

Max Planck Institute for Evolutionary Anthropology/Linguistics

"Speaking (of) Khoisan"

A symposium reviewing African prehistory

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Southern Africa as a phonological area

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Map 3.1 Six phonological zones in Africa

Quelle: Clements & Rialland (2008: 37)

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1. Introduction

Phonological similarities

Naro [nhr] (Khoe-Kwadi; Botswana, Namibia; Visser in Vossen 2013: 60ff. and others)

Consonants

	bilab	alv	alv affr	pal	vel	velar/uv affr	glott	ingr dent	ingr alv	ingr pal	ingr al-lat
stop, vls.	(p)	t	ts		k	kx kg	ʔ '	c	! q	‡ tc	x
stop, aspir.	(p ^h)	t ^h th	ts ^h tsh		k ^h kh			^h ch	! ^h qh	‡ ^h tch	^h xh
stop, vd.	b ~w	d ~r	dz		g gh			↓ dc	! dq	‡ dtc	dx
stop, ejective		t'	ts'			kx' kg'		' c'	!' q'	‡' tc'	' x'
nasal, voiced	m	n						ĩ nc	! nq	‡ ntc	nx
fricative, vls.	(f)		s		x g		h				
lateral approx.			(l)								
trill, voiced		[r] r									
approximant	[w]			j y							

- large consonantal inventory (45 c.)
- clicks
- aspirated and ejective stops
- dorsal affricate

1. Introduction

Phonological similarities

Zulu [zul] (Bantu S.42, Nguni/Zunda; South Africa; Taljaard & Bosch 1988, and others)

Consonants

	bilab	lab-dental	alv	alv affr	alv later	p-alv (affr)	pal	vel	vel/uv affr	glott	ingr dent	ingr alv	ingr pal	ingr al-lat
stop, vls.								k k						
stop, aspir.	p ^h ph		t ^h th					k ^h kh			^h ch	! ^h qh		^h xh
stop, breathy	b̤ bh		d̤ d			ɖʒ j		g̤ g			gc	! gq		gx
stop, ejective	p' p		t' t	ts' ts	(kɬ') kɬ	tʃ' tsh		k' k	(kx') kl		' c	' q		' x
stop, vd. impl.	ɓ b													
nasal, voiced	m m		n				ɲ ny	ŋ ng			ĩ nc	ĩ nq		nx
nasal, other	(m̩) m		(n̩) n											
fricative, vls.		f f	s		ɬ hl	ʃ sh		x~χ h			h h			
fricative, vd.		v̤ v	z̤ z		ɮ dl						ɦ hh			
lateral approx.					l l									
lateral, other					(l̥) l									
approximant							j y	w w						
approx., other							(j̥) y	(w̥) w						

- large consonantal inventory (50 c.)
- clicks
- aspirated, slack voiced, ejective and implosive stops
- (dorsal affricate)
- lateral obstruents

1. Introduction

Phonological similarities

Tsonga ~Changana, Thonga [tso] (Bantu S.53, RSA, Mocambique; Baumbach 1987: 3-20 and others)

Consonants

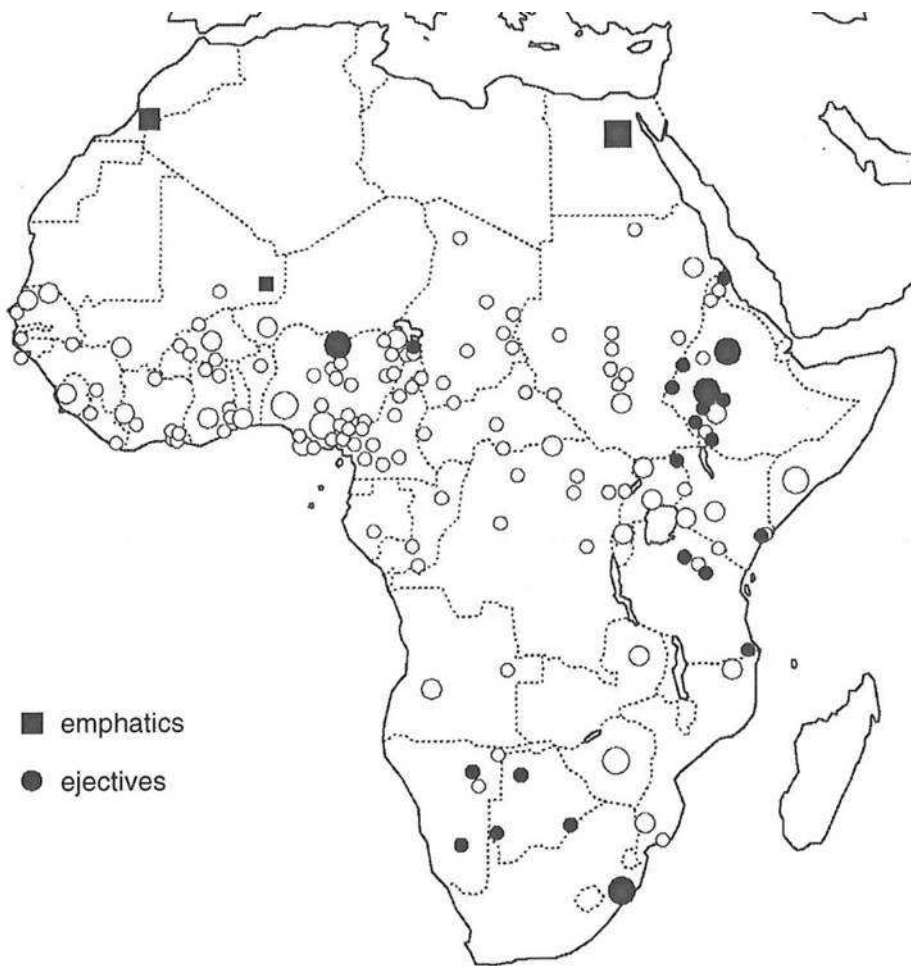
	bilab	lab-dent	alv	alv affr	alv later	p-alv (affr)	vel	glott	ingr dent	other (+ secondary)
stop, vls.	p	pf pf	t	ts	tl tl	tʃ c	k		(! ~ q)	ts ^{v*} tsw pɕ ^{**} ps~py
stop, aspir.	p ^h ph	pf ^h pfh	t ^h th	ts ^h tsh	tl ^h tlh	tʃ ^h ch	k ^h kh		(! ^h ~ ^h qh)	ts ^{vh*} tshw
stop, vd.	b	bv bv	d	dz	dl dl	dʒ j	g		(! ~ gq)	dz ^{v*} dzw bz ^{**} bz~by
stop, breathy*	b ^h bh	bv ^h bvh	d ^h dh	dz ^h dzhdʒ	dʒ ^h dhl	dʒ ^h jh	g ^h gh			dz ^{vh*} dzhw
stop, vd. impl.	ɓ ^{**} b'		d ^{**} d'							
nasal, voiced	m	[m]	n			ɲ ny	ŋ n'		(ĩ ^{**} n'q)	
nasal, other*	ṁ mh		ṅ nh				ŋ n'h			
fricative, vls.	ɸ* ff	f	s		ɬ~ɮ? hl	ʃ x	x* hh			(s ^v sv)
fricative, vd.	β~v vv	vh	z		ʒ~ʒ? lh	ʒ xj		fi h		(z ^{v**} zv)
fricative, other*		v̥ vh								
lateral approx.					l					
trill, voiced			r							
intermittent, other*			r ^h rh							
approximant	w					j y				
approx., other*	ɰ wh					j̥ yh				

*Uncertain.

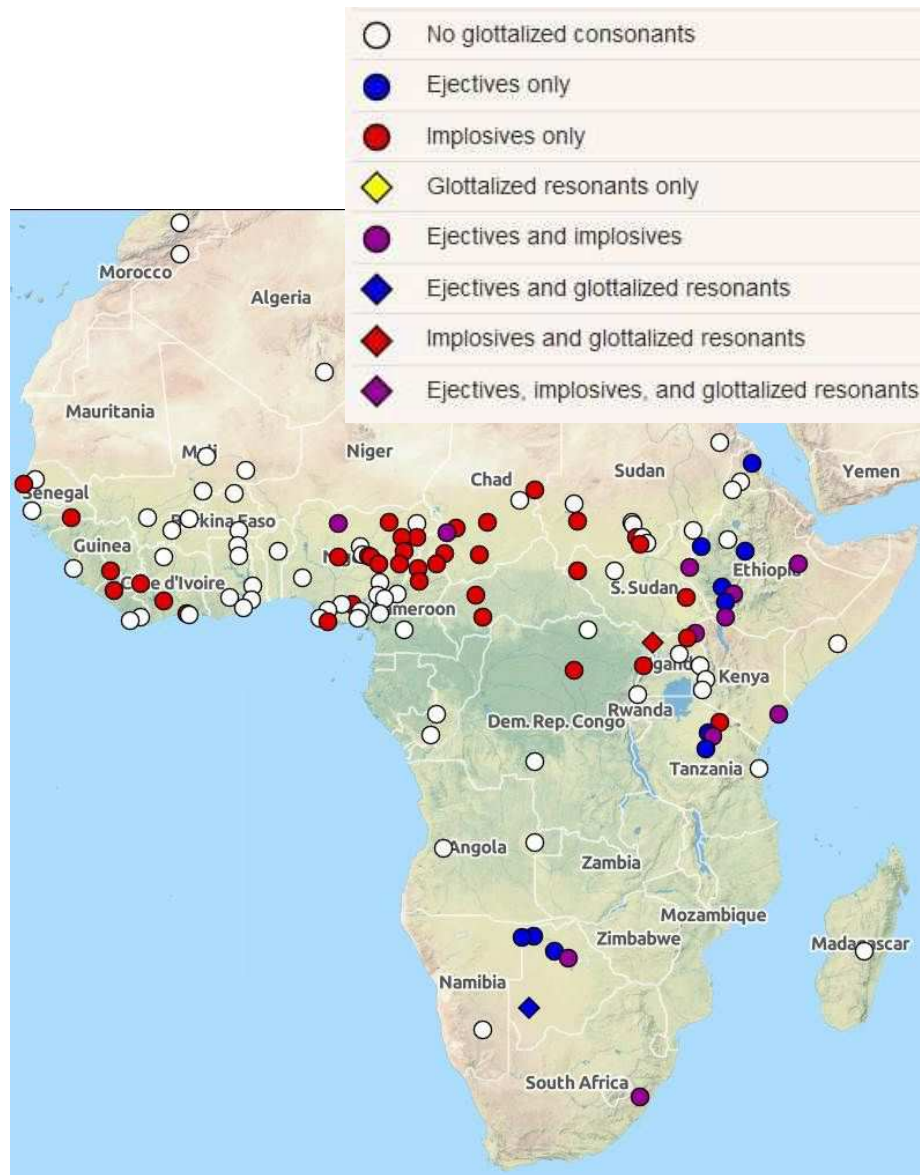
- large consonantal inventory (68 c.)
- (clicks)
- aspirated, breathy and implosive stops
- lateral obstruents

1. Introduction

Example: Distribution of ejectives/glottalized consonants



Clements & Rialland (2008: 62)



Maddieson (2013)

1. Introduction

Africa/South: Phonological characteristics

(Clements & Rialland 2008: 81)

- ejective stops *very common*
- aspirated stops *very common*
- clicks *common*
- two series of high vowels *infrequent*
- nasal vowels *Khoisan: very common*
- 3+ tone levels *Khoisan: infrequent*

- slack voiced stops *Bantu: common*
- implosives *Bantu: infrequent*

Linguistic features of the Kalahari Basin:

Phonetics-phonology (Güldemann & Fehn, in prep.)

	<i>Tuu</i>	<i>Kx'a</i>	<i>Khoe-Kw.</i>	<i>Nguni</i>	<i>Tswana</i>
- ejectives	X	X	X	X	(X)
- aspirates	X	X	X	X	X
- clicks	X	X	X	X	(X)
- nasalization	X	X	X	--	--
- register tone system	X	X	X	--	--
- uvular stops	X/--	X/--	X/--	--	--
- obstruent-obstruent clusters	X	X	X	--	--
- pharyngealization	X	X	X/--	--	--
- specific lexical root phonotactics	X	X	X	--	--

(X = frequent, -- = absent; list includes non-phonological features not given here)

1. Introduction

Problems

- data basis of previous studies, e.g.: ejectives in all languages of South Africa and Botswana?
- conflicting conclusions:

"A third zone, the South, is sharply delineated by the remaining features ...: ejective and aspirated stops, clicks, and slack voiced stops. To these features we could add their characteristic series of lateral affricates and fricatives. All these features are widely shared by Khoisan and Bantu languages in the region."

Clements & Rialland (2008: 82)

"... [S]ubstrate interference contributed repeatedly to creating linguistic similarities [in Nguni, Tswana, and Afrikaans] with Kalahari Basin languages (or at least maintaining existing ones) but has not been strong enough to make the newcomers "full" members of the area."

Güldemann & Fehn (in prep.: 18; cf. also Güldemann 2010: 572f.)

(Note: Clements & Rialland (2008) refer to *phonological* areas, Güldemann & Fehn (in prep.) are concerned more generally with *linguistic* areas.)

1. Introduction

This study

- more systematic investigation of phonological features (phoneme inventories, syllable structure)
- Southern Africa vs. Kalahari Basin ("Khoisan") vs. Southeastern Bantu
- compared to other languages further north (subequatorial Africa)

- Are there sufficient features to treat Southern Africa as one clearly delineated area?
- Can we recognize neat subareas?
- Is it possible to compare their validity on quantitative data?
- Are there South African languages that are not part of the linguistic area? (Why?)
- Are there links to areas outside of the region?

1. Introduction

Linguistic and phonological areas

- phonological areas: linguistic areas claimed on the basis of phonological traits
- linguistic areas (Campbell 2006: 6)
 - several (marked) linguistic features
 - shared by two or more languages (unrelated, or from different subgroups of the family)
 - in a geographically contiguous area
 - < diffusion (borrowing)

Qualifications

- I agree: *"linguistic areas are after-the-fact constructs based on the residue and accumulation of borrowed traits"* (Campbell 2006:14)
- I do not fully agree:
 - *"... [I]t would be more productive just to investigate the facts of linguistic diffusion without the concern for defining linguistic areas."* (Campbell 2006:2)
 - *"the whole notion of 'areal phenomena' is built on the convenient fiction that each language has a specific location in space, that no more than one language is spoken in each place, and that language contact takes place between adjacent languages. However, language contacts typically occur in densely [multilingual] populated places ..."* (Dahl 2001, cited in Campbell 2006: 14)

1. Introduction

"(South African) Khoisan" languages: 3 distinct families

Khoe-Kwadi (≈ "Central Khoisan")

Kwadi†

Khwe (Caprivi Khwe, ||Ani ...; Ts'ixa ?)

Shua (Cara, Deti†, |Xaise, Danisi ...)

Tshwa (Kua, ...)

Naro

G||ana (G|ui, G||ana)

Namibian Standard Khoekhoe

(Nama-Damara, Hai||om, †Aakhoe)

!Ora-Xiri (†)

Eini†

Cape Khoekhoe†

Kx'a (≈ "Northern Khoisan")

Ju (NW !Xun, Ju|'hoan, ...)

‡'Amkoe (N!aqriaxe, †Hoan, Sasi)

Tuu ("Southern Khoisan")

Taa (West !Xoon, East !Xoon, ...)

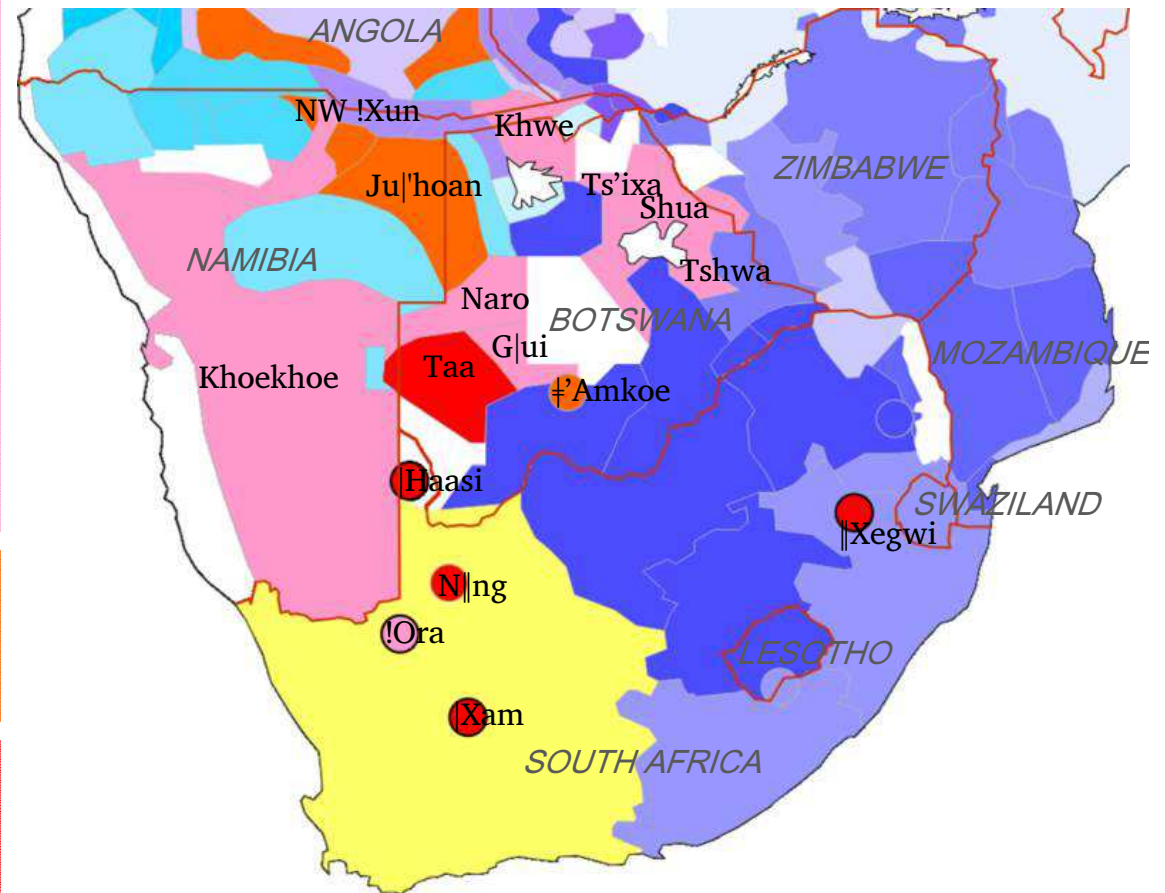
Lower Nossob† (||Haasi, |'Auni)

N||ng (= N|uu, †Khomani, ...)

|Xam† (Strandberg, Achterveld, ...)

‡Ungkue †

||Xegwi†

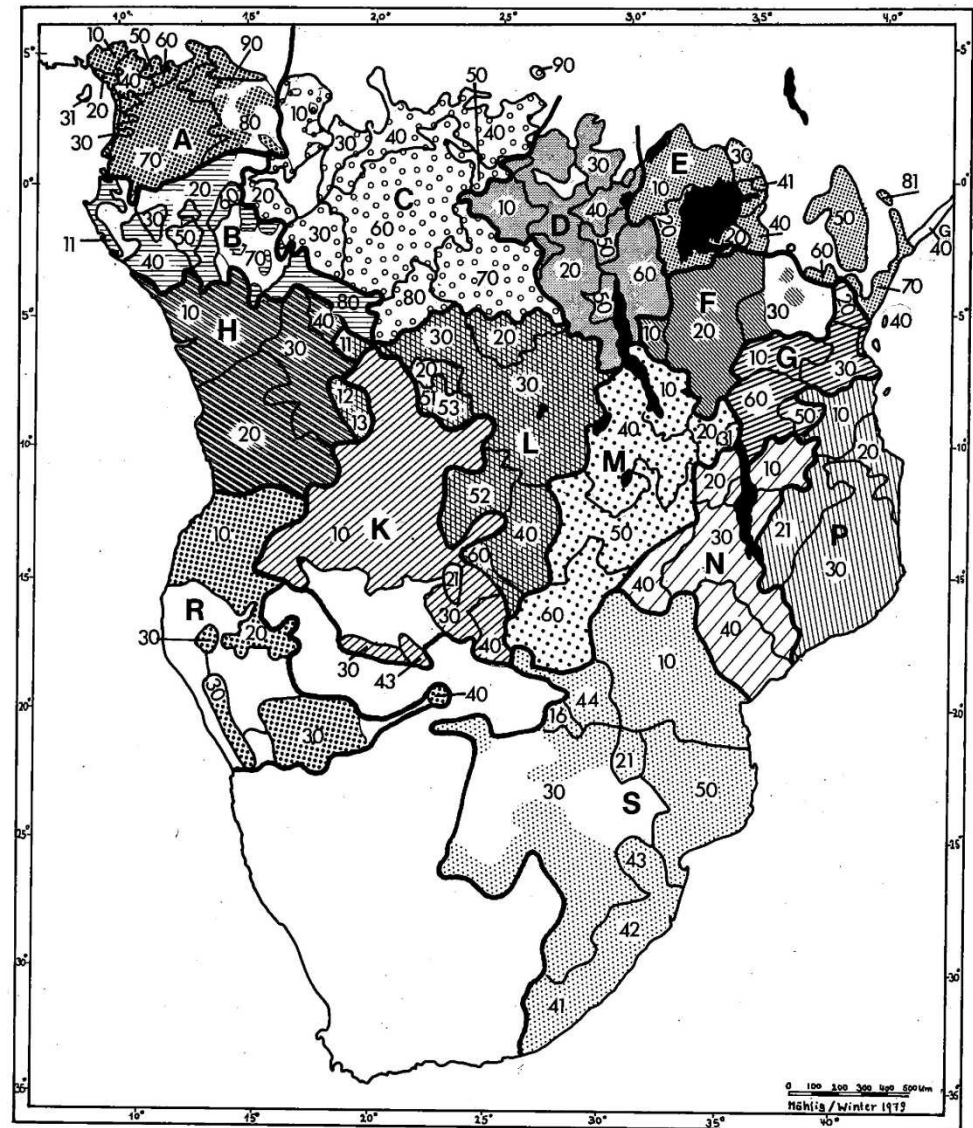


1. Introduction

No accepted genealogical classification of Bantu languages

The referential system by Guthrie (1967-71) (revised by Maho 2009)

- geographic zones: A - S
- local groupings, e.g. A10, S40
- individual languages, e.g.
 - Ewondo A.72
 - Bulu A.74
 - Fang A.75(1)
 - Lingala C.30b
 - Kinyarwanda D.61
 - Kirundi D.62
 - Luganda E.15
 - Gikuyu E.51
 - Kamba E.55
 - Sukuma F.21
 - Swahili G.42-43
 - Kikongo H.14-16
 - Kimbundu H.21
 - Chokwe K.11
 - Luba-Kasai L.31
 - Chichewa N.31
 - Tonga (Zambia) M.64
 - Makhuwa P.31
 - Umbundu R.11
 - Ovambo R.21-24
 - Herero R.31
 - **Shona S.11-15**
 - **Tswana S.31**
 - **N. Sotho S.32**
 - **S. Sotho S.33**
 - **Xhosa S.41**
 - **Zulu S.42**



1. Introduction

No accepted genealogical classification of Bantu languages

E.g.

Hinnebusch (1989: 458,
citing Heine, Hoff & Vossen
1977)

Bantu

I. Tiv

...

VIII. Kongo Branch

1. Upper Kongo Group

...

8. East Highlands Group

...

u. Shona Subgroup [S10]

v. Rue [Sena, N.40?]

w. Venda [S20]

x. Tsonga Subgroup [S50]

y. Inhambane Subgroup [S60]

z. Sotho-Zulu Subgroup
[S30 + S40]

Nurse & Philippson (2003):
Intermediate Bantu groupings
(preliminary proposal)

Bantu

?A11-4, A20-30 less A31

...

K10-30 less K31, L10-50-60,
H21, R

...

...

S10

S20-30-40-?S50-?S60, P30

cf. Hammarström et al.
(2014)

Narrow Bantu

[1.] Ababuan

...

[6.] East Bantu

• Botatwe

...

• **Shona [S10]**

• Southern Bantu-Makua

○ **Chopi [S60]**

○ **Nguni-Tsonga [S30 + S50]**

○ Sotho-Makua-Venda

– **Sotho-Makua**
[**S30 + P30**]

– **Venda [S20]**

1. Introduction

Bantu languages of Southern Africa (local, largely non-controversial genealogical groupings)

(Zone K)

K10: Ngangela, Chokwe, Luchazi, ...

K30: Kwangali, Manyo, Mbukushu, ...

K40: Fwe, Ikuhane (= Subiya), Totela

(Zone R)

R20 (Wambo): Kwanyama, Ndonga, ...

R30 (Herero): Central Herero, Mbanderu, ...

R40 Yeyi

(Zone S)

S10 (Shona): Standard Shona, Ndau, Kalanga, ...

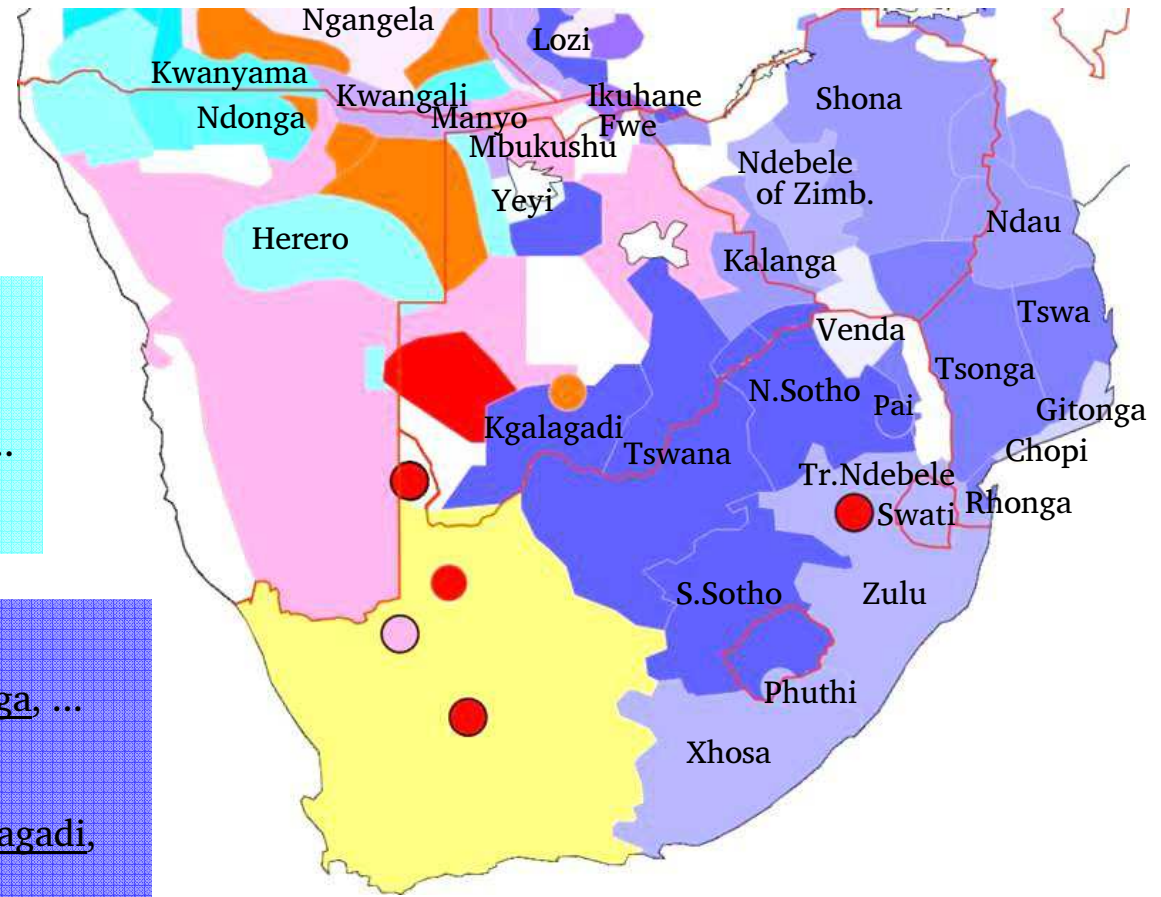
S20 Venda

S30 + K20 (Sotho-Tswana): Tswana, Kgalagadi,
Northern Sotho, Pai, Southern Sotho, Lozi

S40 (Nguni): Xhosa, Zulu, Swati, Phuthi, Transvaal Ndebele, Ndebele of Zimbabwe

?S50 (Tswa-Rhonga): Tswa, Tsonga (= Changana), Rhonga

?S60 (Copi): C(h)opi, Gitonga



1. Introduction

Other languages

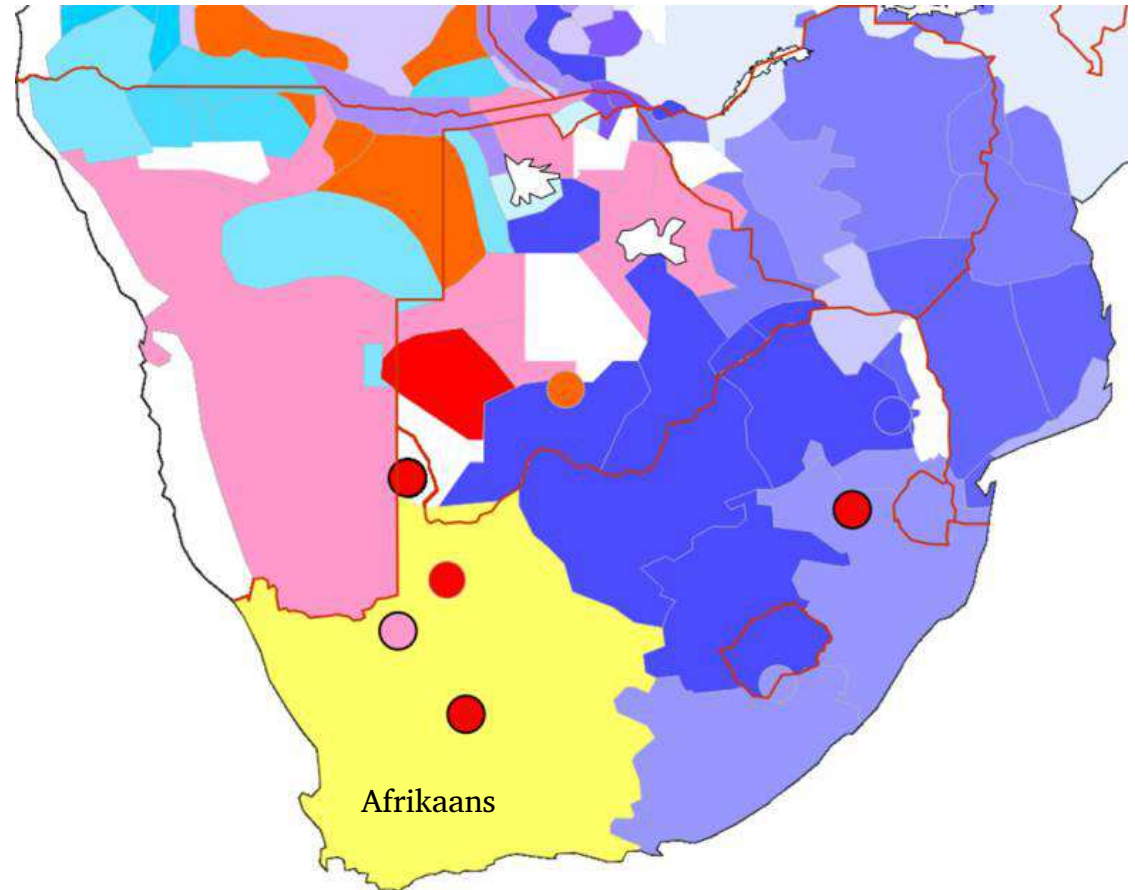
Indo-European
Germanic: Afrikaans

Ignored:

- sign languages
- restructured urban varieties and contact languages
- other Indo-European languages

Notes:

- maps intended as abstraction of majority languages (plus selected minorities and extinct languages)
- Afrikaans also in Namibia (Khoekhoe/
Afrikaans bilingualism)



2. Procedure

- data collection: extraction of phoneme inventories and syllable types from published sources
- language sample: 138 languages
 - aimed at maximal number of documented languages of Southern Africa (cf. above)
 - Sandawe & Hadza (Greenberg's "Khoisan": clicks)
 - 'Southern' Cushitic: Dahalo (clicks), Burunge, Iraqw
 - 3 – 6 languages of different groupings in the remaining Bantu zones (A – P)
 - exemplary languages for other subequatorial and adjacent lineages (Non-Bantu Bantoid [Niger-Kordofanian]; Gbayic, Bandic, Ngbandic, Mbaic, Baka-Mundu, Zandic [Niger-Kordofanian/"Ubangian"]; Lowland East Cushitic [Afroasiatic]; Western, Eastern and Southern Nilotic, Moru-Mangbetu, Kuliak ["Nilo-Saharan"])
- each language: coding of 81 numerical or categorical phonological features, e.g. "number of consonants" (14 – 88) or "whistled obstruents" (0 absent, 1 present)
- value plots for each feature (Hans-Jörg Bibiko, in "R")
- visual inspection: assessment of areally distributed features and recurring areas (of similar distributions) > Kalahari Basin, Southeastern Bantu, and Southern Africa
- for each language, counting how many features are shared with these areas, e.g. "How many of the 15 typical Kalahari features are found in language A, B, C ...?" > listing and histograms
- summary for language groups (cf. handout)

2. Procedure

Phoneme inventories

- special arrangement of consonant charts: affricates and clicks parallel to place of articulation, following the "cluster analysis" of clicks (Nakagawa 2006); e.g. for Taa/West !Xoon below

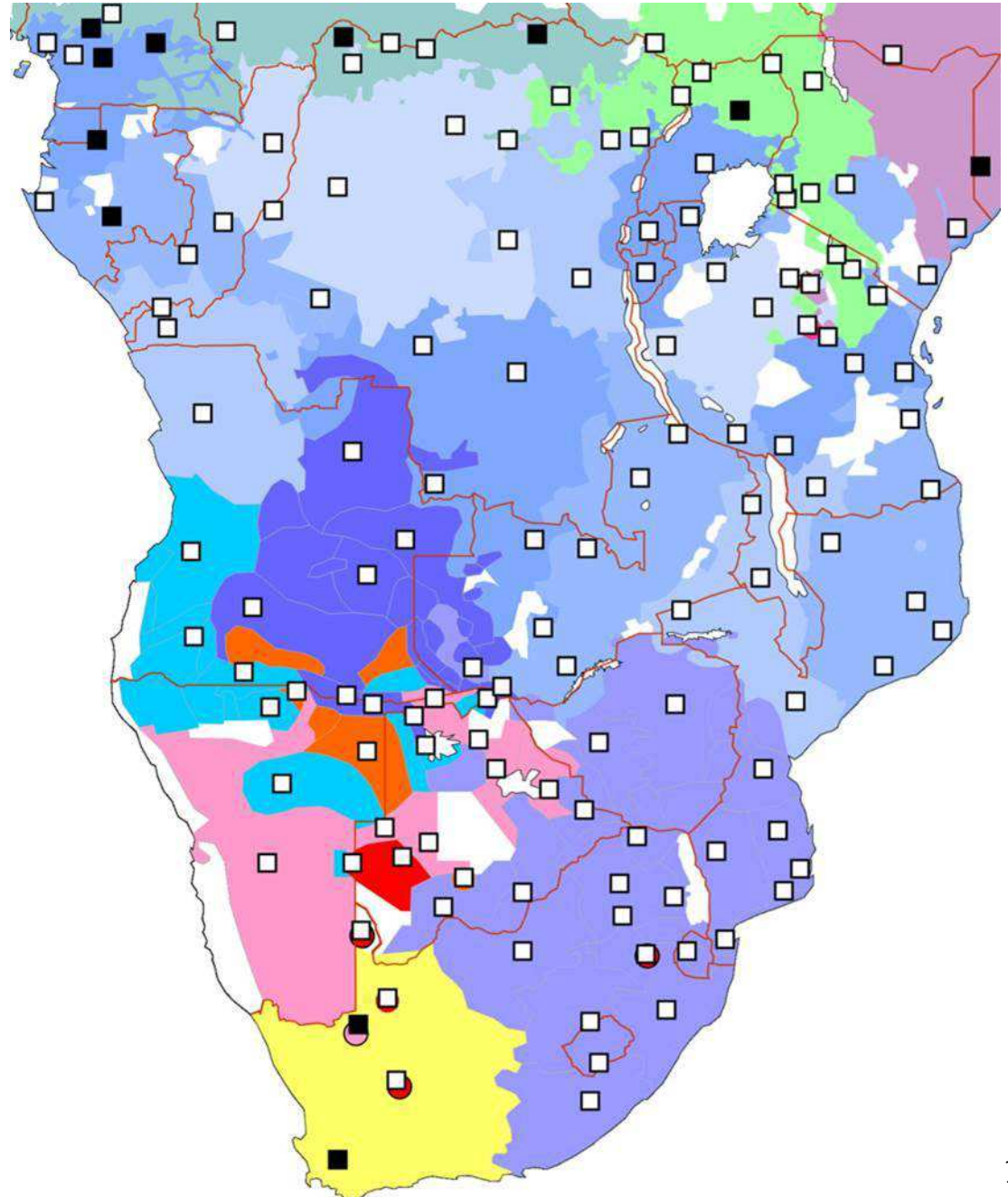
	bilab	lab- dent	dent	alv	alv affr	alv later	retro	p-alv (affr)	pal	vel	lab- vel	uvul	vel/u v affr	phar	glott	ingr bilab	ingr dent	ingr alv	ingr pal	ingr al-lat	other (+ secondary)	
	p	f	t̥	t	ts̥	t̪	t̠	tʃ̥	c	k	k̠p	q	q̠χ̠	ħ	ʔ	⊙		!̥	ǀ̥	ǃ̥	ǂ̥	kʲ, kʷ, tʲ
stop, vls.	p			t	ts					k		q			ʔ	⊙		!	ǀ	ǃ	ǂ	
stop, aspir.	p ^h			t ^h	ts ^h					k ^h		q ^h				⊙ ^h	^h	! ^h	ǀ ^h	ǃ ^h	ǂ ^h	
stop, vd.	b			d	dz					g		G				⊙	↓	!̣	ǀ̣	ǃ̣	ǂ̣	
stop, breathy	b ^h			d ^h	dz ^h					g ^h		G ^h				⊙ ^h	↓ ^h	! ^h	ǀ ^h	ǃ ^h	ǂ ^h	
stop, ejective	p'			t'	ts'					k'		q'	q̠χ'			⊙'	'	!'	ǀ'	ǃ'	ǂ'	
stop, vd. impl.																						
stop, other					dz'					g'		G'	G̠χ'				↓'	!'	ǀ'	ǃ'	ǂ'	
nasal, voiced	m			n					ɲ	ŋ						⊙		!	ǀ	ǃ	ǂ	
nasal, voiceless																	↓	!	ǀ	ǃ	ǂ	
nasal, other	'm			'n												'⊙	'	'!	'ǀ	'ǃ	'ǂ	
fricative, vls.		f		s								χ			h							
fricative, vd.																						
fricative, other																						
lateral approx.				(l)																		
lat. approx., vls																						
lateral, other																						
tap or flap				r																		
trill, voiced																						
intermittent, other																						
approximant	w ?								j													

2. Procedure

Example

Presence (■) vs. absence (□)
of non-open central vowels
(e.g. ə, ɨ, ɘ)

- > areal distribution
- > not very important for
subequatorial Africa



3. Results: Kalahari Basin

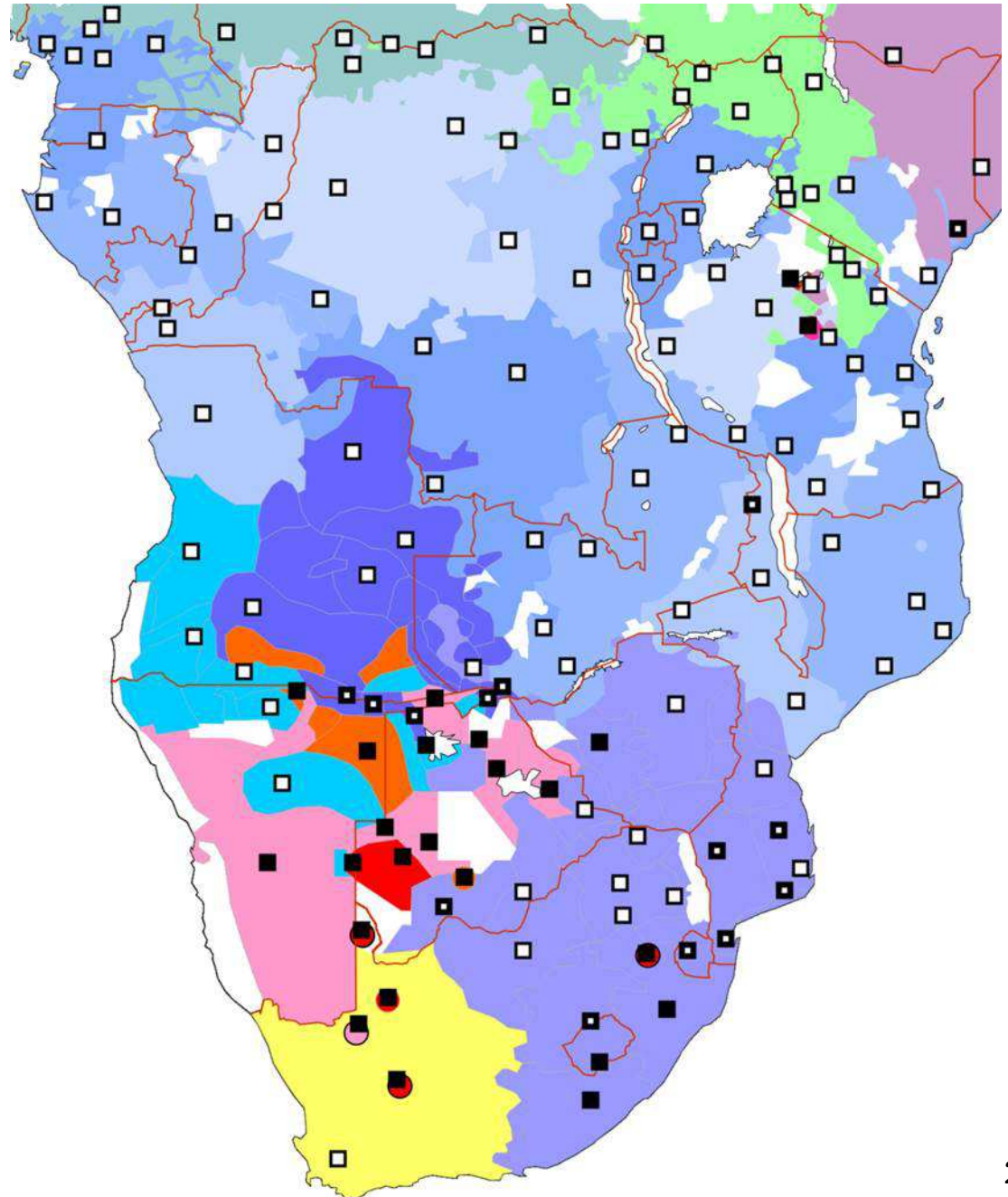
Kalahari Basin

> 5 clicks

significant click inventories

Presence of clicks

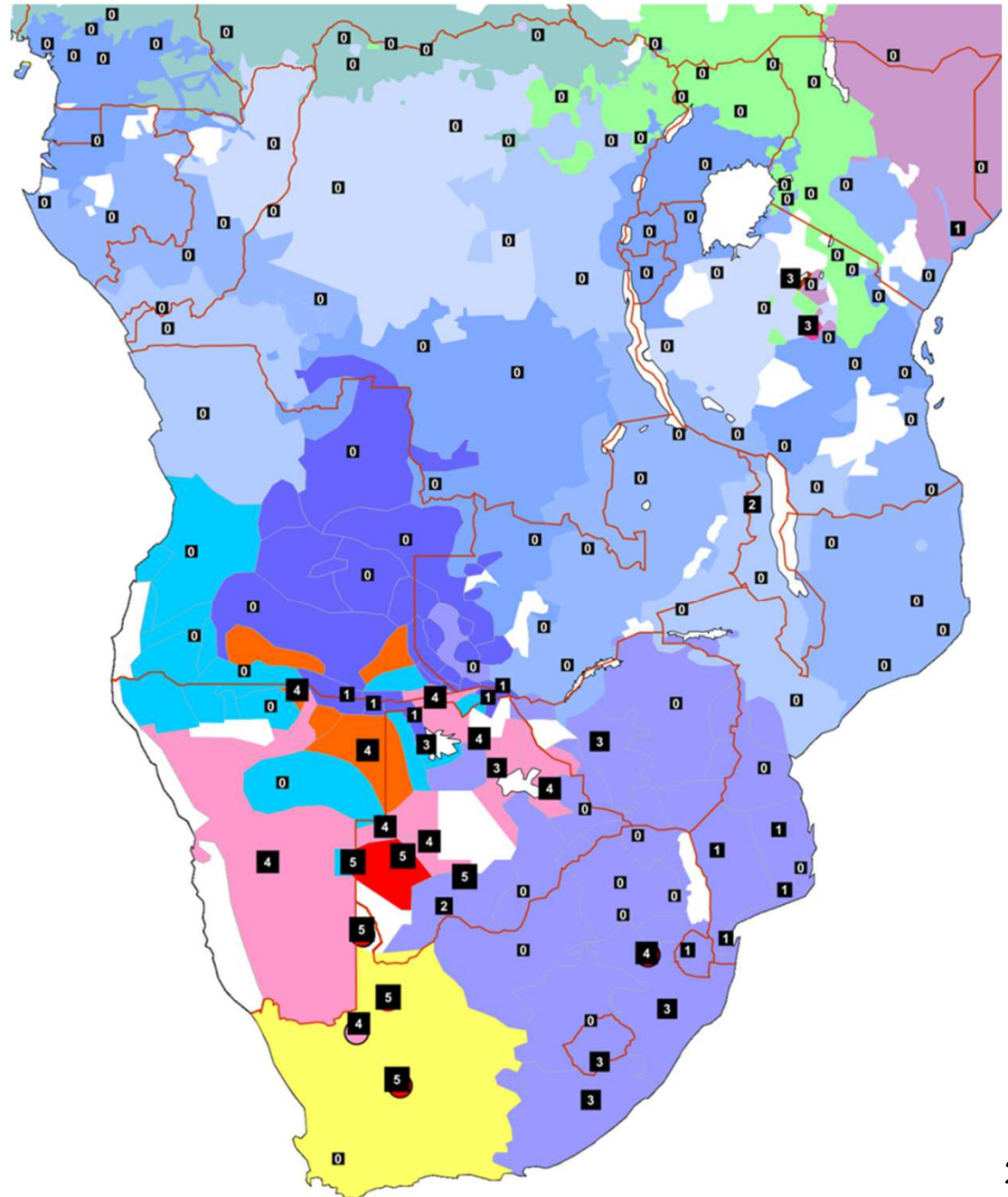
- 0
- ◻ 1-5
- > 5



3. Results: Kalahari Basin

> 3 click types
more than three basic click types,
e.g. ʘ, |, !, †, ||

Number of basic click types:
0 - 5



3. Results: Kalahari Basin

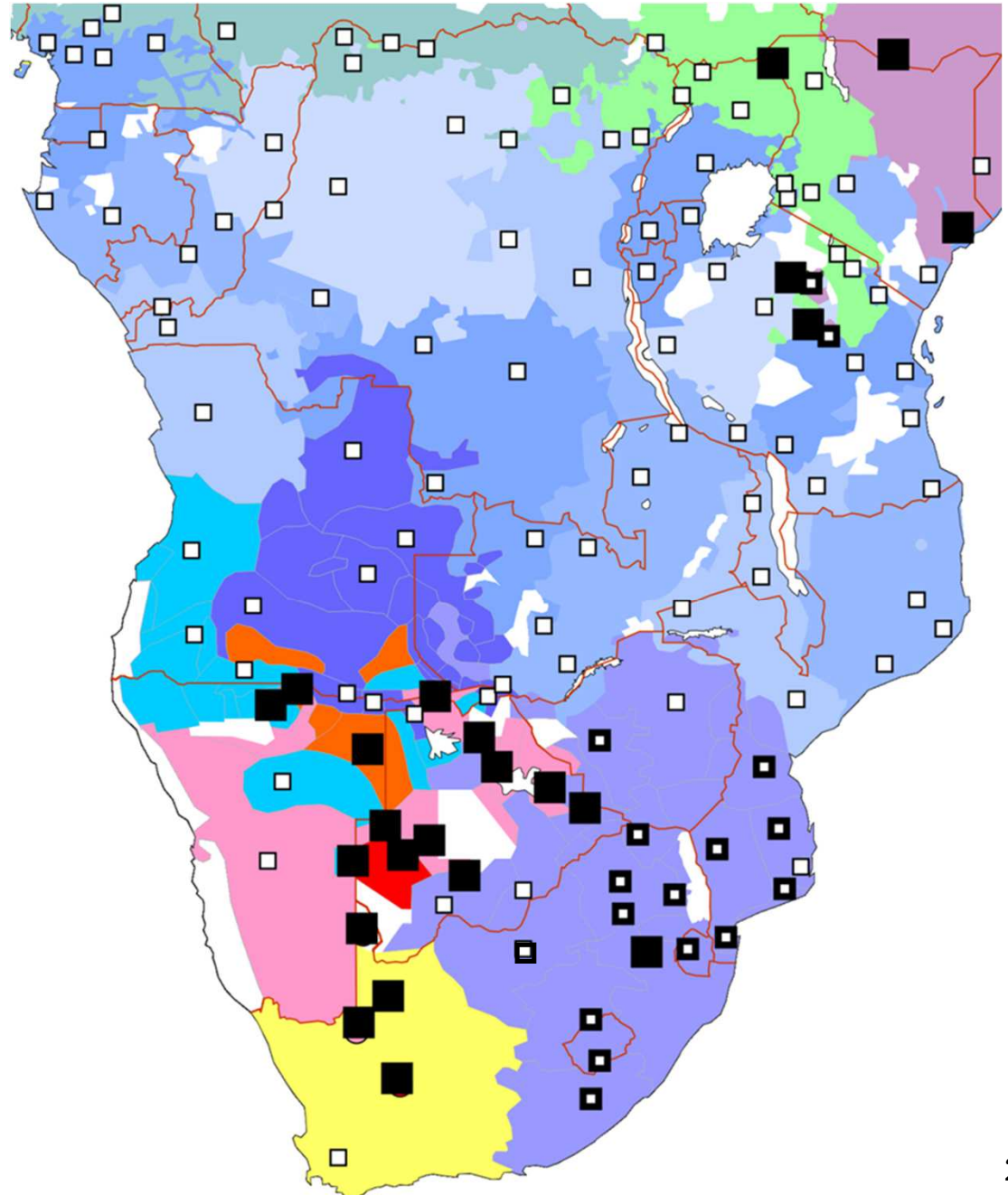
/ejectives/

presence of ejective obstruents
contrastive with plain series,

e.g. /k' / : /k /

Presence of ejective obstruents

- no ejectives
- non-contrastive with plain stops
- contrastive with plain stops



3. Results: Kalahari Basin

Vn

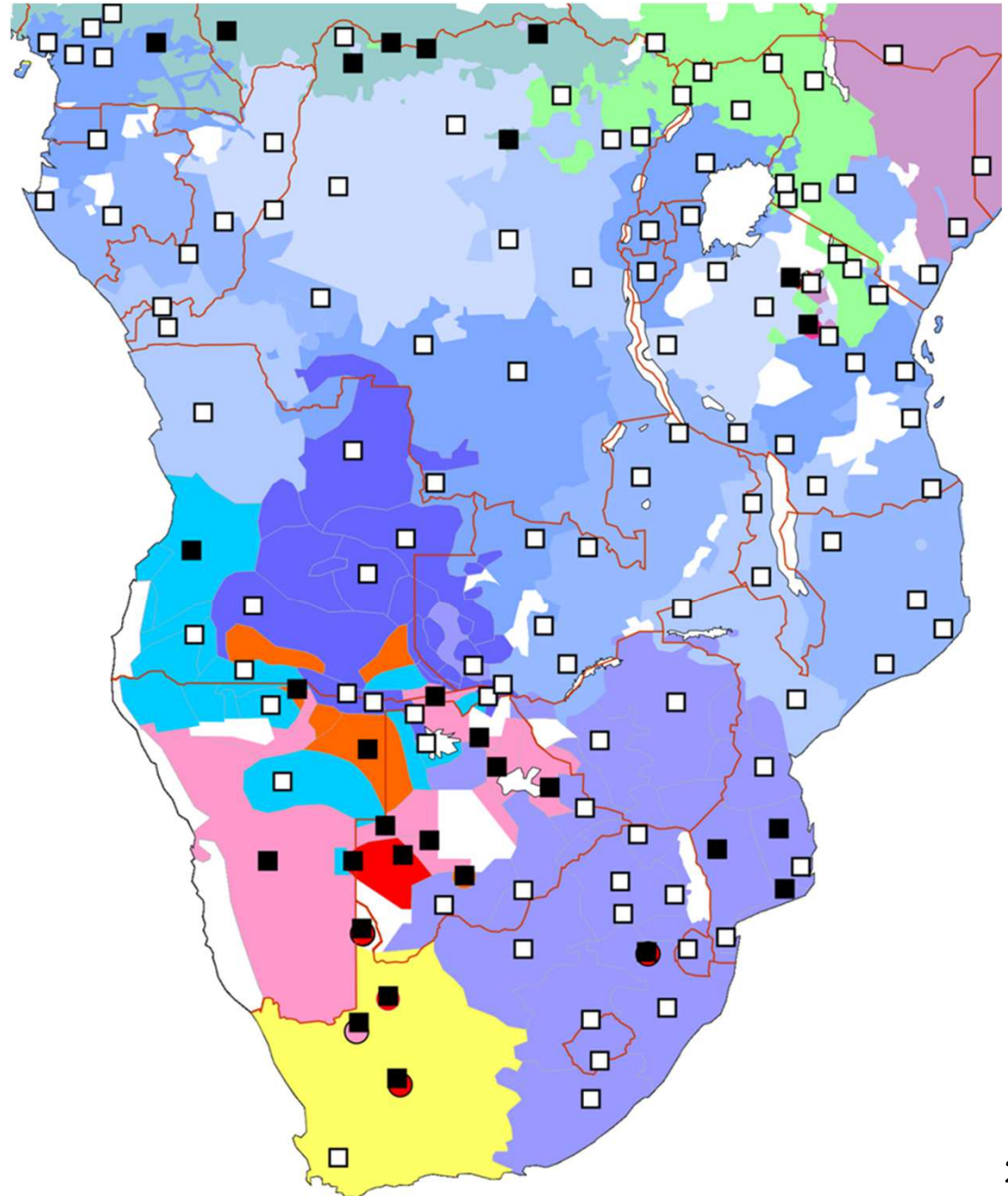
presence of nasalized vowels

e.g. /ã/ (:/a/)

Presence of nasalized vowels

□ 0

■ > 0



3. Results: Kalahari Basin

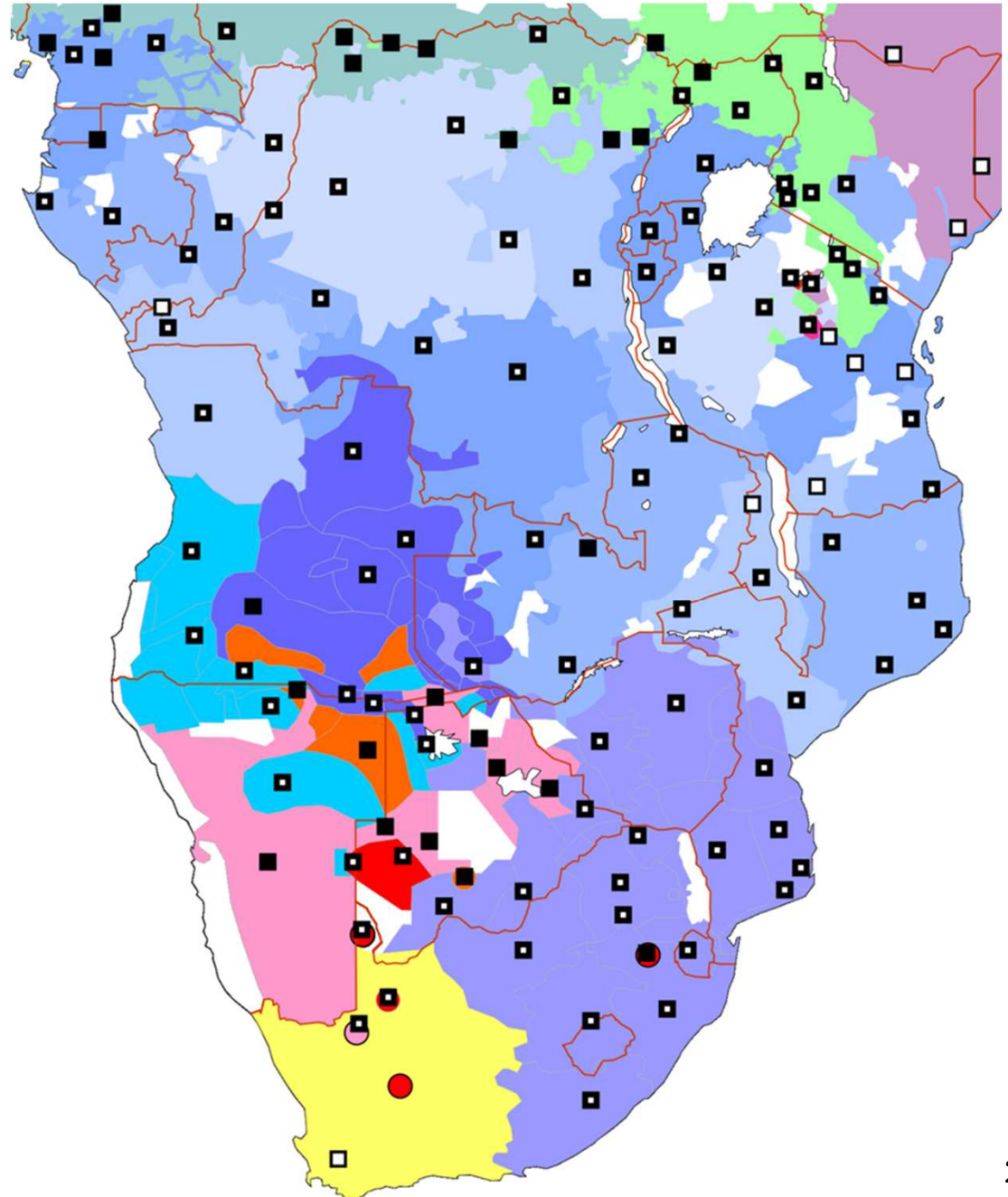
> 2 tones

presence of complex tone systems
including more than 2 tone
levels,

e.g. high : mid : low

Number of distinctive tone levels

- non-tonal
- ◻ 2 tone levels
- > 2 tone levels



3. Results: Kalahari Basin

Kalahari Basin ("South African Khoisan"): 15 (13) typical features

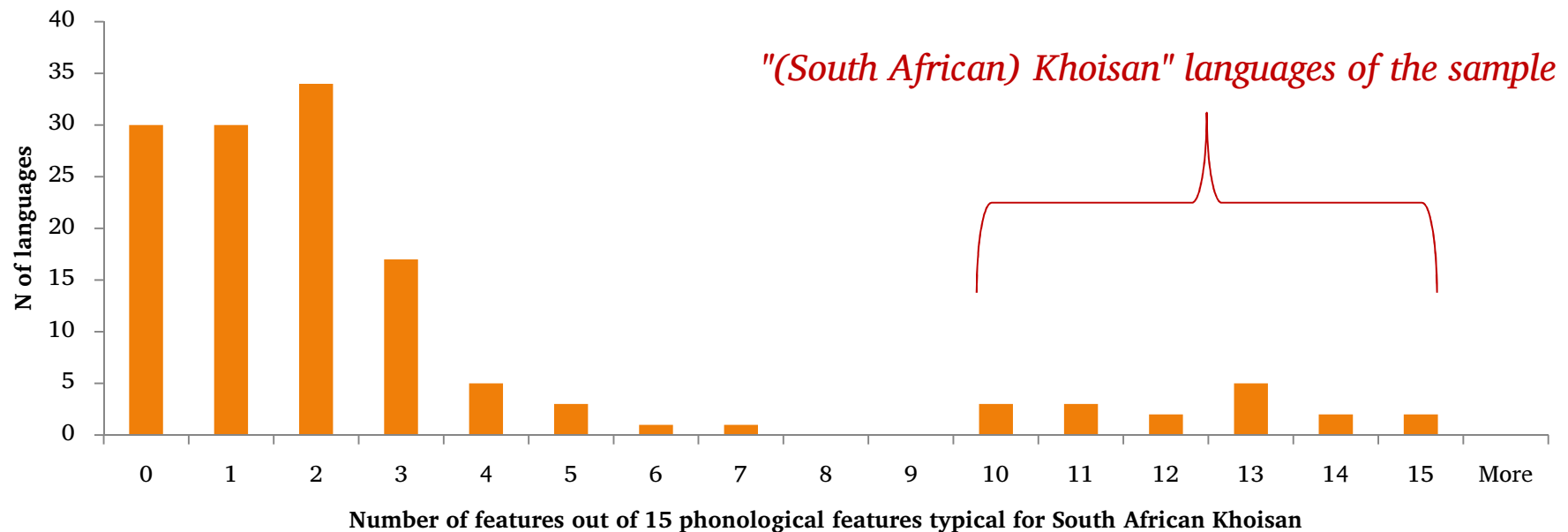
- >5 clicks: significant inventory of clicks
- >3 click types: more than three basic click types, e.g. ⊙ , $|$, $!$, \ddagger , \parallel
- /ejectives/: presence of ejective obstruents contrastive with plain series, e.g. $/k'/$: $/k/$
- Vn: presence of nasalized vowels, e.g. $/\tilde{a}/$ (:/a/)
- >2 tones: presence of complex tone systems including more than 2 tone levels, e.g. H : M : L
- KX: presence of dorsal (velar or uvular) affricates, e.g. \widehat{kx} , $\widehat{q\chi'}$, $\widehat{k\chi'}$
- uvulars: presence of uvular obstruents, e.g. q , g , χ , $\widehat{q\chi'}$
- TK onsets: presence of coronal-dorsal syllable onsets (ignoring plain clicks), e.g. \widehat{tk} , $s + k$, $\widehat{ts} + x$, $ts' + \chi$
- no voiced frics: absence of voiced fricatives, e.g. $/s/$, $/\text{ʃ}/$, but $*/z/$
- 1 sibilant: presence of one sibilant (place of articulation) only, e.g. $/s/$ but $*/\text{ʃ}/$
- R, no L: presence of intermittents (taps, flaps, trills) and absence of lateral approximants
- Vqh: presence of non-modal or pharyngealized vowels, e.g. $/a^{\text{h}}/$, $/\text{a}^{\text{h}}/$, $/\text{a}^{\text{h}}/$
- N coda: exclusively nasals allowed in syllable codas (C(C)V(N) syllable structure)
- no NC: absence of nasal + obstruent syllable onsets, e.g. $*NCV$ and $*\widehat{NCV}$
- no C + w: absence of obstruent + $/w/$ onset clusters

