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Building bridges: Labial harmony in Altaic languages

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Palatal harmony in Turkic languages

- In Turkish, suffixes agree in frontness with the vowel that immediately precedes them. As such, in the left column, the suffixes are front; in the right column, the suffixes are back:

(1) *Unrestricted palatal harmony* (Turkish; Clements & Sezer 1982)

ip-l^{j}er	'rope-PL'	kɨz-lar	'girl-PL'
yúz-l^{j}er	'face-PL'	pul-lar	'stamp-PL'
el^{j}-l^{j}er	'hand-PL'	sap-lar	'stalk-PL'
k^{j}öy-l^{j}er	'village-PL'	son-lar	'end-PL'

- Vowel harmony between roots and suffixes involves alternations in the suffix: the plural suffix in Turkish alternates between [l^{j}er] and [lar].

Labial Harmony in Turkic Languages

(Korn 1969, Steriade 1981, Vaux 1993, Kaun 1995, 2004)

- However, labial harmony displays a more restricted application. In Yakut (2) and Kazakh (3), we see that low vowels do not always display labial harmony.

(2) *Labial harmony only when both trigger and target are low*

(Yakut; Krueger 1962)

künnük-ter	(*künnük-tör)	'window-PL'
börö-lör		'wolf-PL'
kuul-lar	(*kuul-lor)	'sack-PL'
oɣo-lor		'child-PL'

(3) *Labial harmony only when both trigger and target are front*

(Kazakh; Korn 1969)

üj-dö		'house-LOC'
köl-dö		'lake-LOC'
kul-da	(*kul-do)	'at the servant'
son-dan	(*son-don)	'rubble-ABL'

Major claims

- ➔ Standard Government Phonology/Dependency Phonology fails to capture all the variation observed in labial harmony;
- ➔ The RcvP model (Van der Hulst 2005, 2012) of Government/ Dependency Phonology does capture all the variation;
- ➔ Labial harmony is defective in that it is always subject to additional restrictions;
- ➔ Vowel harmony is absolutely local (van der Hulst & Smith 1988);
- ➔ Vowel harmony proceeds cyclically *within the segment*, with labial harmony crucially preceding tongue root harmony;
- ➔ There is a distinction between lexical elements and (harmony-)derived elements;
- ➔ In Mongolian languages, front high vowels are inserted late, which makes them invisible for purposes of labial harmony;
- ➔ Licensing occurs at the syllable level;
- ➔ Labial harmony triggers are sensitive to various levels of the prosodic hierarchy (Selkirk 1978, 1986; Nespor & Vogel 1986).

Overview

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3. Radical cv Phonology (RcvP)
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5. Mongolian languages
6. A brief note on labial harmony triggers
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Standard Government Phonology (GP)

- Following Kaye (1993), in GP phonological segments are composed of three unary elements: |A|, |I| and |U|. These elements can occur on their own:[1]

(4)

/a/	/i/	/u/
A	I	U

- Or they can combine to form more complex structures:

(5)

/e/	/o/
A	A
I	U

- They can be headed or not, and there is maximally one headed element per segment.
- For simplification, I do not indication headedness of elements in this talk.

[1] For expository reasons, I present a highly simplified version of Government Phonology (for details see Kaye, Lowenstamm & Vergnaud 1985, 1990; Kaye 1993).

Vowel harmony (Denwood 2002)

- Vowel harmony involves the licensing of an element, which, in effect, means to be (phonetically) interpreted. Consider the representation of the Turkish plural suffix, which alternates between [I^{j}er] and [Iar]. It contains a low element |A| as well as a front element |I|. |A| is lexically licensed, but |I| is not.

(6) -IAr

Vowel harmony (Denwood 2002)

- In roots that contain a front element |I|, N_1 lexically licenses |I| and, as such, N_1 can license |I| in N_2, resulting in a front suffix:

(7)

ip		-I^{j}er
N_1	→	N_2
|		|
		A
I		I

- However, in roots that do not contain a front element, N_1 does not lexically license any |I| element and cannot license |I| in N_2. As a consequence, |I| is de-linked, which results in a back suffix:

(8)

kɨz		-lar
N_1	→	N_2
		|
		A
		ɨ
		I

Labial harmony in Turkish

(Charette & Göksel 1994, 1996, Denwood 2002)

- The vowel inventory of Turkish is as follows:

(9)

/i/	/e/	/ü/	ö/	/u/	/o/	/ɨ/	/a/
	A		A		A		A
I	I	I	I				
		U	U	U	U		

- Curiously, we see that Turkish high targets and low targets divide into two groups:

Labial harmony in Turkish

(Charette & Göksel 1994, 1996, Denwood 2002)

(10) *High targets always display labial harmony*

(Turkish; Clements & Sezer 1982)

yüz-ün	'face-GEN'
k^{j}öy-ün	'village-GEN
pul-un	'stamp-GEN'
son-un	'end-GEN'

(11) *Low targets never display labial harmony*

(Turkish; Clements & Sezer 1982)

yüz-l^{j}er	(*yüz-l^{j}ör)	'face-PL'
k^{j}öy-l^{j}er	(*k^{j}öy-l^{j}ör)	'village-PL
pul-lar	(*pul-lor)	'stamp-PL'
son-lar	(*son-lor)	'end-PL'

Labial harmony in Turkish

(Charette & Göksel 1994, 1996, Denwood 2002)

- In standard GP, high targets (10) always undergo labial, and palatal, harmony:

(12)

yüz		-ün		k^jöy		-ün
N_1	→	N_2		N_1	→	N_2
|		|		|		|
I		I		A		I
U		U		I		U
				U		

Labial harmony in Turkish

(Charette & Göksel 1994, 1996, Denwood 2002)

- When the root vowel does not contain a palatal element |I|, only labial harmony is observed:

(13)

pul		-un		son		-un
N_1	→	N_2		N_1	→	N_2
|		|		|		|
U		U		A		U
		†		U		†
		I				I

Labial harmony in Turkish

(Charette & Göksel 1994, 1996, Denwood 2002)

- However, in low targets, in effect, the presence of the element |A| *in* N_2 prevents labial harmony:

(14)

son		-lar	yüz		-l^{j}er
N_1	→	N_2	N_1	→	N_2
|		|	|		|
A		**A**	I		**A**
U		┼	U		I
		U			┼
		I			U

Variation in labial harmony: Yakut

(Charette & Göksel 1994, 1996, Denwood 2002)

- In Yakut (2), low targets do sometimes undergo labial harmony:

(15) *When target is low, there sometimes is labial harmony*
(Yakut; Krueger 1962)

künnük-ter	(*künnük-tör)	'window-PL'
börö-lör		'wolf-PL'
kuul-lar	(*kuul-lor)	'sack-PL'
oɣo-lor		'child-PL'

(16) *When target is high, there always is labial harmony*
(Yakut; Krueger 1962)

tübbüg-ü	'check.gloss-ACC'
börön-ü	'wolf-ACC'
murun-u	'nose-ACC'
ox-u	'arrow-ACC'

- High targets are again accounted for by labial harmony occurring unrestrictedly.

