Class 2: Building words

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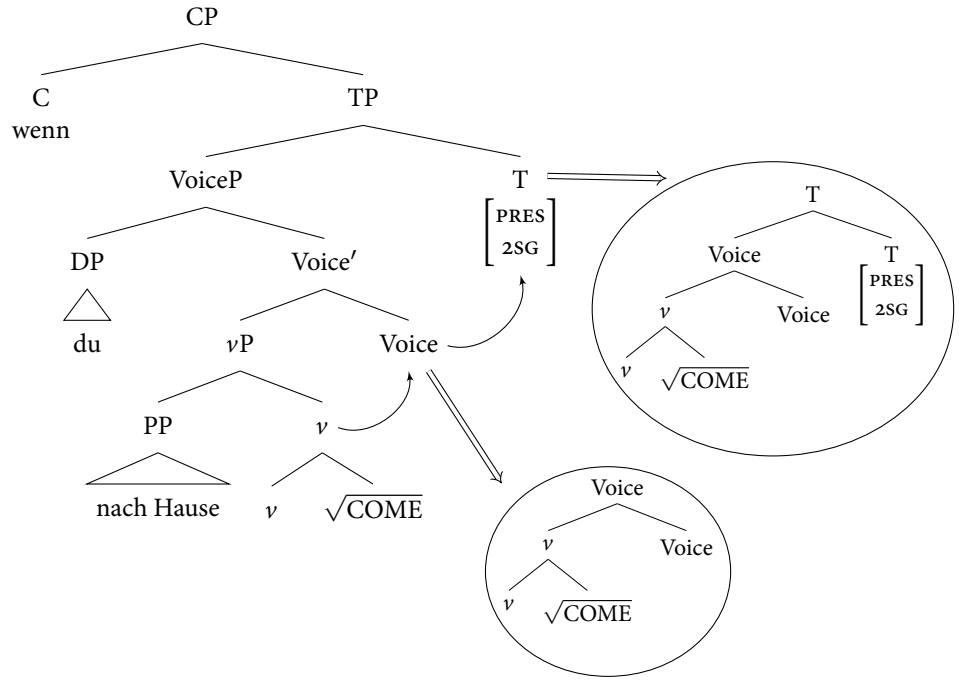
1 Head Movement

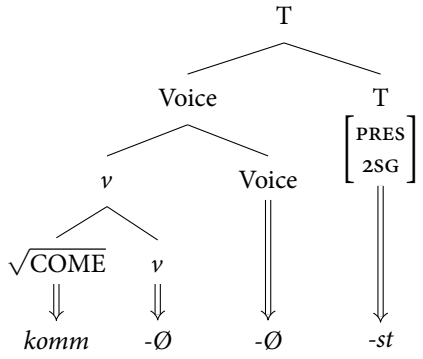
(1) wenn du nach Hause komm-st …
when you to house come-2SG.PRES
'when you get home…'

(2)



- The complex head formed by movement to T is then spelled-out in the usual way:

(3)



2 Lowering

- Is head movement the only way of forming a complex head?
- Consider English:

(4) a. The cat never plays with this toy.
b. *The cat plays never with this toy.

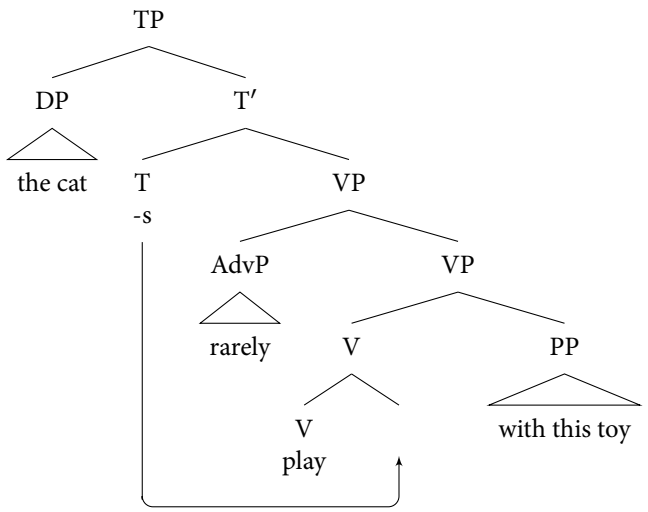
- Compare French:

(5) Jean embrasse [$_{VP}$ souvent [$_{VP}$ ___ Marie]]
John kisses often Mary
'John often kisses Mary'

- Standard interpretation (Pollock 1989): The verb moves to T in French (past any adverbs).

