Class 9

More on Huave and Arabic

11/30/23

1 Mobile affixation

- All of the affixation we've seen thus far has been oriented to one edge of the word or the other.
  - ○ Even when we've seen infixes, they've always been consistently close to the left edge or the right edge.
  - ○ There haven't been any instances where a single affix has alternated between one edge of the word and the other.

⋆ But actually there are some known cases of affixation that have exactly this character.

→ Affixes that behave like this are usually called **mobile affixes**, or sometimes **ambifixes**.

- Some seem to be motivated by morphosyntactic considerations:

(1) **Known cases of morphosyntactically-conditioned mobile affixation**

a. **Swahili** (Bantu, East Africa; Stump 1993:139):
The relative marker alternates between a prefix (sandwiched between agreement prefixes) and a suffix (immediately after the root), depending on tense and polarity.

b. **Fula** (Atlantic-Congo, West Africa; Stump 1993:141):
Agreement morphs alternate between prefixal and suffixal depending on tense and mood; also, the preterite tense suffix alternates between prefix and suffix depending on aspect.

∗ Examples like these may be thicker on the ground than normally believed (Arkadiev & Lander 2021).

- Others seem to be motivated by phonological considerations:

(2) **Known cases of phonologically-conditioned mobile affixation**

a. **Moro** (Kordofanian, Sudan; Jenks & Rose 2015):
Certain object marking affixes alternate between suffixal position and prefixal position, driven by the interaction between tone and alignment (see also Zukoff 2021b).

b. **Afar** (or Qafar [ʕafar]; Cushitic, Ethiopia; Fulmer 1991):
Various verbal affixes alternate between suffixal position and prefixal position, driven by the vowel/consonant status of the base-initial segment.

c. **Huave** (Huavean, Mexico; Noyer 1994, Kim 2008, 2010, Zukoff 2021a):
Various verbal affixes alternate between suffixal position and prefixal position, driven by the vowel/consonant status of the base-initial and base-final segments.

∗ The variety described by Noyer actually has a mix of phonological and morphosyntactic conditioning.

- Among the phonologically-motivated cases, Huave has received the most attention in the literature, and is perhaps the best documented, so that's where we'll start.

2 Mobile affixation in Huave

- In the San Francisco del Mar variety of Huave, as described by Kim (2008), there are at least 5 affixes that can appear on either side of the root, hence *mobile affixes*:

(3) **Huave's mobile affixes** (Kim 2010:139–141)

a.	/t/	[CP]	Completive	**“ASPECT”**
b.	/n/	[ST]	Stative	
c.	/m/	[SB]	Subordinate (/n/ in 1st person [SB1])	
d.	/r/	[2I]	2nd Person Intransitive (occurs only in conjunction with 2nd Person /e/)	
e.	/s/	[1]	1st Person (the only affix in Kim's “Layer 3”; all the others in “Layer 1”)	

- ○ Note that all of the exponents are single consonants.

- The descriptive generalization is as follows:

(4) **Huave's affix mobility generalization**

a. A mobile affix surfaces as a prefix (i.e., to the left of the root) just in case the constituent it attaches to starts in a vowel and ends in a consonant (5a).

b. Otherwise, it surfaces as a suffix (i.e., to the right of the root), after the constituent it attaches to (5b–d).

(5) **Completive /t/ mobile affixation** (Kim 2010:140, 141, 149)

a.	**V**(...)**C** bases:	***t***-*uc*	‘s/he ate’	[**uc-(i̲)**__t__]
b.	**C**(...)**V** bases:	*mo*^{h}*ko-**t***	‘s/he lay face down’	[****t****(a̲)-mo*^{h}*ko*]
c.	**V**(...)**V** bases:	*uju-**m***	‘that it spins’	[****m****-uju*]
d.	**C**(...)**C** bases:	*ɲ-uk*^{w}*al-a̲**s***	‘I am pregnant’	[****s****a̲-ɲ-uk*^{w}*al*]

∗ There's actually some question about the default behavior for **V**(...)**V** bases (Kim 2015b:116):

(6) [VC]$_{\text{ROOT}}$+[V]$_{\text{THEME}}$ → *suffix*
[uj+u]-**m** (***m**-[uj+u])
‘that it spins’

(7) [V]$_{\text{THEME}}$+[CV]$_{\text{ROOT}}$ → *prefix*
m-[a+la] (*[a+la]-**m**)
‘that s/he gobbles (it)’

- ○ Kim (2010) assumes that suffixation is the default (6), and that prefixation in these kinds of bases happens as a way to avoid parsing certain suffixes into the root syllable (7).
- ○ Kim (2015b) assumes that prefixation is the default (7), but that this is blocked just in case the initial vowel is a root vowel (6).

- The problem is, there's not a lot of either of these types of bases, so there isn't quite enough evidence to confidently decide between the characterizations.

- When there are multiple mobile affixes, e.g. (8), one of the affixes always takes “priority” over the other.

