



VOWEL REDUCTION TO /I/ IN FUNCTIONAL MORPHEMES IN NORTHERN SUB-SAHARAN AFRICA

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Kuznetsova & Anderson (2020:7): Two **general paths of vowel reduction** are often distinguished:

- **centripetal**: centralization towards schwa
- **centrifugal**: dispersion towards the three corner vowel qualities *a*, *i*, *u*, which are the most peripheral in F1/F2 space

Kapatsinki et al. (2020):

- ***centrifugal**: The few reported cases of apparent centrifugal vowel reduction do not result from reductive sound change
- As a **result of reduction** vowels:
 - shorten
 - devoice
 - unround
 - and centralize
 - (with some raising)

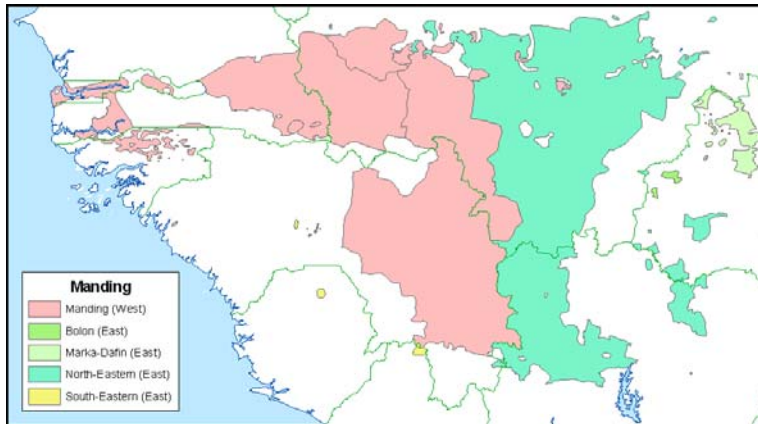
Kapatsinki et al. (2020) on quality changes in reduction:

- **centralization**
- raising
 - ✎ despite being common in Romance and Slavic (Crosswhite 2001; Barnes 2006)
- (lowering can only affect high vowels lowering to mid, but never to low)

In many languages of Northern Sub-Saharan Africa (NSSA) vowel qualities of **functional morphemes** tend to be **neutralized** through raising, fronting and unrounding towards /i/

- typologically uncommon
- targets functional morphemes
- has a non-trivial spatial distribution within NSSA

- Reduction towards /i/ is common in **TAMP markers** in **Greater Manding** languages (cf. Idiatov 2020:65)



Mande > Western Mande > Central Mande > Greater Manding (> Manding, Jogo-Jeli, Mokole)

(1) $TAMP_0$ S **TAMP₁** (O) V-TAMP₂ X $TAMP_3$



- Idiatov (2020) focuses on positive **PFV and historically related markers**, but similar reduction is also observed for other TAM values.

Reconstruction	Reflexes with raising towards /i/
*kà	Maninka of Niokolo ^H <i>ka</i> ~ ^H <i>ke</i> (INF), Mauka <i>kè</i> (INF, COND ⁺), Bamana of Kolona <i>kǐ</i> (INF)
*yá	Ivorian Manding lects of Tenen <i>yé</i> ~ <i>yé</i> (PRF ⁺), Mau <i>yé</i> (PRF ⁺); Standard Bamana <i>yé</i> (PFV _T ⁺)
*tà	Northern Lele <i>ré</i> ~ <i>ré</i> (<i>dé</i> ~ <i>dé</i> after a nasal) (PFV _T ⁺), Maninka of Kita <i>ti</i> ~ <i>di</i> (PFV _T ⁺), Kakabe <i>ti</i> (PFV _T ⁺)
*nà(-RES COP)	Marka <i>ní</i> (PFV _T ⁺), Kakabe <i>ni</i> (SBJV ⁺)
*bá(-RES COP)	Ivorian Manding lects of Tenen <i>wé(é)</i> (PRF ⁺), Finan <i>wéé</i> (PRF ⁺); Bolon <i>wé</i> (PFV _T ⁺)
*-tà	Jogo <i>-re</i> (PFV ⁺), Kakabe <i>bá.tí^(L)</i> (PRF ⁺)
*mààŋ	Bamana of Kolona <i>mí</i> (PFV ⁻)



