Class 4: Allomorphy

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1 Two kinds of allomorphy

- We have already seen rules for English such as those in (1).

(1)
a. [PAST] ↔ Ø / {√BREAK, √WRITE, …} ___
b. [PAST] ↔ -ed
c. [PL] ↔ -en / {√OX, √CHILD, …} ___
d. [PL] ↔ -s

- The context specification of these rules mentions morphosyntactic features/structures. This is therefore often referred to as *grammatically-conditioned allomorphy*.
- In addition, we have cases of *phonologically-conditioned allomorphy*:

(2)
a. [INDEF] ↔ an / ___ V
b. [INDEF] ↔ a

- Case suffixes in Korean:

(3)

	'bird'	'soup'
NOM	se-ka	kuk-i
ACC	se-lɨl	kuk-ɨl
INS	se-lo	kuk-ɨlo

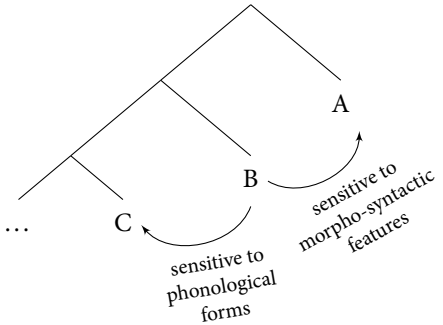
(4)
a. [NOM] ↔ -i / V ___
b. [NOM] ↔ -ka

- Both kinds of allomorphy seem necessary, but are the restrictions on such rules?
  - The *directionality* of allomorphy: Are there principled asymmetries regarding where grammatically vs. phonologically conditioned allomorphy is possible?
  - The *locality* of allomorphy: Are there restrictions on the relation between the target and trigger in a allomorphic conditioning relation?

2 Directionality of allomorphy

- A frequent argument is that allomorphy shows asymmetries in directionality, i.e. inwards vs. outwards (Carstairs 1987; Carstairs-McCarthy 2001).
- Hypothesis: Given a structure such as (5). An affix B may be sensitive to the phonological forms of inner affixes (C) and to morphological features of outer affixes (A).

(5)



- Bobaljik (2000) argued that this follows from a few basic assumptions in a DM approach:
  - Words have hierarchical internal structure
  - Vocabulary Insertion proceeds 'inside-out', i.e. cyclically starting with the root
  - Vocabulary Insertion is *replacive*, i.e. features are overwritten by phonological forms

(6)
a. [[[C] B] A]
b. [[[*do*] B] A]
c. [[[*do*] *re*] A]
d. [[[*do*] *re*] *mi*]

- Classic argument by Bobaljik (2000) is based on Itelmen (Chukotko-Kamchatkan).
- Itelmen has two agreement suffixes (one prefixal, one suffixal):

(7) a. t’- əlčqu -(ɤ)in
1SG.SBJ- see -2SG.OBJ
‘I saw you.’
b. t- k’oɬ -k(ičen)
1SG.SBJ- come -1SG.SBJ
‘I came.’

- The form of the suffix can be sensitive to the features of both the subject and object:

(8) t- tɸɬ -aɬ -**ki** -**čen**
1SG.SBJ- bring -FUT -CL.II -1>3SG.OBJ
‘I will bring it.’

(9) Ø- tɸ -s -**čŋ** -**in**
2SG.SBJ- bring -PRES -CL.II -2SG.SBJ>3SG.OBJ
‘You are bringing it.’

(10) Ø- taβol -aɬ -qzu -s -**čiŋ** -**nen**
3SG.SBJ- embrace -DESID -ASP -PRES -CL.II -3.SBJ>3SG.OBJ
‘He is always wanting to embrace her.’

- Also notice the forms of the class suffix. Below is a further allomorph:

(11) n- tɸɬ -**xk** -**in**
IMP- bring -CL.II -2SG.OBJ
‘Someone brought you.’

