Theories of diphthongs, contour tones and blockers in harmony

comments on papers by Inkelas //Shih

Donca Steriade
steriade@mit.edu

- Inkelas//Shih's proposal:
  - all segments decompose into 3 phases, the qs.
  - each is separately available for correspondence.
  - unusual transparency effects can be analyzed by combining the ABC theory with the 3qs.

Evidence for q-representations from diphthongs

- Diphthongization shows that context can affect the edges of a V separately from its steady state.

  ⇒ Each simple V is potentially heterogeneous, as q-representations assert.

- VH shows that each q in a complex vocoid can be the target or trigger of VH, separate from others.
  - q_2 is said to be the target in Turkish VH
  - q_1 is said to be the trigger in Pasiego VH

- Reduplication shows similar effects in copying.

The argument for qs based on glide-skipping VH

- The *explanandum*:
  Off-glides in [Vj] are transparent to VH,
  yet C's are not necessarily transparent.

- I&S's explanation:
  Glides are skipped because correspondence holds between q_2 only (in red below).

[+back]
/ | \

sarajlɯ = s $\mathbf{a}_1$ $\mathbf{a}^{x}_{2}$ $\mathbf{a}_3$ r $\mathbf{a}_1$ $\mathbf{a}^{x}_{2}$ $\mathbf{j}_3$-l$\mathbf{ɯ}_1$ $\mathbf{ɯ}^{x}_{2}$ $\mathbf{ɯ}_3$

An alternative

- No [±back] contrast in Turkish glides.
  - There is [aj], but no distinct *[aw̞ɯ].
  - Maybe /sarajlɯ/ = [saraw̞ɯlɯ] with the back allophone of [j]
- Only distinctively [+back]/[-back] segments trigger or block FH. Among Cs, only distinctively [±back] [c], [q], [l^j] affect VH.

- Two attractions of the alternative:

  - Turkish diphtongs are *separable*, unlike single segments: ‘the word *ay*, when [one] add[s] the suffix *–ɪ*, becomes *a-yɪ*: *the sound y goes to the next syllable*.’ (Balpinar 2006).

  - Ultimate effect of VH is on more than just q_2: e.g. input /sarej-li/ does not surface like this:

    $sa_1a_2a_3re_1a_2i_3\text{-}li_1ɯ_2i_3$ = *[sareailiɯi]

    but like this:

    $sa_1a_2a_3ra_1a_2j_3\text{-}l\,ɯ_1ɯ_2\,ɯ_3$ = = [sarailɯ]

On VH targetting q2

- One can adjust the output of VH, in a second, post-VH step, to obtain homogeneous Vs.

- But in the simplest VH system predicted by I&S's account, q_2 *alone changes*. All other qs can remain faithful to input values and thus they should. Again, like this:

$$sa_1a_2a_3re_1a_2j_3\text{-}li_1ɯ_2i_3 = *[sare\underset{\frown}{a}i\underset{\frown}{l}i\underset{\frown}{ɯ}i]$$

- Such systems seem not to exist, in contrast to the glide-skipping VH systems. This generalization remains unexplained.

Contextual diphthongization

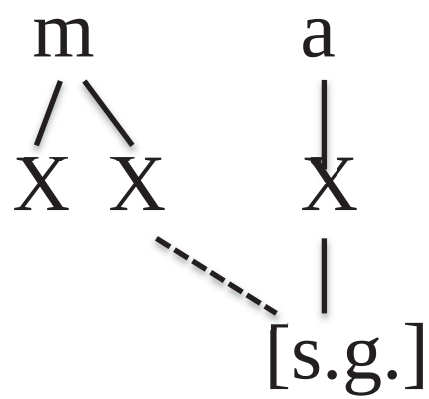
- Context-sensitive dipthongization:
  - OE **sefon→seofon*
  - Huave *mik→miok*

- Segment splitting beyond dipthongs
  - Kaingang: *ama → abmba*
  - S.Paiute: *ama: →amaḁ*

    am:a → amm̥ḁ

- Autosegmental spreading derives all these cases:

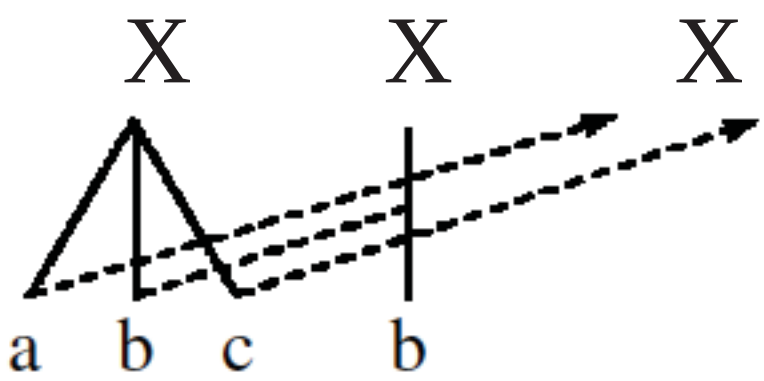
am:a → amm̥a̰



- Provided ‘class nodes’ are seen as classificatory entities, not as autosegments: i.e. features link independently to timing slots, not via class nodes.

Fn: See Hayes 1990, Padgett 1995, Steriade 1988 for such proposals. These works did not “abandon autosegmental representations.” Rather they abandoned the *autosegmental interpretation of class nodes*, when evidence accumulated against it.

- Individual F-spread-to-X is needed anyway: there exist processes that normally spread an entire F group (a,b,c below), but allow intervening segments to block *individual* Fs (b) from reaching their target (cf. Sagey 1987 on Barra Gaelic V-copy epenthesis):



Reduplication targets q_1

- The *explanandum* (Tohono O'Odham)
  - C Glide$_1$V$_2$ reduplicates as CV$_1$
  - *pia* → *pi-pia*; but *kai* → *ka-kai*

- The account proposed by I&S:
  - *ia* = $i_1a_2a_3$
  - *ai* = $a_1a_2i_3$, or $a_1i_2i_3$
  - RED demands a featurally homogeneous correspondent *of q_1 only*.

Alternative

- CONTIGUITY (NOSKIPPING) >> IDSYLLABIC.

pi͡a	*DIPHTH	CONTIG	IDSYLL
pi͡a-pi͡a	*!		
pa-pi͡a		*!	
> *pi-pi͡a*			*

Attractions of the Alternative

- CONTIGUITY / ID SYLLABIC / *DIPHTH generates all attested variation on copied diphthongs

pia	*DIPHTH	CONTIG	IDSYLL
pia-pia Ilocano$_1$	*		
pa-pia Sanskrit Klamath		*	
pi-pia Ilocano$_2$ Tohono			*

- Targeting individual qs for reduplication predicts more options, all unattested:

Copy q_2: *pia* → *pa-pia*
pai → *pi-pai*
piau →*pa-piau*

Copy q_3: *pia* → *pa-pia*
pai → *pi-pai*
piau →*pu-piau*

Basic lurking question: what is a segment?

- Q-Theory offers this answer:

A segment is a cluster of up to 3 adjacent qs, featurally homogeneous, or not.

‘each q is a uniform feature bundle’: by extension, the q-triplet need not featurally be uniform.

- *ntʃ, tʃh, i͡au͡* are said to be possible segments, but not *ntʃh, ʔntʃ, i͡u͡ai͡, hntʃh:* too many qs.
- The limit to 3qs excludes sequences like *camp*, *crow* as single segments. But *rop*, *kis*, *cap?* Can they be monosegmental? If not, why not?

What is a segment (cont.)

- The limit to 3qs has an escape hatch:
  If a diphthong like *i̯u̯ai̯* exists (as in Romanian),
  then it's analyzable as $\underset{\frown}{i}_{1,2,3}$+$\underset{\frown}{u}_{1}a_{2}\underset{\frown}{i}_{3}$

- Resulting structural ambiguity:
  A 3q sequence *i̯au̯* too can be $\underset{\frown}{i}_{1,2,3}$ + $a_{1,2}\underset{\frown}{u}_{3}$

- Or $\underset{\frown}{i}_{1,2,3}$, + $a_{1,2,\,3}$ + $\underset{\frown}{u}_{1,2,3}$, …

  What distinguishes these options?

An imperfect alternative answer (Steriade 1993)

- A segment consists of
  - An oral constriction (OC)
  - The 1 or 2 A-positions the OC generates.
  - As many [nasal] and laryng. Fs as can link 1-to-1 to the A-positions generated by the OC.

