ACTL phonology tutorial 4: Opacity in OT

Wouter Jansen
wouter.jansen@kuvik.net
http://wouter.jansen.kuvik.net

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1 The problem: Turkish vowel epenthesis and velar deletion

In Turkish, vowel epenthesis *overapplies* after velar deletion to produce a *non-surface apparent* generalisation

(1) Interaction between vowel epenthesis and velar deletion in Turkish (data from Kager 1999):

a. Vowel epenthesis

/bɑʃ - m	[bɑʃɨm]	'my head'
/jel - m/	[jelim]	'my wind'

b. Velar deletion

/ɑjak - I/	[ɑ.ja.ɨ]	'his foot'
/inek - I/	[i.ne.i]	'his cow'

c. Interaction

/ɑjak - m/	[ɑ.ja.ɨm]	'my foot'
/inek - m/	[i.ne.i]	'my cow'

The pattern in 1c is easily accounted for in a serial framework, because the conditioning environment for vowel epenthesis appears at the underlying level:

(2) Derivation for [ɑ.ja.ɨm]:

Underlying	ɑjak + m
Vowel epenthesis	ɑjakɨm
Velar deletion	ɑjaɨm
Surface	[ɑ.ja.ɨm]

But in standard OT, this pattern is problematic, because the underlying condition is not available to H-EVAL:

(3) Tableau for [ɑ.ja.ɨm]:

Input: /ɑjak + m/	*COMPLEX	*VKV	MAX-IO	DEP-IO
[ɑ.jakm]	*!			
[ɑ.ja.kɨm]		*!		*
[ɑ.ja.ɨm]			*	*!
☹[ɑ.jam]			*	

2 The problem: Isthmus Nahuat

In Isthmus Nahuat, sonorant devoicing *underapplies* after (optional) apocope to create a *non-surface-true* pattern

(4) Interaction of apocope and devoicing in Isthmus Nahuat (data from Kager 1999)

a. Apocope:
[támi] ∼ [tám] 'it ends'

b. Devoicing:
[tájoːl̥] 'shelled corn'

c. Underapplication of apocope:
[ʃikɑktex́tscili] ∼ [ʃikɑktex́tscil] 'put in it'

Again, the pattern in 4c is easily captured in a serial model, this time because there is an underlying level at which the conditions for sonorant devoicing *do not hold*:

(5) Derivation of [tájoːl̥] and [ʃikɑktex́tscil]:

Underlying	tájoːl	ʃikɑktex́tscili
Devoicing	tájoːl̥	-
Apocope	-	ʃikɑktex́tscil
Surface	tájoːl̥	ʃikɑktex́tscil

3 Solutions

There are a number of ways in which opacity can be approached:

- *Containment Theory*: Underlying phonological structure is retained in the output but is *phonetically covert* (cf. Prince & Smolensky 1993)
- *Stratal OT*: Serialism between levels of the grammar, but paralellism with each level (Kiparsky, 2000; Bermúdez-Otero, 2003)
- *Sympathy Theory*: Simulate an intermediate level using a designated faithfulness constraint (McCarthy, 1999)

4 A stratal analysis of Turkish

See (Kager 1999:383)

(6) Level 1:

Input: /ajak + m/	*Complex	Max-IO	Dep-IO	*VkV
[a.jakm]	*!			
☞[a.ja.kɨm]			*	*
[a.ja.ɨm]		*!	*	
[a.jam]		*!		

(7) Level 2:

Input: /ajakɨm/	*Complex	*VkV	Dep-IO	Max-IO
[a.jakm]	*!			*
[a.ja.kɨm]		*!		
☞[a.ja.ɨm]				*
[a.jam]				**!

References

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