



ATLANTIC GROUPS AS PRIMARY BRANCHES OF NIGER- CONGO

Jack Merrill

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(Northern) Atlantic within Niger-Congo

I propose the following:

- All Northern Atlantic languages are Niger-Congo (NC)
- Atlantic or Northern Atlantic is not a valid subgroup of NC
- The various established groups within the Northern Atlantic area should be treated as primary branches of NC
- As such, the NC homeland is likely to be in the Northwest

The Northern Atlantic languages

I examine the following established language groups:

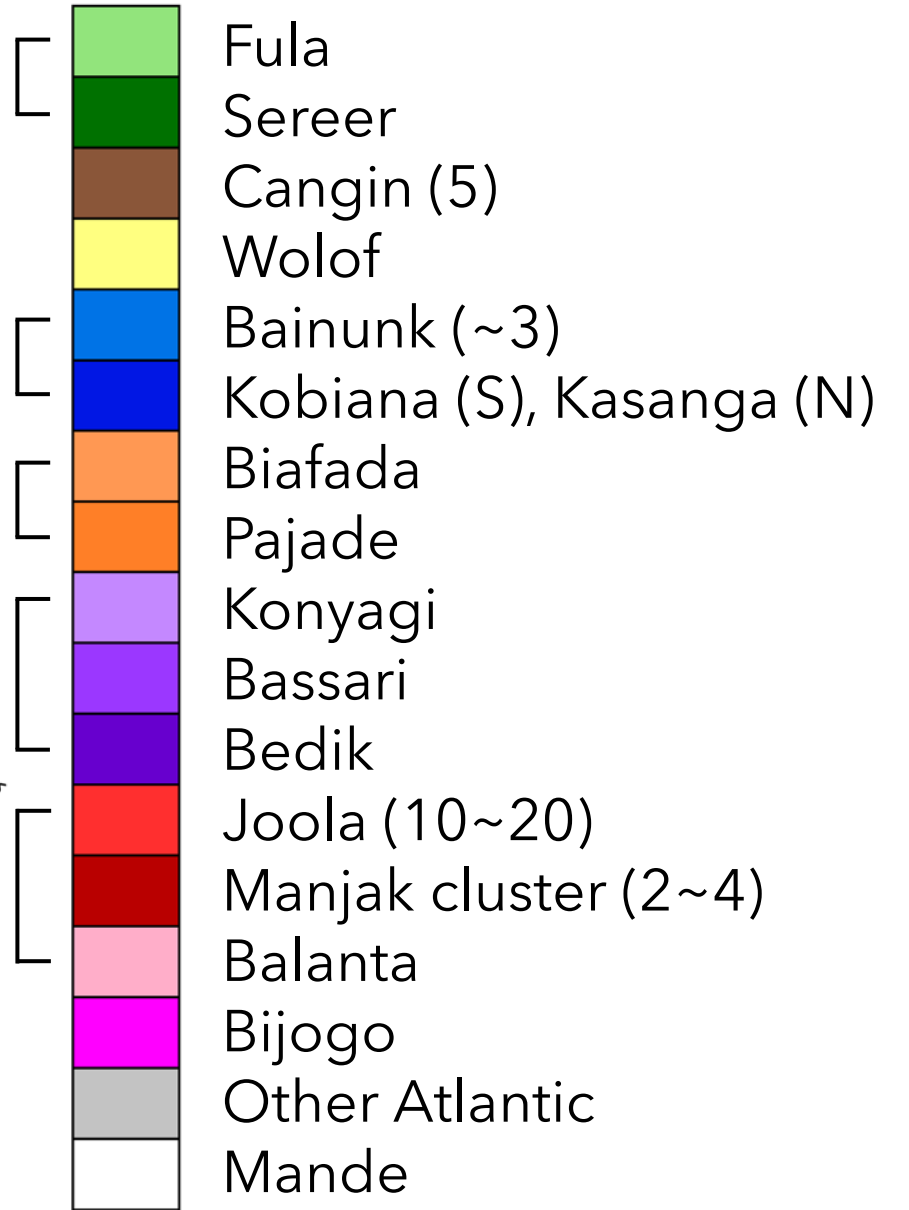
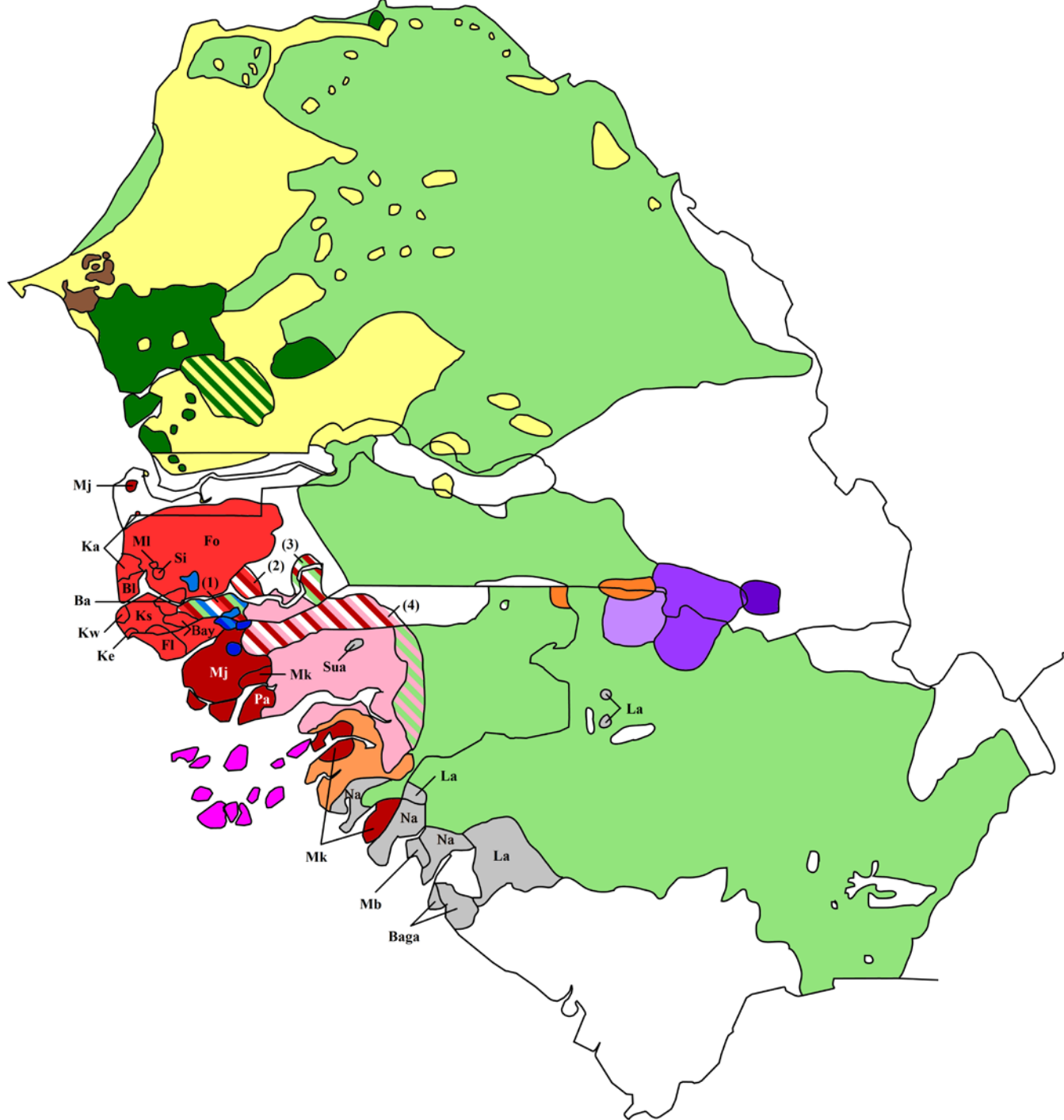
- Fula-Sereer
- Cangin
- Wolof
- Bainunk-Kobiana-Kasanga
- Biafada-Pajade
- Tenda
- Bak (Joola, Manjak cluster, Balanta)
- Bijogo
- Benue-Congo > Bantu

The Northern Atlantic languages

- All but the last (Benue-Congo) have been classified together as (part of) a subgroup of Niger-Congo:
 - Westermann (1928): West Atlantic
 - Greenberg (1963): Atlantic
 - Sapir (1971): Atlantic > North Atlantic, Bijogo, South Atlantic
 - ...
 - Pozdniakov and Segerer (2017): "Atlantic" = North Atlantic + Bijogo

	# of extant languages	size of lexica	# of reconstructed roots
Fula-Sereer	2+ (many Fula dialects)	~15,000 each	>400
Cangin	3~5 (3 dial. continua)	~2000 each	>500
Wolof	1	~15,000	–
Bainunk-Kobiana-Kasanga	~5 (3 Bai. groups)	4x 1500-2000, ~500 (Kas.)	>350
Biafada-Pajade	2	3500 (P), 600 (B)	>200
Tenda	3 (Konyagi, Bas., Bedik)	~4000 each	400, +400 Bassari-Bedik
Joola	10~20	3x ~5000, 1x ~3000, 1x ~1000, ~15x 200	(preliminary)
Manjak cluster	2~4	1x ~3000, 1x 2000, 2x 600	>1000 (Doneux)
Balanta	1~2 (2 dialect areas)	~3000, ~2000	–
Bijogo	1~3 (3 dialect areas)	1x ~1800, 2x ~600	–
Benue-Congo Bantu	~1000 >500		very few 1367 “main” in BLR3





Westermann and (West) Atlantic

- Johnston (and others?) identified some of these languages as “Semi-Bantu” based on typological properties
- Westermann was the first to propose the West Atlantic group, within his West Sudanic family
- Repeated by Greenberg and others
 - But has always been controversial

Westermann (1928): “Die westatlantische Gruppe der Sudensprachen”

- Identifies (almost) all of the languages still called “Atlantic”
 - Notably not Fula – presumably taken to be “Hamitic”?
- Strong focus of “Southern Atlantic” languages, especially the Mel group (incl. Temne)
- 71 total (!) words cited from the languages I examine here
 - 5 for Wolof and others
 - Mostly borrowings and false cognates
- Classification clearly did not rely on establishing sound correspondences and cognates
 - Based on typological features (noun class) and geography

(West) Atlantic since Westermann

- Greenberg (1963) retains the Atlantic group (commendably adding Fula to Niger-Congo), but the evidence isn't any better than what Westermann presented
 - Existence of Atlantic is taken for granted: no attempt to prove the subgroup
- Sapir (1971): very flawed lexicostatistical classification
 - Identifies "North Atlantic," "South Atlantic," +Bijogo
 - Does not compare with outside groups
- Pozdniakov and Segerer (2017)
 - Rejects Atlantic, but accepts N. Atlantic+Bijogo (renamed "Atlantic")

Existing objections to Atlantic

- Widely recognized that the languages are on the surface extremely distinct
- Many have questioned or rejected the unity of Atlantic
- Bennett & Sterk (1977; lexicostatistics): looks no better between Atlantic groups than with Bantu
- Childs (2003: 50)
 - “Neither lexicostatistical data nor shared innovations (nor reconstructions) seem to favor treating Atlantic as a genetic group. The culture of lumping and inertia are the only factors favoring its continuance”
- Güldemann (2018) ... among others

Existing objections to Atlantic

- Dimmendaal (2008: 841-2) (my emphasis)

“The status of Greenberg’s Atlantic group within Niger-Congo is still unclarified. [...] The internal diversification within this presumed primary branch indeed is so huge that some scholars would argue that “Atlantic” is primarily an **areal grouping** representing a number of **independent, early descendants of Niger-Congo**; a few have challenged this view and would go as far as saying that some of the languages originally included in this family may **not even belong to Niger-Congo**”

Atlantic in Niger-Congo classification

- Despite these objections, attempts at top-level classification of Niger-Congo always present a unified (or nearly unified) Atlantic subgroup
 - Bendor-Samuel (1989)
 - Williamson & Blench (2000)
 - Blench (2006)
 - ...