Variation in labial harmony: Yakut

(Charette & Göksel 1994, 1996, Denwood 2002)

- However, low targets require the presence of an |A|-'bridge' to license |U| (cf. Steriade 1981):

(17)

oɣo		-lor
N_1	→	N_2
|		|
A		**A**
U		U

- If no |A|-bridge is available, licensing of |U| fails:

(18)

kuul		-lar
N_1	→	N_2
|		|
		A
		┼
U		U

The Spanner in the Works: Kachin Khakass and Kyzyl Khakass

- However, consider data from Kachin Khakass, in which not all high targets display labial harmony:

(19) *High targets but not always labial harmony*

(Kachin Khakass; Korn 1969)

kün-nü		'day-ACC'
čör-zip[2]	(*čör-züp)	'having gone'
kuš-tuŋ		'of the bird'
ok-tiŋ	(*ok-tuŋ)	'of the arrow'

- Clearly, there is nothing that can prevent licensing into an empty slot. Indeed, even if one would prevent that, there is no element that could form a bridge to save labial harmony in *künnü* and *kustuŋ*. As such, GP cannot account for Kachin Khakass.

[2] Korn's (1969) text reads <čör-zp>; however, his description explicitly states that this form fails to undergo labial harmony. I assume it does undergo palatal harmony (cf. öd-ir 'to kill'; Korn 1969, 103).

The Spanner in the Works: Kachin Khakass and Kyzyl Khakass

- West-Siberian Tatar dialects (Korn 1969) shows a similar pattern; labial harmony is only observed when preceded by an original high rounded vowel, but surface high rounded vowels that derive from mid vowels fail to show labial harmony:[3]

(20) *High targets but not always labial harmony*

(Tar, West-Siberian Tatar; Korn 1969)

original vowel			
ü	tüs-nüŋ		'of the dream'
ö	kür-i̯š-	(*kür-üš-)	'to see each other'
u	tut-up		'having seized'
o	suk-tɨr -	(*suk-tur-)	'to make s.o. hit'

[3] With, unsurprisingly, some variation.

The Spanner in the Works: Kachin Khakass and Kyzyl Khakass

- Similarly, in Kyzyl Khakass labial harmony occurs when trigger and target are high or when trigger and target are front:

(21) *High targets but not always labial harmony*

(Kyzyl Khakass; Korn 1969)

kün-nüŋ		'of the day'
töl-duŋ		'of posterity'
kus-tuŋ		'of the bird'
told-ɨr	(*told-ur)	'to fill'

- Nogai (Karakoč 2005) shows the same pattern as Kyzyl Khakass.

➔ The standard approach of Government Phonology/Dependency Phonology framework fails to capture the labial harmony patterns in Kachin Khakass, the West-Siberian Tater dialects, Kyzyl Khakass and Nogai.

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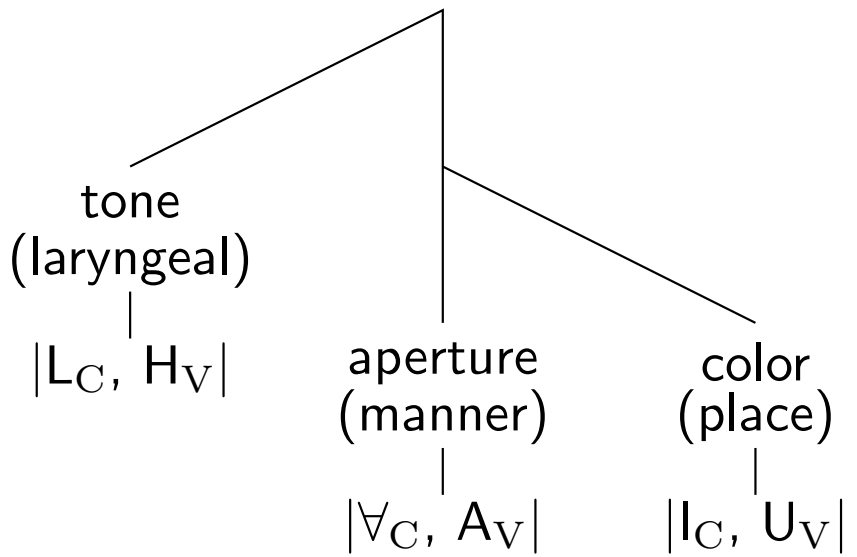
Radical cv Phonology (RcvP)

- RcvP (Van der Hulst 2005, 2012) assumes only two elements: |C| and |V|. Furthermore, these elements are organized into a feature geometry involving three class nodes:

(22)



Radical cv Phonology (RcvP)

- The four elements relevant in the composition of vowels are: |A|, |I|, |U| and |∀|:

(23)

Element	
A	'low or retracted'
∀	'high or ATR'
U	'round'
I	'front'

Vowel harmony in RcvP

- Vowel harmony alternations are represented as underspecified in the lexicon. When a lexical item is involved in a vowel harmony alternation, it includes a variable element "(ɛ)".
- Consider the RcvP representation for the plural in Turkish, which alternates between [lʲer] and [lar]:

(24)
-lAr
A
(I)

Vowel harmony in RcvP

- The variable element "(|I|)" can be licensed (indicated by "≫"), i.e. it is phonetically realized, and we observe a front suffix [I^{j}er]:

(25)

ip		-I^{j}er
∀		A
I	≫	(I)

- If it is not licensed, it is not interpreted, and we observe a back suffix [Iar]:

(26)

kɨz	-Iar
∀	A
	(I)

- Importantly, licensing is local; that is, it cannot apply across a vowel (rhymal head).

Labial harmony is restricted

- Labial harmony is always subject to additional restrictions:

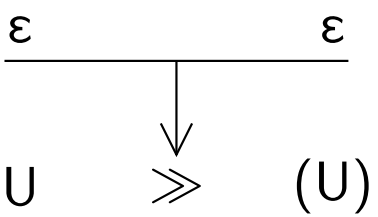
(27) Labial harmony must be licensed by:
  (i) Bridge licensing (Charette & Göksel 1994; cf. Steriade's homogenous rounding harmony); or
  (ii) Asymmetric licensing

Bridge licensing

- Bridge licensing refers to the configuration of trigger and target agreeing for an element ε, which, as such, facilitates labial harmony:

(28)

Bridge Licensing



- Assuming RcvP's elements, we predict that all three elements other than |U| can function as a bridge licensor for labial harmony: |A|, |I| and also |∀|.

Bridge licensing

(29) *Labial harmony when both trigger and target are low*
(Yakut; Krueger 1962)

künnük-ter	(*künnük-tör)	'window-PL'
börö-lör		'wolf-PL'
kuul-lar	(*kuul-lor)	'sack-PL'
oɣo-lor		'child-PL'

(30) *Labial harmony when both trigger and target are front*
(Kazakh; Korn 1969)

üj-dö		'house-LOC'
köl-dö		'lake-LOC'
kul-da	(*kul-do)	'at the servant'
son-dan	(*son-don)	'rubble-ABL'

(31) *Labial harmony when both trigger and target are high*
(Kachin Khakass; Korn 1969)

kün-nü		'day-ACC'
čör-zip[4]	(*čör-züp)	'having gone'
kuš-tuŋ		'of the bird'
ok-tiŋ	(*ok-tuŋ)	'of the arrow'

Asymmetric licensing

- However, we also saw that in many languages high targets always show labial harmony; this is captured here by the hypothesis of asymmetric licensing:

(32) *Asymmetric Licensing*

$$\mathrm{U} \quad \gg \quad \overset{\forall_{\mathrm{C}}}{(\mathrm{U})}$$

- This hypothesis is based on harmonic principles which are grounded in both articulatory/perceptual considerations (Kaun 1995; see also Suomi 1983, Walker 2005 and Finley & Badecker 2008, Finley 2012) as well as theory-internal considerations of the relation between heads and dependents in RcvP (van der Hulst & Moskal 2013).