- Some **phonological environments** are **more propitious for this** reduction than others:
 - **place of articulation of C₋**: palatal *y* > coronal *t* > velar *k* > bilabial *b*
 - **nasalization of C₋**: oral > nasal
 - position wrt the **utterance edge**: obligatory internal (TAMP₁) > often final (TAMP₂, TAMP₃)



- In particular, **reflexes with reduction** are:
 - very rare for **mààŋ*
 - ✎ unlike raising, **unrounding** in the same environment is less rare, as in in the COP **mù > mí*
 - very rare for **bá*
 - ✎ but may appear to be more frequent because of the conflation with the reflexes of **bá-RES* (COP), such as **bá-tà > bati > ...*
 - rare for **nà*



- In particular, **reflexes with reduction** are:
 - rare for TAMP₂ **-tà*
 - ✎ unless as part of TAMP₁ **bá-tà* > *bati*
 - less rare for the reflexes of TAMP₁ ***tà* and *kà*
 - very common for **yá*
 - ✎ remarkably, raising after the palatal approximant *y* was **never found to go all the way up to *i***
 - ✎ the same seems to hold for the environment after **the labial-velar approximant *w***



- Particularly striking evidence is found in Kakabe (cf. Vydrina 2017)
 - With the exception of the PFV_T⁺ *ka*, all light monosyllabic TAMP₁ markers in Kakabe have the shape *Ci*
 - ☞ PROG⁺ and COP⁺ *bi*, IPFV⁺ *si*, SBJV⁺ *ni*, and the allomorph *ti* of PRF⁺
 - Although the regular reflex of the old RES marker **-tà* in Kakabe is the PFV_I⁺ TAMP₂ marker *-ta*, its vowel is reduced to *i* within two synchronically unanalyzable TAMP₁ markers, viz. PRF⁺ *bátí^(L)* < **bá-tà* and COND⁺ *mání^(L)* < **máŋ-tà*.



- Jogo and Ligbi (Kastenholz 1997; Persson & Persson 1980):
 - *tá(gá)* ‘go’, *yá* ‘come’
 - **When used as a kind of auxiliaries** with motion semantics, they have **variants with front vocalism**: *té* (Ligbi, Jogo), *tí* (Jogo) and *yé* (Jogo), *yé* (Ligbi) respectively (irrespective of the TAM construction)