- If the finite verb moved to T in English, then it's placement relative to adverbs would be unexpected.
- Classic analysis of Chomsky (1957): *Affix Hopping*

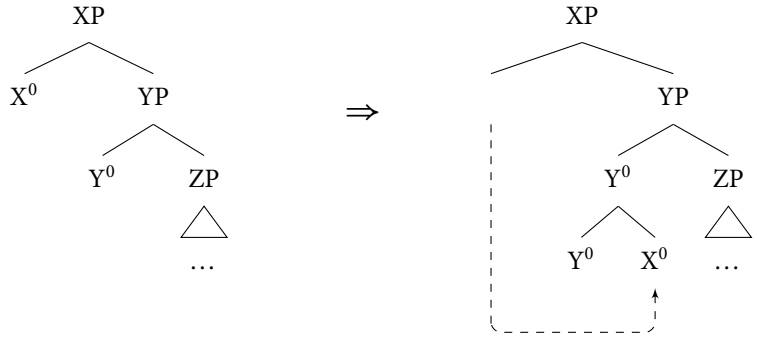
(6)



- In DM, complex heads may be formed by a postsyntactic operation *Lowering* (Embick and Noyer 2001; see Marantz 1984 for an important precursor):

Lowering

For any two heads X and Y such that YP is the complement of X, adjoin X to Y:



- Importantly, this operation can skip intervening adjoined phrases.

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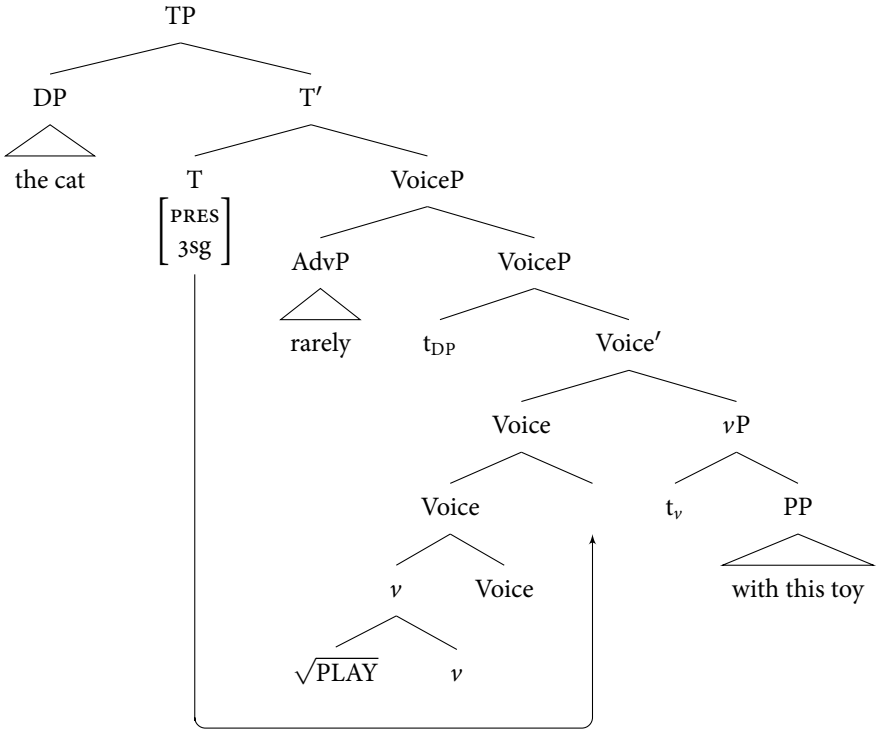
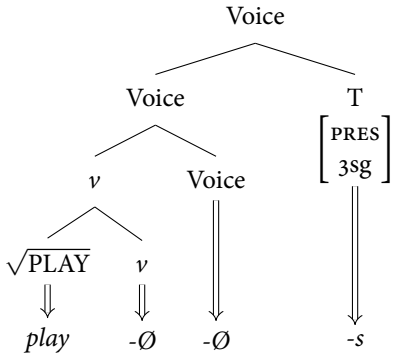


- The complex head that is formed:

(8)

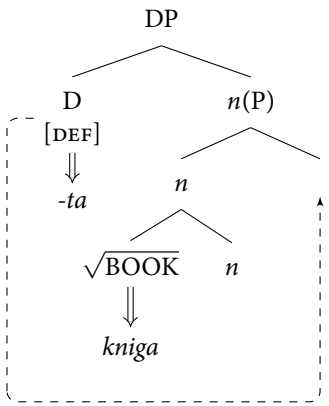


- In Bulgarian, definiteness is marked by a suffix *-ta* (Embick and Noyer 2001):

(9) a. kniga-ta
book-DEF
'the book'

b. xubava-ta kniga
nice-DEF book
'the nice book'

(10)



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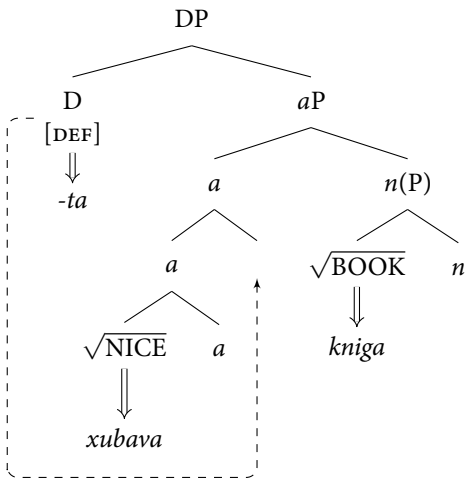


- Why not just attach to first word in the noun phrase?

