Class 3: Morphotactics

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1 Affix order

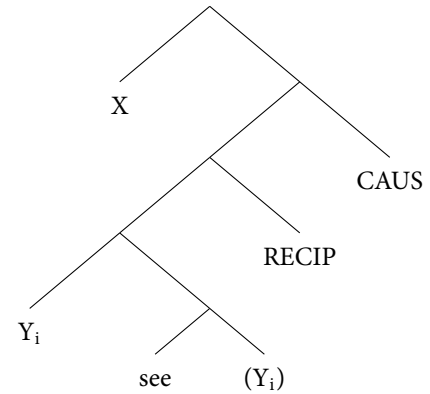
Mirror Principle (Baker 1985)

The order of morphemes reflects syntactic hierarchy.

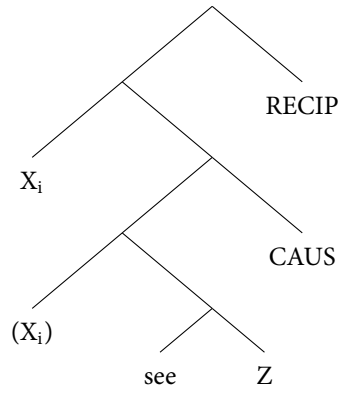
- Semantically transparent affix order in Quechua (Muysken 1986; Ryan 2010):

(1) a. riku-na-chi-n-ku
see-RECIP-CAUS-3-PL
'They make (them) see each other.'
b. riku-chi-na-n-ku
see-CAUS-RECIP-3-PL
'They make each other see (something).'

(2)

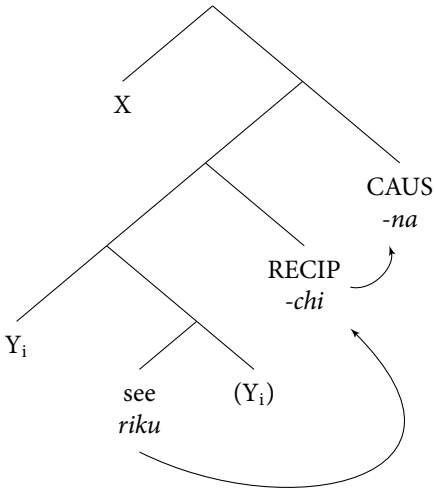


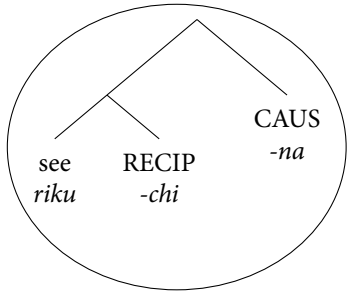
'cause someone to see each other'



'cause each other to see someone.'

(3)





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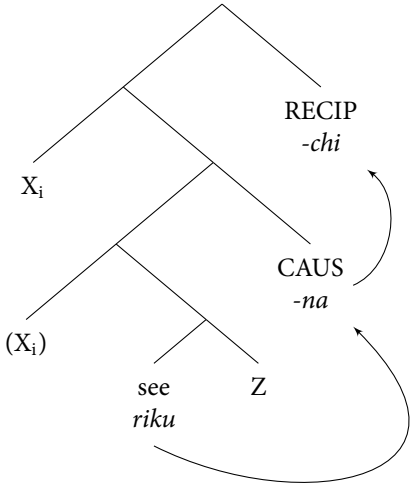
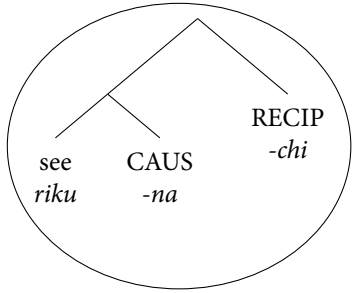




- **Problem**: Affix orders are not always semantically transparent in Chichewa:

(5) *Optionality with one scope only* (Hyman 2003: 250; Ryan 2010: 760)

a. a-ku-máng-its-a:n-a ~ a-ku-máng-a:n-its-a
3PL-PROG-tie-CAUS-RECIP-FV 3PL-PROG-tie-RECIP-CAUS-FV
'They caused them to tie each other.' (CAUS > RECIP)

b. a-ku-máng-its-a:n-a
3PL-PROG-tie-CAUS-RECIP-FV
'They caused each other to tie (them).' (RECIP > CAUS)

