Syntax
VP-Structure and C-Command

Modul 04-006-2002
Phonology – Morphology – Syntax

Institut für Linguistik

Universität Leipzig

home.uni-leipzig.de/heck

Recap

Recap Constituency etc.:

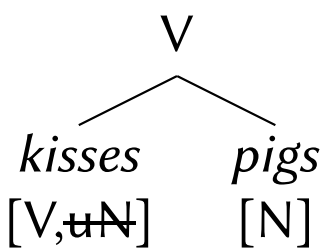
- Sentences are hierarchically structured: they can be divided into constituents at various depths (down to the word level). Constituents can be detected by syntactic processes (displacement, deletion, etc.) that make reference to them.
- The structure underlying all grammatical sentences is generated by the binary, recursive operation Merge. Merge is restricted by C-selection: if ϕ bears [uF], then ϕ can only merge with a ψ bearing the category feature [F]. As a result of Merge, [uF] on ϕ is deleted.
- Every Θ-role of a predicate is associated with a C-selectional feature. But there may also be [uF]s that are not associated with any Θ-role. (This will become clear later).
- Every constituent generated by Merge inherits the morpho-syntactic properties of one of its daughters (immediate consituents ϕ and ψ): the head. The head is defined as the daughter that bears the [uF] that is checked upon Merge(ϕ, ψ).

Phrase structure: VP

Merging the complement:

- Merge of a (transitive) verb with an argument realizing the verb's theme-role results in a binary branching structure with verbal properties (1).
- The position occupied by *pigs* in (1) (the head's sister) is called the lexical head's *complement*. The complement (mainly in the case of verbs) is also called the *internal argument* (IA).
- Transitive verbs also have a second θ-role to assign (often the agent-role). This role is then realized by Merge of another argument (the *external argument*, EA).

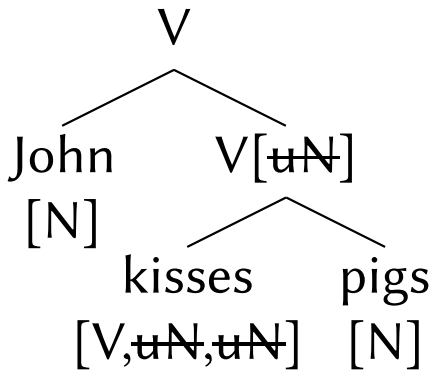
(1) Merge(*kisses*, *pigs*) $\rightarrow$



Phrase structure: VP

Merging the specifier:

- In this situation, Merge applies recursively: it takes the EA and the complex V-constituent previously created and combines them.
- Since every Θ-role is associated with a C-selectional feature, the verb bears another [uN], which is projected and can then be checked off under sisterhood with the EA (2).
- A position such as the one occupied by the EA *John* in (2) is called *specifier* (of a lexical head). A lexical head can, in principle, have arbitrarily many specifiers (but only one sister, i.e., only one complement).

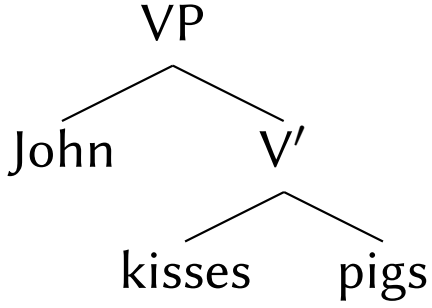
(2) Merge(*kisses pigs*, *John*) → 

Phrase structure: VP

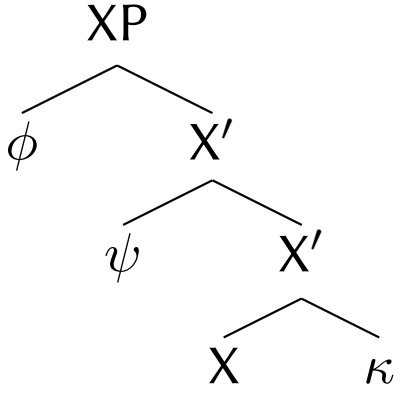
Levels of projection:

- The projection of a lexical head X that bears no more unchecked [uF]s is called a *phrase* and notated as XP.
- Intermediate projections, i.e. projections that still have some [uF]s unchecked are called *bar-levels* and are notated as X′.
- This is illustrated for the constituent *John kisses pigs* in (3) and for an abstract example (with two specifiers ϕ and ψ, and one complement κ) in (4).
- Note that this notation (X vs. X′ vs. XP) is, at least for the moment, only a convention without theoretical relevance.

