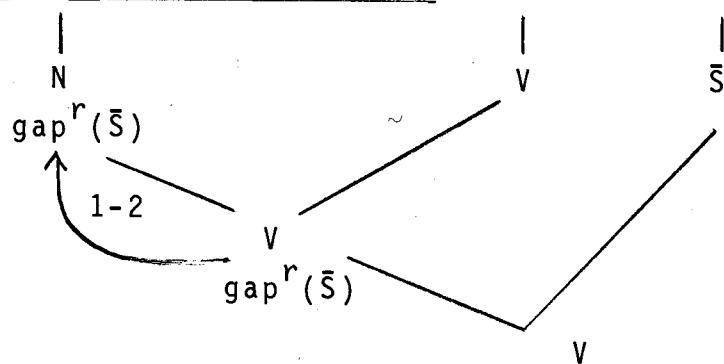
Gap-percolation

(V1-2)  $\frac{V}{\text{gap}(X)} \rightarrow \frac{N}{\text{gap}(X)} V$

Examples

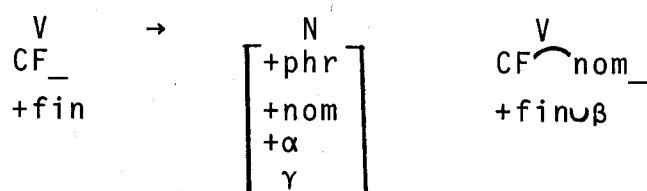
(26)a. Meinen Schlüssel habe ich — vergessen

b. Ede keine schöneres — Mädchen kennt als Senta



Agreement rules for nominatives

(V1-3) a.



$\alpha$  is a number

$\gamma \in \{\lambda, \text{demonstrative} - \text{pro}, \text{int.- pro}, \text{rel.} - \text{pro}\}$

$\beta = \begin{cases} \{\alpha\}, \text{ if } \alpha = \text{plural} \& +\text{fin} \text{ doesn't contain both} \\ \alpha \text{ number and a person} \\ \emptyset, \text{ otherwise} \end{cases}$

(V1-3) b. (depends on (a) )

$V \rightarrow N \quad V$   
 $\alpha$  is a gender.

(V1-4) a.  $V \rightarrow N \quad V$   
 $CF_+ [+nom] CF nom_-$

$+fin \quad +pers-pro \quad \gamma$   
 $\lfloor \alpha, \beta \rfloor$   
 $\alpha$  is a number.

$\beta$  is a person.

$\gamma = \begin{cases} +\text{fin}, \text{ if } +\text{fin} \text{ contains a number and a person} \\ \{\alpha, \beta\}, \text{ otherwise} \end{cases}$

(V1-4) b. (depends on (a) )

$V \rightarrow N \quad V$   
 $\alpha$

$\alpha$  is a gender.

Remark:  $+fin$  is  $\emptyset$ , or it contains a gender, or a person or both.

### Examples

(27) a. Ich bin ein Esel

b.\* Ich ist ein Esel

(28) a. Du wärest zwei Esel

b.\* Du wäre zwei Esel.

(29) a. Ich wäre du

b.\* Ich wärest du (not topicalized)

c. Ich wäre ihr

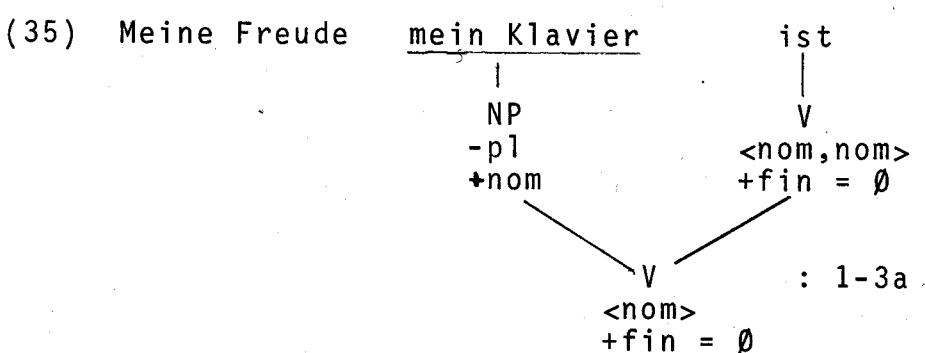
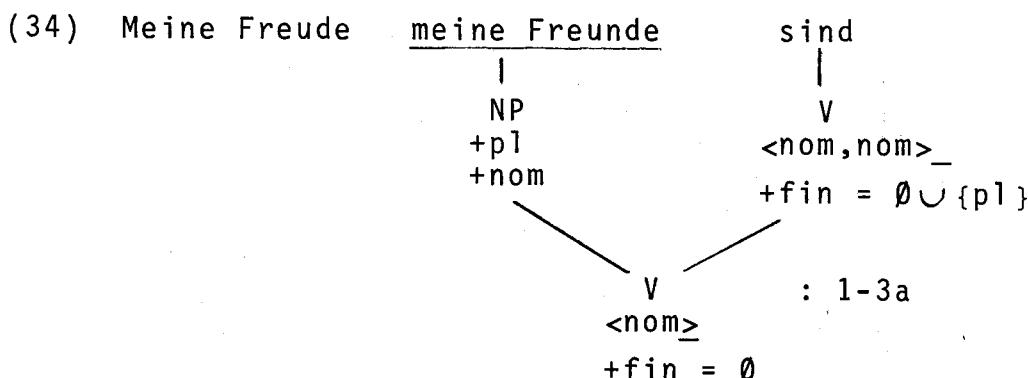
d.\* Ich wäret ihr (not topicalized)