A typology of labial harmony

- Thus, we can make the following typology of labial harmony, where any of the three elements can function as a bridge licensor as well as asymmetric licensing (indicated by '+' in the table).[5]
- Note that the combination of an |∀|-bridge and asymmetric licensing is indistinguishable from asymmetric licensing since an |∀|-bridge is a subset of asymmetric licensing where all high targets result in labial harmony.

[5] The combinations are disjunctive rather than conjunctive.

A typology of labial harmony

Licensing	*Language(s)*
+	Turkish (Clements & Sezer 1982), Ottoman Turkish (Hagopian 1907), Tuvan (Krueger 1977), Azerbaijani (Comrie 1981), Uyghur (Hahn 1999, Lindblad 1990), Karaçay (Herbert 1962)
|A|	Tungusic and Mongolian languages (see section 5 and 6).
|A|, +	Yakut (Krueger 1962), Altai-B (Dyrenkova 1940)
|I|	?
|I|, +	Khazakh (Korn 1969, Menges 1947), Chulym Tatar (Korn 1969), Karakalpak (Menges 1947)
|∀|	Kachin Khakass (Korn 1969), West-Siberian Tatar (Korn 1969)
|A|, |I|	?
|A|, |I|, +	Altai (Korn 1969), Kirghiz-B (Herbert & Poppe 1963), Ojrat (Menges 1947), Teleut (Menges 1947), Shor-A (Korn 1969)
|A|, |∀|	Yawelmani, *non-Turkic* (Cole & Kisseberth 1995)
|I|, |∀|	Kyzyl Khakass (Korn 1969), Nogai (Karakoç 2005)
|A|, |I|, |∀|	Shor-B (Korn 1969)

|∀|, +	= +
|A|, |∀|, +	= |A|, +
|I|, |∀|, +	= |I|, +
|A|, |I|, |∀|, +	= |A|, |I|, +

A typology of labial harmony

- *Tungusic*: Baiyinna Orochen (Li 1996), Solon (Li 1996, based on Hu & Chaoke 1986, Chaoke, Tsumagari & Kazama 1991, Tsumagari 1993), Ulch (Kaun 1995 and Li 1996, based on Sunik 1985), Xunke Orochen (Li 1996, partly based on Zhang, Li & Zhang 1989), Oroch (Tolskaya 2008, based on Avrorin & Boldyrev 2001), Literary Evenki (Li 1996), Classical Manchu (Li 1996; Dresher 2009).
- *Mongolian*: Khalkha Mongolian (Svantesson et al. 2005), Shuluun Höh (Svantesson 1985, based on Dobu 1983).

➔ The RcvP model (Van der Hulst 2005, 2012) of Government/ Dependency Phonology captures the variation in labial harmony restrictions.

Unrestricted labial harmony?

- The only case of 'unrestricted' labial harmony: Kirghiz.

(33) *Unrestricted labial harmony* (Kirghiz; Korn 1969)

tör-dö	'in the corner'
kuš-ka ∼ kuš-ko	'to the bird'
ot-ko	'to the fire'

(34) *Unrestricted labial harmony* (Kirghiz; Korn 1969)

üı-dün	'from the house'
kök-tün	'of the sky'
su-nun	'of the water'
čoro-nun	'of the servant'

- Kirghiz shows both full labial harmony and full palatal harmony, and thus we can say there is full *color harmony* (rather than labial harmony) (van der Hulst & Moskal 2013).

➔ Labial harmony is defective in that it is always subject to additional restrictions.

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Tungusic languages

- In Tungusic languages, the main vowel harmony involves the tongue root (Li 1996). As such, the element |∀| is involved in alternations, resulting in variable "(|∀|)" (cf. palatal harmony in Turkic languages, which was represented by variable "(|I|)").
- Curiously, labial harmony is exclusively observed when trigger and target are low; i.e. labial harmony is licensed by an |A|-bridge:

(35) *Labial harmony only when trigger and target are low*

		(Baiyinna Orochen; Li 1996)
bəju(n)-ksə	(*bəju(n)-kso)	'elk hide'
ʊm-ma	(*ʊm-mɔ)	'who likes to drink'
oloo-mo		'who likes to cook'
sɔnɔ-mɔ		'who likes to weep'

Tungusic languages

- As expected under an approach that assumes absolute locality, /i, ɪ/ are opaque to labial harmony, since they intervene between a trigger and a target:

(36) /i, ɪ/ *are opaque* (Baiyinna Orochen; Li 1996)

bolboxi-wə	(*bolboxi-wo)	'wild duck-DEF.ACC'
tʃɔlik-pa	(*tʃɔlik-pɔ)	'cloud-shaped design-DEF.ACC'

- Furthermore, given that /u, ʊ/ are high, and, as such, do not meet the requirement of an |A|-bridge, they are opaque to labial harmony as well:

(37) /u, ʊ/ *are opaque* (Baiyinna Orochen; Li 1996)

owon-dulәə	(*owon-duloo)	'pancake-DESTIN'
ɔrɔn-dʊlaa	(*ɔrɔn-dʊlɔɔ)	'reindeer-DESTIN'

➔ Licensing is local; that is, it cannot apply across a vowel (rhymal head).

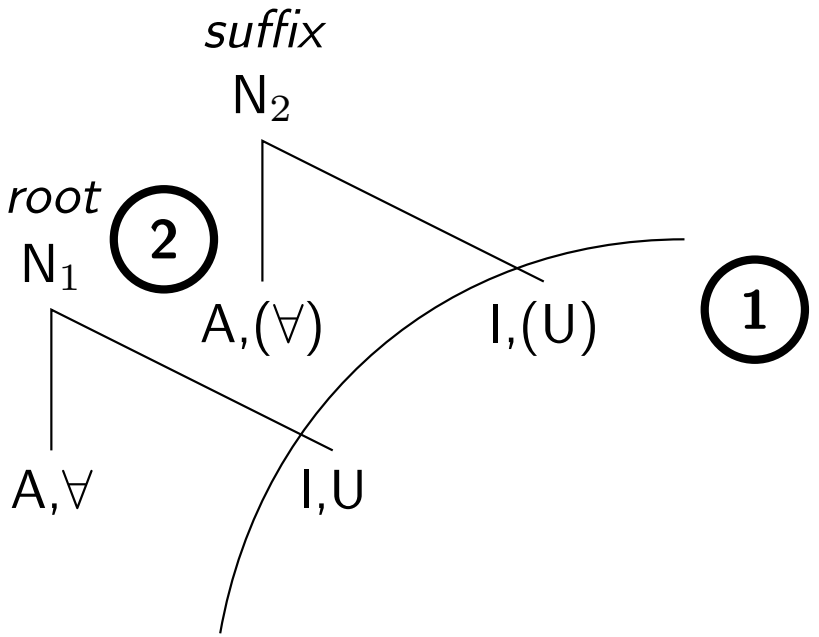
Tungusic languages

- Whereas Turkic languages display a lot of variation regarding which element can function as a bridge to license labial harmony, Tungusic languages almost exclusively make use of an |A|-bridge.
- Indeed, I argue that in Tungusic languages labial harmony, if it is to be observed at all, must be licensed by an |A|-bridge.

A cyclic architecture

- Tungusic languages cannot use an |I|-bridge since there are no front rounded vowels, and I argue that they cannot use the element |∀| because it is involved in tongue root harmony.
- Specifically, I propose that vowel harmony proceeds cyclically within the segment, with labial harmony (1) crucially preceding tongue root harmony (2).

