

The Last Consonant

1. Introduction

Coda conditions can be partially or completely ignored in word-final position.

Conclusions:

- A. All final consonants are onsets.
(Giegerich 1985, Kaye, Lowenstamm & Vergnaud 1990, McCarthy & Prince 1990, Piggott 1991, 1995, Harris 1994, Harris & Gussmann 1998, 2003)
or
- B. At least some final consonants are codas. (Piggott 1999)
or
- C. No final consonant is an onset. (Krämer, here)

(1) Diola Fogni

a.	nimammaŋ	'I want'	b.	nikəkɔb	'I waited'
	ninennen	'I placed'		ijaut	'I did not come'
	kundon	'large rat'		kɔɲilak	'children'
	salte	'be dirty'		nalanlan	'he returned'
c.	famb	'annoy'			
	kaband	'shoulder'			
	bunt	'lie'			
	kaŋg	'be furthest away'			(Piggott 1999: 146f.)

Aim of talk:

Show that in OT irregular final consonants can be accounted for with positional faithfulness (Beckman 1998).

This analysis avoids assumption of final onsets and syllables with empty nuclei.

Structure of talk:

- § 2 outline of proposal: right edge faithfulness
- § 3 A reanalysis of Piggott's typology
- § 4 Additional cross-linguistic evidence for right edge faithfulness
- § 5 Apparent asymmetries
- § 6 Conclusion

2. The proposal

- (2) First syllable root faithfulness (Beckman 1998: 56)
 - Let β be an output segment in the root-initial syllable, and α its correspondent.
 - If β is $[\gamma F]$ then α is $[\gamma F]$.
 - "An output segment in $\sigma 1$ and the input correspondent of that segment must have identical feature specifications."
 - (3) Syllable Positional Faithfulness:
 - a. FAITHOnset: 'Onset segments in the output are faithful to their input.'
 - b. Coda neutralisation grammar: IDENTOnset(F) >> *F >> IDENT(F)
 - (4) Markedness constraints on consonants
 - a. NoCODA 'Syllables do not end in a consonant.'
 - b. *COMPLEX 'Syllables do not have complex onsets or codas.'
 - c. VOP 'Voiced Obstruents are prohibited.'
 - d. *ORAL 'Oral consonants are prohibited.'
 - e. *NONSONORANT 'Nonsonorant consonants are prohibited.'
 - f. *STOP 'Oral stops are prohibited.'
 - g. *PLACE 'Consonants do not have a place feature on their own.'
 - (5) FAITHRight:
 - 'The rightmost syllable constituent in the word is faithful to its underlying form.'
 - (6) Ranking for exceptional final consonants
IDENTOns, FAITHR >> MARKEDNESS >> FAITH
- ## 3. Analyses and typology
- ### 3.1 Compulsory codas
- (7) Spanish loans in Yucatec Maya

yan ʔòorah	'sometimes'	liib'reh	'free/not to be paid for'
katàaroh	'cold/cough'	ʔeskwèelah	'school'
ʔàanyoʔ	'year'	ʔestèeh / ʔestèeʔ	'uh...'
tièendah	'store'	ʔaòorah	'now'

(Blair & Vermont Salas 1979)
 - (8) FINAL-C (McCarthy & Prince 1994: 22)
 - Align(PrWd, Right, Consonant, Right)
 - 'Every prosodic word is consonant-final.'

(9) Consonant epenthesis in Yucatec

	FINAL-C	MAX-IO	DEP-IO	*ORAL
a. kataaro	*!			
b. kataar		*!		
c. kataarot			*	*!
d. kataaroh			*	

3.2 Compulsory codas in a coda-less language: Yapese

(10) Yapese: no word-internal codas

garik	'jellyfish'	rugo:d	'woman'	
faraf	'floor'	bure:y	'hillside'	
magad	'container'	to:tu:l	'bark'	
pa:log	'far'	ge:θi:θ	'living room'	(Piggott 1999: 146)

(11) Yapese final vowel deletion

a. <i>luba</i>	[lú:b]	'breath'	
<i>luba-gu</i>	[lubá:g]	'my breath'	
<i>luba-mu</i>	[lubám]	'your breath'	
b. <i>robe</i>	[ró:b]	'beard'	
<i>robe-gu</i>	[robé:g]	'my beard'	
<i>robe-mu</i>	[robém]	'your beard'	(Piggott 1999:64)

(12) Yapese I: FINAL-C, DEP-IO >> MAX-IO

(13) Yapese final consonants

/luba/	FINAL-C	DEP-IO	MAX-IO
a. lú:ba	*!		
b. lú:baʔ		*!	
c. lú:b			*

(14) Yapese II: FAITHR >> NoCODA >> MAX-IO

(15) Hypothetical word-internal consonant cluster in Yapese

/gaprik/	FAITHR	NoCODA	MAX-IO
a. .gap.rik.		**!	
b. .ga.ri.	*!		**
c. .gap.ri.	*!	*	*
d. .ga.rik.		*	*