3. Results: Kalahari Basin

Kalahari Basin: Features by language

- ideal phonological area: clear boundaries (not fuzzy)
- all "Khoisan" languages show at least 10 out of 15 typical phonological features, no other language has more than 7 > bimodal distribution, discrete boundary

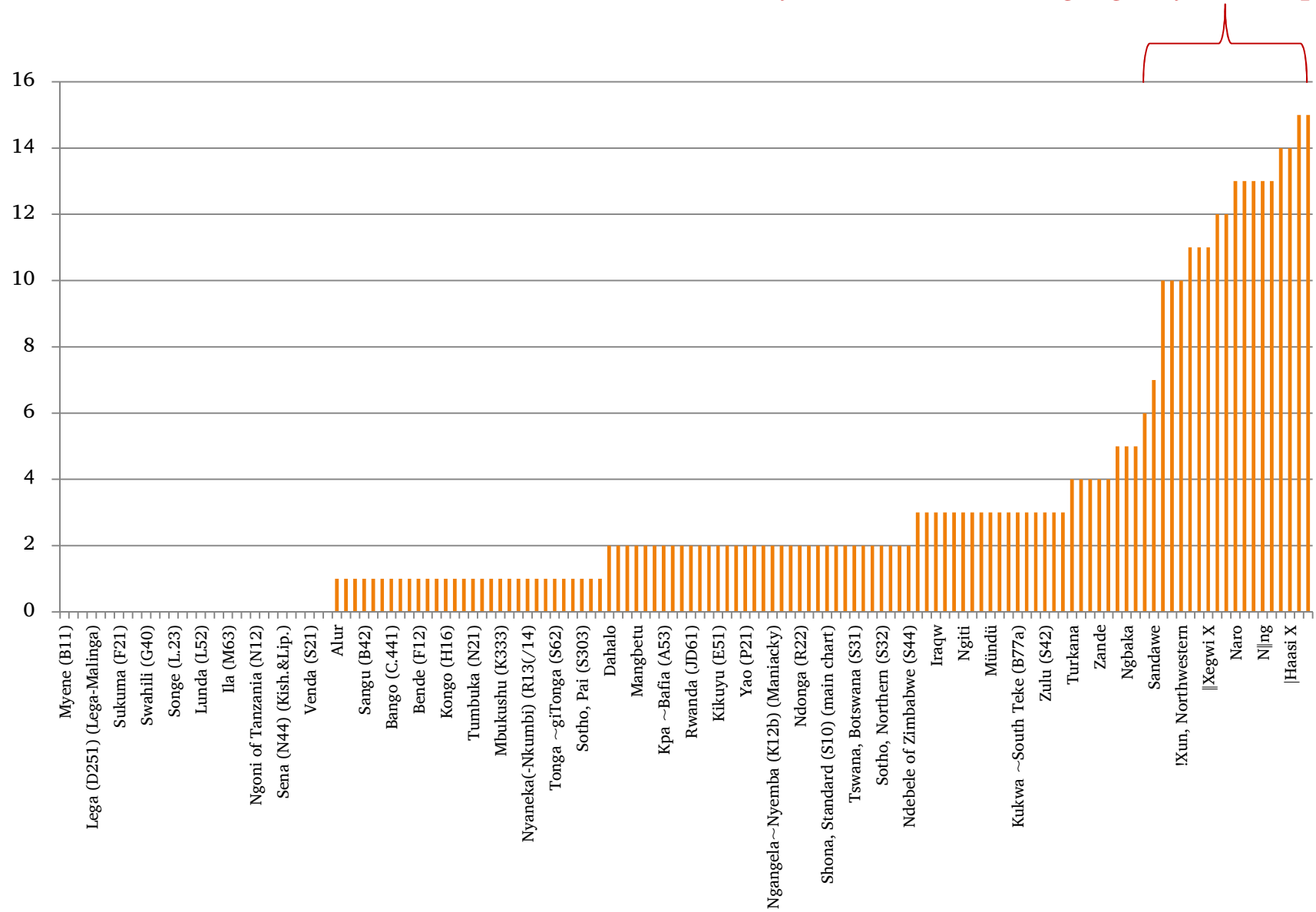
Histogram



3. Results: Kalahari Basin

Features by language

"(South African) Khoisan" languages of the sample



3. Results: Kalahari Basin

Features by language group

group	>5 clicks	>3 click types	KX	uvulars	/eject- ives/	TK onsets	N coda	Vn	Vqh	>2 tones	R, no L	no voiced frics	1 sibilant	no NC	no C+w
Cushitic, other (2)	0	0	0	0.5	0.5	0	0	0	0	0	0	0	0	1	1
Nilotic (6)	0	0	0	0	0	0	0	0	0.167	0	0	0.83	0.83	0.67	0.167
Kuliak (1)	0	0	0	0	1	0	0	0	1	0	1	0	1	1	0
Moru-Mangbetu (3)	0	0	0	0	0	0	0	0	0	0.67	0	0	1	0	1
"Ubangian" (8)	0	0	0	0	0	0	0	0.75	0	0.75	0.125	0	0.75	0.125	0.625
N-Bantu Bantoid (1)	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
Bantu A-R, other (68)	0	0	0	0	0.013	0.016	0.05	0.013	0.016	0.1	0.13	0.14	0.41	0.06	0.05
Germanic (1)	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0
'South' Cushitic (3)	0	0	0.33	0.33	0.33	0	0	0	0.33	0	0	0.33	0.33	0.67	1
Sandawe, Hadza (2)	1	0	0	0	1	0	0	1	0.5	0	0	0.5	0.5	0.5	0.5
Bantu K30 (3)	0	0	0	0.33	0	0	0	0	0	0	0.67	0	0.33	0	0
Bantu R40 (1)	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Bantu S10 (3)	0	0	0	0	0.33	0.67	0	0	0	0	0.67	0	0	0	0
Bantu S20 (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bantu S60 (2)	0	0	0	0	0	0	0	0.5	0	0	0	0.5	0.5	0	0
Bantu S50 (3)	0	0	0	0	0	0	0	0.67	0	0	0	0	0	0	0
Bantu S30,K21 (7)	0	0	0.43	0.43	0	0	0	0	0	0	0	0	0	0.71	0
Bantu S40 (6)	0.67	0	0.83	0	0	0	0	0	0	0	0	0.5	0	0	0
Khoe-Kwadi (8)	1	0.875	0.625	0.5	0.875	0.75	1	1	0.25	0.875	0.75	0.875	1	0.5	0.875
Kx'a (3)	1	1	1	0.67	1	1	1	1	1	1	0.67	0.33	0.67	0.67	0.67
Tuu (6)	1	1	1	0.83	1	1	1	1	1	0.2	0.67	0.67	0.83	1	0.83
<i>0: wrong/no; <0.26 infrequent, 0.26 - 0.74 common, >0.74 very frequent; 1: true/yes</i>															
average of area	1.00	0.96	0.88	0.67	0.96	0.92	1.00	1.00	0.75	0.69	0.70	0.63	0.83	0.72	0.79
average of languages outside	0.15	0.00	0.09	0.09	0.23	0.09	0.00	0.16	0.11	0.14	0.14	0.16	0.37	0.37	0.24
difference	0.85	0.96	0.79	0.58	0.73	0.82	1.00	0.84	0.64	0.55	0.55	0.47	0.46	0.35	0.55

4. Results: Southeastern Bantu

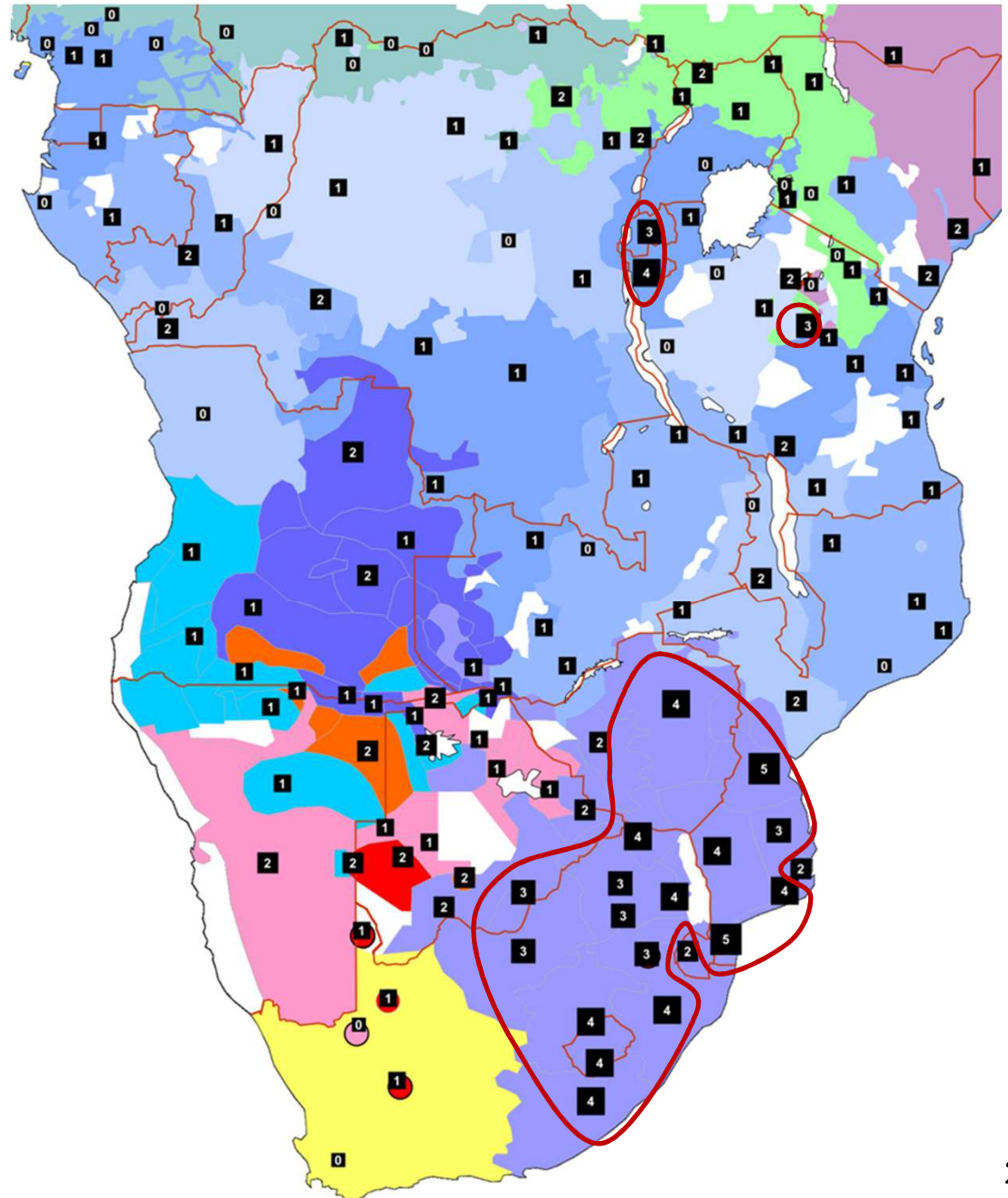
Southeastern Bantu

> 2 affricated series

more than two series of affricates,
e.g. \overline{ts} , $\overline{tʃ}$, \overline{pf} (:t, f)

*Number of affricated series
paradigmatic to non-affricated stops in
at least one series (ts/dz :t, tʃ/dʒ :t,
pf/bv :p, kx, qχ, tʰ)*

0 - 5



4. Results: Southeastern Bantu

TL

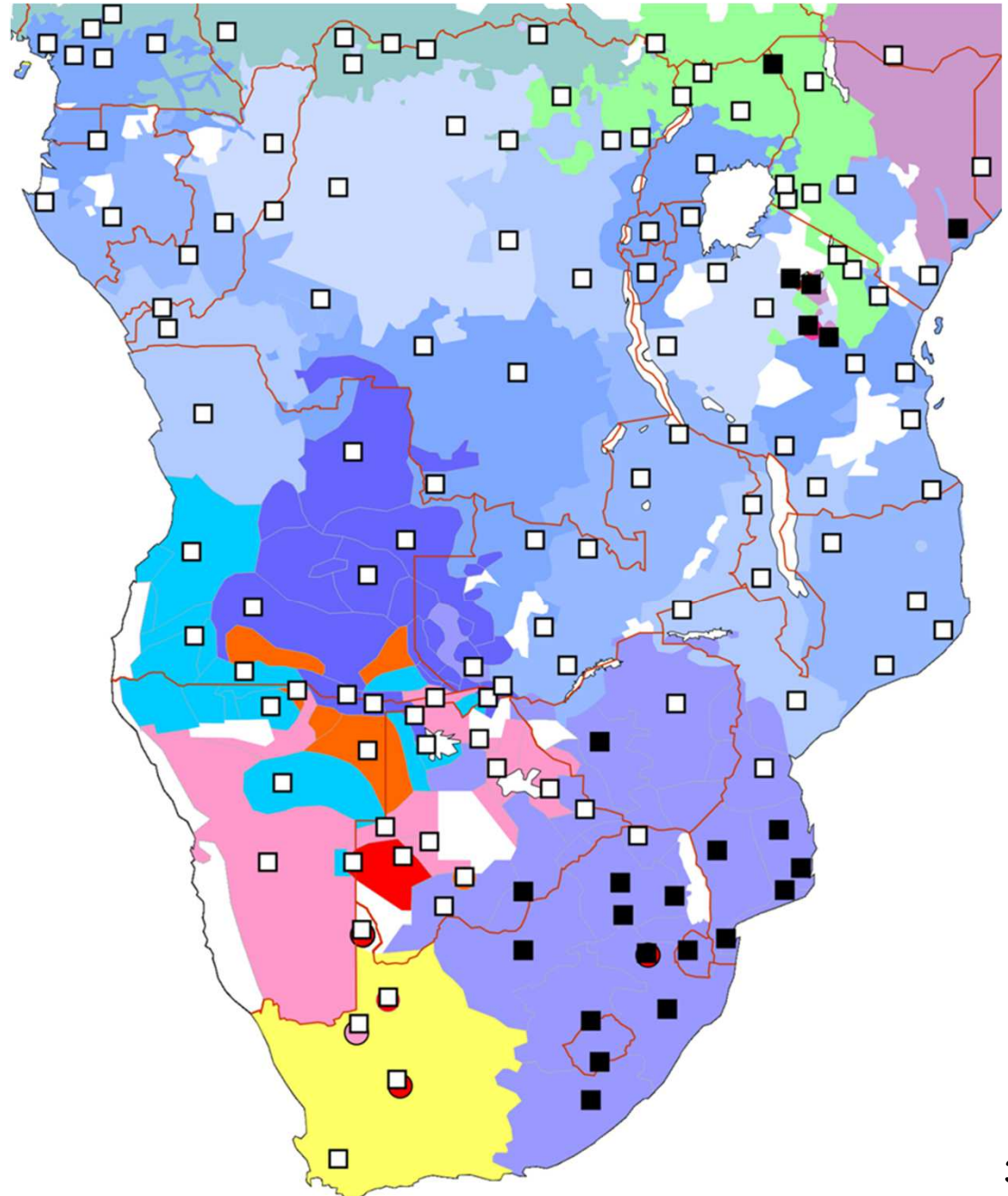
presence of lateral obstruents,
 e.g. $\widehat{t\ell}$, $\widehat{t\ell}$, ℓ , ℓ

*Number of obstruents with lateral
 airstreams (ℓ , $t\ell$, $t\ell$, ℓ), (excluding
 lateral clicks, lateral approximants)*

□ 0
 ■ > 1

e.g.

Dahalo (Cushitic)	/ ℓ , $t\ell$ /
Iraqw (Cushitic)	/ ℓ , $t\ell$ /
Sandawe (isolated)	/ ℓ , $\widehat{t\ell}$, $\widehat{t\ell}$, $\widehat{d\ell}$ /
Tswana (S31)	/ $\widehat{t\ell}$, $\widehat{t\ell}^h$ /
N.Sotho (S32)	/ ℓ , $\widehat{t\ell}^h$, $\widehat{t\ell}$ /
Chopi (S61)	/ ℓ , $\widehat{t\ell}$ ('), $\widehat{t\ell}^h$, $\widehat{d\ell}$ /
Tsonga (S53)	/ ℓ , ℓ , $\widehat{t\ell}$, $\widehat{t\ell}^h$, $\widehat{d\ell}$, $\widehat{d\ell}$ /
Xegwi (Tuu)	/ ℓ , ℓ , $\widehat{k\ell}$, $\widehat{k\ell}^h$, $\widehat{k\ell}$ /
Zulu (S42)	/ ℓ , ℓ , $(\widehat{k\ell})$ /

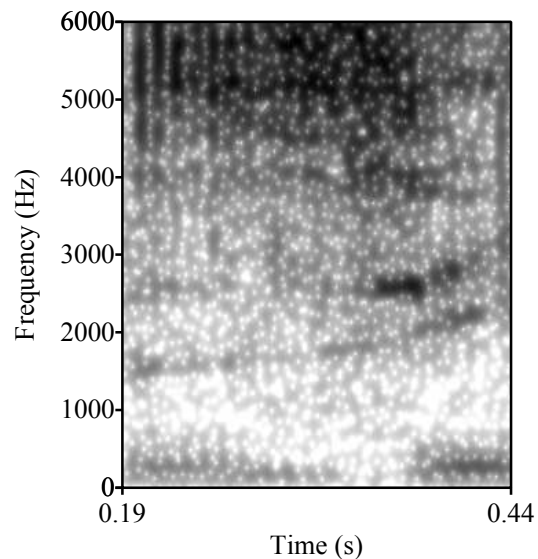
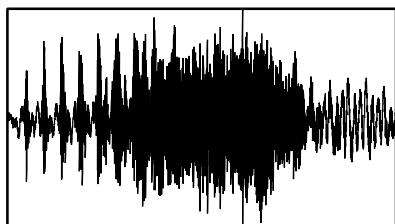


4. Results: Southeastern Bantu

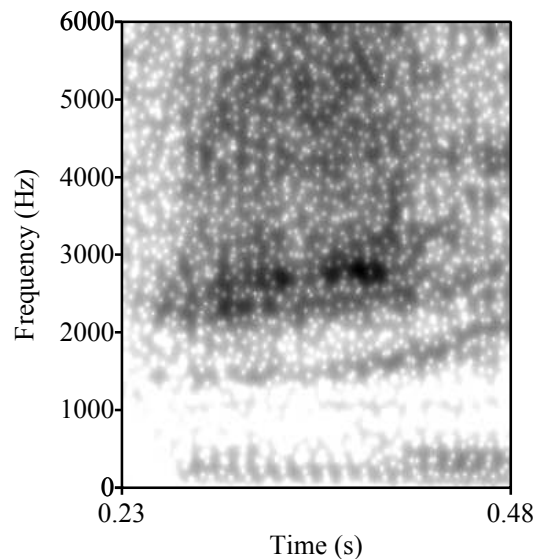
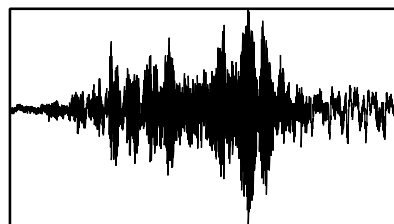
whistled obstruents (simple [non-velarized] labialized sibilants and affricates, e.g. s^v , z^v , \widehat{ts}^v)

Shona (Zimbabwe): /z/ : /z^v/ : /ʒ/ (:/z + w/)

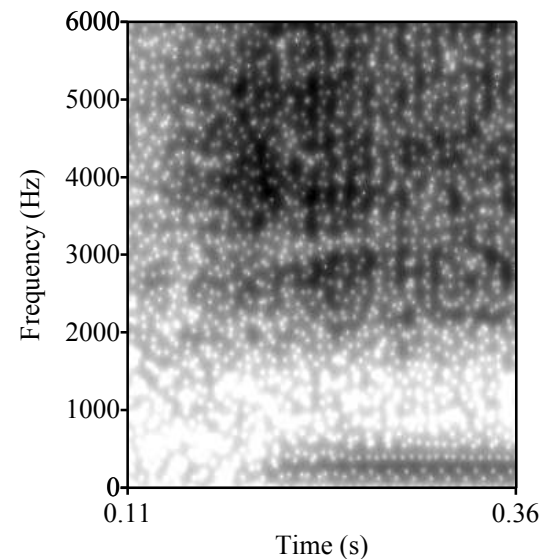
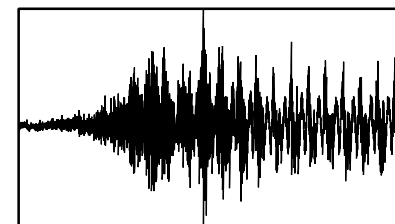
[z i]
aus: /zino/
'tooth'



[z^v i]
/z^vino/
'now'



[ʒ i]
/ʒiʒa/
'rainy season'



4. Results: Southeastern Bantu

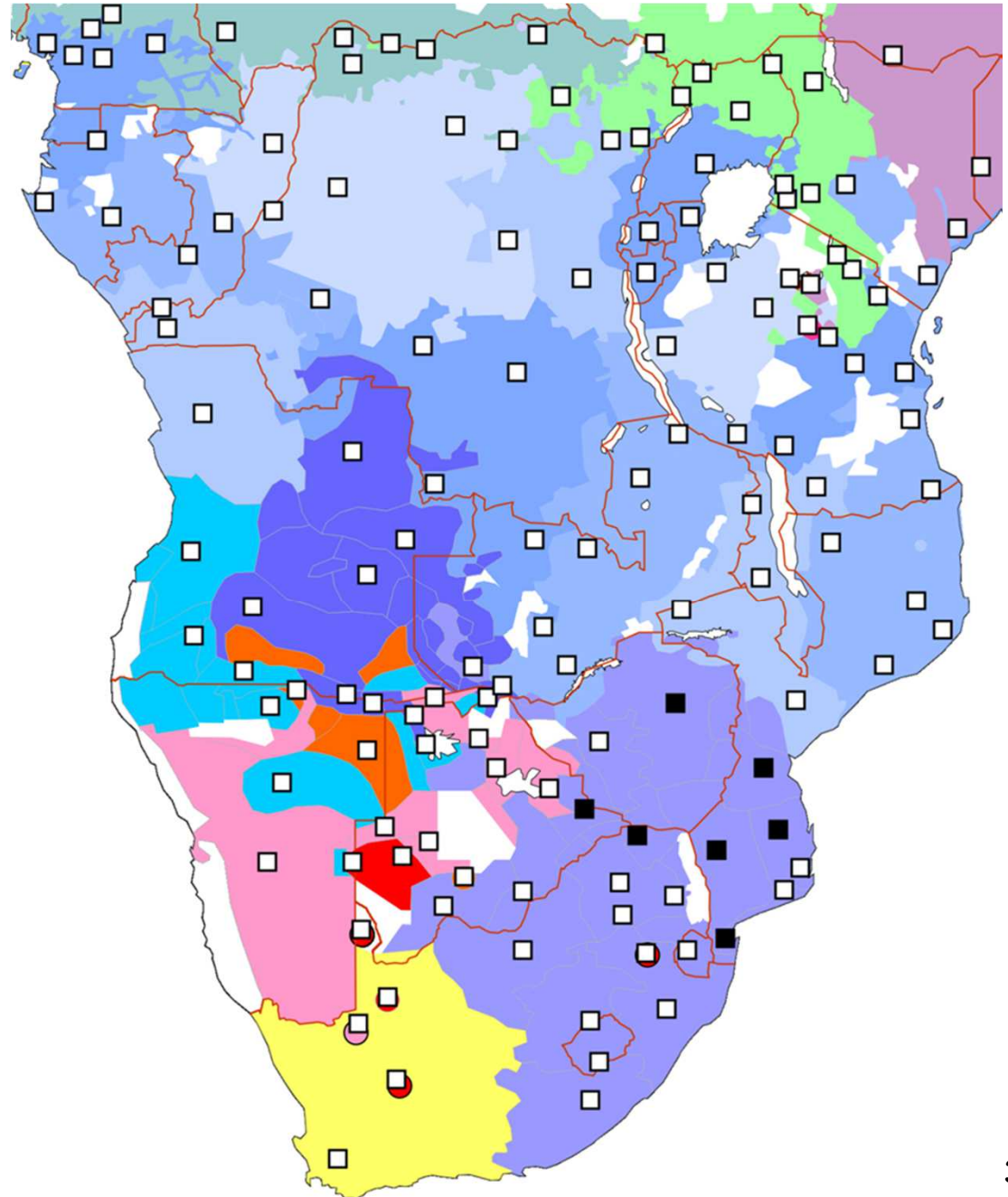
whistled obstruents

presence of whistled fricatives
and affricates, e.g. s^v , z^v , $\widehat{ts^v}$

*Presence of whistled
fricatives/affricates*

□ 0

■ > 1



4. Results: Southeastern Bantu

ph:f

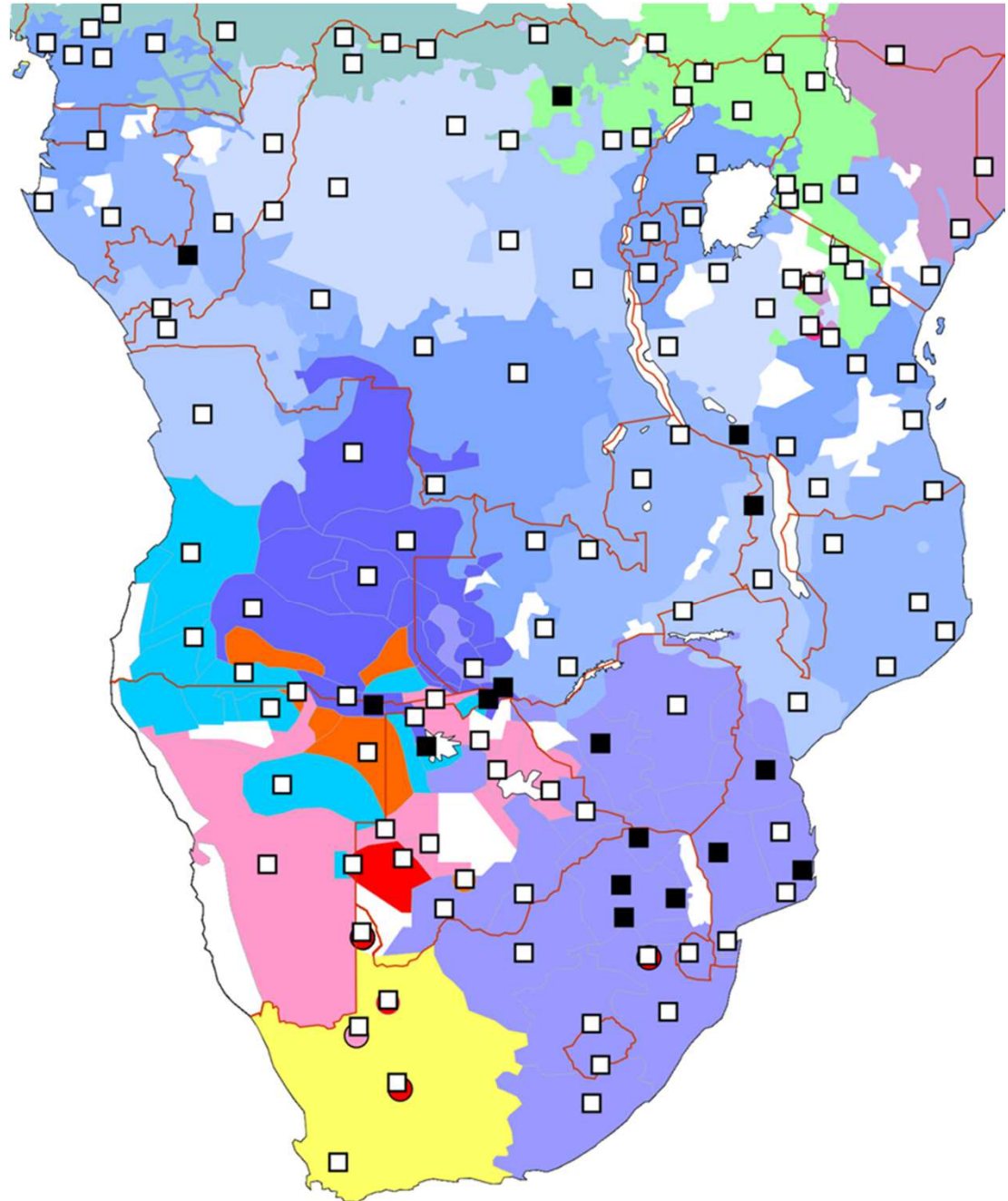
contrast between bilabial and
labio-dental continuants,

e.g. / ϕ :/:/f/, /m:/:/m̥/, / β :/:/v/
(excluding p:pf, mp:mf, etc.)