(8) ***ɲ****-uk*^{w}*al-a̲**s*** ‘I am pregnant’ (****ʃ****-uk*^{w}*al-a̲**n***)

- If we're thinking about it **cyclically** (à la Kim 2010):
  - STATIVE /n/ (→ [ɲ]) must be attaching *first*, and 1ST PERSON /s/ must be attaching *second*.
  - If the base at the time of attachment is [ukʷal], the generalizations in (4) tell us that that affix should surface as a prefix.

  → Since /n/ is the one that does surface as a prefix, it must be attaching first.

- If we're thinking about it **non-cyclically** (à la Zukoff 2021a, 2023):
  - The relative order of the affixes is determined by the ranking of their alignment constraints.

  → So, ALIGN-1-R ≫ ALIGN-ASP-R (if right aligned) or ALIGN-ASP-L ≫ ALIGN-1-L (if left aligned).
  - The generalization in (4) tells us that they can't both end up as prefixes or suffixes.

  ↪ If we use the MAP, we can reverse engineer the syntax from the alignment ranking.

3 Analyses of Mobile Affixation in Huave

- There's (more or less) three analyses out there in the literature:

(9) a. Cyclic subcategorization (Kim 2015b)
    b. Cyclic alignment (Kim 2010)
    c. Non-cyclic alignment (Zukoff 2021a)

- None of them are perfect, but comparing them will be illuminating about the relationship between spell-out and affix order, and what the phonology-morphology interface might look like.

3.1 Cyclic subcategorization

- Responding to comments by Mary Paster, Kim (2015b) proposes a cyclic subcategorization model of Huave's affix mobility.
  - It's based around the idea that affix direction could be specified in VI, and that differences in affix direction could be the only difference between suppletive allomorphs.

- Following the idea that prefixation (7) is the default for all vowel-initial bases (with root vowels specially rejecting it), Kim (2015b:118) proposes the following subcategorization frames:

(10) a. COMPLETIVE ⇔ /t-/ / _[$V_{[\text{-ROOT}]}$
     b. COMPLETIVE ⇔ /-t/

(11) a. 1ST PERSON ⇔ /s-/ / _[$V_{[\text{-ROOT}]}$
     b. 1ST PERSON ⇔ /-s/

⋆ The equivalent pair of VI's would have to be specified for each of the 5+ mobile affixes. This is a very serious duplication problem:

(12) **Duplication problem for mobile affixes' subcat frames**
  a. Each one has the same phonological relationship between their two suppletive allomorphs:
     → *identity*
  b. Each one has the same ordering relationship between their two suppletive allomorphs:
     → *prefix* vs. *suffix*
  c. Each one has the same relationship between the conditioning environments of their two suppletive allomorphs:
     → _[$V_{[\text{-ROOT}]}$ (for the prefix one) vs. *elswhere* (for the suffix one)

- This is a hallmark that a generalization is not being captured properly. But, again, advocates of Paster's (2009) subcategorization approach don't balk at this.

3.2 Cyclic alignment (Kim 2008, 2010)

- Like Kim's (2015b) subcategorization analysis, Kim's (2010) approach is also crucially cyclic, but it differs in the way that affix direction is determined.

→ Rather than being underlyingly specified, affix direction emerges through transparent interaction with the phonology via **P** ≫ **M**.

3.2.1 Cyclic ordering

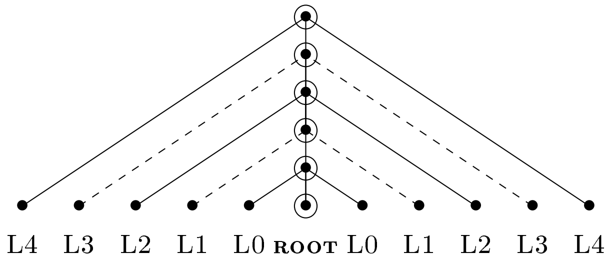
- Whether we go for the subcategorization approach or the alignment approach, we need to specify the very specific cyclic spell-out order in (13):

(13) **Spell-out order** (mobile affixes bolded; vocalic affixes boxed; a few things omitted)

$$\textsc{Root} > \underbrace{\boxed{\text{TV /a-,u-,-V/}} > \textsc{caus}\ /^{\text{h}}\text{ʧ}/}_{\text{Layer0}} > \underbrace{\textbf{2}\textsc{\textbf{i}}\ \textbf{/r/} > \boxed{\text{2 /e/}} > \{\textsc{\textbf{cp}}\ \textbf{/t/},\ \textsc{\textbf{st}}\ \textbf{/n/},\ \textsc{\textbf{sb}}\ \textbf{/m}{\sim}\textbf{n/}\}}_{\text{Layer1}} > \underbrace{\boxed{\textsc{fut}\ \text{/i/},\ \textsc{rfl}\ \text{/e/}}}_{\text{Layer2}} > \underbrace{\textbf{1 /s/}}_{\text{Layer3}} > \underbrace{\textsc{pl}\ \text{/n/}}_{\text{Layer4}}$$

- Kim (2008, 2010) breaks these up into "Layers" (14), in order to emphasize the alternating zones of mobile and non-mobile affixes, and the dissociation of attachment order from linear order:

(14) **Huave's "layered" morphology** (Kim 2015a:114)



- But as we can see from Layer 1 in (13), there's an even more granular level for this alternation.

