

Additive Approaches to Mutation

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Phonological Aspects of Mutation Morphology
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Additive Approaches to Mutation

- ▶ **Autosegmental Model:** Mutation is the effect of affixing subsegmental structure
- ▶ **Coalescence Model:** Mutation is the effect of fusing (coalescing) entire segments
- ▶ **Position taken here:** Both options occur due to Richness of the Base

The Autosegmental Model of Mutation

- ▶ Mutation is triggered by floating features
- ▶ Floating features are affixes
or parts of otherwise segmental affixes
- ▶ To be realized, these features associate to base segments
and “overwrite” features of a base segment

Voicing Mutation in Aka (Akinlabi, 1996; Wolf, 2005)

Class 5 - singular

g̀̀àlà

b̀̀èlèlé

dʒ́ám̀̀bà

d̀̀èngé

ǵásá

b̀̀àp̀̀ùl̀̀àkà

Class 6 Plural

mà-**g**̀̀àlà

mà-**b**̀̀èlèlé

mà-**dʒ**́ám̀̀bà

ma-**t**̀̀èngé

ma-**k**́ásá

ma-**p**̀̀àp̀̀ùl̀̀àkà

(game of imitation)

‘sound of waterfall’

‘mud’

‘piercing tool’

‘palm branch’

‘lung’

Singular of class 5 is expressed by voicing the initial consonant

Autosegmental Analysis (Lieber, 1987; Zoll, 1996; Wolf, 2005)

[+voice] ↔ [+sing]

+

→

g_[+voice]asa

k_[-voice]asa ↔ [+N]

Central Question

Why do floating features

overwrite features of base segments?

How Feature Overwriting could be Derived

- ▶ Standard Faithfulness or Markedness Constraints
- ▶ Special Faithfulness Constraints
- ▶ Distinctivity Constraints

Overwriting by Markedness Constraints: Fula

Class 2

wɔ wu wa wε wi

rV

sV

yε yi yɔ yi ya

wɔ wu yε yi a

V

→

→

→

→

→

→

Class 1

bV

dV

cV

jV

gV

V

Overwriting by Markedness Constraints: Fula

- ▶ Manner Mutation in Fula turns syllables of the form sonorant+vowel or fricative+vowel into syllables of the form stop+vowel
- ▶ According to the Sonority Sequencing Principle: stop+vowel \gg sonorant+vowel, fricative+vowel
- ▶ In this case mutation minimizes markedness

Overwriting by Markedness Constraints: Fula

ra → da


Input: [-son -kont] r_[+son+kont]a

	MAX MANNER	SONORITY-SEQUENCING
☞ a. d _[-son -kont] a	**	
b. r _[+son+kont] a	**	*

Problem for Overwriting by Markedness

VOP (Voiced Obstruent Prohibition): No Obstruent must be voiced
(Kager, 1996:40)


Input: [+vc] k_[-vc]asa

	VOP
a. g _[+vc] asa	*!
 b. k _[-vc] asa	

→ doesn't work for markedness-increasing mutation as in Aka

Overwriting by Standard Faithfulness Constraints

Input: [+vc] + k_[-vc]asa

	MAX	DEP	IDENT
a. g _[+vc] asa			*!
 b. k _[-vc] asa			

MAX and DEP: are indifferent w.r.t. overwriting

IDENT: systematically disfavors overwriting

Zoll's (1996) Problem:

Overwriting should be systematically excluded

Alternative: MAX-Constraints for Features

Input: [+vc] + k_[-vc]asa

	MAX [+vc]	MAX [-vc]
☞ a. g _[+vc] asa		*
b. k _[-vc] asa	*!	

Problem for MAX-Feature Constraints: Bidirectional Mutation in Nuer

(Crazzolara, 1993)

	'overtake'	'pull out'	'scoop hastily'	
Infinitive	coβ	guð	kêp	
3sg.ind.pres.act.	cóβ-έ	gúð-έ	kέβ-έ	[+vc+cont]-ε
1pl.ind.pres.act.	còɔf-kò	gwòθ-kò	kèaf-kò	[-vc+cont]-kɔ

Ranking MAX [+vc] ≫ MAX [-vc] makes wrong prediction for 1pl

Ranking MAX [-vc] ≫ MAX [+vc] makes wrong prediction for 3sg

Overwriting by REALIZE MORPHEME (van Oostendorp, 2005)

Input: [+vc] k_[-vc]asa

	REALMORPH	IDENT	VOP
☞ a. g _[+vc] asa		*	*
b. k _[-vc] asa	*!		