*Presence of bilabial continuants
contrastive with labio-dental
counterparts*

□ 0

■ > 0



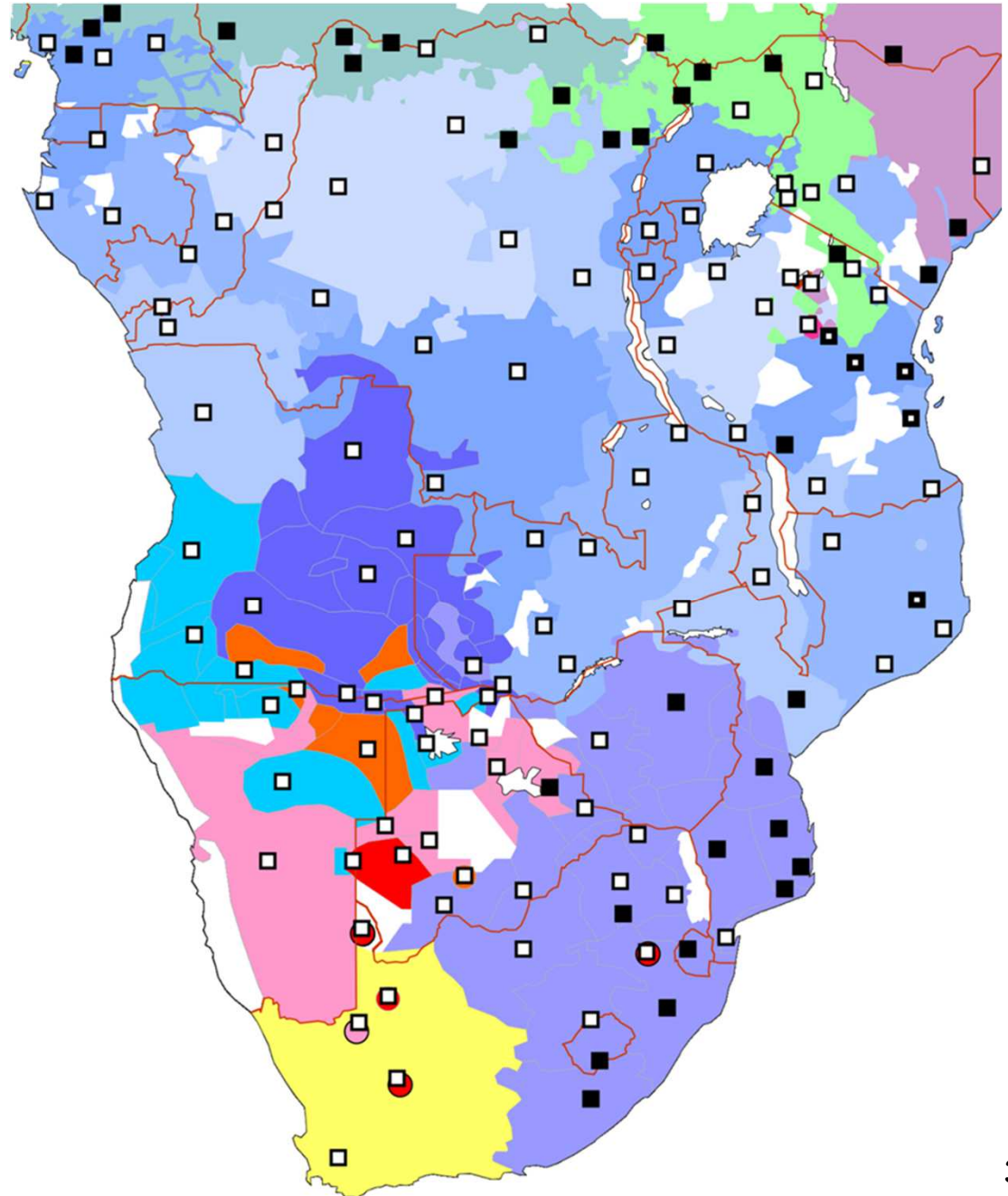
4. Results: Southeastern Bantu

implosives

presence of implosives,
e.g. /ɓ/ or /b/ [ɓ]

Presence of implosives

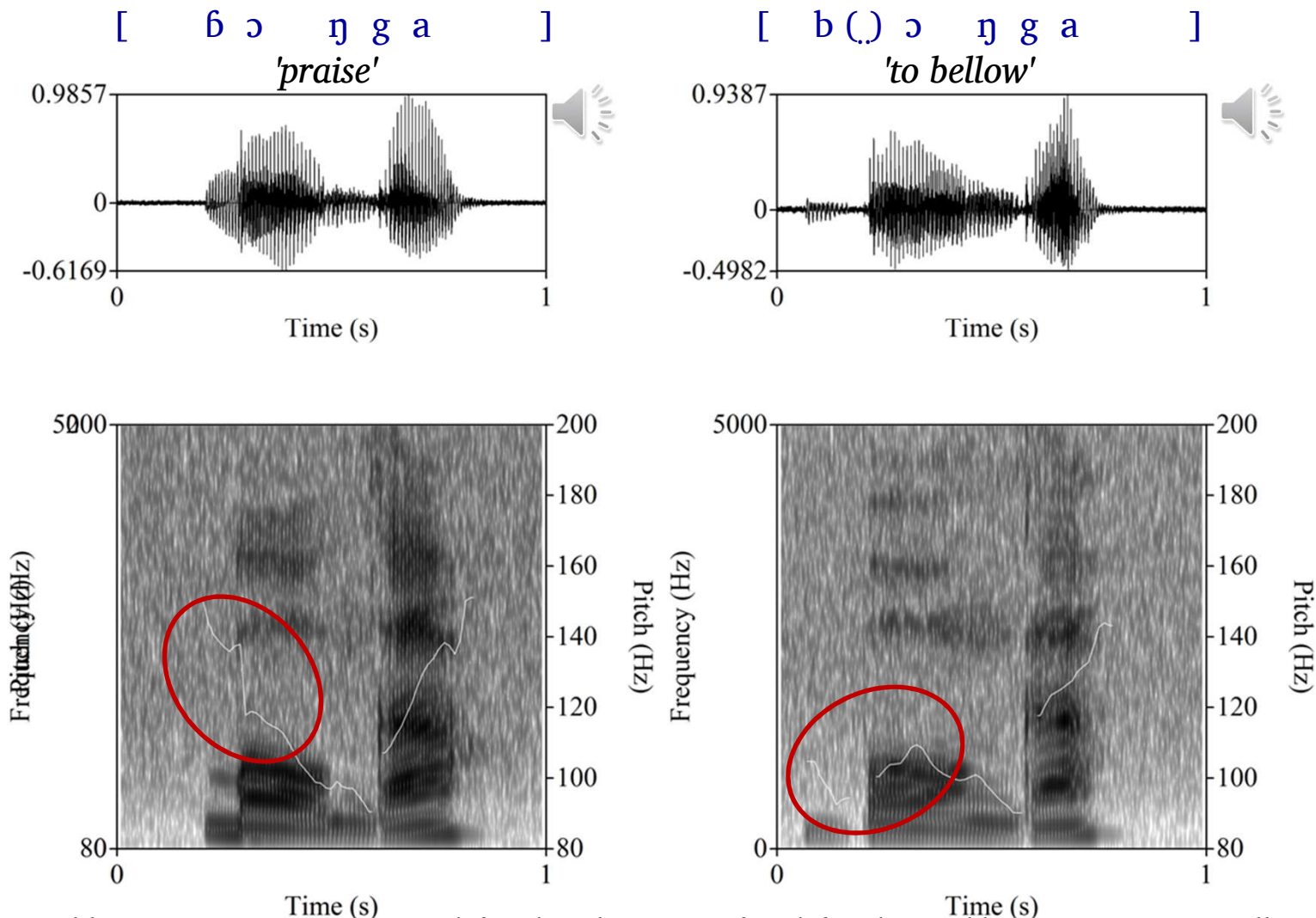
- no observed implosives
- ◻ non-contrastive with voiced stops
- contrastive with voiced stops



4. Results: Southeastern Bantu

Slack voiced stops

slack voice: slightly increased glottal aperture and flow (less than for breathy voice), F0 depression
e.g. Xhosa: voiced implosive /b/ vs. slack voiced /b̥/ (Nguni: main acoustic cue is F0 depression)



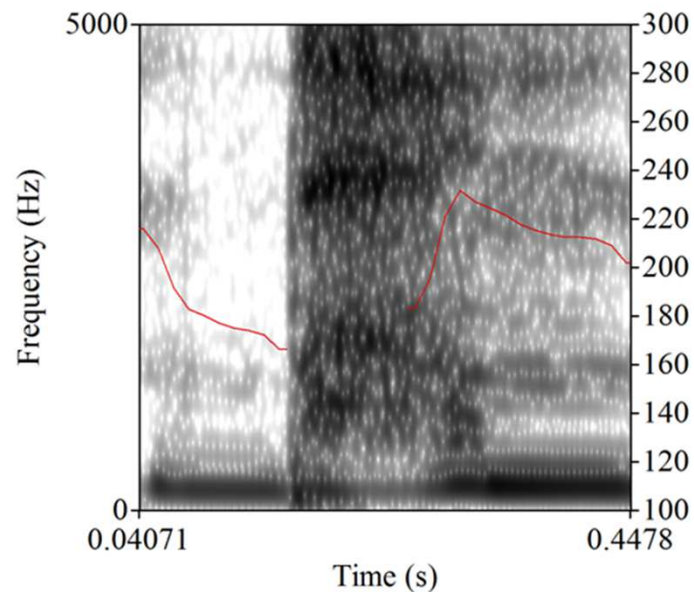
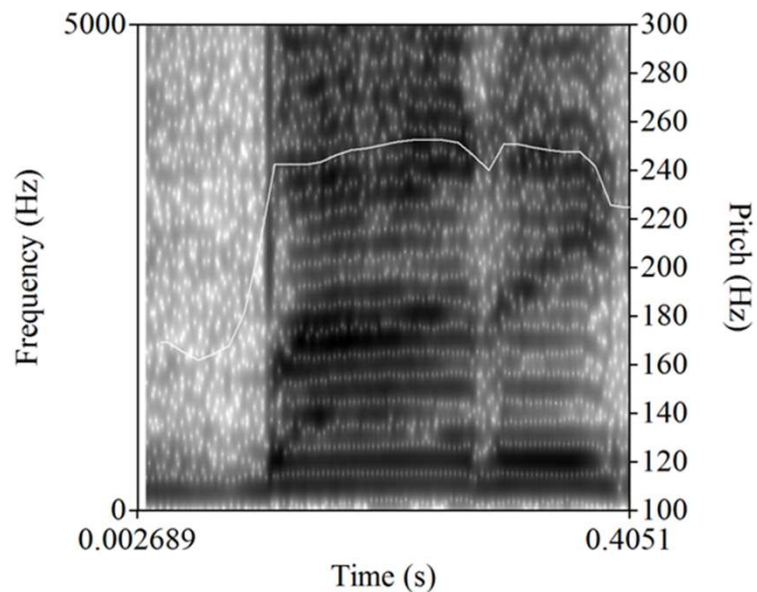
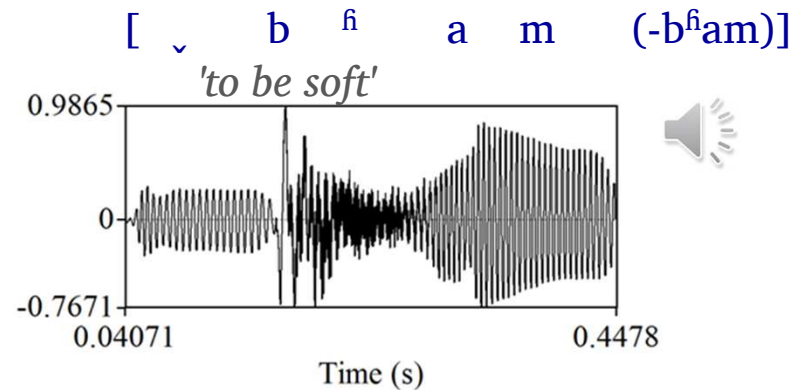
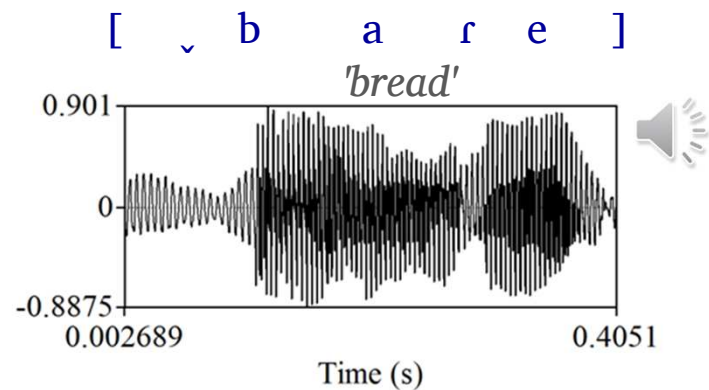
"Xhosa" (xho_word-list_1979_01: 81 s, 86 s) in Ladefoged et al. (2009). Cf. Ladefoged & Maddieson (1996: 63), Trill (1987).

4. Results: Southeastern Bantu

cf. Breathy voiced stops

breathy voice: more increased glottal aperture and flow, loose form of vibration of vocal folds

e.g. Taa/West !Xoon: voiced /b/ vs. breathy voiced /b^h/



4. Results: Southeastern Bantu

BH,DH

presence of slack (or breathy) voiced stops,

e.g. /b/ or /b^h/

Presence of breathy or slack voiced stops

□ absent

■ present

e.g.

NW !Xun (Kx'a) /**d̥z^h** : t̥ʃ : t̥ʃ^h : t̥ʃ' : d̥z̃ : d̥z̃' /

ǀ'Amkoe (Kx'a) /**dz^h** : ts : ts^h : ts' : dz : dz' /

Taa/W.!Xoon (Tuu) /**g^h** : k : k^h : k' : g : g' /

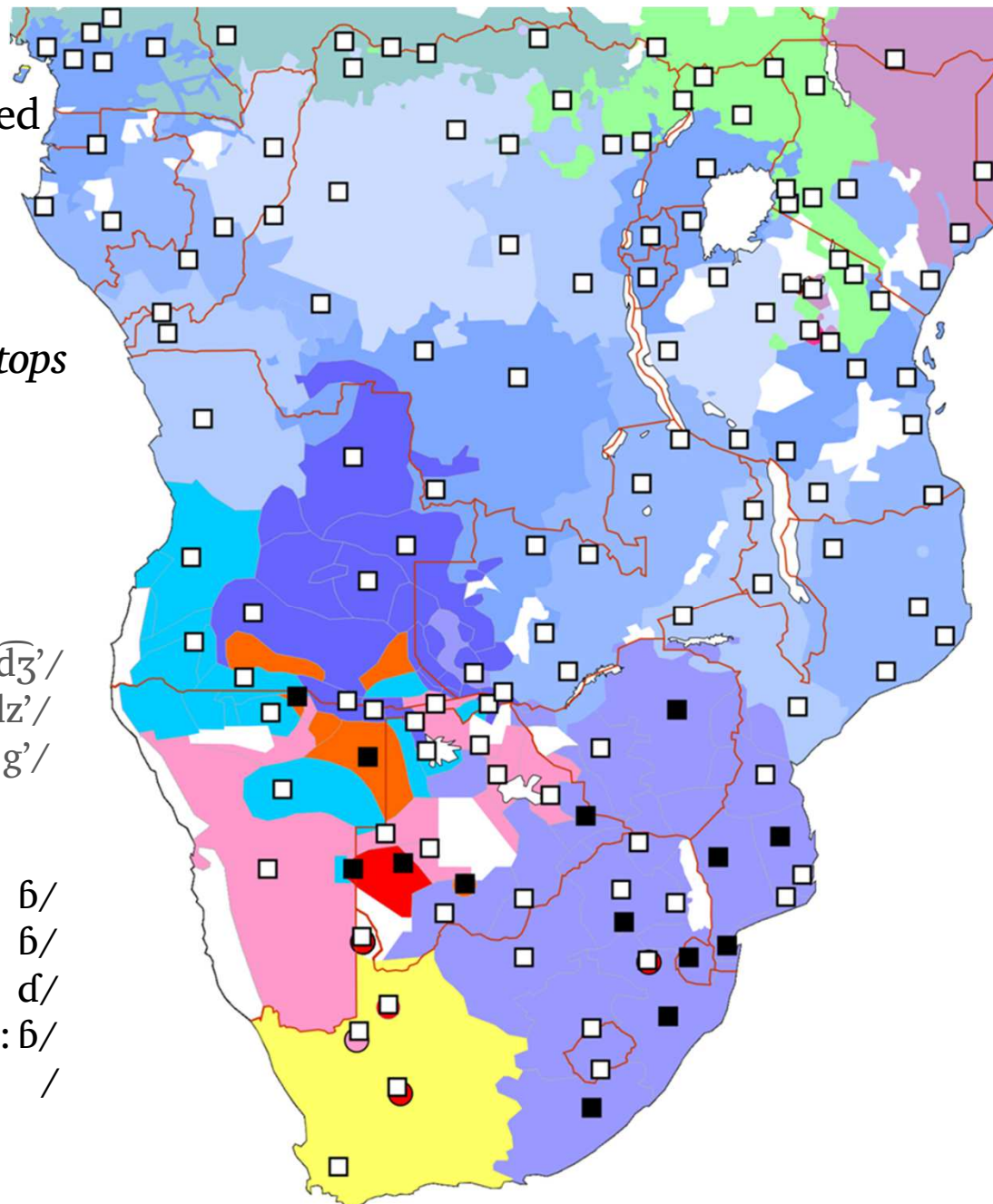
Xhosa (S41) /**b̥** : p' : p^h : b/

Swati (S43) /**b̥** : p' : p^h : b/

Tsonga (S53) /**d̥** ~ **d^h?** : t(̣) : t^h : d : d/

Shona (S10) /**b̥?** : p : b? : b/

Kalanga (S15) /**p^h** : p : p^h : b? /



4. Results: Southeastern Bantu

Southeastern Bantu: 16 (12) typical features

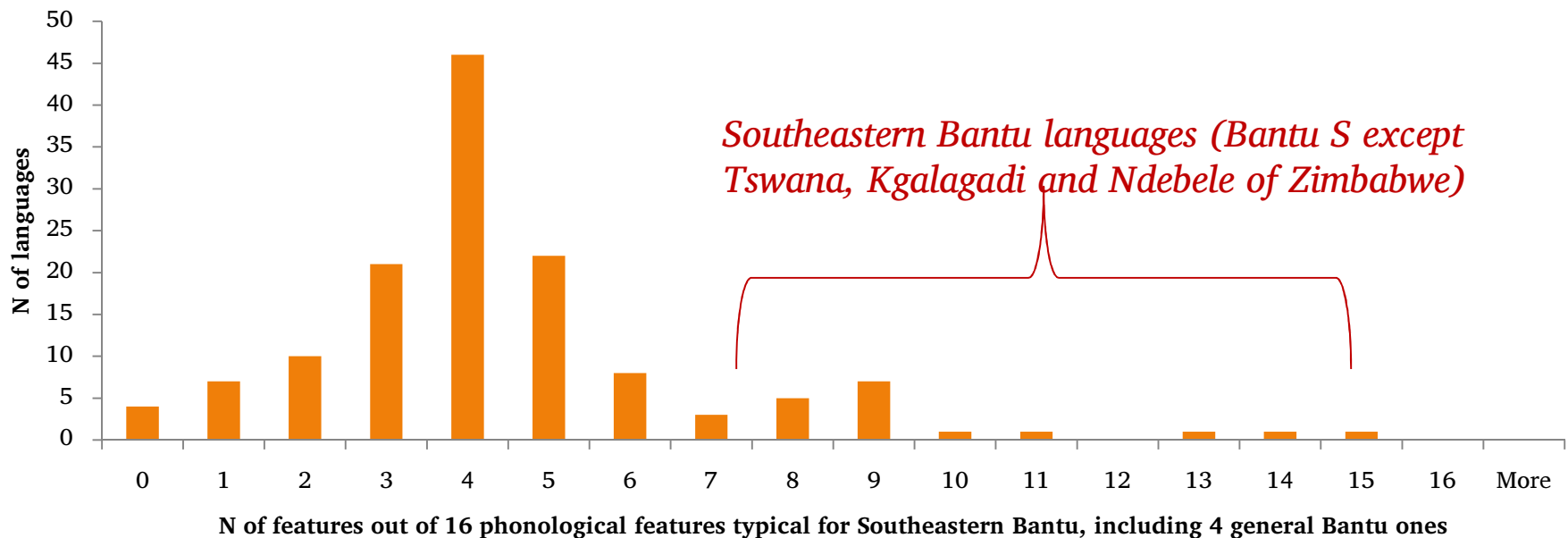
- > 2 affricated series: more than two series of affricates, e.g. /ts/, /tʃ/, /kx/
- TL: presence of lateral obstruents, e.g. $\widehat{t\ell}$, $\widehat{tʃ}$, ℓ , ℓ
- whistled obstruents: presence of whistled fricatives and affricates, e.g. sv, zv, \widehat{tsv}
- ph:f: contrast between bilabial and labio-dental continuants, e.g. / ϕ /:/f/, /m/:/m̥/, /β/:/v/
- implosives: (phonetic) presence of implosives, e.g. /ɓ/ or /b/ [ɓ]
- BH,DH: presence of breathy or slack voiced stops, e.g. /bʰ/ or /b̥/
- plain stops ejected: plain series of (voiceless) stops is ejective
- > 2 sibilants: presence of more than two sibilants (places of articulation), e.g. /s/ : /ʃ/ : /ç/
- > 5 voiced frics: presence of more than five voiced fricatives, e.g. /v/, /z/, /ʒ/, /zv/, /ʁ/, /ɦ/
- PS: presence of labial-coronal onsets, e.g. bz, ps, pʃ
- dent:alv: contrast between dental vs. alveolar stops, nasals or laterals, e.g. /t̪/:/t/ (more local?)
- > 5 vowels: presence of more than five distinctive vowel qualities, e.g. /i, e, ε, a, ɔ, o, u/
- NC: presence of nasal + obstruent syllable onsets, e.g. *NCV and * \widehat{NCV}
- C + w: presence of obstruent + /w/ onset clusters
- no C coda: absence of closed syllables
- 2 tones: two distinctive tone levels, e.g. high vs. low

4. Results: Southeastern Bantu

Features by language (16 features, including 4 general Bantu features)

- weak phonological area: fuzzy boundaries, but slight bimodal distribution
- languages are not very homogenous (no language has all features, only three languages have more than 12: Tswa, Tsonga and Transvaal Ndebele)
- problem: one genealogical group (clade) cannot be excluded (but unlikely)

Histogram

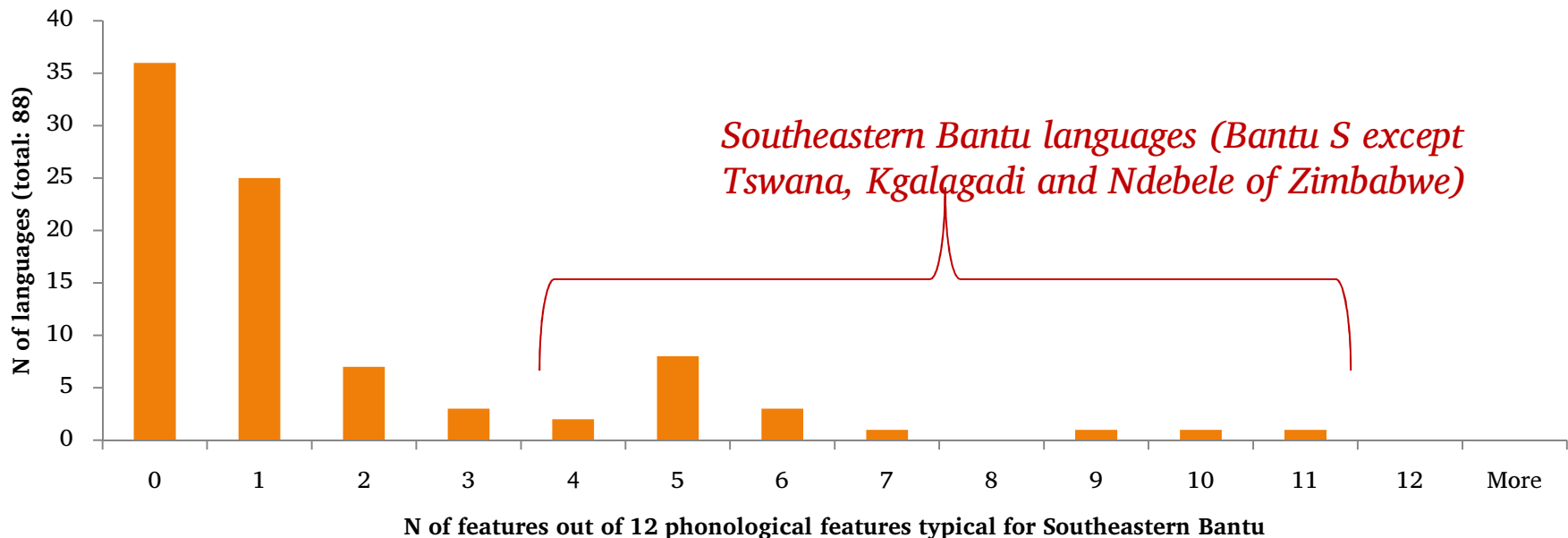


4. Results: Southeastern Bantu

Features by language (12 features, northern languages excluded)

- similar assessment, but
 - general Bantu features (NC, C + w, no coda, 2 tones) excluded
 - ignoring northern languages (Bantu A – E, Nilotic, "Ubangian", Nilotic, Cushitic, Sandawe & Hadza)
- > better results: most languages share no feature (0 or 1), languages in contiguous southeastern area share more than 3 features

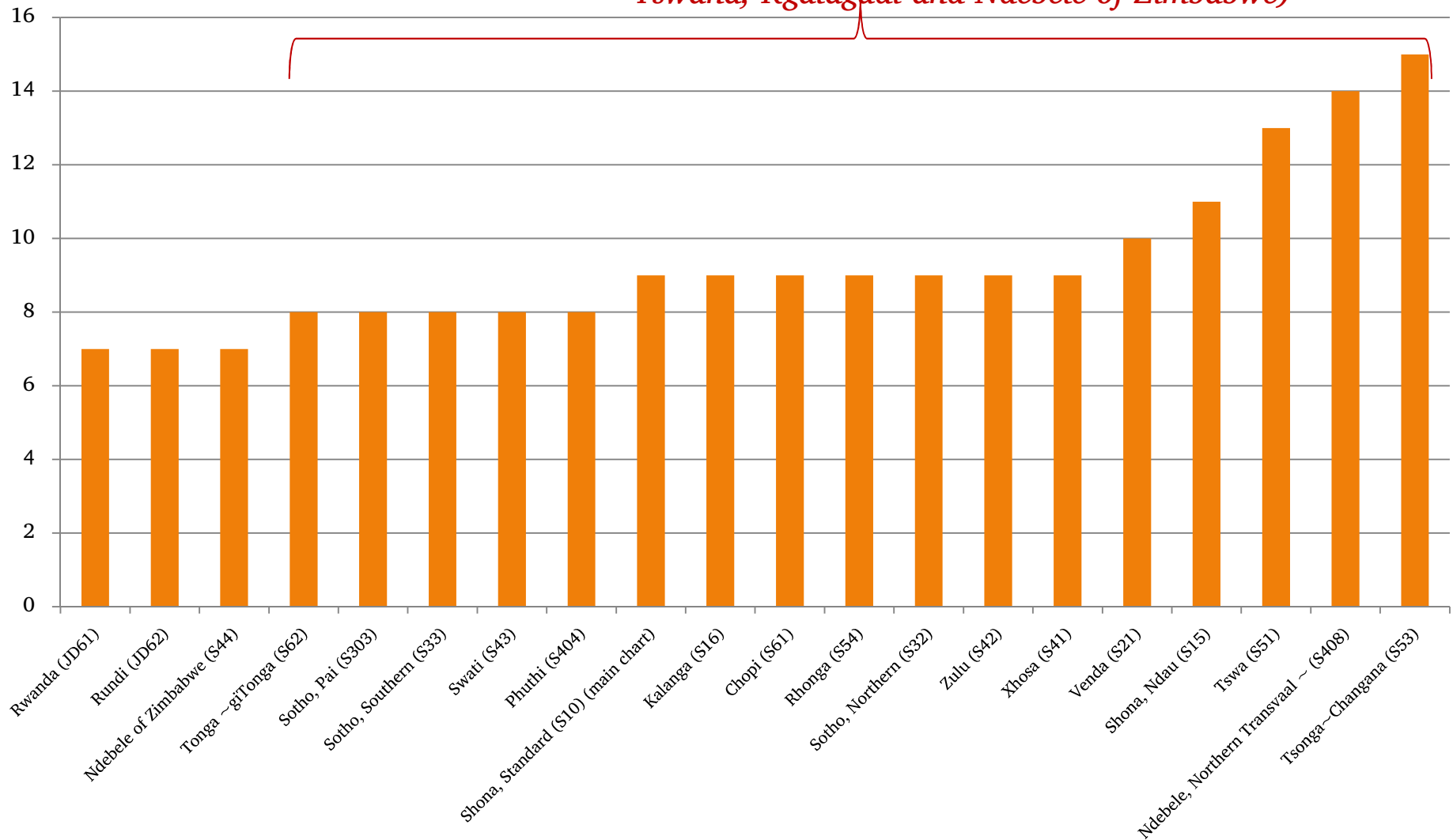
Histogram



4. Results: Southeastern Bantu

Features by language (16 features, all languages)