⋆ Everything comes out right because there's a crucial alternating ordering between every (potentially co-occurring) mobile affix (all consonantal) and some vocalic affix.

- Consider the 2nd person intransitive future subordinate forms:

(15) **2nd Intransitive Future Subordinate** [(Kim 2010:141)]

a. **V(...)C base**	b. **C(...)V base**
i-m-e-r-u+c (*imeruc*) FUT-SB-2-2I-eat 'you will eat'	i-m-e-wic+i-r (*imewicjor*) FUT-SB-2-rise-2I 'you will get up'

- The cyclic derivations for these two forms have to be as follows:

(16) **Cyclic derivations**

	(15a)	(15b)		*(15a)	*(15b)
1. Root	c	wic			
2. Theme Vowel	u+[c]	[wic]+i			
3. 2I /r/	r-[uc]	[wici]-r			
4. 2 /e/	e-[ruc]	e-[wicir]	5. SB /m/	*[ruc]-*i*m	*[wicir]-*a*m
5. SB /m/	m-[eruc]	m-[ewicir]	4. 2 /e/	*e-[rucim]	*e-[wiciram]
6. FUT /i/	i-[meruc]	i-[mewicir]			
	imeruc	*imewicjor*			

→ Switching, e.g., the order of attachment of SB /m/ and 2 /e/ will change the direction of attachment for /m/.
  - ○ If the prefixal vowel is not yet available, the base at that moment is **C(...)C**.
  - ○ This would cause /m/ to surface on the right, for both derivations, contrary to fact.

- We could go through the same exercise for various other combinations. Here's one more:

(17) **1st person Future Subordinate** [(Kim 2010:141)]

a. **V(...)C base**	b. **C(...)V base**
s-i-n-a+^{h}ʧ (*ʃina^{h}ʧ*)	s-i-ʧut+u-n (*ʃiʧutun*)
1-FUT-SB1-give	1-FUT-sit-SB1
'(that) I will give (it)'	'(that) I will sit'

(18) **Cyclic derivations**

	(17a)	(17b)		*(17a)	*(17b)
1. Root	^{h}ʧ	ʧut			
2. Theme Vowel	a+[^{h}ʧ]	[ʧut]+u			
3. 2I /r/	*n/a*	*n/a*			
4. 2 /e/	*n/a*	*n/a*			
5. SB1 /n/	n-[a^{h}ʧ]	[ʧutu]-n			
6. FUT /i/	i-[na^{h}ʧ]	i-[ʧutun]	7. 1 /s/	*[na^{h}ʧ]-*i*s	*[ʧutun]-*u*s
7. 1 /s/	s-[ina^{h}ʧ]	s-[iʧutun]	6. FUT /i/	*i-[na^{h}ʧis]	*i-[ʧutunus]
	ʃina^{h}ʧ	*ʃiʧutun*			

⋆ **Take-away:**
  - ○ Maybe this perfect alternation between consonantal morphemes and vocalic morphemes just happens to be the way the language's morphology is organized.
  - ○ Or maybe there's something more phonological going on than meets the eye...

- Before following up on that skepticism, let's see how Kim (2010) actually derives affix direction.

3.2.2 Cyclic alignment via P ≫ M

- Kim (2010) uses Cophonology Theory (Orgun 1996, 1999, Inkelas, Orgun, & Zoll 1997, Inkelas 1998, Inkelas & Zoll 2005, 2007, *a.o.*) to implement a cyclic **P ≫ M** analysis of affix direction.

⋆ In Cophonology Theory, each morpheme is associated with a (potentially) unique phonological grammar ("**cophonology**").
  - ∘ Words are built up completely cyclically, adding one morpheme at a time.
  - ∘ Each time a morpheme is added to the word, a round of phonological derivation occurs, using that morpheme's cophonology.

> ∗ There's a new version of this theory on the market: "Cophonologies by Phase" (Sande, Jenks, & Inkelas 2020).
> - ∘ Each morpheme still has its own cophonology, but phonological evaluations are triggered only by phases.
> - ∘ The cophonologies interact (through constraint weighting) to produce a single weighting for that phase on that derivation, and that weighting generates an output.
> - → I think this is a non-starter for Kim's (2010) cophonology theory analysis, since it requires the morpheme-by-morpheme cyclicity.

- The way that Kim (2010) accounts for the affix direction generalizations from (4) is by giving different morphemes different cophonologies. These cophonologies differ primarily in two ways:
  1. Which alignment constraints they contain
  2. How their alignment constraints are ranked with respect to other phonological constraints

- Kim (2010) posits two alignment constraints:

(19) **Affix placement constraints** (Kim 2010:148)

a. ALIGN-R: Align the *left edge of the affix* to the **right edge of the domain**. "Suffix!"

b. ALIGN-L: Align the *right edge of the affix* to the **left edge of the domain**. "Prefix!"

