Areal alignment and the diversification of Bua languages (Chad)

Florian Lionnet

Princeton University

Workshop: *"West-central African linguistic history between Macro-Sudan Belt and Niger-Congo: Commemorating Diedrich Westermann's legacy and the 100th anniversary of the Berlin professorship for African languages"*

Humboldt University, Berlin, 4-6 November 2021

Introduction

- Strong areal skewing in distribution of linguistic features in Northern-Sub-Saharan Africa
  - Macro-areal: (Macro)-Sudan(ic) Belt

    (Güldemann 2003, 2008, 2010, 2018; Clements & Rialland 2008)
  - Meso-areal, e.g. Central Africa

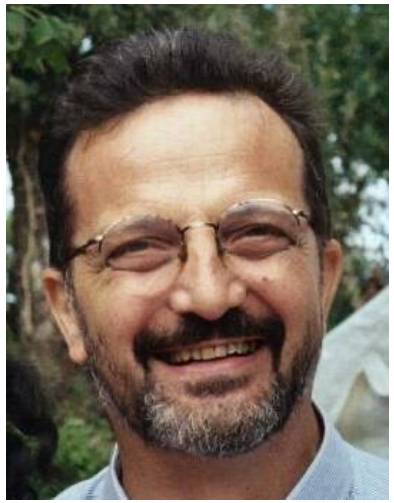
    (Dryer 2009, Idiatov 2018, Güldemann 2018: 457; Rolle, Lionnet & Faytak 2020, a.o.)
  - Micro-areal (in local, small-scale multilingual settings)
- Areal signals are strong and relatively stable over time, migrating languages adapt to local areal profiles, as we saw earlier (Lionnet & Rolle, this workshop)

Introduction

- Goal of this talk: illustrate the inner workings of areal alignment, with a detailed case study of Bua languages (southern Chad)
- A subset of Bua languages underwent radical phonological restructuration as a result of alignment to the phonological profile of
  - their micro-area (languages in immediate contact)
  - their meso-area (Central Africa)

Introduction

- Important acknowledgment: this is based on joint work with:
  - Pascal Boyeldieu, Ulrich Kleinewillinghöfer, and Raimund Kastenholz (Bua comparative database, in progress)
  - Nik Rolle and Matt Faytak (Areal distribution of vowel systems)



Introduction

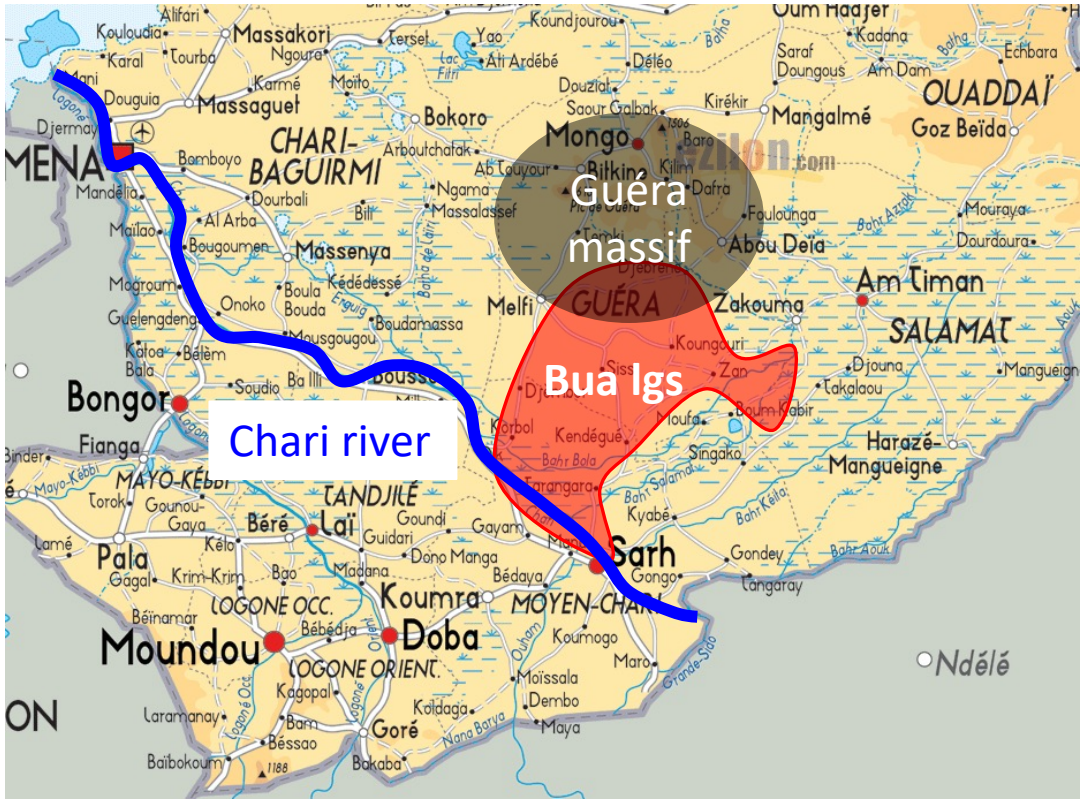
- Roadmap:
    1. Intro to **Bua** languages
    2. Areal alignment of **vowel** systems
    3. Areal alignment of **plosive** systems
    4. The role of **contact**
    5. Conclusions and open questions

1 Bua languages

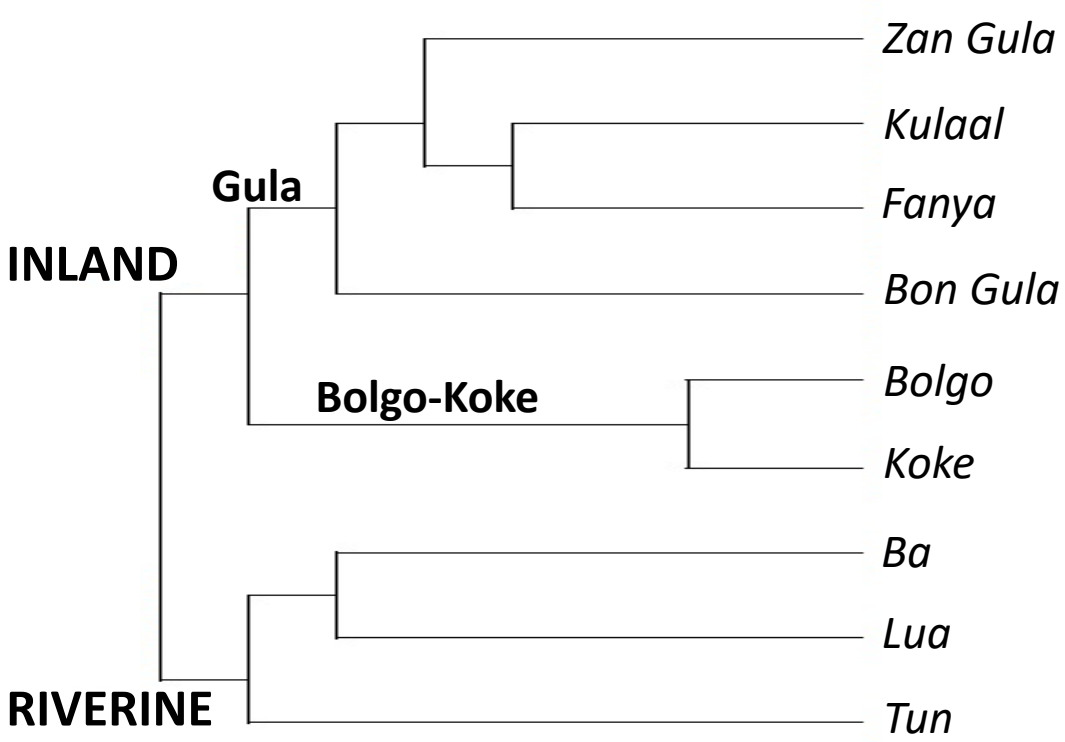
1 Bua languages

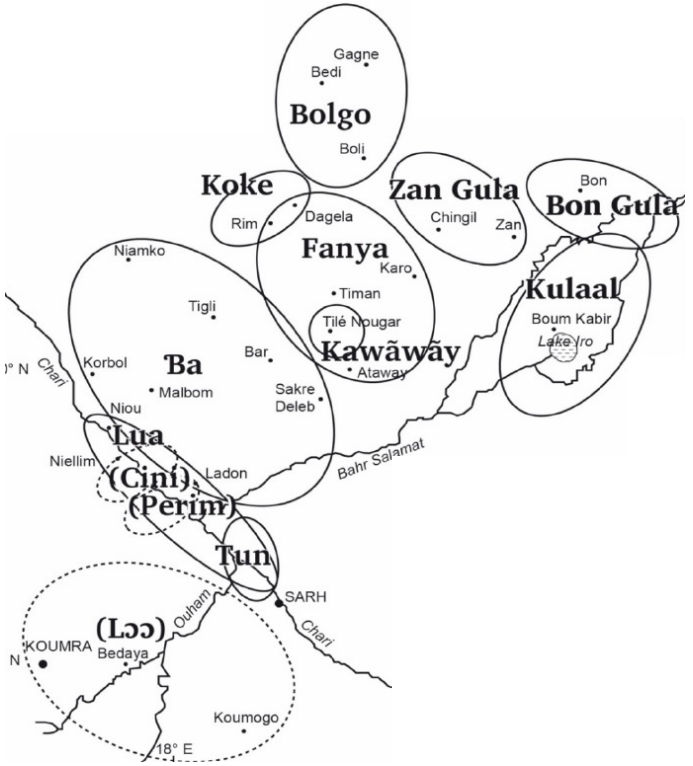
- 9 extant languages + three no longer spoken
- Clear genealogical unit
- Clearly Niger-Congo (lexicon, reconstructed noun class system with clear cognates and parallels with Gur)
  - Subsumed under “Adamawa”, of unclear classificatory status
- Spoken in South-central Chad (easternmost “Adamawa” group)
- Comparative work underway, with tentative classification and reconstructions (Boyeldieu 1986, Boyeldieu et al 2018, 2020)