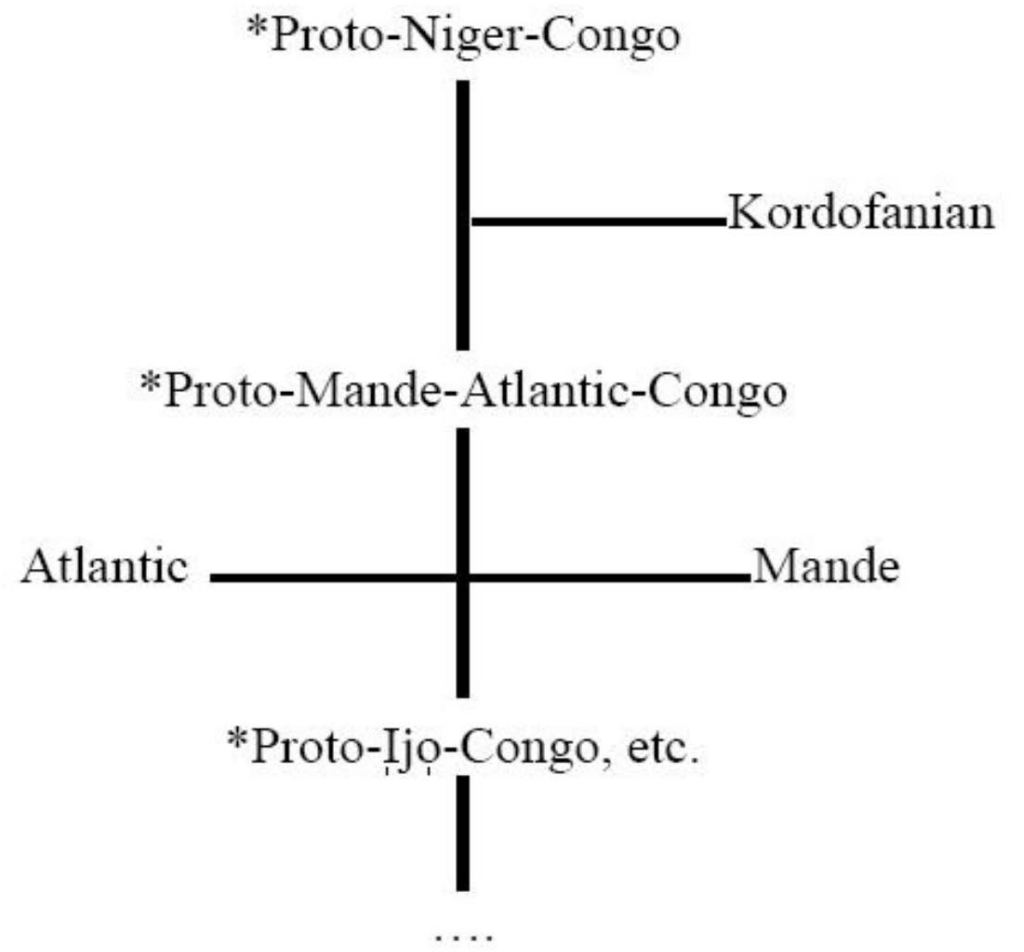
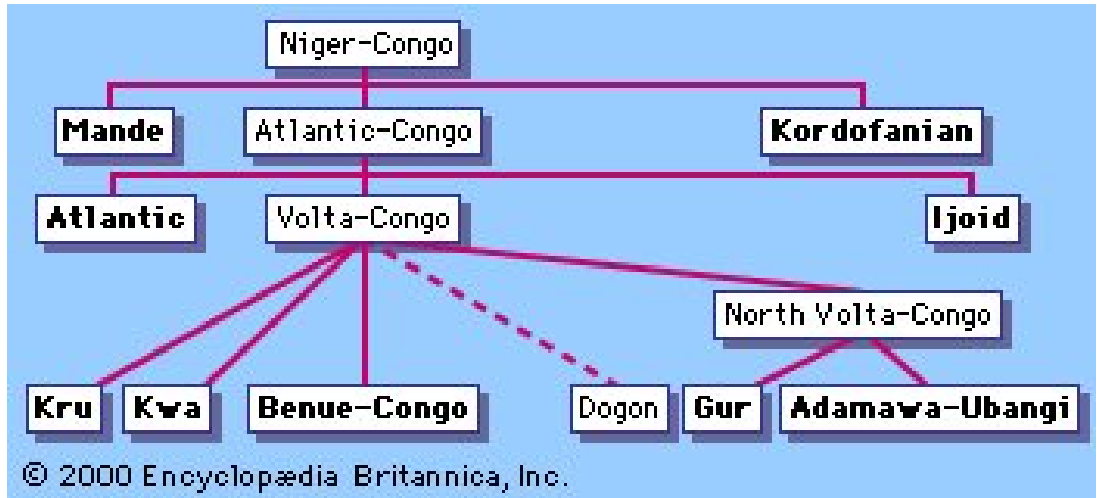


Figure 1: Niger-Congo (Williamson and Blench 2000)

Establishing the status of Atlantic

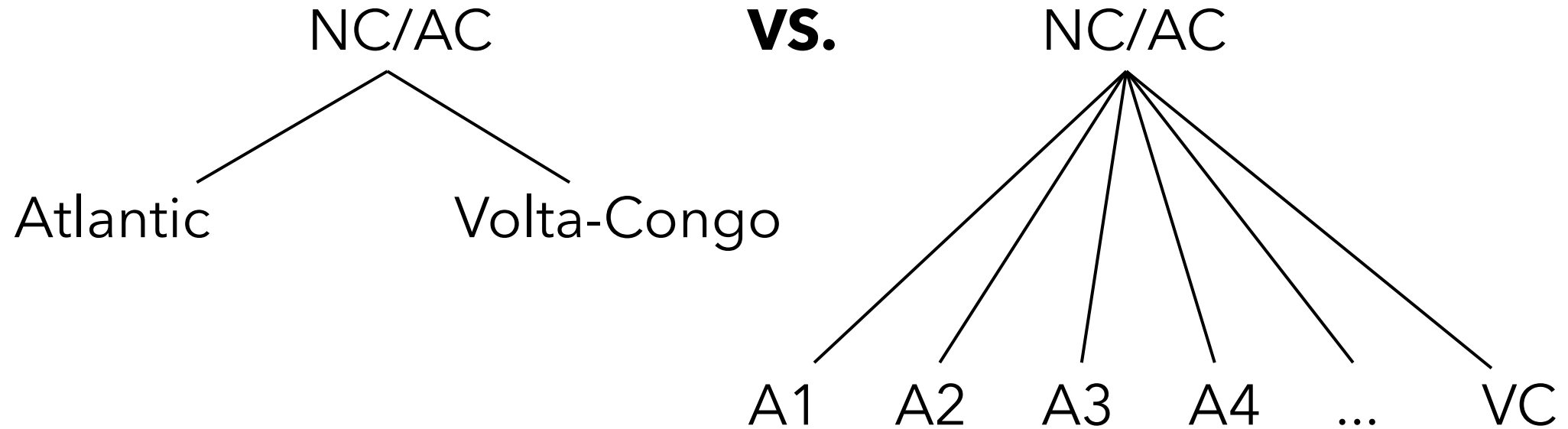
- **Goal:** establish whether (Northern) Atlantic is a valid subgroup, or represents multiple co-ordinate nodes at the top level of Niger-Congo / Atlantic-Congo
- **Strategy:** compare Atlantic groups with Benue-Congo (Bantu), to see if there are shared innovations that justify any subgroups, including (Northern) Atlantic as a whole

Volta-Congo

- The unproven subgroup containing all non-Atlantic Atlantic-Congo languages
 - Benue-Congo, Gur, Adamawa, Senufo, Kwa, (some?) Ubangi, (Kru?)
- Williamson (1989), following Bennett and Sterk (1977)
- Recently argued for in Hepburn-Gray (2020)
- I have no opinion on the matter, but VC's status is important

Volta-Congo

- If valid, the status of Atlantic is especially important



Volta-Congo and Bantu

- Here, I compare only with Benue-Congo (mainly Bantu) within Volta-Congo
- Ideally would compare with all of VC, but this is difficult
 - Proto-VC not reconstructed
 - Even for most subgroups no reconstructed proto-language
 - Documentation poor for many groups vs. Bantu
 - Careful comparison with other VC groups in the future will be highly important
- Much successful reconstruction has been done on a subset of the extant languages (e.g. Guthrie with Proto-Bantu)
 - More languages incorporated later
 - Prompting (minor or major) modifications to the original assumptions

Why compare with Bantu?

- Practical reasons:
 - Most available data
 - Highest confidence in reconstructions
 - Many reconstructions
 - Proto-Bantu = oldest available VC language
- Bantu-specific reasons
 - Seemingly quite conservative:
 - Little phonological reduction vs. certain other groups
 - Retains lots of morphology
 - More impressionistically, seems to be lexically conservative: has roots found in Atlantic, but rare (?) elsewhere in Benue-Congo (e.g. *-jògù “elephant”)

Niger-Congo vs. Atlantic-Congo

- I define “Niger-Congo” as all languages demonstrably related to Bantu
- For now, I do not consider Mande, Ijo, Dogon, Kordofanian
- If these do turn out to be related, substitute “Atlantic-Congo” for “Niger-Congo” in all conclusions drawn here
- Re: Kordofanian: far too early to say, but Hepburn-Gray (2020) notes that the Kordofanian groups with class systems seem closer to VC than to Atlantic groups


Roadmap

I argue for the independent status of Northern Atlantic groups within Niger-Congo based on:

- I) Evidence from sound change
- II) Lexical evidence
- III) Evidence from noun class

Note: bottom-up reconstruction

- Everything I present today is only possible by first carefully reconstructing each subgroup
- The reconstruction of these subgroups is not the focus here
- Most of the relevant argumentation is found in Merrill (2018) and, for Cangin, Merrill (in preparation)



SOUND CHANGE

Establishing sound correspondences

- I have established regular consonant correspondences between groups
 - Based on a set of 315 cognates, of which 150 appear in three or more groups
- And have reconstructed the set of Proto-Niger-Congo consonants
- From this, we can see if any groups exhibit shared sound changes from the PNC system

NC	FS	Cang.	Wolof	BKK	BP	Tenda	Joola	Manj.	Bal.	Bij.	Bantu
p	f	p	f	f	f	f	f	f	f	p	p
t	t	t	t	ɾ	ɾ	ɾ	l, t	ɬ	t	t	t
c	s	s	s	ʃ	s	ʃ	s, c	c	s	c	c
ʈ	s	s	s	s	s	ʃ	ɬ, t	t	s	ʈ	c
k (pal)	x	k	h	k	h s	x ʃ	∅, k	k	h	k	k
x	x	H	x	h	h	x	∅, k	h	h?	k	k
h	h	h	h	h	w/∅	x	∅, k	h	h	∅	∅
b	b	w	b	b	b	w	f, p	p	f	β	b
d	r	l	d	d	r	r	t	tr̥	θ	r	d
g (pal)	g	y	g	g	g j	y y	k	k	g	g	g y
w	w	f	w	w/∅	w/∅	w	w	w		β	
l	l	n	r	n	y	n~l	l	l	l	∅	∅?
j~y	y	y/∅	y	y	y	y	y	y		y/∅	y
ɓ	ɓ	ɓ	w/∅	∅	ɓ	ɓ	b	b	b	b	b
ɗ	ɗ	ɗ	l	r	ɗ	ɗ	d [d~r]	d [d~r]	d	ɗ	ɗ
y	y	y	y?	y	y	y	j	j?	j	j	y?
m	m	m	m	m	m	m~w̃	m	m	m	m	m
n	n	n	n	n	n	n~l	n	n	l	n	n
ɲ	ɲ	ɲ	ɲ	ɲ	ɲ	ɲ~ỹ	ɲ	ɲ	ɲ		ɲ?
ŋ	ŋ	(ŋ)	ŋ	ŋ	ŋ	ŋ~ỹ		ŋ			

Regular outcomes in root-initial position

- Lenition
- Fortition
- Devoicing
- Lenition+Devoicing
- (De)nasalization
- Deimplosion
- Other change

Strength of evidence for the sound correspondences

- Identification of the regular outcomes in each group is supported by a variable number of relevant cognates
 - Some very well-supported
 - Others suggested by only 1 or 2 cognates
- For full transparency, the number of cognates appearing in 3 or more groups that form the basis of establishing each outcome in each group is shown on the following slides
 - But note that these are bolstered by 2-group cognates
 - Bak is counted as a single group, and here there is much additional evidence from Bak-internal cognates

PNC	FS	Cangin	Wolof	BKK	BP	Tenda	Joola	Manjak	Bal	Bij	Bantu
p	f: 4, 3	p: 3 f#: 4	f: 4, 1 pp#: 3	f: 5, 9	f: 4, 10	f: 7, 11	f: 3 w#: 3	f: 3, 1	f: 0, 1 Ø#: 2	p: 2 Ø#: 2	p: 5, 3
t	t: 3, 2 d#: 5	t: 2 r#: 4	t: 3, 6 tt#: 1	r: 5, 4	r: 7, 5	r: 8, 4	l: 3, 3	*t: 3, 2	t: 2, 1	t: 3, 1	t: 5, 3
c	s: 1, 3	s: 0, 1	s: 2, 2	ʃ: 3, 0	s: 2, 1	ʃ: 3, 2	s: 1, 0 c: 2, 1	c: 1, 0	s: 1, 0	c: 1, 0	c: 2, 1
ʈ	s: 3, 3	s: 2, 0	s: 5, 2 cc#: 1	s: 5, 1	s: 3, 1	ʃ: 5, 3	ʈ: 1, 2	t: 4, 3	s: 0, 0	ʈ: 3, 3	c: 2, 1
k (pal)	x: 3	k: 4	h: 1	k: 7	h: 3 s: 2	x: 4 ʃ: 2	k: 1, Ø: 2	k: 2	h: 2	k: 2	k: 4
x	x: 2, 3	H: 2 h: 1	x: 4, 2 q#: 1	h: 3	h: 2, 1	x: 4 Ø: 1	k: 1, 1 Ø: 1	h: 1, 1	h: 0	k: 1, 1	k: 4, 3
h	h: 1	h: 4, 2	h: 4 kk#: 2	h: 2	Ø/w: 2, 2	x: 3, 1	Ø: 1, 1	h: 1 Ø#: 1	h: 1	Ø: 0, 1	Ø: 0, 2
b	b: 5, 2	w: 1 Ø#: 1	b: 4, 1	b: 3, 0	b: 5, 0	w: 5, 0	f: 1, p: 2 w#: 1	p: 3, 0	f: 1 Ø#: 1	β: 1	b: 3, 1
d	r: 4, 3	l: 6, 2	d: 2, 0	d: 7, 6	r: 7, 8	r: 7, 7	t: 3, 3	tr: 3, 6	θ: 1, 2	d: 0, 1 r: 1, 0	d: 0, 6
g (pal)	g: 8, 4	y: 7, 5	g: 5, 4	g: 7, 5	g: 6, 5 j: 1	Y: 6 Ø#: 4 y: 1	k: 5, 5	k: 4, 4	g: 3 Ø#: 2	g: 1, 3 Ø: 1	g: 2, 2 j: 2
w	w: 5	f: 2	w: 3	w: 2 Ø: 1	w: 1 Ø: 1	w: 2	w: 4	w: 3		β: 1 Ø: 1	
l	l: 1, 4	n: 0, 2	r: 0, 1	n: 1, 3	y: 1, 3	n~l: 1, 4	l: 0, 2	l: 0, 2	l: 1, 0	Ø: 1, 1	j/y: 1
j~y	y: 3	Ø(~y): 4	y: 3, 1	y: 4	y: 5	y: 6, 1	y: 1	y: 1		y: 2	j/y: 2
ḅ	ḅ: 11, 3	ḅ: 4, 3	w: 2, 1 Ø: 3, 0	Ø: 5, 1	ḅ: 7, 2	ḅ: 10, 2	b: 3, 2	b: 2, 2	b: 1, 1	b: 1 Ø: 1	b: 5, 1
ɗ	ɗ: 4, 5	ɗ: 1, 7	l: 1, 5	r: 2, 7	ɗ: 3, 6	ɗ: 4, 9	d[~r]: 3, 3	d[~r]: 3, 3	d: 2, 1	ɗ: 2, 2 n: 1	d: 5, 6
ɗ	y: 1, 3	y: 1, 0	y?: 1?	y: 1, 2	y: 1, 3	y: 1, 2	j: 0, 1		j: 1, 0	j: 0, 1	j/y: 0
m	m: 5, 9	m: 4, 6	m: 4, 3 mm#: 1	m: 8, 10	m: 7, 11	m~w̃: 5, 12	m: 4, 6	m: 1, 5	m: 0, 4	m: 1, 3	m: 4, 5 mb#: 1
n	n: 6, 6	n: 4, 5	n: 4, 3 nn#: 4	n: 5, 6	n: 8, 5	n~l: 6, 7	n: 3, 3	n: 3, 4	l: 3, 0	n: 2, 2	n: 4, 3
ñ	ñ: 3, 3	ñ: 2, 3	ñ: 2, 1	ñ: 2, 3	ñ: 1, 3	ñ~ỹ: 3, 1	ñ: 0, 1	ñ: 1, 1	ñ: 0, 1		ɲ?: 1?, 1
ŋ	ŋ: 1	(ŋ)	ŋ: 1	ŋ: 4	ŋ: 4	ŋ~ỹ: 4		ŋ: 2			