  - ∘ These are opposite-edge alignment constraints, technically just saying stick the two things together.
    - ▪ (By "domain", she means the base of affixation.)
  - ∘ But nothing would change if we used same-edge alignment constraints treating the entire output as the domain.

∗ She says that the cophonologies of prefixes only contain ALIGN-L and the cophonologies of suffixes only contain ALIGN-R (Kim 2010:148, fn.8), and implies that the existence of these constraints in a grammar controls what candidate orders can be assessed in the phonological evaluation.
  - ∘ Neither of these are necessary assumptions. The right result can always be achieved by ranking and an unrestricted candidate set.

- But the basic point is right:
  - ∘ Prefixes are morphemes with high-ranked ALIGN-L
  - ∘ Suffixes are morphemes with high-ranked ALIGN-R

⋆ **So what are mobile affixes?**
  - → If we follow the generalizations in (4), we know that the elsewhere position for mobile affixes is suffix position. This means that they should also have high-ranked ALIGN-R, just like suffixes.

⋆ **So what differentiates them from regular suffixes?**
  - → They are sensitive to phonological considerations.
  - ∘ i.e., for mobile affixes, ALIGN-R is **dominated** by certain phonological constraints.

⋆ **What are those phonological considerations/constraints?**

- ○ Let's look at the basic data and generalizations again:

(20) **Completive /t/ mobile affixation** (Kim 2010:140, 141, 149)

a.	**V**(...)**C** bases:	***t**-uc*	's/he ate'	[**uc-(i)**t**]
b.	**C**(...)**V** bases:	*mo^{h}ko-**t***	's/he lay face down'	[*t(a)-mo^{h}ko*]
c.	**V**(...)**V** bases:	*uju-**m***	'that it spins'	[****m**-uju*]
d.	**C**(...)**C** bases:	*ɲ-uk^{w}al-**as***	'I am pregnant'	[****sa**-ɲ-uk^{w}al*]

(21) **Huave's affix mobility generalization**

a. A mobile affix surfaces as a prefix (i.e., to the left of the root) just in case the constituent it attaches to starts in a vowel and ends in a consonant (20a).

b. Otherwise, it surfaces as a suffix (i.e., to the right of the root), after the constituent it attaches to (20b–d).

- The way to turn these generalizations into an analysis is to identify what is being *avoided* by prefixation to **V**(...)**C** bases:
  - ○ This is the only case where prefixation avoids a **consonant cluster** but suffixation doesn't.

- The language does not allow consonant clusters.
  - ○ When they do arise, they are repaired by vowel epenthesis.
  - → So we independently know that *CC (22a) outranks Dep (22b):

(22) **Cluster constraints**

a. *CC: Assign one violation * for each sequence of adjacent consonants.

b. Dep: Assign one violation * for output segment w/o an input correspondent. ("Don't epenthesize!")

- We can thus characterize affix mobility as a way of avoiding clusters without epenthesis:

(23) **Ranking for mobile affixes:** *CC ≫ Dep ≫ Align-R

- ○ What this ranking says:
  - ▪ The best way to fix a cluster is to move an affix away from the right edge (violate Align-R).
  - ▪ If you can't fix the problem that way, fix it by epenthesis (violation Dep) (...and don't bother displacing the affix).

3.2.3 Single mobile affixes

- If there's a vowel at the end of the base, suffixation will never create a cluster, therefore suffixation is perfect ((24a) and (25a)).

(24) **Derivation of *suffixation* for mobile affix with a C**(...)**V base**

/[mo^{h}ko], t/	*CC	Dep	Align-R	Align-L
a. ☞ mo^{h}ko-t				*
b. mo^{h}ko-*o*t		*!		*
c. t-mo^{h}ko	*!		*	
d. t*o*-mo^{h}ko		*!	*	

(25) **Derivation of *suffixation* for mobile affix with a V**(...)**V base**

/[uju], m/	*CC	Dep	Align-R	Align-L
a. ☞ uju-m				*
b. uju-*u*m		*!		*
c. m-uju			*!	
d. m*u*-uju		*!	*	

- If the base both begins and ends in a consonant, both suffixation (26a) and prefixation (26c) would create a cluster, which would need to be repaired by epenthesis (26b,d).
  - Since either option would incur the same violations of the phonological constraints (*CC and Dep), the Align-R violation you'd get from prefixation (26d) doesn't buy you anything.
  - So you do suffixation plus epenthesis (26b).

(26) **Derivation of *suffixation* (plus epenthesis) for mobile affix with a C(...)C base**

/[nukʷal], s/	*CC	Dep	Align-R	Align-L
a. nukʷal-s	*!			*
b. ☞ nukʷal-*a*s		*		*
c. s-nukʷal	*!		*	
d. s*u*-nukʷal		*	*!	