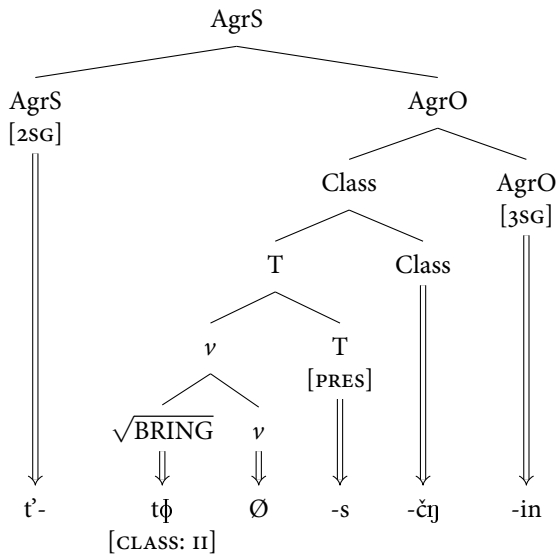
- Furthermore, the form of the class marker is sensitive to these features, too.
- We can posit the following rules for the object agreement suffix:

(12) a. [AgrO 3SG] ↔ -in / ___ [AgrS 2SG]
b. [AgrO 3SG] ↔ -nen / ___ [AgrS 3SG]
c. [AgrO 3SG] ↔ -čen

- We then have further rules for the class suffix:

(13) a. Class ↔ -čŋ / [CLASS:II] ___ [AgrO 3SG] [AgrS SG]
b. Class ↔ -nen / [CLASS:II] ___ [AgrS 3SG]
c. Class ↔ -če(ʔ)n

(14)



- Allomorphy of the object suffix is outwardly-sensitive for features of the AgrS head.
- Allomorphy of the class suffix is sensitive to features of outer agreement suffixes.
- It is inwardly sensitive to the class feature of the root, which Bobaljik also assumes is inserted with its form.

2.1 Inwards-sensitive grammatically-conditioned allomorphy?

- We do not expect to find inwardly-sensitive grammatically-conditioned allomorphy.
- Recall the Latin data we saw in the first class:

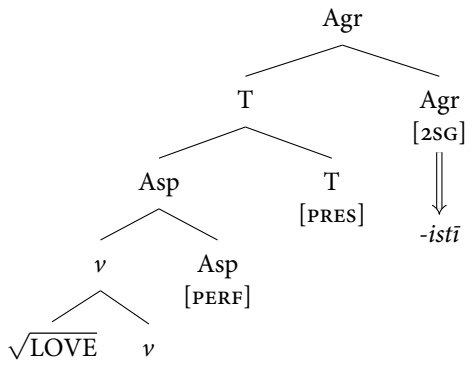
(15)

	Perfect (ind.)	Perfect (subj.)	Pluperfect (ind.)	Future perfect
1sg	amā-v-**ī**	amā-ve-ri-m	amā-ve-ra-m	amā-ve-r-ō
2sg	amā-v-**istī**	amā-ve-rĭ-s	amā-ve-rā-s	amā-ve-rĭ-s
3sg	amā-vi-t	amā-ve-ri-t	amā-ve-ra-t	amā-ve-ri-t
1pl	amā-vi-mus	amā-ve-rī-mus	amā-ve-rā-mus	amā-ve-rĭ-mus
2pl	amā-v-**istis**	amā-ve-rĭ-tis	amā-ve-rā-tis	amā-ve-rĭ-tis
3pl	amā-v-**ērunt**	amā-ve-ri-nt	amā-ve-ra-nt	amā-ve-ri-nt

- Carstairs-McCarthy (2001) points out that this looks like an example of inward-sensitive grammatically-conditioned allomorphy.

- The special perfect indicative forms must be sensitive to the inner perfect feature on Asp:

(16)



[2SG] ↔ *-istī* / [PERF] ∗ ___

- Consider the various forms of the Bulgarian definite suffix that we saw in class 2:

(17)

masculine singular, -C#

brat	'brother'	brat-**a**	'the brother'
čaj	'tea'	čaj-**a**	'the tea'

feminine singular, -C#

krăv	'blood'	krăv-**tá**	'the blood'
prólet	'spring'	prolet-**tá**	'the spring'

/a/-final

žena	'woman'	žena-**ta**	'the woman'
deca	'children'	deca-**ta**	'the children'

Non-/a/-final, plural

ženi	'women'	ženi-**te**	'the women'
măže	'men'	măže-**te**	'the men'

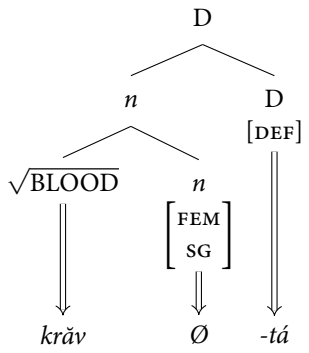
elsewhere

more	'sea'
taksi	'taxi'

more-**to**	'the sea'
taksi-**to**	'the taxi'