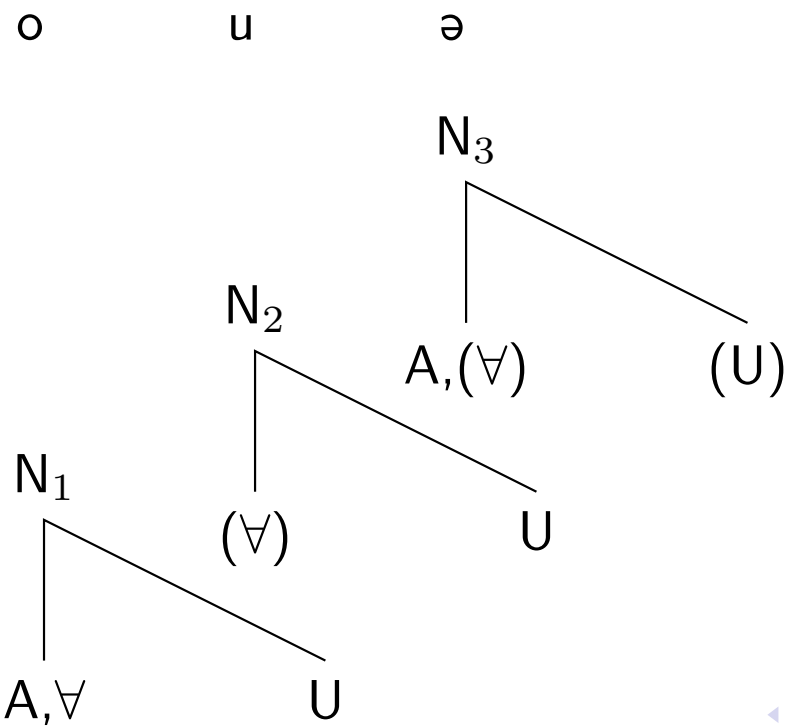
(38)



A cyclic architecture

- Consequently, the element |∀| is unaccessible at the point of labial harmony and thus cannot be a potential licensor for labial harmony.
- Consider the derivation of *owon-dulәә* 'pancake-DESTIN'. The lexical representation is as follows:

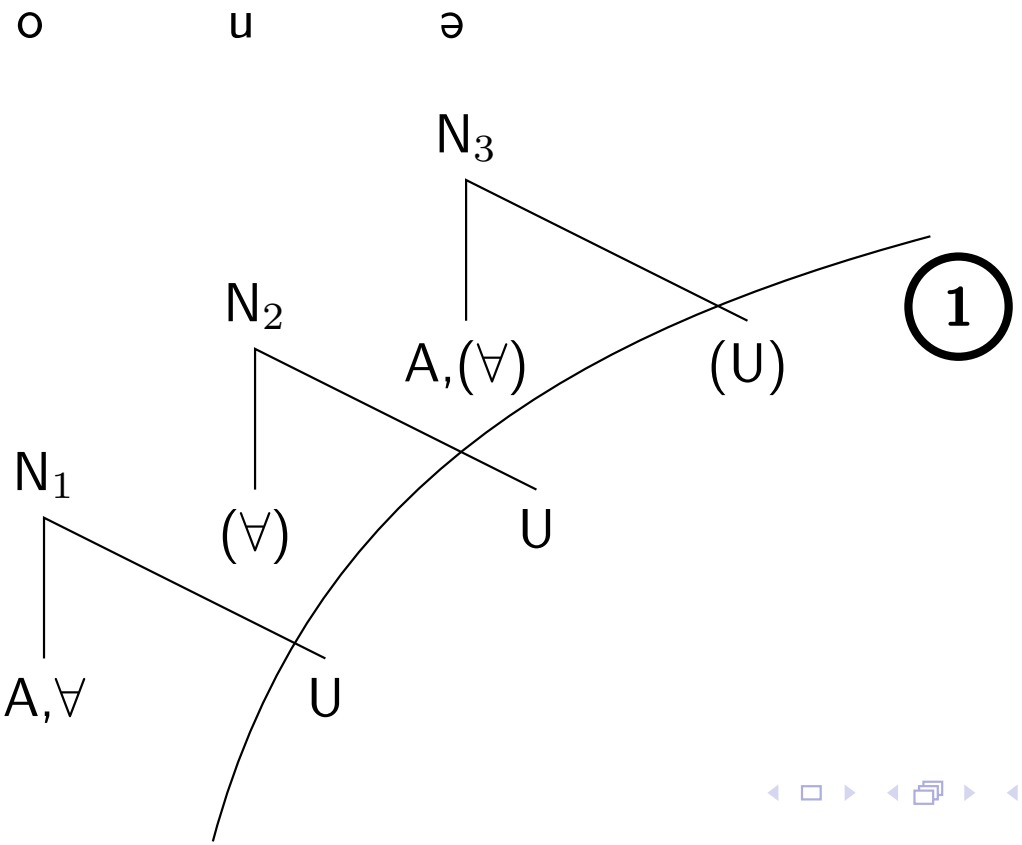
(39)



A cyclic architecture

- Given the architecture in (38), labial harmony will apply first. However, at this point, tongue root harmony has not yet applied: it has not been decided whether the |∀| element in the suffix (N_2) will be licensed or not. As such, it is not accessible, and cannot function as a licensor for labial harmony.

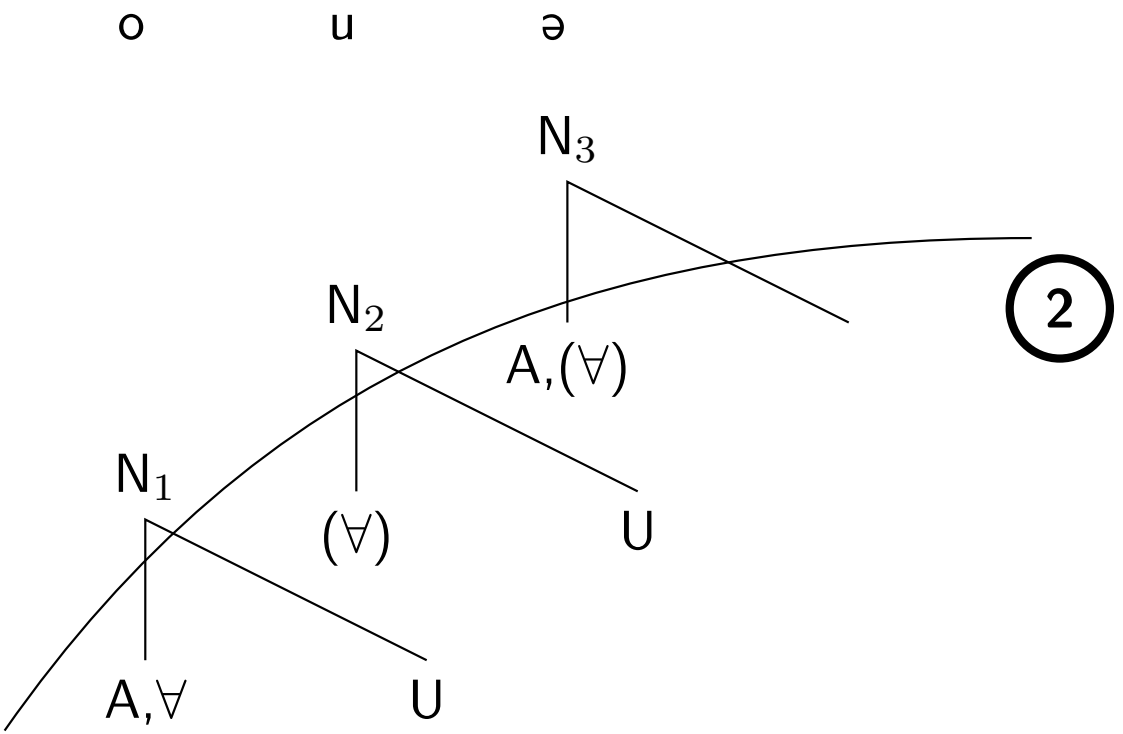
(40)



A cyclic architecture

- In the next step, tongue root harmony applies:

(41)



A cyclic architecture

- Crucially, elements derived by labial harmony do not have access to elements derived by tongue root harmony, which accounts for the non-occurrence of (any type of) $|\forall|$ licensing labial harmony in languages which display tongue root harmony.