1 Bua languages



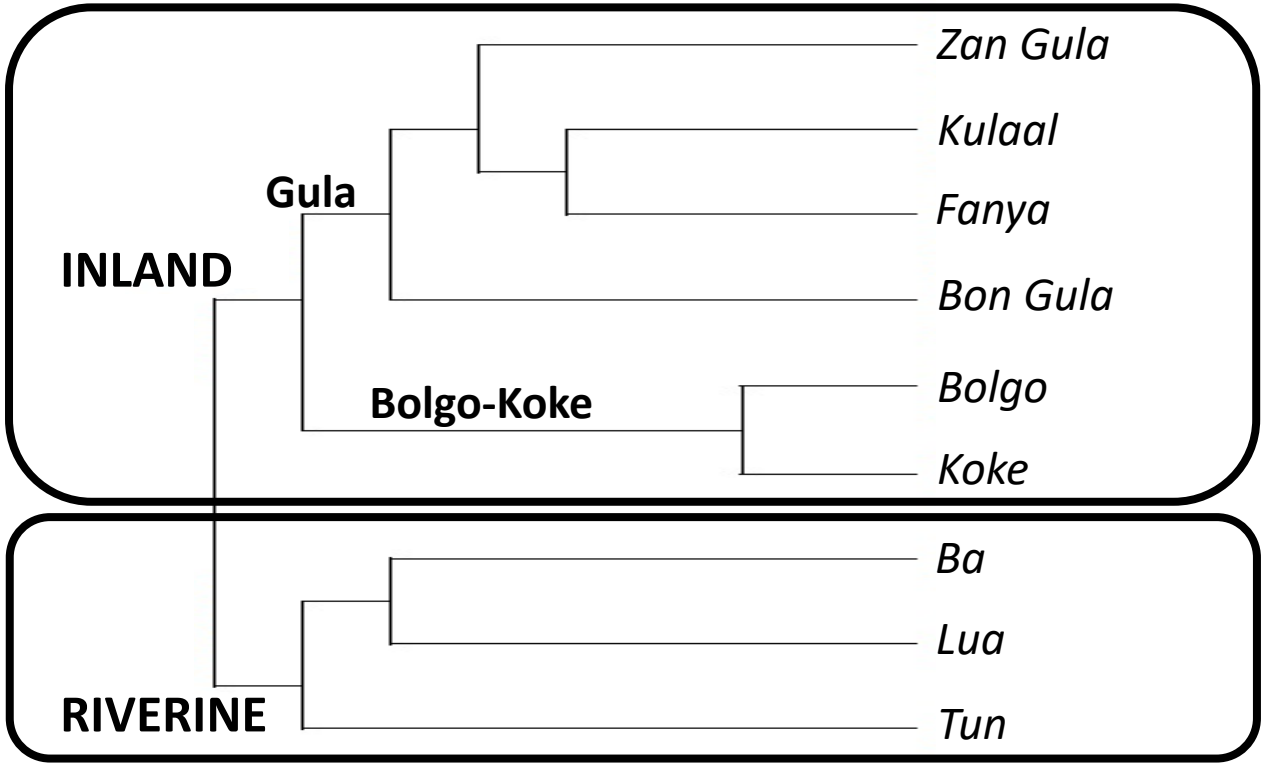
1 Bua languages



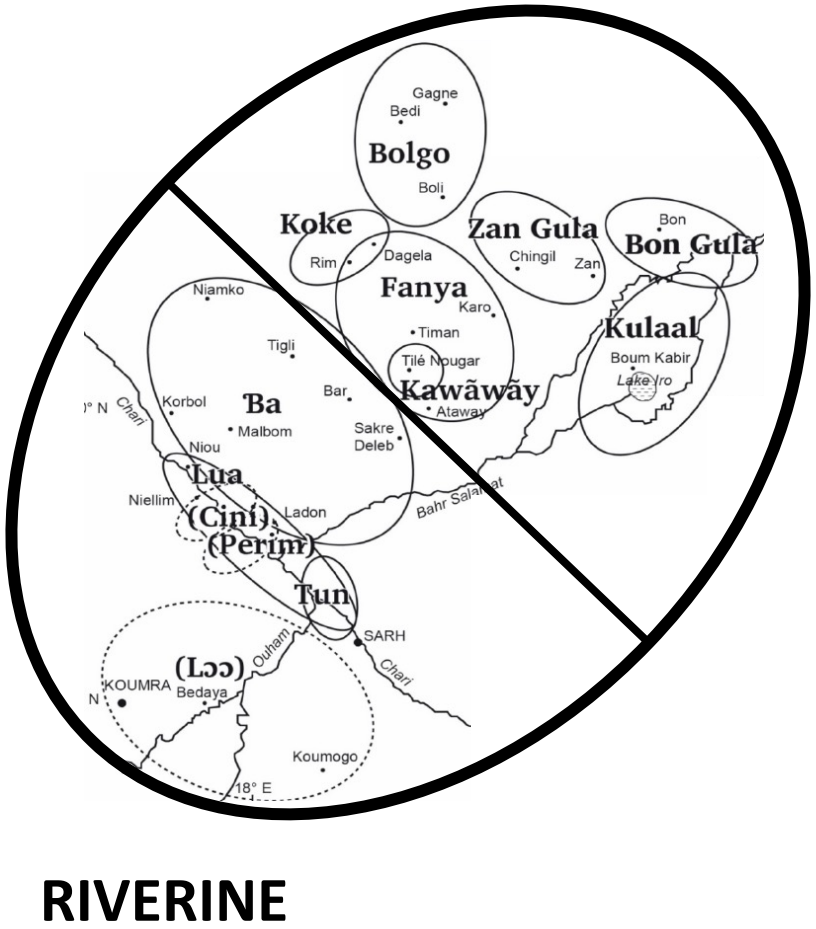


Lexicostatistical classification (branch average)

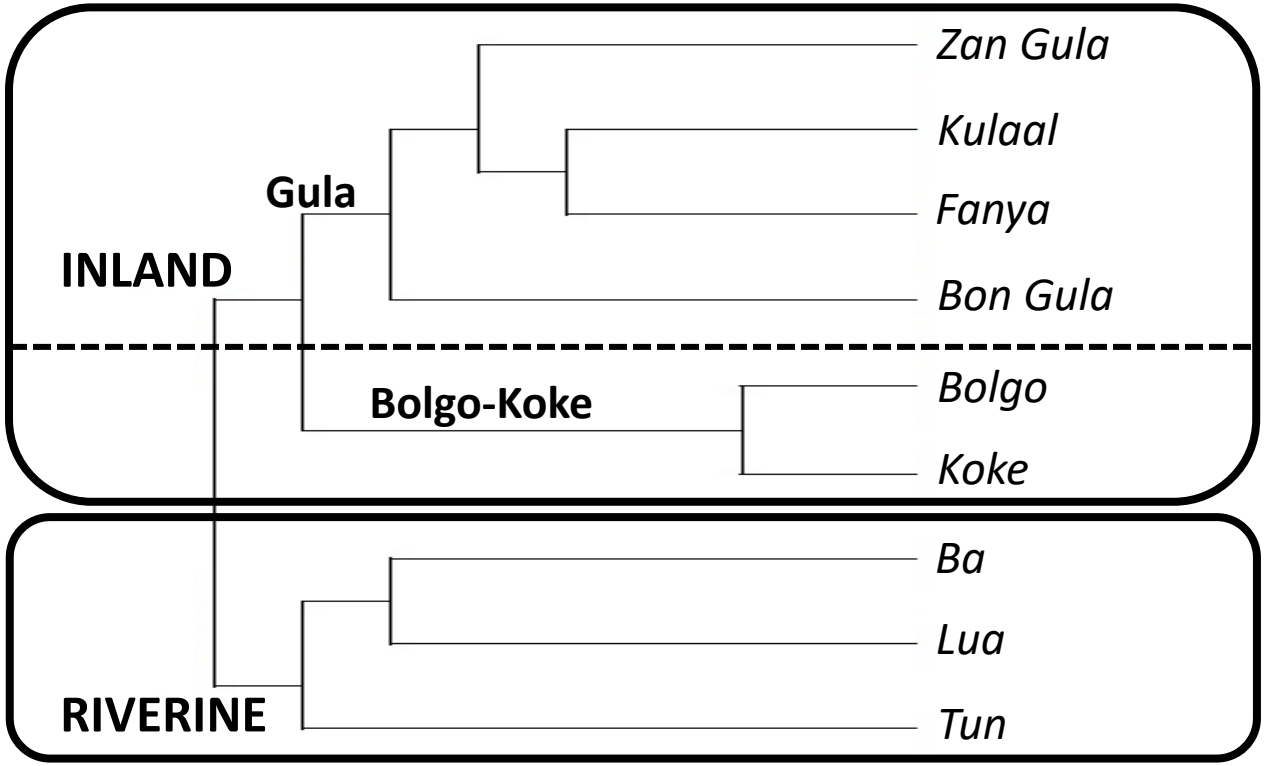
1 Bua languages



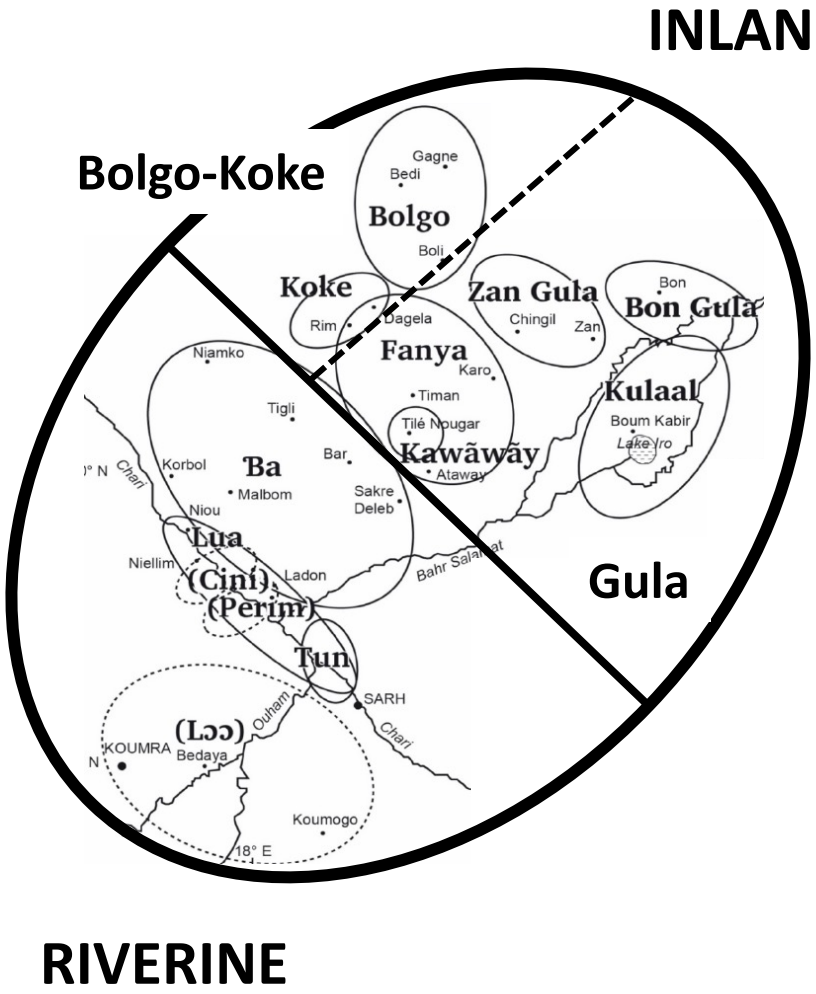
Lexicostatistical classification (branch average)



1 Bua languages

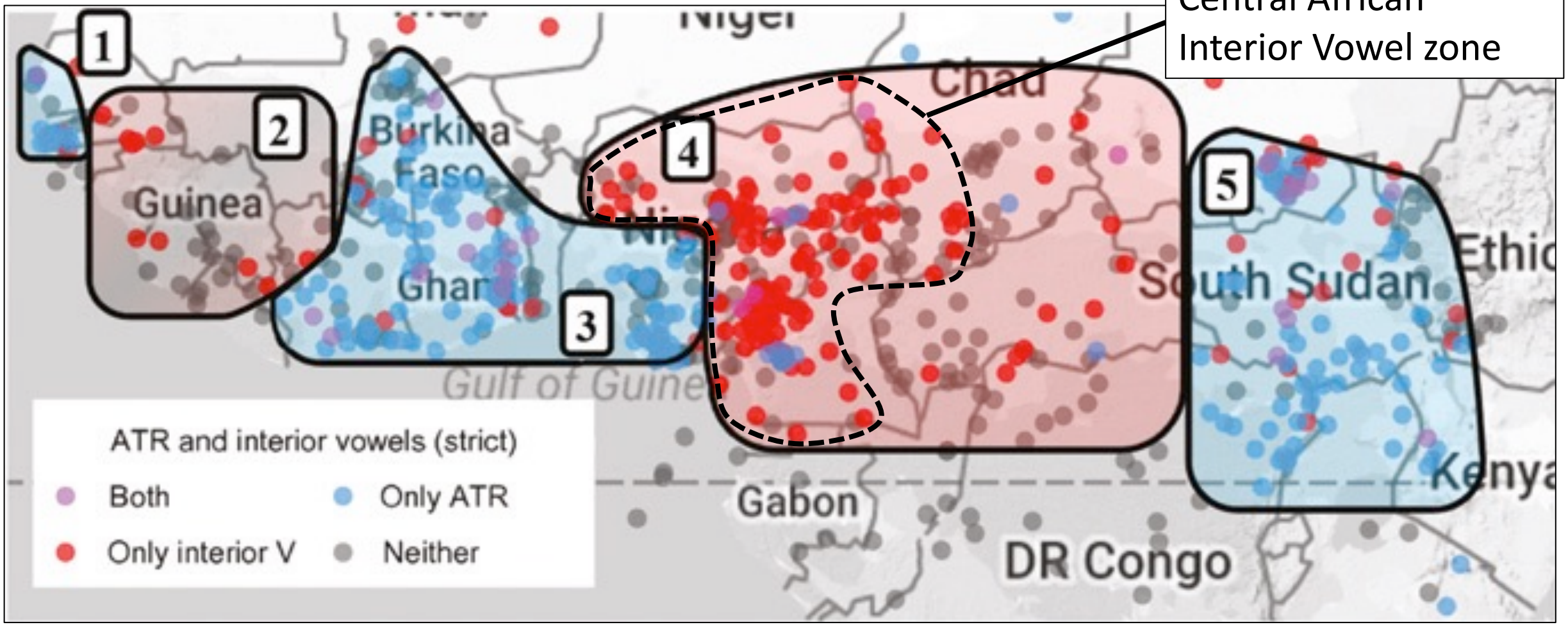


Lexicostatistical classification (branch average)