(6) *Same affix order for different scopes* (Hyman 2003: 248)

a. Alenjé a-ku-líl-its-il-a mwanaá nodo
hunters 3PL-PROG-cry-CAUS-APPL-FV child sticks
'The hunters are making the child cry with sticks.' (CAUS > APPL)

b. Alenjé a-ku-tákás-its-il-a mkází mthíko
hunters 3PL-PROG-stir-CAUS-APPL-FV woman spoon
'The hunters are making the woman stir with a spoon.' (APPL > CAUS)

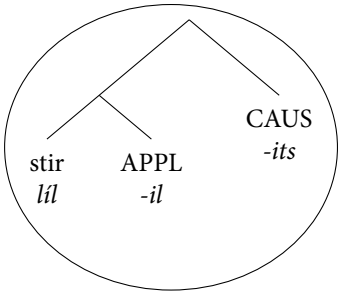
- NB: The applicative suffix adds an additional argument (instrument, location, beneficiary) like the causative does.

The Bantu CARP template (Hyman 2003)

VERB	-**C**AUSATIVE	-**A**PPLICATIVE	-**R**ECIPROCAL	-**P**ASSIVE
	-its	-il	-an	-idw

- Is this fatal for the Mirror Principle? Not if CARP enforces postsyntactic reordering:

(7)



(8) a. $[[\sqrt{\text{STIR}} * \text{APPL}] * \text{CAUS}]$
(violates CARP)

b. $[\sqrt{\text{STIR}} * \text{CAUS} * \text{APPL}]$
(Local Dislocation)

c. *líl-its-il*
(VERB-CAUS-APPL)

- Is there evidence for this?

- *Syntactic argument:* The same suffix order shows syntactic differences viz. passivization:

(9) a. Mchómbó a-ná-líl-its-il-a aná ndodo
Mchombo AGR-PAST-cry-CAUS-APPL-FV children stick
'Mchombo made the children cry with a stick.'

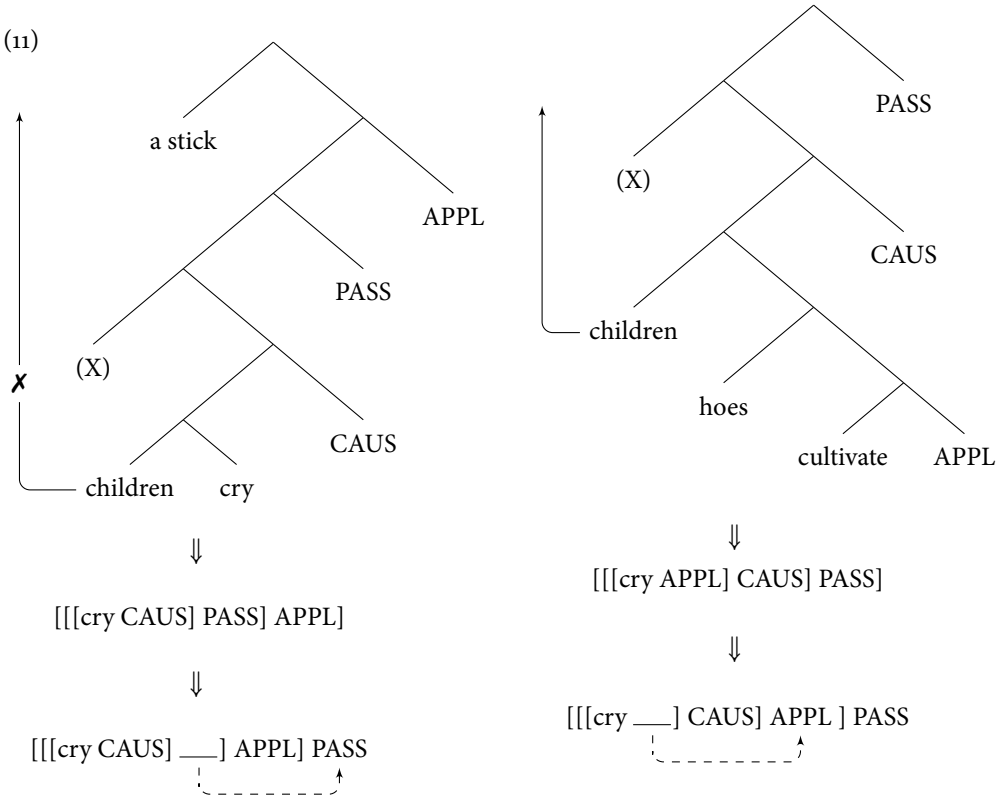
b. *aná a-ná-líl-its-il-idw-a ___ ndodo
children AGR-PAST-cry-CAUS-APPL-PASS-FV stick
'The children were made to cry with a stick.'

