The numeral system of Proto-Niger-Congo

A step-by-step reconstruction

Konstantin Pozdniakov

Niger-Congo Comparative Studies 2

language science press

Series information: ./langsci/seriesinfo/nc-info.tex not found!

The numeral system of Proto-Niger-Congo

A step-by-step reconstruction

Konstantin Pozdniakov

language
science
press

Konstantin Pozdniakov. 2018. *The numeral system of Proto-Niger-Congo: A step-by-step reconstruction* (Niger-Congo Comparative Studies 2). Berlin: Language Science Press.

This title can be downloaded at:
http://langsci-press.org/catalog/book/191

ISBN: no digital ISBN
no print ISBNs!
no DOI
Source code available from www.github.com/langsci/191
Collaborative reading: paperhive.org/documents/remote?type=langsci&id=191

Cover and concept of design: Ulrike Harbort
Fonts: Linux Libertine, Libertinus Math, Arimo, DejaVu Sans Mono
Typesetting software: XeLaTeX

Language Science Press
Unter den Linden 6
10099 Berlin, Germany
langsci-press.org

Storage and cataloguing done by FU Berlin

no logo

Ирине Поздняковой

Contents

4 Step-by-step reconstruction of numerals in the branches of Niger-Congo

In this chapter we will try to create a step-by-step reconstruction of numeral systems for each separate family independent of the data from the other NC families. For each family we shall examine the range of basic numerals from '1' to '10' and then the numerals for '20', '100' and '1000'. We begin our overview with the largest family, Benue-Congo.

4.1 Benue-Congo

There is no Benue-Congo classification that is accepted by all scholars. As noted, the inventory of Benue-Congo groups mainly follows the classification of Kay Williamson (1989: 266–269). We repeat here the scheme of BC given above, in the introduction as Table 4.1.

Table 4.1: Benue-Congo languages

*Western BC	*Eastern BC	Isolated BC
Nupoid	Kainji	Oko
Defoid	Platoid	Akpes
Edoid	Cross	Ikaan
Igboid	Jukunoid	Lufu
Idomoid	**Bantoid**	

Let us begin our overview with the largest group of Bantoid languages.

4.1.1 The Bantoid languages (including Bantu)

The reconstruction of numerals in the Bantoid languages is based on 140 sources for the major branches of this family. What follows is the result of our step-by-step analysis of numeral systems in these languages.

4.1.1.1 'One'

We shall collect the main forms for '1' in different branches of the Bantoid languages. The last column of Table 4.2. shows some isolated forms for '1' which seem to be innovations.

At first glance, the terms for '1' in the majority of the Bantoid languages appear to be quite homogeneous, their roots being traceable to either **mo?* or **moi/mwi* of uncertain etymology. The misleading similarity of the Bantu roots *mòì, mòdì, mòtí* may be due to the merger of the noun class prefix ***mɔ̀-** with the nominal base.[1] This hypothesis (developed in detail in Vanhoudt 1994) has now found its way into the BLR (cf. BLR3 *sub mòdì* (NC): '*plutôt mɔ̀-òdì: voir Vanhoudt 1994* ').

Among other common Bantu forms are *mócà* (zones KN), *mòtí* (ABCEGHKLRS) < **mɔ̀-òtì*, *mɔ́égá* (zones BH) (BLR3: *mòì* + suffix), and *mòì* (ABCDEFGJKLMRS). As will be shown below, the presence of a nasal prefix in the Bantoid numerals is suggested by the distribution of these forms in Benue-Congo. Those BC branches that have nasalless roots within the nominal classes 'one' and 'three' lack the terms for 'one' with a nasal consonant.

This interpretation, however, does not address two major issues, namely 1) whether the forms in question (e.g. ** -òdì/ -oti/ -oʔi*[2]) consist of one or more roots and 2) whether the open back vowel belongs to the root.

A solution to the former problem may turn out to depend on how the latter is treated.

Within the context of Niger-Congo, it is conceivable that the Proto-Bantu *òdì* may go back to **ò-dì*, with ***ò-** being a marker of the NC noun class 1 (***ko-/ ʔo-** according to my reconstruction). This hypothesis will receive a more detailed treatment in the next chapter. At this point, we will only note that it is quite problematic to explain the common reflexes of ***-di**, ***ti**, and ***ʔ-** in Bantu within this hypothesis. Moreover, the etymological relationship between these roots (disregarding **di* and *mɔ(m)* (Tivoid), *ó-mè* (Mbe), *ma* (Mamfe), etc.) would be much less transparent than that in case of *modi ~ moti* or even *-odi ~ -oti*.

[1] I agree with Larry Hyman who reacted to this point: "This would suggest that '1' was a noun; possible, just like '10', but note that '2'–'5' are not nouns!" (p.c.).

[2] Larry Hyman: "The glottal stop goes back to a velar in Grassfields; it could be either alveolar or velar in Tikar".(p.c.).

Table 4.2: Bantoid stems for ‘1’

Branch	Language	‘1’	‘1’	‘1’
Northern				
Dakoid	Chamba-Daka			nòòní
*Mambiloid		mwi	cin, jer	
Fam				wuni[a]
Tiba (Fà)			à-kīn-á	
Southern				
***Bantu**[b]		**mòì/mòdì, mòtí**		**p/m/b-ókó**
*Beboid		mwi/mu		baka, kpaŋ
*Yemne-Kimbi		mwe		
*Ekoid			ji(ŋ)/rəŋ?	yet?[c]
*Jarawan		moʔ		(dĩk)
*Mamfe		mɔt/ma		
*Mbam		mwe/mùʔ		
Mbe	Mbe	ó-mè		
Ndemli	Ndemli	mɔ̀hɔ́		
Tikar	Tikar	mbɔʔ		
*Tivoid		mɔ(m)		
*Esimbi				nə
Wide Grassfields	Befang	moʔ		
GF: Mbam-Nkam	Bamileke	moʔ		cu
GF: Mbam-Nkam	Ngemba	mɔʔɔ		
GF: Mbam-Nkam	Nkambe	moʔ(sír)		
GF: Mbam-Nkam	Nun	moʔ		
GF: Momo		moʔ		fiŋ
GF: Ring		moʔ		

[a] The Fam and Tiba (Fà) forms are quoted according to Blench (n.d)) and Boyd (1999) respectively. The online version of Boyd (https://hal.archives-ouvertes.fr/hal-00323718v3) differs from the printed one.

[b] An asterisk (*) in the second column of the tables (here and below) means that in the corresponding line all the forms are reconstructed. However, with the exception of the Proto-Bantu line, which indicates real reconstructions in BLR3 (*), all other reconstructions are hypothetical (#) and reflect the most typical form/forms attested in a particular branch of Benue-Congo. Forms that may be related are grouped in tables within the columns. The last column of the tables shows isolated forms that are likely to be innovations.

[c] Concerning the form *yet* in Ekoid, I quote a precious remark of John Watters (p.c.): “The actual root for Proto-Ekoid may be **-t ~-d**. The /aŋ/ in some Ekoid languages may be an accretion. The *yét* morphologically is /yé-t/ with the CV being a class agreement prefix, and **-t** being the root. So the **-t** may be closer to the Bantu *moti*. I’m not sure how *ó-mè* in Mbe figures in with the rest of Ekoid, but one possibility is that the **-mè** root derives from /me-t/. Ekoid needs further work”.

The secondary PB form **ókó* (zones ABCHF) (BLR3: "Janssens 1994: alternance C1 p/m/b-ókó- protoforme secondaire, cf. 'seul'") is comparable to **baka* (Beboid: Fio *mbákâ ~ nbáhá*, Nchane (Mungong) *m⁴ba³ka⁴*). It should be noted that the above considerations allow us to explain the initial consonant (and the following back vowel) in these forms as noun class morphemes, too.

The Northern Bantoid *kin/cin* is remarkable and will be addressed later in this chapter.

The Bamileke **tʃu* (Fefe *ʃɯʔ*, Medumba a*ntʃʊʔ*, Nda'nda' *ŋtʃɔʔ*, etc.) is possibly related to the Bantu **tʊ* (BCDEGLP) 'alone, empty, vain'.

4.1.1.2 'Two' and 'Three'

Without exception, the reconstructed root for 'two' in all Bantoid branches has an initial labial consonant, either voiced (b-) or voiceless (p-/f-). A more precise reconstruction of the proto-form is beyond my cognizance. The forms cited above do not permit a conclusion with regard to the number of roots involved (one or two). When comparing the most commonly attested forms **pa/ fe* and **baa*, it is necessary to keep in mind that at least the Proto-Bantu **bàdí/bìdí* could be a reflex of **di*. In the case of **ba**- the proto-form should be interpreted as a prefix of a plural noun class (possibly class 2).[3] The latter proposal finds support in the dialectal Proto-Bantu form *jòdè* (zones BH) (< **jò-dè*?). The main forms show the following zonal distribution: *bàdí* (ABCHKLR), *bìdí* (CDEFGJKLMNPS), *bídì* (?).

It was repeatedly stressed that the root for 'three' (**tat*) is one of the most stable in NC and in the Bantoid languages in particular. Phonetic variation within this root will be studied in Chapter 5.

4.1.1.3 'Four' and 'Five'

The well-known NC root **nai* 'four' is represented in all of the pertinent languages. The only exception is Grassfields, where it was replaced with the innovative **kwa/kya*. According to Roger Blench, Momo *-kpi* and Ring *kaìkò* as well as the Proto-Eastern Grassfields **-kùa* go back to the Proto-Benue-Congo *#-kpà(ko)* (Blench 2004: #387). This root, however, is commonly found in Mbam-Nkam, i.e. in all Grassfields languages, and is barely attested outside this branch.

[3] John Watters: "This analysis, if correct, could work also for most of Bantoid. So Ekoid would derive from **ba**- prefix and **-l ~ -d ~ -n** root. However, the /b/ may derive from /p/. Ekoid may derive from **-pal* and then you have the many other Bantoid languages with /p/" (p.c.).

Table 4.3: Bantoid stems for '2' and '3'

	Language	'2'	'2'	'3'
Northern				
Dakoid	Chamba-Daka		bàárá	tárā
*Mambiloid		fee/fal/hal	baa	taar
Fam			baale	tawnə
Tiba (Fà)			à-ɓɛ̱ɛ̱r-á	à-tár-á
Southern				
***Bantu**			**bàdí/bìdí**	**tátə̀/cátə̀**
*Beboid		fe		tat, te
*Yemne-Kimbi		fi(n)		to
*Ekoid			ba(l)	sa/ra
*Jarawan			ɓar	tat
*Mamfe		pay/pea		rat/lɛ
*Mbam		fande?	bante?	tat
Mbe	Mbe	p^{w}âl		sá
Ndemli	Ndemli	ifɛ́		ítáá
Tikar	Tikar		ɓî	lê
*Tivoid		hal/har/vial		tat
*Esimbi		ra-kpə?		kələ (<*lə?)
Wide Grassfields	Befang	fe		táí
GF: Mbam-Nkam	Bamileke	pu/pwe	bo/bie	tat
GF: Mbam-Nkam	Ngemba	paa	baa/bəgə	tarə
GF: Mbam-Nkam	Nkambe		baa	tar
GF: Mbam-Nkam	Nun	paa	baa	tɛt
GF: Momo			be	tat
GF: Ring			bo/ba	tat

The root for 'five' is almost invariably **tan*. One possible exception is the Ekoid form, unless **don/ron/lon* (Ekajuk *nlɔn*, Ejagham *érôn*, Nkem-Nkum *írn̰̂n*) is a reflex of **tan*).

It should be noted that the Ndemli root *itʃìjɛ̀* may be related to *kwV* in the Grassfields languages. As we hope to demonstrate below, this is probably not a coincidence.

Table 4.4: Bantoid stems for ‘4’ and ‘5’

		‘4’	‘4’	‘5’	‘5’
Northern					
Dakoid	Chamba-Daka	nàà-sá		túùná	
*Mambiloid		na(n)		tien/tin/con/son	ngii?
Fam			daare	tʃwiine	
Tiba (Fà)		à-nè-á		à-tǭ̀ŋ̀-á, tūùŋ	
***Bantu**		**nài/(nài)**		**táànò/cáànò**	
Southern					
*Beboid		na, ne		ti(n)	
*Yemne-Kimbi		ni			kpɔn
*Ekoid		ni			don/lon[4]
*Jarawan		yi-ne?		towun/twan	
*Mamfe		n(w)i		ta(y)	
*Mbam		ni(s)		taan	
Mbe	Mbe	ñî		tʃân	
Ndemli	Ndemli		itʃìjè	ítâŋ	
Tikar	Tikar	ɲî		ʃæ̃	
*Tivoid		ɲi(n)		tan	
*Esimbi		ɲi		tənə	
Wide Grassfields	Befang		kᶣà (kụà)	ìtʲə̂n	
GF: Mbam-Nkam	Bamileke		kwa/kwo	tan	
GF: Mbam-Nkam	Ngemba		kwa/kya	taa(n)	
GF: Mbam-Nkam	Nkambe		kwe/kye	tan/ton	
GF: Mbam-Nkam	Nun		kwa/kpa	tan/tɛn	
GF: Momo			kwe	tan	
GF: Ring			kwi/kye/tsə	tan	

4.1.1.4 ‘Six’

The Grassfields languages show a common root **to?o*. Outside Grassfields, it is attested only in Ndemli (just like the Grassfields root for ‘five’) and thus can hardly be reconstructed for Proto-Bantoid. However, we cannot exclude this, if PB **tóóbá* ‘6’ attested in zones ABCD is related to the Grassfields forms.

[4] John Watters: the Proto-Ekoid probably is *-ron (p.c.).

Table 4.5: Bantoid stems and patterns for ‘6’

		‘6’	‘6’	‘6’	‘6’
Northern					
Dakoid	Chamba-Daka			<5?	
*Mambiloid				5+1	
Fam				5+1	
Tiba (Fà)				5+1	
Southern					
***Bantu**		**tándà** <3redupl.?	**tʊ́ʊ́bá**		**càmb-, kaaga**
*Beboid					so
*Yemne-Kimbi		3PL?			
*Ekoid		3+3			
*Jarawan				5+1	
*Mamfe					kene?
*Mbam		3PL		5+1	
Mbe	Mbe	3+3			
Ndemli	Ndemli		tóhó		
Tikar	Tikar	3PL?			
*Tivoid		3redupl., 2*3?			
*Esimbi		<3redupl.?			
Wide Grassfields	Befang		ⁿdʊ̀fú		
GF: Mbam-Nkam	Bamileke		toɣo		
GF: Mbam-Nkam	Ngemba		toʔo		
GF: Mbam-Nkam	Nkambe		ntunfu		
GF: Mbam-Nkam	Nun		ntúwó/tuʔo		
GF: Momo					foɣ
GF: Ring			tufa		

As in some other NC branches, three patterns that can be used to derive ‘6’ from ‘3’ are attested in the Bantoid languages (the following observations are even more relevant in the case of the patterns for ‘eight’ based on ‘four’):

1. The change of a class prefix (or its addition): Ajumbu *tò* ‘3’ > *kʲà-tò* ‘6’; this pattern is possibly attested in Tutomb (Mbam) *pɛ́-dààt* ‘3’ > *pí-tʃín-dìt* ‘6’, Elip *bʊ́-dáᵩ* ‘3’ > *bʊ́-thín-dàᵩ* ‘6’ (this pattern is marked ‘3PL’ in the table above). To strengthen the etymology for ‘six’ in Tutomb, it should be noted

that in Tunen (another Mbam language) that has **tat* '3' > *lal* (*bɛ́-lálɔ́*), the term for 'six' also contains [l]: *pé-lɛ́ⁿdálɔ.*

2. The combination of 'three' and 'two': Lyive: *hjâl* '2', *tàt* '3', *kə̀lə̀-kə̀-tàt* '6' (<'2*3'?).

3. The reduplication of 'three' (or the simple addition '3+3'): Ekajuk *n-ra* '3' >*n-ra-ke-ra* '6', Ejagham *é-sá* '3' > *è-sá-gà-sá* '6', Nkem-Nkum *i-ra* '3' > *i-ra-ra* '6', Mbe *bɛ́-sá* '3' >*bè-sê-sár*'6', Tiv *ú-táŕ* '3' > *á-tér-á-táŕ* (this pattern is marked as '3+3' in the table above).

The Kenyang (Mamfe) form *bé-tándât* '6' (cf. *bé-rát* '3') deserves special discussion. This form is reminiscent of the common Bantu form *tándà* '6' attested in zones DGM. Its extended variant *tándàtɔ́* is found in EFGJS, while the GNS zones use the form *tántàtɔ́* which is even more interesting. Are the Bantu *tándà* forms cited above based on '3'? If so, **tat-tat* > *tatat* (*tántàtɔ́*) in the languages to which Dahl's law is applicable as well (> *tandat, tanda*).

In this case, the form *tɔ́ɔ́bá* (zones ABCD) that can be interpreted as '*3*2': **tat-X-ba* may also be a derivative form.

If so, the aforementioned Bantu forms (as well as the Kenyang form) are probably not innovations. They may reflect a Proto-Bantoid model where 'six' is based on 'three'. It should be noted that a close parallel to the Kenyang form is attested in the Mbam branch: Nomaande *be-tíndétú* '6'.

In sum, it appears that the most probable word-formation pattern for 'six' in Proto-Bantoid is '3+3' or '3PL'.

4.1.1.5 'Seven'

The case of 'seven' seems pretty straightforward. In the majority of the Bantoid branches (including Bantu) the root is **samba/camba*. However, there is still a question whether this root is indeed primary: its Bantu reflex is strikingly similar to the root for 'six'. Table 4.7 shows some selected examples.

It is noteworthy that the terms for 'six' and 'seven' show similarity not only in case of the root in question, but in case of other roots as well, e.g. J50: Fuliiru -*lindátù* '6'~ -*linda* '7', Shi *ńdarhu* '6'~ *ńda* '7'. This similarity is usually conditioned by one of the following factors:

- the terms for 'six' and 'seven' follow the patterns '10–4' and '10–3' respectively: Yeyi (Bantu R40) *vùndʒà é néɛ́* '6' ('10' 'break' '4 (fingers)'), *vùndʒà ɛ́ táâːtō* '7' ('10' 'break' '3 (fingers)'. This, however, is very rarely attested.