3.3 Coda Condition 'switched off' at the edge in Eastern Ojibwa

(16) Eastern Ojibwa

a. ombibide:	'it flies up'	b. bi:skabi:	'he returns'
mindidido	'he is big'	wa:biška:	'it is white'
bangisin	'it falls'	mo:škine:	'it is full'
ganjibin	'push someone'	ašpa:	'it is high'
c. a:gam	'snowshoe'	nindib	'my head'
wi:giwam	'house'	nizid	'my foot'
wa:bimin	'apple'	askig	'seal'
mi:gwa:n	'feather'	ninik	'my arm'
ne:gaw	'sand'	wa:boz	'rabbit'
omo:day	'bottle'	wi:yas	'meat'

(Piggott 1999: 146)

(17) Dorsal nasals in Ojibwa

a. bizindaŋ	'(that) s/he listens'	
b. bangisin	'it falls'	(Piggott 1999: 155)

(18) Eastern Ojibwa: FAITHR, FAITHONSET >> *STOP >> FAITH >> NoCODA

(19)

/nikzid/	FAITHONSET	FAITHR	*STOP	FAITH	NoCODA
a. nikzid			**!		**
b. nikizid			**!	*	*
c. ninzid			*	*	**
d. nisizid			*	*	**
e. nizid			*	*	**
f. nizin		*!		**	
g. nizi		*!		**	

3.4 Complex final codas in Diola Fogni

(20) Diola Fogni

a. nimammaŋ	'I want'	b. nikəkəb	'I waited'
ninennen	'I placed'	ijaut	'I did not come'
kundon	'large rat'	kuŋilak	'children'
salte	'be dirty'	nalanlan	'he returned'

- c. famb 'annoy'
 kaband 'shoulder'
 bunt 'lie'
 kang 'be furthest away' (Piggott 1999: 146f.)

- (21) Diola Fogni I:
 FAITHR >> *PLACE, *NONSONORANT >> FAITH

Diola Fogni II:
 FAITHR >> *COMPLEX >> FAITHOnset >> *PLACE, *NONSON >> FAITH

- (22) The fate of potential codas in Diola Fogni

/krakband/	FAITH R	*COMPL	FAITH ONS	*PLACE	*NONSON	FAITH
a. kaba	*!*			**	**	***
b. kaban	*!			***	**	**
c. kraband		**!		***	***	*
d. krakband		**!		****	****	
e. kamband		*		***	***	*
f. kaband		*		***	***	*

3.5 Restricted final codas in Lardil

- (23) Lardil
- | | |
|------------------|----------------------|
| a. kantu 'blood' | b. kentapal 'dugong' |
| kumpu 'anus' | keřar 'river' |
| wuŋkunu 'oyster' | miyař 'spear' |
| kaŋta 'grass' | yaraman 'horse' |
| rilta 'neck' | maañ 'spear' |
| wanka 'arm' | ŋampit 'humpy' |
- (Piggott 1999: 153f.)

- (24) *LAB/DORS >> *COR

- (25) Lardil grammar:
 *COMPL >> FAITHOns >> *LAB/DORS >> FAITHR >> *NONSON >> FAITH >> *COR

- (26)

/kramtump/	*COMPL	FAITH Ons	*LAB/ DORS	FAITH R	*NON SON	FAITH	*COR
a. kramtump	*!*		***		***		**
b. kramtup	*!		***	*	***	*	**
c. kamtup		*	**!*	*	***	**	*
d. kantup		*	**!	*	***	***	*
e. kantut		*	*	**	***	****	**

3.6 Summary

We find:

- ☞ languages with compulsory final consonants (Yucatec);
 FINAL-C, MAX-IO >> DEP-IO
- ☞ languages without codas but with compulsory, onset-like final consonants (Yapese);
 a. FINAL-C, DEP-IO >> MAX-IO
 b. FAITHONSET, FAITHRight >> NOCODA >> FAITH
- ☞ languages with restrictions on word-internal codas only (Eastern Ojibwa);
 FAITHR, FAITHONSET >> *STOP >> FAITH >> NOCODA
- ☞ languages with complex final codas but no complex internal codas and no complex onsets (Diola Fogni);
 FAITHR >> *COMPLEX >> FAITHOnset >> *PLACE, *NONSON >> FAITH
- ☞ languages with less restrictions on final than internal codas (Lardil);
 *COMPL >> FAITHOns >> *LAB/DORS >> FAITHR >> *NONSON >> FAITH >> *COR

These data are fully accounted for with a faithfulness constraint on the right edge which is rankable wrt markedness constraints and other faithfulness constraints.