(12) a. [$_{aP}$ mnogo starij-ə] teatər
very old-DEF theatre
'the very old theatre'

b. [$_{aP}$ dosta glupava-ta] zabaležka
quite stupid-DEF remark
'the quite stupid remark'

- Danish marks definiteness in a similar way (Embick and Noyer 2001):

(13) a. hest-en
horse-DEF
'the horse'

b. *den hest
DEF horse
'the horse'

- NB: (13b) is acceptable when the determiner is stressed and functions as a demonstrative ('that horse') (Hankamer and Mikkelsen 2002: 143).

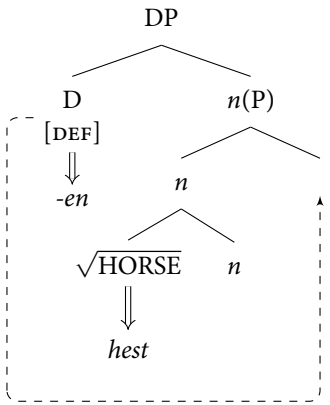
- If modified by an adjective, however, the suffixal definite marker is blocked:

(14) a. *gamle hest-en
old horse-DEF
'the old horse'

b. den gamle hest
DEF old horse
'the old horse'

- Difference between Bulgarian and Danish? In Danish the suffix in D must attach to a noun (*n*), while Bulgarian allows it to attach to *a*, too.

(15)



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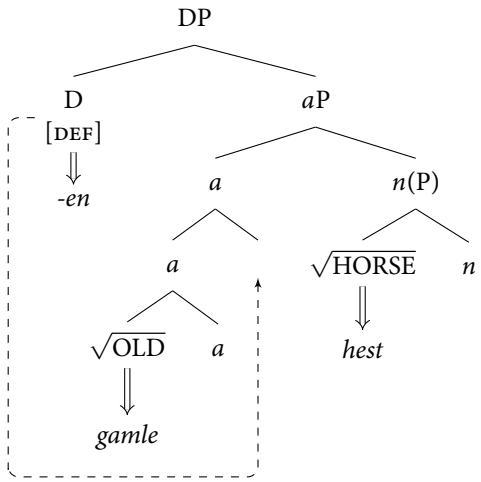
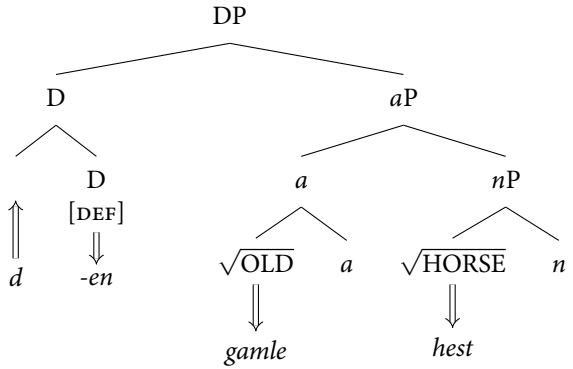


- The stranded suffix in D requires a host – a morpheme *d* is inserted (cf. *do*-support):

(17)

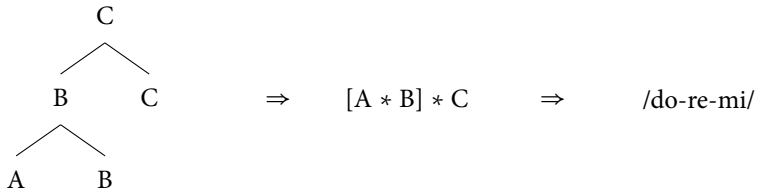


- This line of analysis faces some challenges, however (see Hankamer and Mikkelsen 2005).

3 Linearization and Local Dislocation

- A common assumption is that, prior to Vocabulary Insertion, the hierarchical structure generated by the syntax is translated into a string of linearized terminals:

(18)



(Syntax) (Linearization) (Vocabulary Insertion)

- Embick and Noyer (2001) assume that displacement can take place in the linearized string.
- The ∗ symbol here stands for linear precedence: [A ∗ B] precedes C and A precedes B (so, A also precedes C by transitivity).
- The linearized representation also contains bracketing to indicate the constituent relations.
- Insertion applies 'inside-out' starting from the root (Bobaljik 2000).
- One can replace the initial ∗-relation with a relation of affixation.

