

Nasality and Syllable Structure in Gengbe

Samson Lotven and Samuel Obeng

ACAL 50-University of British Columbia

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I. Intro

- Syllable markedness hierarchy does not predict languages with CCV as the maximal syllable to exist (Kaye and Lowenstamm 1981).
- Some West African languages are reported counterexamples (Vata, Eastern Kru; Kaye 1985)

Previous analyses of attested CCV maximal syllable languages:

- CVV analysis: liquids and glides in apparent CCV syllables are nuclear (Kaye 1985)
- CVC analysis: covertly permit codas but lack input forms (Baertsch & Davis 2009)

Duthie's (1996) Ewe maximal syllable is CCV

- Nucleus: oral vowel (V), nasal vowel (Ṽ) or syllabic nasal (N)
- Margins: zero (N or V), one (CV), or two (CCV)
- Tone: (H)igh or (L)ow

Research question:

- What phonological processes in Gengbe support a CCV maximal syllable analysis?

Analyses we're working towards:

- Nasality spreads from a vowel to all segments able to license nasal features in that syllable and does not spread between syllables
- Gengbe does not permit a sonority fall within a syllable
- Consonant-glide-vowel (CGV) is CVV but Consonant-liquid-vowel (CLV) is CCV

Sonority hierarchy:

Low Sonority

Obstruents>>Nasals>>Liquids>>High Vowels (Glides)>>Mid Vowels>>Low Vowels

High Sonority

Roadmap

- 2) Background on Gengbe
- 3) Data
- 4) Phonetic Inventory of Gengbe
- 5) Gengbe nasal segments
- 6) Nasal spreading
- 7) Is CLV underlyingly CVV?
- 8) Summary

II. Background

- Niger-Congo>>Kwa>>Left Bank>>Gbe>>Gengbe (Mina, Gě, Gen, Mina-Gen, or Popo)
- Spoken in Southern Togo and in the Mono sub-region of Benin, by about 400,000 people as L1 or L2 (K.Dorvoló, p.c.)
- 3 major dialects: Anéxo, Agói, Glijí. (Capo 1991)

III. Data

- A 53-year-old male from Batonou (near Gliji, Togo); also speaks and/or understands Wachi Gbe, Fongbe, Ajagbe, Ewe, Akan, Ga, French, English, Russian; elicitation at IUB.
- A 66-year-old male from Batonou; also speaks and/or understands Wachi Gbe, Fongbe, Ajagbe, Ewe, Akan, Ga, French, English; elicitation at University of Ghana

IV. Phonetic inventory of Gengbe

1) Vowels

i/ĩ u/ũ

e/ɛ/ẽ o/ɔ/õ

a/ã

2) Consonants

	Bilabial	Labio-dental	Alveolar	Post-alveolar	Retroflex	Palatal	Velar	Glottal	Labio-velar	Labio-palatal
Stop	p b		t d		ɖ		k g		kp gb	
Nasal	m		n			ɲ	ŋ		ŋm	
Fricative	ɸ β	f v	s z	ʒ			x	h		
Affricate				tʃ dʒ						
Flap			r							
Nasal Flap			ɾ̃							
Lateral			l							
Nasal Lateral			l̃							
Glide						j			w	ɥ
Nasal Glide						ĩ			ũ	ũ̃

3) Tone:

Register: (L)ow & (H)igh

- tù** ‘to grind’
- tú** ‘to close’
- ńtí** ‘orange’
- ńtí** ‘body’

Contour: Rising (LH) & Falling (HL) (derived, loanwords) ¹

- ègbòó** ‘goat’
- dóòsé** ‘to forbid’
- tíi** ‘tea’
- sigáà** ‘cigarette’
- àgláà** ‘crab’

In Ewe **àgálà** (Westermann, 1928/1973)

¹ See Lotven & Berkson (to appear) for more on LH tone in Gengbe and consonant effects on L and H register tone.