(10) a. Mchómbó a-ná-lím-its-il-a aná makásu
Mchombo AGR-PAST-cultivate-CAUS-APPL-FV children hoes
'Mchombo made the children cultivate with hoes.'

b. aná a-ná-lím-its-il-idw-a ___ makásu
children AGR-PAST-cultivate-CAUS-APPL-PASS-FV hoes
'The children were made to cultivate with hoes.'

- PASS suppresses an argument (here: the causer)

(11)



- The underlying syntax reflects the scopal order – this is later obscured by postsyntactic operations.
- CARP is therefore a 'morphotactic' constraint:

Morphotactics

A theory of which sequences of morphemes are (im)possible in a language

- What other kinds of morphotactic constraints are there and how do languages respect them?

2 Non-initiality in Spanish

- Different word order possibilities in Spanish imperatives (Arregi and Nevins 2018):

(12) *Standard Spanish*
Vénda -**n** -lo!
sell.IMP -PL -CL.3SG.M.ACC
'Sell it! (imperative pl.)'

(13) *Nonstandard Spanish*
a. Vénda -lo -**n**!
sell.IMP -CL.3SG.M.ACC -PL
'Sell it! (imperative pl.)'
b. Vénda -**n** -lo -**n**!
sell.IMP -PL -CL.3SG.M.ACC -PL
'Sell it! (imperative pl.)'

- We already know how to use Local Dislocation to derive (13b) from (12), for example.
- But Local Dislocation cannot derive doubling (13b).

Generalized Reduplication (Harris and Halle 2005)

Different possibilities for copying (copies underlined):

(14) a. Repeat all material inside […]:
[A B] → AB<u>AB</u>
b. Delete the material after > in the second copy:
[A > B] → AB<u>AB</u> → ABA
c. Delete the material before < in the first copy:
[A < B] → ~~A~~B<u>AB</u> → BAB

This now gives us a way of doing metathesis:

(15) [A > < B] → ~~A~~B<u>AB</u> → BA

- Some language realizes grammatical categories through reduplication, e.g. plural in Warlpiri (Marantz 1982):

(16) a. kurdu 'child' → kurdu-<u>kurdu</u> 'children'
b. kamina 'girl' → kamina-<u>kamina</u> 'girls'

- Reduplication can also be partial, e.g. in Chuckchee (17a) and Madurese (17b).

(17) a. nute → nute-<u>nut</u> 'earth (ABS.SG)'
b. búwáq-an → <u>wáq</u>-búwáq-an 'fruits'

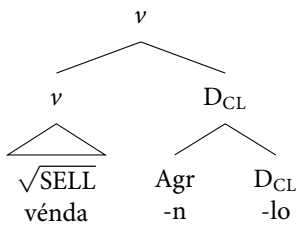
(Marantz 1982)

- Using Generalized Reduplication, we can account for both types:

(18) a. *Total reduplication*
[kurdu] → kurdukurdu
b. *Partial reduplication*
[nut > e] → nutenut~~e~~ → nutenut [bú < wáq]-an → ~~bú~~wáqbúwáq-an

- How do we derive the different options in Spanish imperatives?

(19)



√SELL Agr D_CL
vénda -n -lo

Standard Spanish
Vénda -**n** -lo!
sell.IMP -PL -CL.3SG.M.ACC
'Sell it! (imperative pl.)'

- NB: Arregi and Nevins (2018) assume that hierarchical and linear structures exist in parallel. Operations on linearized strings are mirrored in the hierarchical representation using the minimal structure means (Arregi and Nevins 2012: 324).

Noninitiality (Spanish)

Not all instances of *-n* are initial in a clitic cluster.

- This constraint can be formalized in the GR framework:

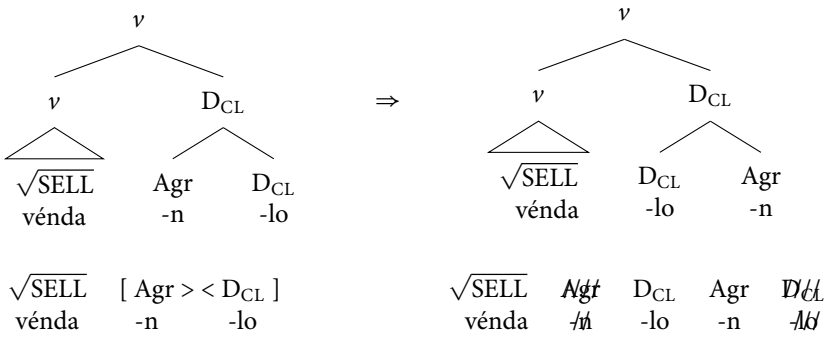
(20) *Plural mesoclisis (simplified)*
  a. Structural description: [$_{D_{CL}}$ Agr D_{CL} …, where Agr is plural,
  b. Structural change:
    (i) Insert [to the immediate left of Agr and] to the immediate right of D_{CL}.
    (ii) Insert either >< (displacement) or > (doubling) to the immediate right of Agr.

