

Floating suprasegmental component in Nuer

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The phenomenon: data from Lou Nuer

Some Nuer nouns have a floating suprasegmental component (FSC). FSC occurs at the left edge of the nouns. It is realised only with the addition of the preceding context.

- (1) a. $\text{w}\dot{\text{a}}\text{n}$ $\text{n}\acute{\text{e}}\text{aaan-}\grave{\text{à}}$ $\text{g}\grave{\text{à}}\text{t}$ (ordinary noun)
 1SG see.TR-1SG child.SG
 ‘I see a child.’
- b. $\text{w}\dot{\text{a}}\text{n}$ $\text{n}\acute{\text{e}}\text{aaan-}\grave{\text{à}}\grave{\text{á}}$ $\text{d}\grave{\text{o}}\text{k}$ (FSC noun)
 1SG see.TR-1SG Dok.person.SG
 ‘I see a Dok person.’

Nuer language and dialects



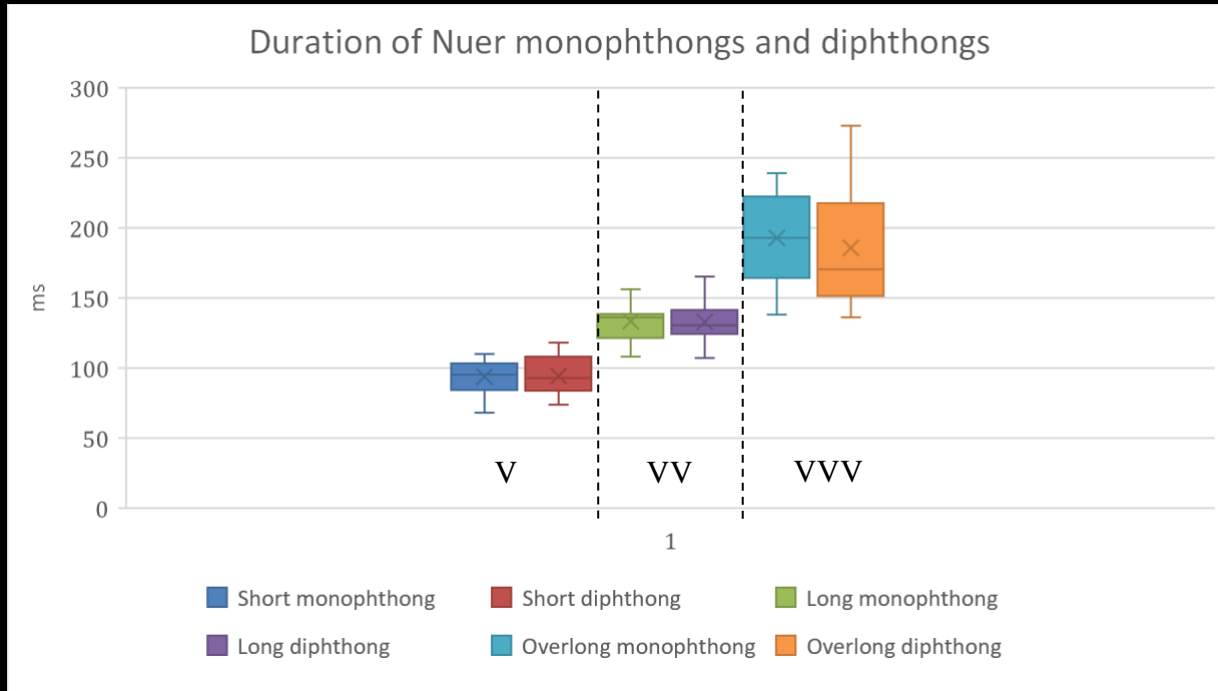
Nuer [nus] is a Nilo-Saharan language (Nilo-Saharan, Eastern Sudanic, Nilotic, Western, Dinka-Nuer) spoken in South Sudan and Ethiopia.

Three broad varieties: Eastern Nuer, Central Nuer and Western Nuer. Within Eastern variety there are a number of dialects.