*Southeastern Bantu languages (Bantu S except
Tswana, Kgalagadi and Ndebele of Zimbabwe)*



4. Results: Southeastern Bantu

Features by language group

group	>2 affricated series	plain stops ejected	TL	whistled obstr.	ph:f	>2 sibilants	>5 vd_frics	ps,bz,psh	implosives	dentalv	BH,DH	>5 vowels	NC onsets	C+w clusters	no C coda	2 tones
Cushitic, other (2)	0	0	0	0	0	0	0	0	0.5	0	0	1	0	0	0	0
Nilotic (6)	0	0	0	0	0	0	0	0	0.33	0.33	0	1	0.33	0.83	0	1
Kuliak (1)	0	0	1	0	0	0	0	0	1	0	0	1	0	1	0	1
Moru-Mangbetu (3)	0	0	0	0	0.33	0	0	0	1	0	0	1	1	0	1	0.33
"Ubangian" (8)	0	0	0	0	0	0	0	0	0.75	0	0	0.875	0.75	0.375	0.75	0.25
N-Bantu Bantoid (1)	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0
Bantu A-R, other (68)	0.03	0.00	0.00	0.00	0.10	0.03	0.00	0.05	0.15	0.07	0.00	0.32	0.94	0.95	0.86	0.81
Germanic (Afrikaans afr)	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0
'South' Cushitic (3)	0	0.67	1	0	0	0	0	0	0.67	0.33	0	0	0.33	0	0	0.33
Sandawe, Hadza (2)	0.5	0	1	0	0	0	0	0	0	0	0	0	0.5	0.5	0.5	1
Bantu K30 (3)	0	0	0	0	0.33	0	0	0	0	0.67	0	0	1	1	1	1
Bantu R40 (1)	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	1
Bantu S10 (3)	0.67	0.33	0	1	0.33	1	0	0.67	0.67	0.33	0.67	0	1	1	1	1
Bantu S20 (2)	1	1	0	1	1	0	1	0	0	1	0	0	1	1	1	1
Bantu S60 (2)	0.5	0.5	1	0	0.5	0	0.5	0.5	1	0	0	0	1	1	1	1
Bantu S50 (3)	1	1	1	1	0.33	1	0.67	0.67	0.67	0	1	0.33	1	1	1	1
Bantu S40 (6)	0.67	1	1	0	0.33	0.167	0	0.167	0.83	0.167	0.67	0.29	1	1	1	1
Bantu S30,K21 (7)	0.71	0.5	0.71	0	0.29	0.14	0	0.29	0	0	0	0.71	0.29	1	1	1
Khoe-Kwadi (8)	0	0	0	0	0	0	0	0	0.125	0	0	0.25	0.5	0.125	0	0.125
Kx'a (3)	0	0	0	0	0	0	0	0	0	0	1	0	0.33	0.33	0	0
Tuu (6)	0.167	0	0.167	0	0	0	0	0	0	0	0.33	0	0	0.167	0	0.8
<i>0: wrong/no; <0.26 infrequent, 0.26 - 0.74 common, >0.74 very frequent; 1: true/yes</i>																
average of area	0.76	0.72	0.62	0.50	0.46	0.38	0.36	0.38	0.53	0.25	0.39	0.22	0.88	1.00	1.00	1.00
average of languages outside	0.05	0.04	0.21	0.00	0.12	0.00	0.00	0.07	0.37	0.09	0.09	0.50	0.45	0.55	0.34	0.51
difference	0.71	0.68	0.41	0.50	0.35	0.38	0.36	0.31	0.16	0.16	0.30	-0.27	0.44	0.45	0.66	0.49

Southern Africa

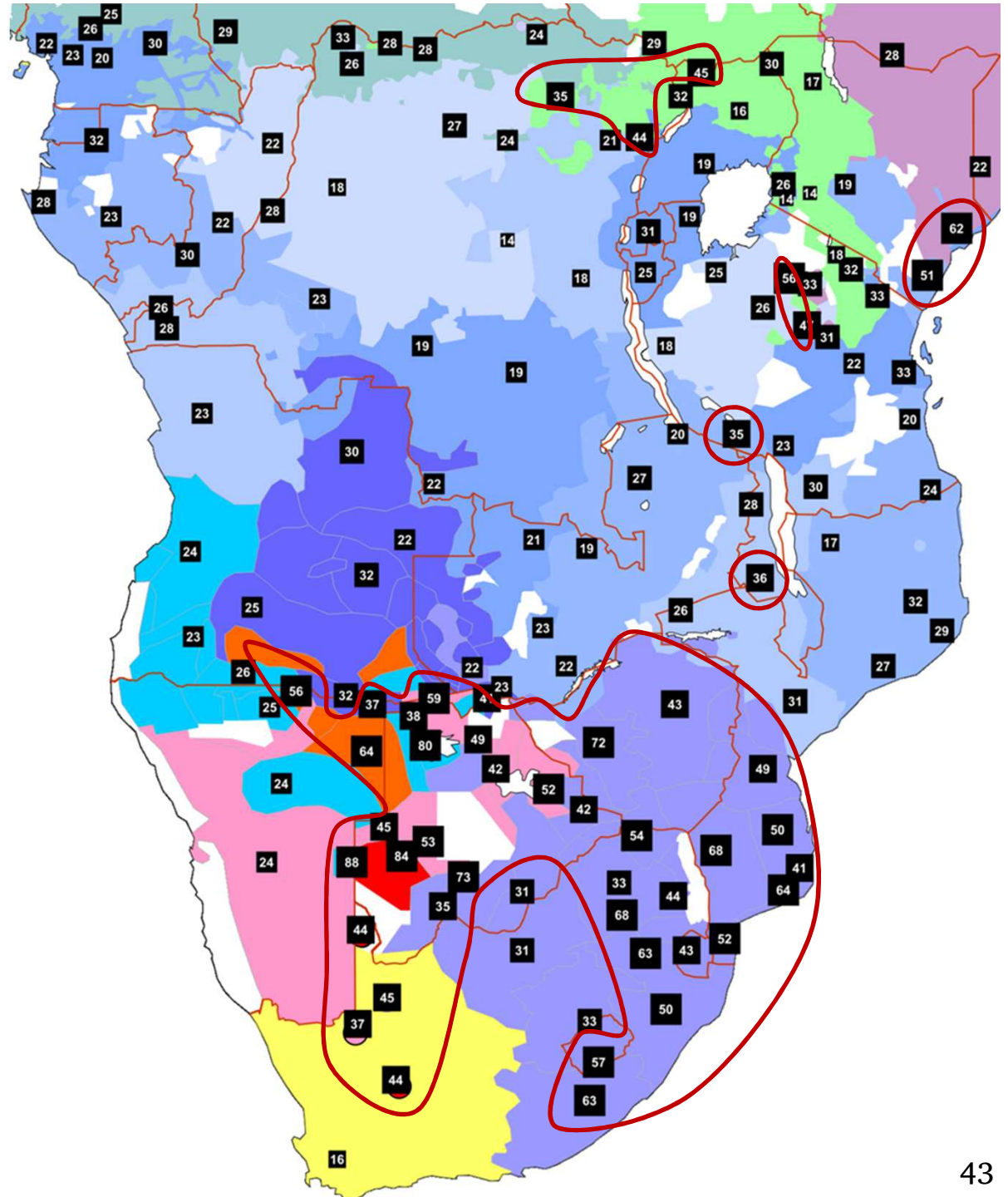
large C inventory

large consonantal inventory
(> 33 phonemic consonants)

*Number of distinctive
consonants*

14 – 88

clicks: cf. above



5. Results: Southern Africa

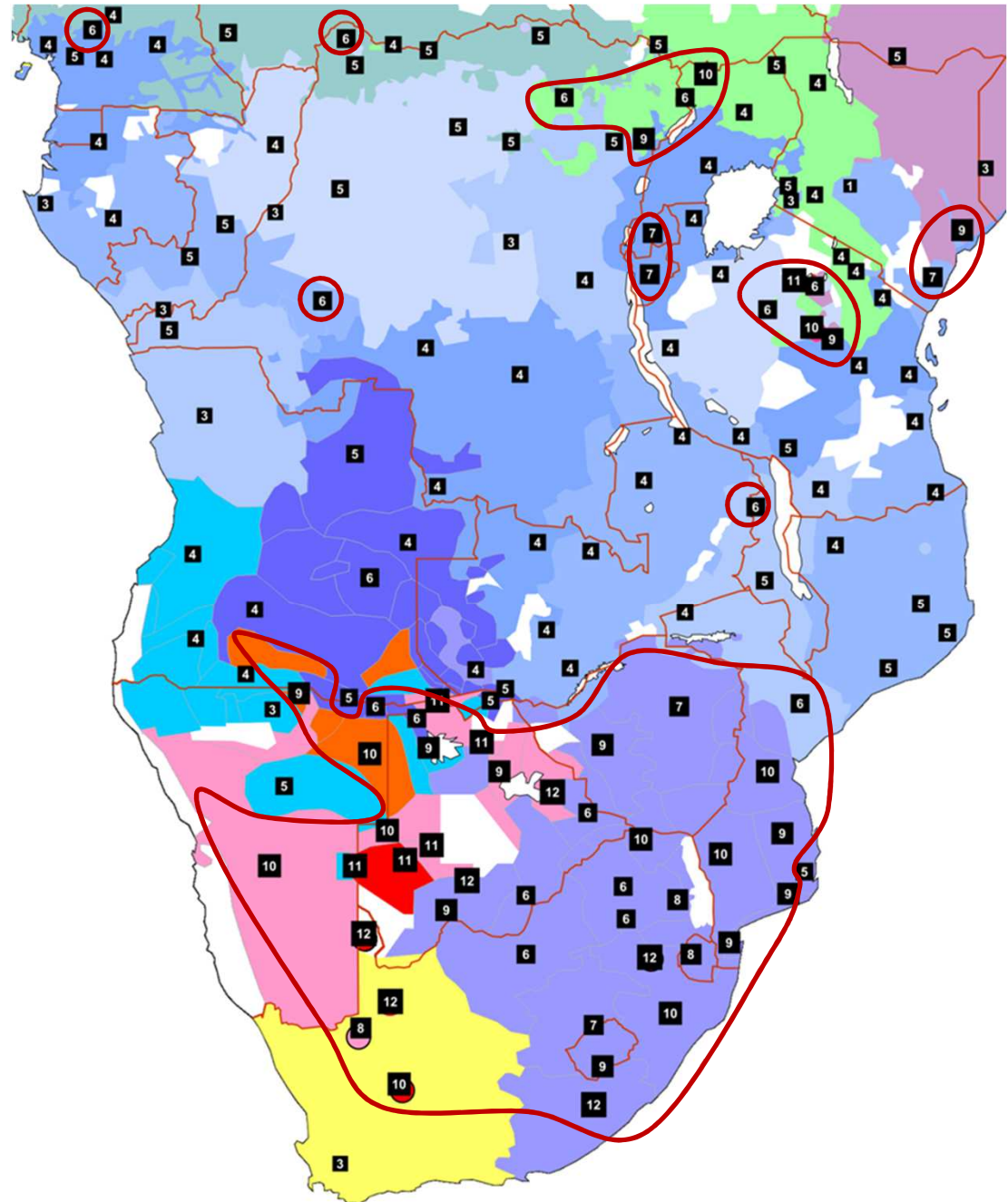
> 5 plain stops

more than 5 places of articulation
or configurations for plain series
of stops,

e.g. /p, t, tʃ, k, q, ʄ/

*Number of stops in the plain
(usually voiceless or aspirated;
sometimes ejectives) series*

3 - 12



5. Results: Southern Africa

aspirated stops

presence of aspirated stops
contrastive with plain series,

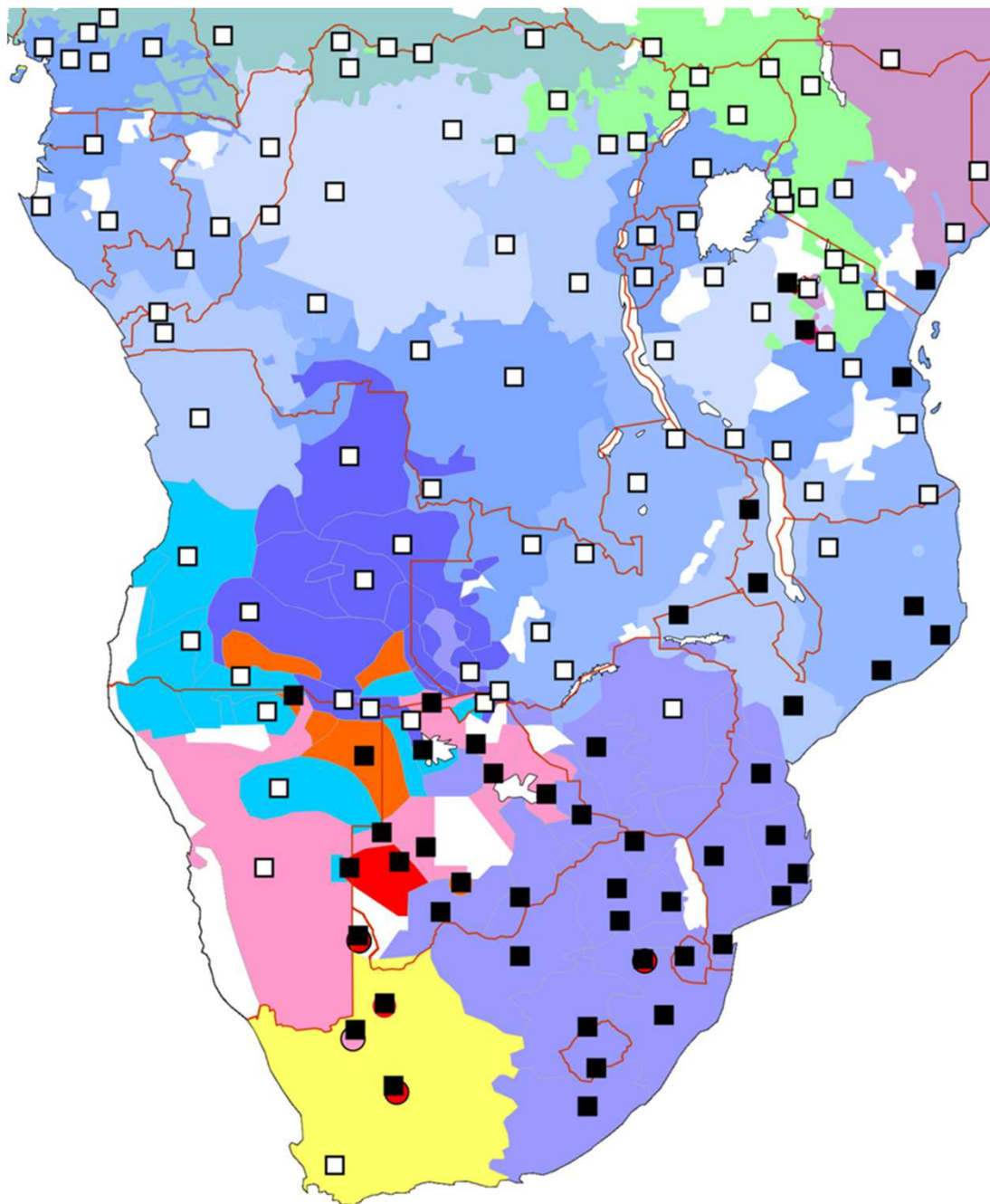
e.g. /p^h, t^h/ vs. /p, t/

Presence of aspirated stops

□ no

■ yes

Ejectives: cf. above



5. Results: Southern Africa

UV or KX

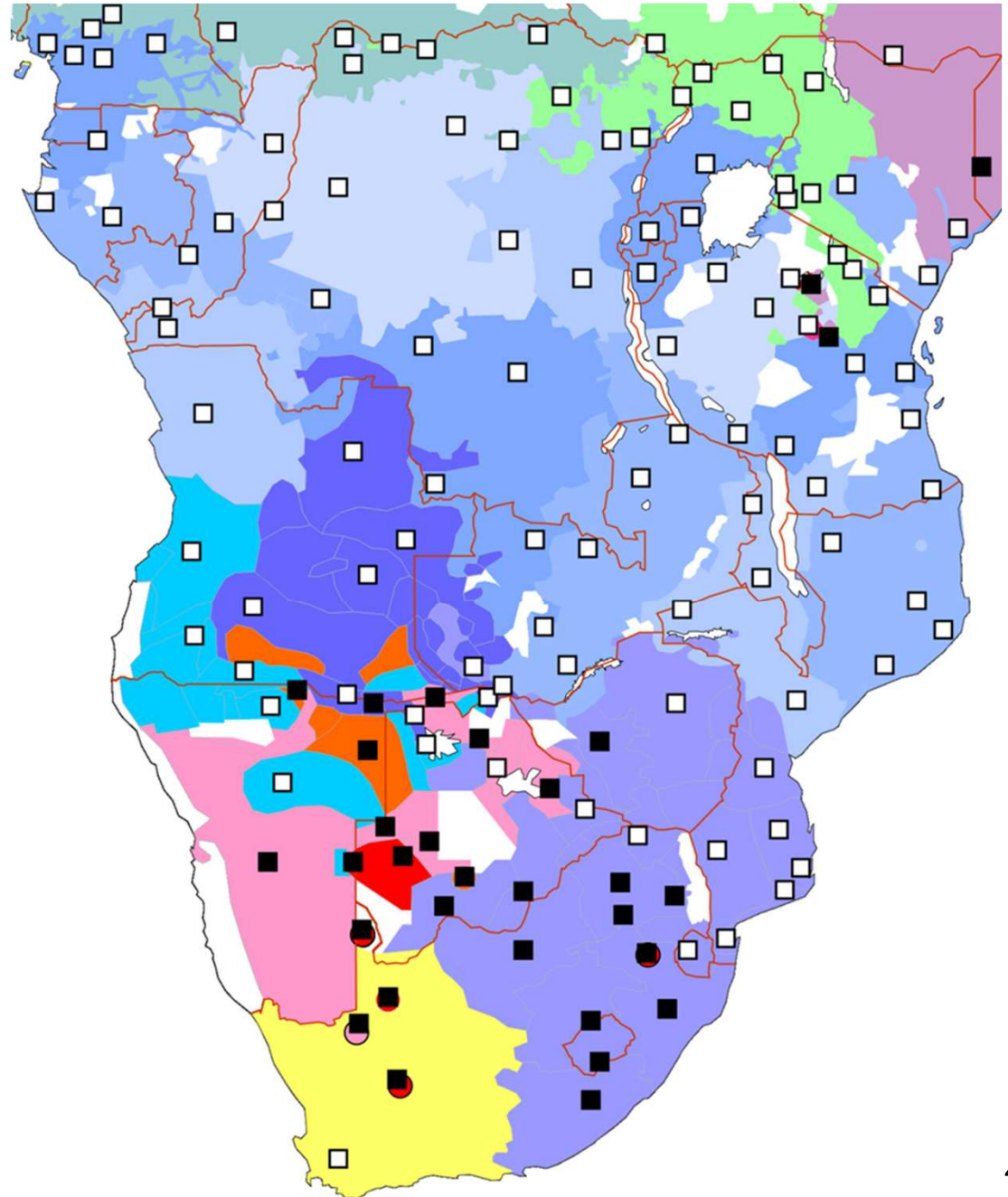
presence of uvular obstruents or
dorsal affricates,

e.g. q , χ , kx , or $q\chi'$

*Presence of uvular obstruents or
dorsal affricates*

□ 0

■ > 0



5. Results: Southern Africa

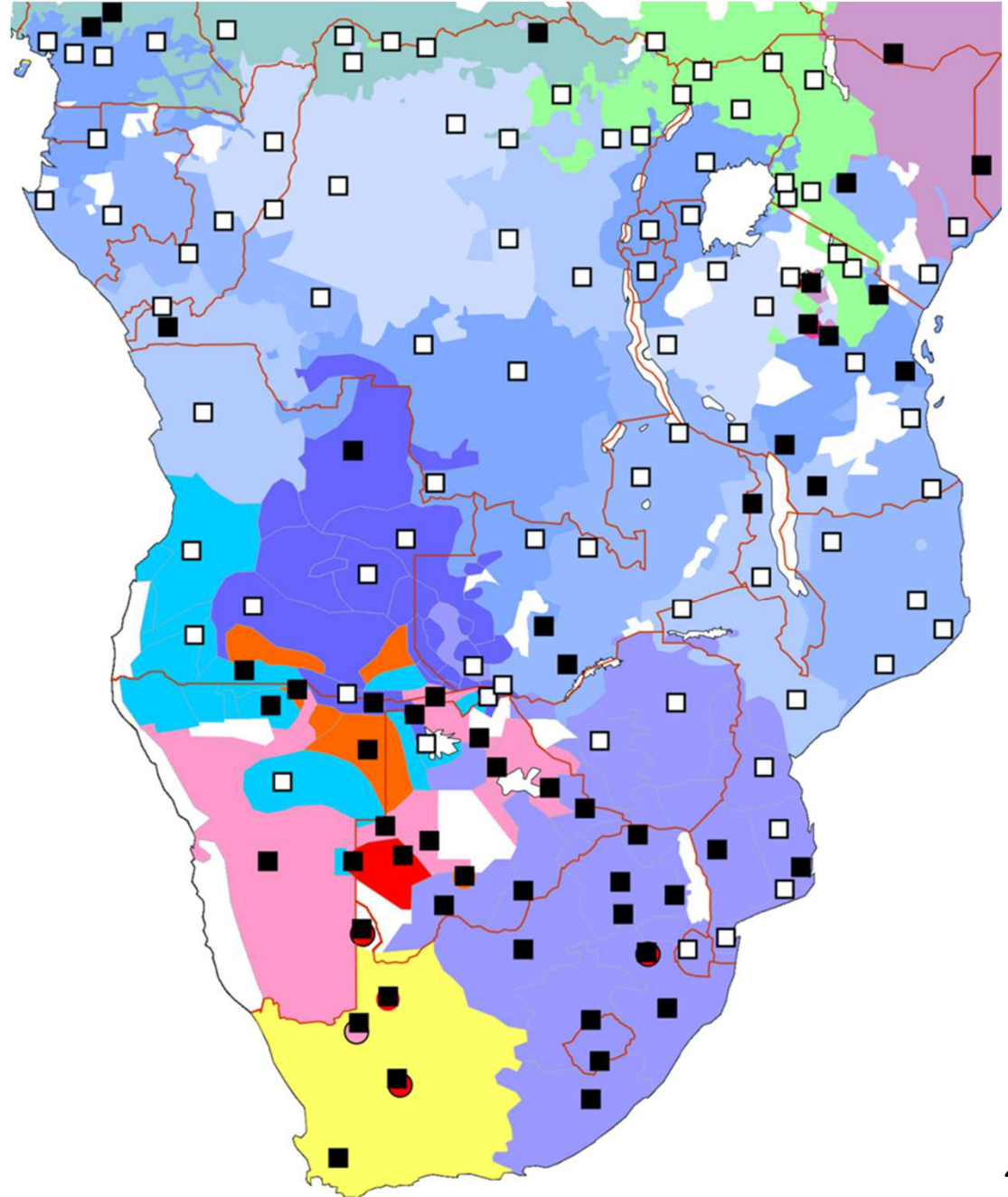
dorsal fricatives

presence of velar or uvular
fricatives,

e.g. x , γ , χ , ʁ

Presence of dorsal fricatives

- absent
- present



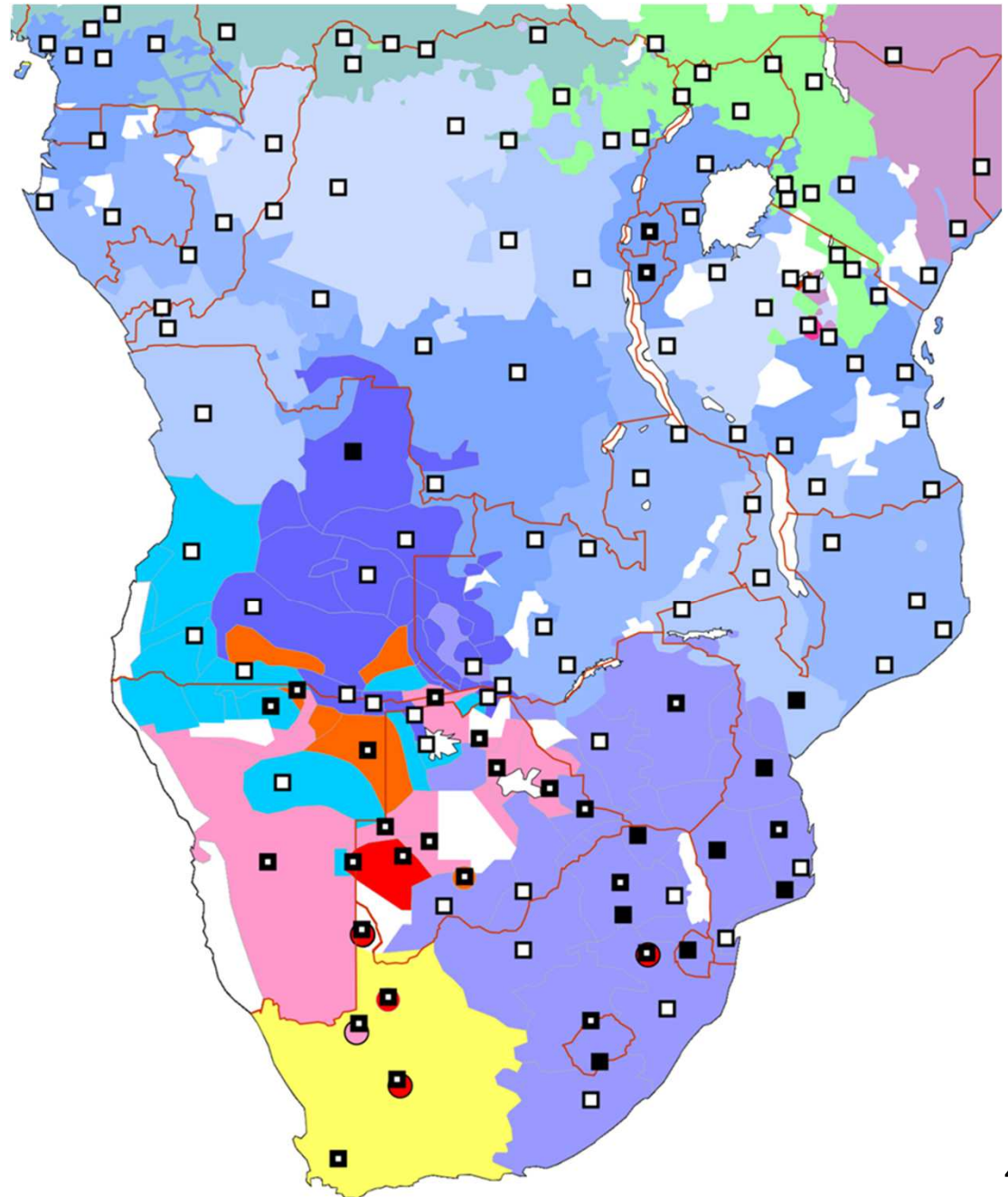
5. Results: Southern Africa

double obstruent onsets
presence of double obstruent
onsets disregarding simple labial-
velars (\widehat{kp}), clicks (!) and whistled
obstruents ($\widehat{ts^v}$),

e.g. labial-coronal, labial-dorsal,
or coronal-dorsal double
articulations or clusters such as
ps, *bg*, *tf* or χ

Presence of double obstruent onsets

- 0
- ◻ analyzed as clusters (C1 + C2)
- analyzed as units (\widehat{CC})



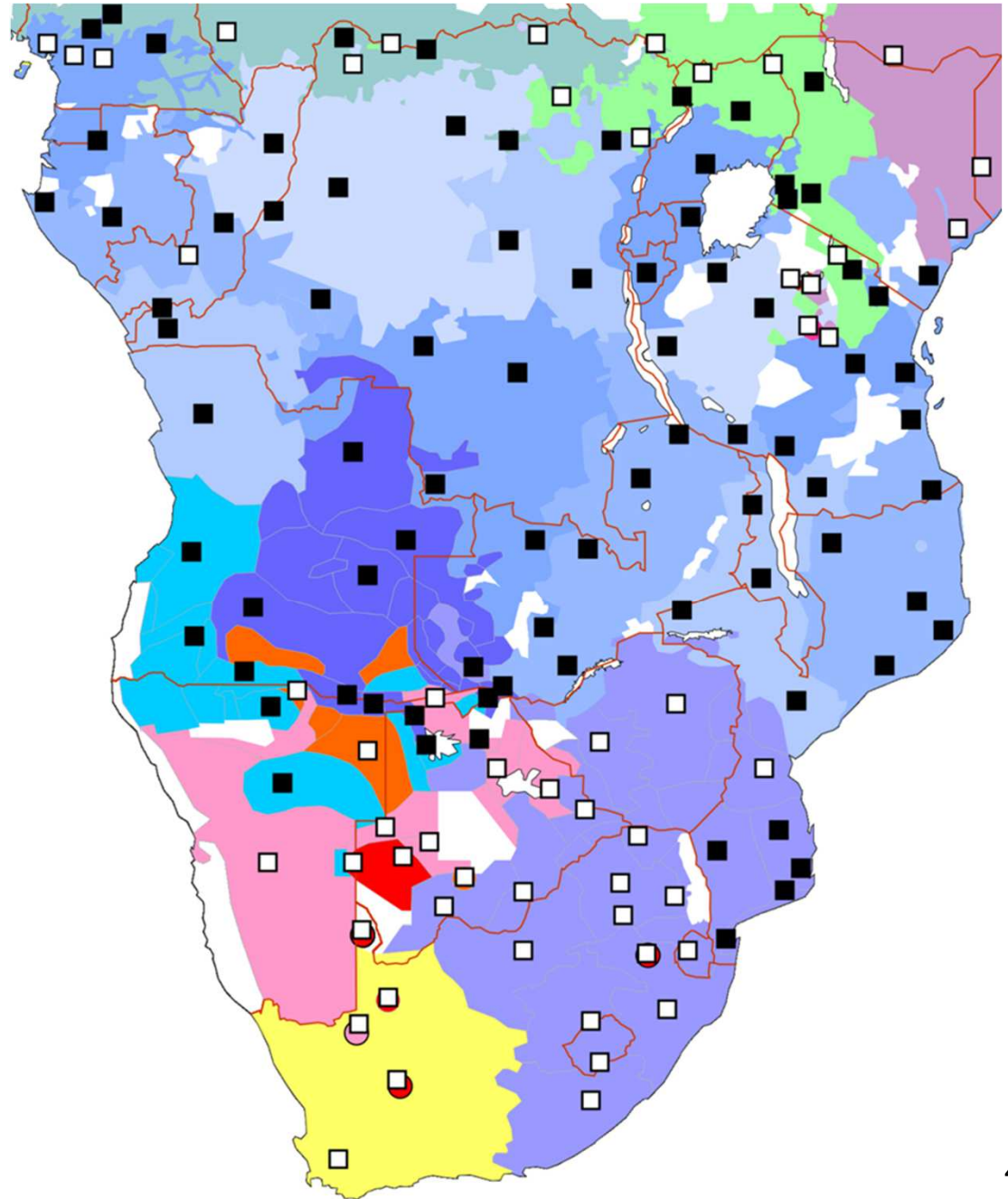
5. Results: Southern Africa

no C + y

absence of clusters C + /j/

Presence of clusters C + /j/

- absent
- present



5. Results: Southern Africa

Southern Africa: 10 typical features

- large C inventory: large consonantal inventory (> 33 phonemic consonants)
- clicks: presence of ingressive stops (clicks), e.g. /ǀ, ǁ or ǃ
- > 5 plain stops: presence of more than 5 places of articulation (or configurations) in the plain series of stops, e.g. /p, t, tʃ, k, q, ʎ/
- aspirated stops: presence of aspirated stops contrastive with plain series, e.g. /p^h, t^h/ vs. /p, t/
- ejectives: presence of ejective obstruents, e.g. /pʼ/ (vs. /p/) or simply /p/ [pʼ]
- BH,DH: presence of breathy or slack voiced stops, e.g. /b^h/ or /b̤/
- UV or KX: presence of uvular obstruents or dorsal affricates, e.g. q, χ, kx, or qχʼ
- dorsal frics: presence of dorsal fricatives, e.g. x, χ, γ
- double obstruent onsets: presence of double obstruent onsets disregarding simple labial-velars (\overline{kp}), clicks ($\overline{ǀ}$) and whistled obstruents ($\overline{ts^v}$), e.g. labial-coronal, labial-dorsal, or coronal-dorsal double articulations or clusters such as ps, bg, tf or ʎχ
- no C + y: absence of obstruent + /j/ onset clusters

other potential features (more local distributions or secondary?)