Table 4.6: Bantoid stems and patterns for ‘7’

		‘7’	‘7’	‘7’	‘7’	‘7’
Northern						
Dakoid	Chamba-Daka					dùtím
*Mambiloid					5+2	
Fam					5+2	
Tiba (Fà)					5+2	
***Bantu**		**càmbà-dì/càmbɔ̀-à-dì**	**6+1?**			**púngàtí**
Southern						
*Beboid		fumba?	6+1	4+3		
*Yemne-Kimbi				4+3		
*Ekoid		sima?		4+3?		
*Jarawan					5+2	
*Mamfe			6+1			
*Mbam			6+1			
Mbe	Mbe				5+2	
Ndemli	Ndemli	sà^{m}bá				
Tikar	Tikar	ʃâmɓì				
*Tivoid			‘6+1		5+2	
*Esimbi					5+2	
Wide Grassfields	Befang			4+3		
GF: Mbam-Nkam	Bamileke	samba				
GF: Mbam-Nkam	Ngemba	samba				
GF: Mbam-Nkam	Nkambe	samba				
GF: Mbam-Nkam	Nun	samba		4+3		
GF: Momo		sambe				
GF: Ring		samba				

Table 4.7: Similarities between ‘6’ and ‘7’ in Bantu

	‘6’	‘7’
PB	càmbànò (HL)/cààmànò (ABCHLR)/càmbombo (L)	càmbà-dì/càmbɔ̀-à-dì
A40 Bankon	bi-sámà	bi-sámbɔ̀k
A80 Kol	twáb	tábɛl
B20 Mbangwe	-syami	ntsaami
B60 Mbere	-syaami	ntsaami
B70 Teke-Tege	ósámìnì	ónsàámì
B80 Tiene	ísyam	nsam
C40 Sengele	ísama	ísambiálé
C90 Ndengese	isamo	isambé

- the term for ‘seven’ is based on ‘six’ (‘6+1’). This pattern is much more common (see Table 4.8).
- The similarity may also be due to the derivation of these terms from ‘five’ using ‘5+1’ and ‘5+2’ patterns, respectively (this is the most common case). It should be noted that there is another, much less transparent pattern for ‘seven’ (‘X+2’ or ‘5+X’). It is frequently attested not only in the Bantoid languages, but also in the Mande languages.
- Finally, we may be dealing with an alignment by analogy.

maybe reference the relevant tables here

Table 4.8: Common stems for ‘6’ and ‘7’ in Bantu

	‘6’	‘7’
J50 Fuliiru	-lindátù	-linda
J50 Shi	ńdarhu	ńda
A80 Byep	tʷɔ́p	tʷɔ́p ɓə̀l (6+?)
C10 Yaka	βúè	βúè nà -mɔ̀tí (6+1)
D30 Budu	mèɗìà	mèɗìàníkà (lit: níkà ‘to come’)
M20 Malila	ɔ́mʊtʰaːⁿda	ɔ́mʊtʰaːⁿda na jěːkʰa (6+1)
B10 Myene	òɾówá	òɾwáɣénô (6+1)

Table 4.9: ’6’ and ‘7’ from ‘5’ in Bantu

	‘6’	‘7’
H10 Koongo	sàmbánù	sàmbú-wàlì (wálì ‘2’)
K20 Nyemba	pàndù	pàndù vàlì (-vali ‘2’)
K60 Mbala	sambanu	nsambwadi (mbadi ‘2’)
L30 Luba-Katanga	isamba	isambaibindi (ibindi ‘2’)
R10 Khumbi	epándú	epándúvalí (valí ‘2’)

Staying within the Bantoid family, it is difficult to say which of these explanations should be applied in the present case. If it is alignment by analogy, we should reconstruct a Proto-Bantoid primary root **samba/camba* for ‘seven’ and then explain the many irregular shifts in the forms of ‘six’ (e.g. t > s) by analogy with this root (as shown above, the Proto-Bantu ‘six’ is based on ‘three’ (*tat)).

We may also be dealing with a derived proto-form **sam-ba/cam-ba* with the second element probably going back to 'two'.

4.1.1.6 'Eight'

Both Grassfields and Ndemli share the common primary root for 'nine' (**famV*). We have already seen this distribution, which only suggests that Ndemli belongs to the Grassfields branch (at least on the basis of their numeral systems). The majority of other branches point to the reconstruction of the term for 'eight' as

Table 4.10: Bantoid stems and patterns for '8'

		'8'	'8'	'8'
Northern				
Dakoid	Chamba-Daka			7+1
*Mambiloid				5+3
Fam				5+3
Tiba (Fà)				5+3
Southern				
***Bantu**		**nainai(**4 redupl.)/ **nake**		
*Beboid		ɲaŋ (<4?)		
*Yemne-Kimbi		4 redupl.		
*Ekoid		4+4		
*Jarawan				5+3
*Mamfe		4PL		
*Mbam		4 redupl.		
Mbe	Mbe	4 redupl.		
Ndemli	Ndemli		fɔ:mɔ́	
Tikar	Tikar			
*Tivoid		4 redupl.		
*Esimbi		4 redupl.		
Wide Grassfields	Befang		éfómó	
GF: Mbam-Nkam	Bamileke		fum/hum/fo?	
GF: Mbam-Nkam	Ngemba		famə	
GF: Mbam-Nkam	Nkambe		waami	
GF: Mbam-Nkam	Nun		fame	
GF: Momo			fami/foŋ	
GF: Ring			faamə	

based on ‘four’ (either by means of reduplication or by the noun class switch, or both).

4.1.1.7 ‘Nine’

Table 4.11: Bantoid stems and patterns for ‘9’

		‘9’	‘9’	‘9’	‘9’	‘9’
Northern						
Dakoid	Chamba-Daka					kúūm
*Mambiloid			5+4			
Fam			5+4			
Tiba (Fà)			5+4			
Southern						
***Bantu**		**bùá**	**5+4**		**10–1**	**kèndá/ jèndá**
*Beboid		bùkə?				fumḅɔ?
*Yemne-Kimbi			5+4			
*Ekoid			5+4		10–1	
*Jarawan			5+4			
*Mamfe				8+1		
*Mbam			5+4	8+1		
Mbe	Mbe		5+4			
Ndemli	Ndemli	bùʔɛ̀				
Tikar	Tikar		5+4?			
*Tivoid			5+4	8+1		
*Esimbi			5+4			
Wide Grassfields	Befang		5+4			
GF: Mbam-Nkam	Bamileke	fuʔu				
GF: Mbam-Nkam	Ngemba	buʔu/puʔu				
GF: Mbam-Nkam	Nkambe	bùʔû? búum?			10–1?	
GF: Mbam-Nkam	Nun	puʔu?				cipo?
GF: Momo		bok				ko?
GF: Ring					10–1	

It seems likely that there was a primary root for 'nine' in Proto-Bantoid. It can be tentatively reconstructed as **bukV*.[5] In Bantu, this root is found in the ABCDHL zones. The most common pattern '5+4' (as well as the less frequently attested '10–1') often develops independently in various languages. A marginal pattern '8+1', attested in Mamfe, Mbam and Tivoid is noteworthy. Because of its rarity, it is relevant for the genetic classification of the Bantu languages, since it is hard to imagine that this form developed independently in each of these branches. The last column of the table below lists bases that are exclusively found in a specific Bantoid branch.

4.1.1.8 'Ten'

At least two Bantoid roots (**fu* and **kum/ kam*) may be useful for our reconstruction purposes. Both of them are attested in no fewer than six of the Bantoid branches (note also the Chamba-Daka *kúūm* 'nine'). The Mambiloid languages show the greatest variety of roots.

It should be noted that a separate Proto-Bantoid form for 'ten' is not traceable in some of the pertinent languages. Despite this, it has been preserved as a part of the term for 'twenty', e.g. 'ten' is attested as *é-pɔ́:t* in Ipulo (Tivoid). This form is probably related to Tiv *púè/ púwè* and Lyive e*pùè* and may be attested in the Mbam branch as well (Nubaca *mwa-pwat* 'ten', etc.).

It is clear, however, that the Ipulo 'twenty' (*i-ham*) is derived from the Proto-Bantoid term for 'ten' by means of a noun class switch. The same can be applied to Bhele (D30): *mɔkɔ́* 'ten' but *e-kómi í-ɓalé* '20' (*í-ɓalé* 'two'). The root *kam* will be discussed below in connection to the terms for 'hundred'.

[5] John Watters: "Given the distribution of these forms for 'nine' I would conclude that Proto-Bantoid likely used 5+4 and that **bukV* was an innovation in the pre-Bantu era when Proto-Bantu had not yet separated from what became Grassfields and other closely located Bantoid groups".

Table 4.12: Bantoid stems for ‘10’

		‘10’	‘10’	‘10’	‘10’	‘10’
Northern						
Dakoid	Chamba-Daka		kúūm-kərərə			
*Mambiloid				cóŋ		job-, jer, jula ? fɛ́ŋ ?
Fam						kwoy
Tiba (Fà)						à-wo̱o̱b-á
Southern						
***Bantu**			**kʊ́mì/ kámá**			**dòngò**
*Beboid		jo-fi/jo-fu				
*Yemne-Kimbi		jo-fu		koŋ?		
*Ekoid		fo				gol, wobo
*Jarawan						lum
*Mamfe		fia, bjo				
*Mbam					p-wat/b-wad	
Mbe	Mbe	fwə̂r				
Ndemli	Ndemli		dʒòm			
Tikar	Tikar		wûm			
*Tivoid		puɛ	*ham		pɔt	
*Esimbi						bu ɣu? (<9?)
Wide Grassfields	Befang		éɣúm			
GF: Mbam-Nkam	Bamileke		ɣam			
GF: Mbam-Nkam	Ngemba		ɣám			
GF: Mbam-Nkam	Nkambe		ʔum			ri/ru
GF: Mbam-Nkam	Nun		ɣom			
GF: Momo			ɣum			
GF: Ring			ɣəm			

4.1.1.9 'Twenty'

It is not necessary to quote the forms for 'twenty', since in the majority of the Bantoid branches (including Bantu) this term is based on 'ten' and follows the pattern '10*2'. Some minor but peculiar variations should be noted here, but all of them are of little significance for our reconstruction. E.g. the term for 'twenty' often employs the plural noun class with the two components in agreement. However, non-compound forms based on 'ten' or 'two' in the plural are also attested. For instance, in one of the Bafut dialects *báà* 'two', *tà-wûm / nɨ̀-wûm* 'ten' > *mɨ̀-wúm mí-mbáà* 'twenty', while *tà-ghûm* 'ten' ~ *mɨ̀-ghum* 'twenty' in another. At the same time, Limbum *bá:* 'two' ~ *m̩-bá:* 'twenty'. These patterns (especially the former) are common in the majority of the Bantu languages as well.

Primary roots for 'twenty' are rarely attested. They may go back to the lexical base 'man' (e.g. in D30 Komo *nkpá búi* 'twenty' = 'whole person'), 'head' (Suga (Mambiloid)) *ɓʉʉ bíb* 'twenty' <*ɓʉʉ* 'head') or some other lexical bases (e.g. Bantu A50: Bafia *ɨ̀-tín*/*mʌ̀-tín* 'twenty' <'score').[6]

4.1.1.10 'Hundred' and 'thousand'

It appears that the term for 'hundred' cannot be reconstructed for Proto-Bantoid: in most of the branches the pattern employed is '20*5',[7] whereas in some of the branches the term is borrowed. Both Grassfields and Bantu show innovations. The Grassfields root may be tentatively reconstructed as **ku*. Several roots are known for Bantu, their use being limited to certain zones: *kámá* ABCDHL, *gànà* DEFGJNPS, *tʋa* DL, *jànda* MNP. None of these roots is attested with this meaning elsewhere in the Bantoid languages, except for Bantu. The similarity of *kámá* with the root reconstructed for 'ten' is noteworthy. Moreover, it is attested with the meaning 'thousand' in at least three of the Bantoid branches as the table below shows (Table 4.14).

The root *kam* allows multiple interpretations. We will return to it after the evidence from other Benue-Congo branches has been examined.

[6] John Watters: "The Bakor group of Ekoid attest something like **-tên* and Mbe has *-têl*. The other two Ekoid groups have a form *-rim* or *-sam*. I would reconstruct for Proto-Ekoid **-têl* or **-tên* which is like Bantu Bafia. They are a few hundred kilometers apart with many languages and a significant mountain range in between, so this is not borrowing" (p.c.).

[7] John Watters: "The distribution of this form is suggestive of an older vigesimal system for Bantoid rather than a decimal one. I would take the decimal ones as innovations" (p.c.).

Table 4.13: Bantoid stems for ‘100’

		‘100’	‘100’	‘100’	‘100’	‘100’	‘100’
Northern							
Dakoid	Chamba-Daka	20*5					
*Mambiloid		20*5					<fula
Southern							
***Bantu**						**kámá**, **gànà**, **tʊa**, **jànda**	
*Beboid				gbi			
*Yemne-Kimbi				gbi?ŋwe?			
*Ekoid		20*5					
*Jarawan			10*10			luru?	<Hausa
*Mamfe		20*5					
*Mbam							<Engl.
Mbe	Mbe	20 *5					
Ndemli	Ndemli					m̀bókó	
Tikar	Tikar					nɗu?	
*Tivoid		20*5					
*Esimbi			10*10				<Engl
Wide Grassfields	Befang					bɔ̀mí^{n}dáŋgàŋ	
GF: Mbam-Nkam	Bamileke				k(h)u		
GF: Mbam-Nkam	Ngemba				k(h)i/kirə		
GF: Mbam-Nkam	Nkambe				ŋkʉ̀?	rdʒèe?	
GF: Mbam-Nkam	Nun				ŋku		
GF: Momo					ki, ko		
GF: Ring					ɣí/vi	ntu?	

Table 4.14: Bantoid stems for ‘1000’

		‘1000’	‘1000’
Northern			
Dakoid	Chamba-Daka		100*10
*Mambiloid			ndúúŋ ‘sack’, <Fula
Southern			
***Bantu**			**nùnù**, **pɔ̀mbì**, **kɔ́tɔ̀**
*Beboid			cuku
*Yemne-Kimbi		kam?	kia?
*Ekoid			200*5?
*Jarawan			?
*Mamfe			nka?
*Mbam			<Engl.
Mbe	Mbe		400*2+200
Ndemli	Ndemli		kòlí
Tikar	Tikar	ŋkæm	
*Tivoid			20*10, engl.
*Esimbi			<engl
Wide Grassfields	Befang		ítʃən ~ étʃən
GF: Mbam-Nkam	Bamileke		tsa/sa?
GF: Mbam-Nkam	Ngemba	kamə?	tsuʔu?
GF: Mbam-Nkam	Nkambe		cuki?
GF: Mbam-Nkam	Nun		100*10
GF: Momo			<engl
GF: Ring		kam	

The Proto-Bantoid numeral system can be reconstructed as in Table 4.15.

Table 4.15: Proto-Bantoid numeral system[8]

1	m-o-ʔ, m-o-i, m-o-ti, mo-di	7	samba/camba (<*c/saN+2?)
2	pa/fe, badi (*ba-di?)	8	na-nai (<4 redupl.)
3	tat	9	bukV
4	nai	10	fu, kum/kam
5	tan	20	10*2
6	ta-ta(t) (<3 redupl.?)	100	gbi? ki? 20*5? kam?
		1000	?

According to Kay Williamson, the base for 'one' in Benue-Congo should be reconstructed as *#-kani*. The only form quoted in support of this hypothesis in her first article (Williamson 1989: 255) is a supposed Bantoid reflex of the root in Tiba (*a-kina* '1'). Later (Williamson 1992: 396) she adduced one more Bantoid form, a Southern Bantoid Esimbi term *keni* '1'. That Williamson gives too much weight to these two marginal Bantoid forms is evident from the fact that she reconstructs this base not only for Benue-Congo, but for Niger-Congo as well. This leads her to the idea (probably expressed in the latter work for the first time) that Niger-Congo originally roots had a triconsonantal structure, hence her reconstruction of the proto-form for 'one' as ***-ʻkə'gəni*. This Niger-Congo etymology will be studied in detail below. At this point we will only note that the Esimbi form cited above is strikingly unusual for the Bantoid languages and was probably misinterpreted. The form *kēnə̄* '1' is indeed attested in some of the Esimbi sources (see Brad Koenig, https://mpi-lingweb.shh.mpg.de/numeral/Esimbi.htm). However, in other sources the form *ɔ-nə* is attested (Cristin Kalinowski in (Chan)), so the term for 'eleven' is *bùɣù nə-nə* (*bùɣù* '10'). In other words, the base for 'one' in Esimbi is *-ni/-nə̄* (!), while the first syllable should be interpreted as the noun class prefix, just as in other numerals (cf. the forms *mərākpə̄* '2', *mōɲī* '4', *mātənə̀* '5', etc. in Koenig).

As for Tiba, it is still not certain whether this language indeed belongs to the Bantoid group (cf. Boyd 1999, where Tiba is considered an Adamawa language). The only Bantoid forms that could have been used by Williamson in support of her hypothesis are found in some of the Northern Mambiloid languages, cf. Twendi (Cambap) *tʃínī*, Mambila *tʃén* (with palatalization assumed). However,

[8] My competence does not allow me to reconstruct the tones in the numeral Bantoid languages, especially in Benue-Congo.

these forms are extremely marginal as well, so they cannot give ground for the proto-language reconstruction (in any case, not for Proto-Bantoid).

4.1.2 Benue-Congo (the Bantoid languages excluded)

After the numerals of the Bantoid languages, let's consider the numerals in each of the other groups within this vast family, namely Cross, Defoid, Edoid, Idomoid, Igboid, Jukunoid, Kainji, Platoid, Nupoid (Sections 4.1.2.1–4.1.2.9) and in some isolated BC languages – Ikaan, Akpes, Oko and Lufu (Sections 4.1.3.1–4.1.3.4). After this, we will generalize the results obtained in order to try to reconstruct the numerals of Proto-BC (§4.1.4).

4.1.2.1 Cross

Let us consider the typical stems for numerals in the Cross languages.

Table 4.16: Cross stems for '1'

	'1'	'1'	'1'	'1'
1. Bendi				
Bendi	ken		-bɔ́ŋè?	
2. Delta-Cross				
Upper Central		ni (D[9]: *gʷá-nì)	wɔ̀n, guŋ?	mɔ́ɔ̀?
Lower	sin/cin, ki/ge, kiet/keed (D:*cèèd)	nin		
Ogoni	zɪ̀ɪ̀	nɛ(n)		

Let us dwell on this table, using it as an example for understanding the majority of the subsequent tables given in this book. Almost every table represents the synthesis of the primary data. We cannot publish all of these primary forms. Let's make an exception. In order to make clear to the reader on what basis the generalizations were made, we present in Appendix D all the forms available for the numerals '1' in the Cross languages, including intermediate Proto-Upper

[9]Here and below, index D introduces the reconstruction proposed by Dimmendaal (1978).

Cross and Proto-Lower Cross reconstructions, proposed by Dimmendaal (1978) and Connell (1991). From the Appendix D, it is clear that Connell accepts the Dimmentaal hypothesis, according to which in Upper Cross **g^{w}á-* is interpreted as a prefix, and the lexical stem is represented by **-ni*, attested also in Central Delta-Cross and Ogoni. Based on the 60 sources listed in Appendix D, in table 3.15 for the numeral '1', the root *ni(n)* is allocated. The table also identifies the second root for '1', also possibly represented in the three branches of their five. Connell reconstructs it as **cèèd*, but the data from various Lower Delta-Cross, as well as from Dendi, suggests that perhaps we are dealing with a palatalization of the velar before the front vowel: **ked / ket / kin > ced / cin* (unfortunately, for most groups of the Niger-Congo, including Cross, we do not have sufficient grounds for reconstructing the tones). Finally, the third root presented in Icheve *à-mɔɔ* is probably related to Bantu.

