FACULTY OF ARTS AND PHILOSOPHY

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TESTING FOR PHONETIC CORRELATES OF STEM-INITIAL PROMINENCE IN MBAM BANTU

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Llacan

STEM-INITIAL PROMINENCE

Stem-initial prominence (SIP)

Prosodic prominence of the beginning of the stem

- **Stem-initial prominence** results proposed as areal feature of Bantoid languages, linked to maximality constraints on verb forms (Idiatov and Van de Velde 2016; Lionnet and Hyman 2018; Hyman et al. 2019)

- SIP may be manifested by **phoneme inventory**, **phonetic effects** (e.g. lengthening of C_1/V_1 material), and **position-based phonological rules** (e.g. lenition, tone) (Lionnet and Hyman 2018; Hyman et al. 2019; Lovegren 2012, i.a.); correlation with **gestures** (Franich et al. 2025)

SIP

Phoneme inventory

- Lionnet (2017): overview of strong vs weak SIP based on skew of phoneme inventory
- Argues that SIP is an areal feature, mainly but not exclusively found in Niger-Congo

Example of a very strong SIP language: Lua (Adamawa, Bua) [Boyeldieu 1985]

❖ C_1V_1 | (C).(CV)(C)

C1	p	t	c	k	ʔ	b	d	j	g	mb	nd	nj	ŋg	ɓ	ɗ	s	h	m	n	ɲ		l	r	w	w̃	y
C2+	/B, D, J, G/															s		m	n	ɲ	ŋ	l	r	w		y

V1	i	e	ɛ [ia]	ɨ	ə	a	u	o	ɔ [ua]	ĩ	ẽ	ɛ̃ [iã]	ə̃	ã	ũ	õ	ɔ̃ [ũã]	+ length
V2	i	e		ɨ	ə	a	u	o										no length

C1 > C2+	V1 > V2+	Stem type	Stem max
strong	strong	All	2σ

Example of a weaker SIP language: Gbaya [Moñino & Roulon 1972]

❖ C_1 | V_1(C).(CV)(C)

C1	p	t	k	kp	ʔ	b	d	g	gb	mb	nd	ŋg	ŋgb	ɓ	ɗ	f	s	h	v	z	m	n	ɲ	ŋ	ŋm	l	r	w	y
C2+		t	k	kp						mb	nd	ŋg	ŋgb	ɓ	ɗ	f	s			z	m	n	ɲ	ŋ	ŋm	l	r	w	y	v
C/_#	p	t		k																	m	n		ŋ		l	r			

V1	i	e	ɛ	a	ɔ	o	u	ĩ	ẽ	ã	ɔ̃	ũ
V2	i	e	ɛ	a	ɔ	o	u	ĩ	ẽ	ã	ɔ̃	ũ

C1 > C2+	V1 > V2+	Stem type	Stem max
weak	(no)	All	2σ (3σ)

Figure: SIP in Lua and Gbaya (Boyeldieu 1985 and Monino & Roulon 1972, via Lionnet 2017).

SIP

Phonetic correlates

- Phonological prominence of stem-initial position can be reflected by **phonetic/acoustic effects**, e.g. lengthening, intensity
  - Such phonetic effects interact with phoneme inventory - e.g. allowing for consonants in C1 position that require higher articulatory effort (e.g. labiovelars)

- Phonetic correlates less well-studied than phoneme inventories

! A language may have SIP without phonetic effects (see e.g. Lovegren (2012) on phonetically 'covert' SIP in Mungban (Bantoid; [mij]))

IDIATOV & VAN DE VELDE (2016)

- Idiatov and Van de Velde (2016) [ms.]: lengthening of C_1 found in 7 of 9 Cameroonian Bantoid languages sampled
  - Eton (A71/[eto], Cam), Bafut (Bantoid/[bfd], Cam), Basaa (A43a/[bas], Cameroon), Okak Fang (A75/[fan], Gabon), Kota (B25/[koq], Gabon), Kwasio (A81/[nmg], Cam), and Bagyeli (A81/[gyi], Cam)
- No increased C_1 duration for Bapuku (A30/[bng], Equatorial Guinea/Gabon) or Orungu (B11b/[mye], Gabon)
- Increased C_1 also found for Ejagham (Ekoid/[etu], Cam), Gbaya Mbodomo (Gbaya/[gmm], Cam), Vute (Mambiloid/[vut], Cam), and Yemba (Bamileke/[ybb], Cam) (Dmitry Idiatov, p.c.)