V. Gengbe nasal segments

- 1) 5 Nasal Vowels: [ĩ ẽ ã õ ù]
 - a) zĩ ‘to crack (a nut)’
 - b) àgẽ ‘magical dwarf’
 - c) ènẽ gǎǎ ‘fourth’
 - d) sjõ ‘to filter’
 - e) àkpóù ‘fish hook’

- 2) 4 Syllabic Nasals (CV=ŋ or ŋCV): [m n ŋ ɲm̩]
 - a) tá=ɲm̩ ‘draw me’ (draw=1ST PERSON SINGULAR OBJECT)
 - b) ɲdò ‘afternoon’
 - c) ɲkú ‘eye’
 - d) ɲm̩gbé ‘back’

- 3) 5 Single onset (C₁V): [m n p ŋ ĩ]
 - a) mǎlú ‘rice’
 - b) nǎnǎ ‘grandmother’
 - c) pǎ ‘to wash’
 - d) ɲǎtí ‘nose’
 - e) èlǎ ‘animal/meat.’

- 4) First onset of a consonant cluster (C₁C₂V): [m p ŋ]
 - a) mlĩ ‘to roll in’
 - b) pǎ ‘to be ugly/bad’
 - c) ɲlǎ ‘to write’

- 5) Second member of an onset cluster (C₁C₂V): [ĩ r̃ j̃ ŋ̃ w̃]
 - a) glĩ ‘to adjust’
 - b) pǎ ‘to sharpen’
 - c) h̃j̃ ‘to need’
 - d) àp̃ŋ̃ ‘low tide’
 - e) h̃w̃ ‘to stink’

VI. Nasal Spreading

- Vowel nasality is contrastive, consonant nasality is allophonic (Bole-Richard 1983)
- Where does nasality spread from a vowel and where does it not?

Nasality spreads from a vowel:

- 1) To C₁ able to license nasal features
[b d l j w] occur only before oral vowels
 - a) bà ‘to cheat’
 - b) dǎ ‘to cook’
 - c) èlò ‘crocodile’
 - d) jì ‘to go’
 - e) wò ‘to do’

[m n ɲ] occur only before nasal vowels

- f) mākpró 'to not be seen'
- g) nānā 'grandmother (term of address)'
- h) lĩ 'to agree'
- i) ɲĩ 'to raise (animals)'
- j) ɲótĩ 'nose'

Allophony rules for C₁ in Gengbe (Capo, 1981; 1991; Bole-Richard, 1983; Kangni, 1989)

- k) /b/ → [m] / \bar{V}
- l) /d/ → [n] / \bar{V}
- m) /l/ → [ɲ] / \bar{V}
- n) /j/ → [ɲ] / \bar{V}
- o) /w/ → [ɲ] / \bar{V}

2) To all C₂:

- a) blè 'to decieve'
- b) mlĩ 'to roll (in)'
- c) fɲɔ 'to itch'
- d) fɲɔ́ 'to teach'
- e) àbɲĩ 'needle'
- f) àɲɲĩ 'low tide'

3) To height/ATR harmonic 3rd singular object enclitic

- | | |
|-------------------------------------|---|
| a) $\Phi\bar{o}$ beat | m) $\Phi\bar{o}=\bar{e}$ beat him/her/it |
| b) $kpr\bar{o}$ see | n) $kpr\bar{o}=\bar{e}$ see him/her/it |
| c) $m\bar{o}$ have intercourse with | o) $m\bar{o}=\bar{e}$ have intercourse with him/her |
| d) $k\bar{e}$ spread | p) $k\bar{e}=\bar{e}$ spread it |
| e) $\Phi l\bar{e}$ buy | q) $\Phi l\bar{e}=\bar{e}$ buy it |
| f) $s\bar{e}$ bear (fruit) | r) $s\bar{e}=\bar{e}$ bear it |
| g) $d\bar{z}i$ bear (a child) | s) $d\bar{z}i=i$ bear him/her |
| h) $f\bar{i}$ steal | t) $f\bar{i}=i$ steal it |
| i) $t\bar{u}$ close | u) $t\bar{u}=i$ close it |
| j) $\beta\bar{u}$ open | v) $\beta\bar{u}=i$ open it |
| k) $f\bar{a}$ cool | w) $f\bar{a}=\bar{e}$ cool it (down) |
| l) $s\bar{a}$ tie | x) $s\bar{a}=\bar{e}$ tie it |

