NEUTRALIZATION OF LARYNGEAL SETTINGS OF WORD-FINAL STOPS IN BUTO LANGUAGES

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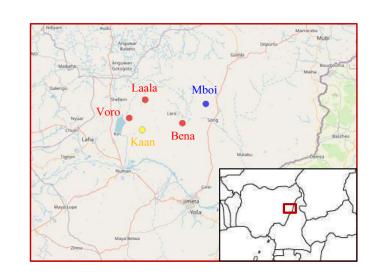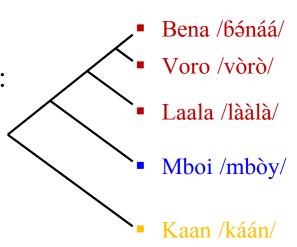
- The Buto language (aka Bena-Mboi)

- No mutual intelligibility, but genealogical unity is uncontroversial

- The obvious similarities allow for a straightforward subdivision

  ✋ slightly different from Kleinewillinghöfer 1996a:82).

- The name *Buto* represents the root for 'land':

  - Bena, Mboi: *bùtò*
  - Laala *pûtú*
  - Kaan *wùdú*

- Bena /ɓə́náá/
- Voro /vòrò/
- Laala /lààlà/
- Mboi /mbòy/
- Kaan /káán/

- In the word-initial position, Buto languages distinguish:

	voiced	voiceless	implosive
bilabial	b	p	ɓ
coronal	d	t	ɗ
velar	g	k	

- Word-initial consonants in Bena (before a vowel and after a pause or the final vowel of a preceding word) (Idiatov 2019)

	Bilabial		Labio-dental		Alveolar		Post-alveolar	Palatal	Velar		Labial-velar		Glottal
plain stop & affricate	pʰ	b			tʰ	d	ʧ		kʰ	g	k͡p	g͡b	(ʔ)
implosive		ɓ				ɗ							
fricative			f	v	s	z	ʃ						h
nasal		m				n				ŋ		ŋ͡m	
trill/tap/approximant						r							
lateral approximant						l							
central approximant								j				w	
								j̃				w̃	

- The aspiration of voiceless stops is moderate
- Utterance-initially, vowels are often pre-glottalized
- Utterance-initially, voiced stops (except LVs) may be partially or fully devoiced
- Voiced fricatives /v, z/ are found in some varieties only

- In the word-internal intervocalic position, Buto languages distinguish:

	voiced	voiceless	implosive
bilabial	(b)	(p)	ɓ
coronal	(d)	t	ɗ
velar	(g)	k	

- In the word-final position (in fact, syllable-final in general), all Buto languages neutralize this three-way distinction to a single value: P, T, K

- The stops in the word-final position may be:

  - lexical

    sàkàT 'quickly', *ɓīP* 'well-built, sturdy', *dèK* 'with a spot'

  - derived through the deletion of the final vowel in certain utterance-internal morphosyntactic contexts.

    été 'person' > *éT yá* 'this person'

    bòɓò 'ask for' > *ā bóB ɓōllē* 'He asked for a pumpkin'

    bòB-rā '(n) request'

    sòkò 'do, make' > *sòK gùlààrá* 'Do the work!'

- Lexical word-final stops tend to be limited to words of minor word classes, such as adverbs and ideophones

- Buto languages vary as to:

  - how frequent such word-final consonants are in the lexicon

  - how general the morphosyntactic rules resulting in derived word-final consonants are
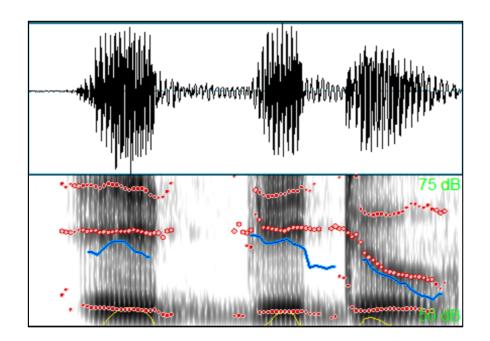
    ☞ most prominent in Bena & Laala

- In non-prepausal positions, the phonetic outcome of the neutralization of word-final oral stops is generally similar across all Buto languages:

  - full or partial anticipatory assimilation in laryngeal settings of C1

  - the voicing of C2 may itself be affected too, presumably because of the difficulty in maintaining such a prolonged voicing

- If C2 is voiced → C1 is also fully or partially voiced

  ✋ Also with C2 that may not require feature [voice] but are voiced phonetically, such as continuants, nasals and *l*.