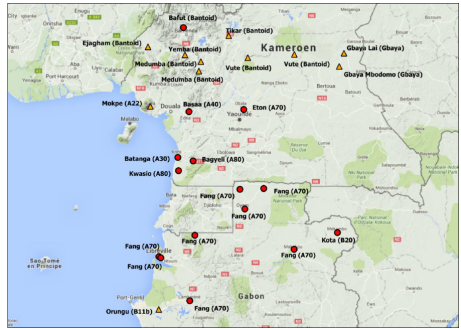

Figure: Map of languages in Idiatov and Van de Velde (2016)'s study (Idiatov and Van de Velde 2016:8).

IDIATOV & VAN DE VELDE (2016)

- Idiatov and Van de Velde (2016): lengthening of C_1 found in 7 of 9 Cameroonian Bantoid languages
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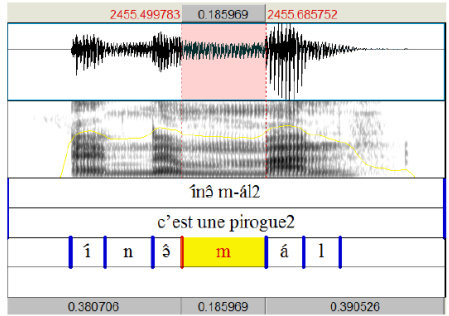
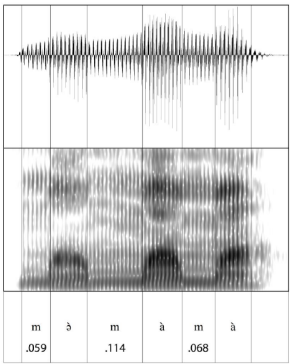


Figure: Example length of /m/ in C1 position in Eton (Idiatov and Van de Velde 2016:14)

IDIATOV & VAN DE VELDE (2016): C1 LENGTH

- Idiatov and Van de Velde (2016) report application of stem-initial prominence to nonce words
- e.g. Eton nonce word *mə-mama*:



Pfx = 59ms

C1 = 114ms

C2 = 68ms

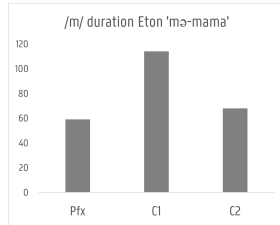


Figure: Annotated Eton nonce word (Idiatov and Van de Velde 2016:3).

REPLICATION STUDY

- No SIP effects reported in previous work on Mbam Bantu (A40b/A60)
- Research stay at CNRS-LLACAN (Oct 2025-Feb 2026): Replication study conducted for Tunen (Bantu A44 [tvu]) and Nomaandé (Bantu A46 [lem])

RQ: Do Tunen and Nomaandé show lengthening of C_1?

→ Test for /m/ and /b-p/ using replication of Idiatov and Van de Velde (2016)'s method[1]

[1] With thanks to Dmitry Idiatov for discussions of stimuli/experimental design/annotation.

METHODOLOGY

- Fieldwork experiment conducted in-situ with 4 speakers of Tunen (2 M, 2 F) and 4 speakers of Nomaandé (3 M, 1 F)
- Drafted wordlists controlling for /m/ and /b-p/ across prefixal, C_1, C_2, and C_3 contexts, + fillers
- Checked wordlists in advance with speakers and checked sentential frame
- Sessions recorded in a quiet environment (Zoom H5 + Shure WH20XLR headphone microphone + video)
- Interviews conducted in French; discourse contexts provided by the elicitor during the experiment in the target language