(3)



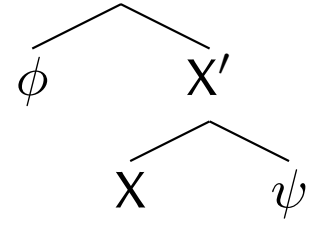
(4)



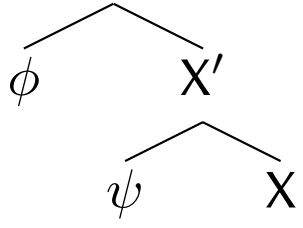
Phrase structure: VP

Linearization:

- Tree structures not only encode hierarchical relations, they may also be interpreted as determining linear precedence relations (though some scholars deny that the linear order depicted by a tree should be interpreted as phonological linear precedence).
- In (3), the head *kisses* follows its specifier *John* and precedes its complement *pigs*.
- The linearization of specifiers relative to their head appears (by and large) to be uniform cross-linguistically: there are hardly any convincing cases of specifiers that follow their head.
- In contrast, languages are clearly *parametrized* with respect to their relative ordering between head and complement.

(5) 

(head-initial)

(6) 

(head-final)

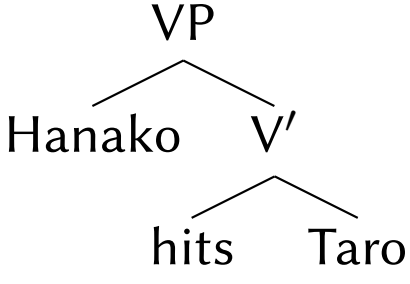
Phrase structure: VP

Examples:

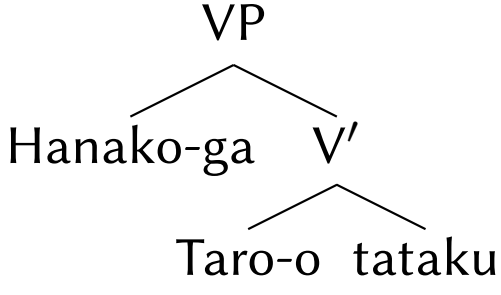
- While English is strictly head-initial, Japanese is strictly head-final.
- This is illustrated for the English and Japanese VP in (7-a,b), but it also holds for phrases of other categories (AP, PP, NP, etc.).

(7) a. Hanako hits Taro.
b. Hanako-ga Taro-o tataku.
Hanako-subj Taro-obj hits
"Hanako hits Taro"

(8)



(9)

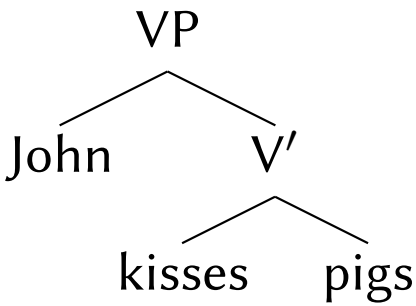


Phrase structure: VP

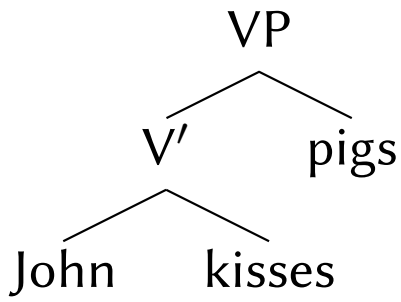
Recall:

- How do we know that the VP-structure of *John kisses pigs* is (10-a) and not (10-b) (with a rightward specifier)? The linear order of the terminal nodes in both structures matches the relevant string of the constituent.
- One answer to this question is based on constituency tests: (11-a,b) show that the verb forms a constituent together with the IA (to the exclusion of the EA).

(10) a.



b.



(11) a. Dr. Brumm said that he will [shave himself] . . .
. . . and [shave himself] he will.

b. Dr. Brumm [shaved himself], and Pottwal did Δ, too.
(Δ = *shave himself*)

C-Command

Observation:

- The representations in (10-a,b) not only involve different constituents. They also involve different relations between the nodes that are part of the representations.
- A particularly relevant relation is known by the name of *c-command* (c = constituent; Reinhart 1976). Its definition is given in (12).