- (30) a. Er ist zwei Institutionen.  
b.\* Er sind zwei Institutionen

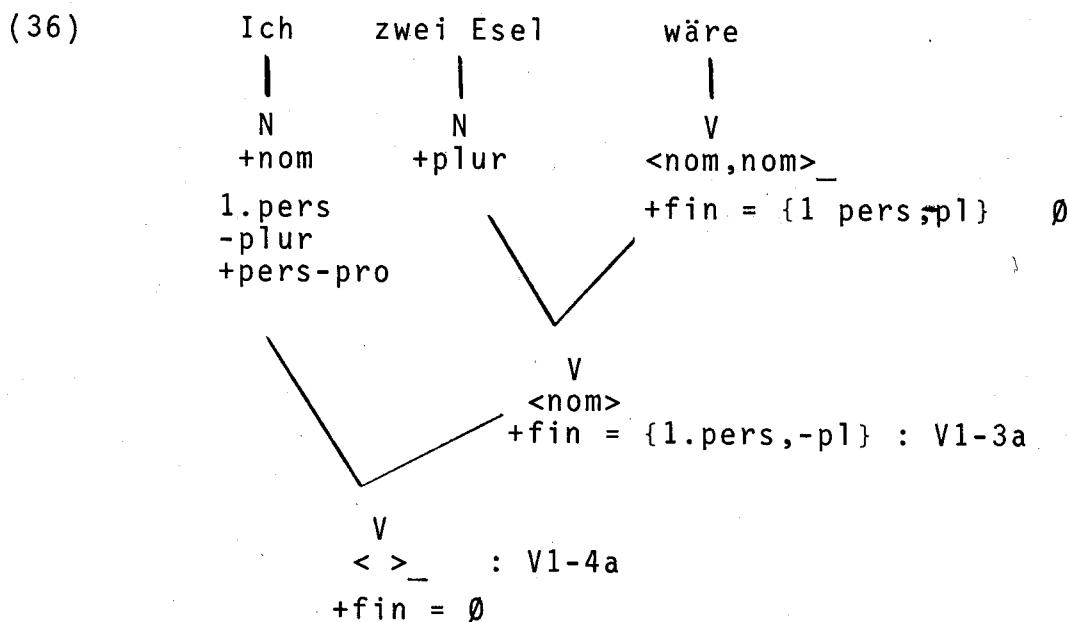
(31) a. ? Die Weltbank ist zwei Institutionen  
(ungrammatical according 1-4)  
b. ? Die Weltbank sind zwei Institutionen  
(grammatical according 1-4)

(32) a. Ihr seid ein großartiger Verein  
b.\* Ihr ist ein großartiger Verein.

(33) a. Das waren die Nachrichten  
b.\* Das ist die Nachrichten  
c. This is the news  
d. Das sind Kälber e.\* Das ist Kälber  
f. Diese sind Kälber  
g.\* Diese ist Kälber



Remark: +fin = Ø is the unmarked form of the finite verb, i.e. the third person (or no person, if you like) singular.



(V1-4) Feature percolation to the right

$$V \rightarrow N \quad V \\ \alpha \qquad \alpha$$

$\alpha$  is an appropriate syntactic marker or gap-marker  
except gap( $\underset{k}{\overset{N}{es}}$ )

(V1-5) Feature percolation to the left

$$V \rightarrow N \quad V \\ \text{gap}(X) \quad \text{gap}(X)$$

Examples

(37) a. Einen Ring  $\downarrow$  fand er  $\overline{\quad}$  im Magen des Fisches  $\overline{\quad}$ .

b. Es  $\downarrow$  hat er  $\overline{\quad}$   $\overline{\quad}$  versäumt,  $\downarrow$  Ede anzurufen.

But the following sentence is good:

c. Es  $\downarrow$  hat  $\overline{\quad}$   $\overline{\quad}$  gestimmt  $\overline{\quad}$  daß Ede angerufen hat.

§ 3.2 The rule  $V \rightarrow A V$

(V2-1) a.  $V \rightarrow A V$   
 $\quad\quad\quad +pred \quad +sein$   
 $\quad\quad\quad +aux$

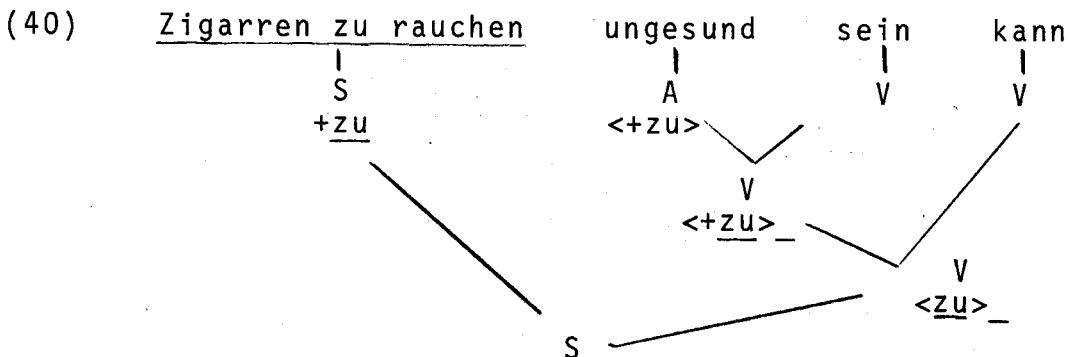
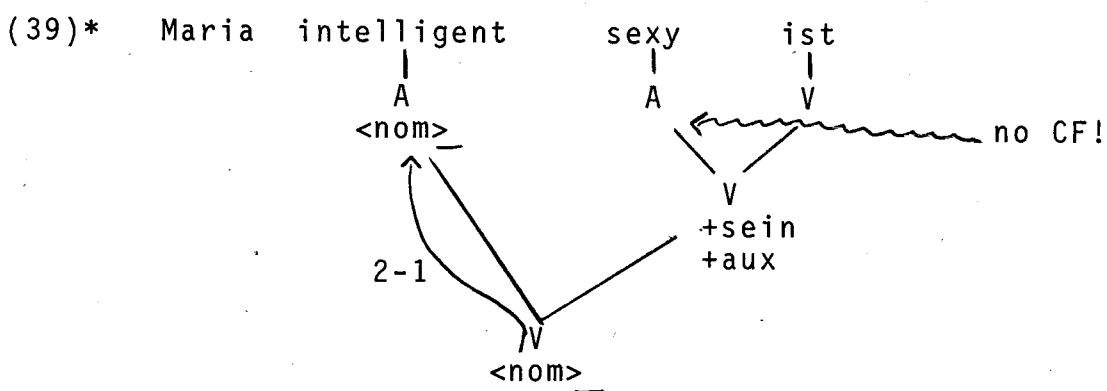
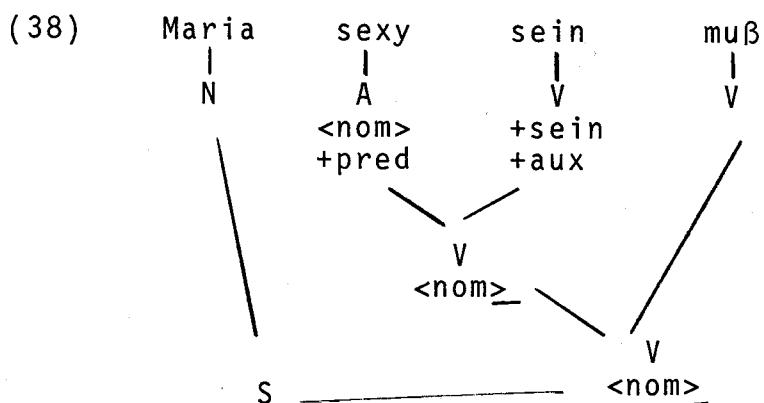
(V2-1) b. (depends on (a))