- Recall the two non-standard variants of the plural imperative:

(21) a. Vénda -lo -**n**!
sell.IMP -CL.3SG.M.ACC -PL
'Sell it! (imperative pl.)'

b. Vénda -**n** -lo -**n**!
sell.IMP -PL -CL.3SG.M.ACC -PL
'Sell it! (imperative pl.)'

(22)



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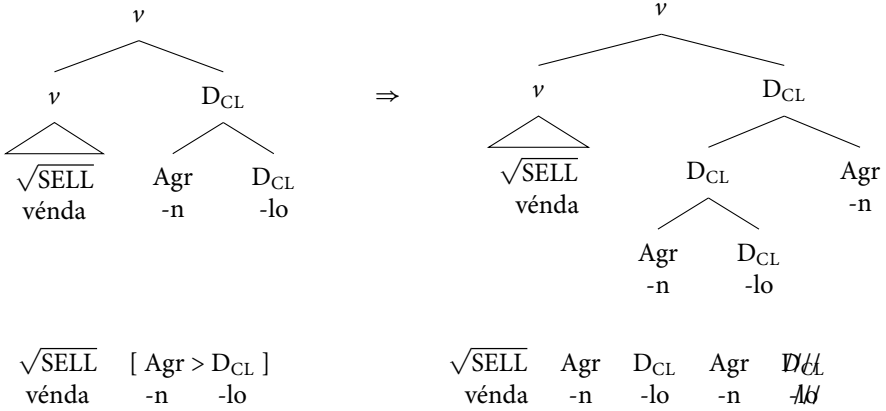


- This constraint can derive further variation with two argument clitics:

(24) *Standard Spanish*
Vénda -**n** -me -lo!
sell.IMP -PL -CL.1SG.DAT -CL.3SG.M.ACC
'Sell it! (imperative pl.)'

- Here, we find more variation across dialects and speakers:

(25) a. vénda-me-**n**-lo
b. vénda-me-lo-**n**
c. vénda-me-**n**-lo-**n**

(26) a. vénda-**n**-me-**n**-lo
b. vénda-**n**-me-lo-**n**
c. vénda-**n**-me-**n**-lo-**n**

- The GR framework can handle this if we assume that the rule in (20) applies cyclically.
- Consider the derivation of (25b).

(27) vénda -n -me -lo
⇓
vénda [-n >< -me] -lo
⇓
vénda -me /-n/ -n /-mos/ -lo
⇓
vénda -me [-n >< -lo]
⇓
vénda -me /-os/ -lo -n /-Ø/

- We also have the possibility of mixing displacement and doubling:

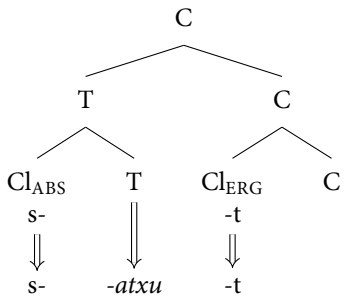
(28) vénda -n -me -lo
⇓
vénda [-n > -me] -lo
⇓
vénda -n -me -n /-mos/ -lo
⇓
vénda -n -me [-n >< -lo]
⇓
vénda -n -me /-os/ -lo -n /-Ø/

- In each case, we still have a repair to the morphotactic Noninitiality constraint. The difference is the size of the domain in which it applies.