Affixation

A linear-precedence relation X ∗ Y may be replaced by an affixation relation X-Y/Y-X.

(19)
a. [A ∗ B] ∗ C (Linearization)
b. [*do* ∗ *re*] ∗ C (Vocabulary Insertion – inner bracket)
c. *do-re* ∗ C (Affixation)
d. *do-re-mi* (Vocabulary Insertion – C)

Local Dislocation (cf. Embick and Noyer 2001: 563)

In a structure X ∗ [Y ∗ Z], X's ∗-relation to [Y ∗ Z] may be exchanged for an affixation relation to Y (the linearly-closest element of [Y ∗ Z]).

$$\underline{X} * [Y * Z] \Rightarrow Y + \underline{X} * Z$$

NB: It is possible that there is a prior step of Rebracketing: X ∗ [Y ∗ Z] ⇒ [X ∗ Y] ∗ Z

(20)
a. [A ∗ B] ∗ C (Linearization)
b. [*do* ∗ *re*] ∗ C (Vocabulary Insertion – inner bracket)
c. *do* ∗ C-*re* (Local Dislocation)
d. *do-mi-re* (Vocabulary Insertion – C)

- Concrete example:

(21)
a. Sarah is smarter than me.
b. *Sarah is intelligenter than me.
c. Sarah is more intelligent than me.

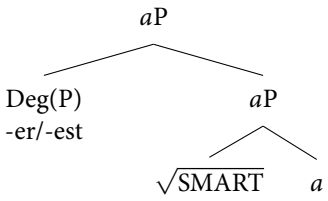
(22)
a. Sarah is the smartest.
b. *Sarah is the intelligentest.
c. Sarah is the most intelligent.

Comparative/superlative rule (English)

Attach Deg to a monosyllabic adjectival host via Local Dislocation.

- The structure of an adjective phrase with a comparative/suplerative degree modifier:

(23)



(24)
a. Deg ∗ [$\sqrt{\text{SMART}}$ ∗ *a*] (Linerization)
b. Deg ∗ [*smart* ∗ Ø] (Vocabulary Insertion – inner bracket)
c. *smart*-Deg ∗ Ø (Local Dislocation)
d. *smart-er* ∗ Ø (Vocabulary Insertion – Deg)
e. *smart-er-Ø* (Affixation)

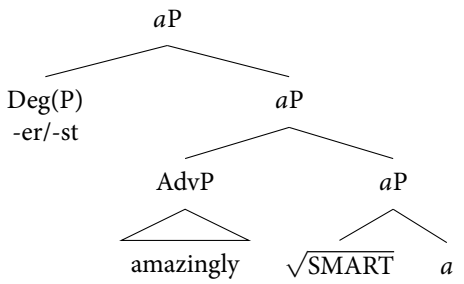
- Importantly, the form of the adjective is already present when

(25)
a. Deg ∗ [$\sqrt{\text{INTELLIGENT}}$ ∗ *a*] (Linerization)
b. Deg ∗ [*intelligent* ∗ Ø] (Vocabulary Insertion – inner bracket)
c. **intelligent*-Deg ∗ Ø (Local Dislocation not possible)
d. *-er* ∗ [*intelligent* ∗ Ø] (Vocabulary Insertion – Deg)
e. *mo* ⇑ *-er* ∗ [*intelligent* ∗ Ø] (*mo*-support)

- If the adjective is modified by an adverb like *amazingly*, attachment of Deg is blocked:

(26) a. *Sarah is the amazingly smartest person
b. Sarah is the most amazingly smart person

(27)



(28) a. Deg ∗ [AdvP ∗ [$\sqrt{\text{SMART}}$ ∗ *a*]]
b. Deg ∗ [AdvP ∗ *smart*-Ø] (Affixation/Vocabulary Insertion)
c. Deg ∗ [*amazingly* ∗ *smart*] (Vocabulary Insertion)
d. **amazingly* ∗ *smart*-Deg (Local Dislocation not possible)
e. *-st* ∗ [*amazingly* ∗ *smart*] (*mo*-support)
⇑
mo

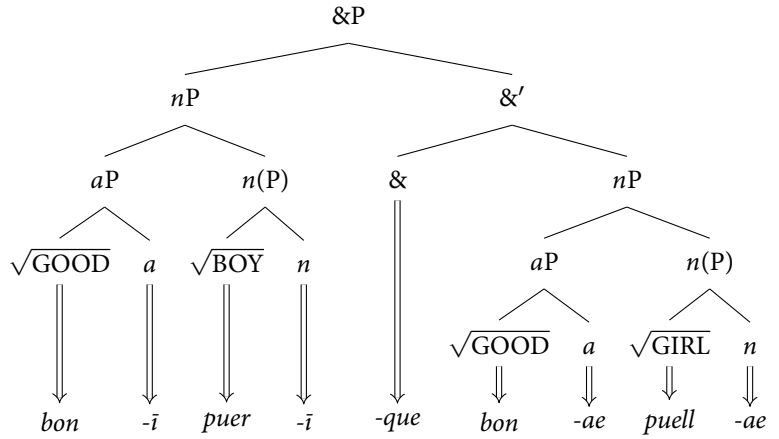
- Consider the coordinator *-que* in Latin (Embick and Noyer 2001; Embick 2007):

(29)
[vivimus] ___ [vigemus-**que**]
live.1PL flourish.1PL-and
'We live and we flourish.'