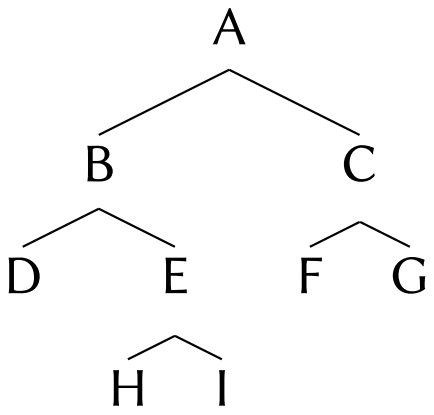
(12) *C-command*:
A node α c-commands a node β iff (a) or (b) hold:

a. β is the sister of α.
b. β is dominated by the sister of α.

C-Command

Abstract example:

(13)



1) A c-commands nothing.
2) B c-commands C, F, G.
3) D c-commands E, H, I.
4) H c-commands I and vice versa.
5) E c-commands D.
6) C c-commands B, D, E, H, I.
7) F c-commands G and vice versa.

C-Command: Reflexivization

Reflexivization:

- A first motivation for c-command comes from the conditions that govern *reflexivization* (illustrated for English).
- A reflexive pronoun (such as *himself*) can show up as the IA of a transitive verb (such as *shave*) if there is an EA that is interpreted as being coreferent with the IA (14-a), but not vice versa (14-b,c).

(14)
a. (Mary believes) [Max$_i$ to shave himself$_i$].
b. *(Mary believes) [himself$_i$ to shave Max$_i$].
c. *(Mary believes) [[the mother of himself$_i$] to shave Max$_i$].

Comments:

- α and β are coreferent if they refer to the same individual (which implies identity of features such as person, number, gender).
- Coreference is indicated by co-indexation.
- *Max* and *himself* in (14-a,b), respectively, are the EAs of the bracketed infinitives. Just assume that these are VPs, and ignore the little word *to* for the moment.

C-Command: Reflexivization

Hypothesis:
Reflexivization is governed by linear precedence.

(15) *Reflexivization-generalization:*
A reflexive pronoun must be coreferent with a *linearly preceeding* category (its *antecedent*).

Problem:
The generalization in (15) fails to explain the ungrammaticality of the following examples, which involve complex NPs (*noun phrases*) as EAs.

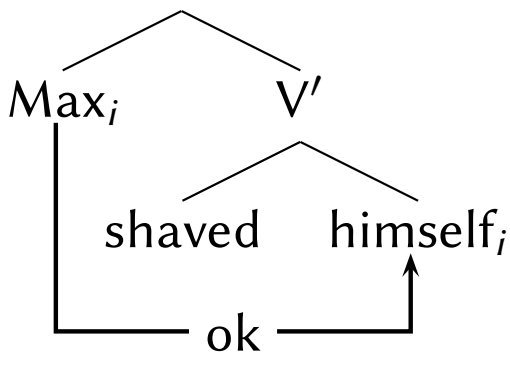
(16) a. *[$_{NP}$ His$_i$ mother] hated himself$_i$.
b. *[$_{NP}$ The man I$_i$ met] shaved myself$_i$.

C-Command: Reflexivization

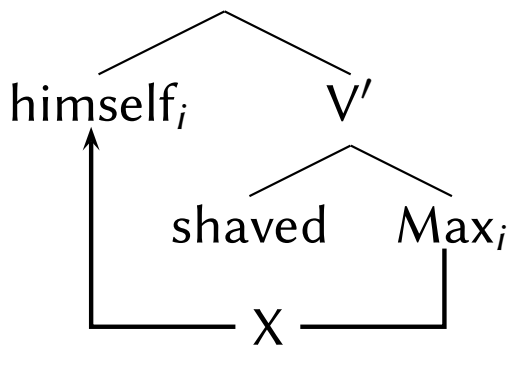
C-command accounts for the asymmetry:

- The alternative generalization in (18) exploits the fact that the EA asymmetrically c-commands the IA (given what we know from constituency tests).
- In what follows, c-command is indicated by arrows.

(17) a.



b. *



(18) *Reflexivization-generalization (revised):*
A reflexive pronoun must be coreferent with a *c-commanding* category.