Sound inventory

- 20 consonant phonemes: /p, b, m, t̪, d̪, n̪, t, d, n, c, ʃ, ɲ, k, g, ŋ, l, r, w, j, ɥ/
- 22 vowel phonemes: /ɪ, ī, e, ē, ε, ʌ, ɔ, ɔ̄, o, ō, ʊ, ɪɛ, īɛ, εa, ēa, ɔa, ɔ̄a, ʊɔ, ʊ̄ɔ/
- 3 tonemes: High, Mid, Low
- Three-way vowel length: short (V), long (VV) and overlong (VVV) in monophthongs and in diphthongs.

Vowel length contrast



lèp
open.APPL.NF

lēep
tongue.PL

lēep
open.MUL.APPL.NF

pīem
boxing.AP.NF

pīeem
boxing.APPL.NF

pīeem
boxing.VN

Syllable and word structure

The majority of words are monosyllabic.

The syllable/word structure:

C(w/j)V(V)(C)

There can be suffixes, but there are virtually no (segmental) prefixes.

Back to floating suprasegmental component (FSC)

Ordinary noun: **gàt** 'child'

FSC noun: **dòk** 'Dok person'

(2) a. **gàt** gòaaɥ-é
 child.SG good-3SG
 'The child is good'

b. **dòk** gòaaɥ-é
 Dok.person.SG good-3SG
 'The Dok person is good'

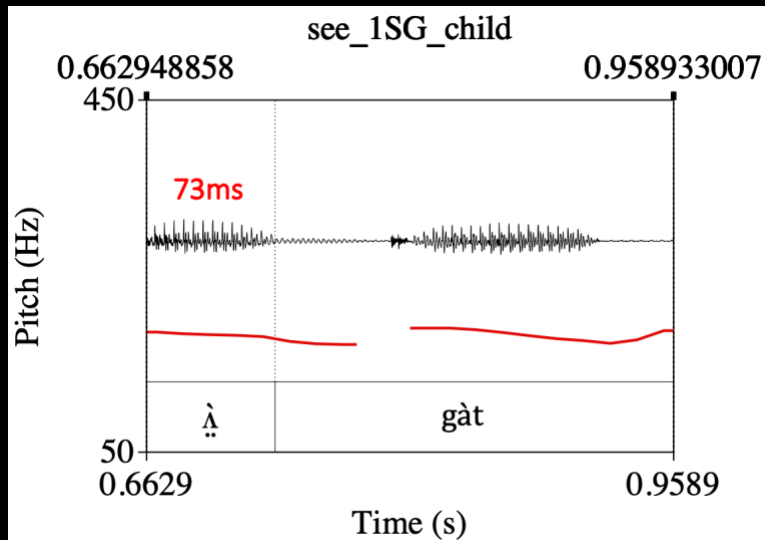
Realisation of FSC (Lou dialect)

FSC is realised **only** with the addition of the preceding context. Example below from Lou Nuer dialect shows the effects of FSC in the preceding context: increase in vowel duration, change in tone.

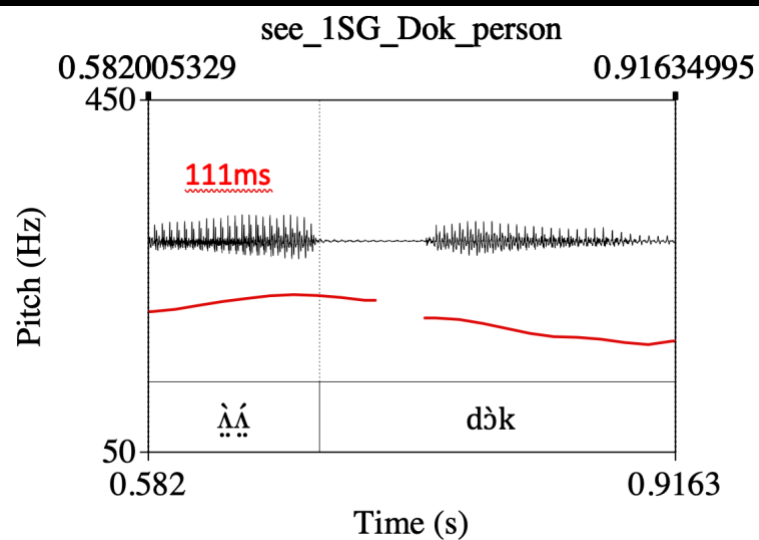
- (3) a. $\text{w}\acute{\text{a}}\text{n}$ $\text{n}\acute{\text{e}}\text{aaan}\grave{\text{à}}$ $\text{g}\grave{\text{à}}\text{t}$ (ordinary noun)
 1SG see.1SG child.SG
 ‘I see a child.’
- b. $\text{w}\acute{\text{a}}\text{n}$ $\text{n}\acute{\text{e}}\text{aaan}\grave{\text{á}}$ $\text{d}\grave{\text{o}}\text{k}$ (FSC noun)
 1SG see.1SG Dok.person.SG
 ‘I see a Dok person.’