'Two' (Table 4.17)

Table 4.17: Cross stems for '2'.

	'2'	'2'	'2'
1. Bendi			
Bendi		fe, ha?	
2. Delta-Cross			
Upper		fa(n)/poo (D:*ppán)	
Central			jal/yal/zal/wal
Lower	bà (D:*íbà)		
Ogoni	bàè/bɛrɛ		

The roots **bae* and **po/pa* are noteworthy.

'Three' and 'Four' (Table 4.18) The common Niger-Congo roots are attested for these numerals in all of the branches (**ta(t)/ ca(t)* and **na(n)* respectively).

Table 4.18: Cross stems for '3' and '4'

	'3'	'3'	'4'	'4'
1. Bendi				
Bendi	kie/cia/cat		ne	
2. Delta-Cross				
Upper	tat/tan/*sa, kia(t) (D: ttán ~ ttáD)	naan?	na (D: *nàŋì ~ này)	
Central	sar/rar		ŋa	
Lower	tá (D:*ítá)		nàaŋ/nìàŋ (D:*ìnìàŋ)	
Ogoni	taa		nia	3+1

'Five' (Table 4.19) Two roots can be postulated for Cross, namely **tan* and its alternative, tentatively described as **gbo(k).*

Table 4.19: Cross stems for '5'

	'5'	'5'	'5'
1. Bendi			
Bendi	taŋ		dʲoŋ
2. Delta-Cross			
Upper	tə̀ə́n/tāŋ/zen/cen	gbo/buo(k)	
Central		oɣ/wʊ?	
Lower	tîŋ/tin/tion, go? (D:*ítíòn)		
Ogoni	*rɛ̀	ʔòò/vòò/wò/*ʔa	

'Six' to 'Nine' (Table 4.20) At this stage it seems reasonable to maintain the forms and patterns represented in the last line of the table.

Table 4.20: Cross stems and patterns for '6'-'9'

	'6'	'6'	'6'	'7'	'8'	'9'
1. Bendi						
Bendi	5+1			5 + 2	5 + 3	5 + 4
2. Delta-Cross						
Upper	5+1		ránē , 3+3	5+2, 4+3	4+4	10−1, 5+4
Central		di(n)		ɗùal/ɗuən	4PL	súɣó
Lower	5+1			5+2	5+3	5+4
Ogoni	5+1	nìʔĩ̃ʔ	ʔɔ̀rɔ̀?	5+2	5+3	10−1, 5+4
CROSS	**5+1**	**diʔ**	**3+3**	**5+2**	**4+4**	**10−1, 5+4**

'Ten', 'Twenty', and 'Hundred' (Table 4.21) It should be noted that providing a detailed reconstruction for each of the Cross numerals lies beyond the scope of the present investigation, so there is probably no point in trying to establish which of the roots for 'ten' (**kpo* or **job*) should be reconstructed in the Proto-Cross (especially impossible without external evidence).

The Cross languages are highly divergent in regard to numerals (an exception should be made for 'three' and 'four' which are remarkably stable in Cross, as well as in the other NC branches). However, the forms cited above do not provide sufficient reason to suggest a closer relationship within any randomly selected pair of the Cross branches. Hence, it would be too daring to interpret the roots attested in both of these branches as shared innovations. Let us count the numbers of related numeral forms in different pairs of the Cross branches (Table 4.22).

This distribution is remarkable with regard to the total absence of shared forms (with the 'three' and 'four' excluded) between Bendi and Central Cross. Keeping this in mind, all of the established alternative roots and patterns can be reserved for a later discussion. At this point the following reconstruction of the Proto-Cross numerals can be suggested (Table 4.23).

Table 4.21: Cross stems and patterns for ‘10’, ‘20’ and ‘100’

	‘10’	‘10’	‘20’	‘20’	‘20’	‘100’
1. Bendi						
Bendi	kpu, hwo, fo		ci/si		jam	20*5
2. Delta-Cross						
Upper		jo(b)/zob/ jop (D:*jòb)	ti	lop, nip (D:*níb)	zol …	20*5
Central		dìoβ		lisiíβ/rusuβ	poɣ, 2PL	kùròn, 5*20, 80+20
Lower	kɔp (D:*lùgòp)	duob/duop, dugu/lugu		e-dip (D: *édíp)		i-kie (D: *íkíè)
Ogoni	òb, ʔò				tub/cu	5*20
CROSS	**kpo**	**job**	**ti/ ci?**	**dip?**		**20*5**

Table 4.22: Number of related numerals in different pairs of the Cross branches

	Central	Lower	Ogoni	Upper
Bendi	**0**	4	4	5
Central		2	2	4
Lower			5	4
Ogoni				4

Table 4.23: Numeral system of Proto-Cross(*)

1	*kin/cin, *ni(n), *gboŋ/gwan	7	5+2
2	*bae, *po/pa	8	4+4
3	*ta(t)/ca(t)	9	10−1, 5+4
4	*na(n)	10	*kpo/kop, fo? ʔo? *job
5	*tan, *gbo(k)	20	*ti/ci ? dip ?
6	5+1, diʔ, 3+3	100	20*5

4.1.2.2 Defoid

The Defoid branch is relatively compact: it is composed of four languages including Yoruba and its dialects. Historical phonetics of these languages should be considered for a proper reconstruction of the Defoid numeral system, because most of the terms show great phonetic variety. E.g. for 'four' several forms are attested: *-nɛ* (Arigidi), *-jɛ̃* (Ayere), *-rin/-hɛ̃/-ɛ̃* (Yoruba), *-lɛ̀* (Igala). The main forms are given in Table 4.24, and their reconstruction will be discussed below.

Table 4.24: Defoid numerals

	Arigidi (dial.)	Ayere (dial.)	Yoruba	Igala	*Yoruba-Igala	*Proto-Defoid
1	kɛ̀ɛ́-ɲɛ̃	ʃ̃ì-kʌ̃́	ē-nḭ́, ɔ̀-kọ̄	é-ɲɛ́/ǒ-kâ	***ɲɛ́ , ka(n)**	***ɲɛ́ , ka(n)**
2	kè-ji	ì-dʒì	è-jì	è-dʒì	***jì**	***jì**
3	ke-dà	ī-tā	è-tā	è-ta	***tā**	***tā**
4	ke-nɛ	ʃ̃ī-jɛ̃	è-rī̩	è-lɛ̀	***lɛ(n)**	***lɛ(n)/ ne, je**
5	ké-ntɔ	ʃ̃ī-tʌ̃́	à-rṵ́	è-lú	***lú(n)**	***lú(n)/tu(n)**
6	ke-fà	ì-fà	è-fà	è-fà	***fà**	***fà**
7	ke-ɸi	ī-dʒʷī	è-jē	è-bʲe	***byē**	***byē**
8	ke-rò	ī-rō	è-jɔ̄	è-dʒɔ	***jɔ̄**	***jo/ ro**
9	ké-ndà	ʃ̃ī-dʌ̃́	è-sọ́	è-lá	***sá(n)**	***sá(n), dà**
10	ké-è	ī-gʷá	è-wá	è-gʷá	***gwá**	***gwá**
20	u-gbɔrɔ	ē-gbɔ̄lɔ̄	ō-gṵ́	ó-gʷú	***gwú(n)**	***gwú(n)/ gbolo**
100	20*5	20*5	20*5	20*5	**20*5**	**20*5**

Following the Proto-Yoruba-Igala reconstruction (Pozdniakov, ms), the terms **lɛ(n)* '4', **lú(n)* '5' and **sá(n)* '9' are reconstructed on the basis of the following regular phonetic correspondences (Table 4.25).

These examples illustrate the phonetic correspondences coming from *l '(Table 4.26).

Table 4.25: Fragment of the Yoruba-Igala phonetic reconstruction

	Yoruba	Igala
***l**	r	l
***r**	r	d
***d**	d/j	d
***n**	l/n	n
***s**	s	l
***ʃ**	s	r
***c**	ʃ	c

Table 4.26: *L-stems in Proto-Yoruba-Igala and their regular reflexes

Meaning	*Yoruba-Igala	Yoruba	Igala
animal, meat	ɛ́lɔ̃	ərɔ̃	ɛ́la
toad	àkèlé	àkèré	àkèlé
four	èlĩ	èrĩ	èlɛ̀
five	èlṵ	àrṵ	èlu
ant	èlìlà	èèrà	èlìlà
ashes	élílú	eérú	élúlú
feel	gbɔ́ òlílṵ	gbɔ́ òórṵ	é-gbúlù
star	ìlàwɔ̀	ìràwɔ̀	ìlàwò
small	kékélé	kékeré	kékélé
buy	là	rà	é-là
see	lí	rí	é-lí
plow	lo	roko	é-lo
body	ɔ́la	ara	ɔ́la
word	ɔ̀là	ɔ̀rɔ̀	ɔ̀là
sun	ólìlṵ	òòrṵ	ólù
sleep	oólũ	oorũ	ólu
neck	ɔ́lṵ	ɔrṵ	ɔ́lɔ̀
thirst	òlṵgbə	òrṵgbə	òlùgbə
ring	ɔ́lṵ-ìka	òrùka	èlìka
run	sṼlé	sáré	é-rúlé
fat	ùla	ɔ̀rá	ùlà
seed	úlú	irú	úlú

Yoruba [s] is correspondent to Igala [r] (<*ʃ) or [l] (<*s) in at least six examples, see Table 4.27 below.

Table 4.27: Reflexes of *ʃ and *s in Yoruba-Igala

Meaning	*Yoruba-Igala	Yoruba	Igala
leg	éʃɛ̀	əsɛ̀	ɛ́rɛ̀
fruit	èʃo	èso	èro
block/ close	ʃé	sé	é-ré
launch	ʃɔ	sɔ	é-rɔ
nine	èsɔ̰́	èsɔ̰́	èlá
sleep	sṵ̀	sṵ̀	*é-lu-

The reconstruction of the term for 'seven' (**byē*) is based on the following correspondences (Table 4.28).

Table 4.28: One more fragment of the Yoruba-Igala regular correspondences

	Yoruba	Igala
*by	j	by
*j	j	j
*b	b	b

The reflexes of ***by**- can be represented as follows (Table 4.29).

Table 4.29: Reflexes of *by in Yoruba-Igala

Meaning	*Yoruba-Igala	Yoruba	Igala
dog	abyá	ajá	abyá
blood	èbyɛ̀	èjɛ̀	èbyɛ̀
seven	ebye	èje	ebye

Finally, the terms **gwá* '10' and **gwú(n)* '20' are reconstructed in view of ***gw** > Yoruba **w** (before [a])/**g** (before [u]) ~ Igala **gw** (Table 4.30).

Table 4.30: Reflexes of *gw in Yoruba-Igala

Meaning	*Yoruba-Igala	Yoruba	Igala
ten	ègwá	èwá	ègwá
beans	ègwà	èwà	ègwà
dig	gwà	wà	é-gwà
swim	gwà	wɛ̀	é-gwà
sweat	(ò)úgwṵ	òógṵ	úgwù
bone	égwṵ́gwṵ́	egũgũ	ógwúgwú
ascend	gwṵ	gṵ	é-tə-gwù
war	ógwũ	ogũ	ógwu
twenty	ōgwṵ́	ōgṵ́	ó-gwú
vulture	úgwṵ́nú	igṵ́nugṵ́	úgwúnú

These correspondences are treated here in detail because they may be of special interest for the comparative study of the Defoid languages.

4.1.2.3 Edoid

The following reconstruction is based on nearly forty sources which represent twenty languages within this group. The reconstruction proposed by Elugbe was also considered.

Being no specialist in the comparative study of the Edoid languages (unlike Elugbe), I don't feel competent enough to criticize his ideas. Elugbe likely had his reasons for reconstructing the same consonant (***ch**-) in the terms for 'three', 'five', 'six' and 'seven'. Indeed, the comparison of data from the four Edoid branches confirms that the terms for 'three' and 'five' (but not for 'seven') have the same initial consonant. This is common for many of the NC branches (and probably for the Proto-NC as well).

In view of this, I would like to suggest a simplified reconstruction that is closer, in my opinion, to the actually attested forms (Table 4.31).

Table 4.31: Edoid numeral systems and Proto-Edoid

	1. Delta	2. North-Central	3. North-western	4. South-western	Proto-Edoid (Elugbe)	***Proto-Edoid**
1	βʊ	kpa, wo/gwo	kpa	vʊ		**kpa, wo/gwo/vu**
2	βə/βa	va	va	vɛ	i-və	**va/və**
3	saa	sa	sa	sa	ɪu-chaGɪ	**sa**
4	ni	ne	ni	ni	niə	**ni**
5	súwón/ syònì	sen/ʃen	sie	soi/siorin/ jorin	ii-chiNənhi	**sien/ su(w)on**
6	3PL	3+3?	3+3	3PL?	chaN	**3PL, 3+3**
7	5+2	hiron/hilon, 5+2	sie/hi/rhi	ɣwrɛ́/hre	i-chiə	**ghie?**
8	4PL, 4 redupl	renren/lelen	nien	re(r)e	nhɪNanhɪ	**4 redupl.**
9	10−1	sin(rin), tili	5+4	rhi(r)i, zi	i-ciənhi	**cien/sin**
10	gbeny/gbei	gbe	gbe	kpe/xwe	gbeNi	**gbe, kpe**
20	jow/yei	gie/je	gboro, ghe/ze/ye	dhe/ɟè/ʒè	u-gheGi ~ u-ɟh	**gie/jie**
100	20*5	20*5	10PL	20*5		**20*5**
1000		ria/li, gbele	500*2	du, riorin		**du, ria/li**

4.1.2.4 Idomoid

The roots attested in about ten of the Idomoid languages are represented in Table 4.32.

Table 4.32: Idomoid numerals

1	nze/je/nye/ye, kpokpoh?[a]	7	5+2, renyi
2	pa, miyeh?	8	5+3
3	ta/la	9	5+4
4	nɛ̀, ndo, he	10	gwo/wo, jwo
5	do/lo, ho, ro/rwo	20	fu/hu, su
6	rowo/riwi, ji, hili	100	20*5, 10*10

[a] Please note that hypothetically related forms are separated by a slash (/), whereas unrelated ones are separated by a comma.

It should be noted that the data on the Yatye-Akpa branch (one of the two Idomoid branches) is systematically absent. The analysis is based on the Akweya languages only, so unexpected issues may arise.

4.1.2.5 Igboid

This is a small group consisting of several languages. The forms which could be found in modern Igboid languages are listed in Table 4.33.

Table 4.33: Igboid numerals

1	tù, ŋìnɛ́ (Ekpeye)?	7	saà
2	bɔ́	8	5+3
3	tɔ́	9	totu/tolu
4	nɔ́	10	dì/ri/li
5	sé	20	gwʊ̄́/ɣʰʊ̄, kpɔrɔ
6	ʃĭi	100	20*5
		1000	puk(w)u

Interestingly, the terms for ‘one’ attested in the Igboid languages (as found in Koelle 1963[1854]) are subject to significant variation. The following forms are noteworthy: ‘1’ – Īsóāma *oo-te*, Íṣiēle *mfuu*, Ábādṣa *na*, Aro *mbɔ*, Mbó̱fīa *mpoŋ* (the transcription of the forms and languages follows Koelle). The rest of the numerals quoted by Koelle are essentially the same as the ones found in Table 4.34.

4.1.2.6 Jukunoid

Table 4.34: Jukunoid numerals

	1. Bete (Juk.)	2. Central	3. Yukuben-Kuteb	Proto-Jukunoid
1	ʃíʃe	(d)zun/(d)zuŋ	nzo, ji?, yʊn?, ŋgēmé?, tə́ŋ?	*d)zun? ʃíʃe? tə́ŋ?
2	há	pye(na)	pa(n)/fa(n)	*pa(n)/fa(n)
3	tà	(t)sara	ta	*ta
4	ɲè	nye(na)	ɲi, nje/nzì	*nye
5	tsòŋ	(t)swa(na)	t(s)oŋ	*tsoŋ
6	5+1	5+1	5+1	*5+1
7	5+2	5+2	5+2	*5+2
8	5+3	4 redupl., 5+3	5+3	*4 redupl., 5+3
9	5+4	5+4?	5+4	*5+4
10	wo	dub (<Hausa?), dz(w)e	kur? kuwub, bji/bzi, jwēr	*jwe, wo? kur?
20	?	'body' (á-dì)	kam/k(w)om	*'body' (di)
100	?	20*5	20*5, Hausa	*20*5
1000	?	<Hausa	Hausa	<Hausa

Tentative reconstructions for the three major branches of this relatively small family are presented in the table above. The terms for 'one' and 'ten' vary significantly.

4.1.2.7 Kainji

The comparative analysis of the Kainji group is hindered by the fact that there is no linguistic description for the majority of its languages. However, there is a great range in numerical terms within those languages, for which reliable data is available. The following analysis is based on thirty pertinent sources, including the comparative list of forms compiled by Dettweiler & Dettweiler (1993). What follows is a step-by-step analysis of the available data that will hopefully yield some answers.

4.1.2.7.1 ‘One’

Table 4.35: Kainji stems for ‘1’

	Language	‘1’	‘1’	‘1’	‘1’
Eastern					
Jera	Iguta			dínkā	
Jera	Janji			diŋkɛ	ɪnde
Jera	Bunu		ù-ŋ̀ŋínì	díŋkà	
Jera	Buji			díŋkà	
Amo	Amo			*lu-ruŋ	
Western					
Basa	Basa	hĩn			
Duka	C’lela	tʃĩ́			
Duka	Hun-Saare(Duka)	cɔɔn			
Duka	Ut-Ma’in	tʃə̄ːn			
Duka	Rijau	tʃoon			
Duka	Darangi	tʃooɾ			
Duka	Bunu	dɨ̄ɨ̄			
Duka	Iri	dən			
Duka	Dukku	dɛn			
Duka	Giro	dɨ̄ɨ̄n			
Kambari	Tsishingini (Kambari)		íyyán		
Kambari	Agaushi (Tsikimba)				‘-tè
Kambari	Kambali (Koelle)		ííŋa		
Kamuku	Western Acipa (Cicipu)				tôː
Kamuku	Kamuku (dial.)		ĭ̃jɑ́		
Kamuku	Hungworo (Hungwere)		ĭ̃ːjə̃́		
Kamuku	Pongu (Pangu)	hĭ̃ː			
Kamuku	Kamuku (Koelle)	hí͡ía			
Kamuku	Fungwa	hĩ̃			
Reshe	Reshe (Tsureshe)	tsúnnɛ̀			

The grouping principles for the forms included in this table are admittedly haphazard. On the one hand, the relationship between some of the forms arranged into the same column (e.g. *hĩn, tʃə̄ːn* and *dɛn* or *dínkā* and **lu-ruŋ*) is not immedi-

ately apparent. On the other hand, some of the forms placed in separate columns might be etymologically related (e.g. *dɨ̈ɨ̈n* Giro and *dínkā* Iguta). In these circumstances it seems reasonable to go back to the reconstruction of the Kainji term for 'one' on the basis of the data provided by other Benue-Congo branches (see §4.1.4).