METHODOLOGY: WORDLISTS

Item	Cat.	Meaning	Condition(s)
màmá	N	'mama'	m_C_1, m_C_2
bamámá	N	'mamas'	b_Pfx, m_C_1, m_C_2
àkzà	V	'to do'	filler
mahùma	N	'forests'	m_Pfx, m_C_2
ɛmɛna	N	'neck'	m_C_1
mɛnyama	N	'animals'	m_Pfx, m_C_2
tɛtámátámá túnùɔ	N+Mod	'all the fruits'	m_C_2, m_C_{Redup}
misi mìkimɔ	N+Mod	'the whole world'	m_C_1
mɔnà	N	'child'	m_C_1
mɔnà mɛlɛ̀mɛndɔ	N_Comp	'boy'	m_C_1
mɔnà ámɔtɛ	N+Mod	'one child'	m_C_1
wɔmɔtɛ̀ mɔnà	D+N	'a certain child'	m_C_1
hìwɔ	N	'fire'	filler
mɔnìfɔ	N	'water'	m_Pfx
ìbuɔ̀	N	'salt'	b_C_1
tunɔnì	N	'Tunen'	filler
bɛfàfálaka	N	'butterflies'	b_Pfx
ɛmalamandà	N	'thunder' (sg.)	m_C_1, m_C_3
mamalamandà	N	'thunder' (pl.)	m_Pfx, m_C_1, m_C_3
ámanà bulìlɔ̀	Other	'only tomorrow'; 'see you tomorrow'	m_C_1, b_C_1
ɛmanya	N	'intelligence'	m_C_1
ɛ̀tasɛ	Other	'very soon'	filler
mambɔmɔ	N	'forests'	m_Pfx, m_C_2
mambɔmɔ má Kamɛ́únù	N	'forests of Cameroon'	m_Pfx, m_C_2, m_C_2
bɛlama	N	'vegetables'	b_Pfx, m_C_2
ámɛ̀la	V	'be pregnant'	m_C_1
ɔmɛma	V	'to swallow'	m_C_1
mɛma!	V	'swallow!'	m_C_1
tɛmɔmɔ	N	'fingers'	filler
mamɛna	N	'necks'	m_Pfx, m_C_1
tɛfátɛfá	Other	'quickly'	filler
ɔfáma	V	'to arrive'	m_C_2
ɔbɔ́ŋɔ	V	'to find'	b_C_1
ɔmanya	V	'to know'	m_C_1
bɛsɛ́ákà	V	'to wash oneself'	b_Pfx
usùbɔ	V	'to drum'	b_C_2
ɛ̀hɔka	N	'place'	b_C_1
ábà	V	'to be'	b_C_1
bàbɛ̀!	V	'turn! (couscous)'	b_C_2
uhɔ̀bɔ	V	'to turn (couscous)'	b_C_2
bɛlama bɛ̀ Kalɛ̀bɛ	N+Mod	'Caleb's vegetables'	b_Pfx, b_C_1, b_C_3
mamama máfandɛ́	N+Mod	'two *mamamas*'	m_Pfx, m_C_1, m_C_2
mɛmama máfandɛ́	N+Mod	'two *nɛmamas*'	m_Pfx, m_C_1, m_C_2
talɔkɔ	N/A	N/A	filler
bababa bálálɔ̀	N+Mod	'three *bababas*'	b_Pfx, b_C_1, b_C_2
babɔbɔ bálálɔ̀	N+Mod	'three *babɔbɔs*'	b_Pfx, b_C_1, b_C_2

Item	Cat.	Meaning	Condition(s)
1. mɔaɔmɔ	N	mama	m_C_1, m_C_2
2. amɛna	N	neck	m_C_1
3. nyɛbána	N	breast	b_C_1
4. hinonyi	N	birds	filler
5. ɔmùá mɔnyìfɔ	V	to drink water	m_C_2, m_Pfx
6. makɛ̀lɛ́	N	salt	m_Pfx
7. buúsa	N	face	b
8. ɛnyama	N	animal	m_C_2
9. ìbùnyi inyísa	N+Mod	four goats	b_C_1
10. mabala	N	urine (pl.)	m_Pfx, b_C_1
11. ɛŋkɔ̀ɔmianá	N	sky	m_C_2
12. yɔɔbɔ́	N	skin	b_C_2
13. ɔɔbɔ́	N	?	
14. ahàma	V	to go out	m_C_2
15. owɔàbɔa	V	to steal	b_C_2
16. nɔbɛmbɛ	N	tongue	b_C_1
17. mɛnà mɛnyìfɔ!	V	drink water!	m_C_2, m_Pfx
18. ɔətù	N	ears	filler
19. ɔ́ɔcɔ́	N	sun	filler
20. ɔɔcɔ́	N	fire	filler
21. ɔɔcɔ	N	man	filler
22. bunɔɔ búmɔtɛ́	N+Mod	one village	b_Pfx
23. háma!	V	go out!	m_C_2
24. obíkútə	V	to shave oneself	b_Pfx
25. ɔfaaya	V	to come	filler
26. ɔbɔ́ŋɔ	V	to find	b_C_1
27. búmàkə bìbábì!	V	chase the he-goats!	b_Pfx, b_C_1 (x2), b_C_2
28. malaka má Kalɛ̀bɛ	N+Mod	Caleb's clothes	m_Pfx, m_C_1
29. bɛnyɛma bɛ̀ Bálàna	N+Mod	Miriam's things	b_Pfx, b_C_1
30. mamama máfandɛ́	N	two *mamamas*	m_Pfx, m_C_1, m_C_2
31. nyɛmama nyémɔtɛ́	N	one *nyɛmama*	m_C_1, m_C_2
32. talɔkɔ	N/A	N/A	filler
33. bababa bátátɔ	N	three *bababas*	b_Pfx, b_C_1 b_C_2
34. babɔbɔ bátátɔ	N	three *babɔbɔs*	b_Pfx, b_C_1 b_C_2

Figure: Tunen and Nomaandé real and nonce words.