Realisation of FSC

Ordinary noun



Noun with FSC



FSC in other vocalic contexts

(4) a. $\text{ʃ}\underset{\cdot}{\text{í}}\text{n}$ $\text{n}\acute{\epsilon}\epsilon\epsilon\text{n}-\underset{\cdot}{\text{ì}}$ **gàt** (ordinary noun)
 2SG see-2SG child.SG
 ‘You see a child.’

b. $\text{ʃ}\underset{\cdot}{\text{í}}\text{n}$ $\text{n}\acute{\epsilon}\epsilon\epsilon\text{n}-\underset{\cdot}{\text{í}}\underset{\cdot}{\text{í}}$ **dòk** (FSC noun)
 3SG see-2SG Dok.person.SG
 ‘You see a Dok person.’

(5) a. $\text{ʃ}\bar{\epsilon}\text{n}$ $\text{n}\acute{\epsilon}\epsilon\epsilon\text{n}-\bar{\epsilon}$ **gàt** (ordinary noun)
 3SG see-3SG child.SG
 ‘S/he sees a child.’

b. $\text{ʃ}\bar{\epsilon}\text{n}$ $\text{n}\acute{\epsilon}\epsilon\epsilon\text{n}-\bar{\epsilon}\acute{\epsilon}$ **dòk** (FSC noun)
 3SG see-3SG Dok.person.SG
 ‘S/he sees a Dok person.’

The origins of FSC in Nuer

- In Nuer, all nouns start with a consonant. There are no nouns that start with a vowel, except for some place names, like Akobo.
- By contrast, Nuer's closest relatives Dinka and Reel have nouns that start with a prefix vowel /a-/. In Reel (Reid 2010) and in Dinka (Remijsen & Manyang 2009) the initial vowel is toneless.
- Nuer cognates of the nouns that start with the vowel /a/ in Dinka and Reel are the nouns which have FSC.

The origins of FSC in Nuer

Table from Reid (2019: 78) showing cognates in Nuer and Reel. Reel data are drawn from own fieldwork; items marked by (*) are from Cien et al. (2016).

Nuer nouns with FSC	Reel cognates	Translation
dáạar	aḍàạar	'pot'
dáạaŋ	adaŋ*	'bow'
kọ́ạl	akạl*	'calf'
tị́iiw	aṭị́iw	'grass door'
láạt	alâạt	Nuer 'thread'; Reel 'cloth'
tạ́ak	aṭak*	'pot made from mud'

FSC in Nuer

Nuer has lost this vowel as is evident from the example of the noun ‘Dok person’ in the phrase-initial context. Because of the effect on the preceding context (vowel lengthening and tonal change), I hypothesise that the segmental component alone has been lost but some suprasegmental component has remained and is realised on the preceding context.

- (6) a. **dòk** gòaaɥ-é (FSC noun)
 Dok.person.SG good-3SG
 ‘The Dok person is good’
- b. **ʃín** néɛɛn-ǐǐ **dòk** (FSC noun)
 3SG see-2SG Dok.person.SG
 ‘You see a Dok person.’

Tone and quantity mobility in West Nilotic languages

- Andersen (1990) for Dinka and Reid (2009) for Shilluk – with the loss of suffixation stem vowel lengthens.
- Remijsen & Ayoker (2020) for Shilluk – loss of suffixes results in a floating quantity that associates across the word boundary with the following context.
- Reid (2009), Remijsen & Ayoker (2019), Lam (2021) for Shilluk – loss of segmental suffixation, floating tone remains and interacts with the tone in stems.

Composition of FSC in Lou Nuer - quantity

Tonal change occurs only when the preceding context is phonologically Low.

Vowel lengthening occurs regardless of the tonal specification in the preceding context – an argument for a floating quantity.