PNC	FS	Ca	Wo	BKK	BP	Ten	Jo	Manj	Bal	Bij	Bant
p	7	7	5	14	14	18	6	4	3	4	8
t	10	6	10	9	12	12	6	5	3	4	8
c	4	1	4	3	3	5	4	1	1	1	3
ṭ	6	2	7	6	4	8	3	7	0	6	3
k (pal)	3	4	1	7	3 2	4 2	3	2	2	2	4
x	5	2	6	3	3	4	3	2	0	2	7
h	1	6	4	2	4	4	2	1	1	1	2
b	7	2	5	3	5	5	4	3	2	1	4
d	7	8	2	13	15	14	6	9	3	1, 1	6
ḡ (pal)	12	12	9	12	11 1	10 1	10	8	5	4	4 2
w	5	2	3	3	2	2	4	3		1	
l	5	2	1	4	4	5	2	2	1	2	1
j~y	3	4	4	4	5	7	1	1		2	2
ḃ	14	7	6	6	9	12	5	4	2	1	6
ḋ	9	8	6	9	9	13	6	6	3	4	11
ỵ	4	1	1?	3	4	3	1		1	1	0
m	14	10	7	18	18	17	10	6	4	4	9
n	12	9	7	11	13	13	6	7	3	4	7
ṅ	6	5	3	5	4	4	1	2	1		2?
ṇ	1	0	1	4	4	4		2			

Selected sound correspondences

- Let's examine a few selected sound correspondences
 - First a straightforward one:
 - **p
 - Then some more interesting ones:
 - **t
 - **ḡ
 - **l

Stem-initial **p

	Proto-FS	Fula	Sereer	Cangin	Wolof	Proto-BKK	Kobiana	Gujaher	Gubëeher	Guñaamolo	Proto-BP	Pajade	Biafada	Proto-Tenda	Konyagi	Bassari	Bedik	Joola	Manjak	Balanta	Bijogo	Bantu (BC)	
flay/skin skin (n)			fas 'strip bark'		fees		-ppaacc 'strip bark'	-pas 'strip bark'			*fəs	fəs	fəs	*-feʃ	-fès	-fèʃ	-féʃ	F. -fetul	fət	fur, fer	peʃak~pəʃak ko-pəʃo	*púcuð *pùcù	
split	*fals	fecc-, fels-	fac(it)		fàcc 'crack'	*-facc	-f~ppaacc 'strip bark'	-fac	-pac 'sculpt'	-fac								F. -fac (Fonyi only)				*pàc	
white						*-fes	(-f~ppundu)	-fer	-fer	-fer	*faas *fVc	faas fac~fic 'be clean, pure'	f~paas fəc 'be clean'	*-feʃ		-fèʃ	-fèʃ	*-fiit	*fac~faac				*pe, Lamnsó fǎ́r, etc.
foot shoe	*-fad	fad-o	o-ñafaf ol-			*ta-pper	tá-pp(e)r							*-feed *-feed(d)	i-fàry i-pàry	ba-pèd	gi-pə́d						*pàdǐ
ten					fukk						*ba-ppo	pa-ppo	ba-ppo	*-foox/fuux	i-páxw	f~pəx/pux	ma-fú/pó						BC *pu
clap	*foh		fox	*puh/poh								fuk 'hit with fist'		*-fok(k)-a, *-fox 'hold in 2 hands'	-fákwá	-fòxwá, -fòxw	-fōwà, -fó						
leave	*ful	ful-		*pùl		*-fud	-f~ppul	-fūr	-fūr	-fūr								*-fùl, *-pur < BKK?					*púduð 'escape, go out'
blow											*fuur	fuur	fuul					*-fütən	*fuutɿ				*púð
armpit	*-naaf-faand		o-naapaand ol-			*-fand		gu-fan	ji-fand											f-fáandɿ			
do, act, make				*pang 'do'																			*páng
wound				*puuɾ																			*pútá
froth/foam					fuur																		*púð
tick	*feed	fetto	feedl-		fel w-	*-fer ?		a-fen						*er-fVd		e-pə̀l 'louse'		F. ba-fet 'body louse'			ka-pede 'louse'		

**p	Fula-Sereer	Cangin	Wolof	Bainunk-KK	Biafada-Pajade	Tenda	Joola	Manjak	Balanta	Bijogo	Bantu (BC)
	*f	*p	f	*f	*f	*f	*f	*f	f	p	*p
flay/skin skin (n)	*fas ‘strip bark’		fees		*fəs	*-feʃ	F. -feʉl	fət	fur, fer	pɛʈak~pɔʈak kɔ-pɔʈɔ	*púcuɗ *pùcù
split	*fals		fàcc ‘crack’	*-facc			F. -fac				*pàc
white				*-fes	*faas ‘w.’ *fVc ‘be clean’	*-feʃ	*-fiit	*fac~faac			*pe, Lamnso fór, etc.
foot shoe	*-fad			*ta-pper		*-feed, *-feed(d)					*pàdɨ
ten			fukk		*ba-ppo	*-foox/fuux					BC *pu
clap	*foh	*puh/poh			P. fuk ‘hit with fist’	*-fok(k)-a, *-fox ‘hold in 2 hands’					
leave	*ful	*pɨl			*-fɨɗ						*púduk ‘escape, go out’
blow					*fuur		*-fɨuten	*fuutɾ			*púɗ
armpit	*-naaf-faand			*-fand					f-fáandɪ		
do, act, make		*pang ‘do’									*páng
wound		*puurɿ									*pútá
froth/foam			fuur								*púɗ
tick	*feed		fel w-	*-fer		*er-fVɗ	F. ba-fet ‘body louse’			ka-pɛɛɛ ‘louse’	



	Proto-FS	Fula	Sereer	Cangin	Wolof	Proto-BKK	Kobiana	Gujaher	Gubêeher	Guñaamolo	Proto-BP	Pajade	Biafada	Proto-Tenda	Konyagi	Bassari	Bedik	Joola	Manjak	Balanta	Bijogo	Bantu		
block/stop up/ram in	*sux, sox	sukk-	sux; o-soxoof ol- 'cork'	*sox 'plant' *soH 'seeds'	sox 'load gun'	*-sox	soh		-roox	-rokk				*-jo(y)	-sòy	-jó	-jòy	*-look	*tuh				*-còk 'poke in, ram in'	
daylight					ceeñeer l- 'sunbeam'	*ma-senn *senn 'be clear'	má-sen -s~ccen, táccen 'dawn'	-ren	-renn	-renn, harenaam 'dawn'				*-jan 'dawn, tomorrow, morning'	æ-cáɛl	e-cán	bājál					[ɛn(e) 'shine']	*mu-càná	
smoke	*-suuC	cuur-ki	fo-suun ol-	*sūt (v)	suur (v)	*	á-cculugg				*hu-cci/u	ku-ci	fu-cu, fu-ci	*-jən (v) *xɔC-[-...]	-sáɭ xwə-cicá	-jən o-kwocán	-jəl go-kwòc					[ɬɨp (v) maa-ɬɨkpa]		
crocodile					jasig j-	*ja-sɛg		jɛreeg	ja-rɛg	jəg	*		jaasugu							*u-tɨk		ɛ-ɬɛgɑ		
put in bag/container	*sod	sod-	sod	*sod	sol 'wear'															*tɔr				
leak, drain, ooze	*si	si'	si'								*	suu		*-juu		-jú	-jù				tu			
split											*sab	sap	sabw								*taw			
sow, plant seeds						*-sugg	-s~ccugg	-rɨug	-rɨug	-rɨg									*-ɬuk		sug			
look at					séen 'see, glimpse'																*tɛn			
flay/skin skin (n)			fas 'strip bark'		fees						*fəs	fəs	fəs	*-fɛɭ	-fès	-fèɭ	-féɭ	F. -fɛɬul	*fət			pɛɬak~pɔɬak ko-pɔɬɔ	*-púcut *di/du-pùcù	
fish scale	*-was	bacc-e	o-was		waas (v) waasintoor w-	*-(y)es	sá-yeese(n)	gu-yer	gu-er	gu-yer									*ka-wɛɬ			Kam. ŋɔ-ɛɬ		
suck	*-buus	buuc-o-	buus	*baas										*-buuɭ	i-bús	-búɭ	-bùɭ				Pepel boot	bɔɬ		
anus	*-suus		o-suus ol-																		pə-cut			
milk				*miis																	*mijit			

**t	Fula-Sereer	Cangin	Wolof	Bainunk-KK	Biafada-Pajade	Tenda	Joola	Manjak	Balanta	Bijogo	Bantu
	*s	*s	s	*s	*s	*ʃ	*ɗ	*t	s	t	*c
block/stop up/ram in	*sux, sox	*sox 'plant' *soH 'seeds'	sox 'load gun'	*-sox		*-ʃo(y)	*-ɗook	*tuh			*-còk 'poke in, ram in'
daylight			ceeñeer l- 'sunbeam'	*ma-senn *-senn (v)		*-ʃan 'dawn, tomorrow, morning'				ʃen(e) 'shine'	*mu-càná
smoke	*-suuC	*sɔt (v)	suur (v)	K. á-cculugg	*hu-cci/u	*-ʃən (v) *xOC-ʃ...				ʃukp (v) maa- ʃukpa	
crocodile			jasig j-	*ja-sɛg	B. jaasugu			*u-tɪk		ɛ-ʃɛga	
put in bag/container	*sod	*sod	sol 'wear'					*tɔr			
leak, drain, ooze	*si'				P. suu	*-ʃuu		tu			
split					*sab			*taw			
sow, plant seeds				*-sɔgg			*-ɗuk		sug		
look at			seen 'see, glimpse'					*tɛn			
flay/skin skin (n)	S. fas 'strip bark'		fees		*fəs	*-feʃ	F. -feɗul	*fət		peɗak~pɔɗak kɔ-pɔɗɔ	*-púcuɗ *di/du-pùcù
fish scale	*-was		waas (v)	*-(y)es			*ka-weɗ			Kam. ŋɔ-ɛɗ	
suck	*-ɓuus	*ɓaas				*-ɓuuʃ		Pepel boot		ɓɔɗ	
anus	*-suus							pə-cut			
milk		*miis					*mɪɗ				

**ɓ	Fula-Sereer	Cangin	Wolof	Bainunk-KK	Biafada-Pajade	Tenda	Joola	Manjak	Balanta	Bijogo	Bantu (BC)
	*ɓ	*ɓ	CL-Ø, w	Ø	*ɓ	*ɓ	*b	*b	b	b	*b
breast (breast)milk	*ɓir- ‘milk(v)’	*ɓiiɓ	w- <i>een</i> w- <i>m- een</i> m-	*bu-(mu-)ɨn(d) *mu-ɨn(d)	*pa-ɓɓər *mam-ɓər	*er-ɓər *maŋ-ɓər					*di-béèdè (~*béenè)
mosquito	*gun-ɓog	*ɓuk	yoo w- <*y-oh	*-ux			*e-buk				*m/du-bú, (Somyev tə-bogo)
arm	*-ɓaxay		l-oxo l-		*gam-ɓahay	*ji-ɓaakk ‘hand’				kɔ-ɔkɔ	*ku-bókò
dog	*-ɓox	*ɓuh			*ji-ɓa(h)	*ji-ɓV		*u-ɓuɗ		e-ɓooɗi	*m-búà
child	*-ɓiy				*nin-ɓe	*ha-ɓi ‘girl’			mbî		*-bɨ́-ad ‘bear child’ (Reshe ú-bì)
baobab baobab fruit	*-ɓok~ɓag	*ɓoy		*ki-ɔog *bu-ɔog		*gaŋ-ɓakk/ɓuy *er-ɓakk/ɓuy	*bu-bak *fu-bak	*bə-bak			
suck	*ɓuus	*ɓaas				*-ɓuuɗ		Pepel boot		ɓɔɗ	
bathe	*ɓog	*ɓo(ɣ)-ox				*-ɓoggən					(Tikar ɓɔ? < *ɓɔk)
birth, beget	*ɓas-	*ɓasiɓ (< ser)	wasin		*ɓas	*-ɓaɗ					
black	*ɓaal				*ɓa(y)	*-ɓan	Kw. -ɓani				
body	*-ɓaal			*saN-(a)an	*-ɓo	*geŋ-ɓa(a)n					
belly	*re-ɓer ‘heart’	*pi-ɓil ‘lower abdomen’	b-iid b-	*bu-yɛd							
exchange			wecci	*-wocc	*ɓacc						
baobab b. fruit			g-uy g- b-uy b-								*mu-bùjú
twist	*ɓoCɗ ‘strangle’				*ɓond						