  ✋ Higher speech rate > more voicing assimilation

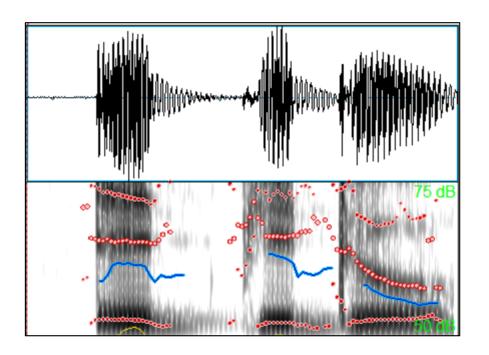éT bídò [db] 'writer (person of writing)'

< été 'person'

- The voiced C2 may then itself be partially devoiced
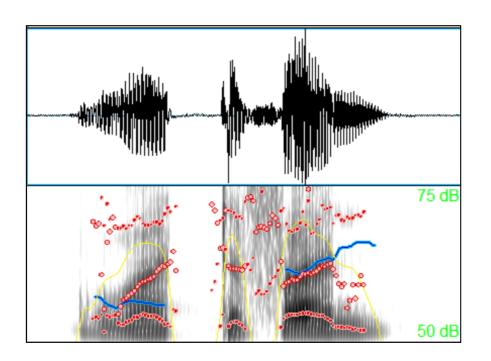

éT bídò [db̥] 'writer (person of writing)'

< été 'person'

- If C2 is voiceless or implosive → C1 is voiceless

wàT tə̀fán [tː] '[The flow of the water that is pouring] is too strong'
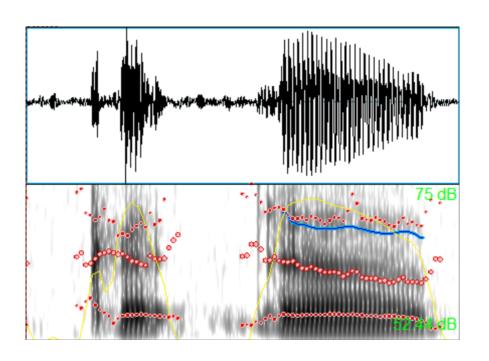
< wàɗà 'go away; exceed'

- The implosive C2 is then itself regularly partially devoiced

káT ɗáá [ɗ̥ː] = [tɗ̥] '[Wild animals] live in [the hills]'

< kāɗā 'sit, stay'
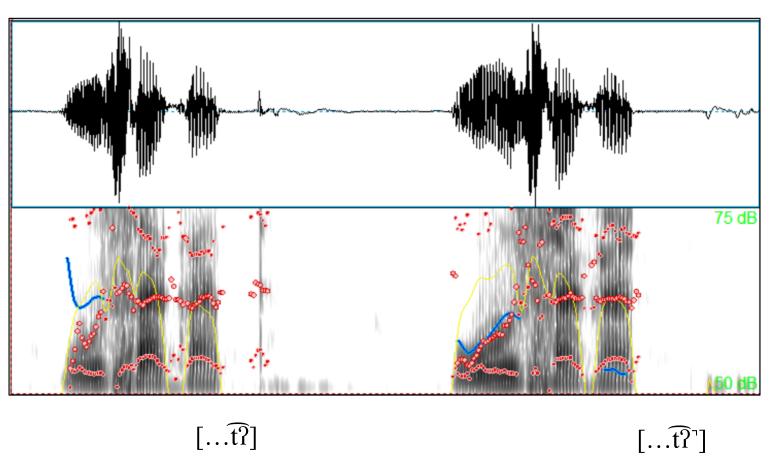
- All Buto languages appear to prefer to realize prepausal stops as glottalized often also lacking audible release, viz. [p͡ʔˈ, t͡ʔˈ, k͡ʔˈ]

  ☞ Idiatov (2019) on Bena

- The glottal closure may have a weak audible release:

  • nasal: after all places of articulation

  • oral: after alveolar or velar

wú sàkà**T** 'It is quick'
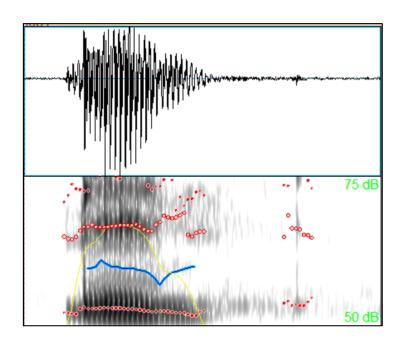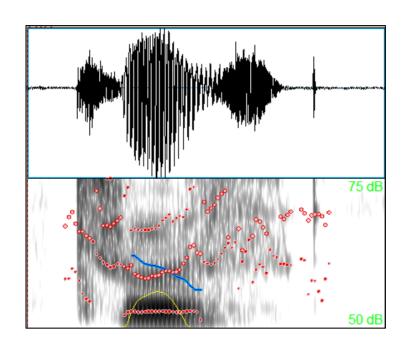

$[…\widehat{t\textipa{P}}]$ $[…\widehat{t\textipa{P}}^\textsf{¬}]$

- At least in Bena, pre-pausal glottalisation also occurs with continuants, nasals, [l] and vowels (cf. Idiatov 2019).