- (7) a. $\omega\grave{a}n$ $n\acute{e}aaan-\grave{\eta}$ $g\grave{a}t$ b. $\omega\grave{a}n$ $kw\bar{a}n-\acute{\eta}$ $g\grave{a}t$
 1SG see-1SG child.SG 1SG choose-1SG child.SG
 'I see a child.' 'I am choosing a child.'
- c. $\omega\grave{a}n$ $n\acute{e}aaan-\grave{\eta}\grave{\eta}$ $d\grave{o}k$ d. $\omega\grave{a}n$ $kw\bar{a}n-\acute{\eta}\grave{\eta}$ $d\grave{o}k$
 1SG see-1SG Dok.SG 1SG choose-1SG Dok.SG
 'I see a Dok person.' 'I am choosing a Dok person.'

Composition of FSC in Lou Nuer - tone

The tonal effect is present when the FSC noun is Low or High toned, suggests that the High element is not due to tone spreading, but that the FSC consists of a High tone.

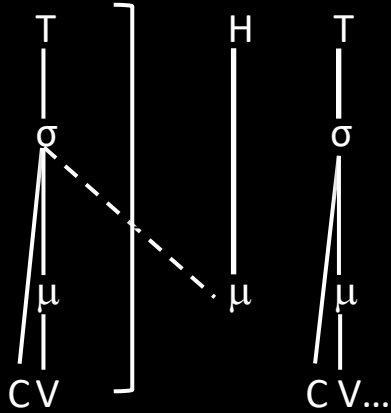
(8) a. $\text{w}\acute{\text{a}}\text{n}$ $\text{n}\acute{\text{e}}\text{a}\text{a}\text{a}\text{n}-\grave{\text{a}}\acute{\text{a}}$ $\text{d}\grave{\text{o}}\text{k}$
 1SG see-1SG Dok.person.SG
 ‘I see a Dok person.’

b. $\text{w}\acute{\text{a}}\text{n}$ $\text{n}\acute{\text{e}}\text{a}\text{a}\text{a}\text{n}-\grave{\text{a}}\acute{\text{a}}$ $\text{g}\acute{\text{u}}\text{r}$
 1SG see-1SG meerkat.SG
 ‘I see a meerkat.’

FSC in Lou: a High tone + mora

Based on the realisation of FSC in Lou Nuer, we might expect that there is a floating High tone and a floating mora at the left edge of FSC nouns: $\acute{\mu}d\grave{o}k$ 'Dok person'.

The mora and tone cross the word boundary to associate with the preceding syllable:



FSC data from four South Sudanese Nuer dialects

(9) $\omega\grave{\lambda}\eta\grave{n}$ $n\acute{e}aaan-\grave{\lambda}$ $g\acute{o}\omega$ (ordinary noun, all dialects)
 1SG see-1SG prophet.SG
 'I see a prophet.'

(10) a. Lou (Eastern Nuer) $\omega\grave{\lambda}\eta\grave{n}$ $n\acute{e}aaan-\grave{\lambda}\acute{\lambda}$ $g\acute{o}\omega r$
 b. Nasir (Eastern Nuer) $\omega\grave{\lambda}\eta\grave{n}$ $n\acute{e}aaan-\grave{\lambda}\acute{\lambda}$ $g\acute{o}r$
 c. Gawaar (Central Nuer) $\omega\grave{\lambda}\eta\grave{n}$ $n\acute{e}aaan-\grave{\lambda}\acute{\lambda}$ $\eta g\acute{o}\omega r$
 d. Bentiw (Western Nuer) $\eta\grave{\lambda}\eta\grave{n}$ $n\acute{e}aaan-\grave{\lambda}\acute{\lambda}$ $\eta g\acute{o}\omega r$
 1SG see-1SG meerkat.SG
 'I see a meerkat.'

FSC in Nasir

Vowel lengthening and tone change occur when the preceding context is phonologically Low.

- (11) a. $\psi\grave{\alpha}n$ $n\acute{e}aaan-\grave{\alpha}$ $g\grave{a}t$ (ordinary noun)
 1SG see-1SG child.SG
 ‘I see a child.’
- b. $\psi\grave{\alpha}n$ $n\acute{e}aaan-\grave{\alpha}\acute{\alpha}$ $d\grave{o}ak$ (FSC nouns)
 1SG see-1SG Dok.person.SG
 ‘I see a Dok person.’