***1

	Proto-FS	Fula	Sereer	Cangin	Wolof	Proto-BKK	Kobiana	Gujaher	Gubëeher	Guñaamolo	Proto-BP	Pajade	Biafada	Proto-Tenda	Konyagi	Bassari	Bedik	Joola	Manjak	Balanta	Bijogo	Bantu
king/chief	*ox-lam	lam-do	o-lam 'heir' lam 'inherit'		borom b- 'master'	*u-nam	u-nám	u-nam	u-nam		*u-yam-ä *yam 'reign'	u-yame yam	u-yamä	*aa-nam *nam 'reign'	-læw̄		a-lám			a-lámà	ɔ-am 'boss'	*mu-jámí
be clean	*laaḅ	laaḅ-	laaḅ 'wash butt'											*-naaḅ		-nɛḅ	-làḅ					
sand	*		o-leeñ ol-								*gun-yeen(ə)	ku-yeenə	gu-yyeen	*er-niinnii		e-dīnì	i-níní					
spread out to dry in sun	*liil	liil-, liir-	liil								*	yii										
be stuck in mud	*loof	loof-al 'mud'	loof															F -luufo Kasa ha-luf 'mud'				
sow											*yadɗ	yadd	yadd	*-nadd	i-næɗ	-nɛɗ	-lád					
hair	*wil	bilee-wol (Ada.)	wil l-	*fen	kawar g-						*-j		ga-i/bwa-i	*-waan		e-mbän	gu-mbál	*ka-wal	*ka-wel	gi-húl	ɛ-wa	
black	*ḅaal	ḅal-w-	ḅaal, ḅal-ig								*ḅa(y)	ba(y)	bang	*-ḅan	-væɭ	-ḅ~mànəx	-ḅ~málà	Kw. -ḅaani				
body	*-ḅaal	ḅan-ndu/ ḅal-li	fo-ḅaal ol-		yaram	*sa-(a)an	saa(n) Ka. saan				*-ḅo	mam-bo		*geŋ-ḅa(a)n	i-mbæɭs	e-mən	gi-mäl					
finger	*ru-xol	hon-ndu	nqol n-	*kun	baaraam < *ba- hVrVm?	*-kunum	á-kkunu(m)	gu-kunumb	gu-xunum	gu-kunum												
love						*	-ŋan				*ŋay ?	ŋii		*-ŋan	i-ŋæɭ	-yän	-ŋál		*ŋal	naŋ		
spread out to dry in sun	*liil	liil-, liir-	liil								*	yii										
day	*re-ñaal	ñaan-de	ñaal l-											*geŋ-ñan		e-ñàn	gi-ñál					
bone						*gu-huun		gu-huun	gu-huun	gu-huun								*ka-uul		f-hóul		
horse	*gun-pVls	pucc-u	pis n-	*panɿs	fas w-, †fars						*	ŋa-fas		*fanacc	i-pæɭæcə		fándàc	F. e-piling Kw. e-falinj	*u-mpəlmc	fálás		

*1	Fula-Sereer	Cangin	Wolof	Bainunk-KK	Biafada-Pajade	Tenda	Joola	Manjak	Balanta	Bijogo	Bantu
	*l	*n	r	*n	*y/Ø	*n	*l	*l	*l	Ø	Ø? “*y/j”
king/chief	*ox-lam		borom b- ‘master’	*u-nam	*u-yam-ä *yam ‘reign’	*aa-nam *-nam ‘reign’			a-lámà	ɔ-am ‘boss’	*mu-jámí
be clean	*laaɓ					*-naaɓ					
sand	S. o-leeñ ol-				*gun-yeen(ə)	*er-niinnii					
spread out to dry in sun	*liil				P. yii						
be stuck in mud	*loof						F -luufo Kasa ha-luf ‘mud’				
sow					*yadd	*-nadd					
hair	*wil	*fen	kawar g-		*-i	*-waan	*ka-wal	*ka-wel	gi-húl	εε-βa	
black	*baal				*ba(y)	*-ɓan	Kw. -ɓaani				
body	*-baal		yaram	*sa-(a)an	*-ɓo	*geŋ-ɓa(a)n					
finger	*ru-xol	*kun	baaraam *ba-hVrVm?	*-kunum							
love				K. -ŋan	P. ŋii	*-ŋan		*ŋal	naŋ		
spread out to dry in sun	*liil				P. yii						
day	*re-ñaal					*geŋ-ñan					
bone				*gu-huun			*ka-uul		f-hôul		
horse	*gun-pVls	*panɿs	fas w-, †fars		P. ŋa-fas	*fanacc	F. e-piling Kw. e-falinj	*u-mpəlinc	fálás		

Shared sound changes: Bak

- There is good evidence for the Bak subgroup (Joola, Manjak, Balanta) based on the following shared changes:

PNC	Proto-Bak	Joola	Manjak	Balanta
**ɓ, ɗ, ɣ	*b, d, j	*b, d~r, j	*b, d~r, j	b, d, j
**b, d, g	*p, t, g	*f, t, k	*p, t̥, k	f, θ, g
**p, t, k	*f, t̥, k	*f, l, Ø	*f, t̥, k	f, t, h
**x, h	*h	Ø	*h	h

- Joola exhibits split reflexes of Proto-Bak {*t̥, c, t̥, k, h, p}
 - Likely the result of gemination (or prenasalization?)
 - Not explored here

NC	FS	Cang.	Wolof	BKK	BP	Tenda	Bak	Bij.	Bantu
p	f	p	f	f	f	f	f	p	p
t	t	t	t	ɾ	ɾ	ɾ	ʈ	t	t
c	s	s	s	ʃ	s	ʃ	c	c	c
ʈ	s	s	s	s	s	ʃ	ʈ	ʈ	c
k (pal)	x	k	h	k	h s	x ʃ	k	k	k
x	x	H	x	h	h	x	h	k	k
h	h	h	h	h	w/∅	x	h	∅	∅
b	b	w	b	b	b	w	p	β	b
d	r	l	d	d	r	r	t	r	d
g (pal)	g	y	g	g	g j	y y	g	g	g y
w	w	f	w	w/∅	w/∅	w	w	β	
l	l	n	r	n	y	n~l	l	∅	∅?
j~y	y	y/∅	y	y	y	y	y	y/∅	y
ɓ	ɓ	ɓ	w/∅	∅	ɓ	ɓ	b	b	b
ɗ	ɗ	ɗ	l	r	ɗ	ɗ	d [d~r]	ɗ	d
y	y	y	y?	y	y	y	j	j	y?
m	m	m	m	m	m	m~w̃	m	m	m
n	n	n	n	n	n	n~l	n	n	n
ñ	ñ	ñ	ñ	ñ	ñ	ñ~ỹ	ñ		n?
ŋ	ŋ	(ŋ)	ŋ	ŋ	ŋ	ŋ~ỹ	ŋ		

Regular outcomes in root-initial position

Lenition
Fortition
Devoicing
Lenition+Devoicing
(De)nasalization
Deimplosion
Other change

NC	FS	Cang.	Wolof	BKK	BP	Tenda	Bak	Bij.	Bantu
p	f	p	f	f	f	f	f	p	p
t	t	t	t	ɾ	ɾ	ɾ	ɬ	t	t
c	s	s	s	ʃ	s	ʃ	c	c	c
ɬ	s	s	s	s	s	ʃ	ɬ	ɬ	c
k	x	k	h	k	h	x	k	k	k
(pal)					s	ʃ			
x	x	H	x	h	h	x	h	k	k
h	h	h	h	h	w/∅	x	h	∅	∅
b	b	w	b	b	b	w	p	β	b
d	r	l	d	d	r	r	t	r	d
g	g	y	g	g	g	y	g	g	g
(pal)					j	y			y
w	w	f	w	w/∅	w/∅	w	w	β	
l	l	n	r	n	y	n~l	l	∅	∅?
j~y	y	y/∅	y	y	y	y	y	y/∅	y
ɓ	ɓ	ɓ	w/∅	∅	ɓ	ɓ	b	b	b
ɗ	ɗ	ɗ	l	r	ɗ	ɗ	d [d~r]	ɗ	d
y	y	y	y?	y	y	y	j	j	y?
m	m	m	m	m	m	m~w̃	m	m	m
n	n	n	n	n	n	n~l	n	n	n
ñ	ñ	ñ	ñ	ñ	ñ	ñ~ỹ	ñ		n?
ŋ	ŋ	(ŋ)	ŋ	ŋ	ŋ	ŋ~ỹ	ŋ		

Regular outcomes in root-initial position

Lenition
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Shared sound changes in Atlantic?

- There are no shared changes for all of the Atlantic groups taken together
- With Bijogo excluded, there are still none, but lenition of voiceless obstruents is common
- With Bak also excluded, there is one candidate
 - Lenition of ****c** and ****t** to fricatives [ʃ] or [s]
 - Lenition of ****p** to [f] is also common, but does not take place in Cangin

NC	FS	Cang.	Wolof	BKK	BP	Tenda	Bak	Bij.	Bantu
p	f	p	f	f	f	f	f	p	p
t	t	t	t	ɾ	ɾ	ɾ	ʈ	t	t
c	s	s	s	s	s	ʃ	c	c	c
ʈ	s	s	s	ʃ	s	ʃ	t	t	c
k	x	k	h	k	h	x	k	k	k
(pal)					s	ʃ			
x	x	H	x	h	h	x	h	k	k
h	h	h	h	h	w/∅	x	h	∅	∅
b	b	w	b	b	b	w	p	β	b
d	r	l	d	d	r	r	t	r	d
g	g	y	g	g	g	y	g	g	g
(pal)					j	y			y
w	w	f	w	w/∅	w/∅	w	w	β	
l	l	n	r	n	y	n~l	l	∅	∅?
j~y	y	y/∅	y	y	y	y	y	y/∅	y
ɓ	ɓ	ɓ	w/∅	∅	ɓ	ɓ	b	b	b
ɗ	ɗ	ɗ	l	r	ɗ	ɗ	d [d~r]	ɗ	d
y	y	y	y?	y	y	y	j	j	y?
m	m	m	m	m	m	m~w̃	m	m	m
n	n	n	n	n	n	n~l	n	n	n
ñ	ñ	ñ	ñ	ñ	ñ	ñ~ỹ	ñ		n?
ŋ	ŋ	(ŋ)	ŋ	ŋ	ŋ	ŋ~ỹ	ŋ		

Regular outcomes in root-initial position

Lenition
Fortition
Devoicing
Lenition+Devoicing
(De)nasalization
Deimplosion
Other change

Shared sound changes in Atlantic?

- Should $**c, **t > s/\ʃ$ (often merged) be taken as evidence for grouping all Atlantic languages but Bak and Bijogo?
- Probably not
 - The lenition is overwhelmingly common in Bantu
 - Fricative realizations are so common in NC (including 2/3 Bijogo dialects, and 2/3 Bak groups) that variability likely existed in PNC
 - The merger also occurs in Bantu (and Balanta within Bak)
 - The merger did not take place in BKK

Shared sound changes in Atlantic?

- It is clear that lenition of voiceless stops is a popular change in the Atlantic area (and elsewhere)
 - But this is easily accounted for as an areal effect
 - And crucially does not occur in all groups

Shared sound changes in Atlantic?

- Any evidence for smaller subgroups?
- Not really
 - Implosives lenite in Wolof and BKK
 - but the outcomes are not the same for ****d**
 - ****t** (and ****p**) lenite in BKK, BP, Tenda, Bak
- Setting aside ****c**, ****t**, no two Atlantic groups have more than two proto-NC phonemes with shared innovative outcomes to justify a potential subgrouping
 - Except BP + Tenda, and BKK + Wolof, which have four each
- In fact Bijogo and Bantu have the most: 5 or 6
 - (depending on the status of PB ***j/y**)



LEXICAL EVIDENCE

Shared cognates

- Observation 1: There are shared cognates between Atlantic groups and Bantu
- Observation 2: There are shared cognates between Atlantic groups that do not appear in Bantu
- Can we conclude that this is evidence for Atlantic, taking the ones not found in Bantu as Proto-Atlantic innovations?

Shared cognates

- Observation 1: There are shared cognates between Atlantic groups and Bantu
- Observation 2: There are shared cognates between Atlantic groups that do not appear in Bantu
- Can we conclude that this is evidence for Atlantic, taking the ones not found in Bantu as Proto-Atlantic innovations?
- **No!**

Shared cognates

Additional accurate observations:

- Observation 3: There are shared cognates between Atlantic groups (and Bantu) that do not appear in **Wolof**
- Observation 4: There are shared cognates between Atlantic groups (and Bantu) that do not appear in **Cangin**
- Observation 5: There are shared cognates between Atlantic groups (and Bantu) that do not appear in **Bak**
- ...