- It appears to attach to the second conjunct, but if the conjunct is internally complex, it attachs to the first word inside the conjunct:

(30)
[bon-ī puer-ī] ___ [bon-ae-**que** puell-ae]
good-NOM.PL boy-NOM.PL good-NOM.PL-and girl-NOM.PL
'good boys and good girls'

(31)



(32) a. [& ∗ [[$\sqrt{\text{GOOD}}$ ∗ *a*] ∗ [$\sqrt{\text{GIRL}}$ ∗ *n*]]] (Linearization of &′)
b. [& ∗ [*bon-ae* ∗ *puell-ae*]] (Vocabulary Insertion)
c. [*bon-ae-*& ∗ *puell-ae*] (Local Dislocation of &)
d. [*bon-ae-que* ∗ *puell-ae*] (Vocabulary Insertion)
e. [[$\sqrt{\text{GOOD}}$ ∗ *a*] ∗ [$\sqrt{\text{BOY}}$ ∗ *n*]] ∗ [*bon-ae-que* ∗ *puell-ae*]
f. [*bon-ī* ∗ *puer-ī*] ∗ [*bon-ae-que* ∗ *puell-ae*]

- Now consider how *que* is positioned relative to prepositions:

(33) a. circum-que ea loca
around-and those places
'and around those places'
b. contrā-que lēgem
against-and law
'and against the law'

(34) a. in rēbus-que
in things-and
'and in things'
b. dē prōvinciā-que
from province-and
'and from the province'

- Embick and Noyer (2001) assume that phonologically light (monosyllabic) preposition are morphologically affixed to their nominal complement. They therefore act as a single unit for the purposes of Local Dislocation:

(35) a. & ∗ [*in* ∗ *rēbus*]
b. & ∗ [*in*+*rēbus*] (Affixation/Leaning)
c. *in*+*rēbus*-& (Local Dislocation)
d. *in*+*rēbus-que* (Vocabulary Insertion of &)

4 Fission

- Consider German (regular) preterite tense forms:

(36)

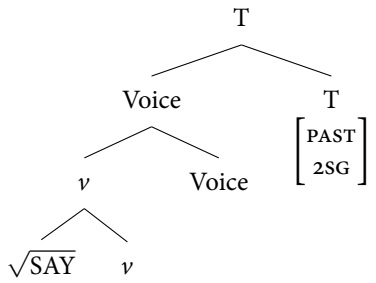
	singular	plural
1	sag-t-e	sag-t-en
2	sag-t-est	sag-t-et
3	sag-t-e	sag-t-en

a. [SG] ↔ -e
b. [2, SG] ↔ -(e)st
c. [2, PL] ↔ -(e)t
d. [PL] ↔ -(e)n

e. [PAST] ↔ -t

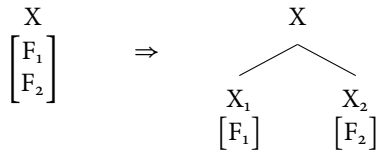
- A common assumption in DM is that each morpheme 'position' corresponds to a distinct terminal node.
- Given the syntax of the German verb, we only have one position for both tense and agreement:

(37)



Fission

For a head X bearing feature sets F_1 and F_2, create two distinct daughters of X, X_1 and X_2, such that X_1 bears F_1 and X_2 bears F_2.

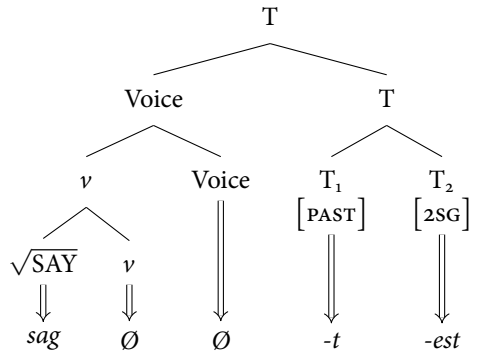


- We can assume that German has a Fission rule that splits off tense from agreement:

German past tense rule

A head bearing both [PAST] and [φ] must be fissioned into H_1 and H_2, such that H_1 bears [PAST] and H_2 bears [φ].