- This requires inward-sensitivity for features and form (Gribanova and Harizanov 2017):

(18)



a. [DEF] ↔ *-a* / [MASC, SG], C# ___
b. [DEF] ↔ *-tá* / [FEM, SG], C# ___
c. [DEF] ↔ *-ta* / a# ___
d. [DEF] ↔ *-te* / [PL] ___
e. [DEF] ↔ *-to*

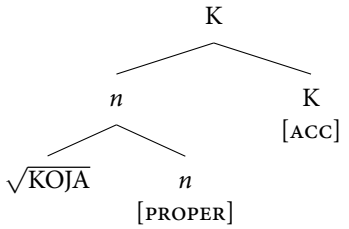
- Accusative case in Moro shows a similar pattern (Jenks and Sande 2017). The accusative case suffix is only possible with proper names:

(19) a. éga-nac-ó ŋállo-**ŋ** kója-**ŋ**
1SG.RTC-give-PFV Ngallo-ACC Koja-ACC
'I gave Ngallo to Koja.' / 'I gave Koja to Ngallo.'

b. éga-nac-ó kója-**ŋ** diɔ(*-**ŋ**)
1SG.RTC-give-PFV Koja-ACC cow(*-ACC)
'I gave the cow to Koja/Koja to the cow.'

c. éga-nac-ó kója-**ŋ** ŋera(*-**ŋ**)
1SG.RTC-give-PFV Koja-ACC girl(*-ACC)
'I gave a girl to Koja/Koja to a girl.'

(20)



[ACC] ↔ -ŋ / [PROPER] ___

- But could a syntactic solution be possible (e.g. Differential Object Marking)?
- In response, we could abandon the assumption that Vocabulary Insertion is fully replacive.
- There are different options here:
  - Halle (1990, 1992) views abstract morphemes as ordered pairs containing a set of features F and a phonological placeholder Q: <F, Q>. If Vocbulary Insertion just replaces Q, then inwardly-sensitive grammatically-conditioned allomorphy should still be possible.
  - Embick and Noyer (2007) assume that Vocabulary Insertion involve mapping the syntactic representation to a 'PF image'. Therefore, there is no consumption of resources.
  - Recall from class 3 that Arregi and Nevins (2012) assume parallel hierarchical and linear representations.
- An advantage of not replacing the morphosyntactic properties of an abstract morpheme post insertion is that we do not need to rules that refer to class features.
- Instead the rule can just list the roots that belong to that class (21).

(21) Class ↔ -čŋ / {√BRING, …} ___ [$_{\text{AgrO}}$ 3SG] [$_{\text{AgrS}}$ SG]

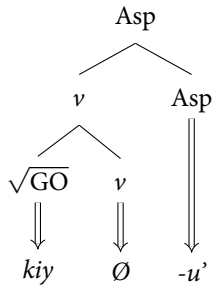
2.2 Outwards-sensitive phonologically-conditioned allomorphy?

- Are there examples of phonologically-conditioned allomorphy that look outwards?
- Unlike inwards-sensitive grammatically-conditioned allomorphy, there are very few clear examples of this.
- Recent example from Nez Perce (Deal and Wolf 2017):

(22)

kiy-u'	go-PROSP.ASP	kuu-se-Ø	go-IMPF.SG-PRES
kiy-ii-se-Ø	go-APPL-IMPF.SG-PRES	kuu-tetu-Ø	go-HAB-PRES
kiy-ey'-se-Ø	go-*μ*-IMPF.SG-PRES	kuu-qa-qa	go-PST.HAB-REC.PST

(23)



(24) a. $\sqrt{\text{GO}} \leftrightarrow$ *kiy* / ___ V
b. $\sqrt{\text{GO}} \leftrightarrow$ *kuu*

- In general, a complication when looking at phonologically-conditioned allomorphy is that such cases are often *phonologically-optimizing*, i.e. they avoid codas/hiatus.
- So, one often has the option of deriving what looks like phonologically-conditioned allomorphy by using a single underlying representation and a more powerful phonology.