3 Non-initiality in Basque

(29) Ni-k seu-Ø ikus-i [**s** -atxu -t]
I-ERG you.SG-ABS see-PFV CL.ABS.2SG -T.PRS.2SG -CL.ERG.1SG
'I have seen you.' (Ondarru)

(30)



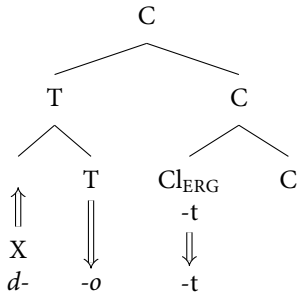
Noninitiality (Basque)

T may not be initial within the auxiliary

- Across and within dialects of Basque, we find different repairs:

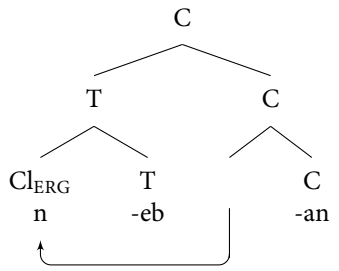
(31) Neu-k bakarrik eda-n [**d** -o -t] au-Ø
I-ERG only drink-PFV L -T.PRS.3SG -CL.ERG.1SG this-ABS.SG
ardau-au-Ø ?
wine-this-ABS.SG
'Only I have drunk this wine?' (Zamudio)

(32)



(33) Baña seoser-Ø ai-ttu [**n** -eb -an] e?
but something-ABS hear-PFV CL.ERG.1SG -T.PST.3SG -CPST huh
'But I heard something, huh?' (Lekeitio)

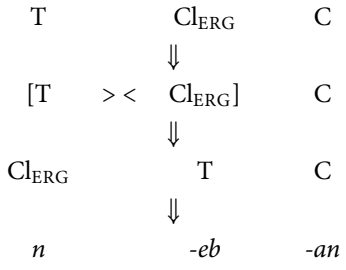
(34)



(35) *Ergative Metathesis*

a. Structural description: [$_{T}$ T$_{[PAST]}$ X Cl$_{ERG}$
b. Structural change:
   (i) Insert [to the immediate left of T, and] to the immediate right of Cl$_{ERG}$.
   (ii) Insert > < to the immediate left of Cl$_{ERG}$

(36)



- Interestingly, some dialects show a doubling strategy for ergative metathesis, too:

(37) a. s -eun -tz -n (→seuntzan)
Cl.ERG.2SG -PST.3SG -Cl.DAT.3SG -CPST
b. s -eu -ku -su -n (→seuskusun)
Cl.ERG.2SG -PST.3SG -Cl.DAT.1PL -CPST
(Alboniga)

- In the context of a 1sg dative clitic, the ergative is doubled.
- We can therefore modify (35) to allow doubing in such cases.
- Interestingly, the form of the ergative clitic is sensitive to the surface position (we get *s* when initial in the auxiliary).
- This has the consequence that displacement must apply *before* Vocabulary Insertion.

4 Initiality in Cypriot Greek

- There are strikingly similar patterns in Cypriot Greek (CG) (based on data from Pavlou 2018 as presented in Arregi and Nevins to appear).
- In CG, all past tense consonant-initial verb forms have a so-called 'augment' *e-*

(38) a. **é**- psi -n -es
AUG- cook -IMPF -PST.2SG
'You (sg.) were cooking.'

b. **e**- fíli -s -es
AUG- kiss -PFV -PST.SG
'You (sg.) kissed.'

- The augment precedes all material in the verb, including incorporated adverbs:

(39) a. **é**- para- psi -s -a
AUG- over- cook -PFV -PST.1SG
'I overcooked.'

b. **é**- ksana- psi -s -a
AUG- again- cook -PFV -PST.1SG
'I cooked again.'

- It is possible to multiple adverbs incorporate into the verb, as long as the augment precedes them all:

(40) a. **e**- ksana- para- psi -s -es
AUG- again- over- cook -PFV -PST.2SG
'You overcooked again.'

b. *ksana- **e**- para- psi -s -es
again- AUG- over- cook -PFV -PST.2SG
'You overcooked again.'

c. *ksana- para- **e**- psi -s -es
again- over- AUG- cook -PFV -PST.2SG
'You overcooked again.'

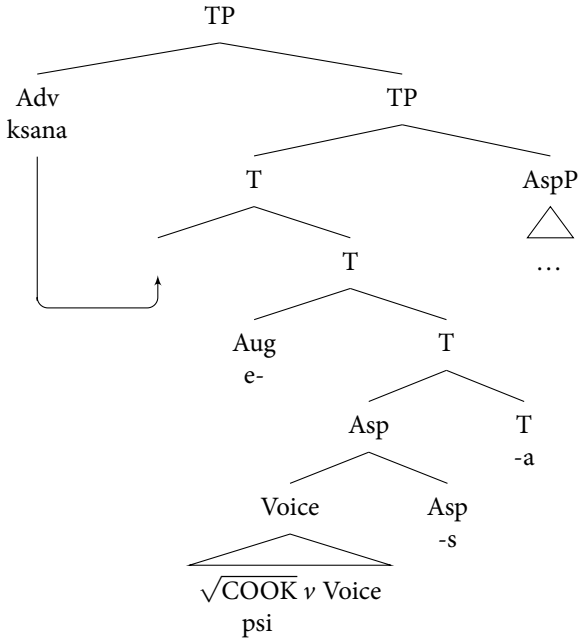
- The main idea is that augment is generated initially within T. This is supported by the fact that it always surfaces before in Standard Modern Greek:

(41) a. ksana- **e**- psi -s -a
again- AUG- cook -PFV -PST.1SG
'I cooked again.'

b. *ksana- para- **e**- psi -s -es
again- over- AUG- cook -PFV -PST.2SG
'You overcooked again.'