(38)



- Possible objection: How do we know this isn't just a single suffix, e.g. *-test*?
- Consider these paradigms from Ṣanʕānī Arabic for the verb 'sit' (Hewett 2023):

(39) *Prefixing conjugation*

	singular	plural
1	**ʔa**-gambir	**ni**-gambir
2M	**ti**-gambir	**ti**-gambir-**ū**
2F	**ti**-gambir-**ī**	**ti**-gambir-**ayn**
3M	**yi**-gambir	**yi**-gambir-**ū**
3F	**ti**-gambir	**yi**-gambir-**ayn**

Suffixing conjugation

	singular	plural
1	gambar-**t**	gambar-**nā**
2M	gambar-**t**	gambar-**t**-**ū**
2F	gambir-**t**-**ī**	gambar-**t**-**ayn**
3M	gambar	gambir-**ū**
3F	gambir-**at**	gambir-**ayn**

- In the prefixing conjugation, for non-1st persons, agreement is clearly *discontinuous*: Person is realized by a prefix (2 = *ti-*, 3= *yi-*), while number and gender are realized as a suffix (M, PL = *-ū*, M, PL = *-ayn*).
- This pattern is found across Afro-Asiatic languages has been taken a good argument for Fission rules (Noyer 1992; Halle 1997).

Ṣanʕānī Arabic Fission rule

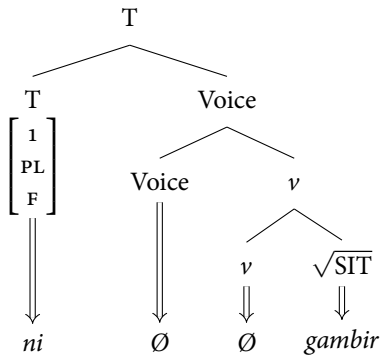
A head bearing either [2] or [3] as well as [NUMBER, GENDER] must be fissioned into H_1 and H_2, such that H_1 bears [PERSON] and H_2 bears [NUMBER, GENDER].

(40) *Prefixing conjugation*

	singular	plural
1	**ʔa**-gambir	**ni**-gambir
2M	**ti**-gambir	**ti**-gambir-**ū**
2F	**ti**-gambir-**ī**	**ti**-gambir-**ayn**
3M	**yi**-gambir	**yi**-gambir-**ū**
3F	**ti**-gambir	**yi**-gambir-**ayn**

(41)
a. [1, PL] ↔ ni-
b. [1, SG] ↔ ʔa-
c. [M, PL] ↔ -ū
d. [F, PL] ↔ -ayn
e. [F, SG] ↔ -ī
f. [2] ↔ ti-
g. [3] ↔ yi-

(42)



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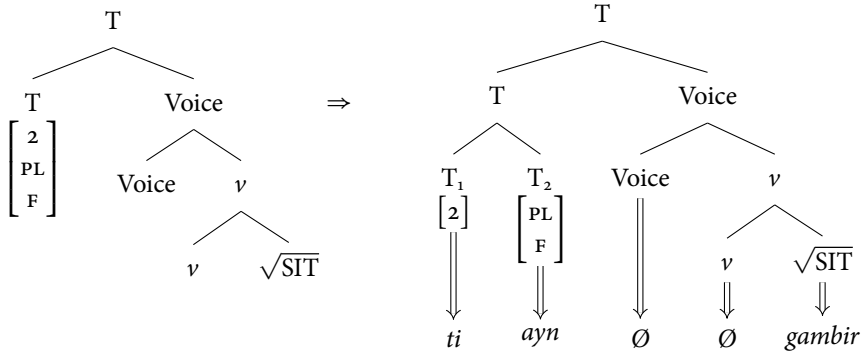


- Now, we need to do some Local Dislocation to get the exponent of T_2 as a suffix:

(44)
a. $[T_1 * T_2] * gambir$
b. $T_1 * [T_2 * gambir]$ (Rebracketing)
c. $T_1 * gambir\text{-}T_2$ (Local Dislocation of T_2)
d. $T_1 * gambir\text{-}ayn$ (Vocabulary Insertion of T_2)
e. *ti-gambir-ayn* (Affixation/Vocabulary Insertion of T_1)