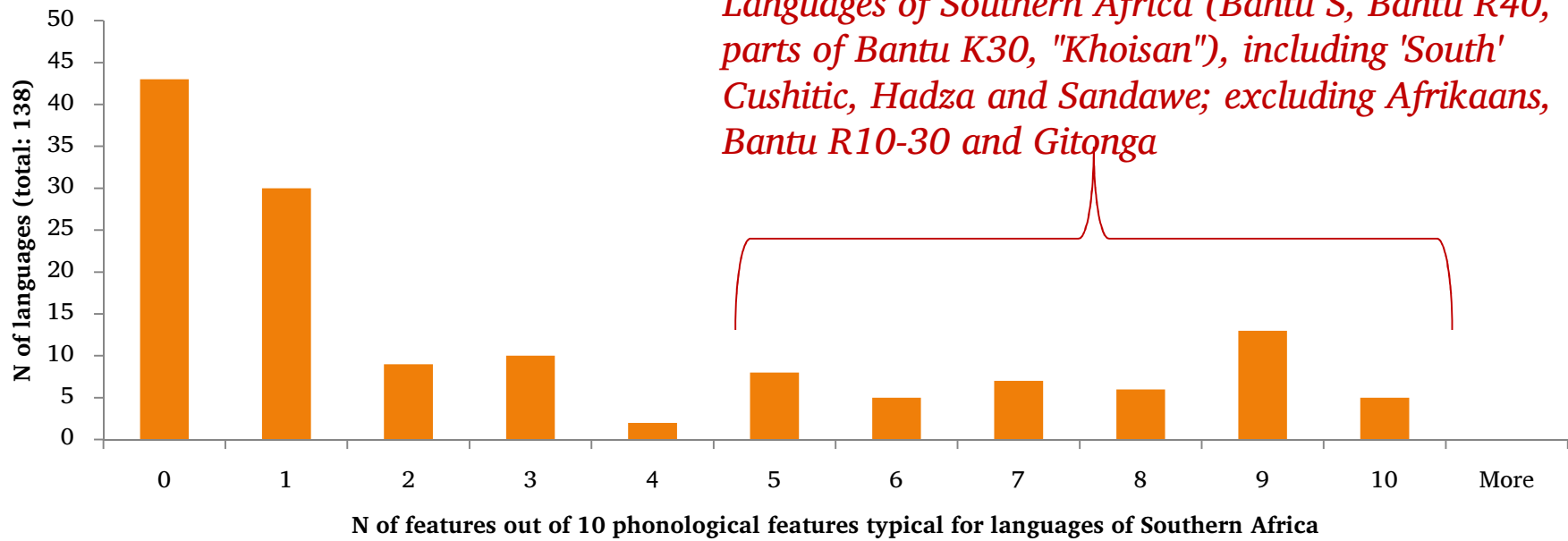
- presence of voiceless, breathy or slack voiced nasals (cf. below)
- palatalization of dental/alveolar coronal series (t > c; cf. below); palatalization more generally?
- presence of palatalized units (C^j)

5. Results: Southern Africa

Features by language

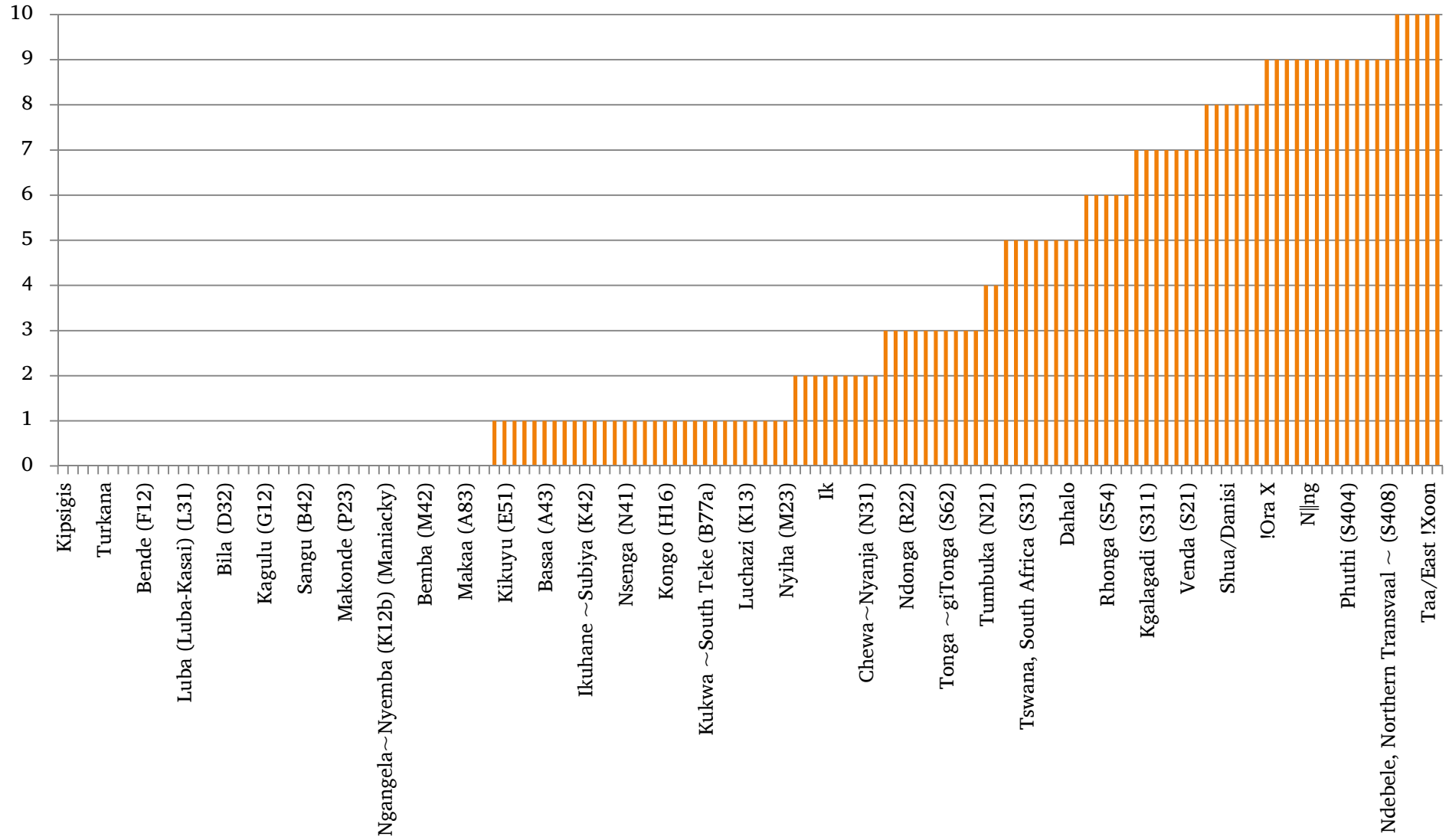
- bimodal distribution, although no clearcut boundary
- most languages in the sample share no or few features
- languages of Southern Africa (including 'Southern' Cushitic, Sandawe and Hadza) share more than half of the features (5-10)
- "best languages" are Khoisan > clear relation to Kalahari Basin > "2nd layer"?!

Histogram



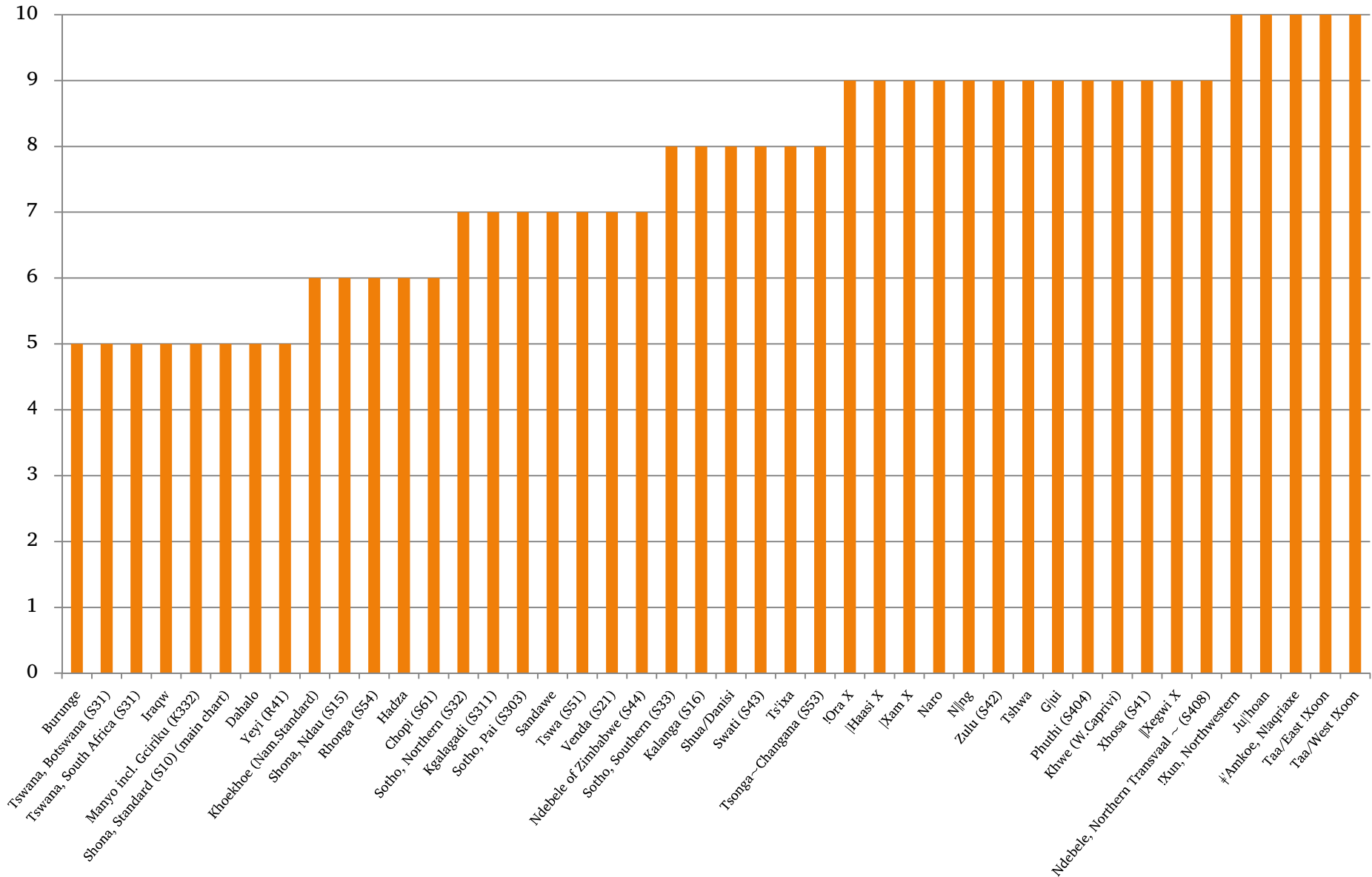
5. Results: Southern Africa

Features by language



5. Results: Southern Africa

Features by language: Languages sharing 5 features and more



5. Results: Southern Africa

Features by language group

	large C inventory	clicks	> 5 plain stops	aspirated stops	ejectives	BH, DH	UV or KX	double obstr. onsets	dorsal frics	no C + y
Cushitic, other (2)	0	0	0	0	0.5	0	0.5	0	1	1
Nilotic (6)	0	0	0.167	0	0	0	0	0	0	0.167
Kuliak (1)	0	0	0	0	1	0	0	0	0	1
Moru-Mangbetu (3)	1	0	1	0	0	0	0	0	0	1
"Ubangian" (8)	0	0	0.125	0	0	0	0	0	0.125	0.625
N-Bantu Bantoid (1)	0	0	0	0	0	0	0	0	1	0
Bantu A-R, other (68)	0.07	0.08	0.13	0.12	0.01	0.00	0.00	0.07	0.18	0.05
Germanic (Afrikaans afr)	0	0	0	0	0	0	0	1	1	1
'South' Cushitic (3)	0.33	0.33	1	0	1	0	0.67	0	0.67	1
Sandawe, Hadza (2)	1	1	1	1	1	0	0	0	0.5	1
Bantu K30 (3)	0.67	1	0.67	0	0	0	0.33	0	0.67	0
Bantu R40 (1)	1	1	1	1	1	0	0	0	0	0
Bantu S10 (3)	1	0	1	0.67	0.67	0.67	0	1	0.33	1
Bantu S20 (2)	1	0	1	1	1	0	0	1	1	1
Bantu S60 (2)	1	0.5	0.5	1	0.5	0	0	0.5	0.5	0
Bantu S50 (3)	1	1	1	1	1	1	0	0.67	0.33	0
Bantu S40 (6)	0.29	0.29	0.86	0.86	0.5	0	0.86	0.29	0.86	0.86
Bantu S30,K21 (7)	1	0.83	1	1	1	0.67	0.83	0.5	0.67	1
Khoe-Kwadi (8)	0.875	1	1	0.875	0.875	0	0.875	1	1	0.875
Kx'a (3)	1	1	1	1	1	1	1	1	1	1
Tuu (6)	1	1	1	1	1	0.33	1	1	1	1
<i>0: wrong/no; < 0.26 infrequent, 0.26 - 0.74 common, > 0.74 very frequent; 1: true/yes</i>										
average of area	0.86	0.69	0.93	0.80	0.81	0.28	0.43	0.54	0.66	0.67
average of languages outside	0.13	0.01	0.18	0.01	0.19	0.00	0.06	0.13	0.41	0.60
difference	0.72	0.68	0.75	0.79	0.62	0.28	0.37	0.40	0.24	0.07

6. Results: Local and dependent features

Features excluded above

Features of minor distribution and
 features strongly correlated to others

> more subareas within Southern Africa?

example: glottalized nasals

(Kalahari Basin, possibly Yeyi)

*Presence of glottalized (incl. preglottalized,
 laryngealized) nasals contrastive with
 plain voiced nasals (including nasal clicks)*

□ absent
 ■ present

e.g.

NW !Xun: /^ʔm, ^ʔn, ʔ̃, ʔ̃/

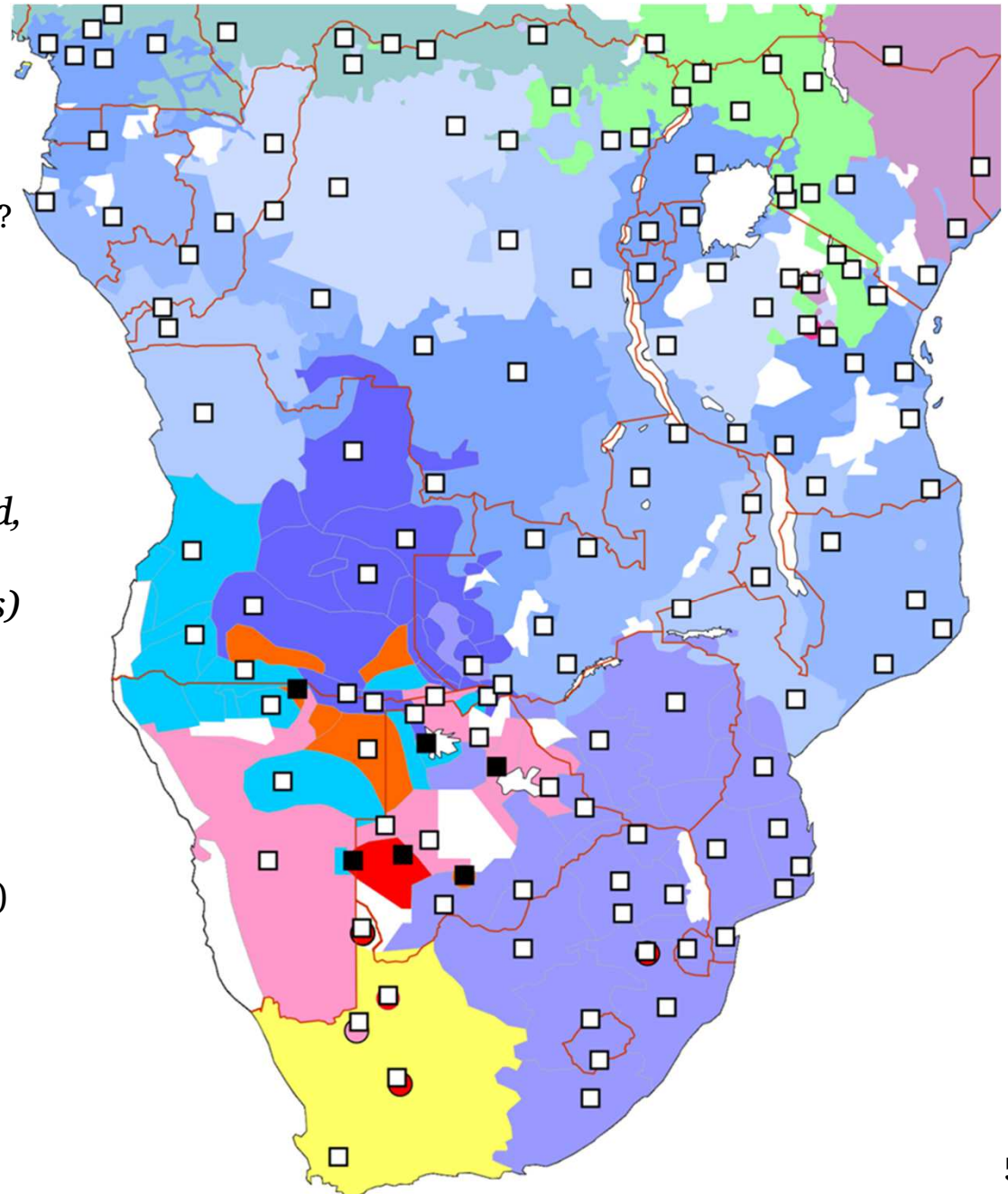
Yeyi: /ʔ̃, ʔ̃/ (cluster?)

Shua: /^ʔn/?

ǀ'Amkoe: /^ʔṰ, ʔ̃, ʔ̃, ʔ̃, ʔ̃/

Taa: /^ʔm, ^ʔn, ^ʔṰ, ʔ̃, ʔ̃, ʔ̃, ʔ̃/

(cf. Hadza (ŋ)|ʔ, (ŋ)|ʔ, (ŋ)|ʔ "ejective stops")



6. Results: Local and dependent features

absence of /ŋ/
(Kalahari Basin)

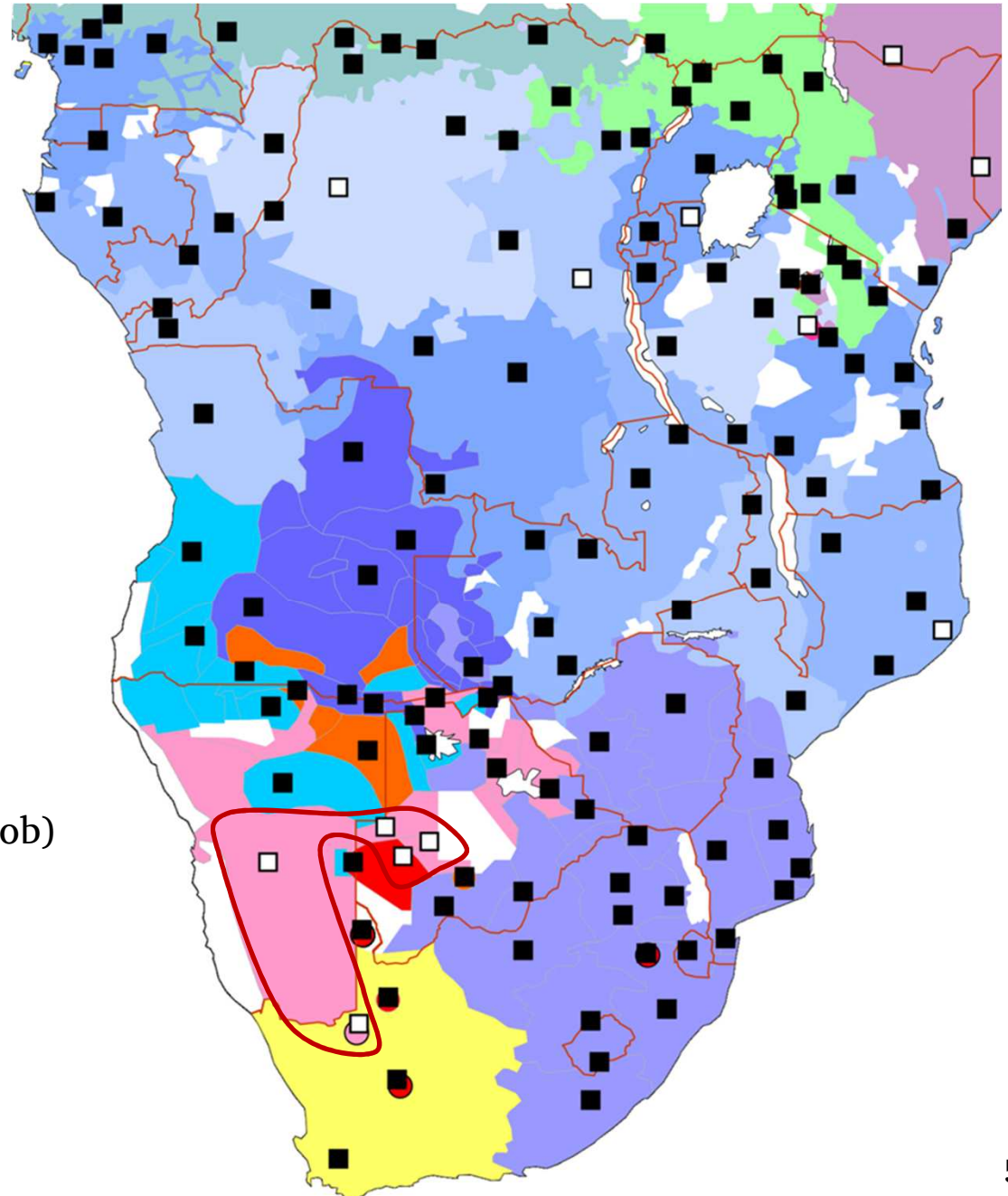
Presence of the velar nasal

- absent
■ present

Velar nasal /ŋ/ absent in

- Khoekhoe (Khoe-Kwadi/Khoekhoe)
- !Ora (Khoe-Kwadi/Khoekhoe)
- Naro (Khoe-Kwadi/Kalahari Khoe/W)
- G|ui (Khoe-Kwadi/Kalahari Khoe/W)
- Taa/East !Xoon (Tuu/Taa-Lower Nossob)

(cf. #'Amkoe: marginal (ŋ), Gerlach p.c.)



6. Results: Local and dependent features

retroflex consonants

presence of retroflex consonants,

e.g. /t̠, d̠, s̠, r̠/

(Southeastern Bantu?)

Presence of retroflex consonants

□ absent

■ present

e.g.

Fwe (K402): /r̠/

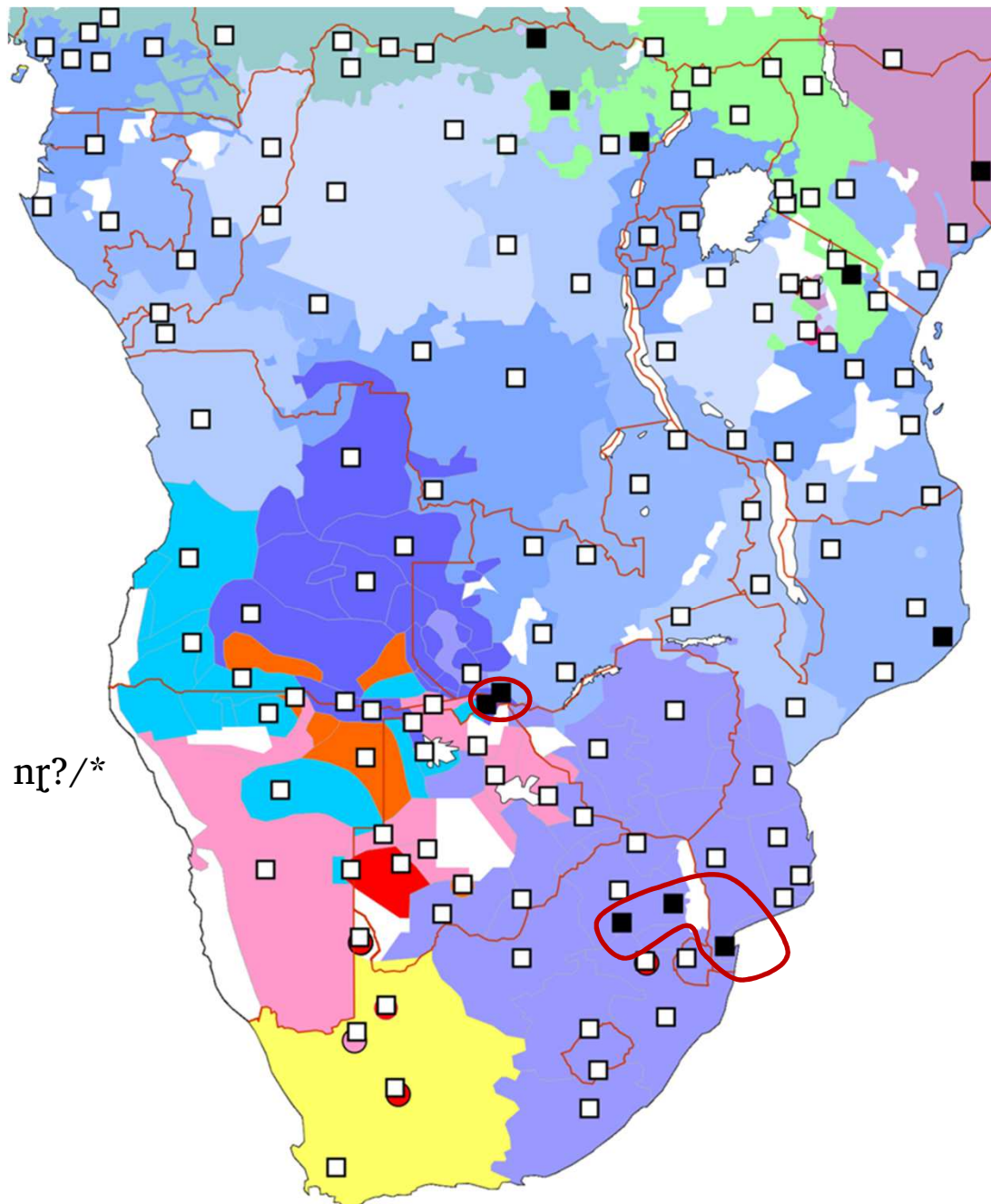
Ikuhane incl. Subiya (K42): /r̠/

N.Transvaal Ndebele (S408): /nd̠, nd̠r̠, nr̠?/*

Pai (S303): /t̠ʰ, t̠ʰh, d̠, nd̠z, (z)/*

Rhonga (S54): /t̠, t̠h, d̠, n̠, r̠/

**Prenasalized stops analyzed as units.*



6. Results: Local and dependent features

> 1 glottal fricative
presence of more than one glottal
fricative,
e.g. /h/ : /fi/
(Southeastern Bantu)