Shared cognates

- Pre-emptively singling out one group from the others and noting that it lacks certain widespread roots is not convincing
- These sorts of arguments must have **numerical** support
 - I.e. *how many* widespread cognates are absent in a particular group, and is it conspicuously higher than for others?
 - Among the proposed ingroup, are the cognates found in all languages, or a random smattering?

Numerically-backed lexical evidence

- We'll look at the lexical evidence in three ways:
 - 1) Lexicostatistic counts (100 word list)
 - 2) Outgroup identification
 - 3) Total cognate comparison

100 WORD LISTS

Atlantic + Bantu Swadesh list

- I have created 100 word lists for the languages in question (Swadesh list with minor modifications)
 - Modern languages, except Proto-Bantu
 - One deviation from Swadesh methodology: in some cases >1 word listed for a given meaning (slightly inflates the numbers)
- Identified cognates between each language
 - Strict criteria: based on regular correspondences
 - Counts based on look-alikes (as in Sapir 1971) don't really tell you anything that can't be gleaned by eyeballing the data
 - The utility of even strict cognate numbers is highly debatable

	Ful	Ser	Pal	Saf	Non	Wlf	Guñ	Gub	Guj	Kob	Bia	Paj	Koñ	Bas	Bed	JFñ	JEg	JKw	Mnj	Bal	Bij	PB
Fula	—	35	13	13	14	8	6	8	10	10	13	14	15	12	11	6	8	5	4	6	4	8
Sereer	35	—	14	16	14	7	7	6	11	9	16	18	15	13	14	8	7	6	7	6	6	11
Paloor	13	14	—	75	70	8	9	9	12	11	11	12	14	11	11	6	8	6	7	8	4	5
Saafi	13	16	75	—	82	7	9	9	13	11	11	13	14	11	11	7	8	6	9	8	5	6
Noon	14	14	70	82	—	8	9	9	12	10	10	10	14	13	11	8	10	7	8	8	5	5
Wolof	8	7	8	7	8	—	11	11	12	11	11	11	10	12	10	5	6	5	6	4	7	8
Bai. Guñaamolo	6	7	9	9	9	11	—	64	64	32	17	16	8	8	9	9	6	4	3	4	3	3
Bai. Gubëeher	8	6	9	9	9	11	64	—	70	40	20	18	8	9	10	9	8	6	4	6	3	4
Bai. Gujaher	10	11	12	13	12	12	64	70	—	41	21	20	10	13	13	10	8	6	5	7	5	5
Kobiana	10	9	11	11	10	11	32	40	41	—	27	23	14	12	14	4	6	4	4	6	5	5
Biafada	13	16	11	11	10	11	17	20	21	27	—	53	27	19	26	8	9	8	6	7	8	10
Pajade	14	18	12	13	10	11	16	18	20	23	53	—	32	25	29	11	9	8	9	9	8	13
Konyagi	15	15	14	14	14	10	8	8	10	14	27	32	—	39	40	7	8	6	10	8	7	11
Bassari	12	13	11	11	13	12	8	9	13	12	19	25	39	—	66	6	7	6	12	5	8	11
Bedik	11	14	11	11	11	10	9	10	13	14	26	29	40	66	—	8	8	7	10	6	7	9
Joola Fonyi	6	8	6	7	8	5	9	9	10	4	8	11	7	6	8	—	59	37	23	16	7	7
Joola Eegimaa	8	7	8	8	10	6	6	8	8	6	9	9	8	7	8	59	—	38	24	17	7	4
Joola Kuwaataay	5	6	6	6	7	5	4	6	6	4	8	8	6	6	7	37	38	—	17	14	4	3
Manjak	4	7	7	9	8	6	3	4	5	4	6	9	10	12	10	23	24	17	—	17	7	10
Balanta	6	6	8	8	8	4	4	6	7	6	7	9	8	5	6	16	17	14	17	—	3	4
Bijogo	4	6	4	5	5	7	3	3	5	5	8	8	7	8	7	7	7	4	7	3	—	10
Proto-Bantu	8	11	5	6	5	8	3	4	5	5	10	13	11	11	9	7	4	3	10	4	10	—
	Ful	Ser	Pal	Saf	Non	Wlf	Guñ	Gub	Guj	Kob	Bia	Paj	Koñ	Bas	Bed	JFñ	JEg	JKw	Mnj	Bal	Bij	PB

Cognate counts

Major takeaways:

- Very low numbers outside of established groups
- Numbers no better between (most) Atlantic groups than with Bantu (echoing Bennett and Sterk)
- Tenda and BP lexically conservative: numbers always higher when any group is compared to either of these
- Conspicuously high numbers for BP + Tenda, and BP + BKK
 - But not BKK + Tenda!

OUTGROUP IDENTIFICATION

Outgroup identification

- 100 word list is not helpful in establishing subgroups (at least in this case)
- How can we use lexical evidence to identify or reject subgroups?
- I believe the best procedure is a process of **outgroup identification**

Outgroup identification

- Among related languages, with respect to an established subgroup (e.g. Germanic within Indo-European):
 - All languages in the subgroup are **ingroup** members
 - All related languages outside of the subgroup are in the **outgroup**
- Languages in the ingroup will share more cognates with each other than with outgroup members, for two reasons
 - Lexical innovations of the subgroup in question
 - Lexical innovations of the outgroup languages

Outgroup identification

Procedure:

- Start with any list of target meanings (larger list = more significant results)
- Collect the meanings for each language
- Determine the shared cognates that appear across languages in the sample
- Count how many widespread cognates are missing in each language

Outgroup identification

Interpreting results:

- If a language is missing a large number of widespread cognates, it is likely an outgroup member
- If a group of languages have a higher number of widespread cognates present, they likely form a subgroup
 - Many of the cognates that they share are innovations of the subgroup
 - Others may be shared retentions, lost in the outgroup member(s)
- Let's look at an example with Germanic and Latin

English	Dutch	German	Icelandic	Swedish	Latin
cow	koe	Kuh	kýr	ko	bōs
fish	vis	Fisch	fiskur	fisk	piscis
mouse	muis	Maus	mús	mus	mūs
wolf	wolf	Wolf	úlfur	varg	lupus
hare	haas	Hase	héri	hare	lepus
bear	beer	Bär	bera	björn	ursus
fly	vlieg	Fliege	fluga	flyga	musca
louse	luis	Laus	lús	lus	pēdis
bee	bij	Biene	bí	bi	apis
dog	hond	Hund	hundur	hund	canis
squirrel (borr)	eekhoorn	Eichhorn	íkorna	ekorre	sciūrus
goat	geit	Ziege	geit	get	caper
bird	vogel	Vogel	fugl	fågel	avis
deer	hert	Hirsch	dá-dýr	rå-djur	cervus
sheep	schaap	Schaf	kindur	får	ovis
pig	varken	Schwein	svín	gris	sūs
ant	mier	Ameise	og	och	formīca
horse	paard	Pferd	hestur	häst	equus
chicken	kip	Huhn	kjúklingur	kyckling	pullus, gallus
turtle	schildpad	Schildkröte	skjaldbaka	sköldpadda	testūdō

Outgroup identification: Germanic

of cognates found in more than 3 languages (16) but NOT:

English	4
Dutch	2
German	2
Icelandic	1
Swedish	3
Latin	10

Outgroup identification: Atlantic

- Let's try the same procedure with Atlantic
- List of target meanings: 21 animals
- If Atlantic is a valid subgroup, Bantu should emerge as an outgroup
 - Even if a subset of Atlantic groups form a subgroup, this should emerge in the data
- I also compare with Benue-Congo, though here the (pseudo)reconstructions are very limited (most from De Wolf 1971)

	Fula-Sereer		Cangin	Wolof	Bai.-Kobiana-Kasanga		Tenda			Biafada-Pajade		Bak			Bijogo (Orango)	Benue-Congo	
	Fula	Sereer			Bainunk	KK	Konyagi	Bassari / Bedik		Biafada	Pajade	Joola	Manjak	Balanta		(BC)	Bantu
elephant	*ban-ñiig		*ca-oy	ñay w-	*jan-ñiig (?)	*ja-wos	*geŋ-ñay			*wan-yoogä		*e-ñaab	*u-lɔŋg	nááŋ	ka-yoga	*i-ni	*n-jògù
dog	rawaa-ndu, bosaa-ru	o-ɓox ol-	*ɓuh	xaj b-	*ji-xi	*ji-faar	i-vé *ji-ɓV	(deverbal)		ju-saadə (< 'hunt')	ci-baa	*e-yen, *e-jaba	*u-buɗ	bití	e-ɓootɗ	*i-bwoa	*m-búà
cow	*ge-nag		*i/fa-noy	nag w-	*a-hay	*ba-(h)ajer	ÿi-li *ji-nay	*-xeey'		*gun-nagä		*e-bɛ	*u-it	jílà	e-siŋɛ	*i-nak	*n-gòmɓè
hyena	fow-ru	o-moon ol-	*ngumú	bukki b-	*mɔnrum		ÿinó	*ji-rəxənni / ga-tāmā		turuma	wuntuɗe	*e-munduŋo, *e-munguno	*u-ŋil	ŋɔ́ɔn	ɗoobu	*i-mudum	*(ki)-m-bùngú, *m-pítí, *ki-m-bùj
mosquito	*gun-ɓog		*ɓuk	yoo w- *y-oh ?	*-ɔŋ~ux		æ-tɔx	-fálí / -jáyó (< 'thing')		gu-ññongungi	pa-ŋase (< 'bite')	*e-buk, *e-wol	*u-barom (< 'bite')	à-dómà (< 'bite')	ɛ-ɓangɔŋɔ	Somyev tɔ-bogo	*du/m-bú
ant	*-ñiiñ~ñuuñ		*ñiiñ	melentaan w-, xorondom w-	*-ñuuñ		*-ñuuñ			*gun-ñuuñ~ñiñi		(many)	*u-noon, *u-tapəɽ	ngbàmna	Bub. e-taw, ka-baw	?	?
fly	mbuub-u	buc n/k-	*caa-fú	wéñ w-	*-wɔrɔnd		æ-nkú *gaŋ-wu	e-ñòŋəŋ / gi-ñəhəm		gu-njəl	?	*e-a-wu	*u-wu	à-sàlà	ɛ-paɗuma	*i-zin	*n-gɿ
termite	mooy-u	max n- (< Wolof)	*maas	max m-	*a-meh	*ja-mejj	æ-məȳ *gaŋ-may?	*-ñamm		*-mayyä		*e-lol	*u-ɓɔɓ, *pə-pej	ngbóóŋ	Bub. e-babu	?	*mu/n-cúá
hippo	ngabb-u	langbar n-	Sa. cahuy < *ca-ɣuy	léebéer b-	*ja-ɓo		i-mbú *geŋ-ɓu	*geŋ-geɗaa		*wan-guwä		*e-kaw	*u-kɔmal	gómna	ɛ-ɓomarɔ	?	*n-gùbú
goat	*ban-be		*pe'	béy w-	*fa-bɛ	*fa-ŋaas	i-nànkàèlál	-ɓɛcí / -wó		*wan-ɗaaf(ä)		*e-jaamen	*u-pɿ	hàrá	ee-βe	Idoma ò-pí, etc.	*n-búɗi
bird	con-ndu (vsol-)	ndiif n-	*sel	picc m-	*tan-ro	*ja-kkaab	*-jəɗ			*gun-cid~cuɗu		*sua	*u-itɿ (< 'fly')	hòòŋgé	ŋu-nkuɗe	*i-nono	*ki-jùni, *ka-gíɗà
tortoise	huuñaa-re	xomb l-	(borr. Ser.)	mbonaat m-	(borr. Joola)		fæ-rəmp *fa-rəmb	fòxəl *fa-xud	gi-kékū	*-hud(ä)		*e-tukun	*u-faɽɿ	ngòbór	ɛ-ɗanke	*i-kulu	*n-kúɗù
bee	ñaak-u	nguuraan n-	*k-úum	yamb w-	*yum		i-cú	*geŋ-ñanna		gu-ncege	ku-cu	*e-aaj	*u-haaj	à-húú	ne-me	BC *i-swaki Amo fə-ʃù, Irigwe i-ʃwì	*n-jkì
toad	*ru-faaɓ		Sa. mboɓ	mbott m-	*fin-geem ?		fòr *fa-wor	e-pə̀kèl / fé̀cò		tooti	pa-tako	*e-fool	*u-ɓɔpal *u-mfar	nóí, mfól	ñandɔŋge, Bub. ɛ-pɔɔ	*i-boto	*-boto
crocodile	*ban-nooC		(borr. Wo.)	jasig j-	*ja-seeg	*jebba	*-ñam(m)əC, Ko. fæ-rún			jaasugu	faatama	*e-on	*u-tuk	njábirá	ɛ-ʃseega	*i-wame, *i-zibu, *i-kute	*n-gàndú, *n-gòɗnà
leopard	cew-ŋgu, etc.	o-yaxal ol-	*ca-ɓíndo ~ca-ŋgíndo	segg m-	*ji-gaaj		*-jam			ncam	ŋam-baran	*e-saamay	*u-wəɽɿ	à-tɔŋgbà	Bub. ɛ-nsam	*i-kponji	*n-gòì
mouse	doomb-ru	coox n-	—	janax~jinax j-	*ji-kutt	*fa-je	i-ləŋ *ji-naaŋŋ	*-ye(e)r		*fa-yaar		*e-kuku, *e-jura	*u-yaatɿ	θòùbú	ɛ-waɗe	?	*i-púkù
fish	*gun-liɓ		Sa. curun	jén w-	*fa-katt	(borr.)	i-gís	*er-xan		*-yVsa(n)		*e-(w)ol	*u-tɾəɓ	sélè	ŋɔ-kaɗɔ	*i-sidi, *i-kote	*n-cúyí
lion	waroo- (< 'kill')	njogoy n-	*múuma	gaynde g-	ji-muk(k)oor		i-vəsəl *ji-ɓəʃən	(borr. Mande)		(< Mande), ʃji-gadamä	cadame (< 'kill'?)	*e-ŋaŋ	(borr.)	gítá ⁴ múgûr	ɗioŋ (borr. Port.)	?	*n-címbá, *n-kóci, *n-tàmbòì
louse	ten-ŋgu, -ngii tem-mba,	ɓaal n- (< 'black')	*ɗiñ	teeñ w-	(borr. Mande)		(borr. Mande)			(borr. Mande)		*e-tem	*u-tɿem	sùóŋ	ɛ-kekeɗi	*i-kodu	*n-ɗá
sheep	*gun-baal (< Mande?)		(borr. Ser.)	xar m-	(borr.)		*ji-fe			mpalala	ci-ppada	(borr.)	(borr.)	(borr.)	'European goat'	*i-gun, *bu-tiaŋe	*n-gú