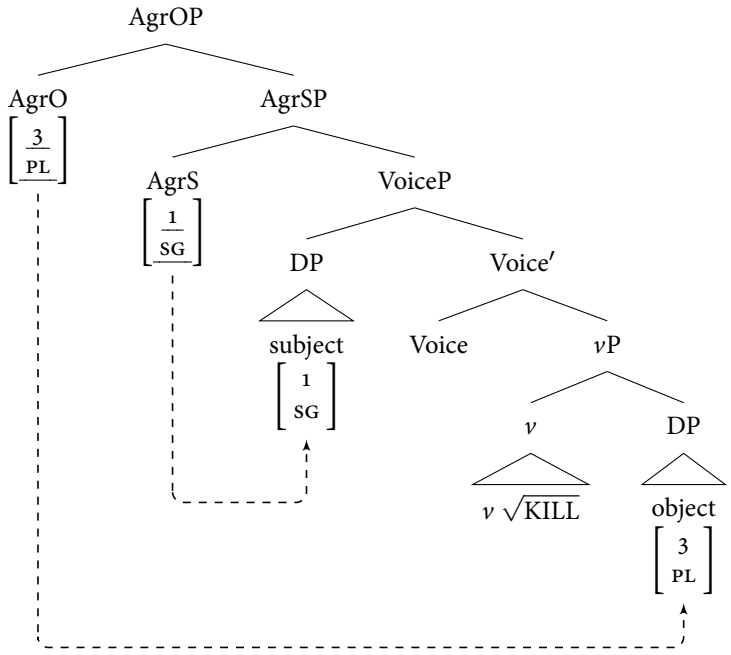
5 Fusion

- Fission is need for cases in which there are more exponents than abstract morphemes. What about the reverse scenario?
- Are there cases in which two separate morpheme slots are sometimes realized by one?
- These are known as *portmanteau* morphemes (Hockett 1954).
- Consider object marking in Lakota (data from Woolford 2016):

(45)
a. wa- psiča
1SG.ACT- jump
'I jumped.'
b. ma- xwa
1SG.STAT- be.sleepy
'I am sleepy.'
c. ya- čheye
2- cry
'You cry.'
d. wičha- wa- kte
3PL- 1SG- kill
'I kill them.'
e. ma- ya- kte
1SG.STAT- 2- kill
'You kill me.'
f. čhi- kte
1/2- kill
'I kill you.'

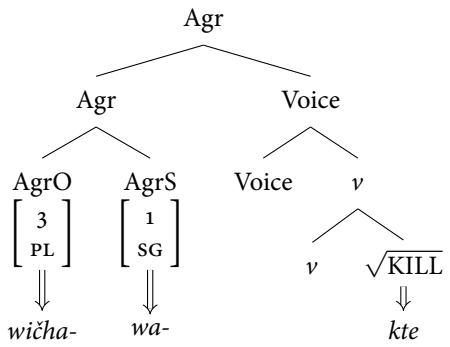
- Subject and object of transitive verbs are marked by separate morphemes (OBJ-SUBJ-verb).
- 1st person subject and 2nd person object is marked by a single morpheme (*čhi-*).

(46)



- Structure of the verb in Lakota:[1]

(47)



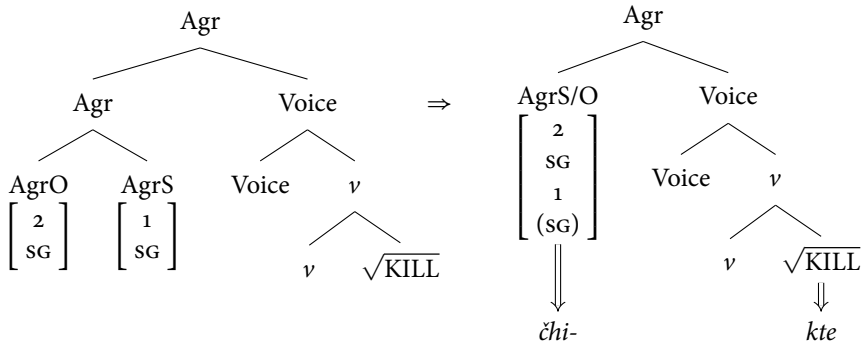
(48) wičha- wa- kte
3PL- 1SG- kill
'I kill them.'

- Halle and Marantz (1993) proposed an operation of Fusion that takes two sister nodes and fuses them into a single node bearing the features of both heads.

Lakota Fusion rule

If AgrO and AgrS are in a sister relation, such that AgrO bears [2, SG] and AgrS bears [1,SG], then fuse AgrO and AgrS.

(49)



(50)
a. [1, 2, SG] ↔ čhi-
b. [3, PL] ↔ wičha-
c. [1, SG] ↔ wa/-ma-
d. [2, SG] ↔ ya-

[1] We can assume that AgrO and AgrS form a complex head separately and then lower to the verb.