PART I: ISOLATION/FRAME

- Part I: SIP Words
  - Display each word on screen; speaker pronounces x1 in isolation and x3 in context 'I say X again'
  - Mix of /m/ and /p-b/ items and fillers

Figure: Tunen consultant performing Part I.

PART II: NONCE WORDS

- Part II: SIP Nonce Words
  - As with Part I, but with nonce words that obey the language's phonotactics
  - Nonce words given with numeral modifiers to cue N status

Figure: Example Nomaandé nonce word *babɔbɔ* cued as N with structure *ba-bɔbɔ* by co-occurrence with numeral *bátátɔ́* 'three').

PART III: DISCOURSE CONTEXT

- Part III: SIP Context
  - Dialogic format with elicitor; background, new information focus, corrective focus, correction of elicitor's mispronunciation (pseudo-argument format)

Figure: Corrective focus context between EK and Tunen consultant.

PART III: DISCOURSE CONTEXT

- Part III: SIP Context
  - Dialogic format with elicitor; background (Bg)[2], new information focus (FocIF), corrective focus (FocCorW), correction of mispronunciation (FocContrPfx, FocContrC1, FocContrC2)

(1) a. ɔ́ ndɔ **ibusə́** sinə eé?
SM.2SG PRS 9.salt see Q
'Do you see salt?'

b. bɔ́ɔ, **mamalamanda** á mɛ́ ndɔ sin.
no 6.thunder COP SM.1SG.REL PRS see
'No, I see [thunder]$_{FOC}$.' (Tunen)

[2]Background context added to Idiatov and Van de Velde (2016)'s design to act as control when testing for C-emphasis prosody on focal material.

METHODOLOGY

- Part III: SIP Context
  - Dialogic format with elicitor; background (Bg)[3], new information focus (FocIF), corrective focus (FocCorW), correction of mispronunciation (FocContrPfx, FocContrC1, FocContrC2)

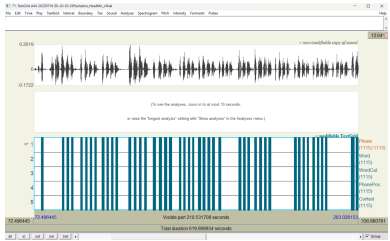
(2) a. buhúnyi écɛ nakɛ́lɛ́.
14.word COP nakɛ́lɛ́
'The word is nakɛ́lɛ́.'

b. əə́?əə́, buhúnyi écɛ **makɛ́lɛ́**, tícáŋa **nakɛ́lɛ́.**
no 14.word COP 6.salt COP.NEG nakɛ́lɛ́
'No, the word is ***m*akɛ́lɛ́**, not ***n*akɛ́lɛ́.**' (Nomaandé)

[3]Background context added to Idiatov and Van de Velde (2016)'s design to act as control when testing for C-emphasis prosody on focal material.

RECORDINGS ⟶ TEXTGRID ANNOTATIONS

- Head mic .WAV files annotated to TextGrid in Praat by same annotator



⇒ 5 annotation tiers:

1. **Phone** (m, b, á, ə, ŋ, etc.)
2. **Word** (ɛmanya, ibusə́, etc.)
3. **WordCat** (N, NComp, NNonce, NMispronun, NProp; V; Assoc, Mod, Other)
4. **PhonePos** (Pfx, C1, C2, C3, C4; V1, V2, V3, V4; C1Redup, C2Redup, V1Redup, V2Redup; NA)
5. **Context** (Iso, Fr, FrIso; Bg; FocIF; FocCorW; FocContrPfx, FocContrC1, ForContrC2)

ANNOTATION DECISIONS

- For consultants that repeated an item more than 3 times, take 3 best-quality audio; if all good quality, take first 3
- Annotate manually in Praat based on waveform + spectrogram (showing formants and pitch trace)
- Annotate surface tone on Phone tier and use lexical tone for Word tier
  - e.g. /ibusə́/ 'salt' pronounced in Iso context as [ibusə] (LLL): Phone = ə; Word = ibusə́
- Annotate entire stop (closure to release, not showing burst location)
- Annotate boundaries at midpoint of formant transition
- Include tail of vowels (! lengthening of final vowels reported cross-linguistically; position-based effect that is likely independent of SIP; see e.g. Seifart et al. 2021; Paschen et al. 2022)

TEXTGRID ANNOTATIONS $\longrightarrow$ ANALYSIS

- TextGrid $\rightarrow$ .txt file via Praat script[4]
- Preliminary analysis in Excel
- Linear mixed effect regression model in R[5]

[4] With thanks to Connor McCabe (University College Dublin).
[5] With thanks to FIRE statistical consulting (Ghent University).