4.1.2.7.2 'Two'

The above considerations regarding the term for 'one' are applicable to the term for 'two' as well. The inventory of forms found in Table 4.36 is neither helpful

Table 4.36: Kainji stems for '2'

		'2'	'2'	'2'	'2'
Eastern					
Jera	Iguta			rɛ̀ːpú	
Jera	Janji		tɪ-rɛ (~wa-~a-)	-rèèpó	
Jera	Bunu				
Jera	Buji			rèpó	
Amo	Amo				im-ba
Western					
Basa	Basa	jèbí (yééwi)			
Duka	C'lela		ʔílɨ̀		
Duka	Hun-Saare(Duka)		yoor		
Duka	Ut-Ma'in		jɔ̄ːr		
Duka	Rijau		jooɾ		
Duka	Darangi		jooɾ		
Duka	Bunu		jɔɔɾ		
Duka	Iri		jooɾ		
Duka	Dukku		juuɾ		
Duka	Giro		jooɾ		
Kambari	Tsishingini (Kambari)		ì-ɾɛ̀		
Kambari	Agaushi (Tsikimba)		-rè		
Kambari	Kambali (Koelle)		íí-lɛ		
Kamuku	Western Acipa (Cicipu)	jápù			
Kamuku	Kamuku (dial.)	ⁿdáuɥə̀			
Kamuku	Hungworo (Hungwere)		ʔʲə̃-dʒə̀		
Kamuku	Pongu (Pangu)		ɾê:nù		
Kamuku	Kamuku (Koelle)				wúúlee
Kamuku	Fungwa	jó:gó			
Reshe	Reshe (Tsureshe)				rìsə̄

for the reconstruction of the Proto-Kainji term for 'two', nor suggestive of the morphemic analysis of the pertinent forms within each of the branches. As we hope to demonstrate below, additional information that may prove useful for the reconstruction of the term for 'two' can be obtained through the analysis of the term for 'seven'.

4.1.2.7.3 'Three', 'Four' and 'Five'

Table 4.37: Kainji stems for '3'-'5'

		'3'	'4'	'5'	'5'
Eastern					
Jera	Iguta	tààrū	nàːnzī		ʃùːbì
Jera	Janji		tɪ-naze		ʧibi
Jera	Bunu		nàːzé		ʃíːbì
Jera	Buji		nàzé		ʃíbí
Amo	Amo		nnas	n-ntaun	
Western					
Basa	Basa	tàtɔ	néʃì (nááʃii)	táná	
Duka	C'lela	tɨ́ːʧù	náːsé	tã́	
Duka	Hun-Saare(Duka)	tett	náss	táán	
Duka	Ut-Ma'in	tɵ̄t	náːs	tán	
Duka	Rijau	tɪtʰ	nəss	taan	
Duka	Darangi	tɪtʰ	nas	taan	
Duka	Bunu	tɪtʰ	nas	tan	
Duka	Iri	tɪɪt	nass	taan	
Duka	Dukku	tɨɨt	nas	taan	
Duka	Giro	tɨtʰ	nass	taan	
Kambari	Tsishingini (Kambari)	tàʔàtsú	nə́ˬʃín	táːˬwún	
Kambari	Agaushi (Tsikimba)		ʻ-nə́ʃì	ʻ-tã́ũ̃	
Kambari	Kambali (Koelle)	táátsu	nóóʃin	tááu̲	
Kamuku	Western Acipa (Cicipu)	tâːtù	nósì	tã̂u	
Kamuku	Kamuku (dial.)	túˈtɔ	nə́ʃì	túù	
Kamuku	Hungworo (Hungwere)	tâ̰t̰ɔ̰	ùnə́sĩ̀	sàtá	
Kamuku	Pongu (Pangu)	tâːtù	nə̃ːʃĩ̀	tá	
Kamuku	Kamuku (Koelle)	tááto	náʃii	taa ~ tááa	
Kamuku	Fungwa		nóːʃì	tá	
Reshe	Reshe (Tsureshe)	tàtswā	nāʃə̃́	tə̃	

Unlike the terms for ‘one’ and ‘two’, the numerals covering the sequence from ‘three’ to ‘five’ are quite homogeneous and thus can be reliably reconstructed (just as in the majority of other NC branches). The provisional forms suggested for ‘three’, ‘four’, and ‘five’ are **tat*, **nas*, and **tan* respectively. The latter form can also be reconstructed for Eastern Kainji on the basis of the Amo evidence. Thus *ʧibi* (*ʧi-bi*?) ‘five’ is an innovation of the Jera subgroup.

4.1.2.7.4 ‘Six’ and ‘Seven’

Table 4.38: Kainji stems and patterns for ‘6’-’7’

			‘1’	‘2’	‘5’	‘6’	‘7’	‘7’
	Eastern							
1	Jera	Iguta				twà:sì		súnā:rí
2	Jera	Janji		tɪ-rɛ		tase		sunare
3	Jera	Bunu				tá:sè ~tà:sé		súnà:ré
4	Jera	Buji				tásé		súnàrí
5	Amo	Amo			n-ntaun	ku-totʃin	kuzor	
	Western							
6	Basa	Basa	hĩn		táná	tʃìhin	tʃéndʒe	
7	Duka	C’lela	tʃĩ	*ʔí-lɨ̀	tã́	ʧíhɨ̀	tã̀ʔílɨ̀	
8	Duka	Hun-Saare	co͞on	* yoo-r	táán	cînd	tá’yoor	
9	Duka	Ut-Ma’in	tʃəːn	*jəː-r	tán	ʃìʃìn	tàʔèr	
10	Duka	Rijau	tʃoon	*joo-ɾ	taan	tʃiin	ta’jooɾ	
11	Duka	Darangi	tʃooɾ	*joo-ɾ	taan	tʃin	taŋ’joɾ	
12	Duka	Bunu	dɨɨ	*jɔɔ-ɾ	tan	tʃiin	ta’juu	
13	Duka	Iri	dən	*joo-ɾ	taan	tʃinnd	ta’jooɾ	
14	Duka	Dukku	dɛn	*juu-ɾ	taan	tʃɪŋ	ta’jaaɾ	
15	Duka	Giro	dɨ̀in	*joo-ɾ	taan	tʃind	ta’jooɾ	
16	Kambari	Tsishingini		ì-ɾɛ̀	tá:wún	tə̀:lí	tʃìndɛ̀ɾɛ́	
17	Kambari	Agaushi	-tè	-rè	-tã́ũ	-tə̀:lì	ʧìndèrè	
18	Kambari	Kambali		íí-lɛ, *rɛ	táá͡u	tɔ́ɔ́li	tsíndɛɛrɛ	
19	Kamuku	West.Acipa		*jà	tã̀u	tóríhɨ̃	tíndàjà	
20	Kamuku	Cinda		*ɯə̀	táù	tənə́hì	təndə́ɯə̀	
21	Kamuku	Hungworo		ʔˡɨ̃-dʒə̀, *ɾˡə̀	sàtá	ū-t̪únìhɨ̃	ū-təndə̀ɾˡə̀	
22	Kamuku	Pongu	hɨ̃ː	ɾêːnù, *ɾə̀	tá	tʃíníhì	tə̃ndə́ɾə̀	
23	Kamuku	Kamuku	hɨ́i̪a	*lee	taa ~ tááa	túnui	tandálee	
25	Kamuku	Fungwa	hĩ	*lò	tá	ʧĩhɨ̃	tíndàlò	
25	Reshe	Reshe	tsúnnɛ̀		tɔ̃	tēnzɔ̄	tànsã̄	

Some of the previously discussed terms for 'one', 'two' and 'five' are quoted in the table above alongside the terms for 'six' and 'seven'. Such grouping might facilitate a better understanding of compound numerals (if 'six' and 'seven' are indeed compounds) as well as the methodological and theoretical aspects behind their reconstruction. In addition, it might help to establish whether parts of compound numerals can be used to enhance the reconstruction of the primary numerical terms such as 'one', 'two', and 'five'.

The compound nature of the term for 'seven' is betrayed by its 'length': the forms quoted in the table normally have two to three syllables, whereas the primary numerals are as a rule mono- or (rarely) bisyllabic.

At the same time, in some of the cases the pattern '7=5+2' is immediately apparent (cf. languages 7–11, 13–15).

At this point, however, we will deal with those languages that show only faint (or no) traces of the pattern in question ('7=5+2'). E.g. in Tsishingini (16) we have to assume the pattern '7=X+2', where 'X' is an unknown element, whereas in language 12 the pattern is '7=5+X' (the relationship between 'X' and the term for 'two' is questionable).

Let us assume that the Proto-Kainji terms for 'two' and 'five' are *CL-**re** (cf. e.g. Duka **jo-re* > *joor*) and **tan* respectively. In this case, the compound term for 'seven' would be **tan-*(CL)*-re* or **tan-X* (connector)-(CL)*-re*. The most typical diachronic scenarios for the emergence of the 'X'-patterns effective on the synchronic level are as follows:

1. Both basic elements of the compound 'seven' (i.e. reflexes of the terms for 'two' and 'five') are preserved in the language, as is the compound itself (sometimes slightly modified in accordance with the relevant phonotactic rules). Cf. e.g. the Darangi (11) evidence: **jo-re* > *joor* '2', **tan* > *taan* '5', **taan-jo-re* > *taŋ'jor* '7'. In this case, the reconstruction comes down to the simple statement that in the Darangi language '7=5+2'.

2. The compound 'seven' (even if slightly modified) is preserved in the language, while the term for 'two' is replaced with an innovation. Let us assume that in the Basa language (6) *jèbí* (Koelle: *yééwi*) '2' < **jo-bi* (innovation), *táná* '5' (the reflex of **tan*), *tʃéndʒe* <**tan-re* '7'. In this case, **tan-re* > *tan-dʒe* > *tendʒe* (regressive assimilation) > *tʃendʒe* (palatalization before the front vowel). Hypothetical as it may be, this example is phonetically plausible.

Any of these model processes may result in the loss of phonetic resemblance between a derived form and its source. This may lead to a situation where a derivation pattern is no longer recognizable by speakers. As a consequence, the term for 'seven' becomes opaque on the synchronic level and can no longer be analysed as '5+2'.

This means that the replacement of the original term for 'two' by an innovation does not affect the compound term for 'seven', i.e. that its second part is not automatically replaced. Moreover, in case there is sufficient evidence that the second of the aforementioned scenarios was applied, we may enhance the reconstruction of the primary term for 'two' on the basis of the compound term for 'seven'. E.g. the form *tʃéndʒe* suggests that the original Basa root for 'two' was **dʒe / re* and not **bi* as in the majority of the Kainji languages.

The available pertinent forms point toward the reconstruction of the Proto-Kainji form as **tan-da-re* ('5'-connector-'2'). The reconstructed forms for 'two' (marked with [*] in Table 4.38) suggest a Proto-Kainji form **re* '2' and the pattern *'7=5+2'. The Eastern Kainji forms for 'seven' are probably innovations.

However, some of the forms attested for 'seven' may point toward the reconstruction of 'two' as **ba/bi* in Proto-Kainji. In this case our reference list should be expanded by adding dialects that were not included for reasons of space: it is not possible to quote every single NC source every time. E.g. Cawai (Eastern Kainji) *a-ba* '2', *a-tar-ba* '7', Ngwoi (Hungworo) *e-bia* '2', *sa-bia* '7' (the root **ba/bi* is also suggested by Eastern: Gure *pi-ba*, Gyem *ve*, Piti *ba*, Surubu *ka-va*).

The forms for 'six' are more problematic since they may go back to a primary root (or roots). They may be tentatively reconstructed as **ci(hi)n, *tas,* and **tel.* We will come back to these forms in order to enhance their reconstruction in case similar forms are detected in other BC branches.

4.1.2.7.5 'Eight'

The Eastern Kainji and Duka forms (if related) suggest that the primary root **-ru* should be reconstructed for 'eight' in Proto-Kainji. At this point, let us reserve a preliminary form **u-ro/ ji-ru* for further comparison. In most of the Kamuku languages the pattern '8=5+3' is traceable (but note the Western Acipa form that is comparable to those attested in Kambari and possibly Amo (Eastern)). This points towards an alternative form of uncertain morphological structure (**kunle(v)/ kunlo* '8').

Table 4.39: Kainji stems and patterns for ‘8’

		‘8’	‘8’	‘8’
Eastern				
Jera	Iguta	ùrū		
Jera	Janji	uro		
Jera	Bunu	ùrú		
Jera	Buji	úrú		
Amo	Amo			kuliv
Western				
Basa	Basa		tɔndatɔ (5+3)	
Duka	C’lela	jɨ́ːɾù		
Duka	Hun-Saare(Duka)	yéér		
Duka	Ut-Ma’in	éːr		
Duka	Rijau	eeɾ		
Duka	Darangi	eɾ		
Duka	Bunu	ɛɛɾ		
Duka	Iri	ɪɪɾ		
Duka	Dukku	ɛɛɾ		
Duka	Giro	ɛɛɾ		
Kambari	Tsishingini (Kambari)			kùnlə
Kambari	Agaushi (Tsikimba)			kúnlòi
Kambari	Kambali (Koelle)			kúnlo
Kamuku	Western Acipa (Cicipu)			kùríl:ò
Kamuku	Kamuku (dial.)		tə́ntátɔ (5+3)	
Kamuku	Hungworo (Hungwere)		ū-tátàt̰ɔ̄ (5+3)	
Kamuku	Pongu (Pangu)		tə́ndáːtù (5+3)	
Kamuku	Kamuku (Koelle)		túndaat (5+3)	
Kamuku	Fungwa		tíndátù (5+3)	
Reshe	Reshe (Tsureshe)		dálànzɔ̀	

4.1.2.7.6 'Nine' and 'Ten'

There are several forms and patterns for 'nine' whose reconstruction is equally plausible: '9=5+4', **tor(b)oj* (possibly <*'10–1'), **jiro*. Each of the forms/patterns is characteristic of a particular sub-group of languages. The term for 'ten' is reconstructed as **pwa*, with its reflexes attested in all Western Kainji branches. Three alternative forms (**turu*, **kuri, *kup/ kpa*) are found in Eastern Kainji, where they are employed for counting and in quantity measures.

4.1.2.7.7 'Twenty' and 'Hundred'

The diversity of patterns for 'hundred' may indicate the absence of the term in Proto-Kainji. The term for 'twenty' likely followed the pattern '20=10*2'. However, the form **ʃín/ ʃík* attested in three of the Western Kainji branches is noteworthy.

4.1.2.7.8 Summary

It should be noted that a full reconstruction of the Kainji numeral system is not presently achievable for a number of reasons: some of the forms have multiple alternative variants, many terms are not attested outside Kainji (or have an obscure morphological structure), the elements of the compound terms are not always identifiable (e.g. in the patterns '7=X+2' or '7=5+X'), etc.

The numerals attested within this group are so peculiar (at least for a non-specialist in the Kainji languages like myself) that one may wonder whether the Kainji group should indeed be treated as a branch of Benue-Congo. In any case, it seems reasonable to record all the forms reconstructable within the Kainji subgroups. These forms and patterns are represented in the table below (Table 4.40).

Table 4.40: Kainji summarized data for BC reconstruction

1	*tsin, hin, din, jan/yan, *te …	7	*5+2
2	*re, *ba/bi, -pu?	8	*ro/ru, *5+3, *kunle(v)/kunlo
3	*tat	9	*5+4, *10–1, *jiro
4	*nas	10	*pwa, *turu, *kuri, *kup/kpa
5	*tan	20	*10*2, *ʃín/ʃík
6	*ci(hi)n, *tas (<3?), *tel	100	?

Table 4.41: Kainji stems and patterns for ‘9’ and ‘10’

		‘9’	‘9’	‘9’	‘10’	‘10’
Eastern						
Jera	Iguta		tɔ̀rbɔ̀ (10–1)			bū-tú:rú
Jera	Janji		toroəi (10–1)			turo, kɪrəu
Jera	Bunu		tò:rêj (10–1)			bì-tú:rú; rú-kúrí
Jera	Buji		toroj (10–1)			bì-túrú; rì-kùrì
Amo	Amo		ku-tivi			ku-lidir *li-kure
Western						
Basa	Basa	tʃíndʒìʃì (5+4)			uḿpwá	
Duka	C’lela			dó:ɾè	ʔó:pá	
Duka	Hun-Saare(Duka)			jírò̲	o̲pp	
Duka	Ut-Ma’in			dʒʷɔ̄:r	ɔ̄p	
Duka	Rijau			dʒiɾɔ	ɔpʰ	
Duka	Darangi			dʒiɾɔ	’ɔpʰ	
Duka	Bunu			dʒiɾɔ	ɔpʰ	
Duka	Iri			dʒɪɾɔ	ɔpʰ	
Duka	Dukku			dʒɪɾɔ	ɔpʰ	
Duka	Giro			dʒɛdɔ	ɔp	
Kambari	Tsishingini (Kambari)	kùttʃí			kùppá	
Kambari	Agaushi (Tsikimba)	kùʧì			kùpà	
Kambari	Kambali (Koelle)	kúciici			hókpa̲	
Kamuku	Western Acipa (Cicipu)	kùtít:í (5+4)			ùkúp:à	
Kamuku	Kamuku (dial.)	tə́ndə́ʃì (5+4)			òpá	
Kamuku	Hungworo (Hungwere)	ūtə́nàsʃ̃ì (5+4)			īkópʲè	
Kamuku	Pongu (Pangu)	tʃ̃ndúʃì (5+4)			úpwá	
Kamuku	Kamuku (Koelle)	tándaaʃii (5+4)			ópaa	
Kamuku	Fungwa	tíndíʃì (5+4)			úpá	
Reshe	Reshe (Tsureshe)	tānāʃ̃è (5+4)			úpwà	

Table 4.42: Kainji stems and patterns for ‘20’ and ‘100’

		‘20’	‘20’	‘20’	‘100’
Eastern					
Jera	Iguta			12+8	12*8+4
Jera	Janji				
Jera	Bunu				rì:mú
Jera	Buji			10*2	*ri-nu
Amo	Amo			akut-2	li-kalt
Western					
Basa	Basa	wéʃi (K:wóóʃi)			dupu íjèbi (50*2)
Duka	C’lela	dᵃkʷèzè			kʷètʧtã́/vzíŋgù
Duka	Hun-Saare(Duka)	ɛ̱r-kwo̱o̱z			kwo̱o̱z-ɛ̱t táán (20 * 4), o-zùngu
Duka	Ut-Ma’in		ɔ̄rʃīk		ɔ̄ʔʃīkɔ̄ʔtán (20 * 5)
Duka	Rijau				
Duka	Darangi				
Duka	Bunu				
Duka	Iri				
Duka	Dukku				
Duka	Giro				
Kambari	Tsishingini (Kambari)		ú:ʃín		?
Kambari	Agaushi (Tsikimba)			kà-màngà	
Kambari	Kambali (Koelle)		úʃi̱		
Kamuku	Western Acipa (Cicipu)			10*2	10*10, mándá
Kamuku	Kamuku (dial.)			10*2	ɗərí (<Hausa) or dè òpá
Kamuku	Hungworo (Hungwere)			10*2	íhɔ̄ŋgʷà, 10*10
Kamuku	Pongu (Pangu)	wɔʃí			bìjĩ́nɔ̃́
Kamuku	Kamuku (Koelle)			10*2	
Kamuku	Fungwa		kùʤìjò		ìkwà:ku, <Hausa
Reshe	Reshe (Tsureshe)			álàsà	ránākū

4.1.2.8 Platoid

4.1.2.8.1 'One' (Table 4.43)

The grouping of roots here is admittedly provisional, because their morphological structure is often obscure. In addition, phonetic changes that may have taken place are unknown. It is very difficult to propose any etymological interpretation for the forms represented in the table. Which of them could be attributed to the Proto-Platoid is unclear (*(*y*)*in* represents a possibility, in case noun class markers are indeed incorporated into the numerical terms).