[dẽn͡ʔ] 'tomorrow'

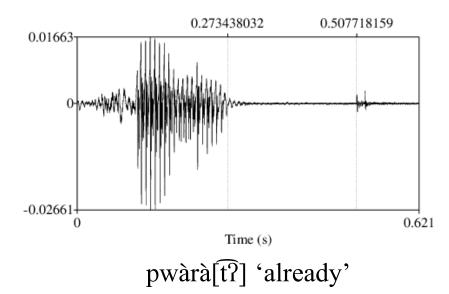[(bí)tʰɾùsʔ] a proper name

- In Bena, consonant lengthening is another important phonetic property associated with the pre-pausal position (cf. Idiatov 2019).

Table 6. *Phrase-internal vs pre-pausal instance of [nə̄n] '1SG.IPFV'*

	[n	ə̄	n]
pause __ [s...]	**115** ms	80 ms	**123** ms
pause __ **pause**	**105** ms	103 ms	**190** ms

pwàrà[t͡ʔ] 'already'

- The duration of the glottal gesture and the frequency of audible release may vary depending on:

  - manner of articulation: stops vs. the rest

  - place of articulation: bilabial vs. the rest

  - speech rate

  - language

  - word class: words that are typically utterance-final, such as ideophones and adverbs (as Bena *sàkàT* 'quickly'), vs. the rest

- What is the phonological status of the prepausal word-final phones [p͡ʔ ˺, t͡ʔ ˺, k͡ʔ ˺]?

- They do **not coincide** with any of the values found in the word-initial position, viz. voiced [b, d, g], voiceless [p, t, k] (also weakly aspirated [pʰ, tʰ, kʰ]) or implosive [ɓ, ɗ].

- This is a common phonological problem in the mainstream phonemic approach requiring only one set of phonemic values across all positions.

- The **default** solution is to identify the prepausal word-final phone with the **voiceless** stop and speak of a prepausal (or word-, or σ-final) **devoicing**.

- Two types of "devoicing":

  - an active phonological process of devoicing: when the prepausal stop alternates with some other sounds in the environments where it is not prepausal, e.g. before a vowel

  - a static phonotactic restriction on voicing: when it does not alternate

  ☞ Possible complications:

  - Still a glottal closure, still no release… (Vietnamese; German)

  - An alternation with yet another phone again different from that in the position of non-neutralization… (Eton)

- According to the typological literature, a phonologically active devoicing may result in an **alternation** with:

  - A voiced stop for all words

  - A voiced or voiceless stop depending on the word

  ☝ If the stop remains voiceless throughout, this is "devoicing" only in the sense of a **static phonotactic restriction.**

- Kaan has "devoicing" only in the sense of a static phonotactic restriction: only voiceless stops are possible in the word-final position and they do not alternate.

(1) bə̀mbə̀[t͡ʔ(˺)] 'ghost' > í bə̀mbə̀[t]=à 'It is a ghost'.

☞ bə̀mbə̀/t/

(2) ʃî[p͡ʔ˺] '(n) rain' > ʃî[p]-ə́m 'rains'

☞ ʃî/p/

(3) gèèmbə́[k͡ʔ(˺)] 'crab' > í gèèmbə́[k]=â 'It is a crab'

☞ gèèmbə́/k/

- Like Kaan, other Buto languages have "devoicing" in the sense of a static phonotactic restriction for the velar place of articulation.

(1) sὲɓὲ[k͡ʔ(˺)] 'weak' > áy sὲɓὲ[k]=ă 'Is he really weak?'

☞ sὲɓὲ/k/

- For bilabial and alveolar stops, Buto languages other than Kaan have a kind of "devoicing" as an active phonological process:

    - "devoicing": laryngeal settings of word-final bilabial and alveolar stops are neutralized before a pause to a non-voiced phone
    - bilabial and alveolar stops do alternate with phones with different laryngeal settings

- For the bilabial and alveolar places of articulation, the alternation is with implosives.