- Only when the base begins in a vowel and ends in a consonant is violation of Align-R motivated.
  - Suffixation would lead to a cluster and violation of *CC (27a), which would need to be repaired by epenthesis (27b).
  - Prefixation (27c) doesn't violate either of these constraints, instead just violating Align-R.
  - Since Align-R is ranked lowest, this is the optimal candidate, and we generate **prefixation**.

(27) **Derivation of *prefixation* for mobile affix with a V(...)C base**

/[uc], t/	*CC	Dep	Align-R	Align-L
a. uc-t	*!			*
b. uc-*i*t		*!		*
c. ☞ t-uc			*	
d. t*u*-uc		*!	*	

3.2.4 Multiple mobile affixes

- The cyclic part of the analysis is that the cophonologies can change as you add successive morphemes.

- The tableaux in (28) show how [n-u+kʷal-*a*s] (*ɲukʷalas*) is derived through two successive rounds of mobile affixation:

(28) **Cycle 1: [Root] + subordinate /n/** (mobile affix cophonology)

/[ukʷal], n/	*CC	Dep	Align-R	Align-L
a. ukʷal-n	*!			*
b. ukʷal-*a*n		*!		*
c. ☞ n-ukʷal			*	
d. n*u*-ukʷal		*!	*	

↪ **Cycle 2: [Root-subordinate] + 1 /s/** (mobile affix cophonology)

/[nukʷal], s/	*CC	Dep	Align-R	Align-L
a. nukʷal-s	*!			*
b. ☞ nukʷal-*a*s		*		*
c. s-nukʷal	*!		*	
d. s*u*-nukʷal		*	*!	

∗ Note that if this grammar tried to add both affixes at once, it wouldn't have any way of determining which one would get kicked into prefix position.
  - This is done instead by specifying the sequence in which affixes are entered into the derivation.

- The tableaux in (30) show how *ʃinaʰʧjon* (29) is derived by switching back and forth between the three different kinds of affixal cophonologies.

(29) [s-i-n-a+ʰʧ-*i*n] (*ʃinaʰʧjon*) [(Kim 2008:279)]
1-FUT-SB1-give-PL
'that we (excl.) will give'

(30) **Cycle 1: [Root] + subordinate /n/** (mobile affix cophonology)

/[aʰʧ], n/	*CC	Dep	Align-R	Align-L
a. aʰʧ-n	*!			*
b. aʰʧ-*i*n		*!		*
c. ☞ n-aʰʧ			*	
d. n*a*-aʰʧ		*!	*	

↪ **Cycle 2: [Root-subordinate] + future /i/** (prefix cophonology)

/[naʰʧ], i/	Align-L	*CC	Dep	Align-R
a. naʰʧ-i	*!			
b. ☞ i-naʰʧ				*

↪ **Cycle 3: [future-Root-subordinate] + 1 /s/** (mobile affix cophonology)

/[inaʰʧ], s/	*CC	Dep	Align-R	Align-L
a. inaʰʧ-s	*!			*
b. inaʰʧ-*i*n		*!		*
c. ☞ s-inaʰʧ			*	
d. s*i*-inaʰʧ		*!	*	

↪ **Cycle 4: [1-future-Root-subordinate] + plural /n/** (suffix cophonology)

/[sinaʰʧ], n/	Align-R	*CC	Dep	Align-L
a. sinaʰʧ-n		*!		*
b. ☞ sinaʰʧ-*i*n			*	*
c. n-sinaʰʧ	*!	*		
d. n*i*-sinaʰʧ	*!		*	

3.2.5 Local summary

- Affix direction is encoded through the direction of the (highest-ranked) alignment constraint in an affix's cophonology.

(31) a. **Prefix** = Align-L
b. **Suffix/mobile affix** = Align-R

- Mobility vs. immobility is determined based on the relative ranking of {*CC ≫ Dep} and that alignment constraint. (The distribution of mobile and immobile affixes is arbitrary.)

(32) a. **Mobile** = {*CC ≫ Dep} ≫ Align
b. **Immobile** = Align ≫ {*CC ≫ Dep}

- The specified cyclic order is crucial in order to derive the correct distribution of mobile affixes in different kinds of complex bases.

3.3 Non-cyclic alignment (Zukoff 2021a)

- Kim (2010:146, fn. 5) said the following:

> *"I do not rule out the possibility of a noncyclic reanalysis, though given the complexity of the facts, a full comparison of cyclic and noncyclic analyses and the more general theoretical implications of each must remain for future research."*

∗ Challenge accepted!

- In Zukoff (2021a), I develop a non-cyclic, alignment-based analysis of these facts.
  - My analysis contains most of the same basic ingredients as Kim's (2010) analysis, namely (31) & (32).
  - The main difference is that order is computed fully in parallel (i.e. all together, all at once), rather than cyclically (i.e. one at a time).

- You can get (almost) everything to work out by positing the single ranking in (33).
  - Unlike in the cyclic alignment approach, we need only a **single constraint ranking** that applies the same to every derivation.