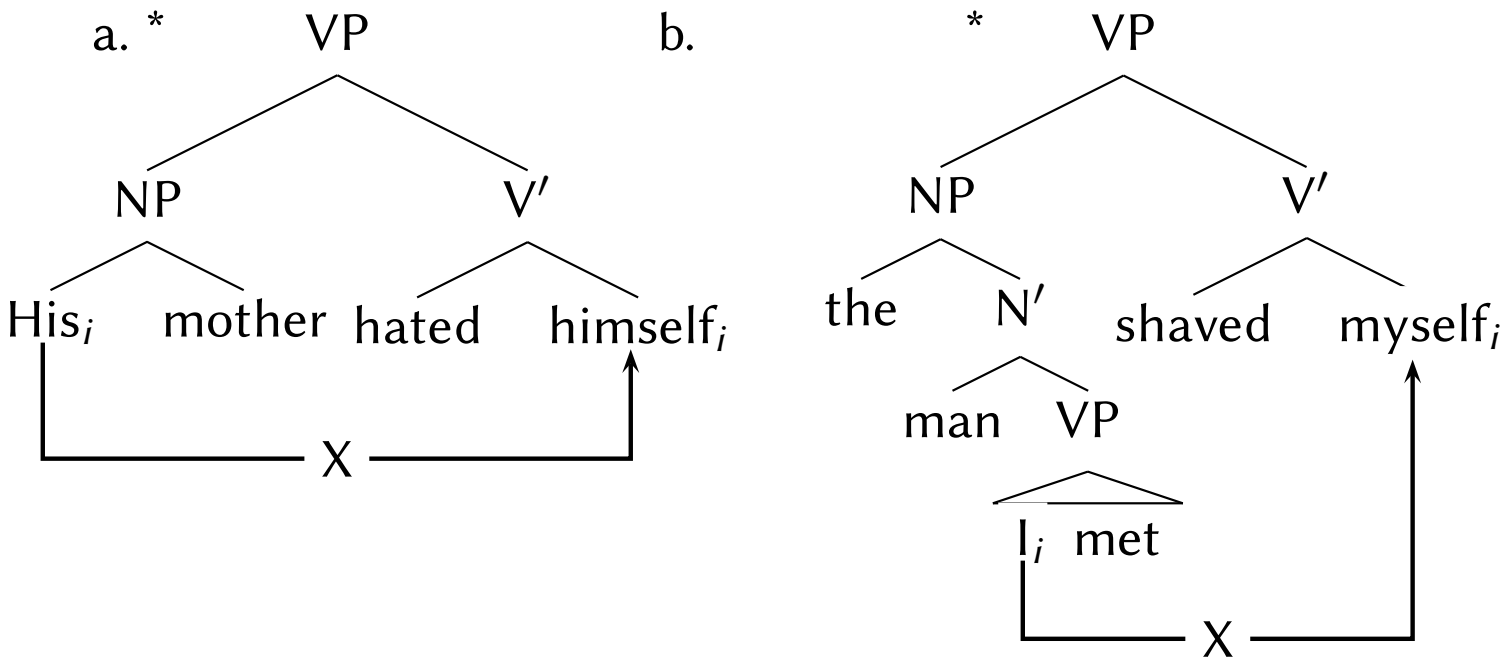
C-command: Reflexivization

Moreover:

- (18) also covers the ungrammaticality of the examples in (19-a,b).
- Constituency tests (not shown here) indicate that the strings *his mother* and *the man I met* form constituents, suggesting the lack of relevant c-command (20).

(19) a. *[$_{NP}$ His$_i$ mother] hated himself$_i$.
b. *[$_{NP}$ The man I$_i$ met] shaved myself$_i$.

(20) a. b.



C-Command: Negative Polarity

Negative Polarity:

- Another domain (exemplified by English) that illustrates the relevance of c-command involves *negative polarity items* (NPIs; not to be confused with NP = noun phrase).
- An NPI as an IA is grammatical if the EA is a negative constituent (such as *no-one*), but not vice versa (21-a,b). An NPI that functions as an adverb such as *ever* is grammatical if there is clausal negation (but not if there is no negation, (21-c,d)).

(21)
a. *Any boy saw no-one.
b. No-one wanted any cake.
c. *I saw him ever.
d. I didn't see him ever.

C-Command: Negative Polarity

Hypothesis:
Negative polarity is governed by linear precedence.

(22) *NPI-generalization:*
An NPI must be *linearly preceded* by a negative category.

Problem:
The generalization in (22) cannot account for the contrast in (23-a,b), where (23-b) involves a complex EA (in contrast to (23-a)).