Number of glottal fricatives
0 - 2

Tonga (M64): /h, fi/

Ndebele of Zimbabwe (S44): /h, fi/

Yeyi (R40): /h, nh̃/

Tswa (S51): /h?, fi/

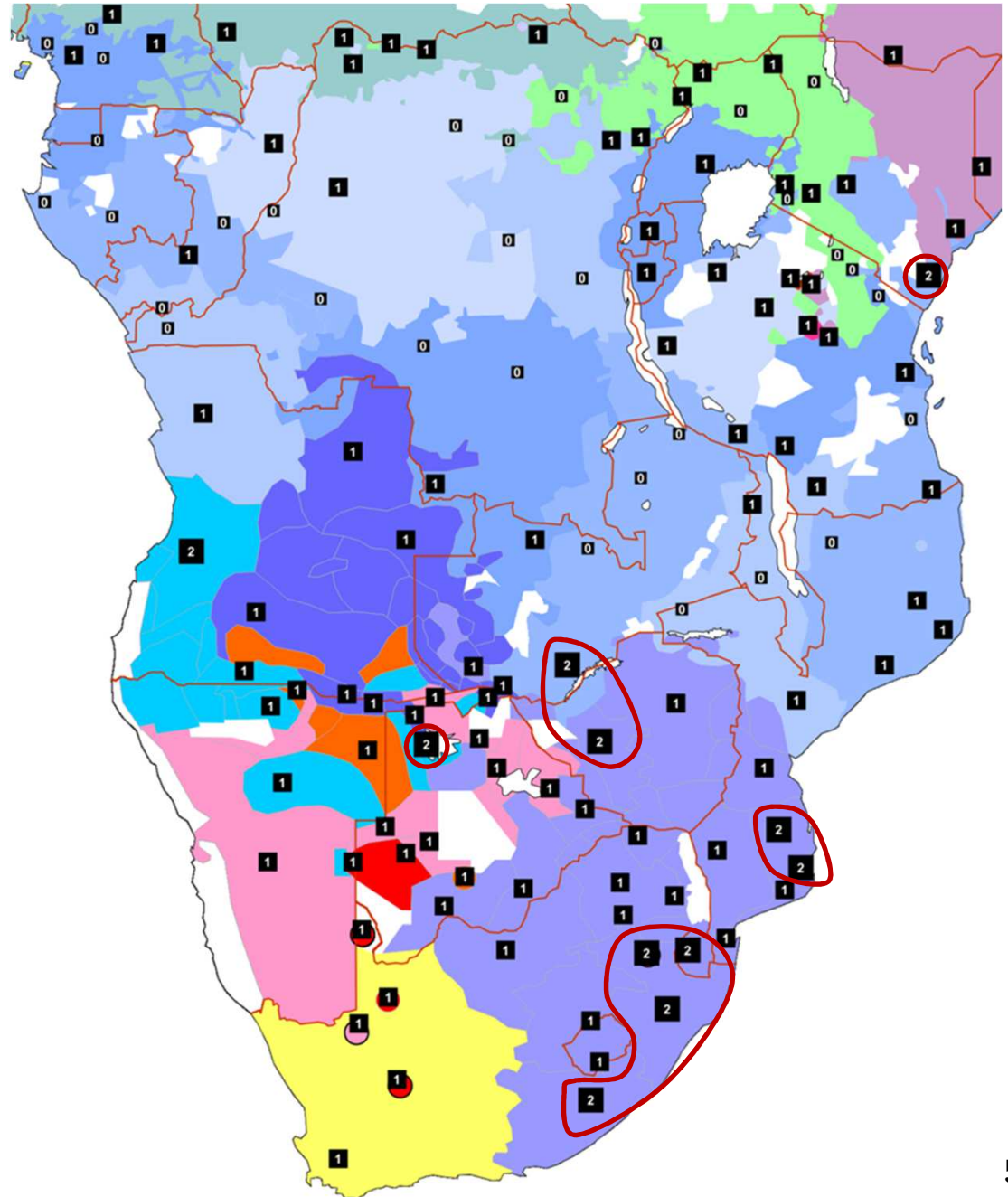
Gitonga (S62): /h, fi^w/

Swati (S43): /h, fi/

ǁXegwi (Tuu): /h, fi/

Zulu (S42): /h, fi/

Xhosa (S41): /h, fi/



6. Results: Local and dependent features

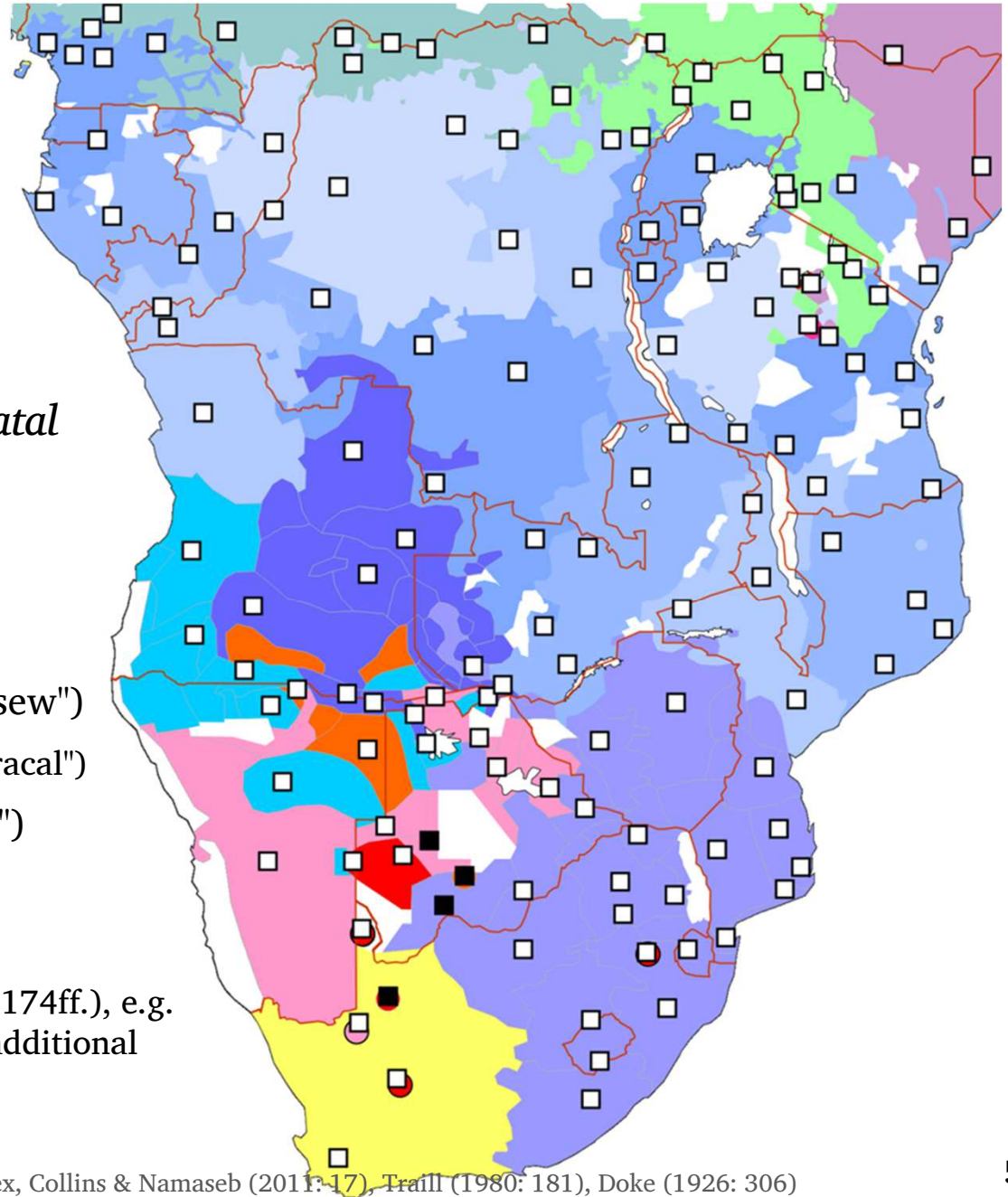
sound change /t/ → /c/
palatalization of dental/alveolar
coronal series,
e.g. /t, t^h, d/ → /c, c^h, ʃ/
(Southern Africa)

Sound change dental/alveolar to palatal

- not observed
- observed

G|ui, G||ana (*c^húĩ* vs. Naro *t^hùì* "sore")
ǀ'Amkoe (N!aqriaxe *c'ám* vs. Sasi *t'am* "sew")
Kgalagadi (*chwáné* vs. Setswana *thwánî* "caracal")
N||ng (*cuu-ke* "men" vs. Taa *tuu* "people")
(S.Kua *t^hum* vs. N.Kua *tum* "swallow")

cf. larger area of palatalization (Traill 1980: 174ff.), e.g.
also Xhosa *c(ç)'ala* vs. Zulu *tʃ'ala* "plant" (additional
palatal series in Xhosa)



6. Results: Local and dependent features

voiceless or breathy nasals

presence of voiceless, breathy or slack
 voiced nasals,

e.g. / ṃ , n^h , ṅ / (Southern Africa)

- strongly correlated to presence of
 breathy/slack voiced stops?

*Presence of nasals contrastive with plain
 voiced nasals (voiceless, breathy, slack
 voiced nasals; excluding glottalized
 nasals; including clicks*

□ absent
 ■ present

e.g.

Sukuma (F21) / m^h , n^h , ɲ^h , ŋ^h /

Kwanyama (R21) / Ṁ , ṅ , ɲ , ŋ /

NW !Xun (Kx'a) / $\text{m}^{h?}$, $\text{n}^{h?}$ / ($[\tilde{h}, \tilde{h}, !\tilde{h}]$ - clusters?)

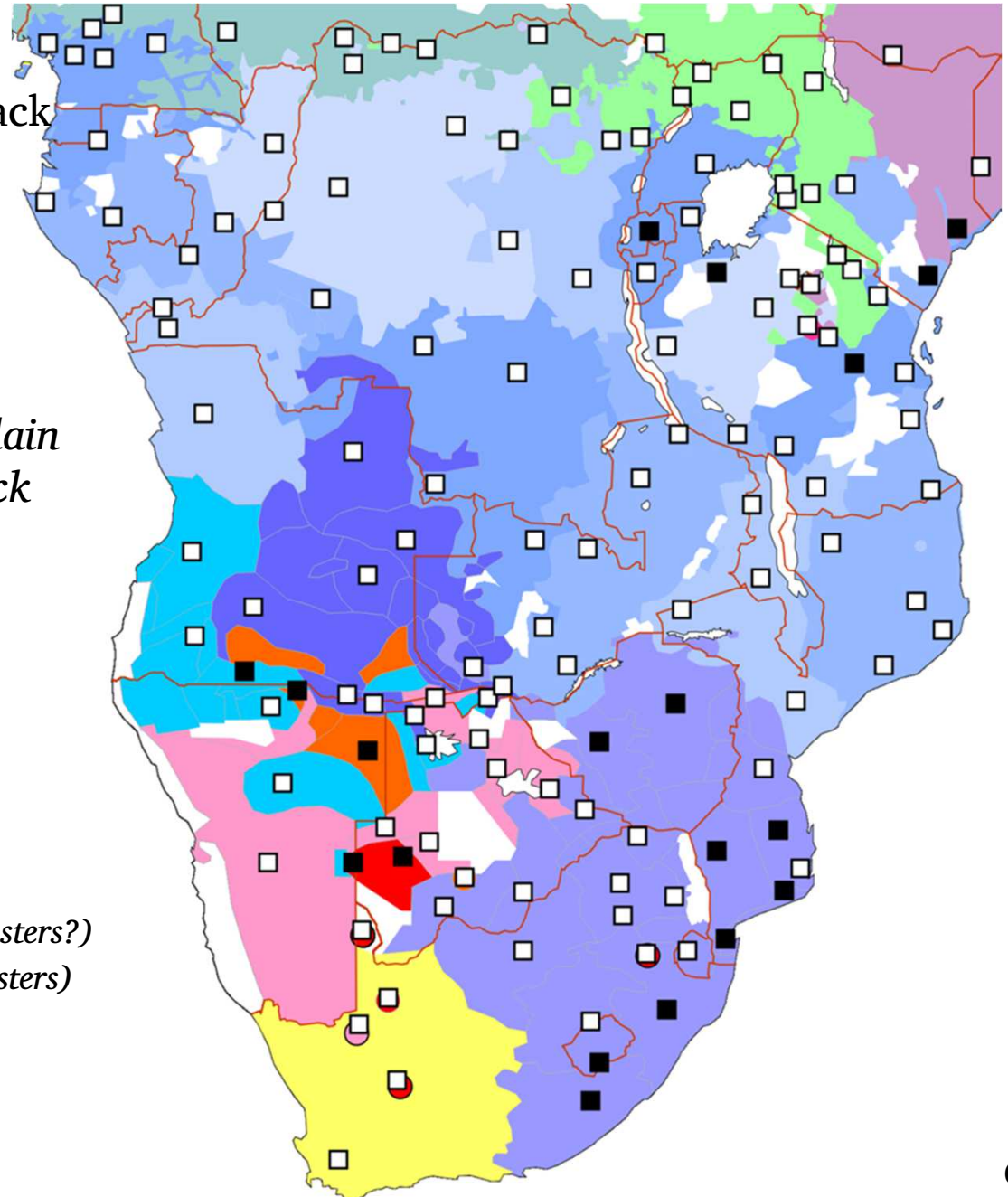
Taa (Tuu) / $\tilde{}$, $\tilde{}$, $\tilde{}$, $\tilde{}$ / ($[\tilde{h}, \dots]$ as clusters)

Shona (S11-15) / m^h , n^h , ɲ /

Tsonga (S53) / m^h , n^h , ŋ^h / ("murmured")

Chopi (S61) / m^h , n^h , ŋ^h /

Zulu (S42) /(Ṁ , ṅ)/



6. Results: Local and dependent features

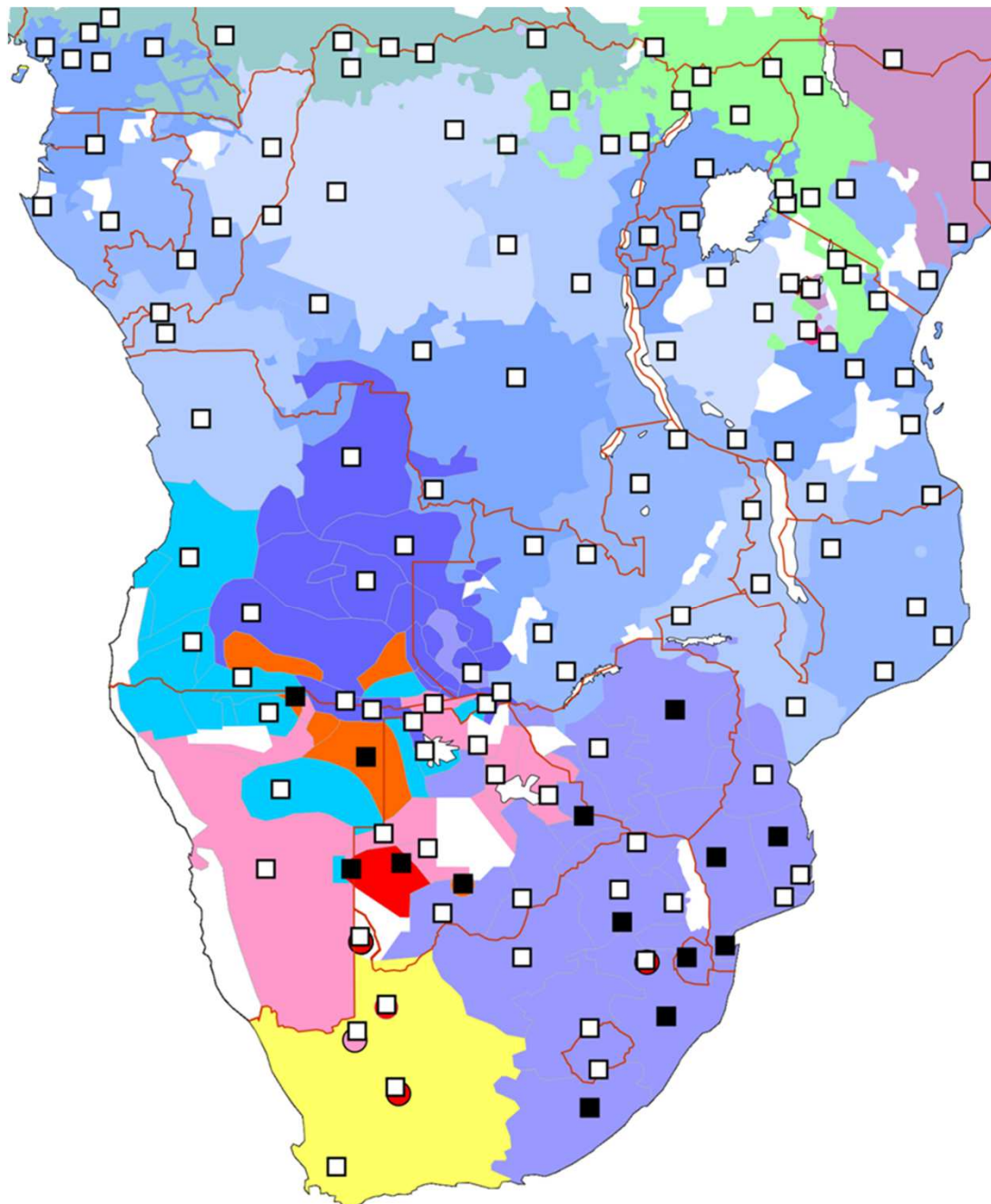
(cf. BH,DH)

presence of slack (or breathy)
voiced stops,

e.g. /b/ or /b^h/

*Presence of breathy or slack voiced
stops*

- absent
- present



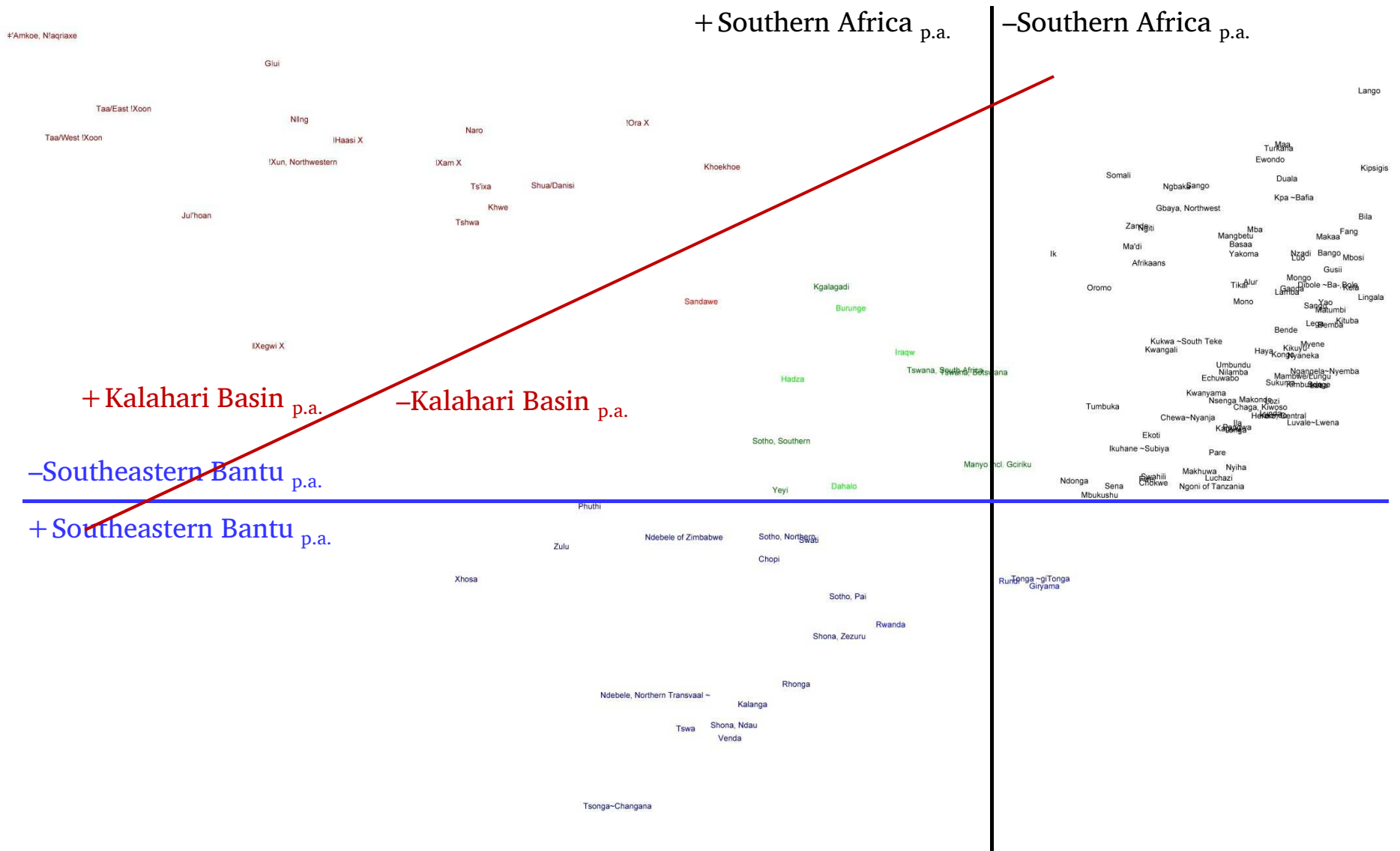
7. Results: MDS

Multidimensional scaling (MDS) and k-means clustering

- based on 59 (/81) features with areal distributions in subequatorial Africa
- including features NOT relevant for Southern Africa, e.g. labial-velar consonants (\widehat{kp}), non-sibilant dental fricatives (θ , δ), or bilabial rhotics (v , ʋ)
- probably biased to Southern Africa, however:
 - several features related to clicks
 - presence of double-articulated consonants (incl. clicks, \widehat{kp} , \widehat{pk} , etc.)
 - presence of ingressive consonants (clicks)
 - number of click types (\odot , $|$, $!$, $!!$, \ddagger , \parallel)
 - only one feature related to implosives
 - presence of implosives

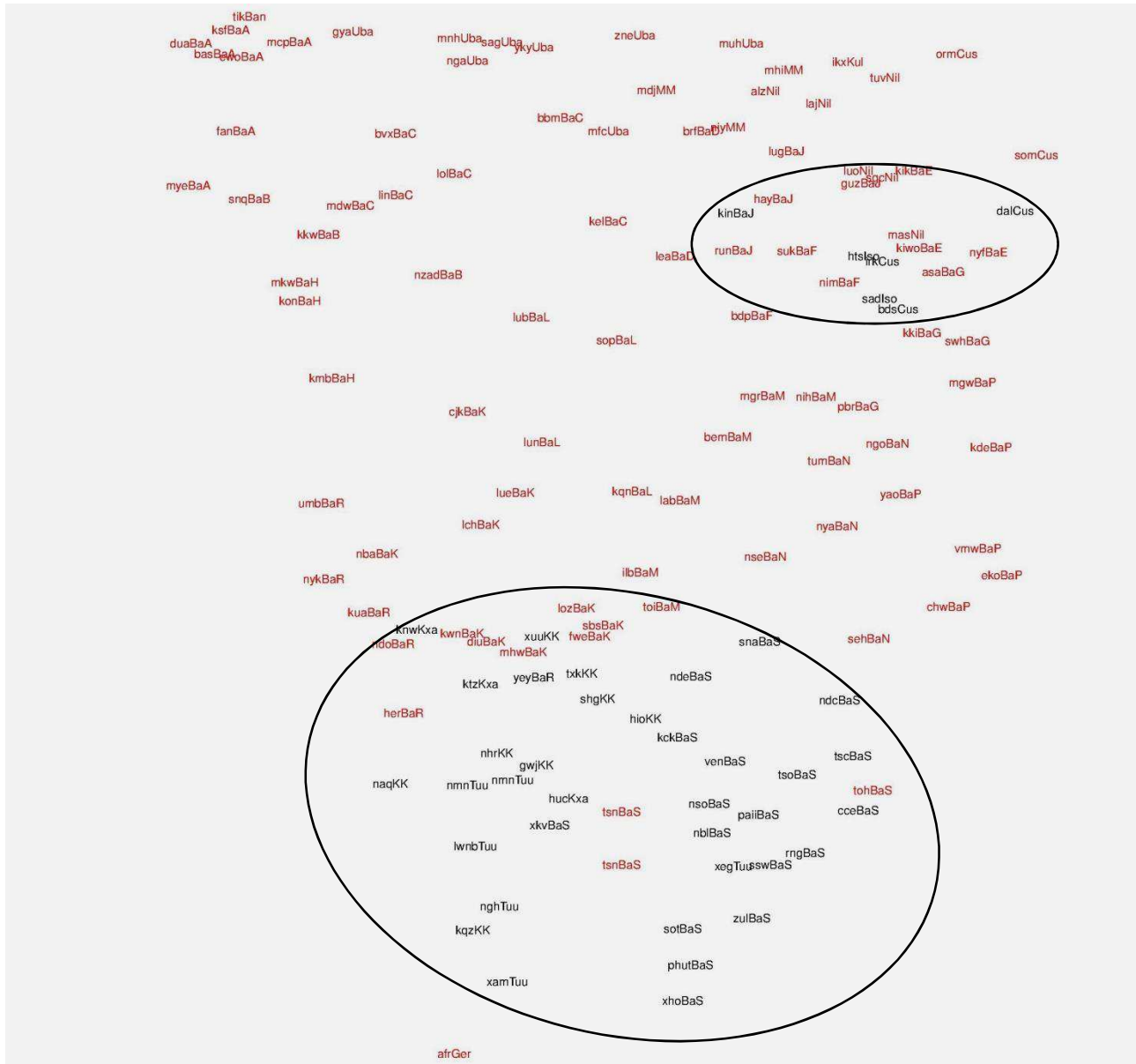
7. Results: MDS

MDS plot



7. Results: MDS

k-means clustering (2)



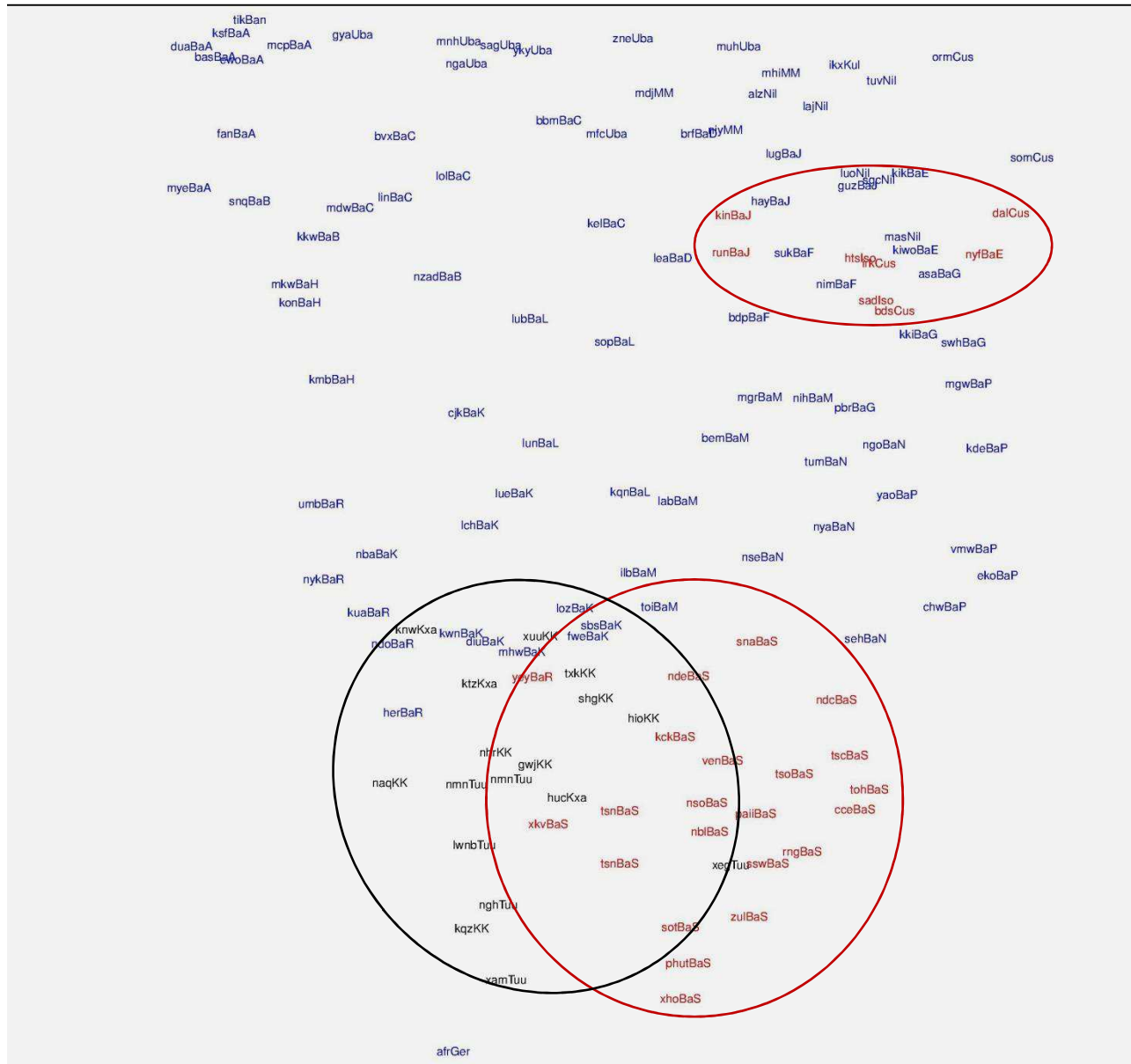
Subequatorial Africa

'Southern Africa'

Rest

7. Results: MDS

k-means clustering (3)



Subequatorial Africa

'Southern Africa'