REALIZE MORPHEME: For every morpheme in the input, some phonological element should be present in the output.

Problem for REALIZE MORPHEME: Multiple-Feature Mutation

	'overtake'	'pull out'	'scoop hastily'	
Infinitive	coβ	guð	kêp	
3sg.ind.pres.act.	cóβ-έ	gúð-έ	kέβ-έ	[+vc+cont]-ε
1pl.ind.pres.act.	còɔf-kò	gwòθ-kò	kèaf-kò	[-vc+cont]-kò

(Nuer; Crazzolaro, 1933)

Problem:

REALIZE MORPHEME requires only realization of 1 floating feature

Overwriting by MAXFLT (Wolf, 2005)

Input: [+vc] k_[-vc]asa

	MAXFLT	IDENT	VOP
☞ a. g _[+vc] asa		*	*
b. k _[-vc] asa	*!		

MAXFLT: All autosegments
that are floating in the input
have output correspondents.

Setting Special Faithfulness Constraints Apart

REALIZE MORPHEME requires that **at least 1** floating feature for a given morpheme is realized in the output if the morpheme is not expressed by full segments

MAXFLT requires that **all** floating features for a given morpheme are realized in the output irrespectively of the segmental expression of the morpheme

Deriving Multiple-Feature Mutation by MAXFLT

cob + [-voi] ₂ [+cont] ₃ kɔ	MAXFLT	IDENT(contin)	IDENT(voi)
a. cɔɔb-kɔ [-voi] ₂ [+cont] ₃	[-voi] ₂ !, [+cont] ₃		
b. ► cɔɔf-kɔ /\		*	*
c. cɔɔβ-kɔ \	[-voi] ₂ !	*	
d. cɔɔp-kɔ /	[+cont] ₃ !		*

Problem for MAXFLT: Voicing Polarity in Luo

Voiceless → **Voiced**

	singular		plural	
[-voiced]	a. arip	'milky way'	ar i b-e	[+voiced]

Voiced → **Voiceless**

	singular		plural	
[+voiced]	b. cog o	'bone'	cok-e	[-voiced]

Voicing Polarity doesn't follow from . . .

- ▶ Standard Markedness constraints
(then mutation should be uniform)
- ▶ Standard Faithfulness constraints
(then mutation should be uniform)
- ▶ Special Faithfulness constraints
(then mutation should be uniform)

NO VACUOUS DOCKING (Wolf, 2005)


NOVACDOC: Floating features cannot dock onto segments that already bore the same feature value in the input.

This is basically a distinctness requirement for the input-output mapping of a segment which is the target of floating-feature docking

uses different floating feature allomorphs (e.g. [+vc] and [-vc]) which are selected by phonological optimization

Voicing Polarity by NoVACDOC:

Input: $\text{bat}_{[-vc]_1} + \{ [-vc]_2, [+vc]_3 \}$

	MAXFLT	NoVACDOCK	IDENT [VC]
 a. $\text{bad}_{[+vc]_3}$			*
b. $\text{bat}_{[-vc]_{1,2}}$		*!	
c. $\text{bat}_{[-vc]_2}$		*!	
d. $\text{bat}_{[-vc]_1}$	*!		