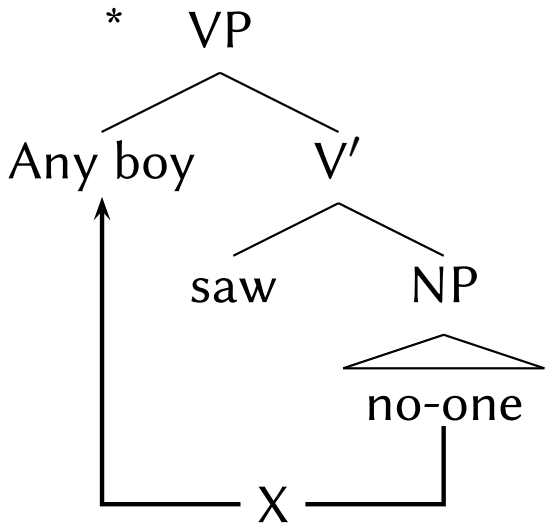
(23) a. No-one wanted any cake.
b. *[$_{\text{NP}}$ The picture of no-one] hung upon any wall.

C-Command: Negative Polarity

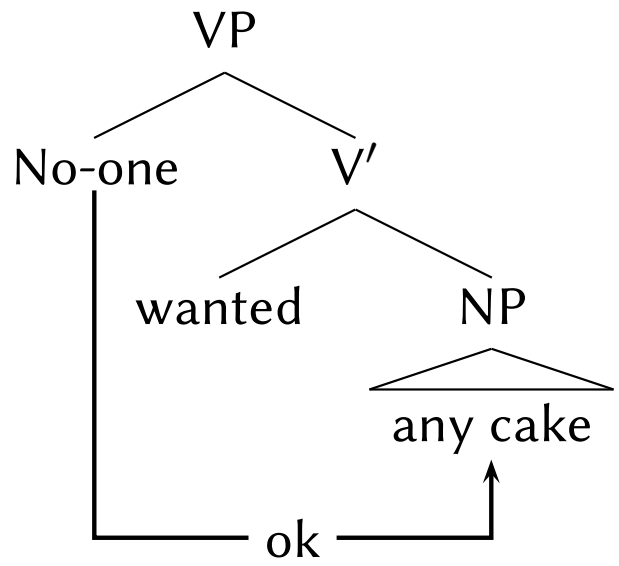
C-command accounts for the asymmetry:
Again, the alternative generalization in (24) exploits that the EA asymmetrically c-commands the IA (25).

(24) *NPI-generalization (revised)*:
An NPI must be *c-commanded* by a negative category.

(25) a.



b.



C-Command: Negative Polarity

Moreover:

- (26-b,c) suggest that *the picture of no-one* is a constituent containing *no-one*.
- It follows that *no-one* does not c-command *any wall* in (26-a) (although *no-one* linearly precedes *any wall*).

(26)
a. *[$_{\text{NP}}$ The picture of no-one] hung upon any wall.
b. *What* hung upon the wall?
c. *The picture of no-one* and *the portrait of nobody* hung upon the wall.

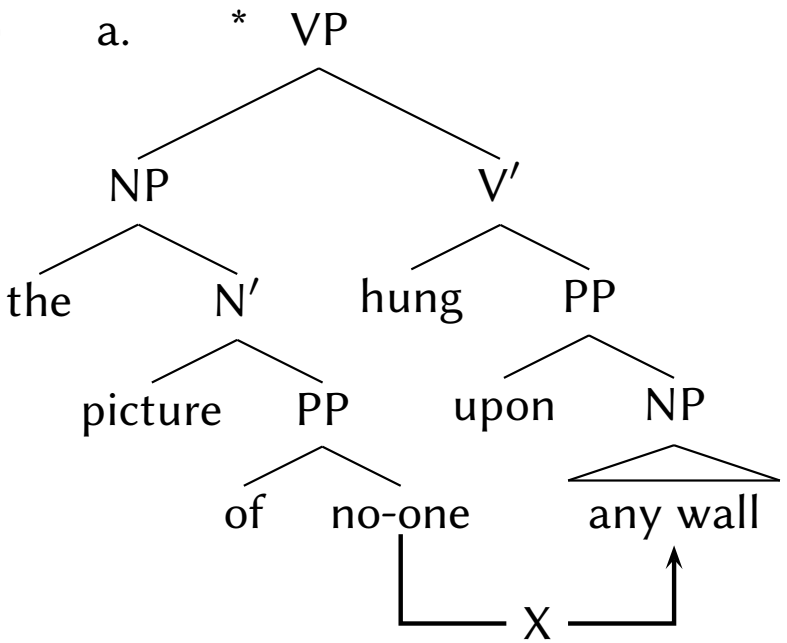
Aside:

- (27-a,b) illustrate two alternative analyses of (26-a). In (27-a), the PP *upon the wall* is analyzed as a complement to V. In (27-b) it is analyzed as an *adjunct*.
- Adjunction is a structure building mechanism that does not involve c-selection (or even Θ-role assignment). Accordingly, the complexity-level (XP vs. X′ vs. X) of the projection of some host remains unaffected by adjunction to the host.