➔ Vowel harmony proceeds cyclically within the segment, with labial harmony crucially preceding tongue root harmony.

Re-emergence of |∀| as a licensor

- Sibe has lost tongue root harmony: |∀| is not involved in harmony. Intriguingly, labial harmony is limited to an alternation between /ɨ/ and /u/, which is represented as |∀| and variable (|U|).
- When the trigger contains |U| lexically, we observe that the high target always displays rounding when preceded by a round vowel:

(42) *Labial harmony in high targets* (Sibe; Li 1996)

utu-xu	'to dress-NON-SELF-PERCEIVED IMM.PAST'
türü-xu	'to rent-NON-SELF-PERCEIVED IMM.PAST'
tɔ-χu	'to curse-NON-SELF-PERCEIVED IMM.PAST'
gö-χu	'to hit (the target)-NON-SELF-PERCEIVED IMM.PST'

Re-emergence of |∀| as a licensor

- This is the same configuration that we saw in Turkish, in which all high targets undergo labial harmony.
  The data below show that the suffix is subject to an alternation:

(43) *High target* (Sibe; Li 1996)

dʑi-xɨ	'to come-NON-SELF-PERCEIVED IMM.PAST'
tɨ-xɨ	'to sit-NON-SELF-PERCEIVED IMM.PAST'
tükɛ-χɨ	'to watch-NON-SELF-PERCEIVED IMM.PAST'
sav-χɨ	'to see-NON-SELF-PERCEIVED IMM.PAST'

Re-emergence of $|\forall|$ as a licensor

- When a language does not display tongue root harmony, $|\forall|$ will not be derived but lexical, and as such accessible to function as a licensor for labial harmony.

➔ Whereas elements derived by harmony become visible in cycles, lexical elements are always visible.

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Mongolian languages

- In Mongolian languages, the main vowel harmony again involves the tongue root (Svantesson et al. 2005), and |∀| is not available as a licensor. Labial harmony is licensed by an |A|-bridge.
- Given that they do not contain |A|, /u, ʊ/ are opaque to labial harmony:

(44) /u,ʊ/ *are opaque*

(Khalkha Mongolian; Svantesson et al. 2005)

og-ulʒ-lʒe	(*og-ulʒ-lʒo)	'to give-CAUS-DIRECT PAST'
	(cf. og-lʒo	'to give-DIRECT PAST')
xʊnʲ-ʊlʒ-lʒa	(*xʊnʲ-ʊlʒ-lʒɔ)	'to pleat-CAUS-DIRECT PAST'
	(cf. xʊnʲ-lʒɔ	'to pleat--DIRECT PAST')

Mongolian languages

- However, /i/ unexpectedly does not block labial harmony but is transparent to it:

(45) /i/ *is* **not** *opaque*

(Khalkha Mongolian; Svantesson et al. 2005)

poor-ig-o	'kidney-ACC-RFL'
xɔɔlʒ-ig-ɔ	'food-ACC-RFL'

- Cf. Tungusic languages, in which /i/ was opaque:

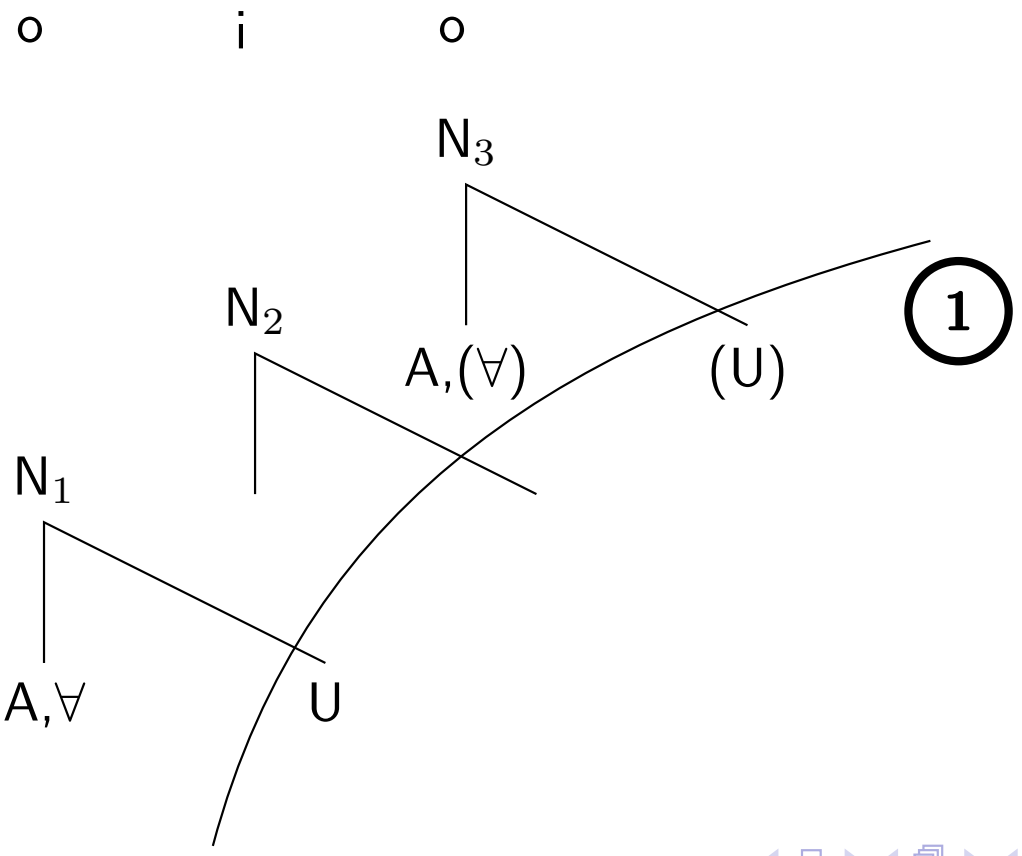
(46) /i, ɪ/ *are opaque* (Baiyinna Orochen; Li 1996)

bolboxi-wə	(*bolboxi-wo)	'wild duck-DEF.ACC'
tʃɔlik-pa	(*tʃɔlik-pɔ)	'cloud-shaped design-DEF.ACC'