- Subsequently, adverbs incorporate into the verbal complex via Merger/Lowering:

(42)



- What distinguishes Cypriot Greek from the standard language is the following morphotactic constraint:

Initiality (Cypriot Greek)

The augment must be initial within the verb.

(43) *Augment externalization*
a. Structural description: [$_T$ Adv Aug X
b. Structural change:
(i) Insert [to the immediate left of Adv, and] to the immediate right of Aug.
(ii) Insert > < to the immediate left of Aug.

- With this in mind, the augment will be displaced to the left edge of the verb:

(44) **e**- ksana- psi -s -a
AUG- again- cook -PFV -PST.1SG
'I cooked again.' (Cypriot Greek)

(45)
Adv Aug √COOK *v* Voice Asp T
⇓
[Adv >< Aug] √COOK *v* Voice Asp T
⇓
~~Adv~~ Aug ~~Aug~~ Adv √COOK *v* Voice Asp T
⇓
e- ksana psi Ø Ø -s -a

- Just like in Spanish and Basque, it is also possible to have multiple occurrences of the argument. We can capture this by allowing

(46) **e**- ksana- **e**- psi -s -a
AUG- again- AUG- cook -PFV -PST.1SG
'I cooked again.' (Cypriot Greek)

(47)
Adv Aug √COOK *v* Voice Asp T
⇓
[Adv < Aug] √COOK *v* Voice Asp T
⇓
~~Adv~~ Aug Adv Aug √COOK *v* Voice Asp T
⇓
e- ksana e- psi Ø Ø -s -a

- And what about with multiple adverbs?

(48) **e**- ksana- (**e**-) para- (**e**-) psi -s -es
AUG- again- (AUG-) over- (AUG-) cook -PFV -PST.2SG
'You overcooked again.'

- This is the same cyclic pattern with we saw with Spanish *vénda-n-me-(n)-lo-(n)*.
- Finally, there is an alternative form of the augment (*i*-) preceding certain verb roots (e.g. 'drink').

(49) a. **i**- pjk -a
AUG- drink.PFV -PST.1SG
'I drank.'

b. **e**- ksana- **i**- pjk
AUG- again- **i**- drink.PFV
-a
-PST.1SG
'I drank again.'

- This illustrates that the morphotactic repair must apply prior to Vocabulary Insertion (or we would expect to find **i-ksana-i-pjka*).

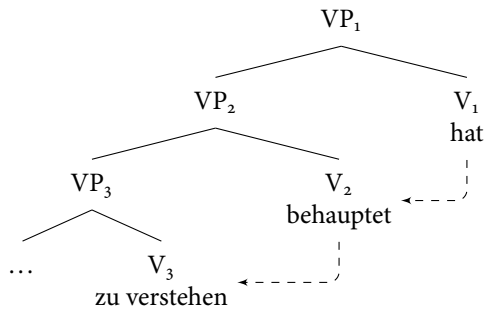
5 Non-finality in German

- In German, the inflectional form is determined by hierarchical relations (Bech 1955/1983):

(50) a. dass er alles verstanden$_2$ hat$_1$ (participle)
that er everything understand.PTCP have.3SG.PRES
'that he understood everything'

b. dass er alles zu verstehen$_2$ behauptet$_1$ (*zu*-infinitive)
that er everything to understand.INF claim.3SG.PRES
'that he understood everything'

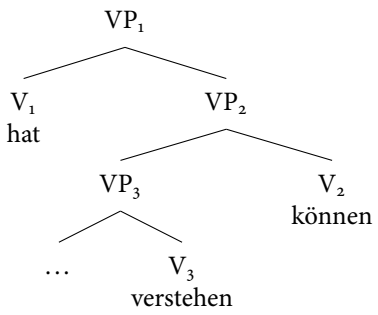
c. dass er alles zu verstehen$_3$ behauptet$_2$ hat$_1$ (*zu*-infinitive; participle)
that er everything to understand.INF claimed.PTCP have.3SG.PRES
'that he claimed to understand everything'