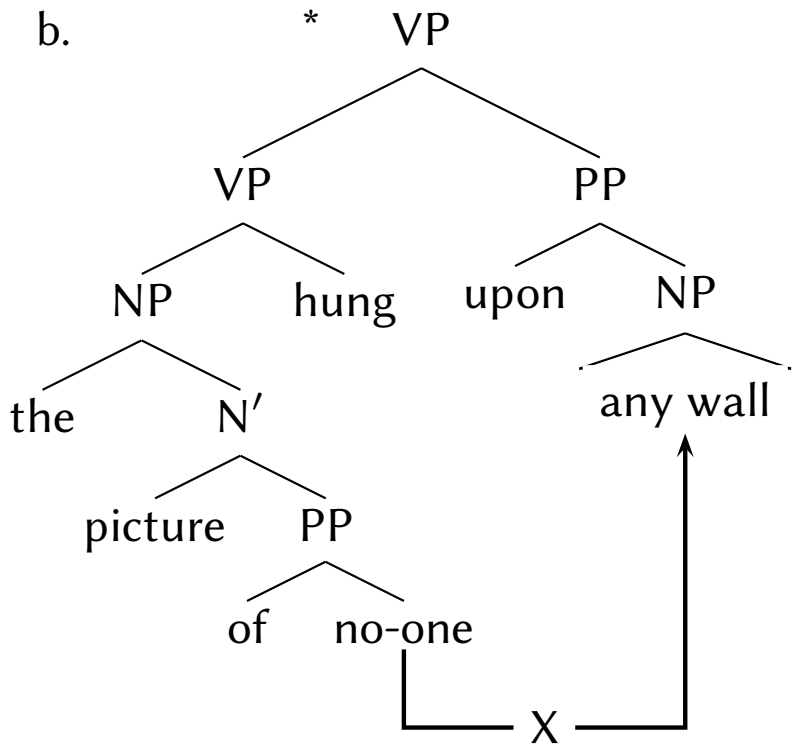
C-Command: Negative Polarity

Important point:
Whatever the right analysis ((27-a) or (27-b)), the negative constituent never comes to c-command the NPI.

(27) a.



b.



C-Command: Variable Binding

Bound variable readings:

- (28-a) (from German) can be paraphrased as (28-c), where the pronoun *er* "he" shows up as a variable *x* whose interpretation is dependent on (*bound by*) the quantifier *jeder* "every-one"
- (28-b) cannot receive such a paraphrase. (29) offers a first generalization of this contrast (based on linear precedence).

(28)
a. weil jeder, dass er geeignet ist, glaubt
since every-one that he suitable is believes
b. weil er, dass jeder geeignet ist, glaubt
since he that every-one suitable is believes
c. For every *x*, *x* a person: *x* believes that *x* is suitable.

(29) *Variable binding generalization:*
A pronoun P can be interpreted as a variable that is bound by a quantifier Q if Q *linearly precedes* P.

C-Command: Variable Binding

Problem:
(30-a) cannot be paraphrased as (30-c), but (30-b) can.