2 Areal alignment of Bua vowel systems

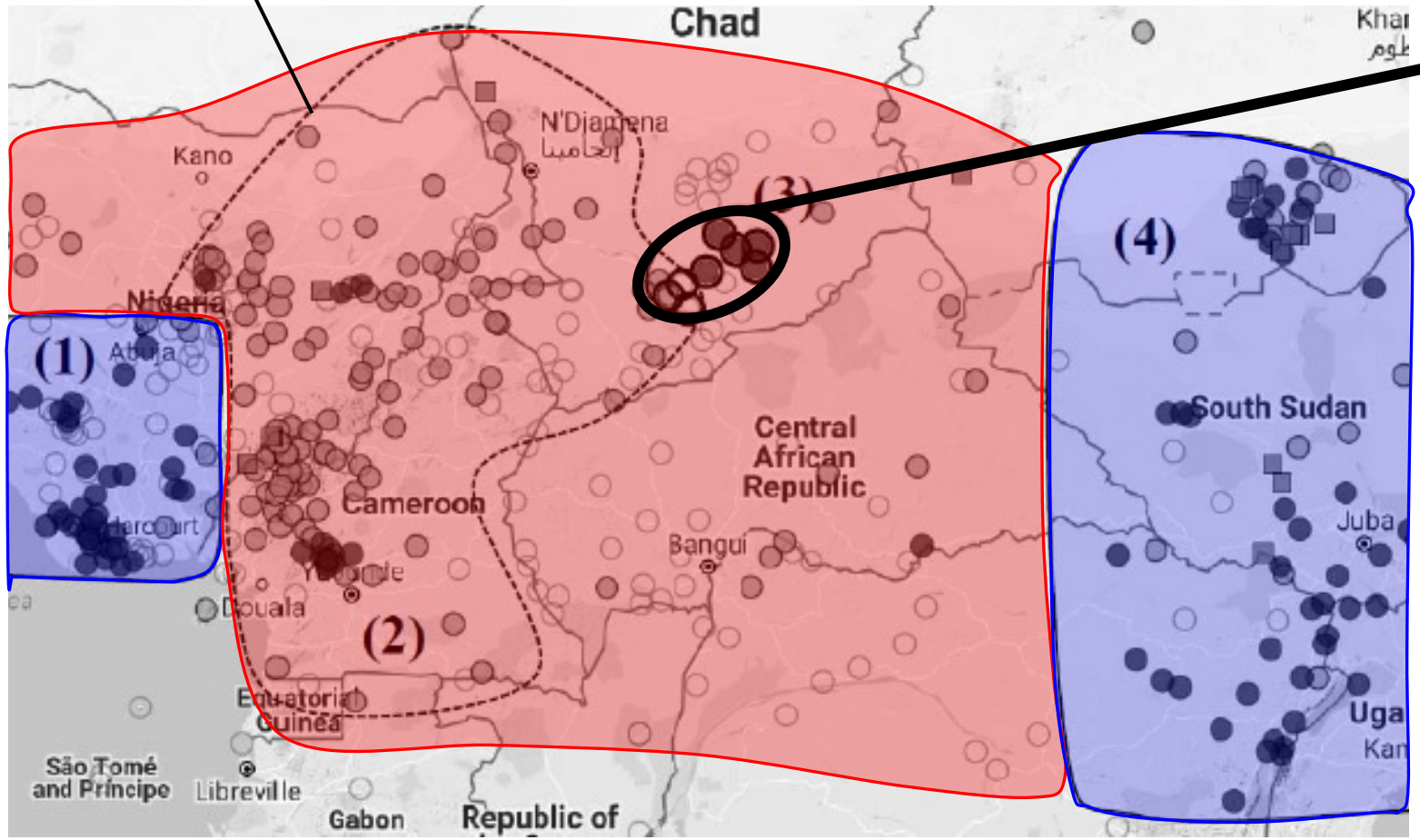
2 Vowels

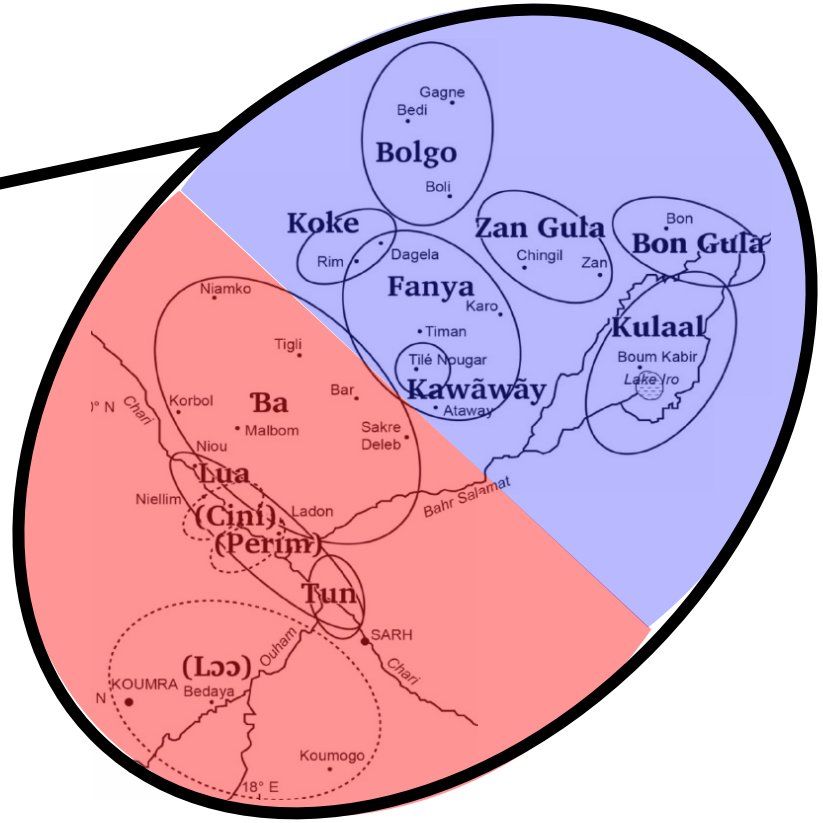


Rolle, Lionnet, & Faytak (2020) – Meso-areas in MSB:]1] Atlantic ATR zone, [2] Guinean ATR-deficient zone, [3] West African ATR zone, [4] Central African ATR-deficient zone (*slash* Central African interior vowel zone), [5] East African ATR zone

2 Vowels

Central African Interior Vowel zone



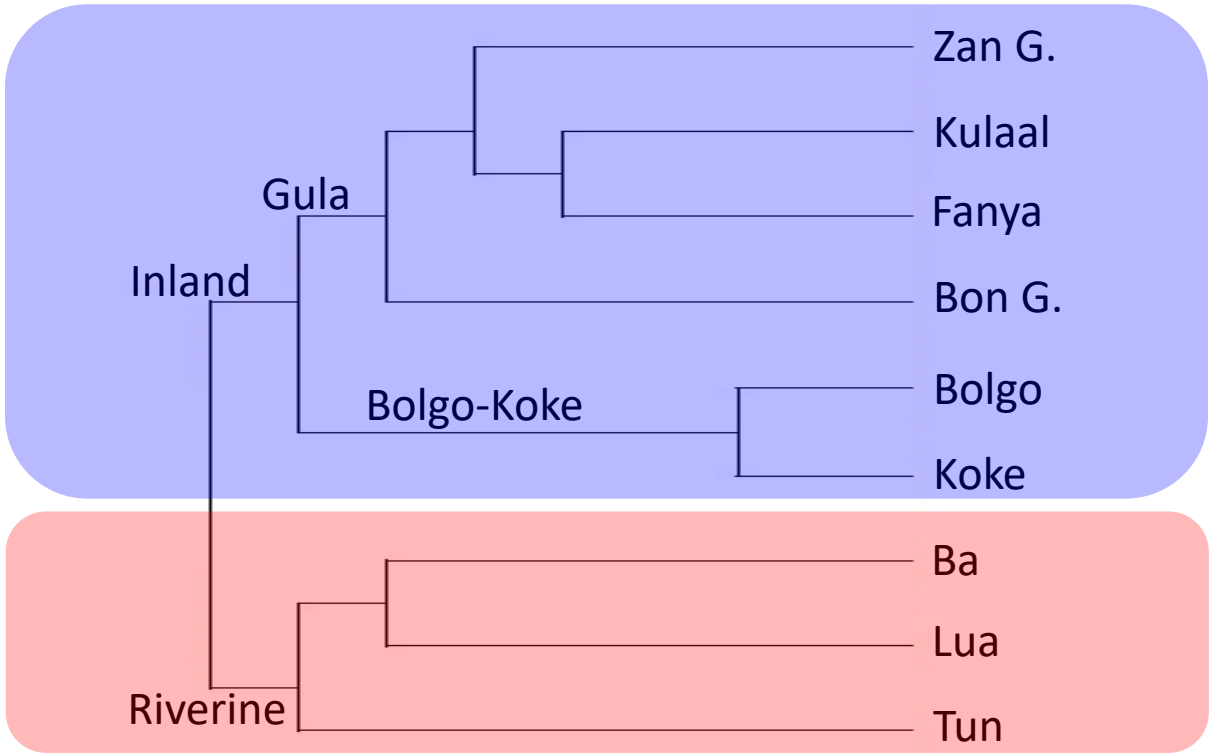


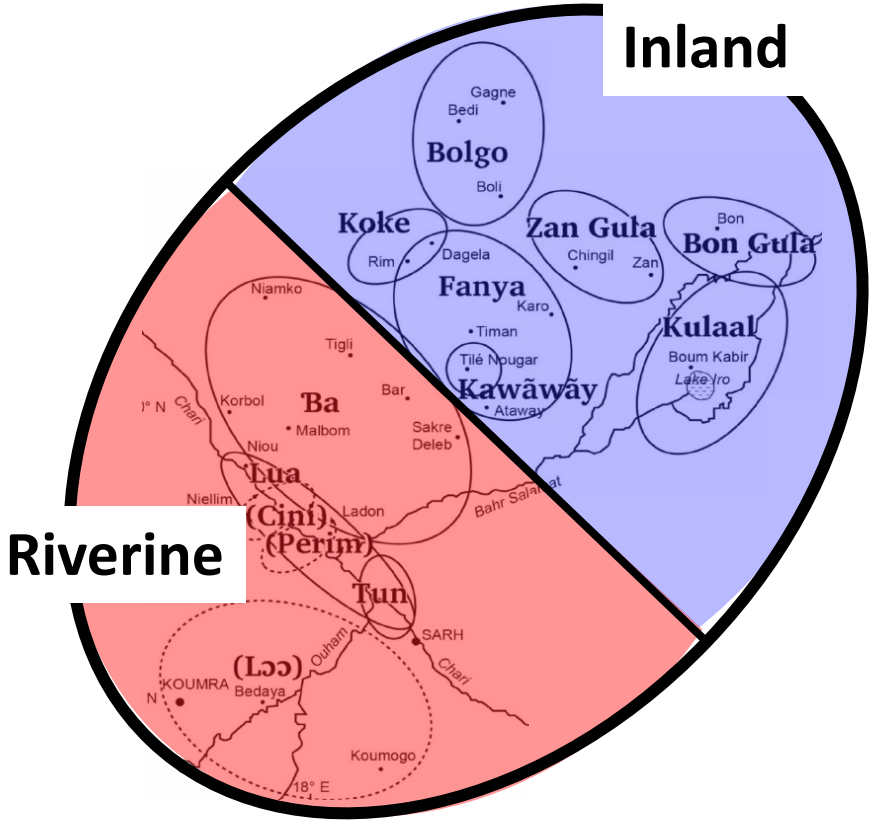
- ATR contrast and harmony
- No interior vowels

- No ATR
- Interior vowels

2 Vowels

- ATR contrast and harmony
- No interior vowels





- No ATR
- Interior vowels

Ref: Kastenholz 2017, Boyeldieu et al 2018

2 Vowels

- Riverine are areally aligned with Central African area where they are spoken:
  - Vowels: no ATR, interior vowels
  - Consonants: 4-way contrast (vl, vd, implosives and prenasalized)
  - Tone: three tone heights
- Inland Bua languages have an areally unexpected phonological profile:
  - Vowels: ATR contrast and harmony, no interior vowels
  - Consonants: two-way laryngeal contrast in plosives (no implosives)
  - Tone: only two contrastive tones in Gula

2.1 Vowels: Riverine

East Chadic A:

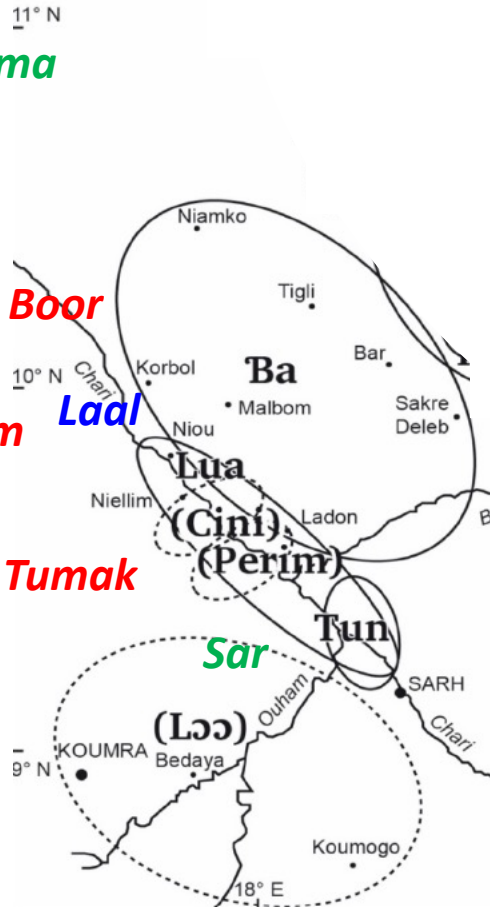
i	ɨ	u
e	ə	o
(ɛ)	a	(ɔ)

Laal:

i	y	ɨ	u
e	ø	ə	o
ɛ	œ	a	ɔ

Barma, Sar (SBB):

i	[ɨ]	u
e	(ə)	o
	a	ɔ



Lua:

i		ɨ	u
e		ə	o
ɛ [ia]		a	ɔ [ua]

Ba:

i	[y]	[ɨ]	u
e	[ø]		o
ɛ	[œ]	a	ɔ

Tun:

i	[ɨ~ʉ~ə]	u
e		o
ɛ	a	ɔ

2.2 Vowels: Inland

Saba (East Chadic B):