$V \rightarrow A V$   
 $CF_1 \quad CF_2$

(V2-2) Percolation to head

$V \rightarrow A V$   
 $\alpha \quad \alpha$

$\alpha$  is a syntactic marker  $\neq$  CF or a gap-marker.



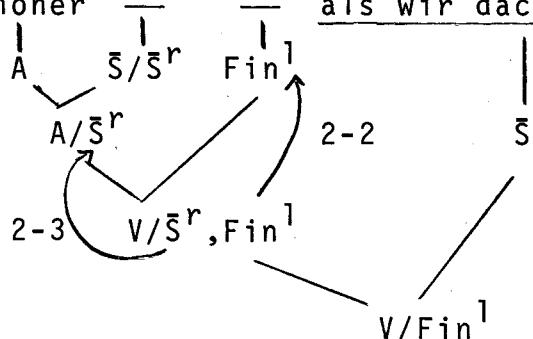
Not explained:

(41) \* Ungesund sein kann Zigarren zu rauchen — —

(V2-3)  $V \rightarrow A \text{ gap}(X)$

(42) a. Sexy muß Maria — sein —

b. Maria ist schöner — als wir dachten



### § 2.3 The rule $V \rightarrow P V$

(V3-1) a.  $V \rightarrow P V$   
+phr

(V3-1) b. (depends on (a))

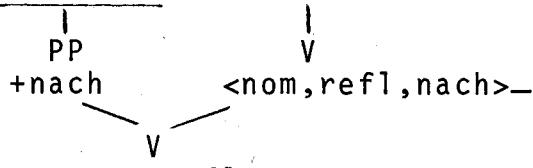
$$\begin{array}{ccc} V & \rightarrow & P \quad V \\ CF_- & +\alpha & CF_-^\beta \\ & \beta \in \{\alpha, \lambda\} & \end{array}$$

Remark:  $\beta = \lambda$  concerns free complements.

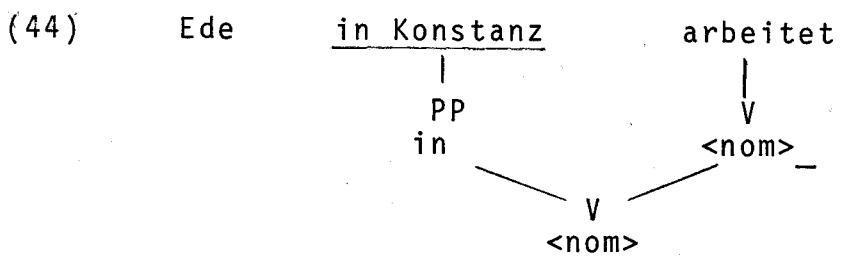
$\beta = +\alpha$ ,  $\alpha$  a preposition-marker, concerns obligatory complements.

### Examples

(43) a. Ede sich nach Senta sehnt



$$\beta = +nach$$



(V3-2) Percolation to head (depends on (V3-1)b.)

$$V \rightarrow P \quad V$$

$$\alpha \quad \alpha$$

$\alpha$  is a feature.

(V3-1) c. (depends on (a))

$$V \rightarrow P \quad V$$
$$\text{gap}_\alpha^1(\text{PP}) \quad \text{gap}_\alpha^1(\text{PP})$$

This rule says that PP-complements can be topicalized only as a whole.

(45) a. [Unter der Brücke über dem Rhein] wohnt — Ede —

b. Unter der Brücke  $\xrightarrow{\quad}$  wohnt Ede [ — über dem Rhein] —

c. Über den Rhein  $\xrightarrow{\quad}$  wohnt Ede [unter der Brücke —] — .

d. Der Brücke  $\xrightarrow{\quad}$  wohnt Ede [unter — über den Rhein] —

(46) Ede hat geschlafen, unter der Rheinbrücke.

