
Week 12 – Phonetics in Phonology I - Addendum

May 6, 2008

1 Place Assimilation

- (1) References on Place Assimilation
 - a. Mohanan, K. P. (1993). Fields of attraction in phonology. In John Goldsmith (ed.) *The Last Phonological Rule: Reflections on Constraints and Derivations*. Chicago: University of Chicago Press. 61-116.
 - b. Jun, Jongho (1996) “Place Assimilation Is Not the Result of Gestural Overlap: Evidence from Korean and English Phonology,” *Phonology* 13:377-407
 - c. Jun, Jongho (1995) “Perceptual and Articulatory Factors in Place Assimilation: An Optimality Theoretic Approach,” UCLA dissertation
 - d. Jun, Jongho. 2004. *Place Assimilation*. In Hayes/Kirchner/Steriade (2004) *Phonetically-Based Phonology*.
 - e. Boersma, Paul (1999) “Phonetically-driven acquisition of phonology,” <http://www.fon.hum.uva.nl/paul/>
- (2) Diola-Fogny (Sapir 1965)
 - a. /ni+gam+gam/ → [nigangam] ‘I judge’
- (3) Typology of Place Assimilation (Jun, Mohanan 1993)
 - a. Coda consonants assimilate to onset consonants (regressive assimilation, see below).
 - b. If non-nasals assimilate, then so do nasals.
 - c. If non-coronals assimilate, then so do coronals.
- (4) Familiar OT analysis

/ni+gam+gam/	*HETEROGENICCLUSTER	IDENT (PLACE)
nigangam	*!	
☞ nigangam		*

- (5) Questions unanswered by this analysis (Jun 2004)
 - a. Why should languages have *HETEROGENICCLUSTER in the first place?
 - b. What accounts for the typological characteristics?

- ★ What constraint could account for the regressive assimilation aspect observed cross-linguistically?

(6) Jun 2004:

In my approach, there is no role for a constraint like *HETEROGENIC-CLUSTER. . . The crucial basis of the explanation lies in asymmetries in the perceptibility of place of articulation in different segments and in different contexts.

1.1 Typology of Place Assimilation

(7) Patterns with respect to manner (Jun 2004:66)

Languages	Nasal	Stop	Continuant
Catalan, English, German, Korean, Malay, Thai, Yakut	yes	yes	no
Brussels Flemish, Diola Fogny, Hindi, Keley-I, Lithuanian, Malayalam Nchufie, Toba Batak, Yoruba	yes	no	no

(8) Conclusions

- a. If continuants are targets of place assimilation, then so are stops.
- b. If stops are targets of place assimilation, so are nasals.

(9) Patterns with respect to place (Jun 2004:66)

Languages	Coronal	Labial	Velar
Diola Fogny, Malay, Nchufie, Yoruba, Thai	yes	yes	yes
Korean	yes	no	no
Hindi, Malayalam	yes	yes	
Catalan, English, German, Toba Batak, Yakut	yes	no	no
Brussels Flemish, Keley-I, Lithuanian	yes	no	

(10) Conclusions

- a. If velars are targets of place assimilation, so are labials.

- b. If labials are targets of place assimilation, so are coronals.
- (11) Position of target position
- Always, $/VC_\alpha C_\beta V/ \rightarrow [VC_\beta C_\beta V]$ (*alpha* and *beta* encode place features).
 - In other words, VC_1C_2V , C_1 is virtually always target of assimilation, i.e it is what changes
 - One exception: VC_1+C_2V ; C_1 is part of the stem and C_1 is part of a suffix (and thus plausibly due to other factors)
- (12) Conclusion: Place assimilation is always regressive

1.2 Perceptual Cues for place

- (13) Sources of consonant place cues generally (e.g. in VCV contexts), Jun (2004:60):

Segment Types	Cue Types	
	Internal	External (transitional)
stops	none	CV,VC formant transitions burst release
nasals	nasal resonance	CV,VC formant transitions
fricatives	frication noise	CV,VC formant transitions
liquids/glides	formant structure	CV,VC formant transitions