BILABIAL STOPS: P OR B?

- Tunen and Nomaandé community orthographies use <b>, but there is no phonological p/b contrast and sources report that the phonetic realisation of plain bilabial stops is usually [p] (Boyd 2015; Philippson 2022; Kerr 2024)
  - ‘/p-b/’ used until now in this presentation as placeholder
  - VOT to be checked in Praat

BILABIAL STOPS: P OR B?

- Tunen and Nomaandé have /**p**/ ($\rightarrow$ [b] / m_): lack of voicing bar before stop release; VOT $\approx$ 0

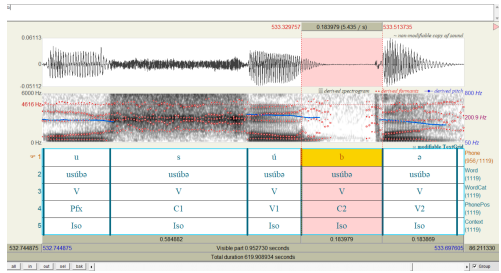


Figure: Example of voiceless unaspirated realisation of word-medial /p/ in Tunen verb usúbə 'to drum'.

- Stop length therefore cannot be checked when stop /p/ is in initial position as there is no voicing bar that can be identified on the spectrogram to measure length of pre-closure part of stop

$\rightarrow$ Exclude /p/ from main analysis due to non-comparability of Tunen/Nomaandé /p/ with /b/ in languages of Idiatov and Van de Velde (2016)'s sample

ANNOTATING /M/

- /m/ selected in Idiatov and Van de Velde (2016)'s study due to its ability to appear in all positions (Pfx/C1/C2) in languages of region, plus ease of identification on spectrogram (Idiatov, p.c.)

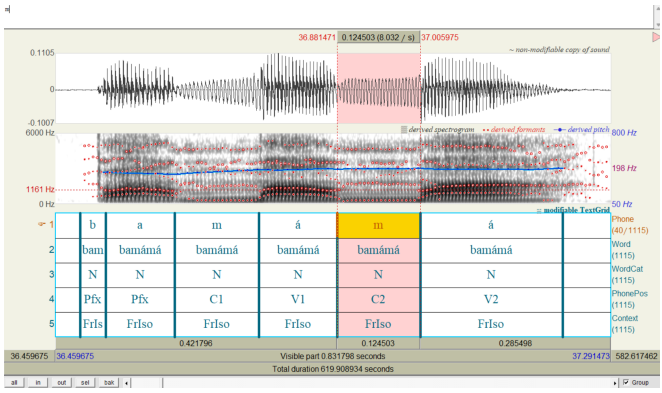


Figure: Example of annotation of /m/ in Praat.

EXAMPLE: /M/ LENGTH IN REAL WORDS

- No position-based visible length difference of /m/ observed in real words

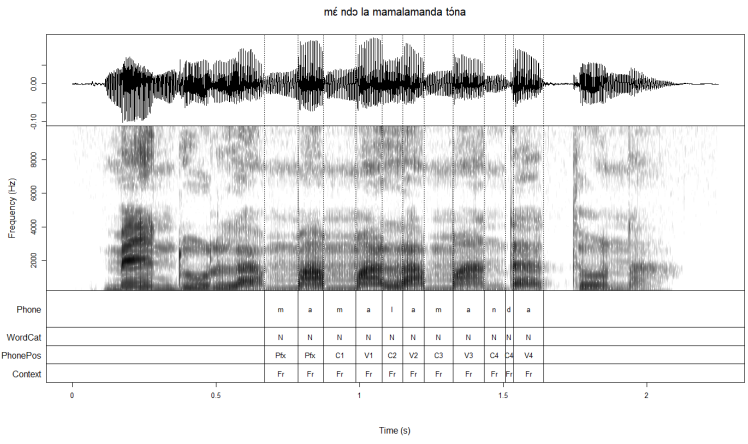


Figure: Example of comparable /m/ length in prefixal, C_1, and C_3 positions (Tunen; Fr context).