4) To the Q and DEF clitic (which also borrows tone from preceding V)

- | | |
|--------------------|----------------------|
| a) èzò=à 'fire=Q' | e) èzò=à 'fire=DEF' |
| b) ètó=à 'ear=Q' | f) ètó=á 'ear=DEF' |
| c) àzĩ=à 'egg=Q' | g) àzĩ=à 'egg=DEF' |
| d) ènú=à 'thing=Q' | h) ènú=á 'thing=DEF' |

Nasality does not spread:

4) To C₁ onsets in CV syllables unable to license nasal features (those occurring before both oral and nasal vowels)

a)	àká	‘coal’	q)	ká	‘to take a bit of’	/k/
b)	àgùtó	‘mushroom’	r)	ègù	‘hole’	/g/
c)	tèphé	‘place’	s)	tè	‘to swell’	/t/
d)	èdò	‘sickness’	t)	èdò	‘gutter’	/d/
e)	ègbà	‘load’	u)	gbà	‘to crush’	/gb/
f)	kpó	‘to see’	v)	èkpò	‘tiger’	/kp/
g)	àphá	‘shout’	w)	èphá	‘belch’	/p/
h)	àβà	‘war’	x)	èβá	‘spear’	/β/
i)	fá	‘to cool’	y)	fá	‘to cry’	/f/
j)	vòvò	‘freedom’	z)	vò	‘to be scared’	/v/
k)	sì	‘to mature’	aa)	sì	‘to grow old’	/s/
l)	zòzrò	‘flight’	bb)	zò	‘to walk’	/z/
m)	hè	‘white’	cc)	hèhè	‘reading’	/h/
n)	xò	‘to cost’	dd)	èxò	‘tick’	/x/
o)	d̄zè	‘to buy (liquid)’	ee)	d̄zè	‘red’	/d̄z/
p)	t̄já	‘to join’	ff)	t̄já	‘also’	/t̄j/

5) To C₁ unable to license nasal features in CCV syllables:

- àglá** ‘chin’
- èkpì** ‘table’
- fjò** ‘to teach’
- vwě** ‘bad, poor’

6) Leftward from C to V

- èpì** ‘cow’
- èlā** ‘meat’
- kákááná** ‘until’

7) Rightward from V to C

- m̄f̄j̄l̄v̄í** ‘forefinger’ ***m̄f̄j̄l̄v̄í** (lit. way-show-hand-DIMINUTIVE)
- èp̄w̄ó** ‘truth’ ***èp̄w̄ó**

8) Leftward from apparent coda N (Verbs+enclitics, ideophones and loanwords)

- dù=m̄** ‘bite me’ (bite=1PSA)
- tá=m̄** ‘draw me’ (draw=1PSA)
- gbúm̄** (the sound of a loud gunshot)
- kápìntà** ‘carpenter’
- àkòntà** ‘mathematics’

A good place for nasometer data comparing C̄VN to CVN

9) Between V in falling sonority VV sequences

- a) **kpédéú** ‘addition’
- b) **téú** ‘to be able to’
- c) **àkpóú** ‘fish hook’
- d) **máú** ‘god’

10) Rightward to the NEG enclitic

- a) **èzò=ò** (fire=NEG)
- b) **ètó=ò** (ear=NEG)
- c) **àzì=ò** (egg=NEG)
- d) **ènú=ò** (thing=NEG)
- e) **ɲě mú jì nǎ=ò** ‘I don’t go.’ (I not go HABITUAL=NEG)

11) Rightward onto DIMINUTIVE -ví

- a) **ɲǎnúví** ‘girl’ (compare to Fongbe **dǎví** ‘little snake’; Lefebvre & Brousseau, 2002).