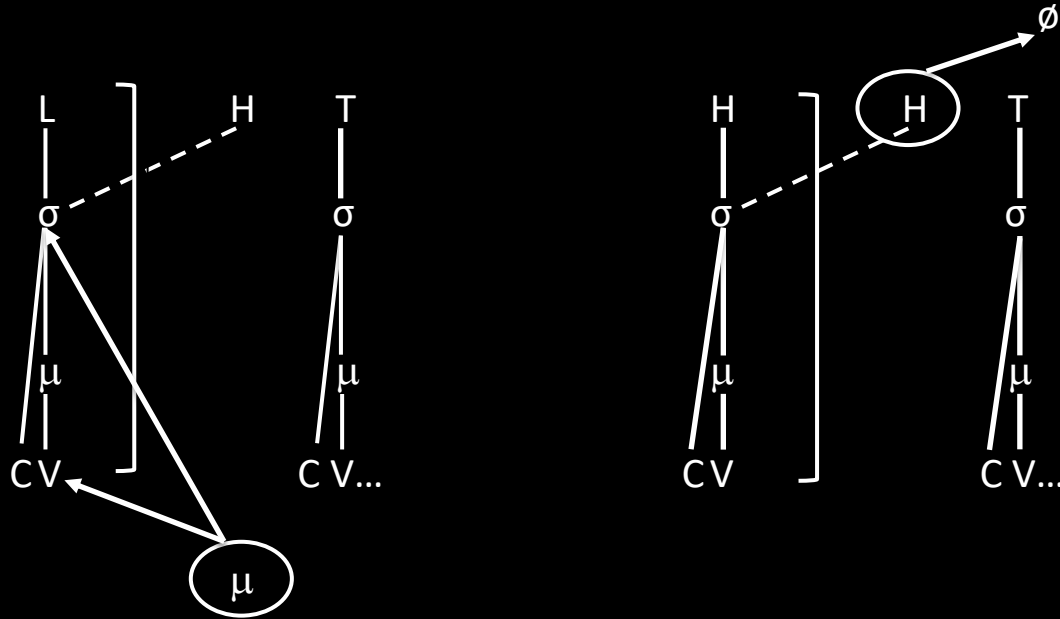
FSC in Nasir

When the preceding context is phonologically High, there is no change in tone and no vowel lengthening. Vowel lengthening is conditioned by the tonal pattern.

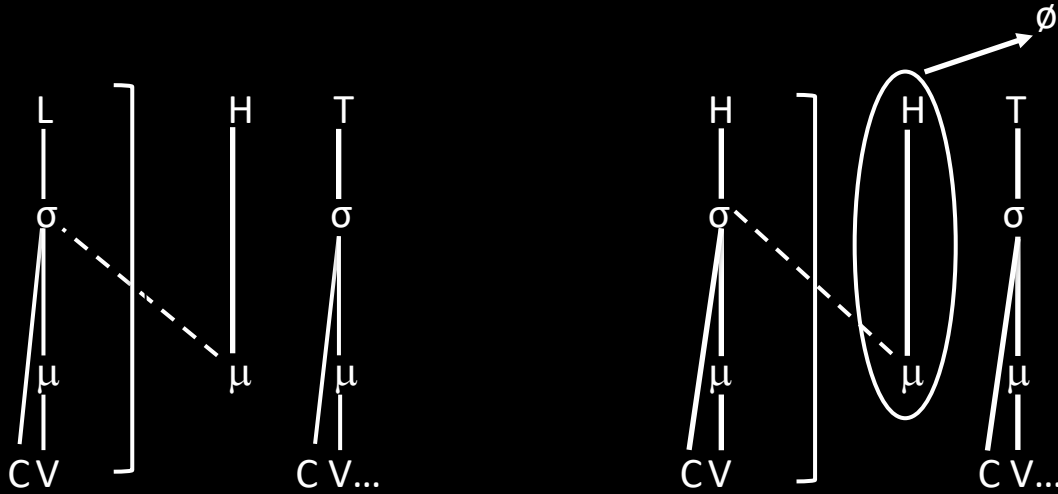
- (12) a. $\text{w}\underset{\cdot}{\text{a}}\underset{\cdot}{\text{n}}$ $\text{kw}\bar{\text{a}}\eta\text{-}\underset{\cdot}{\text{a}}$ $\text{g}\grave{\text{a}}\text{t}$ (ordinary noun)
 1SG choose-1SG child.SG
 'I am choosing a child.'
- b. $\text{w}\underset{\cdot}{\text{a}}\underset{\cdot}{\text{n}}$ $\text{kw}\bar{\text{a}}\eta\text{-}\underset{\cdot}{\text{a}}$ $\text{d}\grave{\text{o}}\text{ak}$ (FSC noun)
 1SG choose-1SG Dok.person.SG
 'I am choosing a Dok person.'