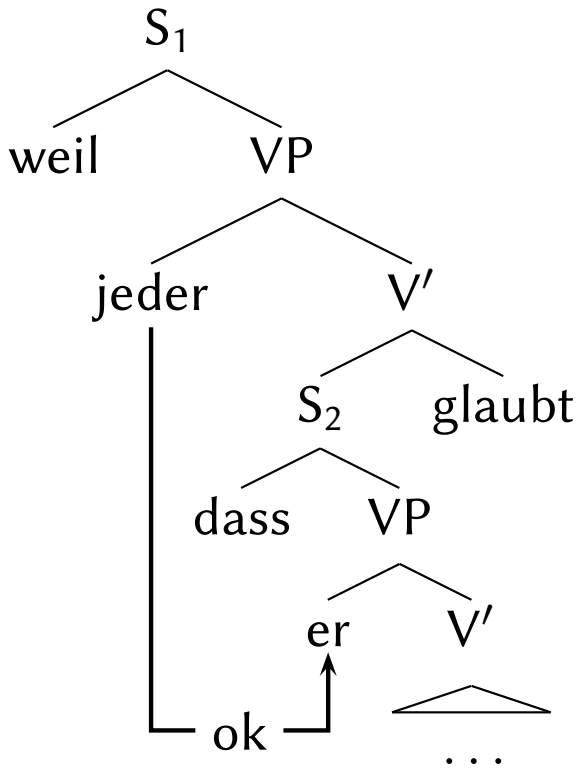
(30) a. weil, dass jeder geeignet ist, er glaubt
since that every-one suitable is he believes
b. weil, dass er geeignet ist, jeder glaubt
since that he suitable is every-one believes
c. For every *x*, *x* a person: *x* believes that *x* is suitable ist.

C-command does the trick:
A superior generalization, which is based on c-command, is given in (31).

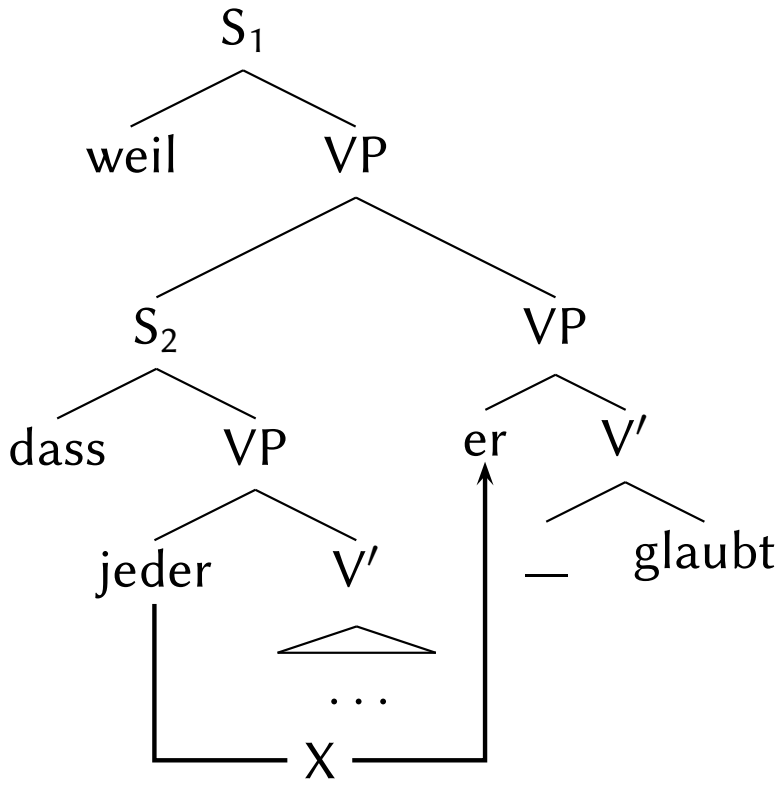
(31) *Variable binding generalization (revised):*
A pronoun P can be interpreted as a variable that is bound by a quantifier Q if Q *c-commands* P.

C-Command: Variable Binding

(32) a. (= (28-a))



b. (= (30-a))



Comments:

- S is a category that results from merging *dass/weil* with VP.
- S_2 in (32-b) (the IA) has been displaced across the EA *er* from the position marked by "_" and has been adjoined to VP.

Take-home message

Take-home message:

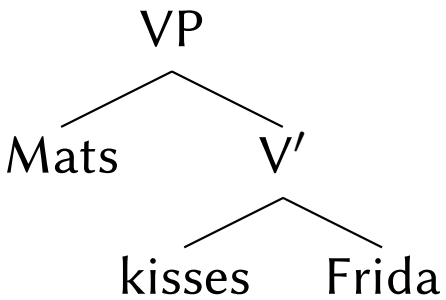
- Syntactic phenomena (such as reflexivization, negative polarity, variable binding, etc.) are rarely (perhaps never!) governed by linear precedence.
- Rather, they are subject to principles that make reference to the hierarchical structure created by Merge via the notion of c-command.