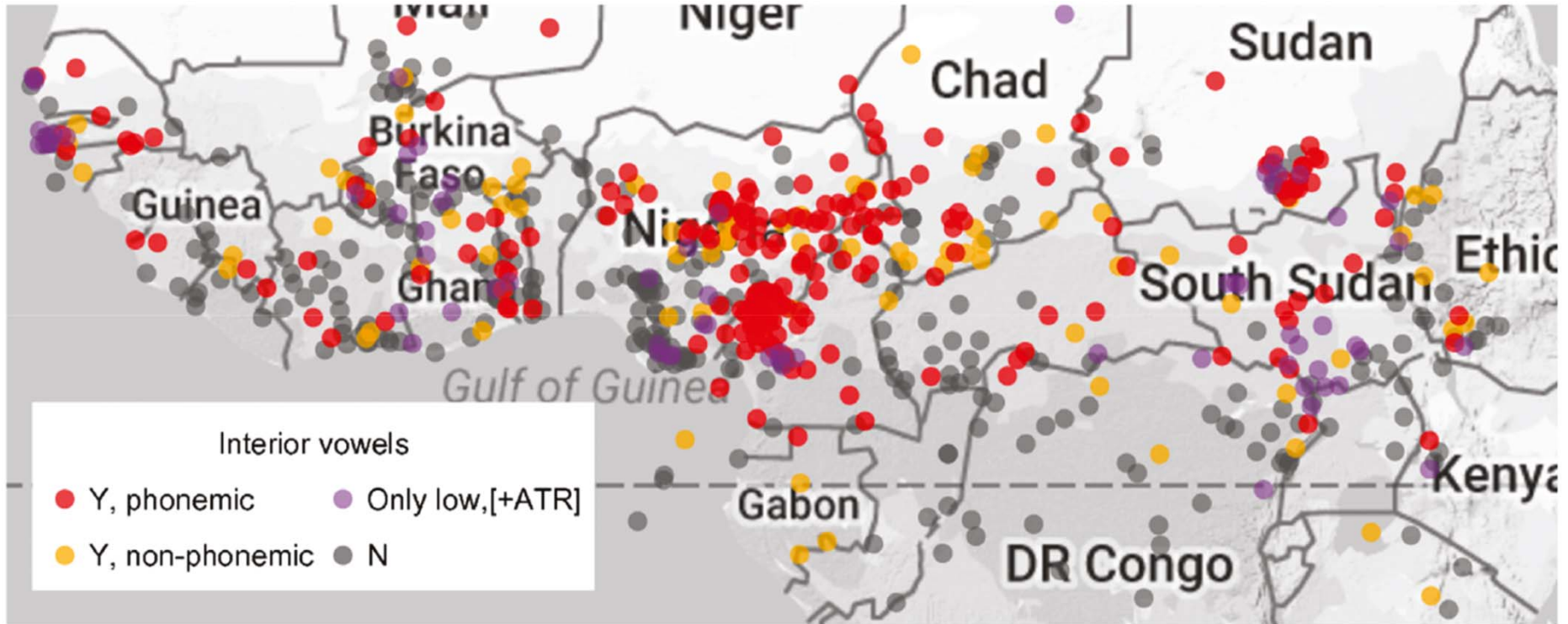
- Neutralization through raising, fronting and unrounding towards /i/ in functional morphemes in Greater Manding can be analyzed as a type of **vowel reduction process**.
- The relevant functional morphemes can be safely construed as **prosodically weak** thanks to the fact that they are typically affected by a whole range of **concomitant lenition** and **neutralization processes**
 - The **consonants** of the TAMP markers tend to undergo lenition mirroring similar lenition processes affecting word-internal consonants, viz. $t > d > r > \emptyset$; $k > g, x, y > \emptyset$; $b > w > \emptyset$; $y > \emptyset$.
 - The long vowels are **shortened**.
 - The **tonal distinctions** of TAMP markers tend to become neutralized, with the markers becoming toneless or H, as is common for clitics and suffixes.



- Both in Mande and in NSSA in general, **vowel reduction** in prosodically weak positions **within lexical morphemes** proceeds **through the typologically more common processes** of shortening, devoicing, unrounding and centralization.
 - Reduction is often driven by the phenomenon of **stem-initial prominence** (cf. Lionnet & Hyman 2018:652–55; Idiatov & Van de Velde 2021:93-94)
 - **Negative evidence**: no noticeable skewing towards front articulations of vowels or palatalization effects on consonants in lexicons of languages affected by phonological erosion.