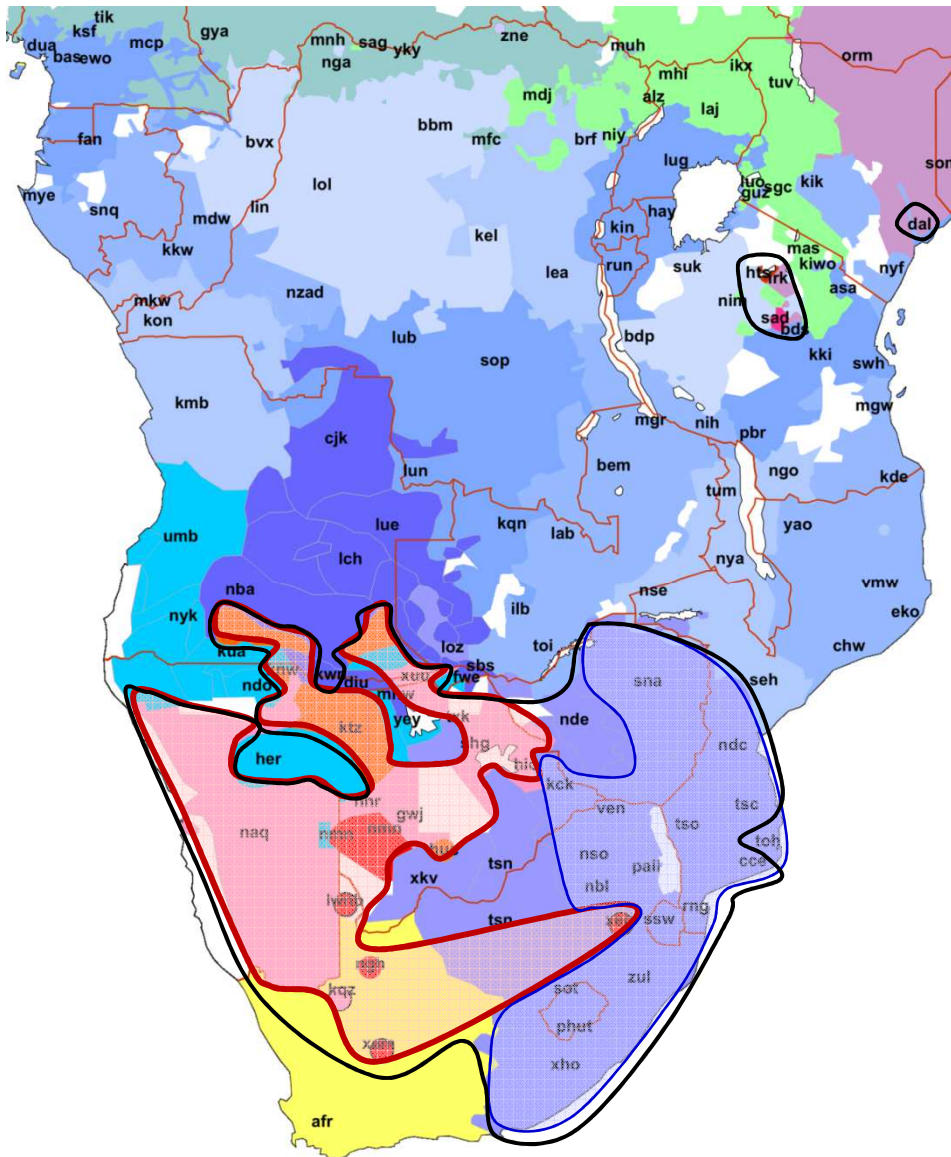
Rest

Kalahari Basin

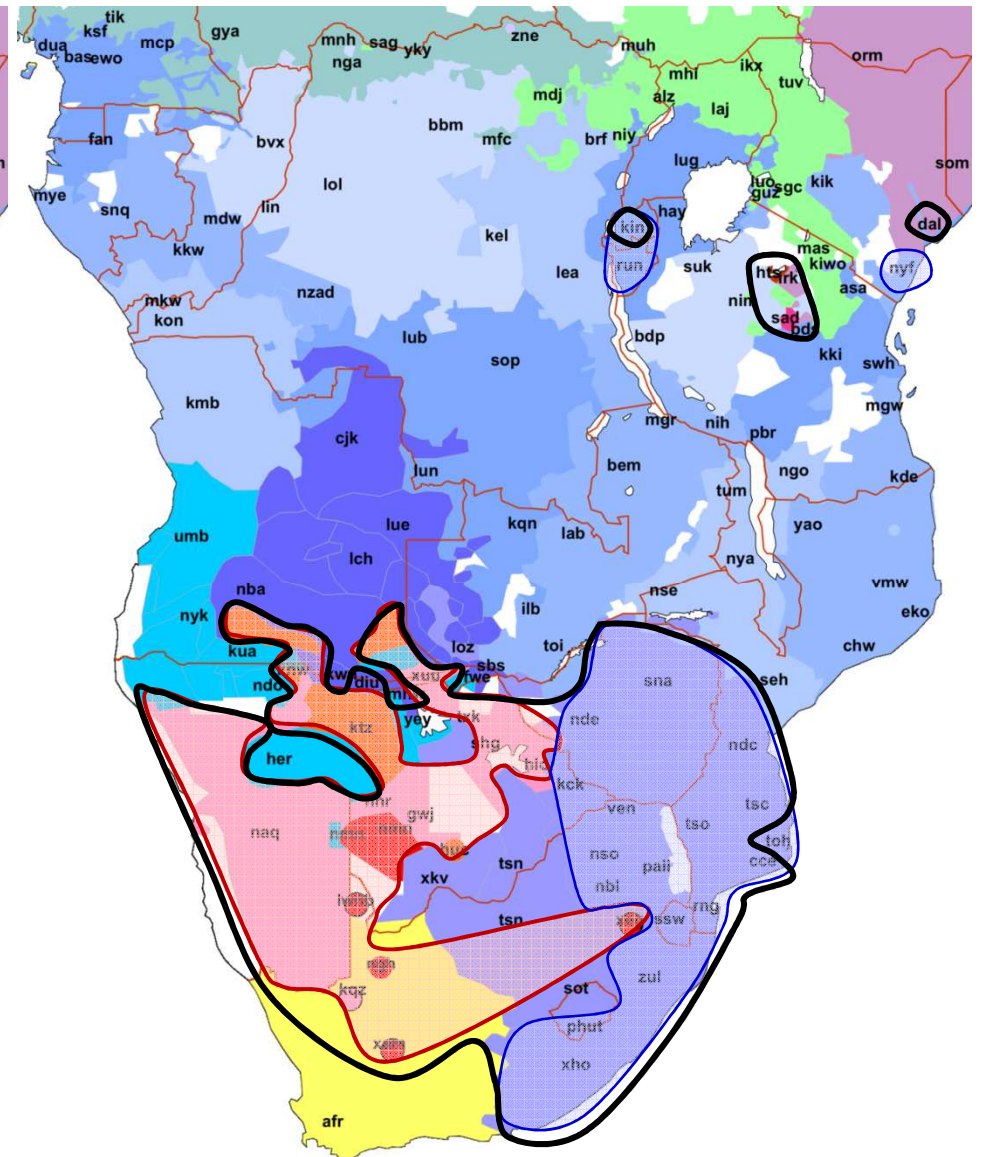
'South-eastern Bantu'

7. Results: MDS

'Hand-made' analysis



Similar: MDS-based analysis



8. Summary

Conclusions

- 3 phonological areas: Kalahari Basin, Southeastern Bantu (?), Southern Africa
 - *'Southern Africa' related to the 'Kalahari Basin' (> Khoisan substrate as main factor?)*
- Kalahari Basin \approx ideal linguistic area (clear boundary/ definition)
 - *but: only second to 'Southern Africa' in MDS and k-means clustering*
- 'Southeastern Bantu' - weakest area, but recognizable
 - *largely excluding Sotho-Tswana*
 - *multiple relations to East African languages?*
- Southern Africa
 - *Kalahari Basin + SE Bantu + Sotho-Tswana + Yeyi + Bantu K.30? (+ East Africa)*
 - *primary phonological area within subequatorial Africa > Southern Bantu languages DO constitute one phonological area with Kalahari Basin (+ partially E.Africa)*
 - *some Southern African languages outside the phonological area*
 - *Lozi (Sotho-Tswana language)*
 - *Herero, Wambo languages*
 - *Afrikaans*
 - *various relations to East African languages < multiple relations? (Sandawe - Khoe-Kwadi?, S.Bantu - E.Bantu, especially Shona - Rundi/Kinyarwanda and Gitonga - Mijikenda?)*
 - *> due to (?)*
 - *Khoisan substrate*
 - *increased network of relations*
 - *repeated historical relations to East Africa*

9. Contact scenarios

Donohue (2013: 222): Typology of unbalanced contact scenarios

Table 3. Results of different superimposition scenarios on local inhabitants

Sociopolitics	Population	
	Intruder populous	Intruder minority
Intruder dominant	1. intruder L largely unchanged	3. intruder L acquires phonology substrate from local L
	2. <i>local languages lost</i>	4a. <i>local languages lost</i> or 4b. local L acquires morphosyntax overlay from intruder L
Intruder subordinate	5. intruder L acquires morphosyntax overlay from local L	7a. <i>intruder languages lost</i> or 7b. intruder L acquires morphosyntax overlay from local L
	6. local L acquires phonology substrate from intruder L	8. local L largely unchanged

9. Contact scenarios

Kalahari Basin (cf. Traill & Nakagawa 2000: 2-9)

- residual zone: high genetic density, deep language families, structural diversity, areal features, "relative equilibrium"
- small, mobile groups (similar cultures and technology)
- "... the population history of South Africa, ..., is one of expansions and contractions that are related to environmental conditions..." (:4, citing Deacon & Deacon 1998)
- no lingua franca, but local bilingualisms to bridge linguistic barriers
- > long-range stability of varying contact situations and bilingualism
- e.g. peripheral G|ui group (near Okwa, Botswana): isolation and increasing contact with Taa > language shift of the entire group to Taa (Traill & Nakagawa 2000)
- e.g. trilingual speaker from Tswaane (≠'Amkoe, Taa, G|ui)
- cf. probably 4 language shifts in Rappelspan-Bokspits/SW Botswana (N||ng/Lower Nossob > Khoekhoe > **Afrikaans** > Tswana)



9. Contact scenarios

Xhosa and Nguni (Lanham 1964)

- Xhosa consonant inventory: made up of Proto-Nguni plus Khoekhoe (except for: 4 > 3 click types; simplification of clusters [click + dorsal affricate] > simple clicks)

Consonants:		-	+	-	+	-	+				
1. Implosive	6		A	B	č	k	C	D			
2. V'less stop	p	t	ts̱	ty̱			kx̱		!		
3. Voiced stop	b	d	ḏz*	ḏy	ǰ	g		g̱	!g̱	g̱	
4. Aspirates	pẖ	tẖ	tsẖ*	tyẖ	čẖ	kẖ		ẖ	!ẖ	ẖ	
5. V'less spirant	f	s			š		x			ɬ	h*
6. V'd spirant	v	z					ɣ			L	fi
7. Non-nasal res.	w	l		y							
8. Nasal resonant	m	n		ɲ		ŋ		ŋ̱	!ŋ̱	ŋ̱	
9. Nasal aspir.	m̱h*			ɲẖ				ŋ̱ẖ	!ŋ̱ẖ	ŋ̱ẖ	

(Correlation according to affrication indicated by + -. * = low frequency.)

(not framed): consonants inherited from Proto-Nguni

(framed): consonants borrowed from Khoekhoe

9. Contact scenarios

Xhosa and Nguni (cf. Lanham 1964, Traill 2002, Herbert 2002)

Several important factors

- bidirectional **language shifts** Khoekhoe < > Xhosa ("assimilation of Khoekhoe into Xhosa lineages and Xhosa into Khoekhoe chiefdoms"), final incorporation of eastern Khoekhoe into the Xhosa kingdoms (early 1700s) (Traill 2002: 29)
- "**Bilingualism**, which opened the door to Khoisan linguistic influence, was nurtured in a different setting from that of Western culture. In the extended polygamous family of the Nguni there was not one, but several "families", each clustering around one of several wives. The father was an occasional visitor to these families and in the linguistically formative years of the child, the predominating influence was that of the [Khoekhoe or San] mother. Only later was the influence of the father and the extended family strongly felt. There was, therefore, an aspect of **separation in time and place in acquiring the two languages ...**" (Lanham 1964: 383)
- **hlonipha avoidance register** (Xhosa, Zulu, S. Sotho): women obliged to avoid names of husband and other male family members, and all syllables thereof > high rate of idiolectal manipulation of majority language (lexical replacement or substitution of sounds > often by clicks) (Herbert 2002)

9. Contact scenarios

Other cases

- Lozi (K20, Zambia)
 - original Sotho group (S.Sotho)
 - Mfecane (warfare, ca. 1815-1840): moving to the upper Zambezi
 - domination of local groups
 - > Sotho morphosyntax, but complete loss of South African phonological profile
- Ngoni (N12, Malawi):
 - Nguni group
 - Mfecane: moving north, incorporating people of diverse origins
 - influencing other groups (clicks > Tumbuka)
 - > linguistically completely absorbed, maintenance of distinct identity/ethnonym (**dominant language lost**)
- Afrikaans, Wambo languages, Herero (R20, R30)
 - little phonological influence (outside the phonological area)
 - < latest newcomers
 - frequent discriminatory attitudes towards local groups (cf. (non-)adoption of children of mixed relationships, cf. 'Basters') ?

Acknowledgements

- Linda Gerlach (sharing unpublished data)
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- Tom Güldemann (sharing his library, comments)

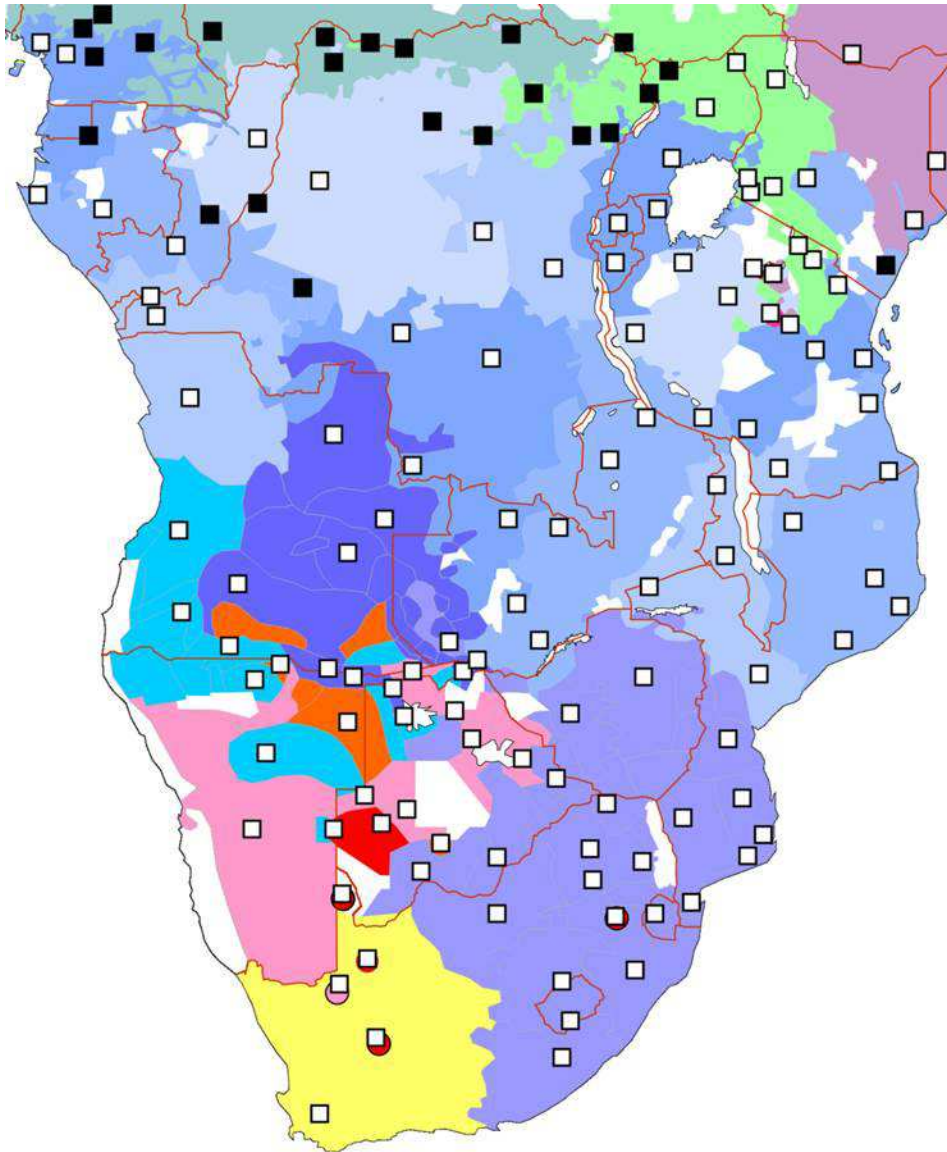
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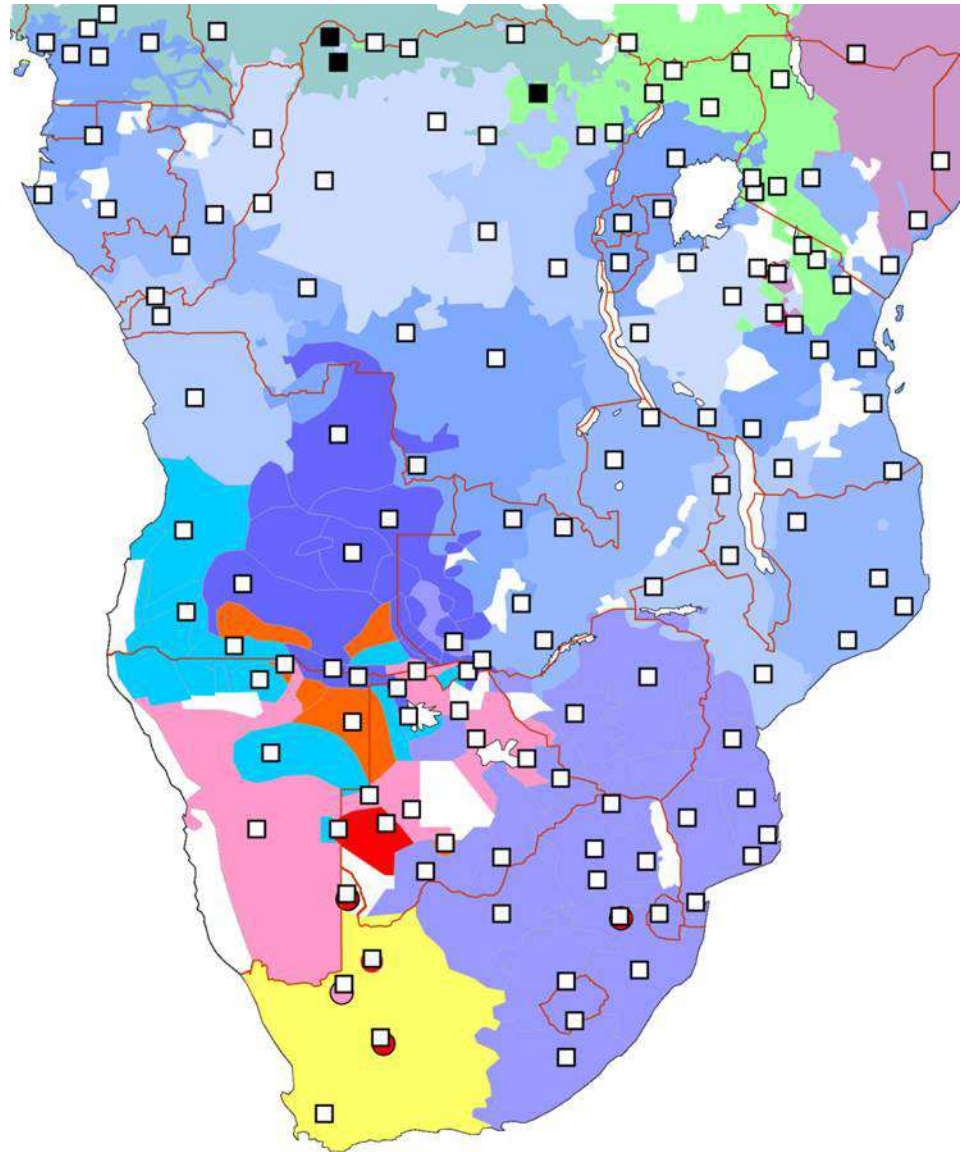
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Other areal features

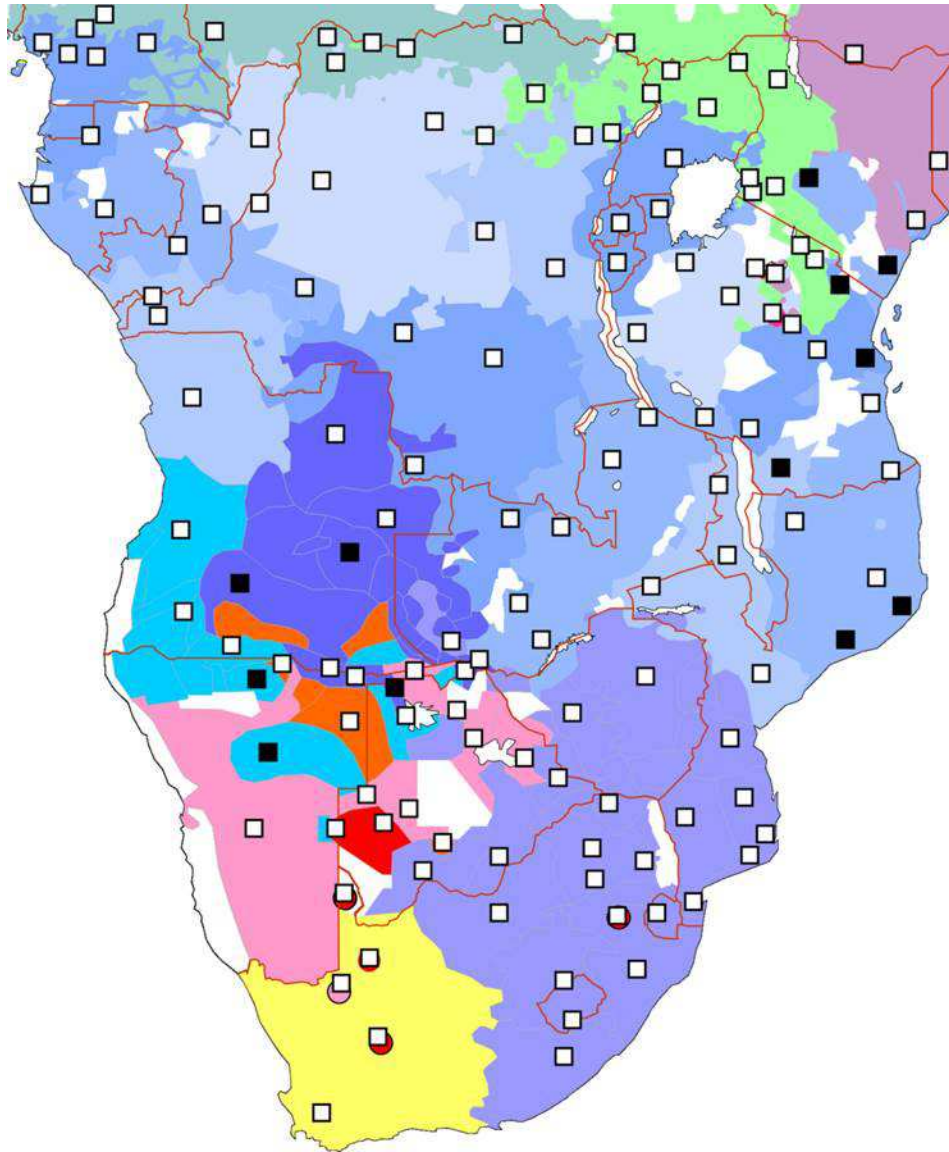


presence of labial-velar consonants (e.g. \widehat{kp} , \widehat{gb} , $\widehat{\eta m}$): \square absent, \blacksquare present

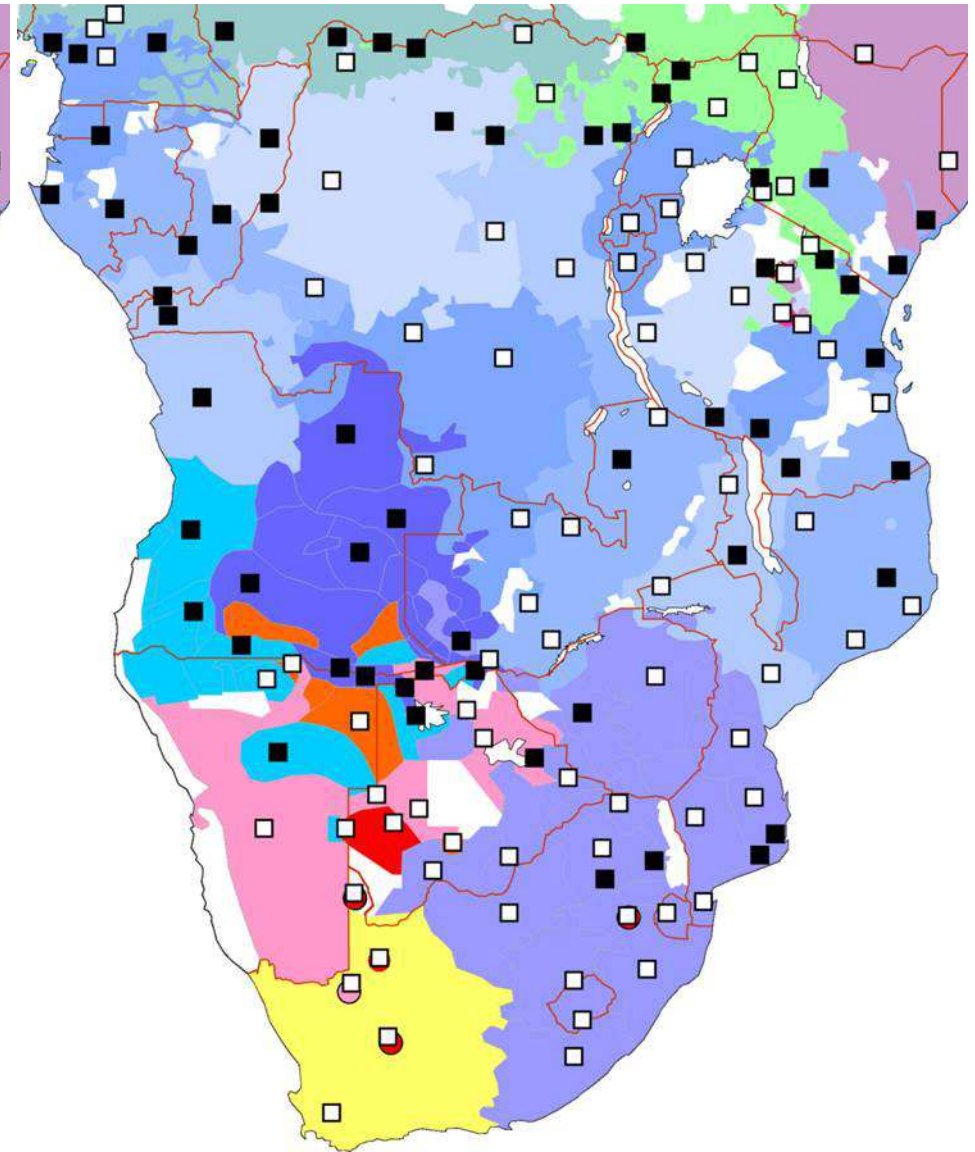


presence of labial taps, flaps and trills (v , β): \square absent, \blacksquare present

Other areal features

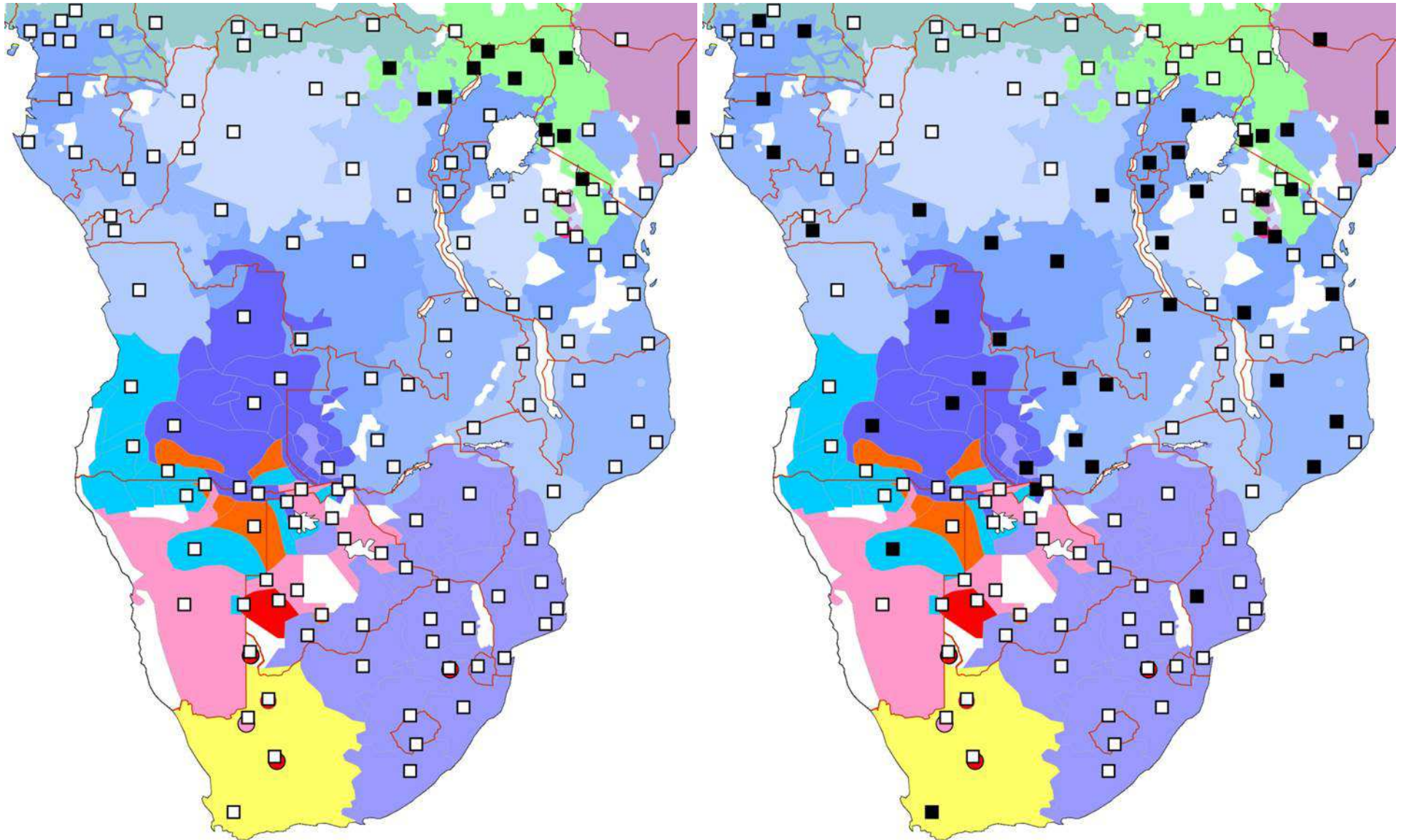


presence of dental non-sibilant fricatives
(e.g. θ , δ , $\widehat{n\delta}$, $\widehat{n\theta}$): \square absent, \blacksquare present



presence of N + C onsets analyzed as units
(e.g. \widehat{mb} , \widehat{mp} , \widehat{mf}): \square absent, \blacksquare present

Other areal features



presence of ATR vowel harmony:
□ absent, ■ present

presence of length distinction in vowels (/V/ :
/V:/): □ absent, ■ present