FSC in Nasir: a High tone hypothesis

This hypothesis hinges on the assumption that each tone in this dialect must associate with a mora. A mora slot must be added to accommodate the tone.



FSC in Nasir: High tone = mora hypothesis



FSC in Gawaar

Vowel lengthening and tone change occur when the preceding context is phonologically Low.

When the preceding context is phonologically High, there is no tone change and vowel lengthening is sporadic.

(13)

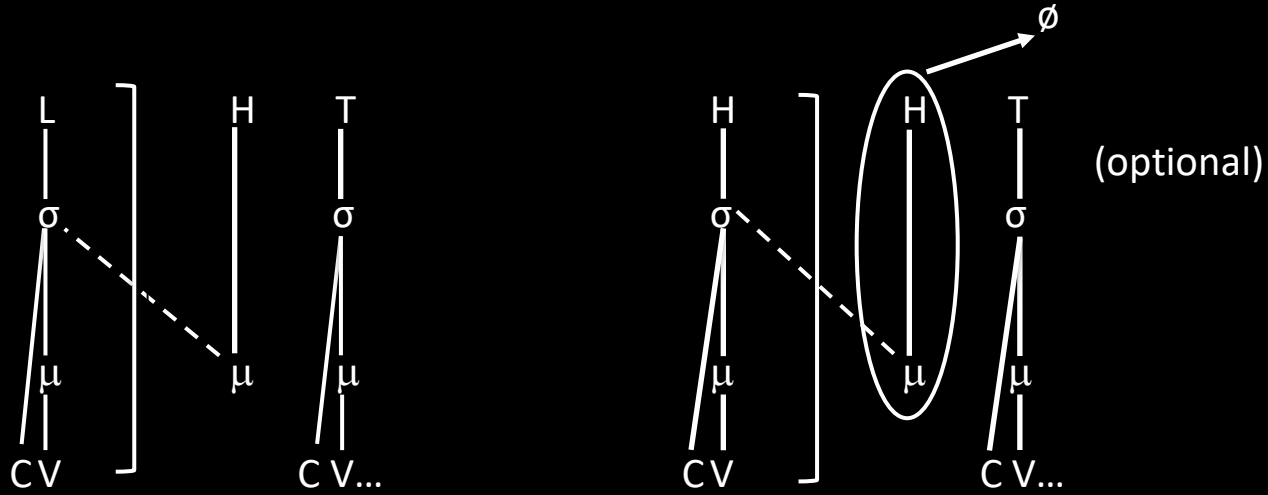
a. $\omega\grave{\lambda}n$ $n\acute{e}aaan-\grave{\lambda}$ $g\grave{a}t$
 1SG see-1SG child.SG
 'I see a child.'

b. $\omega\grave{\lambda}n$ $kw\bar{a}aa\eta-\acute{\lambda}$ $g\grave{a}t$
 1SG choose-1SG child.SG
 'I am choosing a child.'