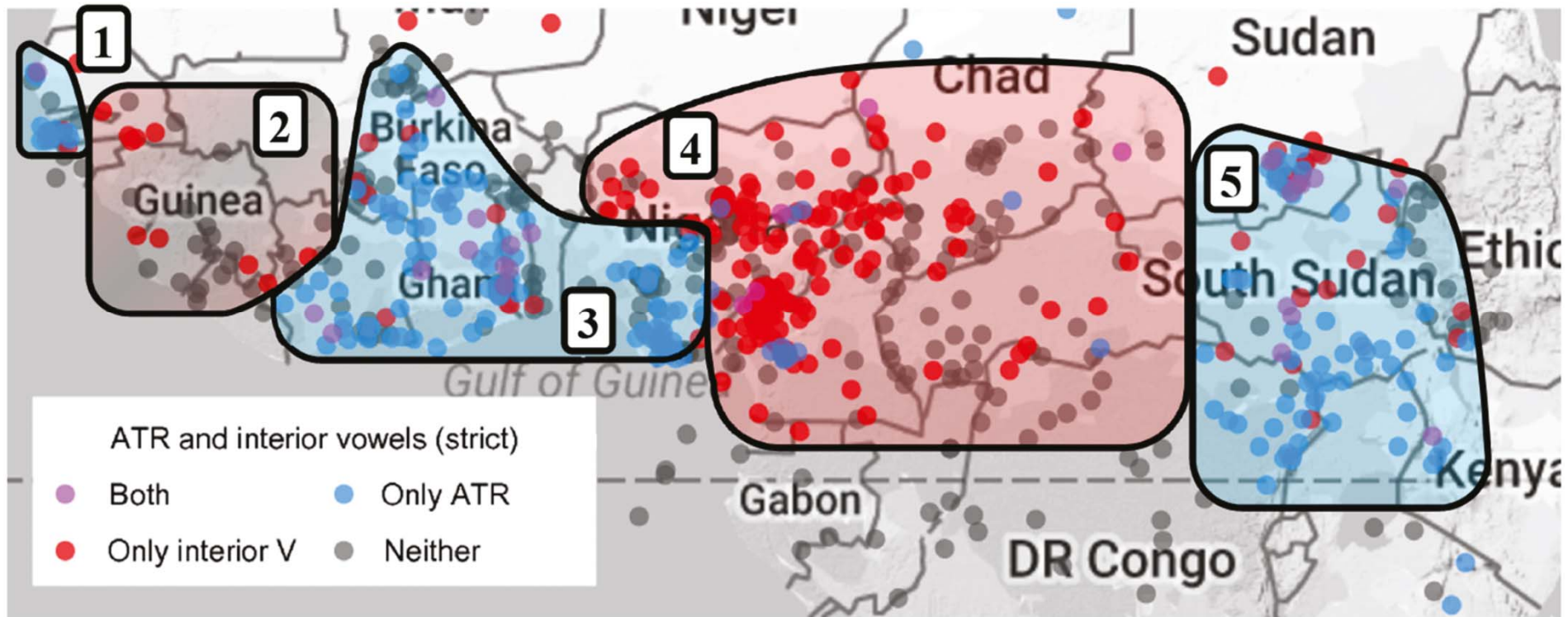


- Reduction towards /i/ in functional morphemes has a **non-trivial spatial distribution within NSSA** with its distribution crossing genealogical boundaries.
 - The details of this spatial distribution are work in progress.
 - On the basis of the sporadic examples so far:
 - More likely to be found as an active process in **languages without interior vowel phonemes**, such as /i ɯ ɜ ə ʌ ... /.
 - **Traces of such a formerly active process** have been found in some languages where currently it is centralization that appears to be the regular reduction process in functional morphemes.



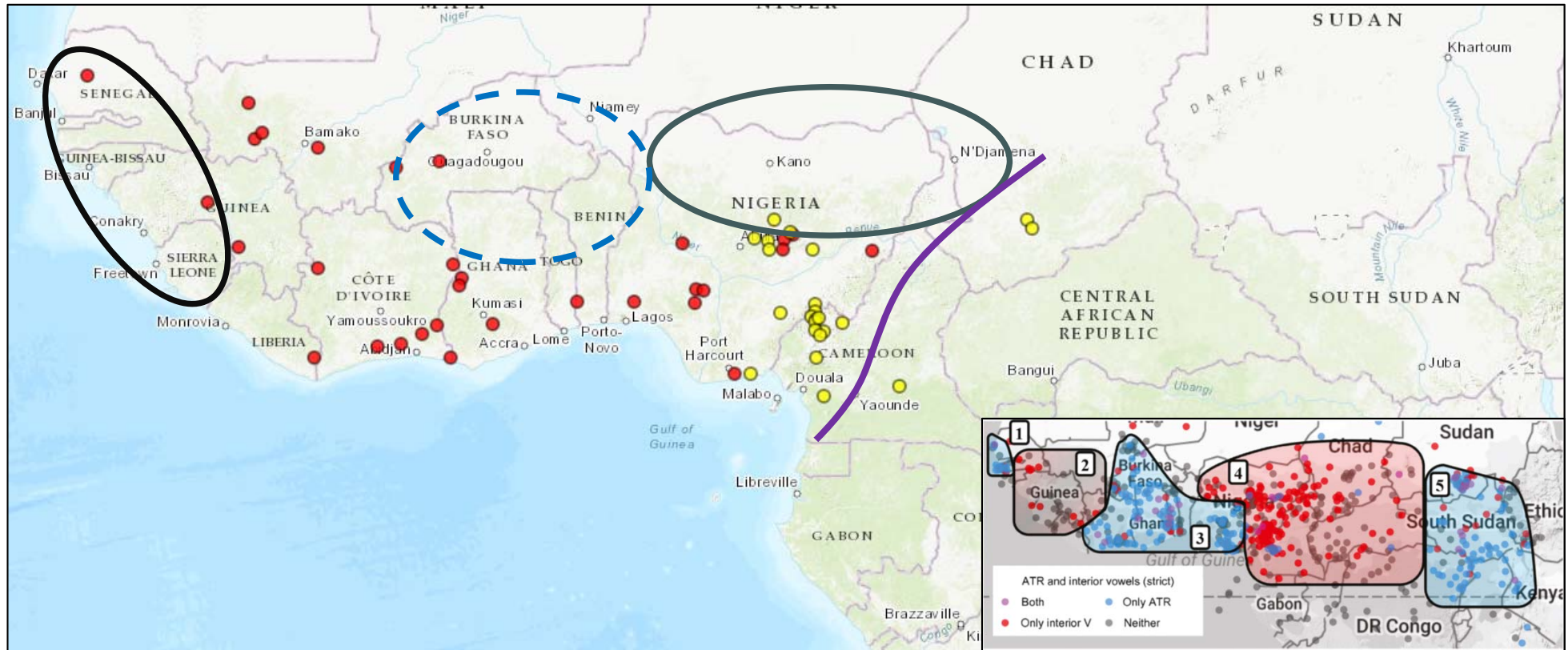
Geographic distribution of interior vowels in NSSA (Rolle et al. 2020:142)