UTAH

Argument linking:

- Why is it not possible to express the proposition "Frida kisses Mats" by the structure in (33)?
- Interpretation: Not only must the Θ-roles of a lexical head X be assigned to some position within XP (due to feature checking locality). They also must be assigned to a specific position within XP (*argument linking*).
- In the case of a transitive VP: the theme-role is assigned to the IA (in the complement-position) of V, the agent-role to the EA (in the specifier-position of V).

(33)



UTAH

A hypothesis:

- This association of phrase-structural position and Θ-role is to be generalized over different types of predicates within and across languages.
- The hypothesis that expresses this has become known as the *Uniformity of Theta Assigment Hypothesis* (UTAH, Baker 1988).

(34) *Uniformity of Theta Assigment Hypothesis*:
Identical thematic relations between predicate and argument are expressed by identical phrase-structural relations.

Unergative versus unaccusative predicates

Consequence (Perlmutter 1978, Burzio 1986):

- An intransitive verb that assigns a theme-role to its only argument (e.g., *die, fall, sicken, drown, arrive, collapse*, etc.) assigns this role to the complement position: *unaccusative verb*.
- An intransitive verb that assigns an agent-role to its only argument (e.g., *work, jump, call, dance, yell, run*, etc.) assigns this role to a specifier position: *unergative verb*.
- This phrase-structural difference between two classes of intransitive predicates has syntactic consequences.

Unergative versus unaccusative predicates

Auxiliary selection and agreement in Italian (Burzio 1986):

(35) *Unergative and unaccusative predicates behave alike:*

a. Molte ragazze telefonano.
many girls call
'Many girls call.'

b. Molte ragazze arrivano.
many girls arrive
'Many girls arrive.'

(36) *Unergative and unaccusative predicates behave differently:*

a. Molte ragazze hanno telefonato.
many girls have called-PRET.PART.3.MASC.SG
'Many girls called.'

b. Molte ragazze sono arrivate.
many girls are arrive-PRET.PART.3.FEM.PL
'Many girls have arrived.'

Unergative versus unaccusative predicates

Auxiliary selection, attributive participles, nominalizations in German (Grewendorf 1989):

(37) a. Er hat gearbeitet.
he has worked
'He worked.'

b. Er ist untergegangen.
he is drowned
'He drowned.'

(38) a. *der gearbeitete Student
the worked student
'the student who worked'

b. der eingeschlafene Student
the slept student
'the student who fell asleep'

(39) a. Arbeit-er, Tänz-er
work-er, danc-er

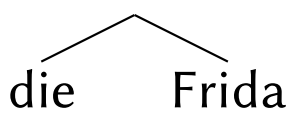
b. *Ankomm-er, *Fall-er
arriv-er, fall-er

Unergative versus unaccusative predicates

Problem (to be solved soon):

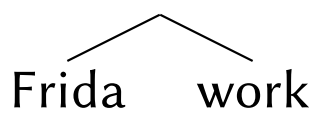
- While the difference between unergative (e.g. *work*) and unaccusative (e.g. *die*) intransitive predicates appears to be a real one, we cannot account for it in purely structural terms (for now).
- If there is only one argument, Merge will automatically make this the IA of the predicate. In other words: specifier positions can only be created if there is already a complement present.
- Ways to analyse the position occupied by *Frida* in (41) as a specifier would be a) by making reference to linear precedence (under the assumption that a complement would have to appear to the right), or b) by assuming an "empty" complement position to be present (cf. Hale and Keyser 1993), both of which may seem unattractive.

(40)



(unaccusative)

(41)



(unergative)

Bibliography

Baker, M. (1988). *Incorporation: A Theory of Grammatical Function Changing*. University of Chicago Press, Chicago.

Burzio, L. (1986). *Italian Syntax: A Government-Binding Approach*. Reidel, Dordrecht.

Grewendorf, G. (1989). *Ergativity in German*. Foris, Dordrecht.

Hale, K. and Keyser, S. J. (1993). On argument structure and the lexical expression of syntactic relations. In Hale, K. and Keyser, S. J., editors, *The View from Building 20*, pages 53–109. MIT, Cambridge, Massachusetts.

Perlmutter, D. (1978). Impersonal passives and the unaccusative hypothesis. In *Forth Annual Meeting of the Berkeley Linguistics Society*, pages 157–190, Berkeley CA. BLS.

Reinhart, T. (1976). *The Syntactic Domain of Anaphora*. PhD thesis, MIT, Cambridge, Massachusetts.