Mongolian languages

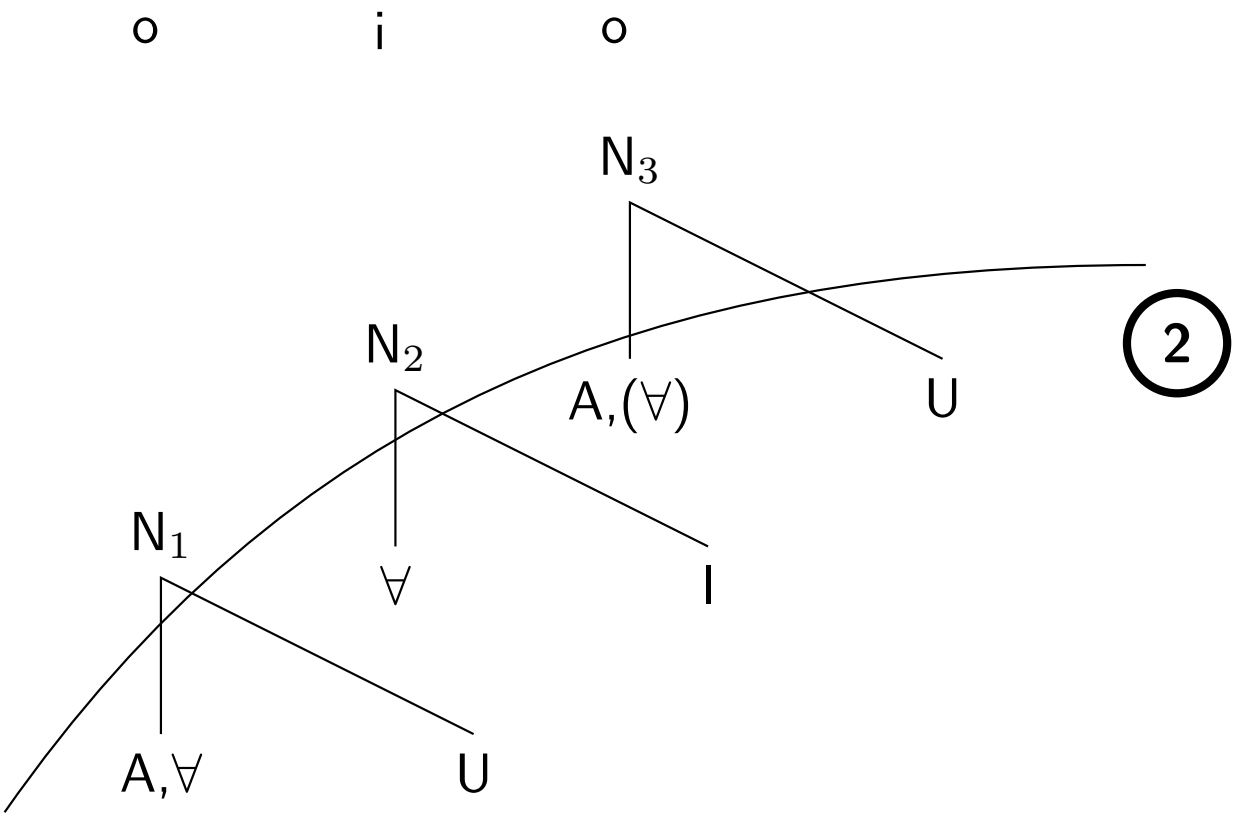
- Given the architecture proposed here, I argue that /i/ in Mongolian is inserted *at the second cycle*. I.e., at the time of labial harmony, the node is not specified for any element at all and locality is not violated:

(47)



Mongolian languages

(48)



Mongolian languages

- Inserting the elemental make-up of /i/ at the second cycle makes the prediction that it should participate in tongue root harmony, which is indeed supported by Shuluun Höh (Svantesson 1985).

(49) /i,ɪ/ *are ignored in labial harmony*

(Shuluun Höh; Svantesson 1985)

gɔt-ɪːxɔː	'town'
tomr-iːxoː	'iron'

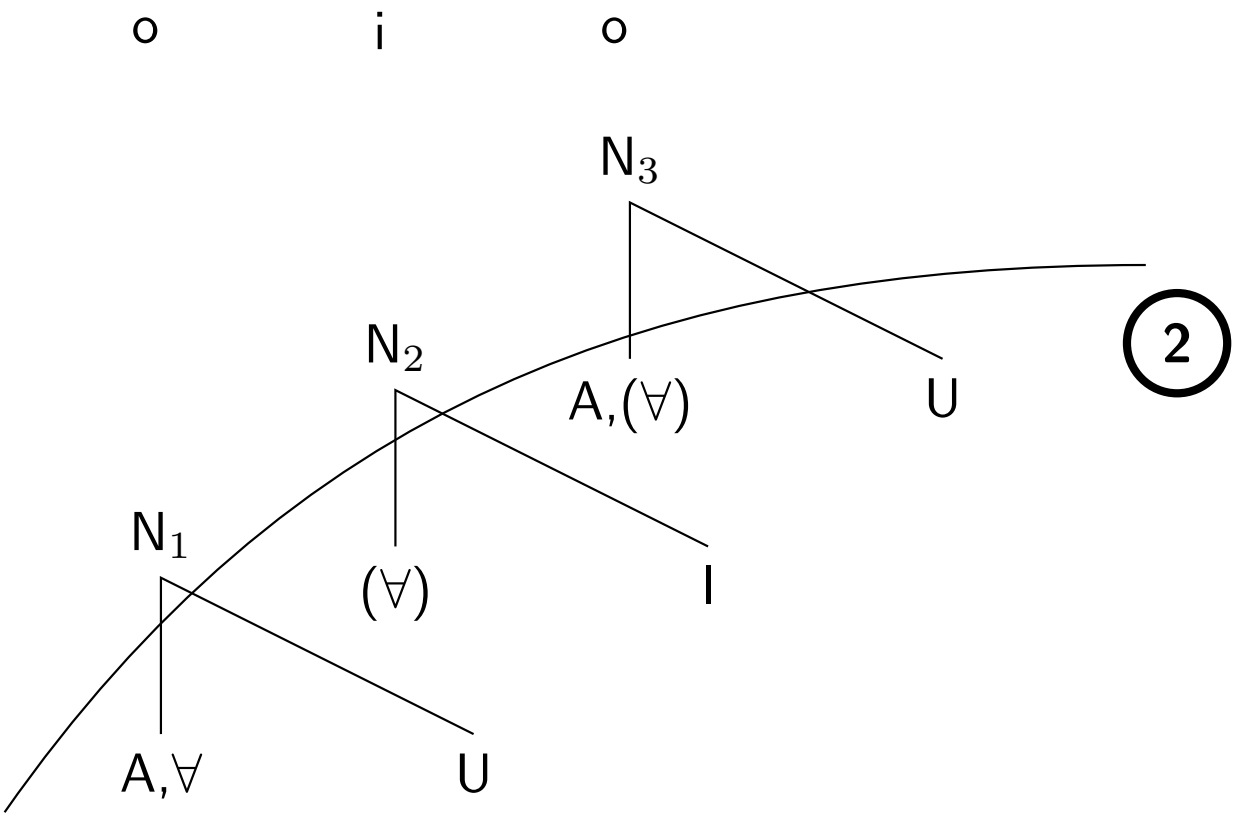
(50) /i,ɪ/ *participate in tongue root harmony*

(Shuluun Höh; Svantesson 1985)

ir(ə)-x-iːg	'come-NON-PST.VERBAL.NOUN-ACC'
xəl(ə)-x-iːg	'speak-NON-PST.VERBAL.NOUN-ACC'
ɪr(a)-x-ɪːg	'expose-NON-PST.VERBAL.NOUN-ACC'
taːr(a)-x-ɪːg	'fit-NON-PST.VERBAL.NOUN-ACC'

Mongolian languages

(51)



Mongolian languages

- Thus, in Tungusic languages all vowels are specified in the first cycle, but in Mongolian languages, the front high vowels are inserted at the second cycle:

(52) *Tungusic and Mongolian (non-epenthetic) vowels*

Tungusic	*Mongolian*	
All vowels	All vowels except /i/ (and /ɪ)	*early*
	/i/ (and /ɪ/)	*second cycle*

➔ In Mongolian, /i, ɪ/ are inserted at the second cycle, which makes them invisible for purposes of labial harmony.