- Rolle et al. (2020) an areal study of vowel systems in NSSA



[1] Atlantic ATR zone, [2] Guinean ATR-deficient zone, [3] West African ATR zone, [4] Central African ATR-deficient zone (includes **Central African interior vowel zone**), [5] East African ATR zone.

REDUCTION TOWARDS /i/: SPATIAL DISTRIBUTION



- Active reduction towards /i/
- Residual reduction towards /i/

[4] Central African ATR-deficient zone
 (includes **Central African interior vowel zone**)



- **Partial CI-reduplication** as a frequent example of reduction towards /i/ in functional morphemes in NSSA.

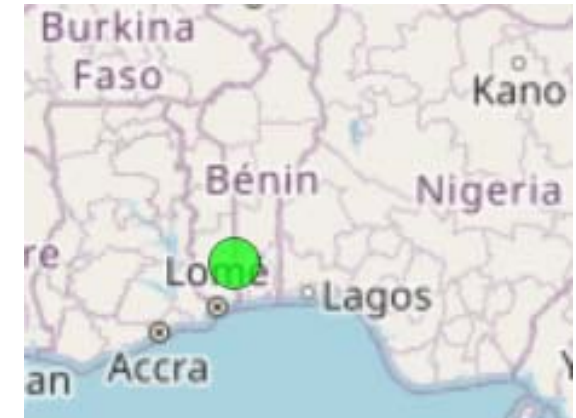
Ibrahim, Njoya. 2015. *A typology of CI-reduplication in Niger-Congo and beyond*. Hamburg: Universität Hamburg PhD thesis.

“In the recent literature, there is a general consensus on the analysis that reduplication consists in a process of affixation (see in particular Lieber 1992 and Marantz 1982). A reduplication morpheme can be a prefix or a suffix.” (Brousseau & Lefebvre 2002:198)

- In NSSA, partial CI-reduplication always involves a **prefix**, viz. RED-STEM.
- In some languages, VRED may assimilate to the **rounding** of VSTEM or graveness of CSTEM (cf. Ibrahim 2015).



- Partial CI-reduplication in **Fongbe** (Kwa; Brousseau & Lefebvre 2002:195-215).
 - Function: NMLZ of verbs.



(39)	a.	<i>zì-zè</i>	<	<i>zè</i>	'to split'
	b.	<i>gbì-gbá</i>	<	<i>gbá</i>	'to build'
	c.	<i>xì-xò</i>	<	<i>xò</i>	'to buy'
	d.	<i>kpí-kpábá</i>	<	<i>kpábá</i>	'to flatten'
	e.	<i>dì-dà</i>	<	<i>dà</i>	'to prepare'
	f.	<i>wì-wlán</i>	<	<i>wlán</i>	'to write'