	pseudo*	FS	Fula	Sereer	Cangin	Wolof	BKK	Bai	KK	Tenda	Kony.	BB	BP	Biafada	Pajade	Bak	Joola	Manjak	Balanta	Bijogo	BC	Bantu/ Herero
elephant	ñig/y	y	y	y		y	y	y		y	y	y				?	?				y	
elephant	yogV				y								y	y	y					y	y	y
dog	buha	y	?	y	y					y?	y?		y		y	?		?		?	y	y
cow	nag	y	y	y	y	y				y	y		y	y	y	?			?		y	
hyena	mu(n)dum	?		?	?		y	y	y				?		?	y	y				y	?
ant	ñiiñ~ñuuñ	y	y	y	y		y	y	y	y	y	y	y	y	y	y?		y?				
fly	wu	y?	y?	y?	y		y	y	y	y	y					y	y	y				
termite	may'	y	y		?		y		y	y	y	?	y	y	y							
hippo	gVbu~gVbu	y	y		?		y	y	y				y	y	y	y	y				y	y
goat	be (Cangin pe)	y	y	y	y?	y	y	y								y		y		y	y?	
mosquito	buk/g	y	y	y	y	y?	y	y	y?							y	y				y	y
bird	cVd~cVl~cVd	y?	y?		y?					y	y	y	y	y	y							
tortoise	kuɗu									y		y	y	y	y						y	y
bee	yVm				y	y?	y	y	y													
bee	cu									y	y		y		y						y	?
toad	boto					y				y	y					y	y				y	y
crocodile	teegV					y	y	y					y	y		y		y		y		
leopard	cam									y	y	y	y	y		y	y			y		
mouse	yaad									y		y	y	y	y	y		y		y	y	
fish	katV/kotV						y	y								y	y			y	y	
Total has:		10	9	7	9	7	11	10	7	12	10	6	12	10	10	11	7	5	0	6	12	6
Total hasn't:		10	11	13	11	13	9	10	13	8	10	14	8	10	10	9	13	15	20	14	8	14

Outgroup identification: Atlantic

Summary:

- Number of the 20 common roots (appearing in 3 or more established groups) absent in each of:

Fula	Sereer	*Cangin	Wolof	Bainunk	Kobiana-Kasanga	Biafada	Pajade	Konyagi	Bassari-Bedik	*Joola	*Manjak	Balanta	Bijogo	*Bantu
11	13	11	13	10	13	10	10	10	14	13	15	20	14	14

- A higher number is characteristic of an outgroup (language)

Outgroup identification: Atlantic

Summary:

- Number of the 20 common roots (appearing in 3 or more established groups) absent in each of:

Fula-Sereer	Cangin	Wolof	BKK	Biafada-Pajade	Tenda	Bak	Bijogo	Benue-Congo
10	11	13	9	8	8	9	14	8

- A higher number is characteristic of an outgroup (language)

Outgroup identification: Atlantic

- Bantu and Benue-Congo do not show evidence of being outgroup members in the animal list
- Possible objections to the animal list:
 - Only one semantic field
 - I chose the list myself
 - Short list
- These can be addressed: use the Swadesh 100 word list

	pseudoreconstruction	Ful	Ser	Pal	Saf	Non	Wlf	Guñ	Gub	Guj	Kob	Bia	Paj	Koñ	Bas	Bed	JFñ	JEg	JKw	Mnj	Bal	Bij	PB			
I	mi	y	y	y	y	y								y	y?									y		
I	ma(n)						y	y	y	y	y	y	y													
you	wu		y	y	y	y							y?	y?	y?		y?	y?	y?	y	y?			y		
be many	ya66										y	y	y	y												
one	-inV			y	y	y	y				?		y													
woman	kaadi											y?			y	y					y			y		
person	nitu	y					y																	y		
person	an											y?	y?	y		y	y	y	y	y?	y					
fish	katV/kotV							y	y								y	y					y			
dog	6uha		y	y	y								y	y						y?			y?		y	
tree	tiK	y?	y?	y	y	y						y	y	y	y	y							y		y	
bark	xu6a	y	y		y	y				y			y	y	y	y	y				y		y		y	
egg	niin						y	y	y	y	y	y?	y	y	y?	y										
feather	dunK						y				y	y	y	y	y	y							?		y	
hair	wVI		y	y?	y?	y?	y					y?			y	y	y	y	y	y			?		y	
head	gaf~gof			y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y			y	y			
ear	nuf	y	y	y	y	y	y			y	y	y	y	y	y	y			y				y	y		
eye	gito	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y			?		y
nose	kin	y					y	y	y	y	y	y	y	y	y	y				?						
tooth	iN~NiN	y	y				y						y	y	y	y	y	y	y					y	y	
tongue	d̄imi	y	y	y	y	y	?				y	y	y	y	y	y					y	y	?		y	
hand/arm	6axa(y)~6oxo		y				y					y	y	y	y	y							y		y	
breast	6ide~6ine			?	?	?	y	y	y	y	y	y	y	y	y	y									y	
liver/heart	keeñ	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y		y	y	y?					y	
eat	d̄ih						y										y				y				y	
eat	yax	y	y					y	y	y		y	y													
eat	ñaaam	y	y	y	y	y					y															
bite	ñat	y	y						y	y	y	y	y	y	y	y										
bite	d̄um (Ca. d6b)			y?	y?	y?											y	y			y	y			y	y
hear	yig								y	y	y			y?												y
sleep	da	y	y									y	y	y		y										y
die	kiid (BB kit?)									y	y				y?	y?	y	y	y	y	y					
swim	wVy		y					y	y	y		y	y				y	y	y	y						
fly (v)	kid~hid							y	y	y	y	y	y				y	y	y	y				y		
give	yed	y		y		y								y	y											
sun	nVg	y?		y	y	y			y	y	y	y							y	y						y
star	xud/xod	y	y	y	y	y		y		y	y	y	y	y		y	y	y								
rain	to6	y		y	y	y	y							y	y				y							
stone	TaK			y	y	y								y	y						y	y				
sand	liiN		y									y	y		y	y										
smoke	tu-	y	y								y	y	y	y	y	y									y	
smoke	xood~xood						y	y	y	y							y	y								
path	(d)aat	y	y	y	y	y		y	y	y	y	y	y													
hill	tunda						y								y											y
dark	mudd							y	y		y	y	y	y?		y										
white	pVc~pe							y	y	y		y	y		y	y			?		y					y
black	6al	y	y									y	y	y	y	y			y							
new	hac~hec	y	y	y	y	y								y	y	y										
new	haam								y	y	y	y	y													y
Total has:		22	23	20	20	20	18	16	20	21	21	30	32	28	25	25	16	16	11	16	11	13		18		
Total hasn't		27	26	29	29	29	31	33	29	28	28	19	17	21	24	24	33	33	38	33	38	36		31		

Outgroup identification: Atlantic

- Number of the 49 common roots (appearing in 3 or more established groups) absent in each of:

Fula	Sereer	Paloor	Saafi	Noon	Wolof	Guñaamolo	Bainunk	Gujaher	Bainunk	Kobiana	Biafada	Pajade	Konyagi	Bassari	Bedik	Joola Fonyi	Eegimaa	Joola	Kuwaataay	Manjak Bok	Balanta	Kagbaaga	Bijogo	Proto-Bantu
27	26	29	29	29	31	33	29	28	28	19	17	21	24	24	33	33	38	33	38	38	36	36	31	

- Note: some individual Bantu languages would have the same or similar number (e.g. Herero = 32)

Outgroup identification: Atlantic

Conclusion:

- Bantu does not emerge as an outgroup
- In fact no larger groups of three or more established groups emerge using this method

TOTAL COGNATE COMPARISON

Total cognate comparison

- Finally, simply look at all identified cognates
- Are there any groups with conspicuously high or low numbers of widespread roots?
- Are there are two groups that share a large number of exclusive roots?
- But there are a number of caveats here
 - Not obvious how to interpret the data in light of these

Total cognate comparison

- Out of 150 cognates which appear in three or more established groups, the number that appear in:

Fula	64
Sereer	69
Cangin (group)	59
Wolof	63
Guñaamolo	55
Bainunk	64
Gujaher	65
Bainunk	63
Gubëeher	
Kobiana	
Biafada	60
Pajade	82
Konyagi	69
Bassari	76
Bedik	77
(group)	48
Joola	45
Manjak (group)	18
Balanta	35
Kagbaaga	
Bijogo	
Proto-Bantu	55

Total cognate comparison

- Out of 150 cognates which appear in three or more established groups, the number that appear in:

Fula-Sereer	Cangin	Wolof	BKK	Biafada-Pajade	Tenda	Bak	Bijogo	Benue-Congo
78	59	63	86	90	99	71	35	63

Total cognate comparison

- Major caveats:
 - For the established subgroups, the cognate number is strongly related to the internal diversity of the subgroup
 - more divergent daughter langs. = more chances of retaining an original root
 - Discrepancies in documentation (see table on next slide)
 - Wildly different amounts of time spent (by me) on examination, internal comparison, and reconstruction of each group
 - e.g. years on Cangin, less than a week on Bijogo

	# of extant languages	size of lexica	# of reconstructed roots
Fula-Sereer	2+ (many Fula dialects)	~15,000 each	>400
Cangin	3~5 (3 dial. continua)	~2000 each	>500
Wolof	1	~15,000	–
Bainunk-Kobiana-Kasanga	~5 (3 Bai. groups)	4x 1500-2000, ~500 (Kas.)	>350
Biafada-Pajade	2	3500 (P), 600 (B)	>200
Tenda	3 (Konyagi, Bas., Bedik)	~4000 each	400, +400 Bassari-Bedik
Joola	10~20	3x ~5000, 1x ~3000, 1x ~1000, ~15x 200	(preliminary)
Manjak cluster	2~4	1x ~3000, 1x 2000, 2x 600	>1000 (Doneux)
Balanta	1~2 (2 dialect areas)	~3000, ~2000	–
Bijogo	1~3 (3 dialect areas)	1x ~1800, 2x ~600	–
Benue-Congo Bantu	~1000 >500		very few 1367 “main” in BLR3

Total cognate comparison

- There is however a way to use this data to probe potential subgroups:
 - Accepting the # of identified cognates in each group as a given:
 - How many are expected to be shared between each group if the cognates are randomly distributed in each group?
 - Vs. how many are actually shared between each group
 - If the ratio is conspicuously high or low between certain groups, this might tell us something
 - If the ratio is close to 1 across groups, there's no evidence for subgrouping

Total cognate comparison

- Expected # of shared widespread cognates if randomly distributed:

	# of widespread cognates	shared w/ FS	shared w/ Cangin	shared w/ Wolof	shared w/ BKK	shared w/ BP	shared w/ Tenda	shared w/ Bak	shared w/ Bijogo
FS	78								
Cangin	59	30.7							
Wolof	63	32.8	24.8						
BKK	86	44.7	33.8	36.1					
BP	90	46.8	35.4	37.8	51.6				
Tenda	99	51.5	38.9	41.6	56.8	59.4			
Bak	71	36.9	27.9	29.8	40.7	42.6	46.9		
Bijogo	35	18.2	13.8	14.7	20.1	21.0	23.1	16.6	
BC	63	32.8	24.8	26.5	36.1	37.8	41.6	29.8	14.7

Total cognate comparison

- Actual # of shared widespread cognates:

	# of widespread cognates	shared w/ FS	shared w/ Cangin	shared w/ Wolof	shared w/ BKK	shared w/ BP	shared w/ Tenda	shared w/ Bak	shared w/ Bijogo
FS	78								
Cangin	59	39							
Wolof	63	38	22						
BKK	86	44	36	29					
BP	90	42	34	30	55				
Tenda	99	51	39	35	58	70			
Bak	71	36	24	29	43	43	44		
Bijogo	35	15	9	17	16	21	18	20	
BC	63	33	17	29	28	33	38	28	20

Total cognate comparison

- Ratio of attested / expected:

shared w/	Fula-Sereer	Cangin	Wolof	Bainunk-KK	Biafada-Pajade	Tenda	Bak	Bijogo
Cangin	1.27							
Wolof	1.16	0.89						
BKK	0.98	1.06	0.80					
BP	0.90	0.96	0.79	1.07				
Tenda	0.99	1.00	0.84	1.02	1.18			
Bak	0.98	0.86	0.97	1.06	1.01	0.94		
Bijogo	0.82	0.65	1.16	0.80	1.00	0.78	1.21	
BC	1.01	0.69	1.10	0.78	0.87	0.91	0.94	1.36