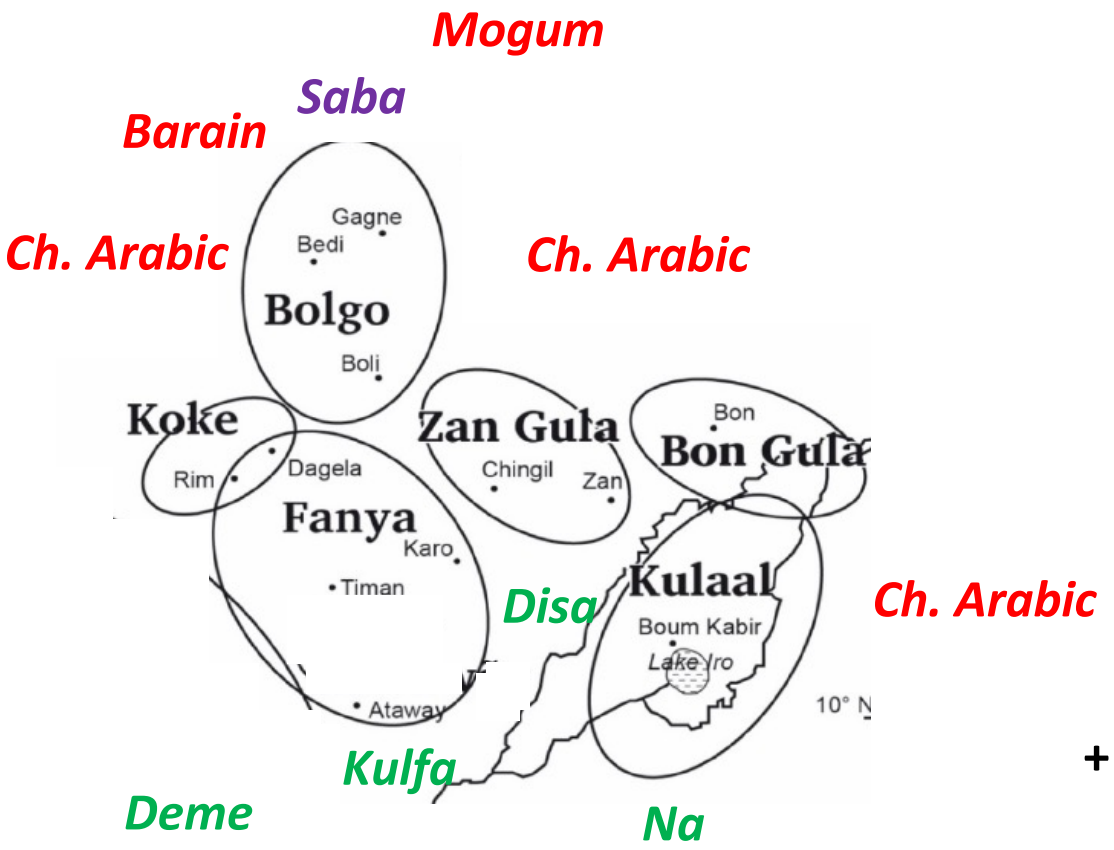
i		u
e	ə	o
	a	

Other East Chadic B + Arabic:

i		u
e		o
	a	

Peripheral Sara :

i		u
e		o
ɛ		ɔ
	a	



Bolgo (North):

i		u
ɪ		ʊ
e		o
ɛ		ɔ
	a	
	ʌ	

Bolgo (South) + all Gula:

i		u
ɪ		ʊ
e		o
ɛ		ɔ
	a	

(Gula)

Ref: Jullien de Pommerol 1999, Kastenhloz 2017, Boyeldieu et al 2018, Lovestrand 2012, Palayer 2006, Keegan & Koutou 2015, Keegan et al 2015, Tikka 2019

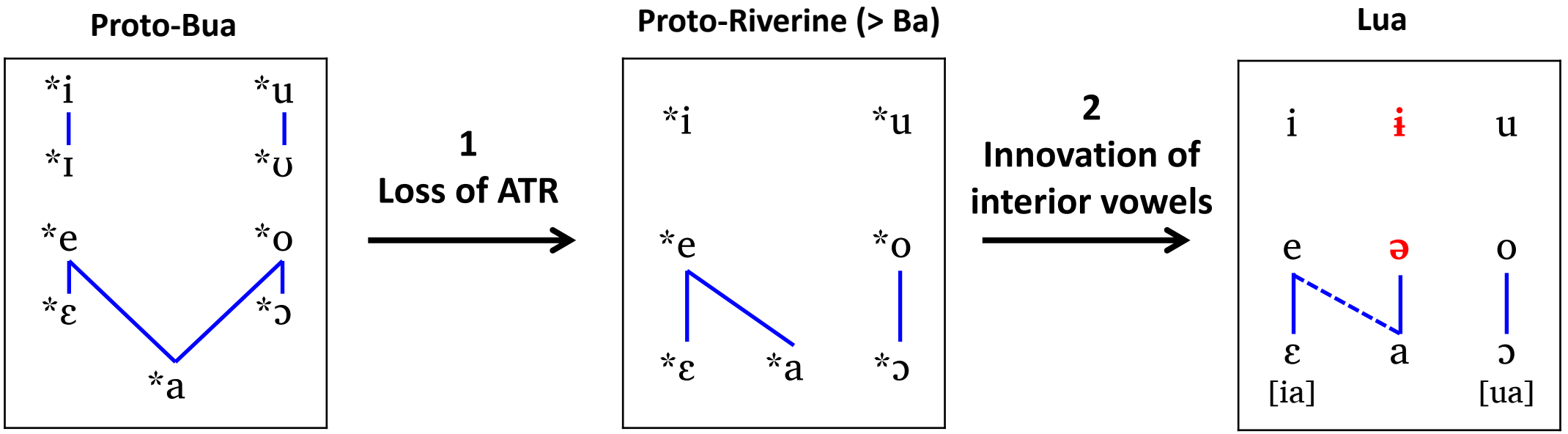
2.3 Vowels: Proto-Bua

- **Proto-Bua had ATR** contrast & harmony, and no interior vowels
- **Inland languages have retained** this system (minor changes only)
- **Riverine languages** changed their profile due to contact with Chadic, Laal, and Sara languages → **alignment to Interior Vowel zone**

- (Unanswered question: how to explain that proto-Bua managed to maintain its ATR system, likely inherited, while being spoken in the middle of the Central African ATR-deficient zone?)

2.4 Steps of change: ATR > INT in Riverine

- Case study: Proto-Bua



Tentative reconstruction:
- ATR harmony
- [+atr] counterpart of /a/ is either /e/ or /o/
- Same system as Gula languages

- *ɪ > e, *ʊ > o merger = loss of ATR contrast
- ATR harmony > height harmony & ablaut
- *a-*o pairing regularized to a-ə or ɔ-o

- Innovation of central vowels /ə/ and /ɨ/

Ref:

2.4 Steps of change: ATR > INT in Riverine

- First step: loss of ATR contrast
  - *ʊ, *o > o merger in Riverine

	‘give birth’	‘ear’ (sg/pl)	‘body’	‘tie’	‘take from’	‘seize’
Proto-Bua	***ʊ**	***ʊ**	***ʊ**	***o**	***o**	***o**
Fanya	tʊ́y	tʊ́ / tʊ́y	lʊ́ʊ́rɛ́	ɓó	kó	hyó
Kulaal	tʊ́í	tó / tú	yʊ̀ʊ̀t	pò	kó	hó
Zan Gula	tʊy	tʊ / tʊy	rʊʊdɛ	bōō	kʊʊ (~ ko)	so
Proto-Riverine	***o**	***o**	***o**	***o**	***o**	***o**
Lua	tōy	túlā / tórī < *tólā	ndúlá / ndórí < *ndólá	ɓōw	kó	sò
Ba (Magal)	tōy	tówī / tóȳ	--	ɓòw	kó	sōw
Ba (Korom)	tōy	tóō / tóȳ	--	ɓōō	kōō	
Tun	tərō < *toro?	tōy / tōn	lōō			

2.4 Steps of change: ATR > INT in Riverine

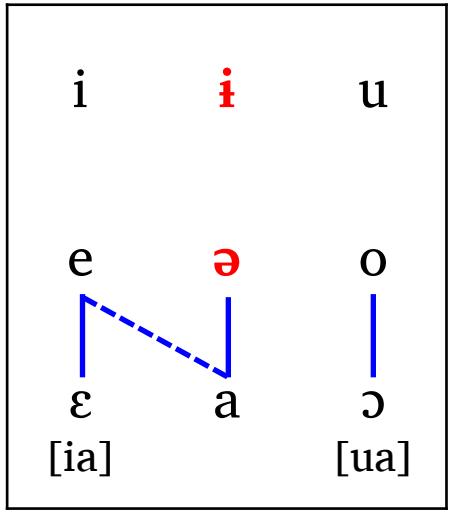
- First step: loss of ATR contrast
  - *ɪ, *e > e merger in Riverine

	‘hunt’	‘cook’	‘tree’	‘chop’	‘hippopotamus’
Proto-Bua	***ɪ**	***ɪ**	***ɪ**	***e**	***e**
Fanya	níŋ	tíɽí	tîw	té	kéndì
Kulaal	nèn (ɪ = ‘e’ / nas)	tíí	téó (=tíó?)	--	(ñáŋ)-kẹ̀nè
Zan Gula	nɪŋ	tɪɾɪ	tʊ <*tɪʊ?	--	--
Proto-Riv.	***e**	***e**	***e**	***e**	***e**
Lua	nēn	tər	tɬlā < *télā (pl: térī)		kàn
Ba (Magal)	nēn	tér	tílā < *télā (pl: tér̄)	tēy	kwḭ̃ḭ̃lī
Ba (Korom)			télā (pl. tér̄)		--
Tun	nɛ̄n	tēl	tə́gā < *tégā?	tēy	cén̄

2.4 Steps of change: ATR > INT in Riverine

- Second step: development of interior vowels

Lua



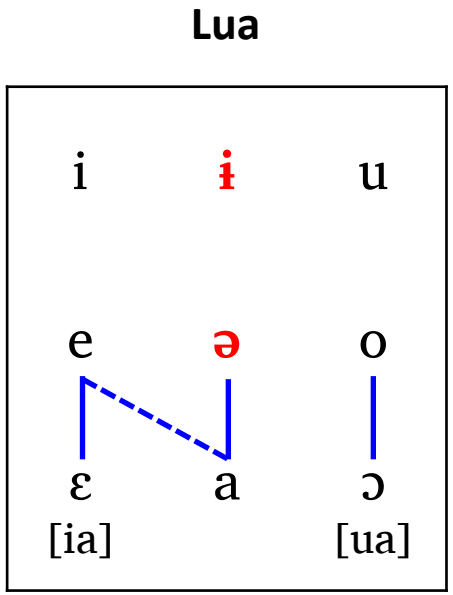
/ɨ/

1. *ʊ,*u > ɨ / C_B# (dissimilation, not regular)

	‘oil’	‘to spit’
Proto-Bua	***u**	**?**
Fanya	n**ú**mí	
Kulaal	nóm (**u** = ‘o’ / nas)	tòpì, t**ʊ̀**pìpɛ̀
Zan Gula	n**u**me	t**ʊ**bsi
Proto-Riv.	***u**	***u?**
Lua	n**ɨ́**m̄	t**ɨ̄**b
Ba (Magal)	n**ú**mū	(?) t**ū**mū
Tun	nɔ̄m	

2.4 Steps of change: ATR > INT in Riverine

- Second step: development of interior vowels



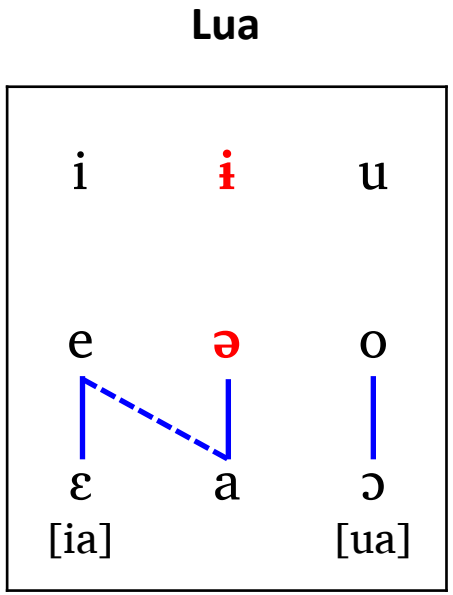
/ɨ/

1. *ʊ,*u > ɨ / C_B# (dissimilation, not regular)

2. Loanwords, e.g. /dɨ̀m/ ‘Barma, muslim person’
   - Laal /dīm/
   - Boor /dīmè/
   - Sar /dùm/

2.4 Steps of change: ATR > INT in Riverine

- Second step: development of interior vowels



/ɨ/

1. *ʊ,*u > ɨ / C_B# (dissimilation, not regular)