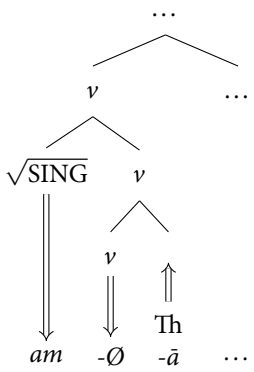
- Fusion rules are typically not as widely used as Fission.
- The main reason is that portmanteaux can also be derived through context-specific forms:

(51)
a. [$_{\text{AgrS}}$ 1, SG] ↔ čhi- / [___ 2, SG]
b. [$_{\text{AgrO}}$ 2, SG] ↔ Ø / [___ 1, SG]

6 Dissociated morphemes

- We have seen several cases in which morphemes appear to be inserted at PF.
- These are called *dissociated morphemes*.
- A standard view is that theme vowels are inserted at PF (Oltra-Massuet 1999):

(52) am- -ā -v -er -am
love -TH -ASP -T -AGR
'I had loved.' (Latin; Embick 2000)



- Case study from Spanish (Oltra-Massuet and Arregi 2005):

(53)

a. Final stress

1sg Fut	can.ta.ré
1sg Prf	can.té

b. Antepenultimate stress

1pl Cond	can.ta.rí.a.mos
1pl ImpSubj	can.tá.ra.mos

c. Penultimate stress

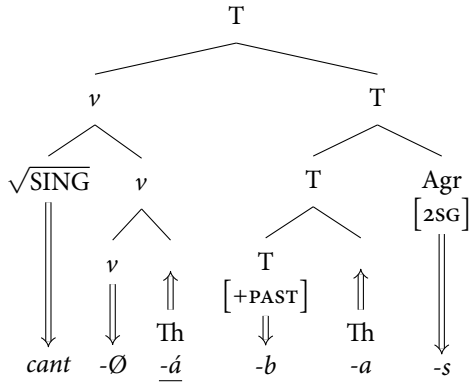
2sg ImpInd	can.tá.bas
1pl Fut	can.ta.ré.mos
2sg Cond	can.ta.rí.as

- Spanish stress placement appears highly irregular.

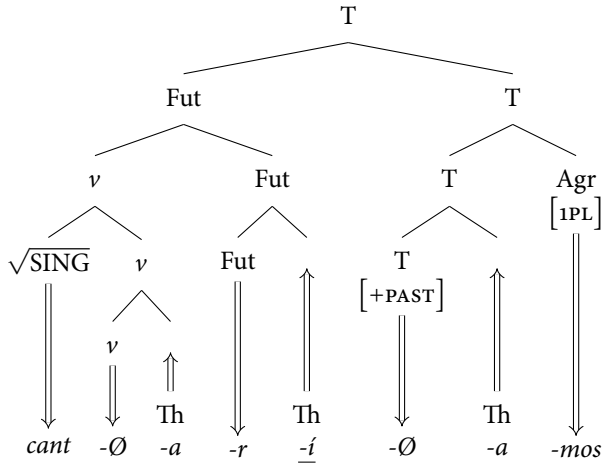
(54) *Generalization* (Oltra-Massuet and Arregi 2005)
Stress in Spanish falls on the vowel preceding the T node.

- Key assumption: Theme vowel insertion at every functional head.

(55) *cantábas* 'you (sg.) sang' (imperfective indicative)



(56) *cantaríamos* 'we would sing' (conditional)



- NB: The conditional consists syntactico-semantically of future + past projections.

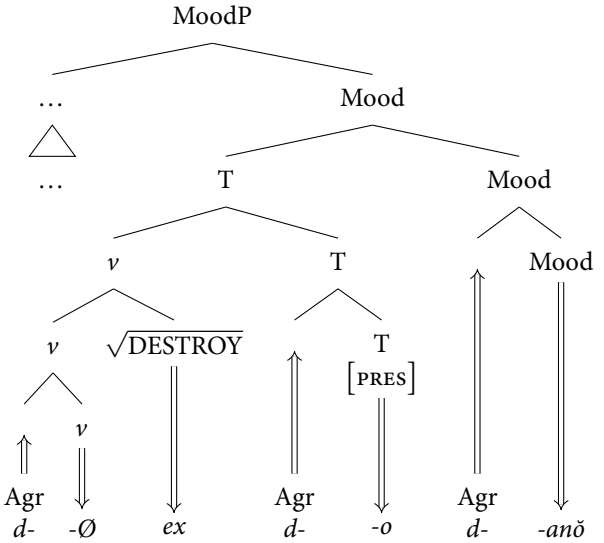
- It is not just theme vowels that can be inserted: Some languages also show multiple agreement morphemes inside the verb.
- Harris (2009) calls this 'exuberant exponence'.
- In Batsbi, the agreement morpheme cross-referencing the noun class (≈gender) and number surfaces multiple times in the verb:

(57) a. tiši^{n} c'a daħ **d**-ex-**d**-o-**d**-anŏ
old house.ABS PV CLASS-destroy-CLASS-PRES-CLASS-EVID
'They are evidently tearing down the old house.'

b. **y**-ox-**y**-o-**y**-anŏ
CLASS-rip-CLASS-PRES-CLASS-EVID
'Evidently, she ripped it.'

- This seems amenable to analysis as adjunction of an agreement morpheme (Agr) to each functional head:

(58)



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