Total cognate comparison

- Between most groups, the ratio is very close to 1
- The deviations may have some significance, but none are particularly extreme
 - Bijogo + Benue-Congo high
 - Cangin w/ Bijogo, Benue-Congo low
- Consistent with a history in which each group inherited the same set of original vocabulary, and independently underwent changes

Evidence for smaller subgroups

- The best lexical evidence for grouping two groups together is the existence of many cognates exclusive to these two groups

Cognates exclusive to two groups

shared w/	Fula-Sereer	Cangin	Wolof	Bainunk-KK	Biafada-Pajade	Tenda	Bak	Bijogo
cangin	4							
Wolof	2	3						
BKK	5	3	8					
BP	4	2	1	10				
Tenda	5	2	3	9	54			
Bak	6	2	1	2	1	3		
Bijogo	1	2	0	2	1	0	4	
BC	4	3	6	0	3	1	3	3

Evidence for smaller subgroups

- The best evidence for grouping two groups together is the existence of many cognates exclusive to these two groups
- Compelling evidence for Biafada-Pajade + Tenda
 - As proposed by Pozdniakov & Segerer (2017), and previous work
 - Need more Biafada documentation to clarify if many of these are borrowings between Pajade and Tenda
 - But certainly looks promising
- Extremely low numbers between all other pairs



NOUN CLASS

Noun class in Atlantic groups

- Often noted for their typological similarity to Bantu, vs. other Volta-Congo languages
- But there is incredible variety in the class systems of the various Atlantic groups
- Noun class evidence is especially important in subgrouping, as it is generally held that morphological evidence is more valuable than lexical evidence for this purpose
 - As argued in Hyman (2014), evidence from verbal morphology is extremely difficult to assess

	# of classes (noun+agr.)	# of classes (agr. only)	# of pl. classes (agreement)	common marker shapes on nouns
Proto-FS	~25		~5	CVC-, CV-
Fula (Gombe)	25	25	5	(m)-(C)VC, (m)-(C)V
Sereer (Saalum)	19	14	6	CV(m)-, V(m)-, (m)-
Proto-Cangin	~20		3	CV-
Noon-Laalaa	14	12	3	∅, C-, CV-
Saafi	10	10	2	∅
Ndut-Paloor	7	7	2	∅
Pre-Wolof	>18		2	CV(m)-
Wolof	10	10	2	∅, C-
Proto-BKK	~52		~10	CVN-, CV(m)-, V-
Gubëeher	36	31	8	CVN-, CV-, V-
Kobiana	52	42	14	CV(m)-, V(m)-
Proto-BP	~28		8	CVN-, CV(m)-, CVV-
Biafada	25	25	9	CV(m)-, CVV-
Pajade	21	16	2	CVN-, CV(m)-, CVV-
Proto-Tenda	~30		4 + g→b	CVC-, CV-, V-
Konyagi	31	28	9	CV(m)-, V(m)-
Bassari	18	17	9	V(m)-, bV(m)-
Bedik	18	17	9	CV(m)-
Proto-Joola	~27		7	CV-, V-
Fonyi	19	13	6	CV-, V-
Kuwaataay	18	13	6	CV-, CVV-, V-
Bayot Kugere	16	9?	6?	V-, C-, CV-
Manjak	15	13	5	CV-, V-
Balanta	7	7	3	C-, Ct-, ∅
Bijogo	14	14	7	CV-, V-, m-
Proto-Bantu	21	19	8	CV-, N-
Herero	17	15	7	V-CV-, V-(N)-

Noun class inventories of modern and reconstructed languages

- “Adverbial” classes without nouns in them not shown
- A raised m indicates consonant mutation

Notable:

- Huge range of # of classes
- Large inventories common
- Lots of CVC- prefixes
- Only Fula w/ suffixes

sg.	pl.	membership	
u-	i(N)-/ja-	humans	
	(bi-)	'child' (Kobiana pl. = collective <i>bi-</i>)	
saN-	ñaN-	crabs, 'scorpion, rooster, roof,' flat, leaves	
ciN-		string/rope-shaped	
kaN-		concave or convex; places; coll. of a few vegetables?	
(a ^X -)	(ga-)	small and round (KK)	
bu-	i-	mainly round (many unpaired body parts)	
ci ^X -		'eye'	
gu-	ha-	long and rigid, languages, 'speech,' misc.	
ki-		'ear, leg, (arm)'	
(ji-)		'hand/arm'	
(uN-)	(daN-)	trees (KK)	
(ki ^(X) -)	(muN-)	trees (Bainunk)	
(paN-)	ba-	small, bead-like (pl. = collective <i>ba-</i>)	
a-	CL- -aŋ	animals, insects (Bainunk), misc.	
ba ^X -		animals, misc.	
bi-		'day, road, death,' misc.; insect swarms (Guñ., Guj.)	
fa-		animals: 'goat,' etc.	
jaN-		animals (large and/or dangerous), insects (KK), misc.	
ji-		animals (dog-sized)	
ka ^(X) -		'fish,' perhaps 'meat'	
kuN-		'fire'	
ta-		birds (pl. -aŋ), cloth? (pl. = collective <i>ja-</i>)	
ta ^X -		?	
ku-		—	
ko-		(ño-)	diminutive
(tu ^X /ti ^X -)		(ni/ñi-)	diminutive (KK)
da-		diN-	augmentative; 'smoke, dust, day'?
(faN-)			augmentative (Kobiana)

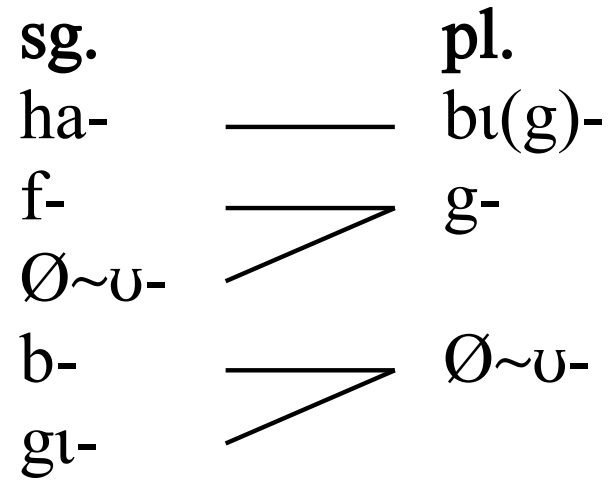
Proto-BKK class system

coll./mass/single-number

ba-	coll. of round objects, incl. vegetables
ja-	coll. of leaves, grasses, 'hair,' etc.
di-	'earth, sand,' grains, formless masses
muN-	liquids (borr. Bak?)
(ma-)	liquids (KK)
tiN-	viscous liquids; insect swarms (Guñ.)
guN-	'honey, palm wine,' some nominalizations
jiN-	terms for years, 'noise' and noises
(nuN-)	places (Kobiana)
(sa/ca-)	'heat, cold'
(gaN-)	'health'
bi-	insect swarms (Guñ., Guj.), 'children' (Ko.) (see sg. <i>bi-</i>)
kaN-	(see sg. <i>kaN-</i>)

Balanta class system

(Creissels & Biaye 2016)



Noun class marker cognates

- Cognate noun class markers between groups are proposed on the following slide
 - strong cognate candidate, compelling candidate, weak candidate
- Relies on the established sound correspondences in large part, but consonants in class prefixes often develop differently than in roots
 - Irregular loss/reduction
 - E.g. Bassari loses all initial consonants but Proto-Tenda *6
 - Often the only word-initial environment for consonants is in a prefix
 - E.g. the devoicing of **b, d, j, g in Cangin prefixes, versus lenition in roots

Noun class marker cognates

- Cognate noun class markers between groups are proposed on the following slide
 - strong cognate candidate, compelling candidate, weak candidate
- Relies strongly on shared semantics
- The PNC class markers are “pseudo-reconstructions” as far as the vowels go; but the Cs are truly reconstructed
 - A final “N” is a nasal, the place of which can’t be identified
 - A final “X” is an oral consonant whose identity isn’t known

NC	FS	Cangin	Wolof	BKK	BP	Tenda	Bak	Bijogo	BC	membership
U				u (~mu)	u			ɔ	u~mu~a	human sg.
HA						aa/ha	ha/na		u~mu~a	human sg.
BV	be	bi			ɓə	ɓə	bV(g)		ba	human pl.
GU			g < gu	gu	go ?			ŋɔ	gu	long + rigid, tree
I	ɗik ?		i	i			i	i	i	pl.
DE	re					er		nɛ	di	small and round; fruits, 'stone'
HA 2	xax ?			ha					a	pl.
MAN	'am	mV	m	ma, muN	maN	maŋ	muN	m	ma	liquids (mass)
MA			m ?		maa	ma	mu	m	ma	pl.
MAK	ɗak ?		m ?		ma ^x	max	mu	m	ma	pl.
KI(X)	hiX	ki ?		ki					ki	trees
GI/JI	ge	ɗi ?	j	ji	ji	ji			ji	animals
DI	ri(n)	ti~tu	ɗdi~du	di	di~du	ɗdə			du	grains, slimes, viscous liquids
TI~TU		ti~tu							tu/ti	pl./collective (incl. dimin. pl.)
BƏ	bo		b	bi	bo	o	pa	u	bu	abstract, mass, (dimin.) pl.
BU			b	bu	bu	o ?	pu	u ?	bu	round, esp. body parts, 'sun'
BU					ɓu		bu	u	bu ?	trees/plants
KƏ	ho ?			ki	go	ɗxo	ka	kɔ	ku	'arm, ear' (leg, armpit), deverbals
PA		pa		fa	fa	fa			pi ?	animals
WAN	ban ?	fa	w		waN					'goat,' large animals
GAN	gan		g < gaN	kaN ?	gaN	gaŋ	ga(N)			large, flat, misc., (augmentative)
BAX			b < ba ^x	ba ^x	ba ^x					deverbals, misc.
ÑA			ñ	ñaN	ña	ña				mass, pl.
GUN			g ?	guN	guN	gəŋ				powders, alcohol, viscous liquid
GUN 2	gun				guN					animals, including insects
KUX				kuN	hu ^x	xoX				'fire,' ('smoke')
JA		ca	j	ja			e ?	e ?		collective/plural
JA(N)		ca	j	ja(N)			e ?	e ?		animals
KAC	han	ka ?	ɗka ?	kaN	gaN ?	xaX	ka ?	ka ?		'wound,' 'hole,' 'mortar'
KAX				ɗka ^x	ha ^x					'sea'
TAX				ta ^x		ɗraX				'foot'

Noun class marker cognates

- No time to motivate these cognate proposals in this talk, but see the provided document if interested

Subgroup-specific classes

- In most groups there are furthermore a large number of classes without convincing outside cognates
- Diminutive/augmentative morphology is subject to rapid innovation
- But for the other classes, inheritance is overall a more likely explanation than innovation within a grammaticalized noun class system
 - Known innovations (borrowings, resegmentations) are excluded from the following chart

Not obviously innovated classes with no compelling cognates:

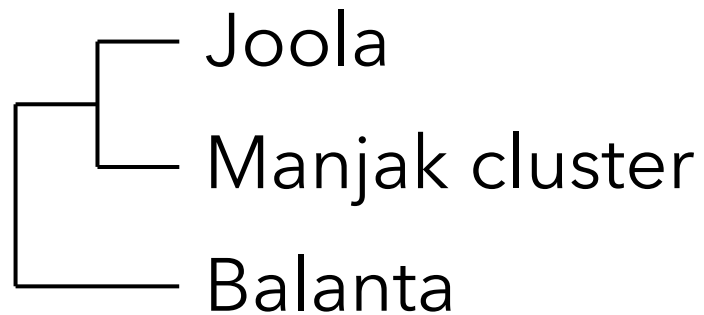
FS	Cangin	Wolof	BKK	BP	Tenda	Bak	Bijogo	BC
'ox	y (agr)	shared ci ^x -, ku ?		sa ^x	geŋ	u (sg)	ya (pl)	bi (pl)
ɗik (pl)	w (agr)	l (lVN)	a	ŋaN	(C)i	gu (pl)	ka	ka
ɗak (pl)	ka	w	a ^x	gə (pl)	xaX	wu (pl/c)	kɔ (pl)	(ki)
rin	ki	m	ka	saa (pl)	ʃaŋ	mu (pl)	mɔ (pl)	
ru	ku	ɾsan	ta	bee (co)	ʃeŋ	ba (co)	ŋa (pl)	
ho	pi	ɾka	ji 'arm'	si	goŋ	ɕi	wɔ	
ge	fi		taN	ya	xoŋ	di		
go	sa		i(N) (pl)	faa?	bə (sg)			
gal	su		uN	gaa (agr)		Joola		
gol	a		saN			si/ti (pl)		
			ciN			ñV (pl)		
			daN			si 'fire'		
			ga (pl)			ti/taa		
			da			ñi		
			tiN			ña		
			jiN			ma		
			ba (co)			l/nV		
			baN			wa		
			nuN					
			ka(N)					
			sa/ca			Manjak		
			paN?			ngə- (pl)		

Dimin./augmentative classes with no compelling cognates:

FS	Cangin	Wolof	BKK	BP	Tenda	Bak	Bijogo	BC
gin	ku		ko	niN	ñañ	Jo. ji	ba	ka
S. onqe	njV		ño/ñi/ni	bu	faŋ	Jo. ñV		Bt. go
...many			da		bə	Jo. ja		Bt. gi
			faN			Kw. a		Bt. ga
			diN			Ma. ndə		
			tu ^x /ti ^x					

Evidence for subgrouping: Bak

- Based on independent (mainly lexical) evidence, the Bak family tree is:



Evidence for subgrouping: Bak

- The following classes can be reconstructed to Proto-Bak:

*Bak	Joola	Manjak	Balanta	semantics
ha-	a-	na-	ha-	human sg.
bV(g)-	bVk-	ba(k)-	bɪ(g)-	human pl.
pu-	fu-	pə-	f-	sg.
bu-	bu-	bə-	b-	sg.
ga(N)-	ka-	ka-	gɪ-	sg.
(w)u-		u-	∅~ʊ-	sg.
gu-	ku-	kə-	g-	pl.
wu-	wu-	u-	∅~ʊ-	pl./coll.
mu-	mu-	mə-		pl.
mN-	mu-	mN-		liquid
ba-	ba-	ba-		mass/coll.
ʈi-	ti-	trə-		location nouns
di-	di-	də-		location nouns

Evidence for subgrouping: Bak

- These are the “leftover” classes (+ Joola diminutives):

Joola	Manjak
si/ti (pl)	i- (pl)
ñV (pl)	ngə- (pl)
si ‘fire’	
ti/taa	
ñi	
ña	
ma	
l/nV	
wa	

Evidence for subgrouping: Bak

- All the Balanta classes are reconstructable to Proto-Bak
- All the Manjak classes but two plurals are reconstructable
- Joola has a number of additional classes

- Class loss is the overwhelmingly common innovation!
 - If class gain is common, there should be a bunch of non-cognate markers in each of the three branches
 - And note: the losses in Manjak and Balanta must be independent
- Thus Proto-Bak had a system at least as large as Joola
 - Perhaps a few Joola innovative classes, but unlikely to be many

Evidence for subgrouping: Bak

- By far the most common class innovation is loss
- Gain through borrowing, resegmentation, etc. is rare
- Some languages exhibit high levels of loss, others don't
- Conclusion:
 - If languages are members of a subgroup, they should not each have a large number of unrelated classes
 - The classes in the most "lossy" languages should in general be found in the more conservative languages
 - Whereas if languages are not members of a subgroup, we do expect a good number of non-cognate classes in each, especially in larger systems
 - Each subgroup undergoes class loss innovations separately from an original large inventory of classes

Evidence for subgrouping: Niger-Congo

- So what does this mean for Atlantic and Niger-Congo groups more broadly?

Evidence for subgrouping: Niger-Congo

- Almost all of the classes present in Benue-Congo are found in various Atlantic groups
 - Seems to be true of Volta-Congo more broadly, based on Hepburn-Gray (2020), and comparison with Gur (Miehe et al. 2012)
- I.e. there is no evidence for shared innovative losses across Atlantic
- Instead we find exactly what we expect of distinct subgroups: original classes scattered throughout each group, + some unrelated classes in each group

NC	FS	Cangin	Wolof	BKK	BP	Tenda	Bak	Bijogo	BC	membership
U				u (~mu)	u			ɔ	u~mu~a	human sg.
HA						aa/ha	ha/na		u~mu~a	human sg.
BV	be	bi			ɓə	ɓə	bV(g)		ba	human pl.
GU			g < gu	gu	go ?			ŋɔ	gu	long + rigid, tree
I	ɗik ?		i	i			i	i	i	pl.
DE	re					er		nɛ	di	small and round; fruits, 'stone'
HA 2	xax ?			ha					a	pl.
MAN	'am	mV	m	ma, muN	maN	maŋ	muN	m	ma	liquids (mass)
MA			m ?		maa	ma	mu	m	ma	pl.
MAK	ɗak ?		m ?		ma ^x	max	mu	m	ma	pl.
KI(X)	hiX	ki ?		ki					ki	trees
GI/JI	ge	ɗi ?	j	ji	ji	ji			ji	animals
DI	ri(n)	ti~tu	ɗdi~du	di	di~du	ɗdɔ			du	grains, slimes, viscous liquids
TI~TU		ti~tu							tu/ti	pl./collective (incl. dimin. pl.)
BƏ	bo		b	bi	bo	o	pa	u	bu	abstract, mass, (dimin.) pl.
BU			b	bu	bu	o ?	pu	u ?	bu	round, esp. body parts, 'sun'
BU					ɓu		bu	u	bu ?	trees/plants
KƏ	ho ?			ki	go	ɗxo	ka	kɔ	ku	'arm, ear' (leg, armpit), deverbial
PA		pa		fa	fa	fa			pi ?	animals
WAN	ban ?	fa	w		waN					'goat,' large animals
GAN	gan		g < gaN	kaN ?	gaN	gaŋ	ga(N)			large, flat, misc., (augmentative)
BAX			b < ba ^x	ba ^x	ba ^x					deverbial, misc.
ÑA			ñ	ñaN	ña	ña				mass, pl.
GUN			g ?	guN	guN	gəŋ				powders, alcohol, viscous liquid
GUN 2	gun				guN					animals, including insects
KUX				kuN	hu ^x	xoX				'fire,' ('smoke')
JA		ca	j	ja			e ?	e ?		collective/plural
JA(N)		ca	j	ja(N)			e ?	e ?		animals
KAC	han	ka ?	ɗka ?	kaN	gaN ?	xaX	ka ?	ka ?		'wound,' 'hole,' 'mortar'
KAX				ɗka ^x	ha ^x					'sea'
TAX				ta ^x		ɗraX				'foot'

Not obviously innovated classes with no compelling cognates:

FS	Cangin	Wolof	BKK	BP	Tenda	Bak	Bijogo	BC
'ox	y (agr)	shared ci ^X -, ku ?		sa ^X	geŋ	u (sg)	ya (pl)	bi (pl)
ɗik (pl)	w (agr)	l (lVN)	a	ŋaN	(C)i	gu (pl)	ka	ka
ɗak (pl)	ka	w	a ^X	gə (pl)	xaX	wu (pl/c)	kɔ (pl)	(ki)
rin	ki	m	ka	saa (pl)	ʃaŋ	mu (pl)	mɔ (pl)	
ru	ku	ɾsan	ta	bee (co)	ʃeŋ	ba (co)	ŋa (pl)	
ho	pi	ɾka	ji 'arm'	si	goŋ	ɕi	wɔ	
ge	fi		taN	ya	xoŋ	di		
go	sa		i(N) (pl)	faa?	bə (sg)			
gal	su		uN	gaa (agr)		Joola		
gol	a		saN			si/ti (pl)		
			ciN			ñV (pl)		
			daN			si 'fire'		
			ga (pl)			ti/taa		
			da			ñi		
			tiN			ña		
			jiN			ma		
			ba (co)			l/nV		
			baN			wa		
			nuN					
			ka(N)					
			sa/ca			Manjak		
			paN?			ngə- (pl)		

Evidence for smaller subgroups?

- Not much
- Perhaps BP and Tenda (and recall the lexical evidence) as regards plural classes (*ma- and *max-)
- Perhaps e- in Joola and Bijogo
 - But could be independent developments of PNC JA and JA(N)
- Maybe a little for Wolof and BKK (cf. Doneux 1991)
 - Though I no longer hold that this subgroup is particularly convincing (contra Merrill 2018)

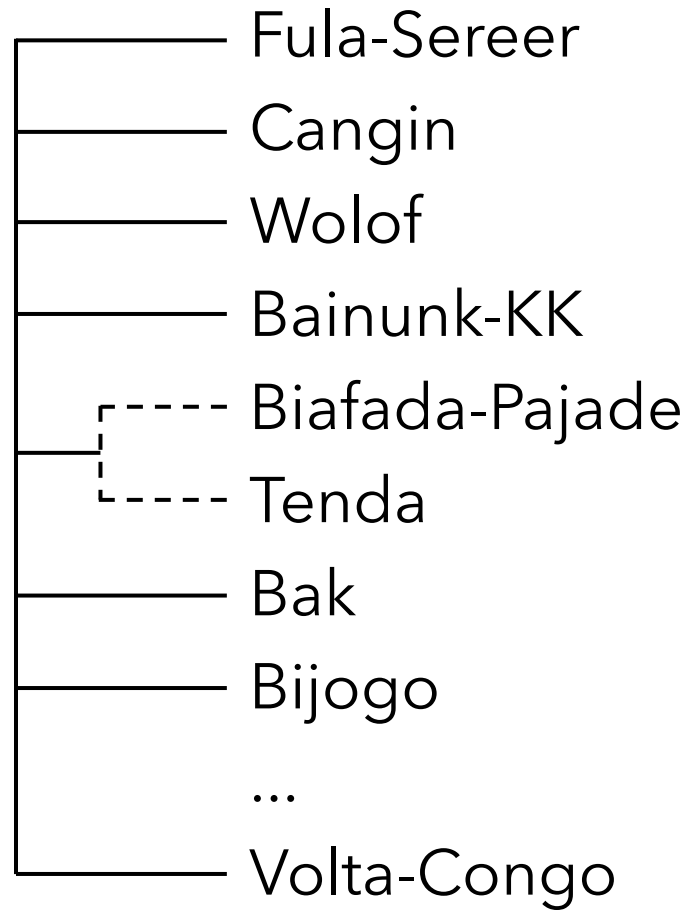


CONCLUSIONS

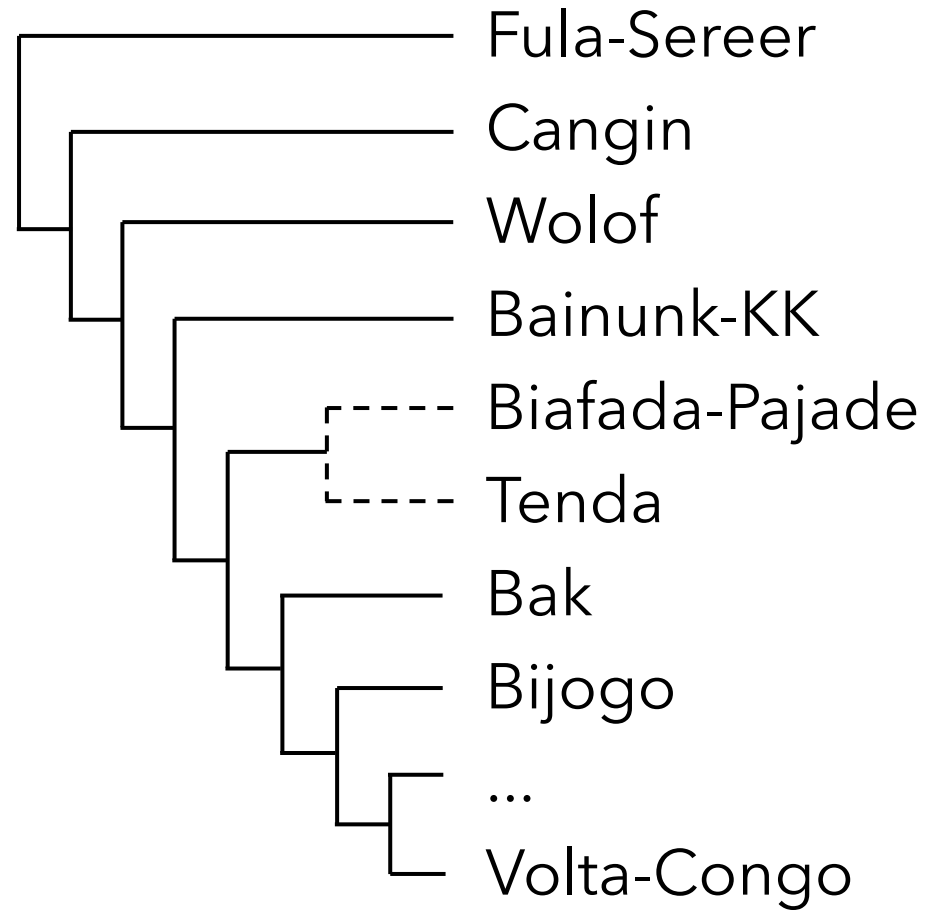
Conclusions

- Based on evidence from sound change, lexicon, and noun class, Northern Atlantic is not a valid subgroup
- Rather, the various established subgroups within the Atlantic area should be taken as primary branches of Niger-Congo (or Atlantic-Congo)
 - Only Biafada-Pajade + Tenda looks promising
- Assuming the validity of Volta-Congo, the NC family tree is similar to one of the trees on the following slide

a)



b)



Conclusions

- We will perhaps never be able to disambiguate between these two trees (or similar)
- Regardless of which is closer to the historical truth, the conclusion is the same:
- All original splits in the established Niger-Congo family tree are situated geographically in the Atlantic area
- It is thus likely that the Niger-Congo homeland was in the far Northwest
 - Cf. Formosan languages within Austronesian

Looking ahead

- This is of course only one piece in understanding the early history of Niger-Congo
 - Investigation of the remaining Atlantic groups (Nalu, Rio Nuñez, Mel, Sua, Limba, Gola) will be very important
 - As well as extensive reconstruction of and comparison with other Volta-Congo subgroups
 - Status of Kordofanian groups remains important and unresolved
 - As does the status of Ubangian groups

PS: Mande connections

- Similarities between Mande and “core Niger-Congo” have been noted
 - I have no stance on the issue, but there do seem to be compelling similarities, e.g. in lower numerals, some animal vocabulary
- If there are non-chance-based similarities, there are two possible explanations:
 - Relatedness
 - Contact
- Whatever the case, this would naturally situate early Mande and Niger-Congo in the same geographic area

PS: Mande connections

- Since Vydrin (2009), it is generally accepted that the Proto-Mande were agriculturalists in the SW ("green") Sahara
 - See also Mande-Songhai connections, as in Creissels (1981)
- Thus a relationship between Mande and Niger-Congo/Atlantic-Congo, whether genetic or areal, would be further evidence of a NC homeland in the northwest



THANKS!

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