- A mutual compatibility condition on the set of features belonging to one segment: they must correspond to a set of potentially simultaneous articulatory gestures. This allows *nʧ(h)*, *(ʔ)nʧ*, but not *rop*, *kis*, *i͡u͡a͡i*

Fn: This proposal assumes that [nasal] is privative; and that stricture features are properties of the A-position.

An imperfect alternative (cont.)

- The mutual compatibility condition does all the work of distinguishing plausibly mono-segmental sequences (*nʃ(h)*, *ʔnʃ*) from clearly polysegmental ones (*rop*, *kis)*.

- The same condition excludes diphthongs of any size: *u͡ai͡* and *ai͡*, as well as *i͡ua͡i*.

The individual q as the TBU

- Nupe trans-voiced tone spreading:
  - ABC places voiced qs in correspondence
  - Spreading to 1/3qs is a compromise between Faith and identity-under-correspondence.

- Dioula trans-sonorant tone spreading:
  - ABC places sonorant qs in correspondence
  - Tone spreads under correspondence.
  - V-identity is a contributing factor in Tone spreading.

Features establishing X⇔X chains vs. features that assimilate;

X⇔X Chain.	Assimilates	Attested Process?
[+son]	Tone	Dioula V́RV →V́ŔV́
[+voice]	Tone	Nupe V̀DV́→V̀D̀V̌
[+contin.]	Tone	Unattested: V́zV →V́ź́V́. But V́nV: spreading blocked.
[±high]	Tone	Unattested: íju → íjú, úwi →úẃí But éju, úwe: spreading blocked.
[±back]	Tone	Unattested: éje → éjé, ówa →ówá. But éja, ówe

In the attested cases, and only in those, the spreading F0 value can be recovered on the transparent interveners, but not on blockers.

Features that set up X⇔X chains vs. features that assimilate

X⇔X Chain.	Assimilates	Attested Process?
[+son]	V-place	Dioula aRu →aRa
[+voice]	V-place	Unattested: adu→ada, vs. asu,atu
[+contin.]	V-place	Unattested: asu→asa, vs. atu, adu
?	V-place	Trans-laryngeal VH aʔu→aʔa, ahu→aha vs. aru, anu, adu,…

In attested cases, and only in those, the spreading F2-F3 value can be recovered on transparent interveners, but less reliably on blockers.

Alternative hypothesis

If only a subset of segments is allowed to intervene between targets and triggers of assimilation, a property selecting this subset is Cue (C) Locality.

C-Locality:

Let x and y be segments specified as [αF].
x and y are c-local wrt [αF] if there exists an auditory correlate c to [αF], and c is present on any segment z, x > z> y.

How this might apply to Dioula

- V-to-V *place* spread is constrained by C-Locality
- V-to-V *tone* spread is constrained by C-Locality
- Effect of V-place identity on tone spread = gradient effect of aggressive reduplication (Zuraw 2002).
- Not explained: effect of nasal identity on tone spread.
- Also not explained: difference between sonorants wrt tone spread.

Articulatory locality, too

G-Locality (G as in Gesture):

Let x and y be segments specified as [αF].
x and y are g-local wrt [αF] if g is the articulatory gesture implementing [αF] and x and y are implemented by the same instance of g.

References

Balpinar, Zülal 2006 *Turkish Phonology, Morphology and Syntax*, Anadolü, Universitesi

Hayes, Bruce 1990 Diphthongization as coindexing, *Phonology* 7, 31-71.

Padgett, Jaye 1995 Feature Classes, in *Papers in Optimality Theory, University of Massachusetts Occasional Papers* 18, J. Beckman, S. Urbanczyk and L. Walsh (eds.), GLSA, UMass, Amherst, 1995. 385-420

Sagey, Elizabeth. 1987. Non-constituent spreading in Barra Gaelic. Ms., University of California, Irvine.

Steriade, Donca 1988 Class nodes, unpublished ms. MIT.

Steriade Donca 1993 Closure, release and nasal contours, in M. Huffmann and R. Krakow (eds.) *Nasals, Nasalization and the Velum*, Academic Press. 401-470

Zuraw, Kie 2002 Aggressive Reduplication, *Phonology*, 19, 3, 395-429