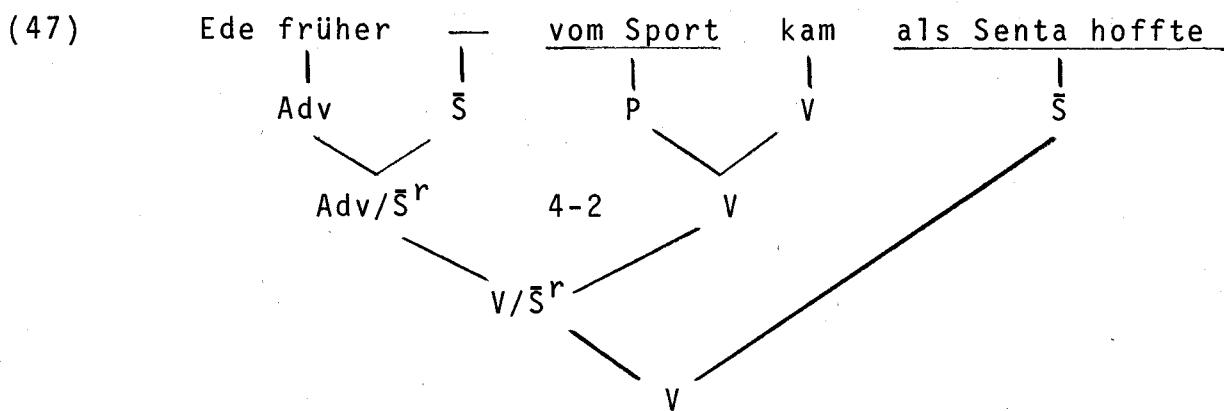
This sentence is not explained via topicalization. The PP is a sort of 'addition'. It is not moved.

#### § 3.4 The rule $V \rightarrow \text{Adv } V$

(V4-1)  $V \rightarrow Adv \quad V$   
 $\alpha \quad \alpha$

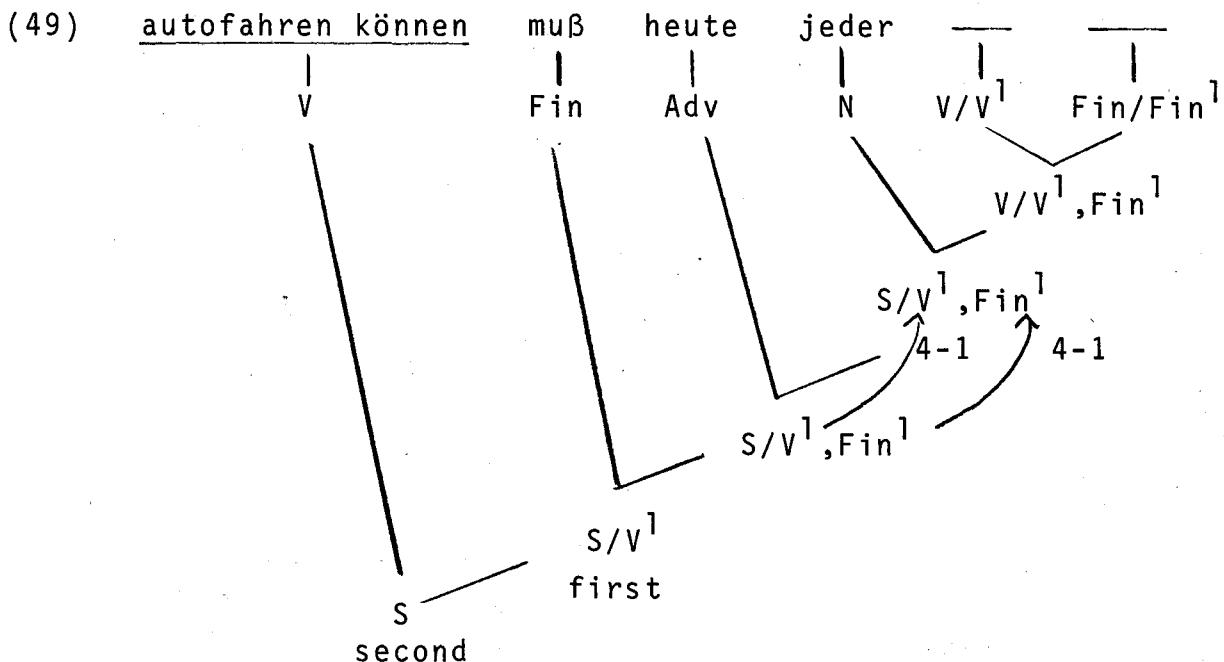
$\alpha$  is an arbitrary feature, except +aux.

(V4-2)  $V \rightarrow Adv \quad V$   
 $gap^r(X) \quad gap^r(X)$



(48) a.\* Ede arbeiten heute kann

b. Ede heute arbeiten kann



§ 3.5 The rule  $V \rightarrow V V$

(V5-1)  $V \rightarrow V \quad V$   
 $\quad \quad +\alpha$

$\alpha \in \{ \text{mod}, \text{fut} \}$

(V5-2)  $V \rightarrow V \quad V$   
 $\quad \quad +\alpha$

$\alpha \in \{ \text{mod}, \text{fut} \}$

(V5-3)  $V \rightarrow V \quad V$   
 $\quad \underline{\alpha} \quad +\alpha$

$\alpha \in \{ \text{aux}, \text{passiv} \}$

(V5-4)  $V \rightarrow V \quad V$   
 $\quad \quad [\underline{\alpha}] +\alpha$

[+perf]

$\alpha \in \{ \text{haben}, \text{sein} \}$

(V5-5)  $V \rightarrow V \quad V$   
 $\quad +\alpha \quad \underline{\alpha}$

$\alpha \in \{ \text{aux} \}$

(V5-6)  $V \rightarrow V \quad V$   
 $\quad +\text{haben} \quad +\text{perf}$

(V5-7)  $V \rightarrow V \quad V$   
 $\quad \underline{\text{aux}} \quad \underline{\alpha}$

$\alpha \in \{ +\text{lassen}, +\text{mod} \}$

(V5-8) a.  $V \rightarrow V \quad V$   
 $\quad \alpha \quad \alpha$

$\alpha \in \{ \underline{\beta}, +\underline{\text{zu}}, +A, +\text{number}, +\text{gender}, +\text{case} \}, \beta \neq \text{CF}$