- (14) Sources of C_1 place cues in VC_1C_2V (esp. C_2 = nasal or obstruent), Jun (2004:61):

Segment Types	Cue Types	
	Internal	External (transitional)
stops	none	VC formant transitions
nasals	nasal resonance	VC formant transitions
fricatives	frication noise	VC formant transitions
liquids/glides	formant structure	VC formant transitions

1.3 Factors Leading to Inferior Perceptibility

- (15) Manner effects: Nasals and stops have much weaker place cues in VC transitions than fricatives and liquids.
- (16) Position effects: Being in non-released positions removes a burst, which encodes crucial place of articulation information. ([at^hpa] vs. [at^hpa])
- (17) Nasality:
- nasality on preceding vowel obscures the shape of vocal tract as it is manifested in formant frequencies ([an ad])¹

¹See Stephen Winters, 2003, *Empirical investigations into the perceptual and articulatory origins of cross-*

- b. Nasals have less prominent place cues than stops in VC transitions.
- (18) Place effects of C_1 :
- more rapid movement of the coronal articulator means more obscuring overlap ([ad adga adba], [ag agba agda]) (Byrd 1994)
 - Winitz et. al (1972) perception test suggest vowel transitions into velars are more informative than for labials (convergence of F2 and F3; i.e. the velar pinch)
 - Place effects of C_2 : If C_2 gesture overlaps with C_1 it can obscure the VC transition cues. Consequently place cues of C_1 are more obscured before noncoronals than coronals
- (19) Position effects: prevocalic Cs have much richer cues than non-prevocalic Cs.

1.4 Analysis

- (20) The representation of phonological strings consists of articulatory *gestures* (cf. ?) and the auditory representations, which includes cues.
- (21) Example
- | | | | | |
|--------------------|-------------|-------------|-------------|---------|
| a. Articulation | t | k | kk | k |
| tongue tip | | | | |
| tongue body | | | | |
| b. Acoustic effect | - silence - | - silence - | - silence - | silence |
- (22) WEAKENING constraints—Conserve articulatory effort
- This constraint assigns a violation for each complete closure gesture
- (23) PRESERVE constraints—Preserve perceptual cues for input features
- Assumes the faithfulness constraints are evaluated with respect to a hypothesized phonetic interpretation of the input string—i.e. “how it would have been pronounced”, including articulatory gestures and acoustic consequences of those gestures
 - A violation is assigned if an acoustic cue in the input is not present in the output.
- (24) General Analysis
- PRESERVE(manner) >> WEAKENING >> PRESERVE(place)

★ Let's work out an analysis with /tk/ → [kk], not *[tk] (no assimilation) or *[k] (deletion).

linguistic asymmetries in place assimilation, Ohio State dissertation, for potential refuting evidence. Winters used stimuli bearing contrastive focus (Say tan, not tam, which might be expected to obscure the issue).

- (25) Production Hypothesis: Speakers make more effort to preserve the articulation of speech sounds with relatively more powerful acoustic cues.
- (26) This hypothesis provides a basis for projecting a fixed ranking of PRESEVE constraints (Jun 2004:73):
- a. PRES(X(Y)): Preserve perceptual cues for X (place or manner of articulation) of Y (a segmental class)
 - b. Universal Ranking: PRES(A(B)) >> PRES(C(D)), where A's perceptual cues for B are stronger than C's cues for D.
- (27) Given the perceptibility scales discussed earlier, we have the following rankings:

Target manner PRES(pl($\frac{\quad}{[+cont]}$ C)) >> PRES(pl($\frac{\quad}{[stop]}$ C)) >> PRES(pl($\frac{\quad}{[nasal]}$ C))

Target place PRES(pl(dorsal^ʹ)) >> PRES(pl(labial^ʹ)) >> PRES(pl(coronal^ʹ))

Target place PRES(pl($\underline{\quad}$ V)) >> PRES(pl($\underline{\quad}$ C))

★ For the 'target manner' scale, what are the possible rankings of WEAKENING? What is the outcome for those rankings?

★ What about for 'target place'?

★ What prediction does the 'target position' make when WEAKENING outranks PRES constraints for the inputs /atka/ and /akta/?