EXAMPLE: /M/ LENGTH IN NONCE WORDS

- No position-based visible length difference of /m/ or /a/ observed in nonce words

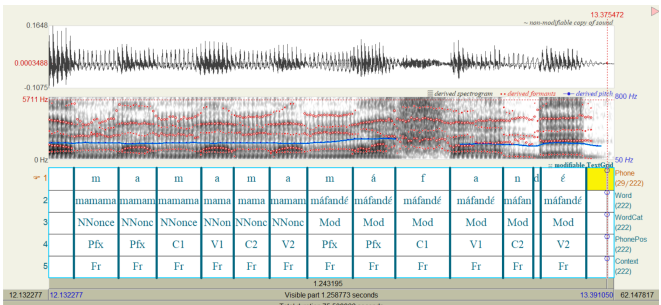


Figure: TextGrid annotation for Tunen nonce word mamama in context of numeral máfandɛ 'two'.

EXAMPLE: /M/ LENGTH IN CONTRASTIVE CONTEXT

- Idiatov and Van de Velde (2016) report lenghtening of C1 material in corrective focus contexts (‘C-emphasis prosody’)
- No visible evidence of C-emphasis in Tunen/Nomaandé corrective focus contexts
  - Tunen/Nomaandé speakers lengthen entire word, not C1 specifically

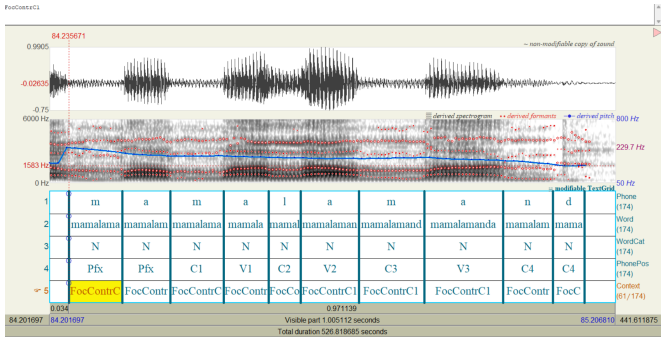
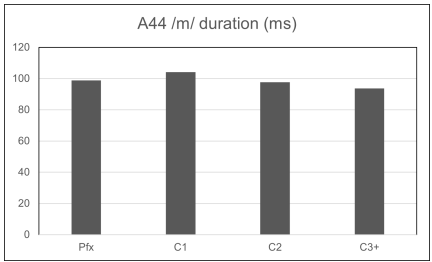


Figure: TextGrid annotation for Tunen word mamalamanda ‘thunders’ in context of correction of mispronunciation of C1 by EK.

INITIAL STATISTICAL ANALYSIS

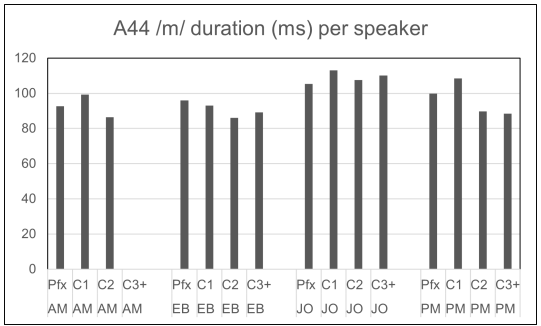
- Mean duration of /m/ in Tunen (across speakers):



Position	Duration (ms)	Count
Pfx	98.90	186
C1	104.20	181
C2	97.64	175
C3+	93.71	32
		574

INITIAL ANALYSIS

- Split per speaker (excluding isolation context (Iso)):

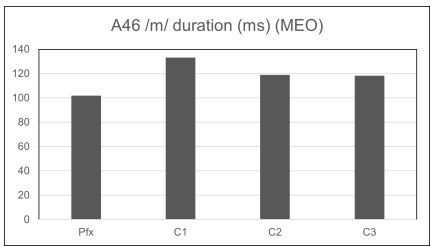


Consultant	Position	Duration (ms)	Count
AM	Pfx	92.75	15
AM	C1	99.31	19
AM	C2	86.47	20
AM	C3+	-	0
EB	Pfx	96.01	51
EB	C1	93.10	50
EB	C2	86.11	49
EB	C3+	89.21	9
JO	Pfx	105.40	47
JO	C1	113.15	46
JO	C2	107.63	46
JO	C3+	110.06	8
PM	Pfx	99.82	24
PM	C1	108.48	18
PM	C2	89.72	14
PM	C3+	88.42	6
			422

$\Rightarrow$! some variation in speech rate between speakers

INITIAL ANALYSIS

- Preliminary analysis for Nomaandé (consultant MEO):



Position	Duration (ms)	Count
Pfx	102.02	19
C1	133.13	20
C2	119.03	22
C3	118.21	4
		65

REGRESSION MODEL

- Check for statistical significance of increased C1 length (i.e. duration vs position) when controlling for variables of word, speaker, discourse context

- Model built in R, checked for Tunen /m/ data[6] (! analysis ongoing)
  - Number of subcodings reduced
  - Deleted isolation context from analysis (keep sentential frame) to test conservative dataset

- Linear mixed effect regression model with word as random effect

```
model <- lmer(duration ~ position + word_category + discourse_context + phone
+ (1 | speaker) + (1 | word), data = dataset)
```

[6] With thanks to FIRE statistical consulting (Ghent University).