(33) **Total ranking** (all rankings crucial, some morphemes not included)
*CC, Align-pl-R ≫ Dep ≫ Align-fut-L ≫ Align-2-L ≫ Align-2i-R ≫ Align-sb-R ≫ Align-1-R ≫ Align-Asp$_{(\text{cp/st})}$-R

- Compare this ranking to the cyclic order Kim needs (34).

(34) **Spell-out order for Kim (2010, 2015b)** (just the morphemes in (33))

$$\text{Root} > \underbrace{\textbf{2i /r/} > \boxed{\text{2 /e/}} > \{\textbf{cp /t/, st /n/, sb /m}{\sim}\textbf{n/}\}}_{\text{Layer1}} > \underbrace{\boxed{\text{fut /i/}}}_{\text{Layer2}} > \underbrace{\textbf{1 /s/}}_{\text{Layer3}} > \underbrace{\text{pl /n/}}_{\text{Layer4}}$$

- Interestingly, the relative rankings don't substantially correspond to the cyclic order.
  - This may indicate that the two analyses are actually more different than meets the eye.

- Note also how this analysis is a reduction in complexity of the morphological specificity of the system.
  - In Kim's analysis, every morpheme was indexed to its own constraint grammar, which included alignment constraints.
  - Here, every morpheme is simply indexed to its own alignment constraint.

3.3.1 Analysis illustration

- Here's a tableau that illustrates how this works for a complex form:

(35) **Tableau for 1st person Future Subordinate of V(...)C bases:** [s-i-n-a^{h}ʧ] (*ʃina^{h}ʧ*)

/a+^{h}ʧ, n$_{\text{SB1}}$, i$_{\text{FUT}}$, s$_{1}$/	*CC	Dep	Align-fut-L	Align-sb-R	Align-1-R
a. s-a^{h}ʧ-i-n			**!* (s, a^{h},ʧ)		**** (a^{h},ʧ, i, s)
b. n-a^{h}ʧ-i-s			**!* (n, a^{h},ʧ)	**** (a^{h},ʧ, i, s)	
c. ☞ s-i-n-a^{h}ʧ			* (s)	** (a^{h},ʧ)	**** (i, n, a^{h},ʧ)
d. n-i-s-a^{h}ʧ			* (n)	***!* (i, s, a^{h},ʧ)	** (a^{h},ʧ)
e. i-s-a^{h}ʧ-*i*n		*!			**** (a^{h},ʧ, *i*,n)
f. i-a^{h}ʧ-*i*s-*i*n		*!*			** (*i*,s)
g. i-a^{h}ʧ-s-n	*!*				* (s)

- (35g) is the candidate that maximally aligns everything to where it wants to go.
  - fut /i/ is a "prefix" (Align-fut-L), so it wants to be at the left edge, and it is.
  - sb1 /n/ and 1 /s/ have right-alignment constraints, so they want to be at the right edge, and they are, as best as possible given the ranking Align-sb-R ≫ Align-1-R.

→ But this creates a long cluster at the right edge, and thus two fatal *CC violations.
  - Therefore, as long as *CC outranks all these alignment constraints, this isn't going to be the winner.

- (35f) fixes all the cluster problems through two instances of epenthesis.
  - It also increases violation of Align-1-R, because the 1 /s/ is now one further segment away from the right edge (because of the insertion of the rightmost [*i*]).

→ This will not be optimal as long as Dep is ranked above the other alignment constraints.

- (35e) avoids one of the consonant sequences by kicking 1 /s/ back to between the two left-edge vowels (incurring violations of Align-1-R, the lowest-ranked alignment constraint).
  - It leaves the other right-oriented affix sb1 /n/ at the right edge, and avoids that consonant sequence by epenthesizing before it, violating Dep.

→ This single Dep violation will again be fatal because it ranks above all the alignment constraints.

⋆ This means that the optimal candidate will have to have some costly alignment violations.

→ Nevertheless, among the candidates that **rearrange** the affixes in such a way that avoids *all clusters and epenthesis* (35a–d), the optimal one is (35c), which minimizes high-ranked alignment violations.
  - This candidate has only one violation of Align-fut-L, but needs that violation because placing one of the right-oriented affixes before it alleviates one of the clusters.
  - (35c) also has fewer Align-sb-R violations than its closest competitor (35d), b/c the rightmost right-oriented affix is sb1 /n/ not 1 /s/, even though it's separated from the right-edge by the whole base.

∗ The paper goes through all the derivations in this manner one by one to motivate the rankings in (33), but they all essentially work the same way.

3.3.2 The distribution of mobility

- What I see as one of the points in favor of this analysis over the cyclic one is that it gives a principled explanation to why the plural markers, including default pl /n/, is always a suffix, even though (almost) all the other consonantal affixes are mobile (Zukoff 2021a:§3).

- The plural is not just always a suffix, but always the *rightmost* affix in the word (Kim 2010:137), as shown in (36–37).