(1) sàkà[t͡ʔ(˥)] 'quickly' > wú sàkà[ɗ]=ǎ? 'Is it really quick?'

   ☞ sàkà/ɗ/

(2) mbē[p͡ʔ˥] 'small' > wú mbē[ɓ]=ě? 'Is it really small?'

   ☞ mbē/ɓ/

- The possibility of neutralization to an implosive has not been acknowledged as such in the typological literature so far.

- Calling it "devoicing" is problematic:

  - Strictly speaking, implosives in Buto do not require feature [voice] in their featural specification

  - At least in Bena, implosives actually pattern with voiceless stops (rather than voiced) in the way they have been interacting with tone historically (see Idiatov & Van de Velde 2020).

▪ This outcome also has practical relevance in terms of orthography development:

📖 **General rule** A: In words that always end in a stop consonant, if the final consonant is a labial stop (your lips are closed), write ‹ɓ›. If the final consonant is coronal (the front of your tongue blocks the air), write ‹ɗ›. If the final consonant is velar (the back of your tongue blocks the air), write ‹k›.

ɗ	mbwāɗ	'all'
	sàkàɗ	'quickly'
	pàvbàɗ	'suddenly, unexpectedly (appear, come out)'
ɓ	mbēɓ	'be small (about a piece of something)'
	mbúkúɓ mbúkúɓ	'spungy'
k	sə̀ɓə̀k	'be weak (due to illness)'
	bòkcìk	'be big (about a cob of maize)'

📖 **General rule B**: In words that end in a consonant in the phrase, but that elsewhere can end in a vowel, write the same consonant that you hear when the word ends in a vowel.

	Consonant-final variant			Vowel-final variant	
t	ét bárè	'man' (male person)	⇔	été	'person'
	ét ké	'some person'	⇔	été	
	hīt līwrā	'church' (building of God)	⇔	hītō	'building; hut; "room"'
	hīt gbàà wá᷇	'a big building'		hītō	
ɗ	Pāɗ hūnú!	'Break the pot!'	⇔	pāɗā	'break'
	Wàɗ tààndî!	'Go out!'	⇔	wàɗà	'go, leave'
k	Sə̀k gùlààrá!	'Work!, Do the work!'	⇔	sə̀kə̀	'do, make'
	Sík kwèl kwél!	'Walk quickly!'	⇔	síkî	'walk'
	Ɓúk kómá!	'Thresh the guinea corn!'	⇔	ɓúkú	'thresh'

📖 **General rule C**: To decide which stop letter to write when you have a stop consonant inside a word and this stop is followed by another consonant, you first need to ask yourself the following question: Is there a related word where this stop is followed by a vowel? If yes, then follow rule B. If no, follow rule A.
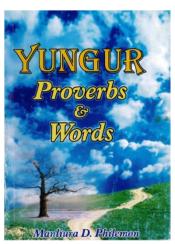
t	(h)án kàtsà	'chairs'	↔	(h)án kátá	'chair'
ɗ	(h)án kàɗsà	'places where one lives'	↔	(h)án káɗǎ	'place where on lives'

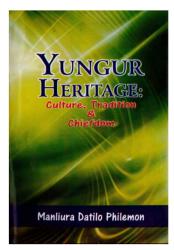| ɗ	tākāɗɗá	'paper, letter'
	tākāɗtá	'papers, letters'

- There is some evidence from an orthography development attempt by a non-linguist native speaker of Bena, Manliura Datilo Philemon, that indeed:

- Bena speakers do not perceive this neutralization for the bilabial & alveolar places of articulation through glottalization as devoicing

- The neutralization is perceived differently for velar and non-velar stops

- He very consistently writes both utterance-internal and prepausal word- and syllable final bilabial and alveolar stops with the voiced symbols, ‹b› and ‹d›, not the voiceless ones.

‹hadma› 'pliers'

‹tebteb› 'black'

‹tod sawo› 'kill a snake' (compare ‹toɗo› 'kill')

‹bud wa› 'this land' (compare ‹buto› 'land')

‹sakad› 'quick'

- At the same time, he also very consistently writes utterance-internal and prepausal word- and syllable final velar stops with the voiceless symbol, viz. ‹k›.

‹bukme› 'body hair'

‹tchik guo› '[guinea fowl] peck a chiken' (compare the verb ‹tchiki› elsewhere)

‹ɗekɗek› 'well, properly'

‹sibik› 'weak'

Nè nə̄ɗ béné hã̄̃ã̄̃!