Quirky Mutation in Breton

b → v *spirantization*

d → t *devoicing*

g → γ *spirantization*

gw → w *deletion*

m → v *spirantization*

(Triggered by *e* “that”, *ma* “that/if”, and the progressive marker *o*)

Quirky Mutation by NoVACDOC:

$\{[+cont, -cor], [-voi +cor]\} + /d/$ <i>Inputs:</i>		IDENT (cor)	MAX FLT	IDENT (cont)	IDENT (voi)	No VAC DOC
$[-voi]_3[+cor]_4 + d$ a. \blacktriangleright t / \ $[-voi]_3[+cor]_4$					*	$[+cor]_4$
$[+cont]_1[-cor]_2 + d$ b. v / \ $[+cont]_1[-cor]_2$	*!		*			

$\{[+cont, -cor], [-voi +cor]\} + /b/$ <i>Inputs:</i>		IDENT (cor)	MAX FLT	IDENT (cont)	IDENT (voi)	No VAC DOC
$[+cont]_1[-cor]_2 + b$ \blacktriangleright a. v / \ $[+cont]_1[-cor]_2$				*		$[-cor]_2$
$[-voi]_3[+cor]_4 + b$ b. t / \ $[-voi]_3[+cor]_4$	*!				*	

De Lacy (2008)

Mutation is the effect of a segmental affix
which cannot surface for phonotactic reasons
and hence fuses (coalesces) with segments of the base

Coalescence

Two or more sounds merge into a single one
under the pressure of phonological constraints

Nasal-Stop Coalescence in Bavarian

Infinitive


2sg

‘talk’	/ret-n/	[re: n]	cf.	(du) [re: t -st]
‘put’	/le:k-n/	[le: ŋ]		(du) [le: k -st]
‘push’	/ʃɛɪp-n/	[ʃɛɪ m]		(du) [ʃɛɪ p -st]

OT-Analysis (Constraints)

*CN#	No sequence stop+nasal at the end of the word
IDENT [+nasal]	In input and output the values of [nasal] of corresponding segments which are underlyingly [+nasal] should be identical
IDENT [-nasal]	In input und output the values of [nasal] of corresponding segments which are underlyingly [-nasal] should be identical

OT-Analysis (Ranking)

Input: $l_1e_2k_3-n_4$	*CN#	ID [+nas]	MAX	ID [-nas]
a. $l_1e_2k_3-n_4$	*!			
b. $l_1e_2k_3-t_4$		*!		
c. $l_1e_2k_3$			*!	
 d. $l_1e_2-\eta_{3,4}$				*

Chaha 3sg Object marking

- (a) Consists of surface [^w...n]
- (b) [^w] lands on the rightmost non-coronal...
- (i) [tikəf^wt-in] ‘she opens it’ (iv) [kətəf^wə-n] ‘chop’
- (ii) [nək^wəsə-n] ‘bite’ (v) [səp^wərə-n] ‘break’
- (iii) [k^wəsərə-n] ‘erect’ (vi) [kəfətɣ^wənim] ?
- (c) If all consonants are coronal, [^w] doesn't appear
- [sədədə-n] ‘chase’
- (d) cf. feminine -na [ji-rəxiβ-n-a] ‘he finds her’

Chaha 3sg Object marking as Coalescence

/k^wn/...

/kətəf ₁ ə-k ^w ₂ n/	NO C CLUSTERS	DON'T DELETE	DON'T ADD	UNIFORMITY
(a) kətəf ₁ ən		*!		
^{wa} (b) kətəf _{1,2} ən				*
(c) kətəf ₁ ək ^w ₂ n	*!			
(d) kətəf ₁ ək ^w ₂ in			*!	

The output segment

/kətəf ₁ ə-k ^w ₂ n/	IDENT w	ROOT -IDENT Fs
^{wa} (a) kətəf _{1,2} ən		
(b) kətəf _{1,2} ən	*!	
(c) kətək ^w _{1,2} ən		**!

Alternation Segment/Floating Feature: Yowlumne

- a. /caaw -(ʔ)aa/ caawʔaa 'shout' *glottalizes R most post vocalic sonorant*
- b. /ʔelk -(ʔ)aa/ ʔelʔkaa 'sing'
- c. /hogn -(ʔ)aa/ hognaa 'float' *fails to surface*
- d. /max -(ʔ)aa/ maxʔaa 'procure' *surfaces in biconsonantal root as stop*

Mutation as Coalescence

- ▶ poses similar problems for overwriting as the autosegmental model
(why do features of the affix overwrite feature of the base)
- ▶ De Lacy (2008) uses special faithfulness constraints and a distinctivity constraint for coalescence
- ▶ **Position taken here:** Both, autosegmental and coalescence-based mutation are possible