2. Loanwords

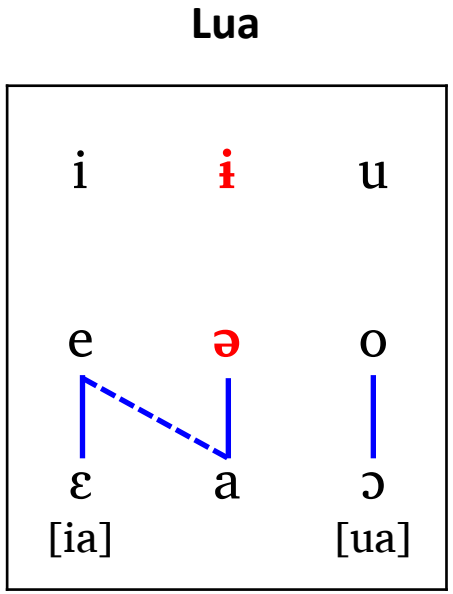
3. Most frequent occurrence = /i/ → [ɨ] / _Ca
   - /mìnā/ → [mɨ̀nā] ‘hoe’ cf. pl. [mìnī]
   - /bīrā/ → [bɨ̄ra] ‘net’ cf. pl. [bīrī]
   - /kìráŋ/ → [kɨ̀ráŋ] ‘basket sp. cf. pl. [kìríŋ]

(same in Ba, Laal, Barma)

Ref:

2.4 Steps of change: ATR > INT in Riverine

- Second step: development of interior vowels



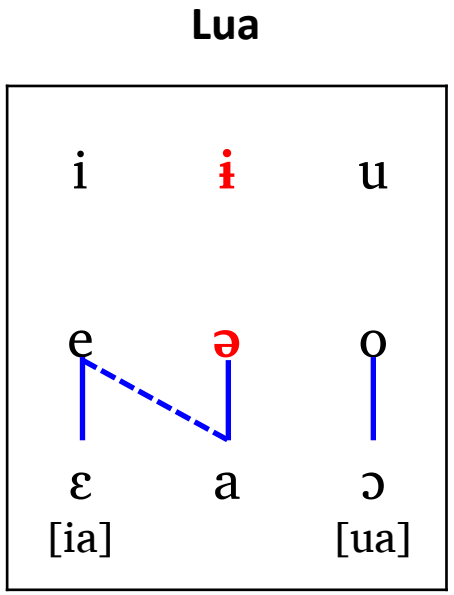
/ə/

1. Proto-Riverine *e, *o > ə in many CVC words (not fully regular)

	‘hippopotamus’	‘to cook’	‘man’	‘to open’
Proto-Bua	***e**	***ɪ**	***o**	***o?**
Fanya	k**é**ndì	t**í**ɽí	ɓ**ò**rìyò	
Kulaal	(ñáŋ)-k**ẹ̀**nè	t**íí**	p**ò**ìl	
Zan Gula		t**ɪ**rɪ	b**ō**rí	t**o**kiŋ
Proto-Riv.	***e**	***e**	***o?**	***e**
Lua	k**à**n	t**á**r	ɓ**á̄**r	t**ā**ŋ
Ba (Magal)	kw**ɪ̃ɪ̃**lī	t**é**r	ɓúrú	t**ē**gēr
Tun	c**é**n̄	t**ē**l	(ùr)-ɓéy	

2.4 Steps of change: ATR > INT in Riverine

- Second step: development of interior vowels



/ə/

1. Proto-Riverine *e, *o > ə in many CVC words (not fully regular)
2. /a/-raising: *a~*e replaced with /a/~/ə/:
   - Raising triggered by PL sfx /-Gɨ/ (height harmony):

bàà / bə̀ə̀gɨ́	‘father’
gàn / gə̀nŋgɨ̀	‘stomach’
hám / hə́mŋgɨ́	‘beer’

   - Morphological raising marking PL:

lág / lə́g	‘hip’
kə̰̀r / kə̰̀r	‘monitor lizard’
yà / yə̀	‘cereal’

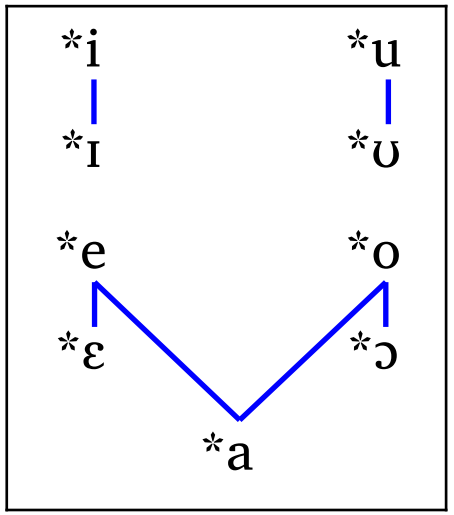
2.4 Steps of change: ATR > INT in Riverine

- ATR harmony > height harmony & morphological raising (ablaut)

2.4 Steps of change: ATR > INT in Riverine

- ATR harmony > height harmony & morphological raising (ablaut)

Proto-Bua



- ATR harmony, [+ATR] dominant (same in all Inland)
- Fanya examples with [+ATR] plural suffixes :

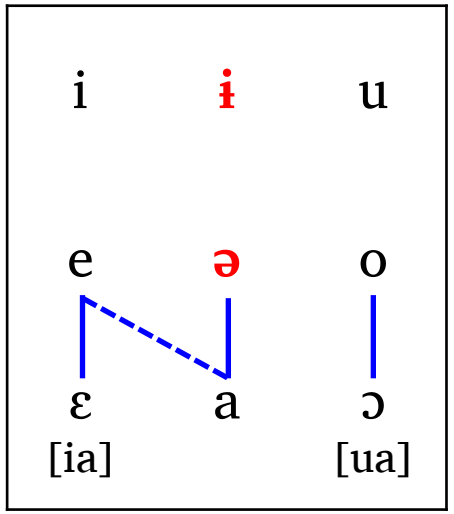
	SG		**PL /-i/, /-nyi/**	
ɪ/i	n**ín**-ú	/	n**ín**-í	‘body, cadaver’
ʊ/u	ɓ**úy**-ú	/	ɓ**úy**-í	‘animal fat’
ɛ/e	hw**èɽ**-wè	/	hw**èɽ**-ì	‘Tilapia sp. (fish)’
ɔ/o	h**ɔ̀ɔ̀**n-ɔ̀	/	h**òn**-nyì	‘hare’
a/e	mìy**àà**-kù	/	mìy**èè**k-ì	‘centipede’
a/o	l**àà**ɽ-à	/	l**òò**ɽ-ì	‘cow’

Ref:

2.4 Steps of change: ATR > INT in Riverine

- ATR harmony > height harmony & morphological raising (ablaut)

Lua



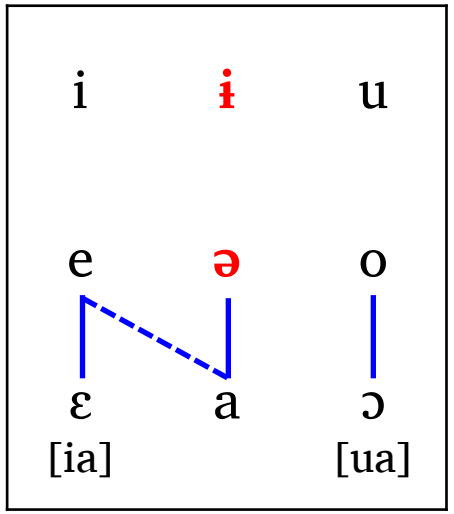
- No ATR, but height harmony (sfx) and ablaut (no sfx)

P-Bua	P-Riv.	SG		PL	
*ɪ/*i	—	—	/	—	
*ʊ/*u	—	—	/	—	
*ɛ/*e	ia/e	tiá-l	/	tē-n-ī	‘Tilapia sp. (fish)’
		piàg	/	pɛ̀g	‘shoulder’
*ɔ/*o	ua/o	kuàr	/	kɔ̀r-gɨ	‘buffalo’
		kuà	/	kɔ̀	‘snake’
*a/*e	a/e	bā-l	/	bē-n-ī	‘fish sp.’
		ndā	/	ndē	‘bird sp.’
	a/ə	bàà	/	bəə̀-gɨ́	‘father’
		lág	/	ləg	‘hip’

2.4 Steps of change: ATR > INT in Riverine

- ATR harmony > height harmony & morphological raising (ablaut)

Lua



- No ATR, but height harmony (sfx) and ablaut (no sfx)

P-Bua	P-Riv.		SG		PL	
*a/*o	*a/*ə	Fanya:	nyǎmm-ì	/	nyǒmm-ì	‘animal, meat’
		Lua:	nyàm	/	nyə̀m	‘animal, meat’
	*ɔ/*o	Fanya	ká̰à̰ɽ-ɛ̀	/	kó̰ò̰ɽ-ì	‘buffalo’
		Lua	kuà̰r	/	kò̰r-gɨ̀	‘buffalo’

3 Areal alignment of plosive contrasts

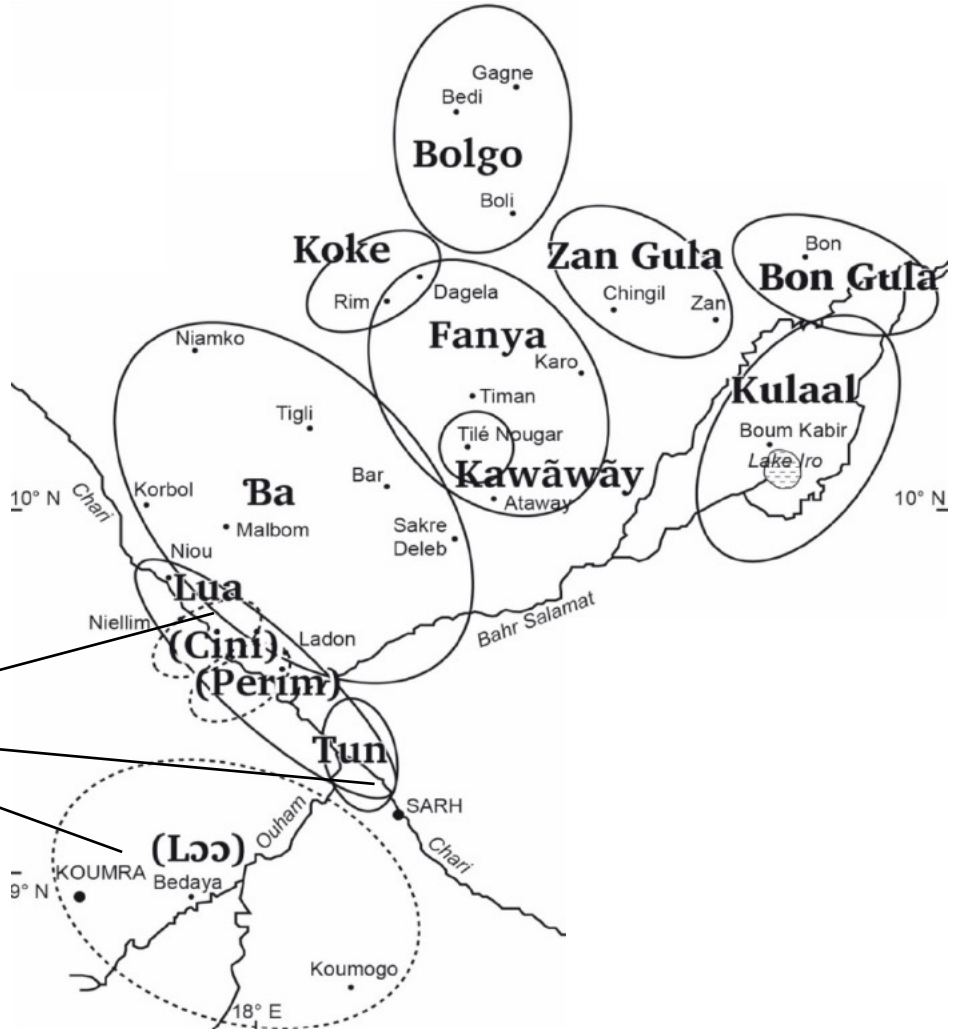
3 Plosives

- Stem-initial plosives = maximal inventory
  - Stem-initial prominence effects at work in all Bua except Gula languages.
- Wide disparity in terms of
  - Number of contrastive series: **1 ~ 4**
  - Number of individual plosives: **4 ~ 14**

3.1 Plosives

Lua & Tun (& Lɔɔ)
(4 series /14 phonemes)

p	t	c	k
b	d	ɟ	g
ɓ	ɗ		
mb	nd	ɲɟ	ŋg



3.1 Plosives

Bolgo North (3/8)