Table 4.43: Platoid stems for '1'

1.	Alumu-Tesu	Tesu				à-nyimbere
2.	Ayu	Ayu	ɪ-dɪ			
3.	Biromic	Birom		gw-īnìŋ/(d)-īnìŋ		
3.	Biromic	Eten	dáy			
4.	Cenral	Izere		z-iníŋ		
4.	Cenral	Irigwe				ˀzrú
4.	Cenral	Kaje (dial.)				yiruŋ/yirəŋ
4.	Cenral	Tyap			a-nyuŋ	
5.	Hyamic	Hyam		ʒ-ìnì		
6.	Ninzic	Mada		*nɛn		gyər
6.	Ninzic	Ninzo		*nì		jír
7.	Northern	Ikulu				íńjí
8.	Southeastern	Fyam		kʲ-éŋ, *in		
9.	Southern	Lijili	lo̰			
10.	Taroid	Tarok (dial.)			ù-zi̱ŋ, *ɗi̱ŋ?	
11.	Western	Yeskwa (dial.)				è-nyí
11.	Western	Rukuba (dial.)		gy-ín		
11.	Western	Eggon (dial.)				á-kiən
11.	Western	Eggon (dial.)	ò-rí			
11.	Western	Hasha		nʸ-ìnāŋ		
?	Sambe		ŋ-íŋínā			

Tesu data are taken from Blench & Kato 2012.

4.1.2.8.2 'Two', 'Three' and 'Four' (Table 4.44)

The roots for 'two' containing voiced and voiceless labials are attested in the Platoid languages (as well as in some other BC branches). They may be tentatively reconstructed as **pa/ fa/ ha* and **ba/ wa.*

Table 4.44: Platoid stems for ‘2’, ‘3’ and ‘4’

			‘2’	‘2’	‘3’	‘4’
1.	Alumu-Tesu	Tesu		à-hùrwi	à-taatɔ	a-anɛ
2.	Ayu	Ayu	ahwa/afah		a-taar	a-naŋaʃ
3.	Biromic	Birom		-bā	-tāt	-nāːs
3.	Biromic	Eten	fà		tàt/tʃàt	nàːs
4.	Cenral	Izere	fà		taar	nààs
4.	Cenral	Irigwe		ʾʍʲè	ʾtsʲɛ̀	ʾni
4.	Cenral	Kaje (dial.)	’-hwa		’-tat	-nai
4.	Cenral	Tyap	a-feaŋ		a-tat	a-naai
5.	Hyamic	Hyam	fe̲ri, *fo		taat	naaŋ
6.	Ninzic	Mada		y-wā, *gba	tar	nlyɛ̄
6.	Ninzic	Ninzo	há	*gba	tár	nə(s)
7.	Northern	Ikulu	íń-pààlá		íń-táá	íń-nāā
8.	Southeastern	Fyam	por		táár	naas
9.	Southern	Lijili		à-bɛ̰	à-tʃɛ́	à-nàrɔ́
10.	Taroid	Tarok (dial.)	ù-pàrɨ́m		ù-ʃádɨ́ŋ	ù-nèɗɨ́ŋ
11.	Western	Yeskwa (dial.)		èn-và	èn-tât	èn-nà
11.	Western	Rukuba (dial.)	’-hàk		-tát	-nàs
11.	Western	Eggon (dial.)	à-hàà		à-tráá	ù-ɲí
11.	Western	Eggon (dial.)	ɔ̀-hà		ɔ̀-cá	ò-ɲì
11.	Western	Hasha	à-pʷò		ā-tāt	à-nìŋ
?	Sambe	bèkà-fà	kà-tú	kà-tār/béká-tār	kà-nɛ̀/bèkà-nè	

The roots for ‘three’ and ‘four’ are more stable. Some of their reflexes suggest that the Proto-Platoid forms must have been close to the NC forms: **tat* ‘3’ and **nai* / **nas* ‘4’.

4.1.2.8.3 'Five' and 'Six' (Table 4.45)

Table 4.45: Platoid stems and patterns for '5' and '6'

			'5'	'5'	'6'	'6'
1.	Alumu-Tesu	Tesu	a-túŋgú		tɛ́rɛ́kífí (<3?)	
2.	Ayu	Ayu	a-tugen		a-tɛɛr (3PL)	
3.	Biromic	Birom	-tūŋūn			-tī:mìn
3.	Biromic	Eten		wí	tà:rà (<3)	
4.	Cenral	Izere	tùwùn		ìgà-rà:r (3PL)	
4.	Cenral	Irigwe	ʾtɕʷòô		rí-tsʲɛ́ (3PL)	
4.	Cenral	Kaje (dial.)		-pfwɔn	kə-tat (3PL)	
4.	Cenral	Tyap		a-fwuon	a-taa (3PL)	
5.	Hyamic	Hyam	twoo		twaa-ni (5+1)	
6.	Ninzic	Mada	tun		tān-nèn (5+1)	
6.	Ninzic	Ninzo	ʈʷí		tā-nì (5+1)	
7.	Northern	Ikulu	íń-cūū		íń-cúnú (5+1?)	
8.	Southeastern	Fyam	tóón		táár-in (5+1)	
9.	Southern	Lijili	à-sǫ́		mìn-zí (3PL?)	
10.	Taroid	Tarok (dial.)	ù-túkún		ù-kpə́-dǐŋ (X+1?)	
11.	Western	Yeskwa (dial.)	èn-tyúò		èn-cí (5+1)	
11.	Western	Rukuba (dial.)	-túŋ		tàiŋ	
11.	Western	Eggon (dial.)	ò-tnó	*fúúɲ	ù-fín (5+1?)	
11.	Western	Eggon (dial.)	ɔ̀-tnɔ̂	*fɔ̀ɲ	ə̀-fǐ̃(5+1?)	
11.	Western	Hasha	ā-tūkūn			à-kʷìp
?	Sambe	kà-tûn			kù-hɔ̀/dɔ̀gɔ̀-hɔ̀	

The term for 'five' is reconstructed as **tu(ku)n*. It is likely that there was no primary term for 'six' in the Proto-Platoid group: in all pertinent languages (except for Eggon, Hasha and Sambe) the term in question either follows the pattern '5+1' or is built by adding a plural class to the term for 'three'.

4.1.2.8.4 'Seven' and 'eight' (Table 4.46)

Word-building patterns for the term for 'seven' are normally quite transparent: '7=5+2' is attested in the majority of the sub-groups, whereas '7=4+3' is more rare. The same can be applied to the term for 'eight', which either follows the pattern '8=5+3' or is built by partial reduplication of 'four' (4 redupl.). Sometimes the archaic primary terms for 'two' and 'five' are traceable in the forms for 'seven' and 'eight' (such forms are marked with an asterisk in the respective tables).

Table 4.46: Platoid stems and patterns for ‘7’ and ‘8’

			‘7’	‘8’	‘8’
1.	Alumu-Tesu	Tesu	téréḱífí naɲí (6+X)		tsyátsyá
2.	Ayu	Ayu	a-taraŋaʃ (3+4)	a-na-ba-bog (4+X)	
3.	Biromic	Birom	-tāːmà (5+2)		-rwīːt
3.	Biromic	Eten	nìtà (4+3)	nàràs (4+X)	
4.	Cenral	Izere	kà-nàsàtáár (4+3)		ì-kárá
4.	Cenral	Irigwe	natsʲɛ́ (4+3)		klaǹvà
4.	Cenral	Kaje (dial.)	tiːruŋ (cf. yiruŋ ‘1’)	nai-mʊwak (4+X)	
4.	Cenral	Tyap	a-natat (4+3)	a-ninai (4 redupl.)	
5.	Hyamic	Hyam	twarfo (5+2)?	naaraŋ (4+X)	
6.	Ninzic	Mada	tāmgbā (5+2)	tāndà (5+3)	
6.	Ninzic	Ninzo	tāŋgbā (5+2)	tāndàr (5+3)	
7.	Northern	Ikulu	tɔ́ɔ̀pāā (5+2)	níǹnāā (4 redupl.)	
8.	Southeastern	Fyam	támor (5+2)		tʃínít
9.	Southern	Lijili	mú-tá		rúnǫ́
10.	Taroid	Tarok (dial.)	ù-fàŋ-ʃát (X+3)	ù-nənnè (4 redupl.)	
11.	Western	Yeskwa (dial.)	tònvà (5+2)	tóndát (5+3)	
11.	Western	Rukuba (dial.)	taŋbák (5+2)	taːrat (5+3)	
11.	Western	Eggon (dial.)	à-fóhà (5+2)	à-fóté (5+3)	
11.	Western	Eggon (dial.)	ɔ̀-fɔ́hà (5+2)	ɔ̀-fɔ́tɛ́ (5+3)	
11.	Western	Hasha	à-kʷìp nʸīnāŋ (cf. 6, 4)	nànìŋ (4 redupl.)	
?	Sambe	kɔ̄rɔ̄nkɛ́rā/kúrkə́nrā		ī-tɔ́r	

4.1.2.8.5 **'Nine' and 'Ten'** (Table 4.47)

It is likely that the term for 'nine' attested in Ikulu, Yeskwa and Sambe (*toro/cora*) is primary. The hypothetical inter-relationship of these roots may be of interest for the Proto-Platoid reconstruction, because these languages do not belong to the same sub-group. The forms of 'nine' in the majority of the languages show traces of 'five', 'four', 'ten' and 'one', which suggests that two alternative patterns ('9=5+4' or '9=10–1') could have been in use. Some rare patterns (e.g. '9=12–3' (Birom) and '9=8+X (Tesu)) are of interest for the linguistic typology.

According to Bouquiaux (1962) the term for 'twelve' (*kūrū*) is attested in Birom. In this language '21' (*kūrū ná syā:-tāt*) = '12+9' (*syā:-tāt*), while '80' (*bākūrū bātī: mìn ná rwī:t*) = '12*6' (*-tī: mìn*) + '8'*(-rwī:t)*. The pattern '9=12–3' is not totally unexpected within this context. A similar system can be traced in the Mada language. As stated in our source (Abiel Barau Kato), "Like many languages in Platoid area, Mada has an old duodecimal numeral system up to 24."[10] The Mada terms for 'twelve' and 'twenty-one' are *tsɔ* and *tsɔtīyār* (*tīyār* '9') respectively. The same root for 'twelve' (*tsó* '12') is found in Ninzo for which our source notes that "In the traditional counting system, to count beyond twelve (12), that is from thirteen onwards, entails counting in sets of twelve."[11] Moreover, the same root is attested in Tesu (*tsɔ* '12'). According to Uche Aaron, a primary root *ɔ́-c^{w}ɔ́* '12' is discernible in Eggon (beside the composite term '12=10+2'). This root is also found in Rukuba (Che) in *u-sɔ́k* '12'. The duodecimal numeral system as attested in this language is of the utmost sophistication. According to Luc Bouquiaux: "There are two words for number '72', *kitu* and *atu*, 144 can be expressed as *atu ahak* and 200 is *atu ahak ni isɔk inas ni hak ni ta:rat* (72 * 2) + (12 * 4) + 8."[12] Other languages in this group normally use less exotic systems. In some of them, however, e.g. in Eten, "The highest number that can be counted in traditional way is 144,"[13] i.e. '12*12'. To sum up, it seems that a primary term for 'twelve' can be reconstructed on the Proto-Platoid level, hence the pattern for 'nine' should most probably be reconstructed as *'9=12–3'.

The system outlined above adds a new perspective to the forms with the meaning 'ten'. Presumably, there was a Proto-Platoid primary term for 'ten' that may be tentatively described as **kop*. The alternative forms *sok/swak* may be etymologically related to the forms for 'twelve' cited above. If so, their change of meaning may have resulted from the adoption of a decimal system. The root *gur/wur* is distinguished as well.

[10] https://mpi-lingweb.shh.mpg.de/numeral/Ninzo.htm
[11] https://mpi-lingweb.shh.mpg.de/numeral/Ninzo.htm
[12] https://mpi-lingweb.shh.mpg.de/numeral/Rukuba.htm
[13] https://mpi-lingweb.shh.mpg.de/numeral/Aten.htm

Table 4.47: Platoid stems and patterns for ‘9’ and ‘10’

			‘9’	‘9’	‘10’	‘10’	‘10’
1.	Alumu-Tesu	Tesu	tsyátsyá naŋí (8+X)				gòròmàvɔ
2.	Ayu	Ayu	a-tu-lu-bog (5+4?)			i-ʃog/ a-ja-la-bog	
3.	Biromic	Birom	syāː-tāt (12- 3)				12–2
3.	Biromic	Eten	dùːdʒàŋ (10-X)				dùːbɔ̀
4.	Cenral	Izere	kàtúbɔ́k (5+X?)			kù-sɔ́k	
4.	Cenral	Irigwe		kruvájá		ʃʷá	
4.	Cenral	Kaje (dial.)	kumʊwiːruŋ (10–1?)		*ku?	swak	
4.	Cenral	Tyap	akubunyuŋ (10–1?)		*kub?	swak	
5.	Hyamic	Hyam	mbwan kɔb (10–1)		kɔ́b		
6.	Ninzic	Mada	tīyār (X-1?)				gùr
6.	Ninzic	Ninzo	tīr (s) (3-X?)				wūr
7.	Northern	Ikulu		tɔ́ɔ̀llāā	nù-kɔ̄p		
8.	Southeastern	Fyam	téres (3-X?)				dukút
9.	Southern	Lijili	zà-tʃɛ́ (X-3?)				zà-bɛ̀
10.	Taroid	Tarok (dial.)	ùfàŋzíŋtíŋ (X+4)		ù-gbɔ́pei		
11.	Western	Yeskwa (dial.)		tyúôrá	ó-kóp		
11.	Western	Rukuba (dial.)	taːras (3-X?)				u-wùruk
11.	Western	Eggon (dial.)	àfúúŋí (5+4)		ó-kpo		
11.	Western	Eggon (dial.)	ɔ̀fɔ̂ŋí (5+4)		ɔ̀-kbɔ́		
11.	Western	Hasha	nànìŋ màrēŋ (4+X)				ā-wūk
?	Sambe		tōrō/kà-tɔ́rɔ́			jɔ̀-wō	

The specific nature of the Platoid numeral system prevents us from providing separate forms for ‘twenty’ and ‘hundred’. The pattern *’20=12+8’ traceable in a number of pertinent languages is reconstructed for Proto-Platoid. A compound nature is also assumed for ‘hundred’.

The results pertaining to the advanced reconstructions of numerals in Proto-Platoid are summed up in the table below (Table 4.48).

Table 4.48: Proto-Platoid numeral system (*)

1	(y)in, di(n), jir, nɨŋ	7	5+2, 4+3
2	pa/fa/ha, ba/wa.	8	4 redupl., 5+3
3	tat	9	5+4, 10−1, 12−3, tu(ku)n
4	nai/nas	10	kop, gur/wur
5	tu(ku)n	20	12+8
6	5+1, 3PL	100	?

4.1.2.9 Nupoid

Let us try to reconstruct the Proto-Nupoid numeral system.

Table 4.49: Nupoid numerals and Proto-Nupoid (*)

Nupoid	Ebira	Gbari	Kakanda	Nupe	*Nupoid
1	ɔ̀ɔ̀-nyī	gbᵐaː-ɾí,*wĩ	gú-ní	ni-ní	**ni/nyi, wi? ri**?
2	èè-vā	ŋʷã̀-ba	gú-bà	gú-bà	**ba**
3	èè-tá	ŋʷã̀-tʃa	gú-tá	gú-tá	**ta**
4	èè-nà	ŋʷã̀-ɲi	gú-ni	gú-ni	**na/ni**
5	èè-hí	ŋʷã̀-tⁿù	gú-tũ	gú-tsũ	**tun/tnu/tsun, hi?**
6	hɨ́-nɔ́-nyī (5+1)	tⁿú-wĩ (5+1)	gú-tua-ɲĩ̀ (5+1)	gú-tswà-ɲĩ (5+1)	**5+1**
7	hɨ́-ḿ-bā (5+2)	tⁿâ-ba (5+2)	gú-tua-bà (5+2)	gú-twà-bà (5+2)	**5+2**
8	hɨ́-ń-tá (5+3)	tⁿã̂-tʃa (5+3)	gú-tò-tá (5+3)	gú-to-tá (5+3)	**5+3**
9	hɨ́-ǹ-nà (5+4)	tⁿâ-ɲi (5+4)	gú-tua-ni (5+4)	gú-twã̂-ni (5+4)	**5+4**
10	èè-wɔ́	ŋʷã̀-wò	gú-wo	gú-wo	**wo**
20	òò-hū,*tʃɛ́	wo-ʃì	e-ʃĩ̀	e-ʃi	**ʃi, hu?**
100	ɛ̄-tʃɛ́-hí (20*5)	40*2+20	ʃìt-ũ (20*5)	ʃit-sũ (20*5)	**20*5**
1000	400*5???	100*10		kpá-tsũ (200*5)	?

The Nupoid group is relatively small and homogeneous and poses no problem for reconstruction.

4.1.3 Isolated BC languages

4.1.3.1 Ikaan

The following description of the Ikaan numeral system (Table 4.50) is based on the analysis of data from a number of its dialects.