Epenthetic vowels

- Intriguingly, epenthetic vowels in Tungusic languages and epenthetic vowels in Mongolian languages behave differently.
- In Tungusic languages, epenthetic vowels (indicated by square brackets) participate in tongue root harmony and, since they are always high, are opaque with regard to labial harmony:

(53) *Tungusic epenthetic vowels participate in harmony*

(Baiyinna Orochen; Li 1996)

olboʃ-[i]-ksə-	(*olboʃ-[i]-kso-)	'to swim, desid.asp.'
tʃɔ-mɔx-[i]-ksa-	(*tʃɔ-mɔx-[i]-ksɔ-)	'to pound, desid.asp.'
ɔtɔw-[ʊ]-ksa-	(*ɔtɔw-[ʊ]-ksɔ-)	'to watch, to guard; desid.asp.'

Epenthetic vowels

- In Mongolian languages, epenthetic vowels do not display any sensitivity to vowel harmony:

(54) *Mongolian epenthetic vowels do* **not** *participate in harmony*
(Khalkha Mongolian; Svantesson et al. 2005)

xuux[ə]lte	'doll'
galʒ[ə]wsa	'sausage'
pɔlʒčm[ə]r	'lark'

- This discrepant behavior follows naturally from the architecture proposed here; in Tungusic languages, epenthetic vowels are inserted early in the structure, whereas in Mongolian languages they must be inserted late.

Epenthetic vowels

- Suppose that epenthetic vowels contain a root node but are unspecified for elemental material.
  - In Tungusic, there are no complications and epenthetic vowels can be inserted at any point, including early.
  - In Mongolian, however, recall that this is exactly the configuration that was argued for /i/ (and /ɪ/), and thus 'reserved' for high front vowels.
  - At the second cycle, the representation for /i/ (and /ɪ/) is remedied by inserting (non-)variable |∀| (and |I|), and, as such, unavailable for segments other than /i/ (and /ɪ/).
  - Thus, in order to be distinguishable from /i/ (and /ɪ/), epenthetic vowels must be inserted after the second cycle.
- As such, it makes sense that epenthetic vowels in Mongolian must be incorporated late in structure given the hypothesis that for Mongolian high front vowels the locus of inserting segmental material is the second cycle.

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A brief note on labial harmony triggers

- So far, I have not made reference to the (phonological) length of a trigger, and both short vowels and long vowels qualify as appropriate triggers for labial harmony:

(55) *Labial harmony triggers* (Solon; Vaux 1993, Li 1996)

ɔrɔttɔ-wɔ	'grass-DEF.ACC'
mɔɔ-wɔ	'tree-DEF.ACC'

- Though a syllable is the canonical case of a vowel harmony trigger, we will see that there are cases in which we have to be more precise than this (at least for labial harmony).

Bigger than a syllable

- In Classical Manchu there is a restriction on the size of trigger (Zhang & Dresher 1996, Walker 2001).
- Whereas two successive round vowels do result in a labial vowel in the suffix, a single rounded vowel does not:

(56) *Two round vowels cause labial harmony*
(Classical Manchu; Walker 2001)

b**o**tʃ**o**-ŋgo ‘colored’

(57) *One round vowel does not cause labial harmony*
(Classical Manchu; Walker 2001)

t**o**-ŋga	(*to-ŋgo)	‘few, rare’
g**o**si-ŋga	(*gosi-ŋgo)	‘loving, compassionate’

Smaller than a syllable

- In Baiyinna Orochen (Li 1996), we find the situation in which a short vowel triggers labial harmony, but a long vowel does not:

(58) *A short round vowel causes labial harmony*
(Baiyinna Orochen; Li 1996)
ɔlɔ-jɔ 'fish-INDEF.ACC'

(59) *A long round vowel does not cause labial harmony*
(Baiyinna Orochen; Li 1996)
g**ɔɔ**l-ja (*gɔɔl-jɔ) 'policy-INDEF.ACC'

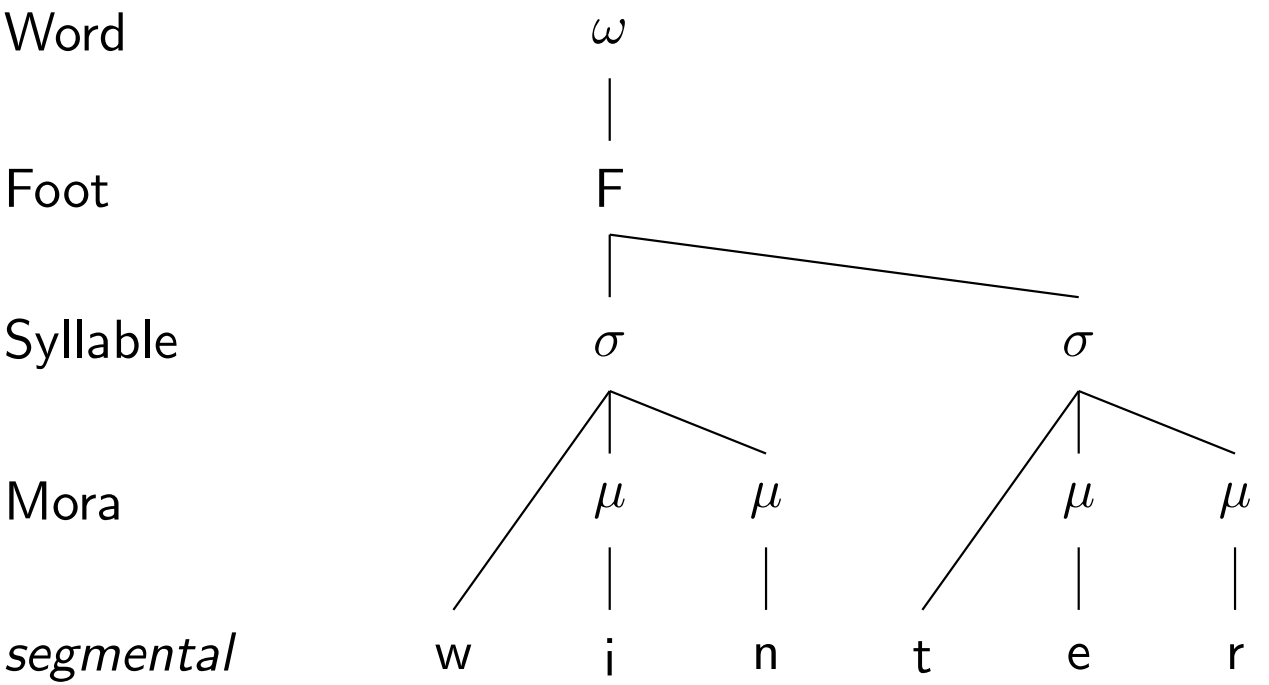
- Interestingly, long vowels do not block labial harmony:

(60) *A long round vowel does not block labial harmony*
(Baiyinna Orochen; Li 1996)
ɔlɔ-xɔɔn-mɔ 'fish-DIM-INDEF.ACC'

The prosodic hierarchy

- I propose that (labial) harmony triggers are sensitive to various levels in the prosodic hierarchy (Selkirk 1978, 1986; Nespor & Vogel 1986).