(36) **2nd person Plural Intransitive (C(...)V)**
i-wic+i-r-u-$\boxed{\text{n}}$ (*iwicjorun*) 'you (pl.) rise'
2-rise-2i-itr-pl [(Kim 2008:252)]

(37) **1st person Plural Atemporal (V(...)C)**
s-a+^{ɲ}ɟim-$\boxed{\text{an}}$ (*sa^{n}ɟjoman*) 'we (excl.) want'
1-want-pl [(Kim 2008:249)]

→ If we're handling order via parallel alignment, this will necessarily mean that Align-pl-R is the highest ranked alignment constraint (as is shown in (33)).

- The interesting thing about the plural, in the context of everything else we've seen thus far, is that it remains a suffix even if this requires epenthesis that could have been alleviated by mobility:

(38) **Phonotactically unnecessary epenthesis in plural forms** [(Kim 2008:249, 257, 279)]

a. e-c-$\boxed{in}$ (*icjon*) — *$\boxed{\text{n}}$-e-c, *e-$\boxed{\text{n}}$-a+c
2-eat-PL
'you (pl.) eat (s.t.)'

b. e-ʰʧ-$\boxed{in}$ (*iʰʧjon*) — *$\boxed{\text{n}}$-e-ʰʧ, *e-$\boxed{\text{n}}$-a+ʰʧ
2-give-PL
'you (pl.) give'

c. e-ᶮɟim-$\boxed{an}$ (*iᶮɟjoman*) — *$\boxed{\text{n}}$-e-ᶮɟim, *e-$\boxed{\text{n}}$-a+ᶮɟim
2-want-PL
'you (pl.) want'

d. e-r-u+c-$\boxed{in}$ (*irucjon*) — *$\boxed{\text{n}}$-e-r-u+c, *r-e-$\boxed{\text{n}}$-u+c
2-2I-eat-PL
'you (pl.) eat' (generic)

e. i-m-e-ʰʧ-$\boxed{in}$ (*imeʰʧjon*) — *$\boxed{\text{n}}$-i-m-e-ʰʧ, *m-i-$\boxed{\text{n}}$-e-ʰʧ, *i-m-e-$\boxed{\text{n}}$-a+ʰʧ
FUT-SB-2-give-PL
'you (pl.) will give'

⋆ While mobility in all the other consonantal affixes is driven by the fact that their alignment constraints rank *below* Dep, the fact that Align-pl-R outranks all these alignment constraints means that having it rank *above* Dep is consistent with all the necessary rankings.

- Whereas the cyclic approach simply has to stipulate that the plural happens to have a suffixal cophonology and everything else has the mobile cophonology, this difference falls out in the parallel approach precisely because of its ranking consistency.

3.4 A problem, and a pseudo-cyclic solution

- The current ranking actually predicts, incorrectly, that left-oriented 2 /e/ should *move rightward* to host the right-aligned PL /n/.
  - ○ The Dep violation incurred by (40b) is worse than the extra alignment violations incurred by (40d).

(39) **Ranking:** Align-pl-R ≫ Dep

(40) **2nd person *plural* atemporal to C(...)C bases** (38c) [e-ᶮɟim-*a*n] (*iᶮɟjoman*) [to be revised]

/ᶮɟim, e₂, n_{PL}/	Align-pl-R	*CC	Dep	Align-2-L
a. e-ᶮɟim-n		*!		
b. ☞/☹ e-ᶮɟim-*a*n			*(!)	
c. n-e-ᶮɟim	*!*** (e, ᶮɟ,i,m)			* (n)
d. 💣 ᶮɟim-e-n				*** (ᶮɟ,i,m)

⋆ **The answer:** BD-correspondence.

3.4.1 Diphthongization and BD-correspondence

- Huave has a process of *diphthongization* (Kim 2008:Ch. 3):

(41) **Diphthongization:** Vowels diphthongize in word-final closed syllables where vowel and coda disagree in backness.

- This process is illustrated in (42a), the singular form corresponding to the plural form currently under discussion (42b) (data from Kim 2008:249).

(42) a. **2nd *singular* (expected):** /e₂-ᶮɟim/ → [iᶮɟ**jo**m] (*[iᶮɟ**i**m])
b. **2nd *plural* (*un*expected):** /e₂-ᶮɟim-n/ → [iᶮɟ**jo**m*a*n] (*[iᶮɟ**i**m*a*n])

→ Diphthongization proper to the singular surfaces in its corresponding plural outside of its proper context.
  - ○ This relationship holds for all singular forms which regularly undergo final diphthongization: their plural forms show *overapplication* of diphthongization.[1]
  - ○ This suggests that a special relationship holds between singulars and plurals.

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[1] Yuni Kim (p.c.) confirmed that this is a correct generalization of the data available in Kim (2008).

- A cyclic phonological approach could generate these diphthongization facts (see, e.g., Noyer 2013).
  → But so can a BD-correspondence approach, which will be compatible with my parallel analysis.

- If the singular serves as the base of correspondence for the plural, faithfulness to the regularly derived diphthong in the singular can induce diphthongization in the plural, even though its context is not met.
  ∗ We can use our structural criterion for basehood (morphosyntactic containment) for this case if we assume that SINGULAR is not present in the structure
  ◦ Perhaps because of impoverishment, or maybe because PLURAL is privative).