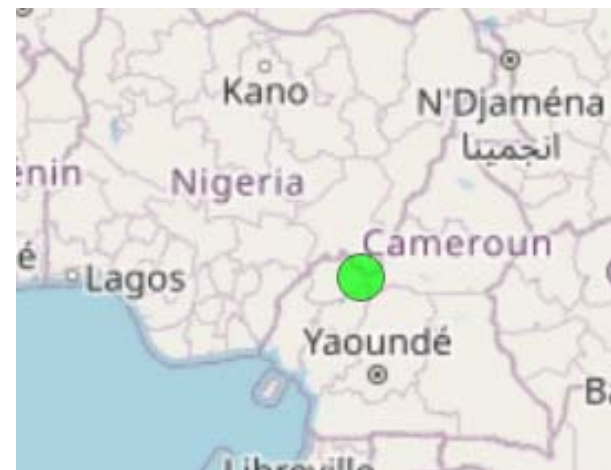


- Kugama (“Adamawa” pool > Mumuye-Yandang; Litvinova 2023).
 - Several **verbal functional morphemes** have the shape *Ci*
 - PFV clitic = *tí/ = rí*
 - CAUS clitic = *si*
 - (preverbal) PROG marker *tì ~ tè < tē* ‘place’ (viz. ‘X is at the place of doing Y’)
 - With only few exceptions, **prosodically weak σ in stems** (non-stem-initial σ) have a closed front vowel, viz. *Ci ~ Ce*, while in **disyllabic verb stems** the final syllable is always *Ci*.





- Lamnso' (Bantoid > Grassfields) (cf. McGarrity & Botne 2001, Anderson 2015)
 - **CV noun class markers** (prefix and enclitics) are all *Ci*
 - E.g., including CL 6 *mi-*, compare Proto-Bantu **ma-*.
 - In lexical morphemes, vowels in prosodically weak positions appear to have been deleted, as the typical root shape is (N)C₁(w)V(V)(C₂) (verbs are just C(w)VC)
 - Lamnso' also has /ə/, also found in prosodically strong positions
 - There are also functional morphemes with /ə/ rather than /i/
 - No vowel reduction in partial reduplication





- Recognizing the existence of an areal tendency to reduction towards /i/ in functional morphemes in large parts of NSSA allows us to offer **a principled solution for two types of reconstruction-related issues**:
 - When **multiple, but only slightly formally divergent cognate sets** and reconstructions have been proposed for a given functional morpheme
 - The nominal prefix of **class 13**: De Wolf (1985) for Proto-Benue-Congo ***ti-** vs. Meeussen (1967) ***tu-** for Proto-Bantu, one of its major branches
 - Creissels (2020) reconstructs several **Mande PL markers** differing in their **u/i vocalism**, such as Manding **-lú** vs. **-lí** and Soninke **-nu** (Eastern) vs. **-ni** (Western), as sourced from the Proto-Mande associative plural marker ***ni**.



- Recognizing the existence of an areal tendency to reduction towards /i/ in functional morphemes in large parts of NSSA allows us to offer **a principled solution for two types of reconstruction-related issues**:
 - It can guide us in the search for **the most plausible lexical source** of a given functional morpheme
 - Creissels (2020) relates the future (“potential”) auxiliary *sí* ~ *sé* in Mandinka to the Mandinka verb *sé* ‘reach; overcome’
 - But the source that would be typologically and comparatively more plausible is the verb **sá* ‘come’, absent as a lexical verb in Mandinka itself



- Reduction through **raising** (as in Slavic or Romance) can be explained by the **failure to lower the jaw** to the mid position (cf. Kapatsinki & Anderson 2020:31)
- The **areality of reduction towards /i/** in NSSA and the fact that it is limited to **functional morphemes** could have something to do with:
 - In **function words** as compared to content words, reduction due to frequency effects is not only more likely, but also more likely to be **more extreme** (cf. van Bergem 1995)
 - A strong correlation with the **lack of phonological interior central vowels**
 - Importance of **language-specific speech rest positions** (cf. Gick et al. 2004)

- Importance of **language-specific speech rest positions** (cf. Gick et al. 2004)

The present findings thus suggest that the language-specific characteristics of schwa may be related at least in part to ASs [Articulatory Settings], but that **schwa is not necessarily simply a voiced version of a language's AS** (at least not in English). That said, 1 subject in Gick's [2002a] study of English showed a **bimodal distinction** between **schwa in lexical words**, which showed **the active tongue retraction**, and **schwa in function words**, which showed **no difference from speech rest position**. Thus, it may be that at least some types of schwa bear no target of their own, and reflect directly the AS posture.”

(Gick et al. 2004:231)