(25) a. [PRES, 3SG] ↔ /-əz/ / [sibilant] ___
b. [PRES, 3SG] ↔ /-s/ / [voiceless] ___
c. [PRES, 3SG] ↔ /-z/

- Instead of this treating this as allomorphy, we could say that there is a single underlying representation /-z/ that is devoiced when it follows a voiceless consonant and there is ə-epenthesis before a sibilant.
- Admittedly, the Nez Perce case is less straightforward to reanalyze in this way, but see Kiparsky (2021).

3 Locality of allomorphy

Question

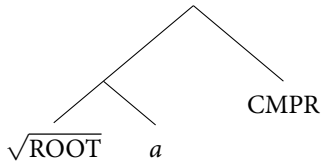
How local must the trigger and target in an allomorphic conditioning relation be?

3.1 *ABA in comparatives

- We find a classic case of stem allomorphy (suppletion) in comparatives:

(26) good — bett-er — be-st bad — worse — wor(se)-st

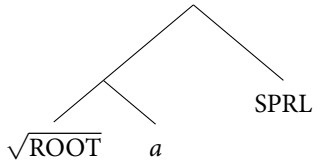
(27) a. $\sqrt{\text{BAD}}$ ↔ worse / ___ CMPR
b. $\sqrt{\text{BAD}}$ ↔ bad
c. $\sqrt{\text{GOOD}}$ ↔ bett- / ___ CMPR
d. $\sqrt{\text{GOOD}}$ ↔ good



- For some cases we need *mutual conditioning*: CMPR triggers a special form of the root $\sqrt{\text{BAD}}$, while the root triggers a null form of CMPR.

(28) a. CMPR ↔ -Ø / {$\sqrt{\text{BAD}}$, …} ___
b. CMPR ↔ -er
c. $\sqrt{\text{GOOD}}$ ↔ bett- / ___ CMPR
d. $\sqrt{\text{GOOD}}$ ↔ good

(29) a. $\sqrt{\text{GOOD}}$ ↔ be(tt)- / ___ SPRL
b. $\sqrt{\text{GOOD}}$ ↔ good
c. $\sqrt{\text{BAD}}$ ↔ worse / ___ SPRL
d. $\sqrt{\text{BAD}}$ ↔ bad

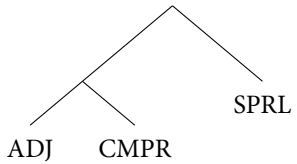


- Do you notice any redundancy in these rules?

Containment Hypothesis (Bobaljik 2012)

The structural representation of the comparative is contained in the representation of the superlative.

(30) *Structural containment*



a. CMPR ↔ -Ø / {$\sqrt{\text{BAD}}$, …} ___
b. CMPR ↔ -er
c. SPRL ↔ -(e)st

d. $\sqrt{\text{GOOD}}$ ↔ be(tt)- / ___ CMPR
e. $\sqrt{\text{GOOD}}$ ↔ good
f. $\sqrt{\text{BAD}}$ ↔ worse / ___ CMPR
g. $\sqrt{\text{BAD}}$ ↔ bad

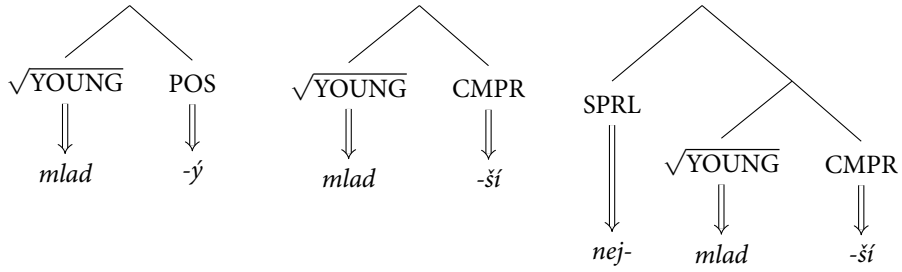
h. CMPR ↔ -Ø / ___ SPRL

- In many languages, this containment is transparent:

(31)

	POS A	CMPR A	SPRL A	
Persian	**kam**	**kam**-tar	**kam**-tar-in	'little'
Cimbrian	**šüa**	**šüan**-ar	**šüan**-ar-ste	'pretty'
Czech	**mlad**-ý	**mlad**-ší	nej-**mlad**-ší	'young'
Hungarian	**nagy**	**nagy**-obb	leg-**nagy**-obb	'big'

(32)



(33)