Table 4.50: Proto-Ikaan numeral system (*)

1	ʃí	7	h-ránèʃì (’6+1’)
2	wà	8	nà:náʲ (4 redupl.)
3	tā:s/h-rāhr	9	h-ráòʃì (X-1)
4	nāʲ/nā/náhi̱	10	ò-pú/fú
5	tò:n/h-rɔ̀:n/sɔ̰̀n/cɔ̰̀nv̰	20	ù-gbɔ́rɔ́ (<‘sack’), * à-gbá
6	h-ɾàdá/sàdá/sàrá	100	à-gbá à-h-ruǹ(20*5)

4.1.3.2 Akpes

Table 4.51: Akpes numerals

1	í-gbōn, ē-kìnì	7	ī-tʃēnētʃ(ì)
2	ī-dīan(ì)	8	ā-nāānīŋ(ì) (4 redupl.)
3	ī-sās(ì)	9	ɔ̀-kpōlɔ̀ʃ(ì)
4	ī-nīŋ(ì)	10	ī-yōf(ì), *t-ēfī
5	ī-ʃōn(ì)	20	ɔ̄-gbɔ̄(lɔ̄)
6	ī-tʃānās(ì)	100	ī-gbɔ́ ʃōnì (20*5)

The original BC forms for ‘five’ (**tan*) and ‘one’ may have been preserved in the term for ‘six’. These forms will be treated below as hypothetical.

4.1.3.3 Oko

Table 4.52: Oko numerals

1	ɔ̀-ɔ́rɛ, ɔ̀-jɛ́rɛ	7	ú-fɔ́mbɔ̀rɛ̀ (5+2)
2	è-bɔ̀rɛ̀	8	ɔ̀nɔ́kɔ́nɔkɔ́nɔ(4 redupl.?)
3	è-ta	9	ù-bɔ́ɔ̀rɛ̀(10–1)
4	è-na	10	è-fɔ
5	ù-pi	20	ɔ́-gbɔlɔ
6	ɔ̀-pɔ́nɔ̀ɔ́rɛ (5+1)	100	í-pì

4.1.3.4 Lufu

Table 4.53: Lufu numerals

1	ù-tí	7	5+2
2	(ba)-máhà	8	5+3
3	bá-tá	9	5+4
4	ba-ɲì	10	ú-wó
5	bá-tsó	20	e-ce
6	5+1	100, 1000	?

4.1.4 Proto-Benue-Congo

4.1.4.1 'One'

The reconstruction of the term for '1' is objectively the most challenging (the term is especially difficult to reconstruct in languages with noun classes and complex systems of determinatives). This situation is even more complicated in the Benue-Congo languages, since more than one reconstruction of the term has been suggested. The existing hypotheses must be studied here, especially because the ones pertaining to the etymology of the term were proposed by Kay Williamson, the leading specialist in NC comparative studies. Moreover, Kay Williamson (1989) used her reconstruction of the term for 'one' as an argument in favor of triconsonantal structure of Niger-Congo roots. This hypothesis has been actively developed by Roger Blench (2012 etc.).

It should be noted that our evidence does not support Kay Williamson's reconstruction. Furthermore, her hypothesis regarding the triconsonantal nature of Niger-Congo roots is, in my opinion, untenable. The Bantoid data utilized by Williamson was discussed above. Now let us review the evidence she uses in support of her hypotheses. Originally she treated the root *#-kani* '1' as one of the basic BC roots ('old root', Williamson 1989: 255). Later she changed her approach (on the basis of a wider NC context, namely on the data from the ljo languages) suggesting a derivation of BC froms from a triconsonantal root ***- 'kə̲'gə̲nı̲* '1', for which she assumed a different set of reflexes (Williamson 1992: 396). The changes introduced by Williamson in this article are significant. She adds the reflexes of the reconstructed root in Akpes and Nupoid, includes its additional reflexes in Esimbi and Bekwarra (Bantoid), adjusts its reflexes in Cross and Platoid (e.g. by reinterpreting PUC previously analysed as an isolated form as a reflex of the root in question), and, finally, omits Kanji and Jukunoid reflexes.

In further interpretation of the BC numeral systems we will use a template chart representing the fourteen branches of BC (Table 4.54). It should be noted that Bantu (as the largest sub-branch of the BC family with the most detailed reconstruction) is treated separately. This means that the Bantoid field will only include non-Bantu forms. The chart below reproduces the data published by Kay Williamson (middle sections) as well as the relevant forms obtained as a result of our step-by-step reconstruction (the rightmost section).

It should be noted that the difference in the results achieved by means of our step-by-step reconstruction (see above) and those of Williamson is significant. According to our evidence, the postulation of the root ***- 'kə̲'gə̲nı̲* '1' for Western Benue-Congo is unsustainable. The existence of this root in Bantoid is also questionable. In her earlier publication, Kay Williamson quoted its only Bantoid reflex (*a-kina* '1') supposedly attested in Northern Bantoid Tiba (Williamson 1989: 255). However, the affiliation of Tiba with the Bantoid languages is debatable (a connection with the Adamawa languages is suggested in Boyd 1999). In the article that followed, Williamson quoted another Bantoid form, this time the one attested in Southern Bantoid Esimbi (*keni* '1'). As noted above, this form was probably misinterpreted, becaused it includes the root *-ni/-nā*. At the same time, as I tried to demonstrate above, a number of related forms may be attested in the Mambiloid languages (Northern Bantoid): Twendi (Cambap) *tʃínī*, Mambila *tʃén*. Thus, we are possibly dealing with Proto-Eastern Bantoid **cin/kin*. In order to decide whether this form is an innovation or a reflex of an inherent Niger-Congo root (as Kay Williamson says) we need to place it into a wider linguistic context. This issue will be addressed later. At this point we will deal with another root for 'one' postulated by Williamson. According to her, the root is a Benue-Congo innovation.

Table 4.54: BC *kin/cin '1' and alternative reconstructions

	Benue-Congo	
Nupoid	Oko	Kainji
Defoid	Akpes	Platoid
Edoid	Ikaan	Cross
Igboid	Lufu	Jukunoid
Idomoid	Bantu	Bantoid
	Williamson 1989: *#-kani* '1'	
Yoruba ɔ̀-kɔ̃		Basa kə Pyem kēŋ Bete-Bendi ì-kən, Bokyi kɨ̀n, PLC *-kèèn Jukun kā
Eloyi kònzé		Tiba a-kina
	Williamson 1992: Proto-Atlantic-Congo ***-*'kə̱'gəni̱*'1'	
Gbagyi gmànyi Yoruba ɔ̀-kɔ̃	Ikeram ɛ-ki	 PP2-J -gini, PP4 -ɣan PUC gá-ni? , PLC -kèèn
Eloyi kònzé		Tiba a-kina, Esimbi keni, Bendi: Bekwarra o-kin
	****kin-/cin-* forms for '1' (step-by-step data)	
	ē-kìnì, *si ʃí	tsin, hin (y)in, kyeŋ, gyin kin/cin ʃíʃe?
		cin (Mambiloid)

Different colors are used in the charts to distinguish between the Eastern and the Western BC languages. A special marking is used for the Bantu languages due to their overall importance for the reconstruction. The abbreviations in the middle sections follow Williamson op. cit. with PLC-Proto-Lower Cross, PUC – Proto-Upper Cross, PP – Proto-Platoid.

Since the root *nə̄ / ni* is distinguishable in Esimbi, it seems logical to treat it together with another set of terms for 'one' (*#-diiŋ*). This data (termed BC innovation by Williamson) compared to the results of our step-by-step reconstruction is quoted in the table below (Table 4.55).

Table 4.55: BC *ni '1' and alternative reconstructions

	Benue-Congo	
Nupoid	Oko	Kainji
Defoid	Akpes	Platoid
Edoid	Ikaan	Cross
Igboid	Lufu	Jukunoid
Idomoid	Bantu	Bantoid
	Williamson 1989: BC innovations: ***#-diiŋ***	
Gwari ǹ-ɲī	Oko ɔ̀ɔ́rɛ	Gurmana nɪ
PY *i-nɛ̃́		PP2K *-niiŋ
		OG è-nɛ̃, CD #-niin
Ikwere ń-ním		PJ *-yiŋ
PId *-nyí		Lamja nūné, Ekoid #-jid, -jiŋ
	***ni** forms for '1' (step-by-step data)	
*ni/nyi		Bunu ù-ŋ̀ŋínì
*ɲé		nìŋ, (y)in, di(n)
		*ni(n)
ŋ̀inɛ́?		*-jin?
nze/je/nye/ye		Esimbi -nə/-ni

Let us review the distribution of this root within the Benue-Congo branches.

are there only two branches?

Western Benue-Congo. This root can be reliably reconstructed in Nupoid and Defoid, but not in Edoid. In Igboid it might be attested in Ikpeye: *ŋì-né (ŋ-ìné*?). The root is possibly found in some of the Idomoid languages as well: Etulo, Agatu *ó-yè*, Idoma *é-yè*, Alago *ó-je*, Eloyi (dial.) *ò-nzé*, *ńgwò-nzé*.

Eastern Benue-Congo. Several Kainji forms deserve closer attention. The Gurmana form quoted by Williamson is unfamiliar to me. It may be related to the Bunu form, but the root itself is uncommon for Kainji and thus cannot be reconstructed. Moreover, the root is only marginally attested in the Platoid languages (single occurrences include Eskwa *è-nyí* '1' and possibly Ikulu *í-ń-jí* '1', and *kɔ̀p-ìrì-zɪ̄ŋ* '11'). Another rare form is *di*(*n*) with an initial oral consonant (e.g. Ayu *ɪ-dɪ* '1', Eggon *ò-rí* '1' and its palatalized variant *tʃíŋ* – cf. *ɔ̀-kbɔ́ à-tʃíŋ* '11', *ə̀-kβɔ́há là-tʃíŋ* '21'). These (etymologically unrelated?) forms, however, should not be reconstructed for Proto-Platoid, because the root *kin* (see above) is clearly

distinguishable in the majority of the Platoid branches. At the same time, the Platoid data discredits the reconstruction of the root as **kin/cin*. Multiple arguments can be adduced in favor of the interpretation of the initial velar as a reflex of an archaic noun class prefix, which would yield a Proto-Platoid form **k-in*. This invites the possibility of an etymological connection between the Benue-Congo roots studied above, namely **-in* and **-ni*. The analysis of the Platoid compound numerals points toward the same conclusion. A number of noteworthy forms can be quoted in support of this, cf. Hyam *ʒìnì* '1' but *twaa-ni* '6' ('5+1', *twoo* '5'), Mada *tānn-èn* '6' ('5+1', *tun* '5'), Ninzo *tānì* '6' ('5+1', *ʈʷí* '5'), Rukuba *tàiŋ* '6' ('5+1', *-túŋ* '5'). These Platoid forms bring to mind the case of the Jukonoid term for 'six'. Kay Williamson quotes a Proto-Jukunoid root **-yiŋ*. The reasons behind this reconstruction are not immediately apparent, since in the majority of the languages other forms are reserved for this meaning. Her reconstruction may be based on the compound terms for 'six' that follow the pattern '5+1' (or rather '5+X', with X ≠ 1), cf. e.g. Jibu *sùn-jin* '6' (*swana* '5', *zyun* '1'), *cìn-jen/ʃì-ʒen* (*tswana* '5', *dzun* '1'). As noted above, the root in question is not reconstructable for the Platoid languages. The reconstruction of **ni(n)* is assured only for the Eastern Benue-Congo branch (Cross), where it is systematically attested in at least three branches out of five, cf. Proto-Upper Cross (**ni*), Central-Cross (*nin*), and Ogoni (*nɛ*). Since **ni* can be safely reconstructed for Nupoid, Defoid and Cross, its further comparison to the pertinent roots attested in the languages that belong to other NC branches is required.

In conclusion, it should be noted that regardless of whether a conservative or a more speculative reconstruction (i.e. **kin* and **ni* vs. **k-in/ ni*) is preferred, the resulting root (or roots) is not tri- or disyllabic but rather monosyllabic.

In addition to this, several isolated roots for 'one' are attested in Benue-Congo. Undoubtedly, they represent local innovations. At first glance, this is applicable to the most common Bantoid roots for 'one', including the Bantu forms *mòì/mòdì mòtí*. This, however, may not be entirely correct for reasons that will be discussed in the next chapter. Another noteworthy root that may be tentatively described as **jir* is attested in both Oko and Platoid.

The table is subject to further interpretation. We will return to it later after the evidence from the other Niger-Congo branches has been collected. A few remarks are in order here:

1. Both Akpes terms for 'one' (*ē-kìnì, í-gbōn*) find close parallels in the Cross languages (**kin/cin, *ni(n), *gboŋ/gwan*). The Icheve form *à-mɔ́ɔ̀* is probably borrowed from one of the Bantu languages;

2. The Kainji term finds parallels in the Platoid languages (Ayu, Eten, Tarok, Eggon) and may be etymologically related to the Bantu and Nupoid terms (the morphological structure of the Proto-Bantu form is, however, unclear: **mòdì? *m-òdì? *mò-dì?*);

3. The Oko form is reminiscent of another Platoid form that is tentatively reconstructed as **jir*. The Akpes root *gbōn* '1' finds parallels in the Cross (*gboŋ*) and possibly Edoid languages (*gwo/ wo/ wu*).

4.1.4.2 'Two'

Table 4.56: BC stems for '2'

		'2'	'2'	'2'
East	Bantu			bà-dí/bì-dí
East	Bantoid (–Bantu)	pa/fe	ba	
East	Cross	po/pa	bae	
East	Jukunoid	pa(n)/fa(n)		
East	Kainji	-pu?	*ba/bi	re
East	Platoid	pa/fa/ha	ba/wa	
West	Defoid			jì
West	Edoid		va/və	
West	Idomoid	pa		
West	Igboid		bɔ́	
West	Nupoid		ba	
West	Akpes			ī-dīan(ì)
West	Oko		è-bɔ̀rɛ̀	
West	Ikaan		wà	

The root **pa* (also found in the Idomoid languages) is reconstructable for Eastern Benue-Congo, but is not systematically attested in Bantu.

The Bantu form (as represented above) does not seem to be related to other Bantoid forms. However, it finds parallels in Defoid and possibly Akpes and Kainji. The most common BC form (**ba/bai*) may go back to **ba-i*, with **ba-* being a noun class prefix. In this case, the BC form may be reconstructed as **ba-di / ba-ji > bai > ba*, which would make the Bantu form the most archaic within Benue-Congo.

These hypotheses will be discussed below, after the evidence from the other BC branches has been reviewed.

4.1.4.3 'Three', 'four', 'five'

Table 4.57: BC stems for '3', '4' and '5'

		'3'	'4'	'5'	'5'
East	Bantu	tat	nài/(nàí)	táànò	
East	Bantoid (–Bantu)	tat	nai	tan	
East	Cross	ta(t)/ca(t)	na(n)	tan	*gbo(k)
East	Jukunoid	ta	nye	tsoŋ	
East	Kainji	tat	nas	tan	
East	Platoid	tat	nai/nas	tu(ku)n	
West	Defoid	tā	lɛ(n), ne, je	tu(n)/lú(n)	
West	Edoid	sa	ni	sien/su(w)on	
West	Idomoid	ta/la	nɛ̀, ndo, he	do/lo, ho, ro/rwo	
West	Igboid	tɔ́	nɔ́	sé	
West	Nupoid	ta	na/ni	tun/tnu/ tsun, hi?	hi?
West	Akpes	ī-sās(ì)	ī-nīŋ(ì)	ī-ʃōn(ì), *tan	
West	Oko	è-ta	è-na		ù-pi
West	Ikaan	tāːs/h-rāhr	nāʲ/nā/náhḭ	tòːn/h-rɔ̀ːn/ sɔ̰̀n/cɔ̰̀nv̰	

This is the most stable group of numerical terms within BC. It comprises the roots **tat* '3', **nai* '4', and **tan/ ton* '5' that are very well-known among the specialists in NC studies. Issues pertaining to the phonetic realization of their reflexes will be treated in the next chapter.

4.1.4.4 'Six'

Table 4.58: BC stems and patterns for '6'

East	Bantu	3 redupl.				
East	Bantoid (–Bantu)	<3 redupl.?				
East	Cross	3+3	5+1	diʔ		
East	Jukunoid		5+1			
East	Kainji	<3?			ci(hi)n	tel
East	Platoid	3PL	5+1			
West	Defoid					fà
West	Edoid	3PL, 3+3				
West	Idomoid			riwi/rowo	ji	hili
West	Igboid				ʃ̃ĩ	
West	Nupoid		5+1			
West	Akpes		5+1?			
West	Oko		5+1			
West	Ikaan					h-ɾàdá/ sàdá/ sàrá

As the table shows, there was probably no primary Proto-Benue-Congo root for 'six'. Two alternative patterns are traceable, namely '3PL' ('3 redupl.', '3+3') and '5+1'. Other forms are marginal. The phonetic resemblance of the Kainji and Igboid forms is noteworthy.

4.1.4.5 'Seven'

Table 4.59: BC stems and patterns for '7'

East	Bantu	càmbà (<**c/saN+2?)			
East	Bantoid (–Bantu)	samba (5+2?)			
East	Cross	5+2			
East	Jukunoid	5+2			
East	Kainji	5+2			
East	Platoid	5+2			4+3
West	Defoid		byē		
West	Edoid		ghie?		
West	Idomoid	5+2		renyi	
West	Igboid				saà
West	Nupoid	5+2			
West	Akpes				ī-tʃēnētʃ(ì)
West	Oko	ú-fɔ́mbɔ̀rɛ̀ (5+2)			
West	Ikaan			h-ránèʃì ('6+1)	

A primary root for 'seven' is also indistinguishable. The form **camba/samba* may have lost any phonetic resemblance to its Benue-Congo prototype *7=5+2 in Proto-Bantoid. The Defoid and Edoid forms are phonetically comparable (a shared innovation?).

4.1.4.6 'Eight'

Table 4.60: BC stems and patterns for '8'

East	Bantu	nai-nai (<4 redupl.)			
East	Bantoid (–Bantu)	na-nai (<4 redupl.)			
East	Cross	4+4			
East	Jukunoid	4 redupl.	5+3		
East	Kainji		5+3	ro/ru	kunle(v)/kunlo
East	Platoid	4 redupl.	5+3		
West	Defoid			jo/ro	
West	Edoid	4 redupl.			
West	Idomoid		5+3		
West	Igboid		5+3		
West	Nupoid		5+3		
West	Akpes	ā-nāānīŋ(ì) (4 redupl.)			
West	Oko	ɔ̀-nɔ́kɔ́-nɔkɔ́nɔ (4 redupl.?)			
West	Ikaan	nà:ná^{j} (4 redupl.)			

In this case, the pattern **nai* '4' >**na(i)-nai* '8' fits the reconstruction better than its alternative. The similarity between Kainji and Defoid is peculiar and may be due to innovations.