(V5-8) b.  $V \rightarrow V \quad V$   
 $\quad +\text{fin} \quad +\text{fin}$   
 $\quad \quad \alpha$

$\alpha$  is FIN or  $\lambda$

(V5-9) a.  $V \rightarrow V \quad V$   
 $\quad \underline{\beta} \quad \underline{\beta}$

(V5-9) b.  $V \rightarrow V \quad V$   
 $\quad +\text{fin} \quad +\text{fin}$   
 $\quad \quad \alpha$

$\alpha$  is FIN or  $\lambda$

(V5-10) a.  $\frac{V}{CF_-} \rightarrow \frac{V}{CF_-} V$

b. (depends on (a))

$$\begin{array}{ccc} V & \rightarrow & V \\ +perf & & +perf \end{array}$$

(V5-11) a.  $\frac{V}{CF_-} \rightarrow \frac{V}{\quad} \frac{V}{CF_-}$

b. (depends on (a))

$$\begin{array}{ccc} V & \rightarrow & V \\ +perf & & +perf \end{array}$$

Note: A general dependence condition for some of these rules  
is given below.

#### Filters

(F4) \*  $\left[ \begin{smallmatrix} +fin \\ \underline{\text{aux}} \end{smallmatrix} \right]$

(F5) \*  $\left[ \begin{smallmatrix} +fin \\ +zu \end{smallmatrix} \right]$

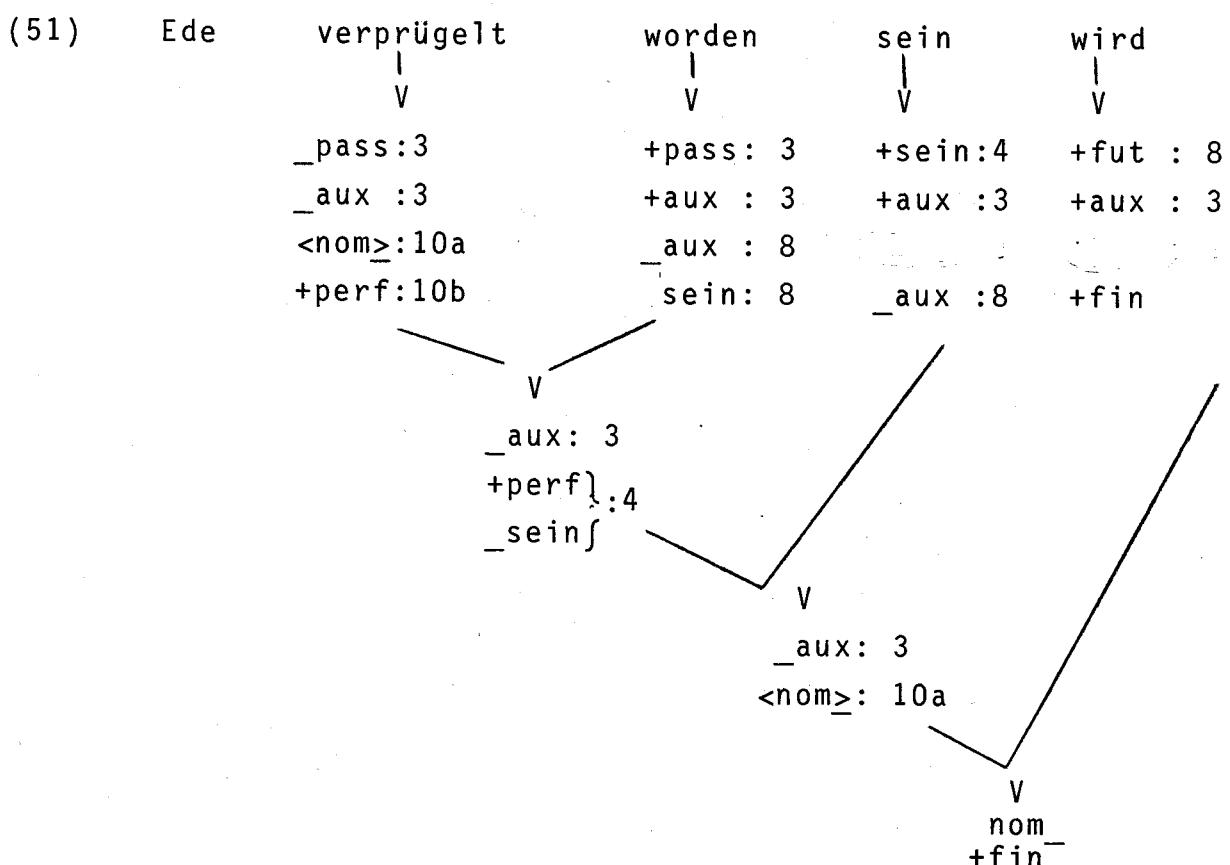
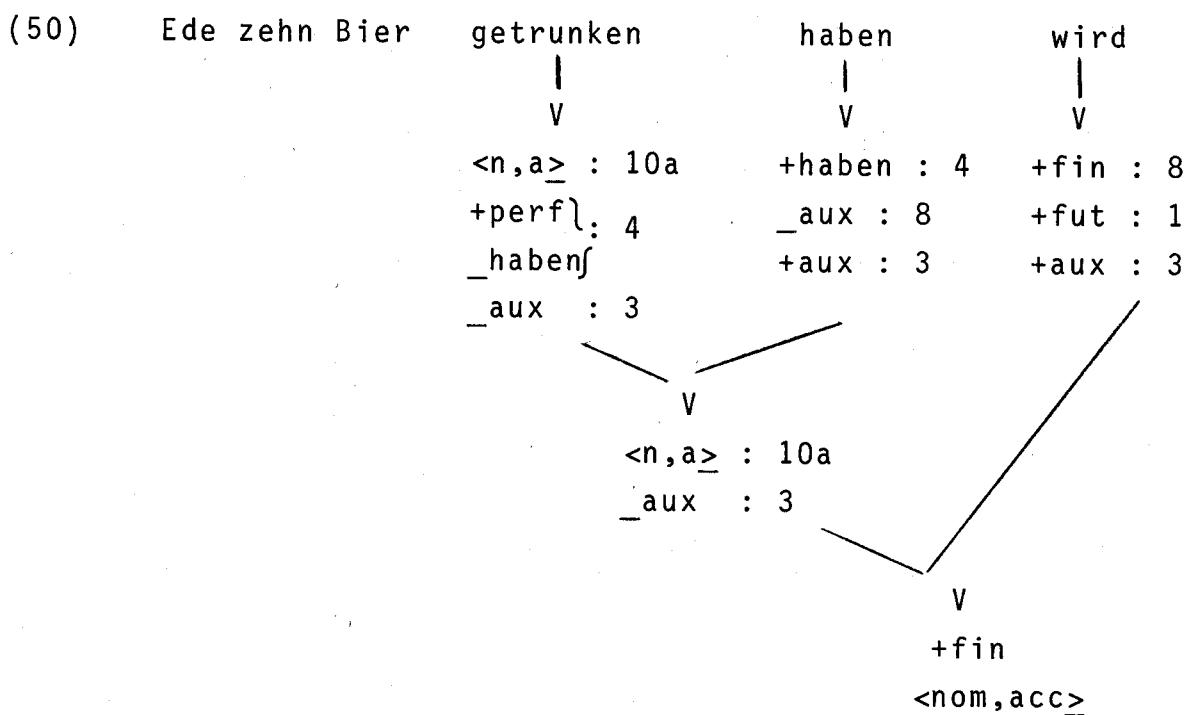
(F6) \*  $\left[ \begin{smallmatrix} +fut \\ +zu \end{smallmatrix} \right]$