	POS A	CMPR B	SPRL B	
English	**good**	**bett**-er	**be**-st	
Danish	**god**	**bed**-re	**bed**-st	'good'
Estonian	**hea**	**pare**-m	**par**-im	'good'
Kildin Saami	**šig'**	**pɛr'**-am	**pɛr'**-mus	'good'

- We find, albeit rarely, ABC patterns too:

(34)

	POS A	CMPR B	SPRL C	
Latin	**bon**-us	**mel**-ior	**opt**-imus	'good'
Welsh	**da**	**gwell**-Ø	**gor**-au	'good'
Old Irish	**maith**	**ferr**-Ø	**dech**-Ø	'good'
Middle Persian	**xōb**	**weh/wah**-īy	**pahl/pāš**-om	'good'

(35)

a. $\sqrt{\text{GOOD}}$ ↔ opt- / ___ CMPR] SPRL
b. $\sqrt{\text{GOOD}}$ ↔ mel- / ___ CMPR
c. $\sqrt{\text{GOOD}}$ ↔ bon

- As Bobaljik (2012) points out, we never find ABA patterns with comparative suppletion:

(36)

	POS A	CMPR B	SPRL A	
Pseudo-English	**good**	**bett**-er	**good**-est	
Pseudo-German	**gut**	**bess**-er	am **gut**-est-en	'good'

- We cannot derive this pattern due to containment – any stem form triggered by CMPR will also be triggered by the SPRL (since it contains CMPR).
- The only way to derive ABA would be to use *accidental homophony*.

(37)

a. $\sqrt{\text{GOOD}}$ ↔ good / ___ CMPR] SPRL
b. $\sqrt{\text{GOOD}}$ ↔ be(tt)- / ___ CMPR
c. $\sqrt{\text{GOOD}}$ ↔ good

- It is generally assumed that learners have a bias to not posit these kind of rules: Accidental homophony is avoided.
- Bobaljik (2012) found that only three of the logically five possible patterns are attested:

(38)

		POS	CMPR	SPRL	
a.	regular	A	A	A	*big – bigger – biggest*
b.	suppletive	A	B	B	*good – better – best*
c.	doubly suppletive	A	B	C	*bonus – melior – optimus*
d.	unattested	A	B	A	**good – better – goodest*
e.	unattested	A	A	B	**good – gooder – best*

- Note that AAB is also not found – we will come back to this.

3.2 Adjacency

- Does the *ABA generalization extend beyond comparatives?
- Consider German stem forms:

(39)

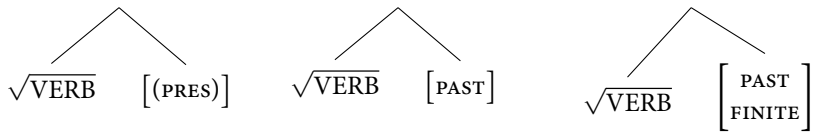
Stem	Preterite	Perfect	
A	A	A	
sag-	**sag**-	ge-**sag**-t	'say'
lieb-	**lieb**-	ge-**lieb**-t	'love'
A	B	B	
bring-	**brach**-	ge-**brach**-t	'bring'
schreib-	**schrieb**-	ge-**schrieb**-en	'write'
A	B	C	
sing-	**sang**-	ge-**sung**-en	'sing'
nehm-	**nahm**-	ge-**nomm**-en	'take'
A	B	A	
geb-	**gab**-	ge-**geb**-en	'give'
komm-	**kam**-	ge-**komm**-en	'come'
trag-	**trug**-	ge-**trag**-en	'give'

- This looks like an ABA pattern.
- In order for this to be a true ABA pattern, the representation of the preterite would have to be properly contained in the representation of the perfect participle:

(40) a. STEM
b. [[STEM] PRET]
c. [[[STEM] PRET] [PERF]]

- Bobaljik (2012) suggests the featural containment relations are actually different (following Wiese 2008):

(41) Stem Perfect Preterite



- Now, we can write rules that derive this in the same way as the comparative:

(42) a. $\sqrt{\text{GIVE}}$ ↔ gab- / [PAST, FINITE]
b. $\sqrt{\text{GIVE}}$ ↔ geb-
c. $\sqrt{\text{WRITE}}$ ↔ schrieb- / [PAST]
d. $\sqrt{\text{WRITE}}$ ↔ schreib-

- So the German ablaut pattern is actually an AAB pattern:

(43)

Stem [ ]	Perfect [PAST]	Preterite [PAST, FINITE]	
A	A	B	
geb-	ge-**geb**-en	**gab**-	'give'
komm-	ge-**komm**-en	**kam**-	'come'
trag-	ge-**trag**-en	**trug**-	'give'

- But recall that AAB patterns don't seem to be possible in comparative suppletion:

(44) *good – good-er – best

- What would the rules for an AAB comparative pattern have to look like?