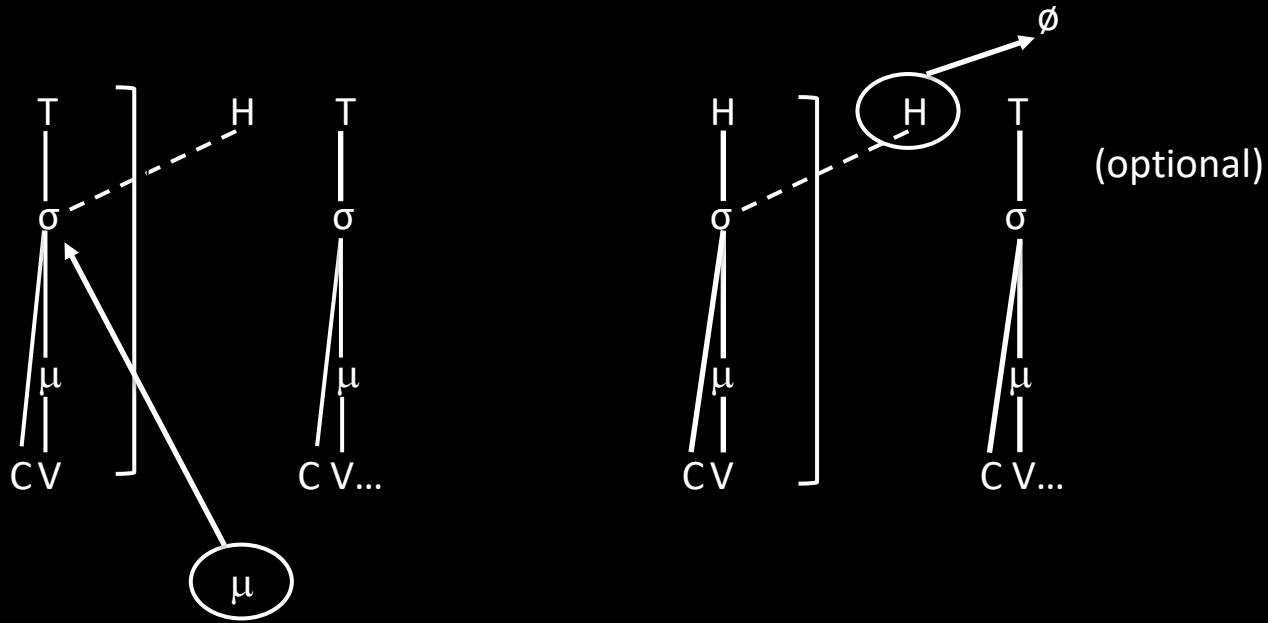
c. $\omega\grave{\lambda}n$ $n\acute{e}aaan-\acute{\lambda}\acute{\lambda}$ $d\grave{o}(a)k$
 1SG see-1SG Dok.person.SG
 'I see a Dok person.'

d. $\omega\grave{\lambda}n$ $kw\bar{a}aa\eta-\acute{\lambda}(\acute{\lambda})$ $d\grave{o}(a)k$
 1SG choose-1SG Dok.person.SG
 'I am choosing a Dok person.'

FSC in Gawaar: High tone + mora hypothesis



FSC in Gawaar: a High tone hypothesis



FSC in Bentiw

Vowel lengthening and tone change occur regardless of the tonal specification in the preceding context.

(14) a. ηḷn néaaan-ḷ̀ gət
 1SG see-1SG child.SG
 ‘I see a child.’

b. ηḷn kwāaŋ-ḷ̀ gət
 1SG choose-1SG child.SG
 ‘I am choosing a child.’

c. ηḷn néaaan-ḷ̀́ d̀̀k
 1SG see-1SG Dok.person.SG
 ‘I see a Dok person.’

d. ηḷn kwāaŋ-ḷ̀́ d̀̀k
 1SG choose-1SG Dok.person.SG
 ‘I am choosing a Dok person.’

Dissimilatory Lowering in Nuer

In verbs (15), the singular person suffixes are High toned underlyingly and are realised as such when the verb stem is Mid or Low toned. These suffixes, however, become Low toned when the preceding stem is High toned (Reid 2019). The same process occurs in nouns (16).

- | | | | |
|------|------------------------|---------------------------|----------------------|
| (15) | kwāaŋ-ǎ́
choose-1SG | lwèeŋ-ǎ́
poison.AP-1SG | néaaan-ǎ̀
see-1SG |
|------|------------------------|---------------------------|----------------------|

- | | | | |
|------|---------------------------|----------------------------|-------------------------|
| (16) | lāaḗt-ní
thread.PL-OBL | ɥḗw-ní
traveller.PL-OBL | gwáḗt-nì
time.PL-LOC |
|------|---------------------------|----------------------------|-------------------------|

Dissimilatory Lowering Rule

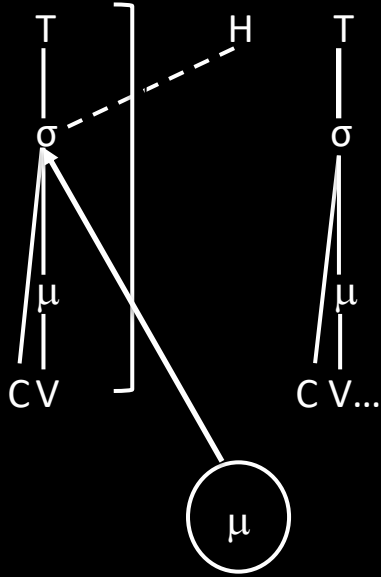
The DL rule modified from Reid (2019: 152) is given below. It says that when subsequent High tones occur within the same word, the second High tone becomes Low. This process does not cross word boundary.