(61)



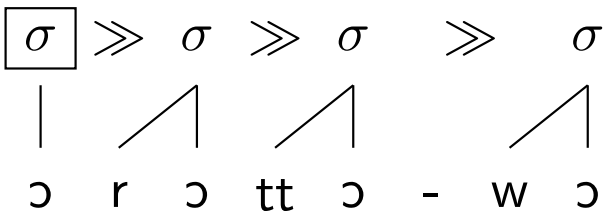
Syllabic level

- Labial harmony triggered at the syllabic level:

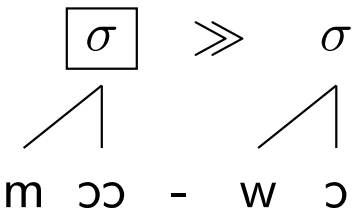
(62) *Labial harmony triggers* (Solon; Vaux 1993, Li 1996)

ɔrɔttɔ-wɔ	'grass-DEF.ACC'
m**ɔɔ**-wɔ	'tree-DEF.ACC'

(63)



(64)



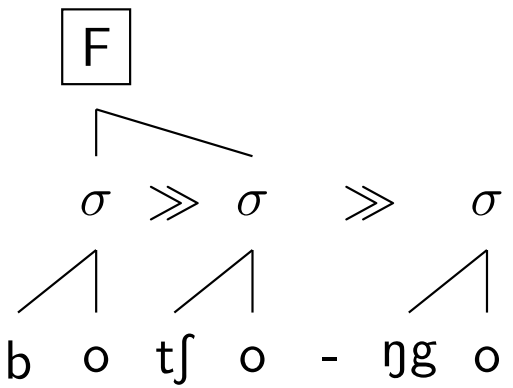
Foot level

- Labial harmony triggered at the foot level:

(65) *Two round vowels cause labial harmony*
(Classical Manchu; Walker 2001)

b**o**tʃ**o**-ŋgo ‘colored’

(66)



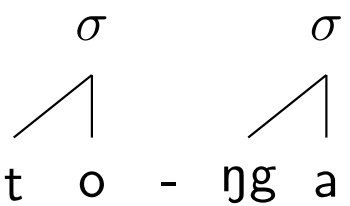
Foot level

(67) *One round vowel does not cause labial harmony*

(Classical Manchu; Walker 2001)

t**o**-ŋga	(*to-ŋgo)	'few, rare'
g**o**si-ŋga	(*gosi-ŋgo)	'loving, compassionate'

(68)



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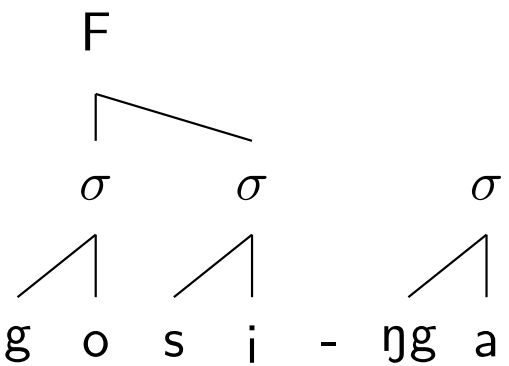


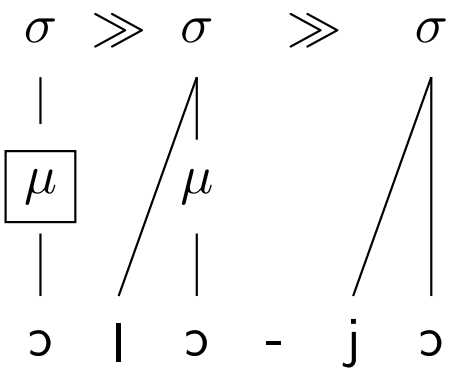
Mora level

- Labial harmony triggered at the mora level:

(70) *A short round vowel causes labial harmony*
(Baiyinna Orochen; Li 1996)

ɔlɔ-jɔ ‘fish-INDEF.ACC’

(71)

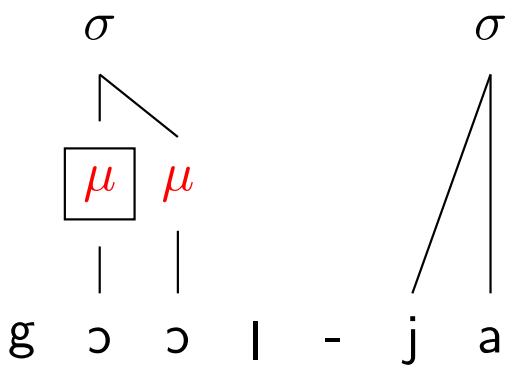


Mora level

- Labial harmony triggered at the mora level:

(72) *A long round vowel does not cause labial harmony*
(Baiyinna Orochen; Li 1996)
gɔɔl-ja (*gɔɔl-jɔ) 'policy-INDEF.ACC'

(73)



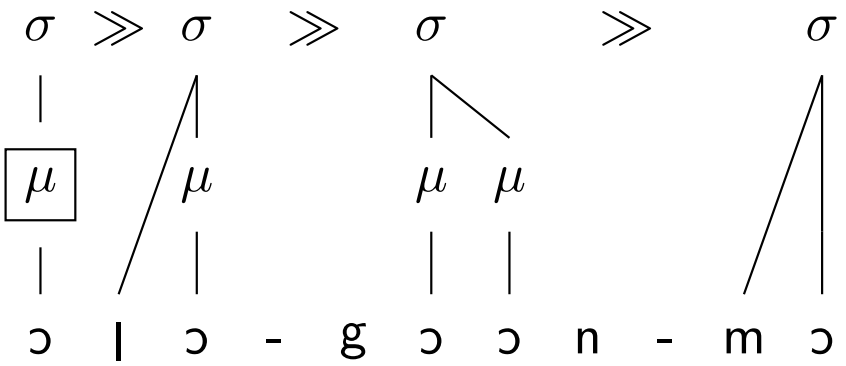
- I propose that, in effect, since the first mora is the head of the second mora, it cannot also be a harmonic 'head', i.e. trigger (see Moskal 2013).

Licensing at the syllable level

- Also, recall that long vowels do not block harmony:

(74) ɔlɔ-xɔɔn-mɔ ‘fish-DIM-INDEF.ACC’

(75)



➔ Licensing occurs at the syllable level.

- In a similar vein, in Khalkha Mongolian it is only the head of a diphthong that is relevant for the licensing of labial harmony:

(76) xɔɔlʒ-t^{h}ɔi-gɔ ‘food-COM-RFL’
(cf. c^{h}aas-t^{h}ai-ga ‘cat-COM-RFL’)

A brief note on labial harmony triggers

- Labial harmony triggers are sensitive to length distinctions; specifically, to various levels corresponding to those identified in the prosodic hierarchy (Selkirk 1978, 1986; Nespor & Vogel 1986), exemplified here by triggers at the level of the syllable, the foot and the mora.

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Conclusion

- ➔ Standard Government Phonology/Dependency Phonology fails to capture all the variation observed in labial harmony;
- ➔ The RcvP model (Van der Hulst 2005, 2012) of Government/ Dependency Phonology does capture all the variation;
- ➔ Labial harmony is defective in that it is always subject to additional restrictions;
- ➔ Vowel harmony is absolutely local (van der Hulst & Smith 1988);
- ➔ Vowel harmony proceeds cyclically *within the segment*, with labial harmony crucially preceding tongue root harmony;
- ➔ There is a distinction between lexical elements and (harmony-)derived elements;
- ➔ In Mongolian languages, front high vowels are inserted late, which makes them invisible for purposes of labial harmony;
- ➔ Licensing occurs at the syllable level;
- ➔ Labial harmony triggers are sensitive to various levels of the prosodic hierarchy (Selkirk 1978, 1986; Nespor & Vogel 1986).