(45) a. $\sqrt{\text{GOOD}}$ ↔ be(tt)- / ___] SPRL
b. $\sqrt{\text{GOOD}}$ ↔ good

- Can we rule AAB out for comparatives, while allowing it for verbal stem suppletion?
- Bobaljik (2012) suggests that adjacency could be the crucial factor here.
- Imagine that a context specification can only refer to the immediately adjacent node or a *span* of adjacent heads (see e.g. Merchant 2015; Moskal and Smith 2016).
- The rule in (45a) has to skip the intervening CMPR head (target and trigger not adjacent!)
- In the case of verbal suppletion, the containment is within the same feature bundle (presumably on a head like T). For this reason, the rule for $\sqrt{\text{GIVE}}$ in (42a) would be licit.
- There are remaining challenges for adjacency approaches, e.g. Kiowa (Adger et al. 2009):

(46) a. á- **k'úú**
3PL.AN- sit
'They sit.'
b. hɔ́n á- **kóp** -gɔ̂ɔ
NEG 3PL.AN- sit -NEG
'They don't sit.'
c. hɔ́n á- **kóp** -yɔ́ -gɔ̂ɔ
NEG 3PL.AN- sit -DIST -NEG
'They don't sit about.'

- Negative root suppletion applies across an intervening distributive morpheme.

3.3 Domains

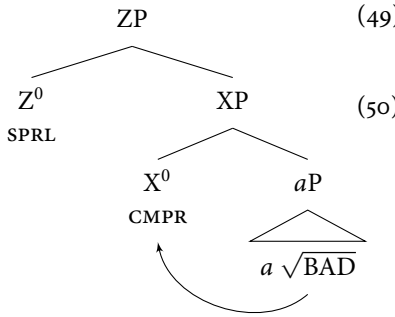
- Bobaljik (2012) notes another interesting generalization about comparatives:

(47)

		positive	comparative	superlative	
a.	Greek	**kak**-ós	**cheiró**-ter-os	o **cheiró**-ter-os	'bad'
		kak-ós	pjo **kak**-ós	o pjo **kak**-ós	'bad'
b.	Georgian	**k'argi**-i	u-**mǰob**-es-i	sa-u-**mǰob**-es-o	'good'
		k'argi-i	upro **k'argi**-i	q'vela-ze (upro) **k'argi**-i	'good'

- If a language allows a periphrastic comparative (where CMPR is not affixal) and has suppletion in the synthetic comparative, there is no suppletion in the periphrastic comparative.
- Synthetic comparatives require complex head formation:

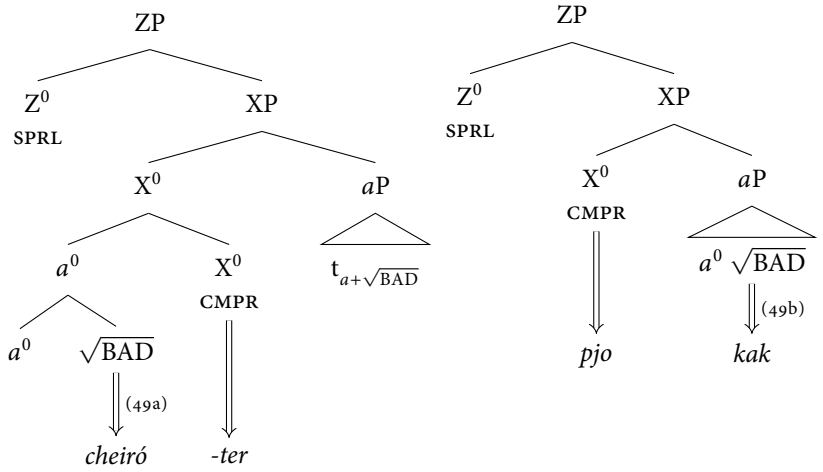
(48)



(49) a. $\sqrt{\text{BAD}}$ ↔ cheiró / ___ CMPR
b. $\sqrt{\text{BAD}}$ ↔ kak

(50) a. CMPR ↔ -ter / $\sqrt{\text{BAD}}$ ___
b. CMPR ↔ pjo

(51)



- Why can the rule in (49a) not apply in the periphrastic comparative?
- *Assumption:* The delimiting domain for contextual specifications of allomorphy rules is the morphological/morphosyntactic word:

Morphological word

X^0 is morphological word (MWd) if it is not dominated by another X^0.