(F7) \*  $\left[ \begin{smallmatrix} \text{aux}_- \\ +fin \end{smallmatrix} \right]$

(F8) \*  $\left[ \begin{smallmatrix} \text{aux}_- \\ \underline{\text{aux}} \end{smallmatrix} \right]$

(F9) \*  $\left[ \begin{smallmatrix} \text{aux}_- \\ +zu \end{smallmatrix} \right]$

Examples



Note: The participle passive verprügelt is either in the lexicon, classified as

V
_passiv
_aux
_nom_
+perf

or this category is further expanded to

V	+ <u>t.</u>
<u>&lt;nom,acc&gt;</u>	
_aux	

It is largely a matter of taste, how to proceed here.

- (52) a. \* Ede verprügelt worden sein ist  
b. \* Ede verprügelt sein worden ist,  
c. \* Ede ein Faß angestochen haben hat

Such cases are filtered out by the lexicon. There are no lexical entries for feature combinations like the following ones:

* [ _sein ]	* [ sein_ ]
[ +sein ]	[ +sein ]
* [ _haben ]	* [ haben_ ]
[ +haben ]	[ +haben ]

The lexicon has a very strong filter effect.

- (53) a. Ede das Land sollte haben verlassen dürfen  
+fin!  
  
b. \* Ede das Land sollte haben verlassen

- (53) a.

sollte	haben	verlassen	dürfen
+	+	+	+
+mod:2	+haben:6	aux_	+aux
+aux:5	+aux :5	+perf	+mod
+fin	aux_ :9	<n,a>	

+fin

b.\*

sollte	haben	verlassen	*
+	+	+	*
+mod	aux_	+perf	
+aux	+haben	aux_	

verlassen doesn't have the feature aux\_. Only the auxiliary haben has the feature aux .

### Comment to the filters

(F4) \*  $\begin{bmatrix} +\text{fin} \\ -\text{aux} \end{bmatrix}$  and (F7) \*  $\begin{bmatrix} +\text{fin} \\ \text{aux\_} \end{bmatrix}$

exclude the possibility that the finite goes to the wrong place, in case we have a +haben - +perf construction.

- (54) a.\* sollen hat verlassen dürfen

[+fin ] \*

- b.\* Ede ein Bier getrunken hat können

[+fin  
-aux ] \*

(F6) \*  $\left[ \begin{smallmatrix} +fut \\ +zu \end{smallmatrix} \right]$  has to do with the fact that there is no

infinitive future in german and therefore no prepositional infinitive future either.

(55) \* arbeiten zu werden.

Note to the category FIN. This means "is the finite verb".

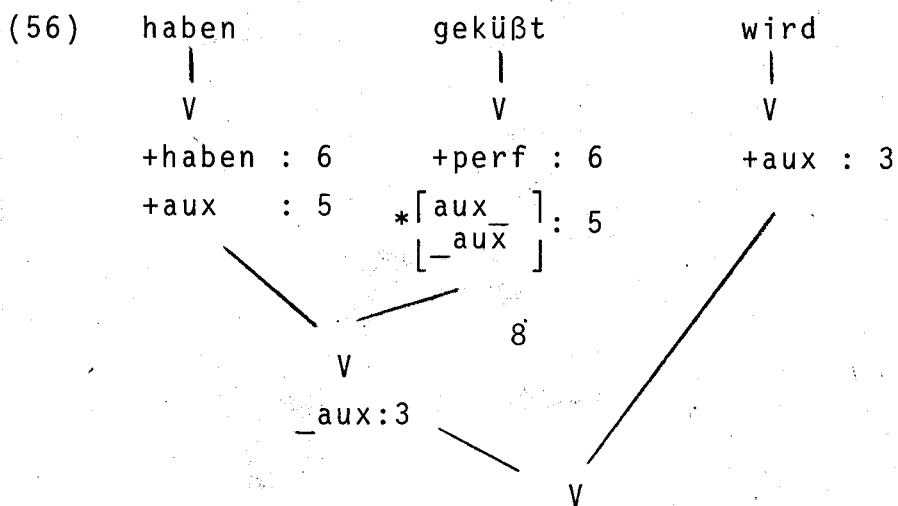
This feature is needed for topicalizing the finite verb.