(17) DL rule

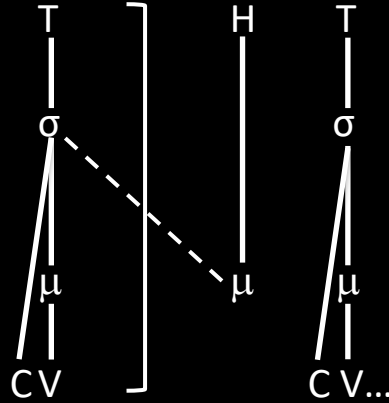
$$H \rightarrow L / [{}_w H _]_w$$

FSC in Bentiw

Floating tone



Floating tone + mora



The two hypotheses

1. FSC consists of a High tone + mora

- for a mora to cross word boundary is typologically rare, but it has been attested in a closely-related language Shilluk (Remijsen & Ayoker 2020).

2. FSC consists of a High tone alone (and vowel lengthens to accommodate the floating tone)

- In world's languages floating tones often associate across word boundary (Hyman 2011).
- Contour tones tend to be restricted to phonemically long vowels (Somali, Saeed 1993; Navajo, Young & Morgan 1992; and Ju|'hoasi, Dickens 1994, Miller-Ockhuizen 1998).
- Longer duration = higher tone bearing ability (Zhang, 2001).

Additional evidence in support of (1): prenasalisation

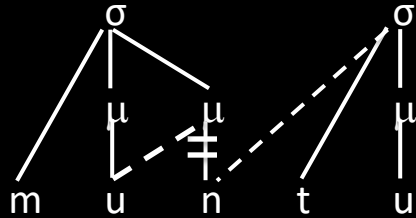
Occurs in a subclass of nouns with FSC in Bentiw and Gawaar dialects.

(18)	<i>Phrase-initially</i>	<i>Phrase-medially</i>	
a.	b̥ùn 'coffee'	ɰ̥n néaaan-ḷ̥ḷ̥ 1SG see-1SG 'I see coffee.'	mbùn coffee
b.	b̥i̥i(k) 'cloth'	ɰ̥n néaaan-ḷ̥ḷ̥ 1SG see-1SG 'I see a cloth.'	b̥i̥i(k) cloth.SG
			(data from Bentiw)

Additional evidence in support of (1): prenasalisation

A hypothesis: the original suffix vowel has weakened and is realised as a homorganic nasal instead (thank you to Bob Ladd for pointing this out to me). What about the mora?

In Bantu languages prenasalised stops induce compensatory lengthening of the preceding vowel (Clements 1986, Hubbard 1995).



(Luganda, adapted from Hubbard 1995: 244).

Additional evidence in support of (2)?: CVV preceding context

When the context before a FSC noun is a long open syllable, no vowel lengthening takes place.

- (19) a. **càa** **gàt** **lwéen** (ordinary noun)
 PASS child.SG poison.AP.NF
 ‘The child was poisoned.’
- b. **càá** **dòk** **lwéen** (FSC noun)
 PASS Dok.person.SG poison.AP.NF
 ‘The child was poisoned.’

But, function words cannot have overlong vowels in Nuer.

Phonotactics block the floating mora association.

Conclusions

- Some Nuer nouns have a floating suprasegmental component (FSC). It originates from a segmental prefix /a-/.
- FSC is realised only with the addition of the preceding context. The effects of FSC are vowel lengthening and tone change in the preceding context, and also prenasalisation in some dialects.
- Between-dialect differences suggest two alternative analyses:
 - FSC consists of a mora + High tone that associate across word boundary with the preceding context (accounts for Lou Nuer data).
 - FSC consists of a High tone that associates across word boundary with the preceding context and requires a mora to be inserted to accommodate this tone (accounts for Nasir data).

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