(51)


- Verb final sequences of verbs ('clusters') can show different orders:

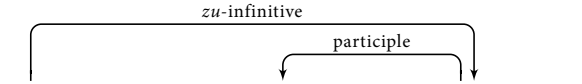
(52) weil er alles hat$_1$ verstehen$_3$ können$_2$
because he everything have.3SG.PRES understand.INF can.INF
'because he was able to understand everything'

(53)



- The complementizer *ohne* appears to assign *zu* to the hierarchically highest verb:

(54)



without everything understand.PTCP to have.3SG.PRES
'without understanding everything'

- With verb clusters however, we see an interesting pattern (Salzmann 2017, 2019):

(55) a. ohne das Buch lesen$_3$ gekonnt$_2$ **zu** haben$_1$
without the book read.INF can.PTCP to have.INF
'without having been able to read the book.' (32*zu*1)

b. ohne das Buch haben$_1$ lesen$_3$ **zu** können$_2$
without the book read.INF have.INF to can.INF
'without having been able to read the book.' (13*zu*2)

c. ohne das Buch lesen$_3$ haben$_1$ **zu** können$_2$
without the book read.INF have.INF to can.INF
'without having been able to read the book.' (31*zu*2)

Nonfinality (German)

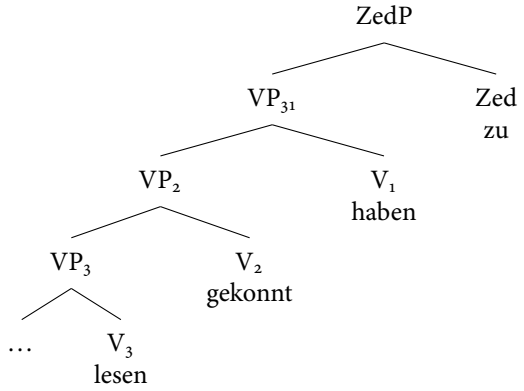
zu may not be final in the verb cluster (ZedP).

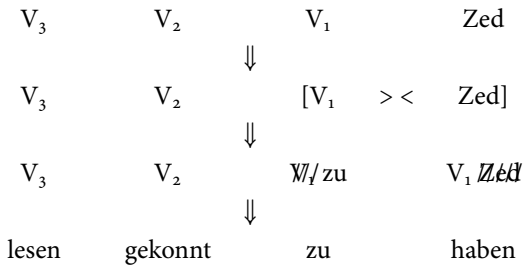
- The main idea is that *zu* originates final in the verb cluster and is displaced inward:

(56) *Zed Internalization*
a. Structure description: V Zed]$_{ZedP}$
b. Structural change:
(i) Insert [to the immediate left of V and] to the immediate right of Zed.
(ii) Insert > < to the immediate left of Zed.

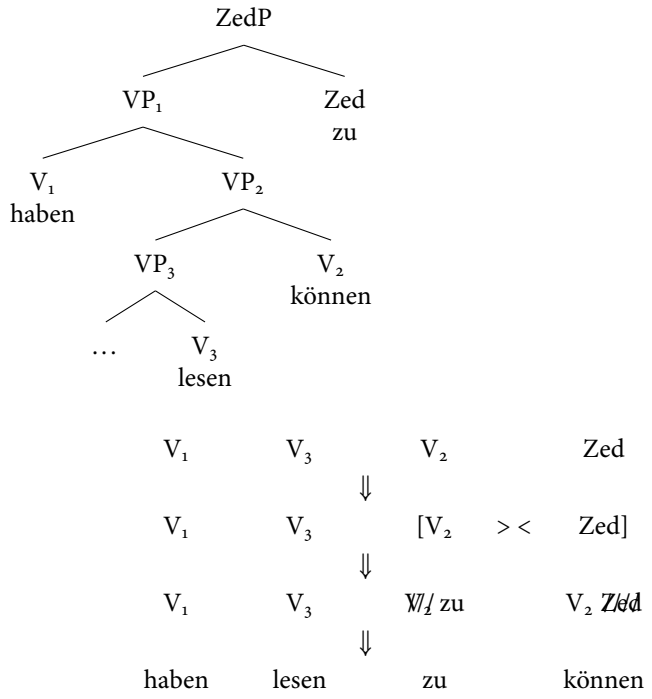
- Regardless of the order inside the cluster, *zu* will invert with the linearly-final verb in the sturcture.