+fin means "is a finite verbal construction". +fin furthermore carries the number and person information.

A note to (F8) \*  $\left[ \begin{smallmatrix} -aux \\ aux \end{smallmatrix} \right]$ .

This accounts for the ungrammaticality of sentences like (56):

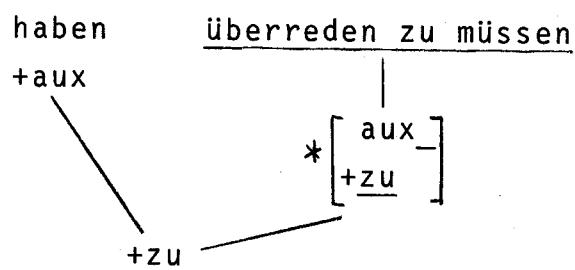
(56) \*Ede Senta haben geküßt wird.



(F9) \*  $\left[ \begin{smallmatrix} aux \\ +zu \end{smallmatrix} \right]$  concerns constructions like these:

(57) a. Er glaubt, ihn dazu überredet haben zu können.

b.\*Er glaubt, ihn dazu haben überreden zu müssen.



The feature +perf can't percolate, because the rules

V +perf	→	V +perf	V
V	→	V +perf	V +haben

which are needed for the percolation can't be fused, because the second positions of the rules are not disjoined.

Here we have a filter effect of the rules.

### General dependency condition

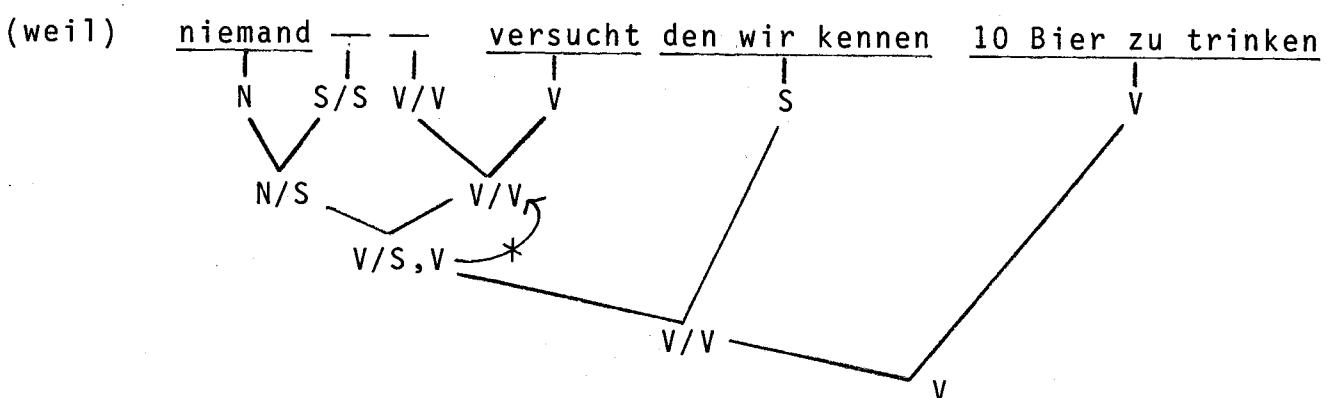
There is none, but we have a general rule:

$$V6 : V \rightarrow X \quad V \\ \text{gap}^1(Y) \quad \text{gap}^1(Y)$$

It seems to be superfluous to have

$$V \rightarrow X \quad V \\ \text{gap}^r(Y) \quad \text{gap}^r(Y)$$

This would account for the ungrammaticality of



### Sentential complement

$$(V5-12) \text{ a. } V \rightarrow S \quad V \\ \text{CF}_- \quad +\alpha \quad \text{CF}^\alpha_- \\ \text{gap}(S_{+\alpha}) \quad \text{gap}(S_{+\alpha}) \\ \alpha \in \{\text{daß, ob}\}$$

b. (depends on (a))

$$V \rightarrow S \quad V \\ \text{gap}(X) \quad \text{gap}(X)$$

This rule makes sure that a (finite) sentential complement must be extracted. "No finite S before the head".

5-12a

(59) a. Wir — glauben daß Jesus lebt

5-12b

5-12a

b. Glauben hat Ede — — können — daß Jesus lebt.

(V5-13) a. V → V CF nom\_ CF zu  
+zu  
CF ≠ < >

(V5-13) b. (depends on (a))

V → V  
gap(X) gap(X)

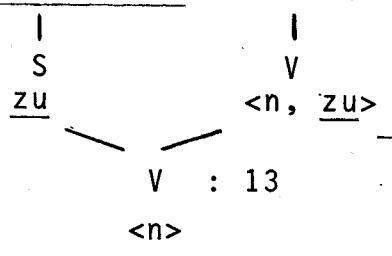
(V5-14) a. V → V CF nom\_ CF zu  
+zu  
CF = < >

b. (depends on (a))

S → V V  
gap<sup>r</sup>(X) gap<sup>r</sup>(X)  
gap<sup>1</sup>(X) = gap<sup>1</sup>(S )  
+zu