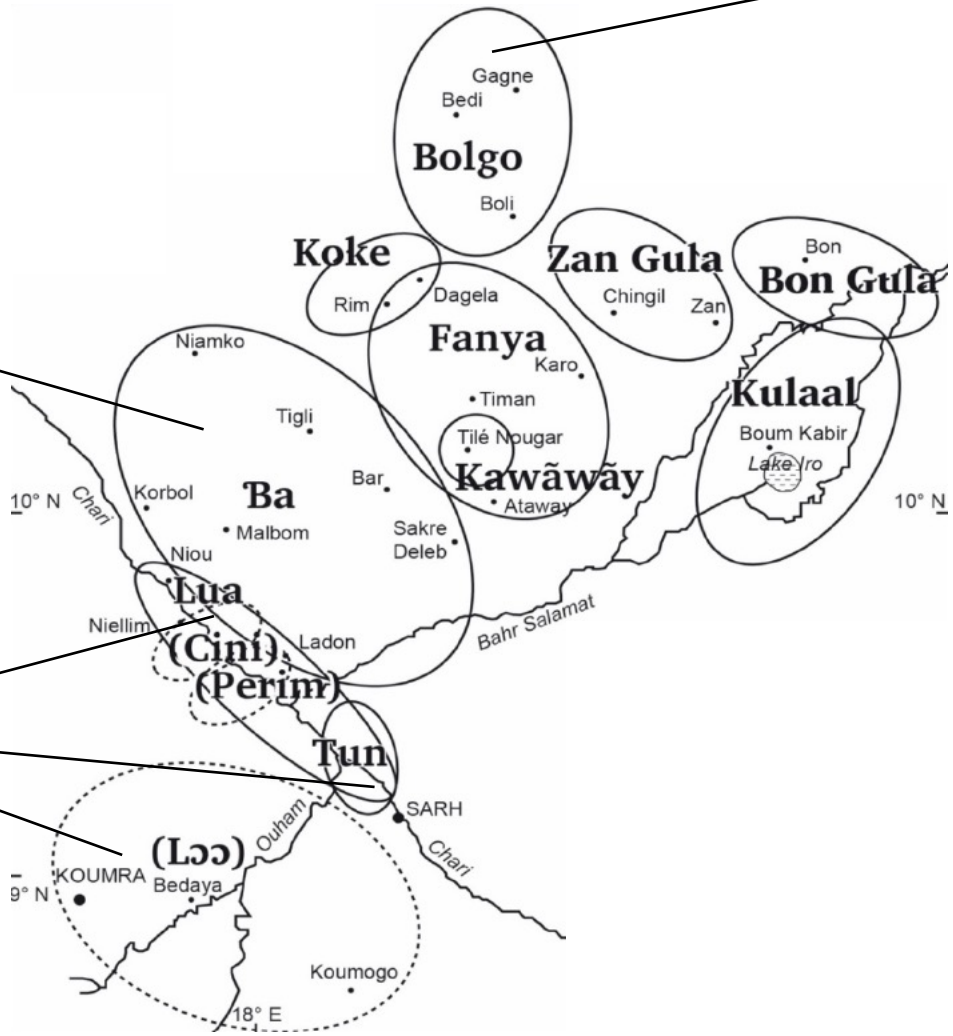
--	t	--	k
b	d	ɟ	g
ɓ	ɗ		

Ba (3/8)

--	t	--	k
b	d	ɟ	g
ɓ	ɗ		

Lua & Tun (& Lɔɔ) (4/14)

p	t	c	k
b	d	ɟ	g
ɓ	ɗ		
mb	nd	ɲɟ	ŋg



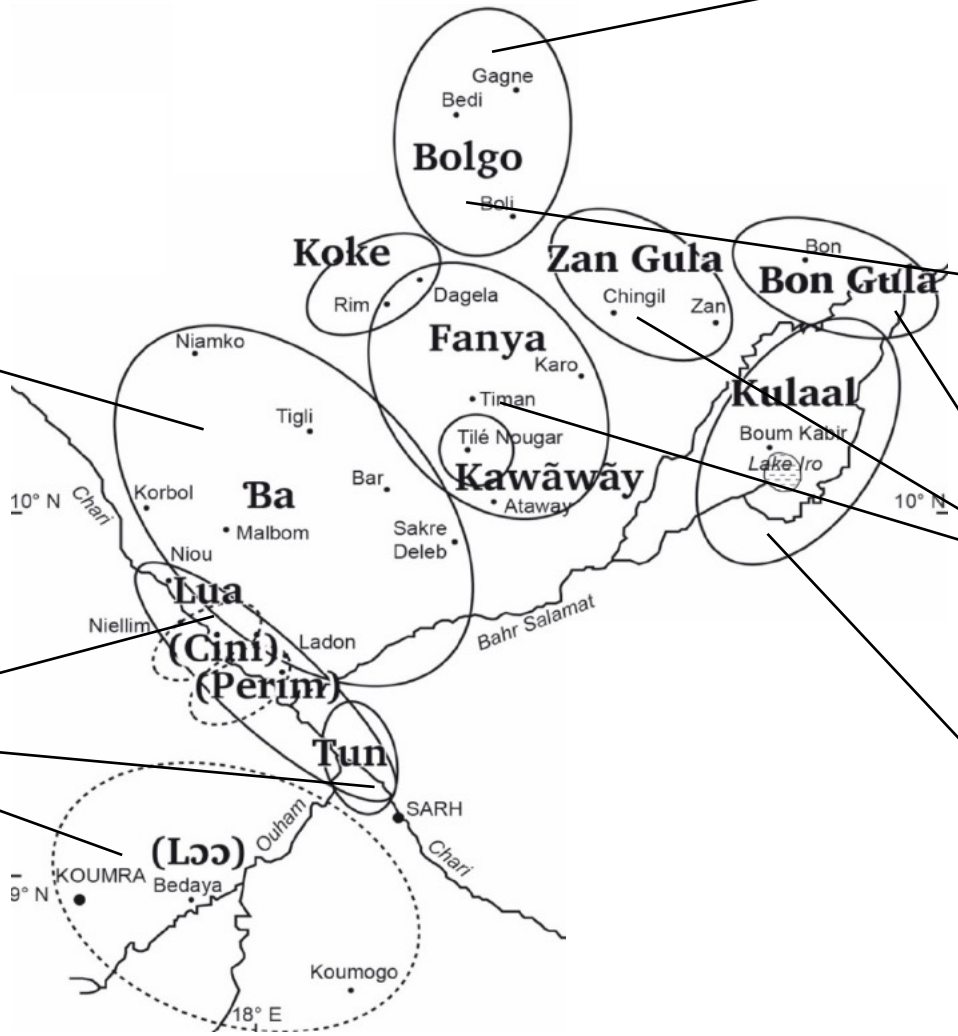
3.1 Plosives

Ba (3/8)

--	t	--	k
b	d	ɟ	g
ɓ	ɗ		

Lua & Tun (& Lɔɔ) (4/14)

p	t	c	k
b	d	ɟ	g
ɓ	ɗ		
mb	nd	ɲɟ	ŋg



Bolgo North (3/8)

--	t	--	k
b	d	ɟ	g
ɓ	ɗ		

Bolgo South (2/6)

--	t	--	k
b	d	ɟ	g

Fanya, Zan G (~Bon G) (2/5)

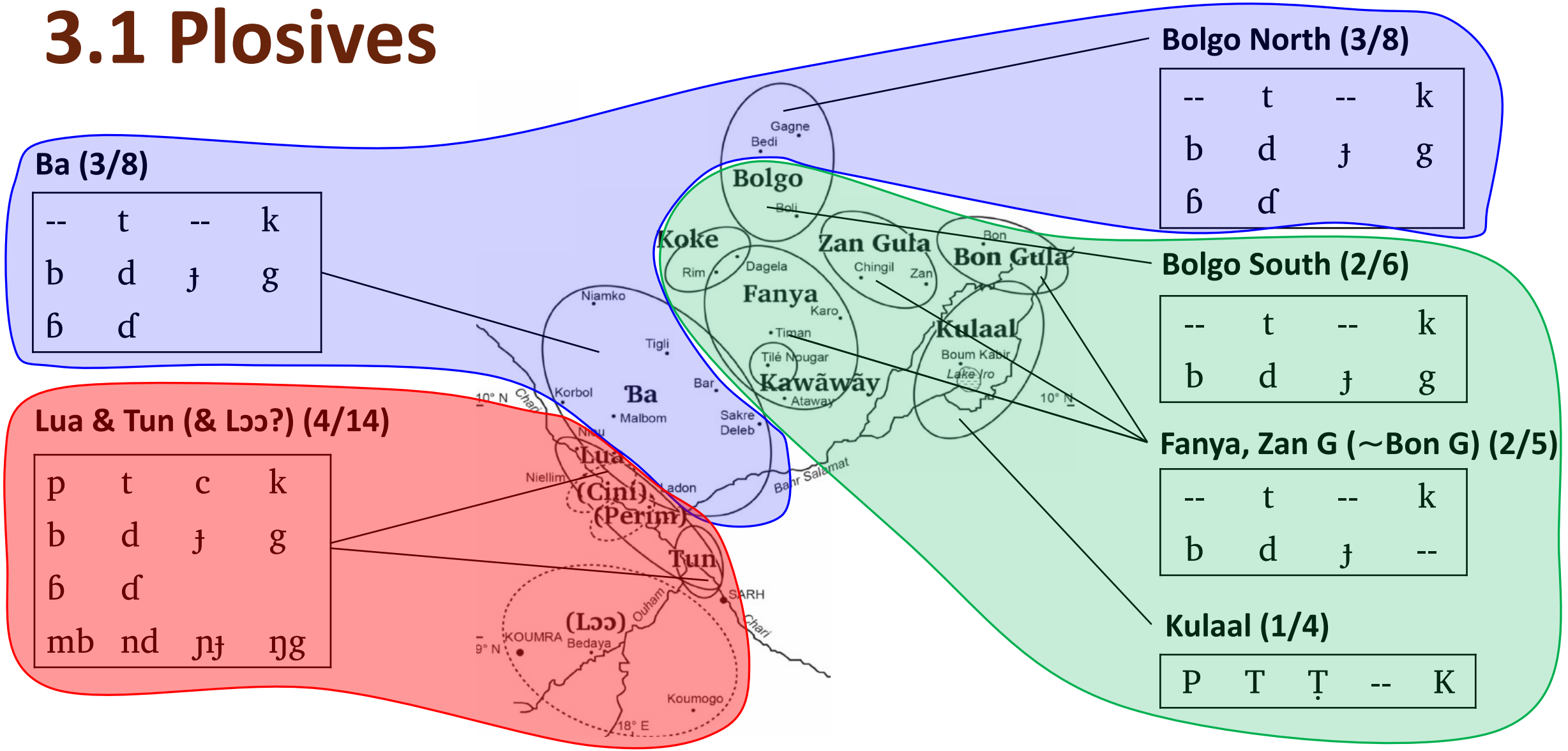
--	t	--	k
b	d	ɟ	--

Kulaal (1/4)

P	T	Ṭ	--	K

Ref: Pairault (1966: 422; 1969: 44), Palayer 1975, Boyeldieu 1985, Kastenhloz 2017, Boyeldieu et al 2018, Tikka 2019

3.1 Plosives



Ref: Pairault (1966: 422; 1969: 44), Palayer 1975, Boyeldieu 1985, Kastenhloz 2017, Boyeldieu et al 2018, Tikka 2019

3.4 Plosives: Proto-Bua

- Proto-Bua can be reconstructed with a **3-way contrast T – D – ’D** (Boyeldieu et al. 2018)

Proto-Bua (3/10)

*p	*t	*c	*k
*b	*d	*ɟ	*g
*ɓ	*ɗ		

Ref: Boyeldieu et al. 2018.

3.4 Plosives: Proto-Bua

- Comparative series *p, *b and *ɓ

	moon	mortar	people (pl)	white	elephant	tie
Proto-Bua	*pɛɛ-	*pɔɔ-	*bi-	*bu…	*ɓal-	*ɓo-
Fanya	hwɛ̀ɛ̀w	hɔ́ɔ́lɛ́	bìyè	bùwóóró	bàlàà	bóó
Kulaal	fɛ̀ɛ̀	fɔ́ɔ́l	pìsè	pùùlò	pàlá	pò
Zan Gula	fɛɛ	fɔɔl	biye	buule	bālá	bōō
Bon Gula			be ~ pe		bàlá ~ pàlá	(lū)bōl/ra
Bolgo S	hɛ̀w	hɔ̄ɔ̄l	bìi	bul	bòòlā	bɔ̄
Bolgo N	hɛ́ʊ̀	—	bìì	buuro	ɓɔlʌ / ɓoliɲ	ɓó
Lua	piā̰ā̰	huáál	bì	buàār	—	ɓōw
Ba	hōw (<*hwēēw)	hóól	bì	bìīl	ɓɛ̀lā	ɓòw
Tun	hɛ̄ɛ̄	hɔ̄y		būūrí	—	ɓōō

3.4 Plosives: Proto-Bua

- Comparative series *t, *d and *ɗ

	arbre	ear	hit	to tear	to lean	to throw
Proto-Bua	*tɪ-	*tʊ́-	*dɔg-	*dạạs-	*ɗik-	*ɗʊ
Fanya	tîw	tʊ́			dìkò	
Kulaal	téʊ́	tó	tɔ́kɔ̀	tạ̀ạ̀sì	ƭìkò	ƭʊ̀ʊ̀-lɔ̀
Zan Gula	tʊ	tʊ	dɔ́kɪ		dike	dʊ́
Bon Gula	tuw, tow	tʊ́	dɔkɪn			dʊba
Bolgo S	tìw	tō				dū
Bolgo N	téu	tò				
Lua	tɨ́lā	túlā	dùgùn	dèèr ~ dạ̀ạ̀r	ɗìg	ɗō
Ba	tílā	tów̄	dōw	dę̀ę̀r		ɗōw
Tun	tə́gā	tōy	dəgù		ɗìngənì	ɗōō