4.1.4.7 'Nine'

Table 4.61: BC stems and patterns for '9'

East	Bantu			bùá		
East	Bantoid (–Bantu)			bukV		
East	Cross	5+4	10–1			
East	Jukunoid	5+4				
East	Kainji	5+4	10–1			jiro
East	Platoid	5+4	10–1			12–3, tu(ku)n
West	Defoid				sá(n)	dà
West	Edoid				cien/sin	
West	Idomoid	5+4				
West	Igboid					totu/tolu
West	Nupoid	5+4				
West	Akpes					ɔ̀-kpɔ̄lɔ̀ʃ(ì)
West	Oko		ù-bɔ́ɔ̀rɛ̀ (10–1)			
West	Ikaan		h-ráòʃì (X-1)			

The rightmost column of the table includes many isolated forms (among them some primary ones). The term **buka*, which may appear as an important BC innovation, is reconstructed for Proto-Bantoid. In addition, the pattern '9=5+4' is distinguishable in Proto-Benue-Congo. Like for '8', Defoid and Edoid forms closely resemble each other.

4.1.4.8 'Ten'

Table 4.62: BC stems for '10'

East	Bantu		kǒmì/ kámá				
East	Bantoid (–Bantu)	fu	kum/ kam				
East	Cross	fo?		kpo/ kop	ʔo?	job	
East	Jukunoid			wo?	kur?	jwe	
East	Kainji	pwa		kup/ kpa	kur?		turu
East	Platoid			kop	gur/ wur		
West	Defoid				gwá		
West	Edoid			kpe	gbe		
West	Idomoid	(fu '20')			gwo/ wo	jwo	
West	Igboid						dì/ri/ li
West	Nupoid	(hu '20)			wo		
West	Akpes					ī-yōf(ì), *t-ēfī	
West	Oko	è-fɔ					
West	Ikaan	ò-pú/fú					

This is a heterogeneous group of forms. The root **pu/fu* attested in both Eastern and Western BC is the most likely candidate for BC reconstruction. However, it is missing from Bantoid, for which the term **kum/kam* is reconstructable. The latter form must be a Bantoid innovation. However, assuming that the second consonant may have undergone nasalization in Proto-Bantoid, this form is comparabale to a number of other roots, suggesting that **kup/ kop* should be reconstructed for Eastern Benue-Congo. As the table shows, other roots should not be neglected either. They will be treated in combination with the evidence from other NC branches.

4.1.4.9 'Twenty'

Table 4.63: BC stems and patterns for '20'

East	Bantu	10*2					
East	Bantoid (–Bantu)	10*2					
East	Cross		*ti/ci?			dip?	
East	Jukunoid					'body' (di)	
East	Kainji	10*2	ʃín/ʃík				
East	Platoid						12+8
West	Defoid			gwú(n), gbolo			
West	Edoid			gie/jie, gboro			
West	Idomoid				fu/hu, su?		
West	Igboid			ɡwɔ́̃/ɣʰɔ̄, kpɔrɔ			
West	Nupoid		ʃi		hu?		
West	Akpes			ɔ̄-gbɔ̄(lɔ̄)			
West	Oko			ɔ́-gbɔlɔ			
West	Ikaan			ù-gbɔ́rɔ́ (<'sack'), *à-gbá			

It is highly unlikely that the Proto-BC term followed the pattern reconstructed for Proto-Bantoid (*'20=10*2'). In all likelihood there was no root for 'twenty' in Proto-BC at all. It should be noted that numerous branches of Western BC use the root (*g*)*bolo* (possibly related to the lexical root with the meaning 'sack') to make 'twenty'. A shorter root (**gba/ gwe*) is reconstructable in the same Western BC branches as well. Its source is likely lexical: it is well-known that the term for 'twenty' in the NC languages often goes back to lexemes with the meaning 'man', 'leader', and 'body' (cf. Jukonoid). The resemblance between the reconstructed Idomoid and Nupoid forms is noteworthy. However, these forms might be etymologically related to the term for 'ten'.

4.1.4.10 'Hundred' and 'thousand'

Table 4.64: BC stems and patterns for '100' and '1000'

		'100'	'100'	'100'	'1000'
East	Bantu		kámá	gànà, tʊa, jànda	nùnù, pɔ̀mbì, kɔ́tɔ̀
East	Bantoid (–Bantu)	20*5?	kam?	gbi? ki?	?
East	Cross	20*5			
East	Jukunoid	20*5			<Hausa
East	Kainji	?			
East	Platoid	?			
West	Defoid	20*5			
West	Edoid	20*5			du, ria/li
West	Idomoid	20*5, 10*10			
West	Igboid	20*5			puk(w)u
West	Nupoid	20*5			?
West	Akpes	ī-gbɔ́ ʃōnì (20*5)			
West	Oko			í-pì	
West	Ikaan	à-gbá à-h-ruǹ (20*5)			

If Proto-Benue-Congo did not have the term for 'twenty', it probably did not have the term for 'hundred' either, because the only pattern it could follow is *'100=20*5'. In this respect the Proto-Bantoid innovation (**kam*) is noteworthy. It resembles another Proto-Bantoid innovation, namely the term for 'ten' (**kum*/*kam*), which is hardly a coincidence. The possibility that in the cases of 'ten' and 'hundred' we are dealing with alignment by analogy cannot be excluded. This could explain the irregular nasalization of the root for 'ten', cf. Proto-Bantoid **kup* '10' → *kum* by analogy with **kam* '100'. The term for 'thousand' was certainly nonexistent in BC.

4.1.4.11 Summary

Taking this into account, the segmental reconstruction of the Proto-BC numeral system may be suggested (Table 4.65).

Table 4.65: Proto-Benue-Congo numeral system (*)

1	ni, kin/cin (<k-in?), gbon, (o-)di(n)?, (o-)ti?	7	5+2
2	ba-di/ba-ji, pa? ba(i)?	8	4 redupl.
3	tat	9	5+4
4	nai	10	pu/fu, kup/kop, gwo/jwo
5	tan/ton	20	absent? gwa/gwe? <'person'?
6	3PL/3 redupl./3+3, 5+1	100	absent? 20*5

This table gives an overview of the BC evidence that will be used for further comparison with other NC branches.

4.2 Kwa

More than eighty Kwa sources were used for the reconstruction. They are representative of the major groups and sub-groups of this family, which consists of about seventy languages. A plausible internal classification of the Kwa languages does not exist. A step-by-step reconstruction of numerals may well be viewed as another important step in this direction. Our preliminary survey of the pertinent evidence is based on the traditional classification that distinguishes five major Kwa branches. We will start with the study of the numerical terms by branch. Then, individual reconstructions will be evaluated with regard to their potential for the general reconstruction of the Proto-Kwa numeral system.

4.2.1 Ga-Dangme

These two languages exhibit isolated forms of the term for 'one'. Both terms will be preserved for further comparison (note that the first syllable of the Dangme term probably represents a noun class prefix). The term for 'eight' is undoubtedly constructed as '6+2'. The term for 'six' is primary, hence the term for 'seven' must be formed of '6+1'. This would suggest the existence of an additional term for 'one' (*-*gō*/-*wo*). Two separate forms are attested for 'hundred'. Apart from that, the Dangme and Ga numeral systems are quite homogeneous.

The Adampe system is in many respects different, so there may be doubts as to whether it indeed belongs together with Dangme. The Adampe evidence will be treated later in this chapter.

Table 4.66: Ga-Dangme numerals

	Dangme	Ga	Dangme	Ga
1	kákē	é-kòmé	7 kpà-à-gō (6+1)?	kpà-wo (6+1?)
2	é-ɲɔ̃̀	é-ɲɔ̀	8 kpà-a-ɲɔ̃̄ (6+2)	kpà-a-ɲɔ̃ (6+2?)
3	é-tɛ̃̄	é-tɛ̃	9 nɛ̃̀ɛ̃́	nɛ̀ɛhṹ
4	é-ywɛ̀/é-wìɛ̀	é-ɟwɛ̀	10 ɲɔ̃̀ŋmā́ (PL: ɲĩ̀ŋmī́)	ɲɔ̀ŋmá
5	é-nṹɔ̃̄	é-nùmɔ̃	20 ɲĩ̀ŋmī́ éɲɔ̀ (10*2)	ɲɔ̀ŋmá -í éɲɔ̀ (10*2)
6	é-kpà	é-k͡pàa	100 làfá	ò-há, pl. -ì
			1000 à-kpé	à-kpé, pl.-ì

4.2.2 Gbe

The reconstruction of the Proto-Gbe numeral system is straightforward, since alternative forms are few (Table 4.67). It is based on the available evidence from twelve of the Gbe dialects.

Table 4.67: Proto-Gbe numerals and patterns (*)

1	è-ɖe/ɖe-kpo	7	‘hand’+2, 5+2
2	è-ve/e-wè	8	e-ɲí, ‘hand’+3
3	è-tɔ̃̀	9	8+1, 5+4
4	è-nɛ̀	10	e-wó, *bula
5	à-tɔ́ɔ̃	20	10*2, ko
6	à-dɛ́/zɛ́	40	e-kà
100	40*2+20	1000	à-kpé, kotokũ

The Gbe term for ‘six’ is primary. Its form, however, differs significantly from the (also primary) one attested in the languages of the Ga-Dangme group.

The term for ‘eight’ seems to be derived from ‘four’, whereas the term for ‘nine’ follows the pattern ‘8+1’.

The forms for ‘twenty’ follow the pattern ’X*2’ in Aja (*bulaa-ve*), Waci-Gbe (*blá-ve*) and Ewe (*blá-vè*), which suggests an alternative form for ‘ten’ (**bula*).

The etymological relationship between the term for 'fifteen' and a lexical root with the meaning 'foot' attested in two of the dialects is an apparent innovation: Maxi-Gbe *à-fɔ̀-tɔ́* ('foot', '3') and Kotafon-Gbe *fɔ́-tɔ̀* ('foot','3'). This pattern is attested in a number of the NC languages (including Atlantic).

A primary term for 'forty' is distinguishable (hence '50=40+10', '60=40+20', '70=40+30', '80=40*2', '90=40*2+10').

4.2.3 Ka-Togo

Ka-Togo is a quite diverse group of the Left Bank languages. The reconstructions for each of its three branches are provided in the table below (Table 4.68). Its rightmost column lists forms and patterns that are the most likely candidates for the Proto-Ka-Togo reconstruction.

Table 4.68: Proto-Ka-Togo numeral system (**)

	*Avatime-Nyangbo	*Kebu-Animere	*Ikposo-Ahlo-Bowili	****Proto-Ka-Togo**
1	o-le	ʈé-ì, bɛ-ɪi	è-dɪ/è-dɪ-gbo	**di**
2	ɛ-bha	din/ji	è-va/è-fwa	**bha, din**
3	ɛ-ta	tha	è-ta/è-la	**ta**
4	ɛ-né	nie	è-na	**na/nɛ**
5	ɛ-tí, ɛ-cu	thu(ŋ)	è-tɔ	**tu(N)**
6	golo/holo	kɔ̀rɛ̀ŋ	è-gɔlu/è-wɔlu	**golo/ koro**
7	6+1	10−3	6+1, kɔ̀nɔ̀, ù-zòni	**6+1**
8	10−2? a-nsɛ	4*2	è-lɛ?,<4	**4*2, nsɛ/lɛ?**
9	10−1? zi+3?	5+4?	8+1, 10−1?	**8+1? 10−1**
10	kɛ-fɔ	the	wa/wu, i-jo, *bula	**fo/wo, te, bula**
20	10*2	10*2?	bula-2, lye-2, ŋué-2, téɛ́yá?	**10*2**
100	a-lafa (< Ewe)	tùùrù, sala	gbɔwa	**lafa?**
1000	a-kpe (< Ewe?)	lààfā	a-kpe	**a-kpe**

It needs to be stressed that the forms marked with /**/ are only suggestive and should not be taken at face value. They are not reconstructions in the strict sense and only serve for comparative purposes, so the absence of a tonal marker in a reconstructed form should not be considered meaningful. It only shows that at this point the available evidence does not allow reconstructing a tone in the pertinent case.

4.2.4 Na-Togo

An overview of numerical terms as attested in the branches of Na-Togo and some isolated languages is provided below (Table 4.69). A tentative reconstruction of the Na-Togo numeral system can be found in the rightmost column.

Table 4.69: Proto-Na-Togo numeral system (**)

	Adele	Anii	*Lelemi	*Likpe-Santrokofi	Logba	**Proto-Na-Togo
1	è-kí	dɪ̃ŋ, *mi	ù-nwi/ɔ-wɛ̃	nɔ̀ɛ́/nwîì (lɛ̀wɛ́)	i-kpɛ	**i-wɛ/kpɛ?** , **di(N)?**
2	è-nyɔ̀ɔn	ī-ɲīō	í-ɲɔ́	ɲɔ́/núə̀	i-nyɔ	**i-nyɔ**
3	à-sì	ī-rīū	è-tɛ	tiɛ́	i-ta	**i-ta**
4	è-nàà	ī-nāŋ	í-na	na	i-na	**i-na**
5	tòn	ī-nōŋ	è-lɔ	nɔ́	i-nú	**i-no(N)**
6	kòòròn	ī-kōlōŋ	è-ku	kua	i-gló	**golo/kolo**, **ku**
7	6 + 1	kūlūmī (6+1?)	4+3?	6+1?	6+1	**6+1**
8	nìyè	4PL	4PL?	4PL?	4PL	**4PL**
9	yè-1	tʃīīnī	10−1	nase	X-1	**10−1**
10	fò	tɘ̄b	vu/we	fo/wo?	u-ɖú	**fo**, **ɗu**, **təb**
20			10*2	10*2		**10*2**, **ɔ-ɖɔ(n)**, **ā-kōō**, **dìkpìlìn**
50	20*2+10	20-PL+10	ti	10*5	10*5	**20*2+10**
100	20*5	20*5, gā-sɘ̄wā	50*2, lafa	kò-lòfá	u-ga	**20*5**, **lofa**, **u-ga**
1000	200*5	ū-fɘ̄lɘ̄, kōtōkū	pim, ka-kpi	kɔ̀-kpí	a-kpi	**a-kpi**, **pim?**

The Lelemi term for ‘fifty’ (*lì-tì*) is peculiar because it is a likely source of ‘hundred’: *è-tì á-ɲɔ́* (‘50*2’).

4.2.5 Nyo

The Nyo group, which is comprised of dozens of languages, is the most representative within the family. For this reason (even though the Nyo numeral systems are closely related to each other) they will be studied separately (by sub-group) and then compared to each other.

4.2.5.1 Agneby (Abbey, Abiji, Adioukru)

Alternative sources representative of these three languages are quoted below (Table 4.70). Significant variation of forms is sporadically attested.

Table 4.70: Proto-Agneby numeral system (*)

	Abbey1	Abbey2	Abiji1	Abiji2	Adioukru1	Adioukru2	***Proto-Agneby**
1	ŋ̀kpɔ̄	ŋ̀kpɔ̄	ń ˈnɔ́	ń̩nɔ̀	ɲâm	ɲâm	**N-kpɔ, ɲ-âm, *a-ri**
2	āɲɔ̰́	āɲɔ́	áá ˈnɔ́	áānɔ̄	yóɲ	ɲóɲ	**a-ɲʊ̰/nɔ̄**
3	ārí	ārí	ɛ̋ɛ̋ ˈtɪ̋	ɛ̋ɛ̄tī	ɲâhǹ	ɲâhǹ	**a-ti(N)/ ri**
4	ālɛ́	àlɛ́	a̋a̋ ˈlā	áā̄lā	yâr	jâr	**a-nḭ́/la, jar**
5	ōnḭ́	ōní	ɛ̋ɛ̋ ˈnɛ̋	éēnē	yên	jên	**o-ne,lɔ̀hɔ̰̀, jên**
6	lɔ̀hɔ̰̀	lɔ̀hɔ̀	náhɔ̀ə̀	náhɔ̀ə̀	nɔ̂hǹ	nɔ̂hǹ	**hu(n)**
7	lɔ̀hɔ̰̀-árī	lɔ̀hm̃ã̄rí	nɔ̰́bɔ̀	nɔ̃ᵐbɔ̀	lɔ́bŋ̀	lɔ́bŋ̀	**6+1, bu(n)**
8	èpyè	èpʲè	nówò	nówò	níwǹ	níwǹ	**è-pyè, wo(n)**
9	ɲâkó	ɲāàkó	nɛ̰̋ ˈbrɛ̋	nɛ̃ᵐbrɛ̀	líbárm̀	líbárm̀	**bare(-n)**
10	ènə̰̀	ǹnè	ńdíɔ̀	ń̩díɔ̀	lêw	lêw	**nɛ(n) (< 5ᴘʟ?), diw/ liw**
20	ēbrá-ɲɔ̰̀	òbrāŋɔ̀	àbrúáɪ̰	àbrʊ̃ã̃ɪ́	líkŋ̀	líkŋ̀	**<'hand' *2?,li-kŋ**
100	yā	jā	yǎ	jǎ	ékŋ̀-yén	ékŋ jên (20*5)	**ja, 20*5**
1000	àkpī	àkpī		àkpɪ̌		fándí (Engl.?)	**a-kpi**

The presence of the primary terms for 'seven', 'eight' and 'nine' is an important characteristic of this sub-group.

4.2.5.2 Attié

Internal reconstruction of the Attié numeral system yielded the following results (Table 4.71).

Table 4.71: Attié numeral system (*)

1	kə(n)	7	nson
2	mwə(n)	8	ma-4? 2 de 10?
3	ha(n)	9	ŋgwan
4	dʒí(n) < *kɥe?	10	kɛŋ
5	bə(n)	20	'hand' (bwa?)*2?
6	mu(n)	100	ja
		1000	a-kpi

4.2.5.3 Awikam-Alladian

No numerical terms (except for 'one' and 'nine') are reconstructable on the sub-group level. This raises doubts as to whether these languages should indeed be grouped together. A representation of the pertinent forms is presented in the table below (Table 4.72) and may serve as a starting point for further discussion.

Table 4.72: Avikam-Alladian numerals

	Awikam	Alladian	**Awikam-Alladian**		Awikam	Alladian	**Awikam-Alladian**
1	ɛ́tɔ́	ɛ̄tɔ̰̄	**ɛ-to**	7	ɛ́byɔ́	ɛ̄bwɛ̰̀	**ɛ́-byɔ́, ɛ̄-bwɛ̰̀**
2	áɲɔ́	ā̰yrɛ̀	**á-ɲɔ, ā̰-yrɛ**	8	ètyɛ́	ēɥrì	**è-tyɛ́, ē-ɥrì**
3	á̰zá̰	ā̰ɔ̰̀	**á̰-zá̰, ā̰-ɔ̰̀**	9	ɛ́mrɔ́	ɛ̄mwrɔ̀	**ɛ́-mrɔ́**
4	ànā̰	ā̰zɔ̀	**à-nā̰, ā̰-zɔ̀**	10	èjú	ɛ̄và	**è-jú, ɛ̄-và**
5	àɲú	ɛ̄nrì	**à-ɲú, ɛ̄-nrì**	20	èvɛ́	ɛ̄ɥá, *ɛ̄kòɥì	**è-vɛ́, ɛ̄-ɥá**
6	áwá	ɛ̄wrè	**á-wá, ɛ̄-wrè**	100	àkpá ˈ-ɲú	20*5	**20*5, àkpá ˈ-ɲú**

4.2.5.4 Potou-Tano

4.2.5.4.1 Potou

The following forms are distinguishable in the Potou sub-group (Table 4.73).