REGRESSION MODEL: PRELIMINARY RESULTS

- Preliminary results for Tunen /m/ using C1 (PhonePositionC1) as reference:

	Estimate	Std. Error	df	t value	Pr (>|t|)	
(Intercept)	88.878	6.545	22.691	13.581	2.22e-12	***
PhonePositionPfx	-6.531	2.319	532.625	-2.816	0.00504	**
PhonePositionC2	-6.660	2.271	519.069	-2.933	0.00350	**
PhonePositionC3+	-1.840	3.634	605.421	-0.506	0.61289	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' '1

⇒ No significant difference between C3 and C1

⇒ but differences between C1 and Pfx and C1 and C2 *are* statistically significant ($p < 0.01$)

⇒ ! Difference is small: C1 is 6.531ms longer than Pfx and 6.660ms longer than C2

REGRESSION MODEL: PRELIMINARY RESULTS

- No significant difference between C3 and C1, but differences between C1 and Pfx and C1 and C2 *are* statistically significant ($p < 0.01$)

- ! Difference is small: C1 is 6.531ms longer than Pfx and 6.660ms longer than C2

⇒ Evidence for slight lengthening of C1 material; **much weaker** length distinction than results reported in Idiatov and Van de Velde (2016) (though no statistics to compare against)

? What is the baseline to compare against?
  - What position-based lengthening effects (e.g. final vowel lengthening) are found cross-linguistically, independent of SIP?

DISCUSSION AND CONCLUSION

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RECAP

- Stem-initial prominence (SIP) = phonological prominence on beginning of verb stem
- SIP can be seen through skew in phoneme distribution and may be visible through phonetic effects e.g. lengthening of C1 and V1
- Idiatov and Van de Velde (2016) [ms.] report C1 lengthening for 7/9 Cameroonian Bantu/Bantoid languages
- Replication study for neighbouring languages Tunen and Nomaandé shows only very slight C1 lengthening (preliminary results), with no evidence for C-emphasis prosody in focal contexts

DISCUSSION

CO-VARIATION WITH PHONEME INVENTORY, AND MAXIMALITY CONSTRAINTS

! Lack of/weak phonetic correlates of SIP in Tunen and Nomaandé does not necessarily mean no SIP (e.g. visible in phoneme inventory)

- Lovegren (2012) on Mungban (Bantoid, Cameroon): evidence for SIP from phoneme inventory, but no phonetic correlates w.r.t. length → SIP is "covert"

- Tunen and Nomaandé show **weak SIP** in terms of phoneme inventory, as most phonemes can appear across all positions
- Tunen and Nomaandé also have **very weak maximality constraints** on verb forms, as verbs can reach 4-6 syllables (cf. restrictions to 2 syllables in Bantoid; 3-4 syllable maximum for verb stems in 12 other Cameroonian Bantu languaages; Grimm 2025:17)

⇒ evidence for **co-variation** between strength of phonetic correlates, skew of phoneme inventory, and strengh of maximality constraints

DISCUSSION

AREAL DISTRIBUTION OF SIP

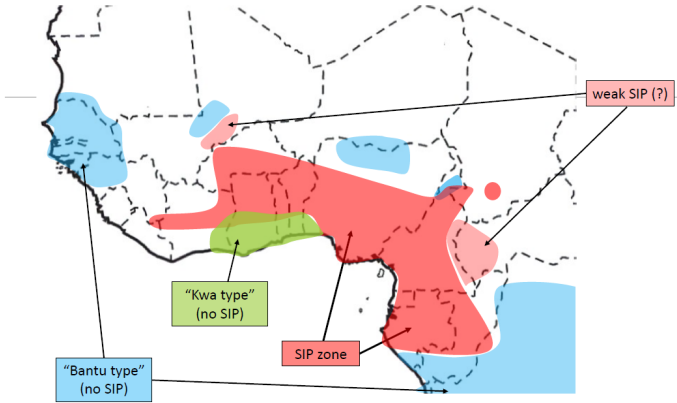

Figure: Preliminary map of strength of SIP by Lionnet (2017:46)

DISCUSSION

AREAL DISTRIBUTION OF SIP

- Strength of the lengthening effect in Idiatov and Van de Velde (2016) study reported to decrease within the A70 group in languages to the south, i.e., to be less visible in the Fang varieties of Gabon than the A70 languages of central Cameroon