3.4 Plosives: Proto-Bua

- Comparative series *c, *ɟ

	dog	smoke	to sneeze	to go down
Proto-Bua	***ca-**	***cɪɪm-**	***ɟɪn-**	***ɟir-**
Fanya	hyàwwɛ̀	híímílɛ́		
Kulaal	hàò	hɛ́ɛ́ɛ́m	kèn	kìrì
Zan Gula	sɔ̀wɛ̀	sɪɪmʊ	ɟɪmɪ	ɟiri
Bon Gula	haw	sim	cɛmɪn	ciɽi
Bolgo S	sàw	sɛ̀m	ɟɛ̄mɛ́	—
Bolgo N	sāò	séém	—	—
Lua	sàw	síím	—	ɟīr
Ba	sà	síím	ɟēn	
Tun	—	sēm	ɟēn	

Ref: Boyeldieu et al. 2018

3.4 Plosives: Proto-Bua

- Comparative series *k, *g

	buffalo	snake	to like	to fold	chin, beard
Proto-Bua	***kaar-**	***kɔ-**	***ge-**	***guur-**	*
Fanya	káa̰a̰ɽɛ̀	kɔ́ɔ̰̀			kʊ̀mɛ̀
Kulaal	(ɲàŋ)-ka̰ra̰	kɔ́ɔ̀	kéé	kʊ̀ɽɔ̀lɔ̀	—
Zan Gula	kaara	kɔ	(?) ɔ̄ɔ̄kí	kulki	kɔmlɛ
Bon Gula	—				kɔmɪl
Bolgo S	kāmlà	kōy			gàmbà
Bolgo N	—	koi			—
Lua	kua̰r	kuà	gə̀ɲ	gūūr	—
Ba	kwa̰a̰r	kò	gèy	gūūrgū	gùmà
Tun	—	kɔ̄ɔ́	gèè	gūr	—

3.5 Plosives: Proto-Bua > Lua, Tun

Proto-Bua (3/10)

*p	*t	*c	*k
*b	*d	*ɟ	*g
*ɓ	*ɗ		

Lua, Tun (4/14)

p	t	c	k
b	d	ɟ	g
ɓ	ɗ		
mb	nd	ɲɟ	ŋg

3.5 Plosives: Proto-Bua > Lua, Tun

- Whence /p/?
  - Lua:
    - *p > h/__[+round],
    - but *p maintained before unrounded vowel

	moon	**mortar**
Proto-Bua	*pɛɛ-	*pɔɔ-
Lua	piāā̃	huáál

    - /h/ phonemicized:
      - *s, *c > /h/
      - loans, e.g. **hálí** ‘tree sp.’ vs. **pār** ‘follow’
  - Tun:
    - *p > h
    - /p/ rare, attested in words with no obvious Bua cognates
      - páā ‘engagement’
      - pàlpày, pàrpày ‘fish sp.’
      - pāārī ‘to criticize’
      - pīrgī ‘folie’

3.5 Plosives: Proto-Bua > Lua, Tun

- Whence /c/?

Proto-Bua ***c > s**

	dog	smoke
Proto-Bua	***ca-**	***cɪɪm-**
Lua	**s**àw	**s**íím
Tun	—	**s**ēm

Position filled by ***k > c / __[+front]**

to cry	crocodile	to turn
***ke/i-**	***kɪɪb-**	***kɪɪr-**
cə́ŋ	**c**ìbà	**c**ēērī
cī̀	**c**ə̄ə́	

k/c phonemicized:

- *e > ə, e.g. **cə́ŋ** ‘to cry’ vs. **kə̄y** ‘what’
- loans, e.g. **kédē** ‘one’ (< Barma) vs. **cə̀l** ‘fish sp’

- → pressure to maintain the system, by filling the gaps created by prior sound changes

Ref: Boyeldieu et al. 2018

3.5 Plosives: Proto-Bua > Lua, Tun

- Prenasalized plosives
  - cannot be reconstructed to Proto-Bua
  - attested only in Lua, Tun, and Lɔɔ (Lɔɔ corpus = only 47 words)
  - rare in both Lua and Tun, e.g. Lua:
    - mb = 0.7% of stem-initial Cs in lexicon
    - nd = 2.8% " "
    - nj = 0.5% " "
    - ŋg = 2.5% " "
  - mostly loanwords

Ref: Boyeldieu et al. 2018

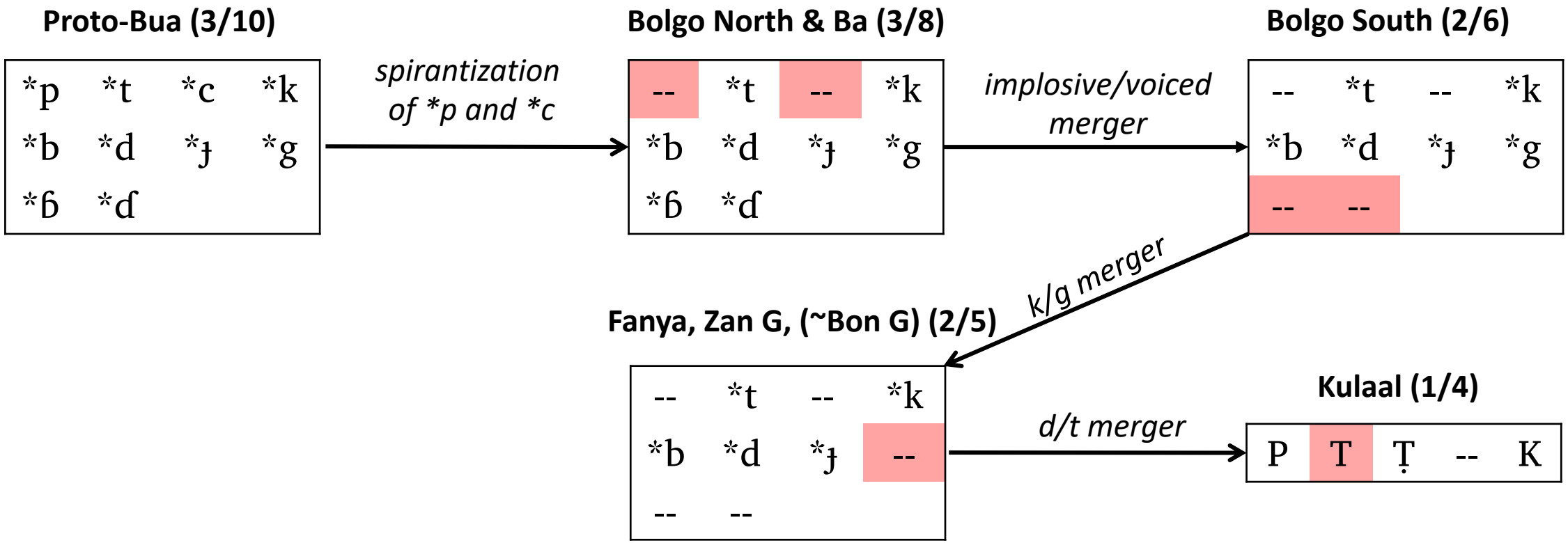
3.5 Plosives: Proto-Bua > Lua, Tun

- Lua innovated /nd/ through regular *r > nd change:

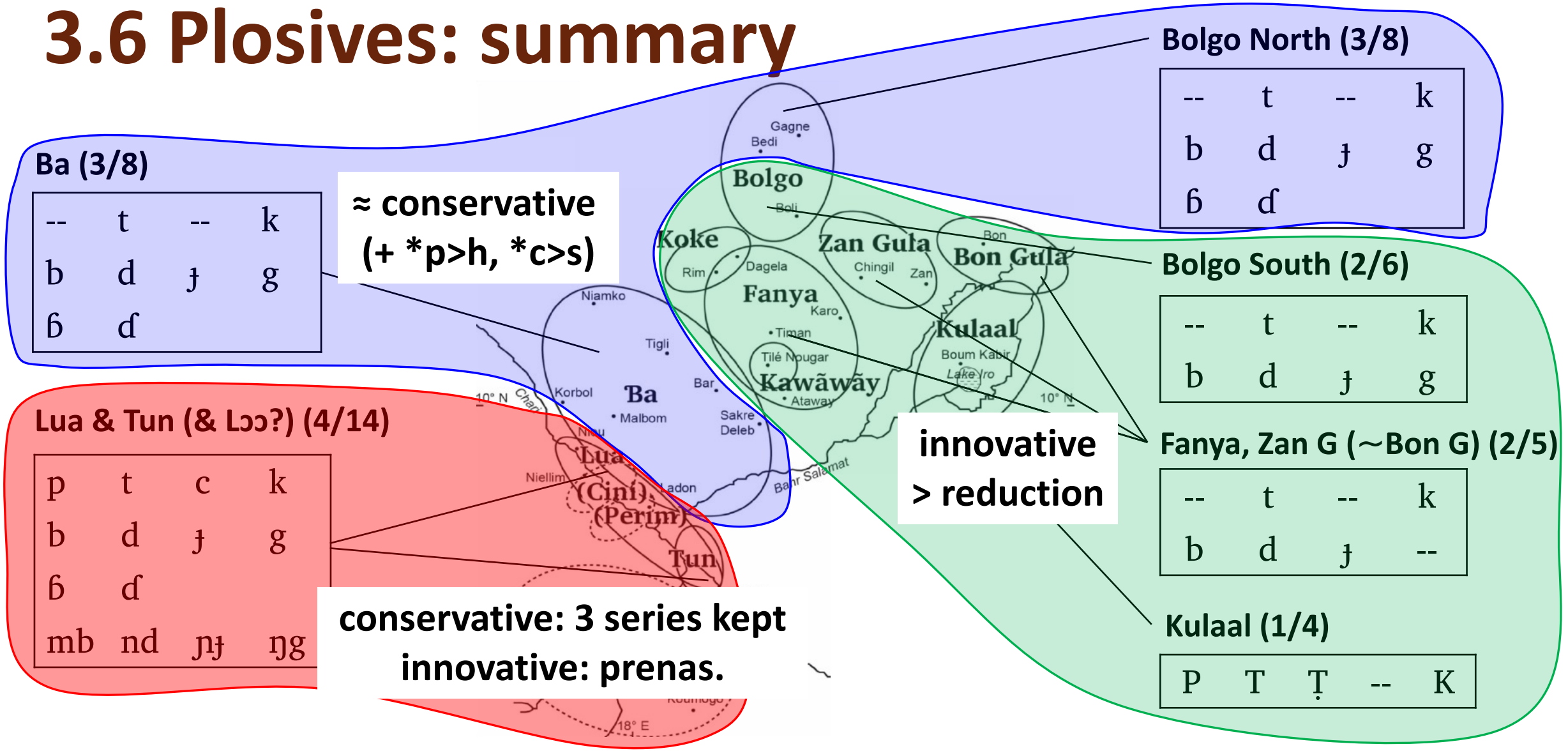
	hunger	knee	name	body	two
Proto-Bua	***rʊl-**	***rul-**	***ril-**	***rʊʊd-**	***ri-**
Fanya	ɽʊ̀llɛ̀	ɽúllé	ɽíllé	lúúrɛ́	ɽíìɽú
Kulaal	yʊ̀l	yúl	ííl (< yíl ?)	yʊ̀ʊ̀t	
Zan Gula	ɾʊllɛ	ɾulle	ɾīnú	ɾʊʊdɛ	ɾisi
Bon Gula				ro	
Bolgo S		ɽúl	ɽíl	lòòɾ	ɾedi
Bolgo N	lòl	ɾúúl	ɾuul	lōr	rɛd
Lua	ndùlà	ndúnngū	ndíl	ndúlá	ndīrí
Ba	rùlā	rúlū	rílí	réé	í-rīī
Tun	--	lūngū	līī	lōō	à-ríī

3.6 Plosives: Proto-Bua > Inland

- Schematic steps involved in series reduction, illustrated:



3.6 Plosives: summary



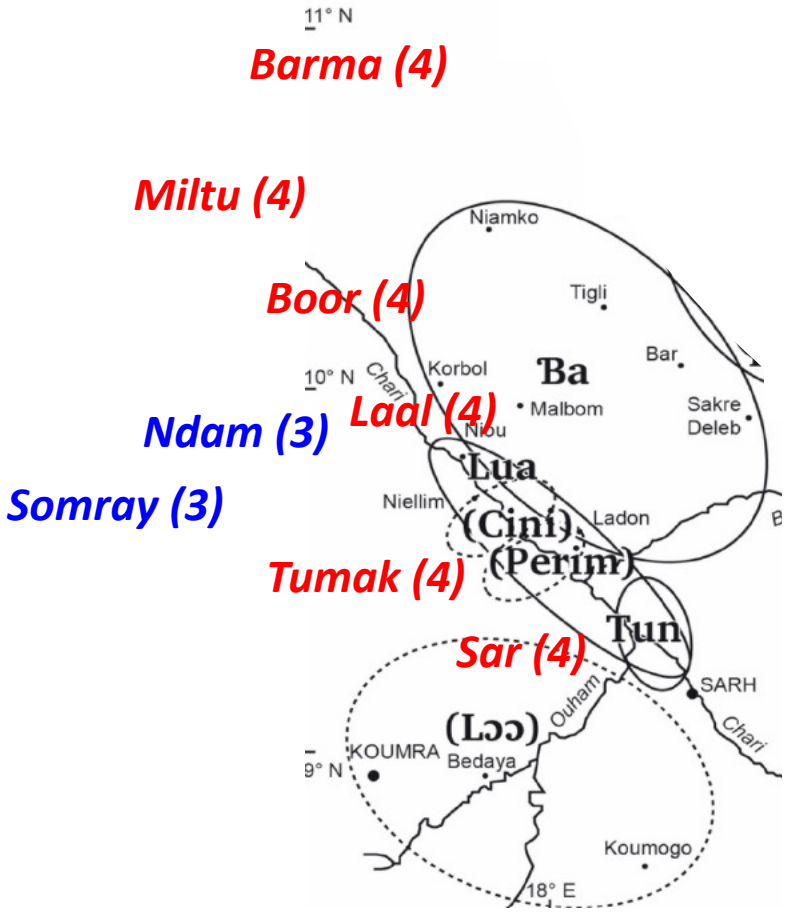
3.7 Plosives: areal alignment

Ndam, Somray (3/10)

p	t	c	k
b	d	ɟ	g
ɓ	ɗ		

Other Chadic A, Laal, SBB (4/14)

p	t	c	k
b	d	ɟ	g
ɓ	ɗ		
mb	nd	ɲɟ	ŋg



Ba (3/8)