Summary:

13) If we take the syllable nucleus to be the origin of nasal features, nasality:

- Spreads leftward from V to C₂ and to any C₁ able to license nasal features /b d l j w/
- Does not spread leftward from C to V or rightward from V to C
- Spreads between some V (only in VV with rising sonority)
- Does not spread from nucleus-only (Ṽ or N) syllables

14) Analysis: Nasality spreads only within syllables, syllables never contain a sonority fall

- Apparent CVN are CV.N
- Apparent CVV with falling sonority VV are CV.V

VII. Reduplication shows differential treatment of CLV and CGV syllables

1) Reduplication (forming deverbal adjectives and nouns) targets the first syllable of a verb

- a) **sókè** ‘to forgive’ **sósókè** ‘forgiveness, forgiven’
- b) **kù** ‘to uproot’ **kùkù or kùkùú** ‘uprooting, uprooted’

2) CGV patterns with CV in full reduplication of first syllable

- a) **nǔ** ‘to drink’ **nǔnǔ or nǔnǔú** ‘drinking, drank’
- b) **lè** ‘to hold’ **lèlè or lèlèé** ‘holding, held’
- c) **jì** ‘to go’ **jìjì or jìjìí** ‘going, gone’
- d) **bjǒ** ‘to ask’ **bjǒbjǒ** ‘asking, asked’
- e) **ljàá** ‘to climb’ **ljàáljá** ‘climbing, climbed’
- f) **hǔěé** ‘to stink’ **hǔěéhǔěé** ‘stinking, stinky’

3)	CLV syllables show partial reduplication			
a)	blè	‘to deceive’	bè.blè or bè.blèé	‘deception, deceived’
b)	flè	‘to buy’	flè.flè or flè.flèé	‘buying, bought’
c)	vľúú	‘to unfold’	vľú.vľú	‘unfolding, unfolded’
d)	gbľěě	‘to spoil’	gběě.gbľě	‘spoilage, spoiled’
e)	mľĩ	‘to roll in’	mľ.mľĩ or mľ.mľĩĩ	‘rolling (in), rolled (in)’
f)	ŋľĩĩ	‘to fold’	ŋĩĩ.ŋľĩ	‘folding, folded’
g)	wľáá	‘to hide’	wáá.wľá	‘hiding, hidden’
h)	tróó	‘to turn’	tóó.tró	‘turning, turned’
i)	sřĩĩ	‘to study’	sĩĩ.sřĩ	‘studying, studied’
j)	zrò	‘to fly’	zò.zrò or zò.zròó	‘flying, flown’
k)	ŋřěě	‘to sharpen’	ŋěě.ŋřě	‘sharpening, sharpened’
l)	jràá	‘to bless’	jàá.jrá	‘blessing, blessed’

Differential treatment could suggest different underlying structures

- CLV is CCV, but CGV is CVV
- What about apparent rising sonority onsets (GLV)?
- Appears G is treated as lower sonority than L in C₁ position of a CCV syllable
- If so, then such /j w/ are roughly equal in sonority to their nasal allophones /ɲ ŋ/.
- Alternatively, CLV could be underlyingly CVLV and reduplicate as bisyllabic roots
- To keep nasality tied to the syllable, use nasal feature copying rather than spreading

VIII. Summary

- Gengbe nasality can be fruitfully analyzed as tied to the syllable, and unable to spread between syllables
- Such an analysis suggests that Gengbe disallows a sonority fall within a syllable
- Reduplication data may suggest that CLV is CCV but CGV is CVV
- Gengbe is likely a language that allows complex onsets but no codas

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