3.4.2 BD-correspondence can fix the ordering problem

⋆ Faithfulness along this same BD-correspondence relation can solve the ordering problem in (40).

- The problematic candidate (40d)/(43d) is the only one which *reorders* the morphemes relative to the singular; namely, it switches the order of the root and the 2 /e/ morpheme.
  → Therefore, faithfulness to the singular could fix our problem, just like faithfulness to the singular induces overapplication of diphthongization. This is shown in (43) with a cover constraint FAITH-BD.

(43) **2nd person *plural* atemporal to C(...)C bases** (38c) [e-ᶮɟim-*a*n] (*iᶮɟjoman*)

BASE: [iᶮɟ**jo**m] (singular) INPUT: /ᶮɟim, e$_2$, n$_{\text{PL}}$/				FAITH-BD	ALIGN-PL-R	*CC	DEP	ALIGN-2-L
a.		e-ᶮɟim-n	[iᶮɟ**jo**mn]			*!		
b.	☞	e-ᶮɟim-*a*n	[iᶮɟ**jo**man]				*	
c.		n-e-ᶮɟim	[ɲeᶮɟ**jo**m]		*!*** (e, ᶮɟ,i,m)			* (n)
d.		ᶮɟim-e-n	[ᶮɟ**i**mjan]	*!				*** (ᶮɟ,i,m)

- All of the complex BD-faithfulness constraints could work here for FAITH-BD.
  ◦ LINEARITY-BD: the /e/ is in a different relative order with all the segments of the root.
  ◦ CONTIGUITY-BD: the /e/ breaks its adjacency relation with the root-initial segment and creates a new one with the root-final segment.
  ◦ ANCHOR-L-BD: the /e/ is no longer the leftmost segment (also violated by (43c)).

⋆ Does this mean we can dump the alignment constraints?
  ◦ In this case, ANCHOR could knock out (43c), rendering ALIGN-PL-R irrelevant (and ALIGN-2-L is doing no work in the first place).
  ◦ However, this is definitely *not* going to be a recipe for deriving the other ordering facts of the language (I think, though I could be wrong), since most of the interesting forms are ones where a new segment is entering initial position relative to anything that might be a base.

∗ Goal for the future: See if BD-correspondence can derive any of the other ordering facts of Huave.

3.5 Conclusions from Huave

- Understanding mobile affixation in Huave is important for understanding the phonology-morphology interface, because it requires grappling with some of the big questions we've been asking throughout the course:

(44) **How cyclic is the interface?**
  a. Kim (2010, 2015b) says it's totally cyclic
  b. Zukoff (2021a) says it's not cyclic at all (though maybe a little pseudo-cyclic)

(45) **How does phonological information come into play?**
  a. Kim (2015b) says it's just in subcategorization frames in VI (following Paster 2009)
  b. Kim (2010) and Zukoff (2021a) say it interacts transparently with ordering in the phonological component (**P** $\gg$ **M**)

- The two kinds of approaches also make (potentially) different predictions about the morphosyntactic structure:

(46) **How does morpheme order relate to morphosyntactic structure?**

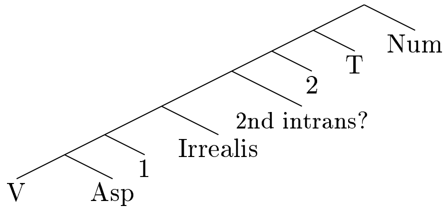
a. Unless we adopt a strongly lexicalist view (and Cophonology theory does), Kim's cyclic order should reflect the morphosyntactic structure.

b. If we adopt the MAP, my alignment ranking should reflect the morphosyntactic structure.

- Here's what the MAP says the structure should look like:[2]

(47) Huave alignment ranking ⇔ (48) Reverse-engineered structure

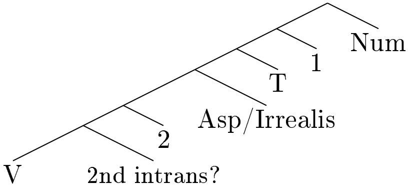
Align-pl-R
|
Align-fut-L
|
Align-2-L
|
Align-2intrans-R
|
Align-irr-R
|
Align-1-R
|
Align-Asp-R



→ This looks like a pretty reasonable syntax!

- Here's what the tree would like if we took Kim's cyclic attachment order:

(49) Kim's (2010) "structure"



→ This doesn't look too bad either.

- Since Kim's cyclic order does not match my alignment ranking, something's gotta give.
  - → But this is good! We want our analyses to make falsifiable predictions.
    - ○ Ideally, someone could go out and do syntactic fieldwork on (this dialect of) Huave to see if we could get independent evidence for one structure or the other.
    - ○ (Probably not going to be possible — Yuni says that the community has mostly shifted away from the language and only very elderly people are still fluent speakers.)

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[2] I'm changing "subordinate" to "irrealis" based on a suggestion by Michelle Yuan.

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