- Lack of lengthening found for Bapuku and Orungu suggested by Idiatov and Van de Velde (2016) to be linked to broader phonological and morphosyntactic differences in the grammar of these languages

DISCUSSION

AREAL DISTRIBUTION OF SIP

- Areal distribution of SIP effects in Cameroonian Bantu/Bantoid is **heteregeneous**
  - Not a clear centre/periphery pattern
  - Internal variation within the 'SIP zone' identified for Cameroon in Lionnet (2017)'s preliminary overview
- **co-variation** between strength of phonetic correlates of SIP, phoneme inventory, and maximality constraints
  - $\Rightarrow$ consistent with diachronic scenario of SIP driving maximality constratints (and increase in morphosyntactic analyticity; Hyman 2017)

THANK YOU!

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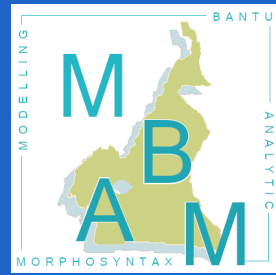

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APPENDIX

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ANNOTATION DECISIONS

VOWEL LENGTH

- Include tail of vowels

- Lengthening of final vowels reported cross-linguistically; likely independent of SIP (see e.g. Seifart et al. 2021; Paschen et al. 2022)

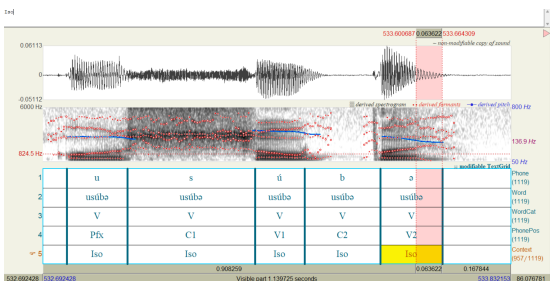

Figure: Example annotation of vowel in final position including tail.

ANNOTATION DECISIONS

STOP ONSET

- Sentential frame context ‘I say X again’: in both languages, target item is followed by adverbial tɔ́na ‘again’

(3) mɛ́ ndɔ la X **tɔ́na.**
/mɛ ^{H}ndɔ la X **tɔ́na**/
SM.1SG PRS say X again
'I say X again.' (Tunen)

ANNOTATION DECISIONS

- Boundary between target and following /t/ based on drop-off of energy on spectrogram

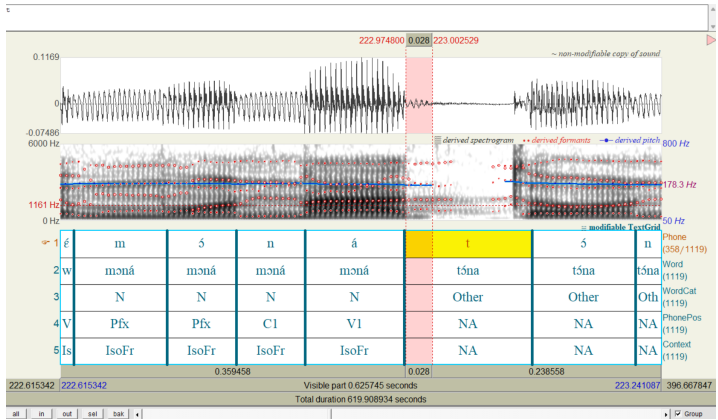

Figure: Annotation of boundary between end of target word and following /t/: highlighted part is not included in duration of vowel (NB: tɔ́na normally not annotated; marked here for expository purposes).

WHAT ABOUT VOWEL LENGTH?

- Vowel length annotations more complicated, e.g. vowels in final position are consistently lengthened
- Preliminary analysis of non-final vowels: no evidence that V1 is lengthened

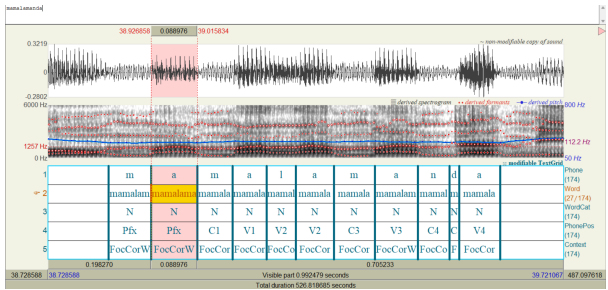

Figure: Example length of /a/ in Pfx, V1, V2, V3, and V4 positions in Tunen word mamalamanda ‘thunder (pl.)’ in corrective focus context on the word level.