4. Additional evidence for right-edge faithfulness

4.1 Language acquisition:

In early words, stressed and *final syllables* are usually preserved (Echols & Newport 1992)

(27) One word phase in English:

Child	Adult target
[raisə]	eraser
[ɛlfʌn]	elefant

4.2 Regressive vowel harmony

Lombardi (1999): Assimilation has no inherent directionality.

Bakovic (2000), Krämer (2001a,b): Vowel harmony has no inherent directionality.

Hyman (2002): Vowel harmony has a right-to-left bias.

(28) Yoruba vowel inventory (Pulleyblank 1996: 297)

+ATR	i	e	o	u
-ATR	ɛ	a	ɔ	

(29) Harmony with prefixes

- a. [oʃewe] 'publisher' ò/ṣ + /ʃèwé/ 'publish a book'
 [oʃowu] 'jealous person' ò/ṣ + /jowú/ 'be jealous'
- b. [ɔkɔɛ] 'person who refuses to run errands' ò/ṣ + /kɔ/ /iʃɛ/ 'refuse' 'message'
 (Pulleyblank 1996:306)

(30) No harmony with enclitics

- a. gbàgbé rɛ 'forget it'
 b. pè ɔ 'call you' (Pulleyblank 1996: footnote 7)

(31) Yoruba stems and positional prominence

- a. [ajɛ] 'witch' b. [afɛ] 'Spotted Grass-mouse'
 [abɛɛ] 'needle' [awo] 'plate'
 [aʃɔ] 'cloth' [adi] 'palm-nut oil'
- c. [ɛba] 'food made from gàrí' *[ɛba]
 [ɛgba] 'whip' *[ɛgba]

(32) Yoruba high vowels

- a. ilé 'house' iǵbó 'forest, wood'
 idɛ 'brass' ikɔ́ 'cough'

(Baković 2000: 140)

Yoruba has prefixation, root-controlled ATR harmony, and harmony only goes right-to-left.

☞ FAITHStem >> FAITH alone not sufficient to explain last syllable exceptionality.

(33)

/awo/	AGREE(ATR)	FAITH
⊗ a. awo	*!	
● b. æwo		*
● c. awɔ		*

(34)

/awo/	*[ATR]	AGREE(ATR)	IDENT
⊗ a. /awo/ ~ awo	*	*	
b. /awo/ ~ æwo	**		*
● c. /awo/ ~ awɔ			*
d. /idɛ/ ~ ide	**		*
● e. /idɛ/ ~ idɛ			*
⊗ f. /idɛ/ ~ ide	*	*	

(35)

/awo/	ALIGNL(ATR)	IDENT
⊗ a. /awo/ ~ awo	*!	
b. /awo/ ~ æwo		*
● c. /awo/ ~ awɔ		*
d. /idɛ/ ~ ide		*
● e. /idɛ/ ~ idɛ		*
⊗ f. /idɛ/ ~ ide	*!	

(36) IDENTRight: The rightmost vowel in the output is identical in feature F with its correspondent in the input.

(37)

/awo/	*ALIEN	IDENTRIGHT	AGREE(ATR)	IDENT
☺ a. /awo/ ~ awo			*	
b. /awo/ ~ awo	*!			*
☹ c. /awo/ ~ awo		*!		*
d. /ide/ ~ ide		*!		*
☹ e. /ide/ ~ ide	*!			*
☺ f. /ide/ ~ ide			*	

(38) Pulaar vowel inventory

+ATR	i	e	o	u
-ATR		ɛ	a	ɔ

(39) Pulaar mid stem vowels and harmony

a. ATR words	gloss	b. RTR words	gloss
sof-ru	'chick'	cɔf-ɔn	'chick'-dim.pl.
ser-du	'rifle butt'	sɛr-ɔn	'rifle butt'-dim.pl.
^m beel-u	'shadow'	^m bɛɛl-ɔn	'shadow'-dim.pl.
peec-i	'slits'	pɛɛc-ɔn	'slits'-dim.pl.
beel-i	'puddles'	bɛɛl-ɔn	'puddles'-dim.pl.
dog-oo-ru	'runner'	dɔg-ɔ-w-ɔn	'runner'-dim.pl.
lot-oo-ru	'washer'	lɔt-ɔ-w-ɔn	'washer'-dim.pl.