- If the adjective does not move to the head hosting the CMPR feature, an XP boundary separates the target and trigger.
- NB: The rules for *pjo* vs. *-ter* are also subject to the same locality condition.
- We can see these effects elsewhere, too.
- Consider that Korean has two ways of forming negation: short-form negation (NEG attached to verb root) and long-form negation (NEG attached to auxiliary).

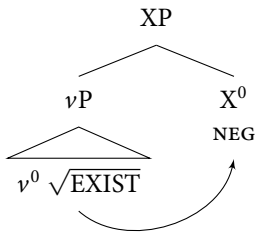
(52) a. eysute-ka **ca**-n-ta
Esther-NOM sleep-PRES-DECL
'Esther is sleeping.'
b. eysute-ka an(i)/mos **ca**-n-ta
Esther-NOM NEG sleep-PRES-DECL
'Esther isn't sleeping/is not allowed to sleep.'
c. eysute-ka **ca**-ci an(i)/mos ha-n-ta
Esther-NOM sleep-CI NEG do-PRES-DECL
'Esther isn't sleeping/is not allowed to sleep.' (Chung 2007: 97–98)

- Some roots (e.g. $\sqrt{\text{EXIST}}$) show suppletion in the context of short-form negation:

(53) a. thuroi mokma-nun **iss**-ess-ta
Troy wooden.horse-TOP exist-PAST-DECL
'The Trojan Horse existed.'
b. thuroi mokma-nun Ø **eps**-ess-ta
Troy wooden.horse-TOP NEG exist.NEG-PAST-DECL
'The Trojan Horse didn't exist.'
c. thuroi mokma-nun **iss**-ci an(i)/mos ha-yess-ta
Troy wooden.horse-TOP exist-CI NEG do-PAST-DECL
'The Trojan Horse didn't exist.'
(Chung 2007: 121)

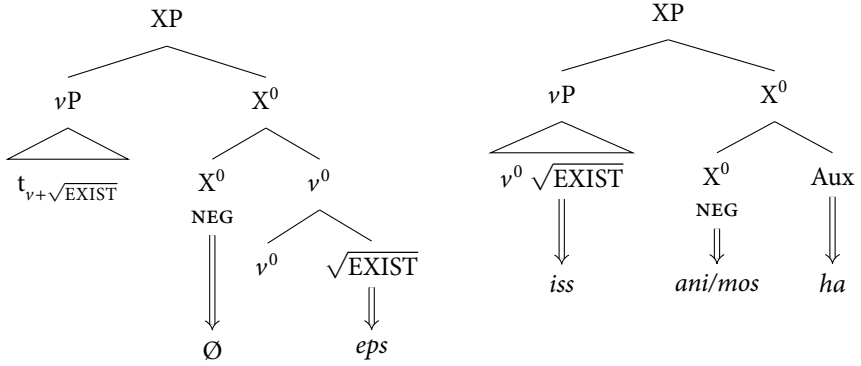
- NB: Negation is null with root suppletion (mutual conditioning again. cf. *worse*).

(54)



(55) a. $\sqrt{\text{EXIST}} \leftrightarrow$ eps- / ___ NEG
b. $\sqrt{\text{EXIST}} \leftrightarrow$ iss-
c. NEG $\leftrightarrow$ Ø / ___ $\{\sqrt{\text{EXIST}}, \ldots\}$
d. NEG $\leftrightarrow$ an(i)/mos

(56)



4 Allosemy?

- Are there similar restrictions on context-dependent meanings (*allosemy*)?
- It has been argued that the choice of possible meanings of the root is restricted to the first categorizing head (Marantz 2002):

(57) a. globe = 'a spherical object' / 'the world'
b. glob-al = 'pertaining the world' / # 'pertaining to a sphere'
c. glob-al-ize = 'to make worldwide' / # 'to make spherical'

- This is essential an obligatory ABB pattern (ABA seems to be ruled out)
- Whether this is a fully general pattern is controversial (Harley and Stone 2013).

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