### Examples

(60) a. Randi Rom zu sehen wünscht



b. Rom zu sehen wünscht Randi — —

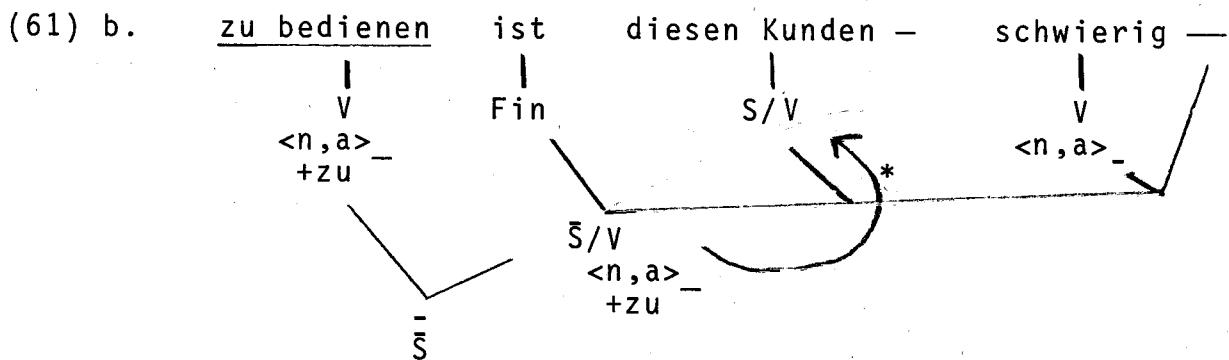
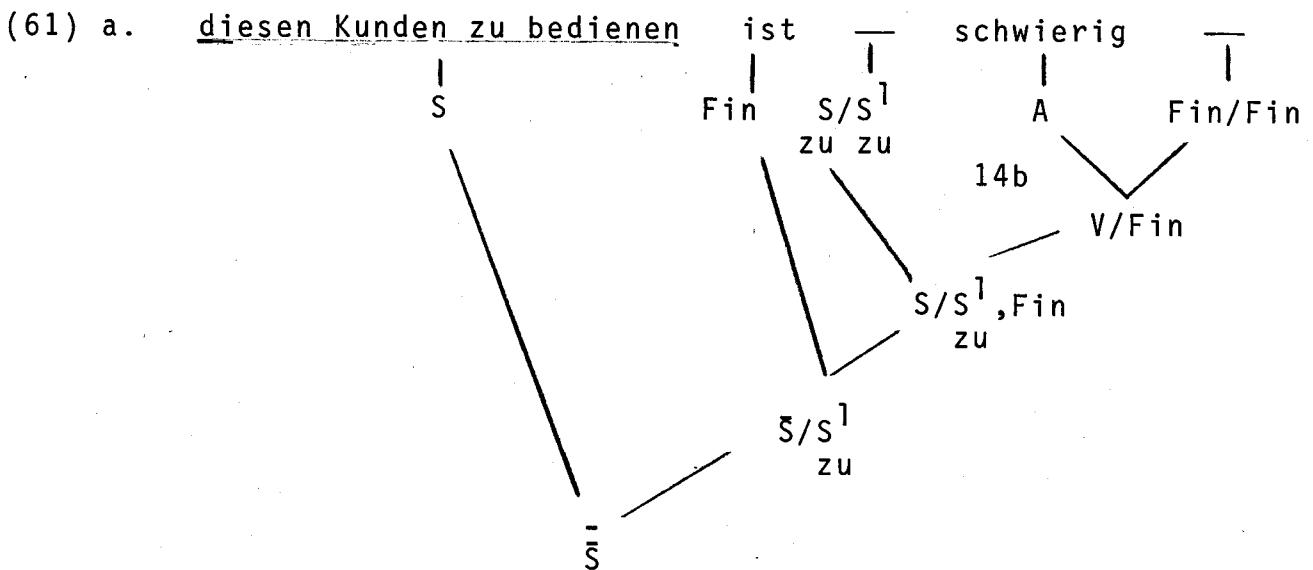
X = S  
zu

c. Rom wünscht Randi — zu sehen —  
 X = NP

d. zu sehen wünscht Randi Rom — —  
 X = V  
 <n, a>  
 +zu

e. Randi — wünscht Rom zu sehen

- (61) a. Diesen Kunden zu bedienen ist schwierig  
 b. \* Zu bedienen ist diesen Kunden schwierig  
 c. \* Dieser Kunde zu bedienen ist schwierig  
 d. Zu bedienen ist dieser Kunde schwierig.



The gap<sup>1</sup>(V<sub><n,a></sub>) can't pass the V because the condition of (V5-14)b. is not fulfilled.

(61) (c) and (d) are constructed differently. Consider (d) only.

(d). Zu bedienen ist dieser Kunde schwierig

$\bar{S}$

$S/X^1, Fin$

$X$

$gap^1(X)$

$V/Fin, X^1$

$n$

$S$

$Fin$

$ist$

$dieser$

$Kunde$

$schwierig$

$Adv$

$V$

$gap^1(X)$

$X$

$+aux$

$+pass$

$zu$

$V$

$N$

$zu$

$V$

$Adv$

$V$

$Fin/Fin$

$< n >$

$+ zu$

$- pass$

$- aux$

Notice: schwierig is an Adv, ist is a special aux requiring a zu-infinitive. ist zu bedienen has a 'passive meaning'.

$$(\underline{V5-15}) \quad V \rightarrow V \quad v$$

gap(X)                      gap(X)

Unrestricted gap-percolation to the right. Always needed.

$$\begin{array}{ccc}
 (\text{V5-16}) \quad \text{a.} & \text{V} & \text{V} \\
 & \text{CF} \_ & \text{CF} \_ & \text{V} \\
 & & +zu & \beta \\
 & & \alpha & \\
 \alpha = & \text{aux} & \& \beta = +aux \\
 \text{or} \\
 \alpha = \lambda & = & \beta
 \end{array}$$

b. V → V      V  
gap(X) gap(X)  
(depends on (a) )

This rule concerns verbs which have no CF:

beginnen, anfangen, . . .

scheinen, haben, sein, . . .  
+aux        +aux        +aux

- (62) a. Ede [[eine Pizza zu essen] beginnt]  
b. Ede eine Pizza [zu essen beginnt]  
c. Wir [[ein Hühnchen miteinander zu rupfen] haben]  
d. Wir ein Hühnchen [[miteinander zu rupfen] haben]
- (63) a. Weil es zu regnen scheint  
b. weil es — <sup>x</sup>  
                  scheint <sup>↓</sup> zu regnen  
                  +aux  
c. weil er — <sup>1</sup> anfängt <sup>2</sup> zu begreifen  
d. weil er — <sup>1</sup> hat <sup>x</sup> nichts <sup>2</sup> zu lachen.  
                  +aux