(Paradis 1992: 87)

(40) Pulaar dominant *e* and *o*

a. ATR forms	b. non-ATR forms	gloss
lef-ol		'ribbon'
lef-el	lef-ɔn	dim. sg. and pl.
keer-ol		'boundary'
keer-el	kɛɛr-ɔn	dim. sg. and pl. (Paradis 1992: 90)
pad-el	pad-ɔn	'shoe dim. sg. and pl.' (Paradis 1992: 1)

(41) Pulaar high stem vowels and harmony

dill-ɛɛ	'riot'	*dillere	
fuy-ɛɛ	'pimple'	*fuyere	
bin ⁿ d-ɔɔ-wɔ	'writer'	*bin ⁿ doowo	(Paradis 1992: 87)
tum ^m bu-kɔn	'small calabashes'	*tum ^m bukon	(Paradis 1992: 1)

(42) Pulaar low root vowels

^m bar-oo-di	'lion'	* ^m barɔɔdi	
bar-o-gel	'lion(dim.)'	*barɔgel	(Paradis 1992: 94)
bal-w-ee-ki	'blackness'		(Paradis 1992: 127)

(43) The low vowel in affixes

bɔɔt-aa-ri	'lunch'	*bootaari	
pɔɔf-aa-li	'breaths'	*poofaali	
nɔɔd-aa-li	'call'	*noddaali	
^ɠ gɔr-aa-gu	'courage'	* ^ɠ goraagu	(Paradis 1992: 88)

(44) Pulaar high vowels in affixes

a. ATR forms	gloss	b. RTR forms	gloss
bet-ir-dɛ	'to weigh with'	bet-dɛ	'to weigh'
hel-ir-dɛ	'to break with'	hɛl-dɛ	'to break'
dɔkk-id-dɛ	'to become one-eyed'	dɔkk-ɔ	'one-eyed person'
feyy-u-dɛ	'to fell'	feyy-a	'to fell (imperfective)'

(Paradis 1992: 87)

Pulaar has suffixation, suffix-controlled ATR, and harmony goes only right-to-left.

☞ FAITHAffix >> FAITH alone not sufficient to explain last syllable exceptionality.

(45)

/lef-ol/	ALIGN(ATR,L, word, L)	IDENT(ATR)
a. lefol	*!	
☞ b. lefɔl		*
☞ c. lefol		*

(46)

/lef-ol/	IDENTRIGHT	ATR HARMONY	IDENT(ATR)
a. lefol		*!	
☹ b. lefɔl	*!		*
☞ c. lefol			*

(47)

/feyy-u-dɛ/	*ALIEN	FAITHR	AGREE	FAITHAFFIX	FAITH
a. feyyude			*!*		
b. feyyude	*!				*
c. feyyude		*!		*	**
☞ d. feyyude			*		*

5. Apparent asymmetries

(48) Two asymmetries

- i. The Lexical-Functional asymmetry:
Stems are more resistant to neutralisation than affixes.
- ii. The Left-Right asymmetry:
 - a. The left edge of words is more resistant to neutralisation than the rest.
 - b. Languages prefer suffixation over prefixation.

(49) First syllable root faithfulness (Beckman 1998: 56)

Let β be an output segment in the root-initial syllable, and α its correspondent.
If β is $[\gamma F]$ then α is $[\gamma F]$.
"An output segment in $\sigma 1$ and the input correspondent of that segment must have identical feature specifications."

(50) The root-affix meta constraint (McCarthy & Prince 1995)

Universal ranking: FAITHroot >> FAITHaffix

[Other cases of root-affix ranking reversal:

- Hebrew Binjanim (Ussishkin 2000)
- Turkana vowel harmony (Noske 2000)
- Jingulu vowel harmony (Pensalfini 2002)]

(51) Edge-Asymmetry-Hypothesis (EAH) (Bye & de Lacy 2000: 122):

No constraint may refer to the right edge of a constituent.

(see also Nelson 1998, 2002 on the exclusion of Right edge Anchoring constraints)

(52) Lexical Privilege Hypothesis:

Content is more important than structural information.

Consequences:

- a. Lexical material tends to be chronologically ordered first.
- b. Lexical material tends to be neutralised last.

Greenberg (1957:91): "Since affix classes are small in membership compared to root classes, to make a choice among the members of an affix class eliminates far fewer [...] possibilities. [...] The utterance of a member of a root class of morphemes gives more information. One would hypothesize that the speaker will tend to choose that order which will, by giving the maximum information elements first, orient the hearer to the appropriate reactive behaviour as soon as possible."

4. Conclusion

Exceptional final consonants = positional faithfulness effect

- additional support for right-edge faithfulness through vowel harmony data, L1 acquisition data

→ no word-final onsets of syllables with empty nuclei;

→ no asymmetric grammar (i.e., right edge reference is not taboo);

→ Numerical tendencies (i.e., cross-linguistic preference for suffixation, neutralisation of codas, stem controlled harmony) have their sources outside core grammar.

Outlook:

Examine more cases of final consonant exceptionality to refine typology.

More cases of 'mirror image' languages could shed more light on whether grammar is asymmetric or not.

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