(57) a. ohne das Buch lesen$_3$ gekonnt$_2$ **zu** haben$_1$
without the book read.INF can.PTCP to have.INF
'without having been able to read the book.' (32*zu*1)

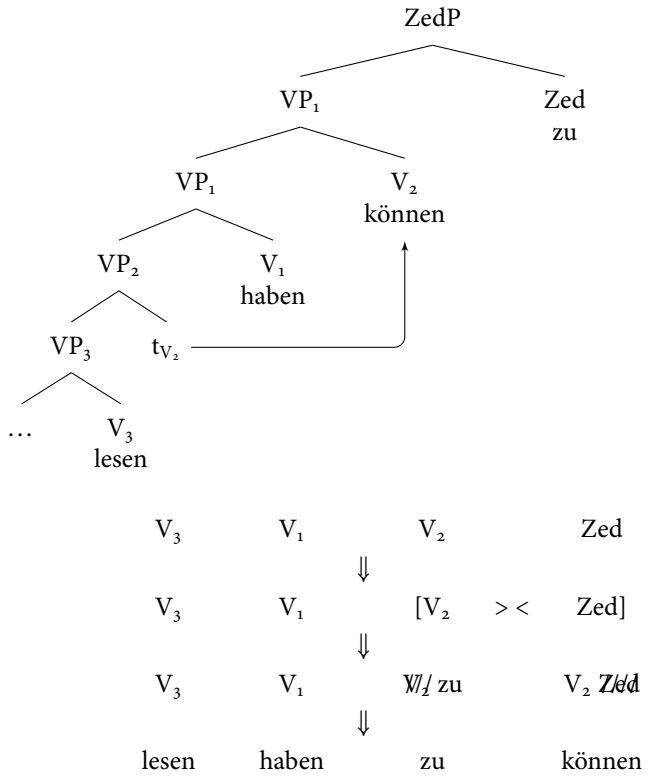




b. ohne das Buch haben$_1$ lesen$_3$ **zu** können$_2$
without the book read.INF have.INF to can.INF
'without having been able to read the book.' (13*zu*2)



c. ohne das Buch lesen$_3$ haben$_1$ **zu** können$_2$
without the book read.INF have.INF to can.INF
'without having been able to read the book.' (31*zu*2)



Arregi, Karlos and Andrew Nevins (2012). *Morphotactics: Basque Auxiliaries and the Structure of Spellout*. Springer: Dordrecht.

Arregi, Karlos and Andrew Nevins (2018). Beware Occam's Syntactic Razor: Morphotactic Analysis and Spanish Mesoclisis. *Linguistic Inquiry* 49(4). 625–683.

Arregi, Karlos and Andrew Nevins (to appear). Morphotactics: An Overview of Positional Constraints and Repairs. In A. Alexiadou, R. Kramer, A. Marantz and I. Oltra-Massuet (eds). *The Cambridge Handbook of Distributed Morphology*. Cambridge University Press: Cambridge.

Baker, Mark C. (1985). The Mirror Principle and Morphosyntactic Explanation. *Linguistic Inquiry* 16(3). 373–415.
Bech, Gunnar (1955/1983). *Studien über das deutsche Verbum Infinitum*. Niemeyer: Tübingen.
Harris, James and Morris Halle (2005). Unexpected Plural Inflections in Spanish: Reduplication and Metathesis. *Linguistic Inquiry* 36(2). 195–222.
Hyman, Larry M. (2003). Suffix Ordering in Bantu: A Morphocentric Approach. In G. Booij and J. van Marle (eds). *Yearbook of Morphology 2002*. Kluwer: Dordrecht. 245–281.
Marantz, Alec (1982). Re Reduplication. *Linguistic Inquiry* 13(3). 435–482.
Muysken, Pieter (1986). Approaches to Affix Order. *Linguistics* 24(3). 629–643.
Pavlou, Natalia (2018). *Morphosyntactic Dependencies and Verb Movement in Cypriot Greek*. PhD thesis, The University of Chicago.
Ryan, Kevin M. (2010). Variable Affix Order: Grammar and Learning. *Language* 86(4). 758–791.
Salzmann, Martin (2017). Displaced Morphology in German: An Argument for Post-Syntactic Morphology. In A. Lamont and K. Tetzloff (eds). *NELS 47: Proceedings of the Forty-Seventh Annual Meeting of the North East Linguistic Society*. Vol. 3. GLSA: Amherst. 77–90.
Salzmann, Martin (2019). Displaced Morphology in German Verb Clusters: An Argument For Post-Syntactic Morphology. *Journal of Comparative Germanic Linguistics* 22(1). 1–53.