--	t	--	k
b	d	ɟ	g
ɓ	ɗ		

Lua & Tun (& Lɔɔ) (4/14)

p	t	c	k
b	d	ɟ	g
ɓ	ɗ		
mb	nd	ɲɟ	ŋg

Ref: Boyeldieu 1985, Palayer 1975, Boyeldieu et al 2018, Boyeldieu 1982, Lionnet 2015, Jungraithmayr 2006, Caprile 1977, Bross 1988, Jungraithmayr & Peust 2019, Lionnet field notes, Boyeldieu field notes

3.7 Plosives: areal alignment

Barayin & Arabic (2/8~9)

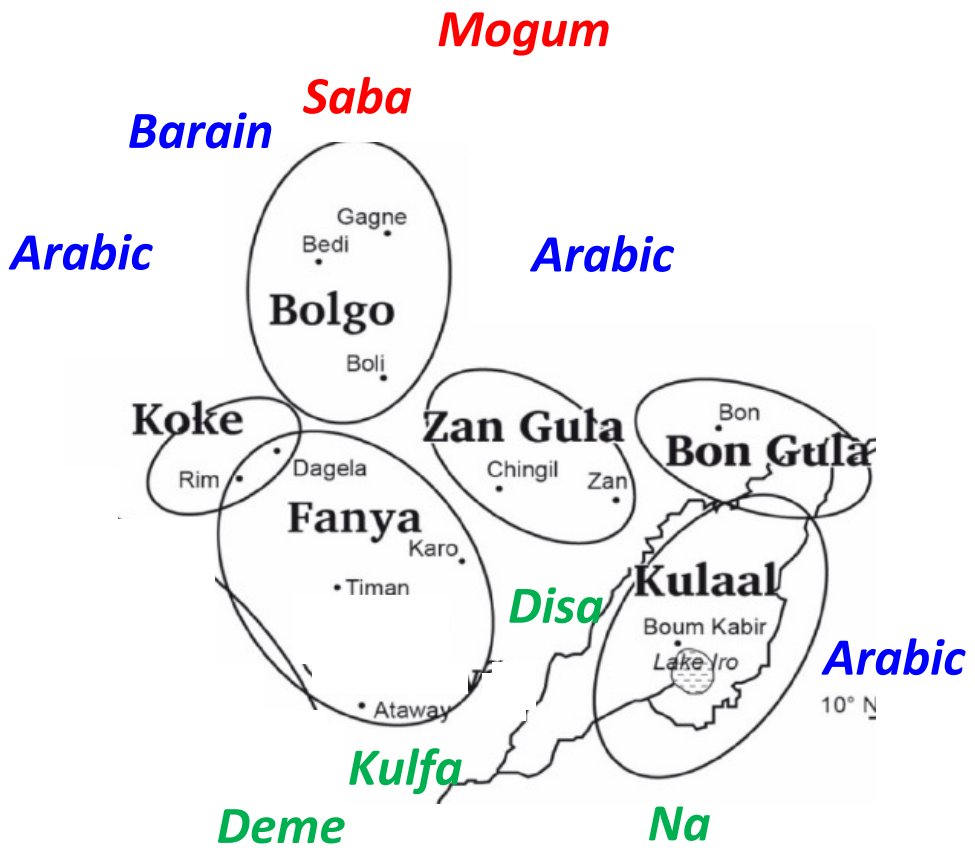
p	t	(c)	k	ʔ
b	d	ɟ	g	
	(ɗ)			

Other East Chadic B (3/10~12)

p	t	(c)	k	ʔ
b	d	ɟ	g	
ɓ	ɗ	(ʄ)		

Peripheral Sara (4/12~13)

--	t	--	k
b	d	ɟ	g
ɓ	ɗ	(ʄ)	
mb	nd	ɲɟ	ŋg



Bolgo North (3/8)

--	t	--	k
b	d	ɟ	g
ɓ	ɗ		

Bolgo South (2/6)

--	t	--	k
b	d	ɟ	g

Fanya, Zan G (~Bon G) (2/5)

--	t	--	k
b	d	ɟ	--

Kulaal (1/4)

P	T	Ṭ	--	K

Ref: Pairault (1966: 422; 1969: 44), Jullien de Pommerol 1999, Kastenhloz 2017, Boyeldieu et al 2018, Tikka 2019, Lovestrand 2012, Palayer 2006, Keegan & Koutou 2015, Keegan et al 2015

4. The role of contact

4 The role of contact

Table 1: Scalar levels in the analysis of linguistic contact (Muysken 2007, 2008: 5)

Level	Space	Time	Sources	Disciplines	Scenarios
Person	Bilingual individual	0–50 years	Recordings, tests, and experiments	Psycho-linguistics	Brain connectivity
Micro	Bilingual community	20–200 years	Recordings and fieldwork observations	Socio- and anthropological linguistics	Specific contact scenarios
Meso	Geographical region	Generally 200–1000 years	Comparative data; historical sources	Historical linguistics	Global contact scenarios
Macro	Larger areas of the world	Deep time	Typological, genetic, archeological data	Areal typology	Vague or no contact scenarios

- At the meso- and macro-level, areal effects are "often due to language contact but **importantly must not be reduced to it**" (Güldemann 2018: 446)

Ref: Muysken 2007, 2008, cited in Güldemann 2018: 445

4 The role of contact

- Profile changes in Riverine Bua are most likely explained by contact
- Small-scale multilingualism (Lüpke 2016)
  - very frequent intermarriage between Ba, Lua, Laal, Boor, and Ndam speakers
  - patrilocality → women bring their language, children acquire both mother and father's lg.
  - Villages are constantly multilingual

Ref: Thomason & Kaufmann 1988, Lüpke 2016

4 The role of contact

- Loanwords are not the main cause of change
  - They reinforce changes, help phonemicize newly created allophones, etc.
  - Changes are mostly internal (*r > nd in Lua, *k > c/__[front] in Lua and Tun)
- Likely at work: **shift-induced substrate effects** (Thomason & Kaufmann 1988): Chadic, Laalic, and Sara speakers are likely to have shifted to Riverine Bua languages at different times, importing aspects of their phonology.

Conclusion

- Riverine Bua, especially the south-westernmost Lua and Tun, adapted their phonological profile to their neighboring languages (Chadic, Laal, Sara).
- This involved major changes / restructurations:
  - loss of ATR
  - gain of interior vowels
  - gain of prenasalized stops
  - (also gain of a third tone height: Proto-Bua had only two tones)
- As well as some conservatism (as opposed to Inland Bua):
  - 3 plosive series maintained (+ extended to four with prenasalized)
  - “Depleting” sound changes remedied: *c > s, replaced by *k > c/__[front]

Acknowledgments: Our colleagues at Princeton, Leibniz-ZAS, and UC Berkeley

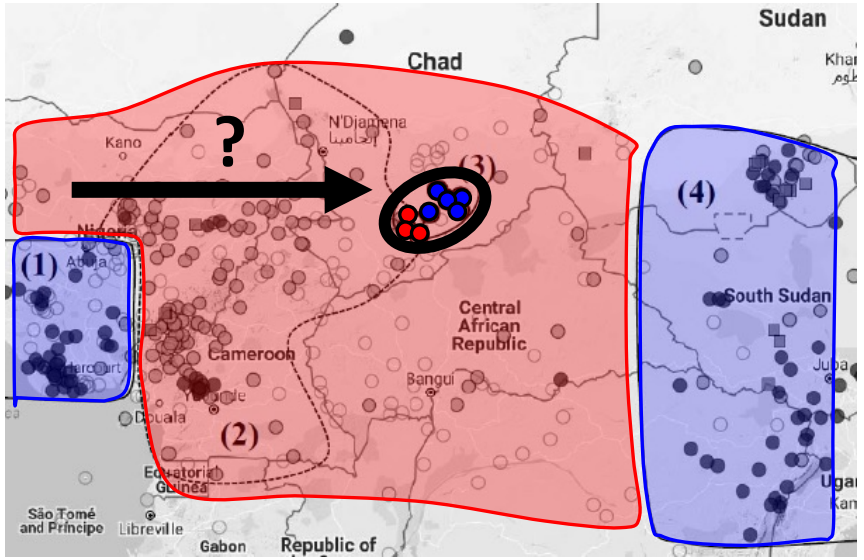
Conclusion

- Languages change profiles when changing areas
  - Areal signals are strong and stable: they resist migration and language shift (percolate up through layers of population movements)
  - Contact is a key factor in such profile changes
    - Small-scale multilingualism (Lüpke 2016)
    - “Shift-induced substrate interference” (Thomason & Kaufman 1988)

Acknowledgments: Our colleagues at Princeton, Leibniz-ZAS, and UC Berkeley

Conclusion

- Proto-Bua (and Inland languages) is areally odd
  - Migration from before the creation of the Central African ATR-deficient and Interior Vowel zones?



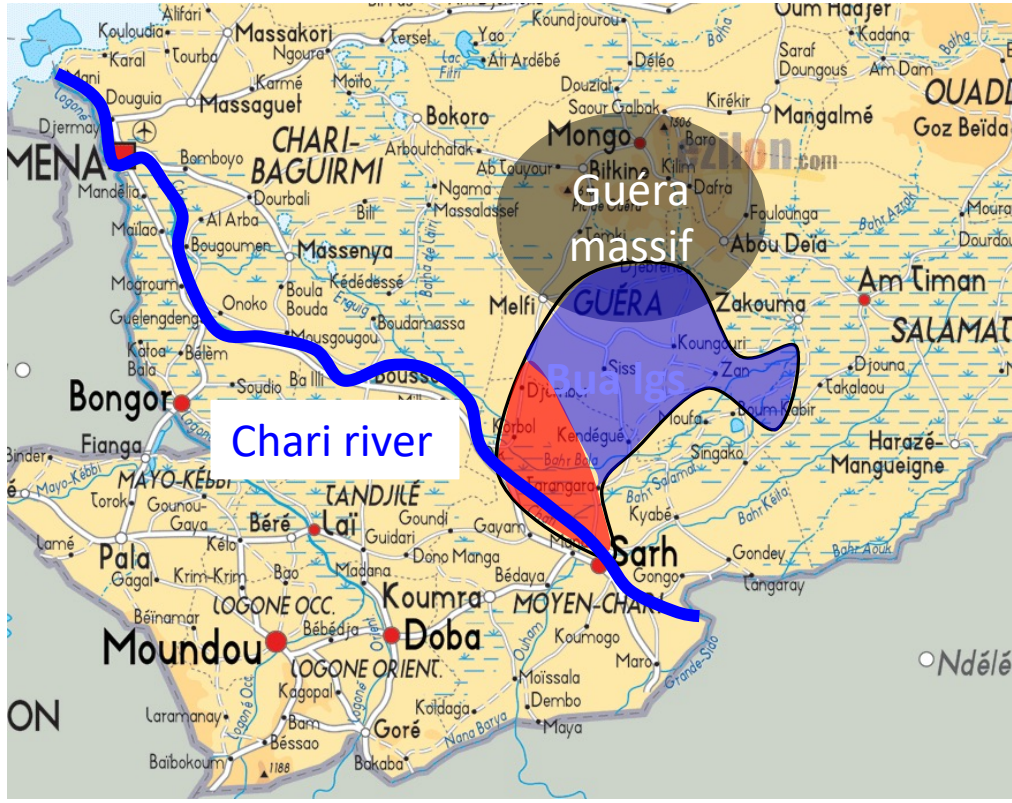
Acknowledgments: Our colleagues at Princeton, Leibniz-ZAS, and UC Berkeley

Conclusion

- Proto-Bua (and Inland languages) is areally odd
  - Inland languages are in a cul-de-sac between **the Guera massif and flood zones** to its south = a refuge area

    → Inland languages conservative, less areally influenced
  - **The Chari river** = crossroads, contact area

    → Riverine languages more prone to areal alignment



Thank you!