Table 4.73: Potou numerals

	Ebrie	Mbato	*Potou		Ebrie	Mbato	*Potou
1	bɛ̰/brɛ̀	lóɓō	**bɛ̰/brɛ̀, ló-ɓō; ce/se**	7	ák^{h}wác^{h}è	óɓīsɛ́	**6+1**
2	mɔ̰	ǫ́nǫ́	**nǫ́**	8	áɓyá	ógɓī	**ɓyá/ gɓī**
3	ɓwàɗyá	nɛ́jē/nǫ́jē	**ɗyá/je**	9	áɓrɔ̀	ótrū	**ɓrɔ, trū**
4	ɓwèɗí	nɛ́ní/nǫ́ní	**ɗi/ni**	10	áwɔ́	ówā	**wɔ**
5	mwa̰ná	nɛ́nā	**na**	20	áp^{h}ɛ̰	ópɛ̄	**pɛ**
6	ák^{h}wá	ókoā	**kwa**	100	àyà	yǎ	**ya**

4.2.5.4.2 Tano

The Tano branch consists of nearly thirty languages. It seems reasonable to treat them by sub-groups.

Western Tano

Table 4.74: Western Tano numerals

	Abure1	Abure2	Eotile	**Western Tano**
1	okuè	ókúè	ìkʊ̀	**o-kue**
2	aɲù	áɲû	àɲɔ́	**a-ɲu(n)**
3	nŋà	ŋ́ŋâ	àhá	**n-ha(n)**
4	nnàn	ńnâ	a̰nɛ̀	**n-na(n)**
5	nnú	ǹnú	ànù	**n-nu(n)**
6	ncɪè	ɲcíè	àhíɛ̰	**n-cíè/híè**
7	ncùn	ɲcʊ̰̂	àfà	**n-cùn, à-fà**
8	mɔ̀kùɛ́	mɔ̀kúè	ànɛ̀mrɔ̰	**mɔ̀-kùɛ́, à-nɛ̀mrɔ̰**
9	puáléhùn	pʊ̀àlɛ̰̀hʊ̰̂	brúkú	**puáléhùn, brúkú**
10	óblún	òbùlú	èdí	**ò-bùlú, è-dí**
20	ɛ́fín	ɛ́fḭ	èfè	**ɛ́-fɪ(n)**
100	èvá okuè	èyǎ kűè	átá	**è-vá/è-yǎ, átá**
1000	akpí okuè			**a-kpi**

Central Tano **Akanic (Table 4.75):**

Table 4.75: Akanic numerals

	Akan1 (Twi dial.)	Akan2	Abron1	Abron2	*Akanic
1	baakó~	baakő	bakũ	bìàkʊ̰̀ʔ	**ba-kó(n)**
2	əbìé-ń	mmie-nú	mie-nu	mi̯ènú̯ʔ	**mie-nú**
3	əbìè-sá~	mmeɛ-nsā́	mie-nsá	mi̯ɛ̀nzā̯ʔ	**mie-nsá(n)**
4	à-náń	(ɛ)náń	nain	ńnā́i̯	**náín**
5	ə-núḿ	(e)núḿ	num	ǹnú̯m	**núḿ**
6	ə-sìá~	(e)nsĩā́	nsiã	ǹzi̯ā́	**sìá(n)**
7	ə-sɔ́ń	(ɛ)nsóń	nsɔ	ǹzʊ̰̋ʊ̰̋	**só(n)**
8	à-wòtɕyé/tw/	nwɔtwé	ŋɔʧwie	wɔ̀cyí	**twé/cué**
9	à-króń	(ɛ)nkróń	ŋkrɔŋ	ŋ̀gɔ́nɔ́	**n-króń**
10	dú	(e)dú	du	dúʔ	**dú**
20	ədùònú	aduonú	edu enu	àdù̯ònù̯	**10*2**
100	ɔ̀hà	ɔha	ɔha	hà	**ɔ-ha**
1000	àpíḿ	apéḿ	apim		**a-píḿ**

Bia The numeral systems in these languages (Agni, Baoule, Sefwi, Nzema, Ahanta, and Jwira-Pepesa) are virtually identical and can be described as follows (Table 4.76).

Table 4.76: Proto-Bia numeral system (*)

1	ko(n)	7	su(n)
2	nu, ɲɔ̀(n)	8	cʊɛ/twɛ
3	sa(n)	9	ŋgɔ̀lǎ, nkróń
4	na(n)	10	bulu
5	nu(n)/nu(m)	20	10*2
6	sia(n)	100	ya
		1000	akpi

Guang This sub-group has two branches, Southern and Northern Guang which consist of four and eleven languages, respectively). Despite, the Guang numeral systems do not differ significantly, hence quoting individual forms seems unreasonable. Our reconstructions for both branches, as well as the general Guang reconstruction, are given below (Table 4.77).

Table 4.77: Guang numerals

	*Northern Guang	*Southern Guang	**Guang
1	kɔ́	kɔ	**kɔ**
2	ɲɔ́	ɲɔ́	**ɲɔ́**
3	sá	sa(n)	**sa(n)**
4	ná	nɛ(n)/na	**na(n)**
5	nú(n)	nu/ni	**nu(n)**
6	síyé	siɛ(n)	**siɛ(n)**
7	súnɔ́	súnɔ̋	**súnɔ(n)**
8	bùrùwá, kwé	twi/cwi	**bùrùwá, kwé/cwi**
9	kpɔnɔ, sàngɔ́ɔ́ʔ	kpunɔ	**kpunɔ, sàngɔ́ɔ́ʔ**
10	dú	du	**du**
20	o-ko, 10*2	10*2	**10*2, koʔ**
100	lafa (< Akan?)	ɔ̀lɔ̀fɛ́/lafa	**lafa**
1000	kpíŋ, pim	a-kpe	**kpi(N), pim**

Krobu; Basilia-Adele; Ega To make our presentation complete, the evidence of these three isolated Tano languages is presented in the table below (Table 4.78).

4.2.6 Proto-Kwa

Intermediate reconstructions suggested above should be compared in order to reconstruct the forms of the Proto-Kwa numerals. It seems reasonable to group potentially related forms (or patterns) together. The rightmost column contains isolated forms attested in one particular group only.

4.2.6.1 'One'

The Awikam-Alladian term for 'one' is definitely an innovation.

The root **di* is attested in four branches out of five and thus is likely reconstructable at the Proto-Kwa level.

Table 4.78: Numerals in Tano isolated languages

	Krobu	Basila-Adele	Ega
1	kɔ̰	kɔ̰, li/diŋ	ì-lō-gɓó
2	ɲ́-ɲɔ́	ɲúà	ì-ɲɔ̀
3	ń-sá	sa	ì-tà
4	ń-ná	na	ì-lɛ̀
5	ń-nù	ton, nun	ì-ŋwè
6	ń-sỹɛ̰	koron	5+1
7	ń-sô	6+1?	5+2
8	mɔ̀-kwɛ́	4−4, cɥ́ɛ́	5+3
9	ŋ̀-grɔ̀ã	-1, gwalan	5+4
10	brú	fo, teb, bulu	ì-zù
20	à-brūāɛ́ (10*2?)	dikpilin, koo, bulV	ú-glū
100	yǎ	20*5	20*5
1000		kpen?	

Table 4.79: Kwa stems for ‘1’

	1	1	1	1
*Ga-**Dangme**	ká-kē, *go/wo			é-kòmé
*Gbe	ɖe-kpo	è-ɖe		
*Ka-Togo		di		
*Na-Togo	i-wɛ/kpɛ?	di(N)?		
Nyo:				
*Agneby	N-kpɔ	*a-ri		ɲ-âm
Attié	kə(n)			
Awikam			ɛ́-tɔ̰	
Alladian			ɛ̄-tɔ̰̀	
Potou-Tano				
Potou	*ce/se			bɛ̰̀/brɛ̀, ló-ɓō
Tano				
Western	o-kue			
Central				
Akanic	ba-kó(n)			
Bia	ko(n)			
Guang	kɔ			
Krobu	kɔ̰			
Ega	ì-lō-gɓó	ì-lō-gɓó (< *li-kpo?)		

The forms given in the left column are more problematic. Each of them contains a velar consonant (the Potu form **ce* may have resulted from the palatalization of a velar before a front vowel, *ce* < **kue* – cf. Western Tano).

Regular phonetic correspondences between these languages have not been established and therefore cannot be used for purposes of reconstruction. In any case, the following considerations might prove useful for the NC reconstruction. The inventory of forms attested in the eighty Kwa idioms may seem rather diverse. However, only two of them may be considered for the Proto-Kwa reconstruction, namely **di* and **k(p)o* (or the compound form **di-kpo* suggested by the Gbe (*ɖe-kpo*) and Ega (**li-gɓó*?) forms).

4.2.6.2 'Two'

Table 4.80: Kwa stems for '2'

	'2'	'2'	'2'	'2'
*Ga-Dangme	é-ɲɔ̀(n)			
*Gbe			è-ve/e-wè	
*Ka-Togo		din		bha
*Na-Togo	i-nyɔ			
**Nyo*				
*Agneby	a-ɲʊ̰/nʊ̄			
Attié			mwə(n)	
Awikam	áɲɔ̰́			
Alladian		ā̰yrɛ̀		
Potou-Tano				
Potou	nʊ̰ɔ̰́			
Tano				
Western	a-ɲu(n)			
Central				
Akanic	mie-nú			
Bia	nu, ɲɔ̀(n)			
Guang	ɲɔ́			
Krobu	ɲ́-ɲɔ̰́			
Ega	ì-ɲɔ̀			

The only form reconstructable at the Proto-Kwa level is evidently **ɲɔ*.

4.2.6.3 'Three' and 'Four'

Table 4.81: Kwa stems for '3' and '4'

	'3'	'4'	'4'
*Ga-Dangme	é-tɛ̃		é-ɟwɛ̀
*Gbe	è-tɔ̃	è-nɛ̀	
*Ka-Togo	ta	na/nɛ	
*Na-Togo	i-ta	i-na	
Nyo			
*Agneby	a-ti(N)/ri	a-nı̰́/la	jar
Attié	ha(n)		dʒí(n) <* kɥe?
Awikam	á͡zá͡	àná͡	
Alladian	ā͡ò͡		ā͡zɔ̀
Potou-Tano			
Potou	ɗyá/je	ɗi/ni	
Tano			
Western	n-ha(n)	n-na(n)	
Central			
Akanic	mie-nsá(n)	náín	
Bia	sa(n)	na(n)	
Guang	sa(n)	na(n)	
Krobu	ń-sá͡	ń-ná͡	
Ega	ì-tà	ì-lɛ̀	

Just as in the majority of the NC branches, the roots for 'three' and 'four' are the most persistent. Suggested Proto-Kwa reconstructions are *_ta_ and *_na_ respectively.

4.2.6.4 'Five'

Table 4.82: Kwa stems for '5'

	'5'	'5'	'5'
*Ga-Dangme		é-nùɔ̃	
*Gbe	à-tɔ́ɔ̃		
*Ka-Togo	tu(N)		
*Na-Togo		i-no(N)	
Nyo			
*Agneby		o-ne	lɔ̀hɔ̰̀, jên
Attié			bə(n)
Awikam		àŋú	
Alladian			ɛ̄nrì
Potou-Tano			
Potou		na̲	
Tano			
Western		n-nu(n)	
Central			
Akanic		núḿ	
Bia		nu(n)/nu(m)	
Guang		nu(n)	
Krobu		ń-nṵ̀	
Ega		ì-ŋwè	

The root **tan* ('five') is only traceable in the Left Bank languages. Another root, commonly attested in other languages (**nun*), is found in these languages as well. Both roots should be considered for the reconstruction (note that the former is comparable to the pertinent form reconstructed for Proto-Bantu).

4.2.6.5 'Six'

Table 4.83: Kwa stems for '6'

	'6'	'6'	'6'	'6'
*Ga-Dangme		é-kpà		
*Gbe			à-dɛ́/zɛ́	
*Ka-Togo	golo/koro			
*Na-Togo	golo/kolo	ku		
Nyo				
*Agneby		hu(n)		
Attié				mu(n)
Awikam				áwá
Alladian	ɛ̄-wrè			
Potou-Tano				
Potou		kwa		
Tano				
Western			n-cíɛ̀/híɛ̀	
Central				
Akanic			sìá(n)	
Bia			sia(n)	
Guang			siɛ(n)	
Krobu			ń-sỹɛ̰̄	
Ega				5+1

The evidence presented in Table 4.83 is inconclusive. At this stage our task is to process the complex Kwa data so that it can be compared to the evidence of other NC languages. In this respect, three provisional Kwa forms are noteworthy: **golo/kolo*, **kua,* and **ciɛ*. In any case, as the forms for 'seven' suggest, the Proto-Kwa term for 'six' was probably primary.

4.2.6.6 'Seven'

Table 4.84: Kwa stems and patterns for '7'

	'7'	'7'	'7'	'7'
*Ga-Dangme	6+1			
*Gbe				5+2, 'hand'+2
*Ka-Togo	6+1			
*Na-Togo	6+1			
Nyo				
*Agneby	6+1		bu(n)	
Attié		nson		
Awikam			ɛ́byɔ̰	
Alladian			ɛ̄bwɛ̰̀	
Potou-Tano				
Potou	6+1			
Tano				
Western		n-cʊ̀n		
Central				
Akanic		só(n)		
Bia		su(n)		
Guang		súnɔ(n)		
Krobu		ń-sô		
Ega				5+2

The forms presented in the table above point toward the pattern '6+1' being used for the Proto-Kwa term for 'seven', whereas Proto-Nyo developed the primary term **sun*.

4.2.6.7 'Eight'

Table 4.85: Kwa stems and patterns for '8'.

	'8'	'8'	'8'	'8'	'8'
*Ga-Dangme					6+2
*Gbe		e-ɲí	'hand'+3		
*Ka-Togo	4*2	nsɛ/lɛ?			
*Na-Togo	4PL				
Nyo					
*Agneby				è-pyè	wo(n)
Attié	ma-4?				10–2?
Awikam		ɛ̀tyɛ́			
Alladian		ēɥrì			
Potou-Tano					
Potou				ɓyá/gɓī	
Tano					
Western		mɔ̀-kʊ̀ɛ́			à-nɛ̀mrɔ̰̀
Central					
Akanic		twé/cué			
Bia		cʊɛ/twɛ			
Guang		kwé/cwi			
Krobu		mɔ̀-kwɛ́			
Ega			5+3		

Based on the evidence attested in the table above, the Proto-Kwa term for 'eight' may be reconstructed as either primary (**kwe/ kye*) or derivative, in which case it must have been based on 'four' (*'4PL').

4.2.6.8 'Nine'

Table 4.86: Kwa stems and patterns for '9'

	'9'	'9'	'9'	'9'	'9'	'9'
*Ga-Dangme						nɛ̀ɛ́(hű)
*Gbe	8+1		5+4			
*Ka-Togo	8+1?		10–1			
*Na-Togo			10–1			
Nyo						
*Agneby		bare(-n)				
Attié					ŋgwan	
Awikam		ɛ́mrɔ̰				
Alladian		ɛ̄mwrɔ̀				
Potou-Tano						
Potou		ɓrɔ̀				trű
Tano						
Western		brúkú				puálɛ́hʊ̀n
Central						
Akanic				n-króń		
Bia				nkróń	ǹgɔ̀lǎ	
Guang						kpunɔ, sàngɔ́ɔ́?
Krobu					ŋ̀-grɔ̀ā̰	
Ega			5+4			

This is the hardest form to interpret. A rare pattern '8+1' is attested in the Left Bank languages. In contrast to this, the Togo pattern is '10–1', while the Nyo term (**brɔ/mrɔ*) is 'primary'. The latter is probably connected to the term for 'ten', although this connection does not necessarily imply a derivation ('10–1') and could be explained by analogy. All three forms/patterns are considered for reconstruction.

4.2.6.9 'Ten'

Table 4.87: Kwa stems for '10'

	'10'	'10'	'10'	'10'	'10'	'10'
*Ga-Dangme						ɲɔ̀ŋmá
*Gbe	e-wó	*bula				
*Ka-Togo	fo/wo	bula			te	
*Na-Togo	fo		ɗu		təb	
**Nyo*						
*Agneby				diw/liw		nɛ(n)<5PL?
Attié						kɛŋ
Awikam			èjú			
Alladian	ɛ̄-và					
Potou-Tano						
Potou	wɔ					
Tano						
Western		ò-bùlṵ̃		è-dí		
Central						
Akanic			dú			
Bia		bulu				
Guang			du			
Krobu		brú				
Ega			ì-zù			

Isolated forms are attested in Ga-Dangme and Attié. The root *tə(b)* is traceable in the Ghana–Togo Mountain languages (Togo-remnant) and is not found elsewhere. Thus we are dealing with another isogloss suggesting that these languages belong to the same branch. The stem **du* supported by R. Blench could be proposed for Proto-Kwa. This stem is indeed attested in the majority of the groups that do not belong to the Left Bank languages (including Na-Togo).

The stem **bula* (Left Bank)/**bulu* (Tano) is distributed fairly evenly.

Finally, a Niger-Congo root reflected in Kwa as **fo/wo* can be reconstructed in a number of languages.

4.2.6.10 'Twenty'

Table 4.88: Kwa stems and patterns for '20'

	'20'	'20'	'20'	'20'	'20'	'20'
*Ga-Dangme	10*2					
*Gbe	10*2	ko				
*Ka-Togo	10*2					
*Na-Togo	10*2	ā-kōō	dìkpìlìn			ɔ-ɖɔ(n) (<10?)
Nyo						
*Agneby	'hand' (bra)*2?		li-kŋ			
Attié	'hand' (bwa?)*2?					
Awikam				è-vɛ́		
Alladian		*ɛ̄kòụì		ɛ̄-ụá		
Potou-Tano						
Potou					pɛ̲	
Tano						
Western					ɛ́-fɪ(n)	
Central						
Akanic	10*2					
Bia	10*2					
Guang	10*2	ko?				
Krobu	à-brūāɛ̰ (10*2?)					
Ega						ú-glū

The pattern '10*2' attested in the majority of the branches. The root **ko* is also to be taken.

4.2.6.11 'Hundred' and 'thousand'

In addition to the pattern '20*5', the roots *lafa*/*lofa* and **ya*/*ja* (Nyo) are reconstructable for 'hundred'. The latter may be etymologically related to **ga*/*ha*.

The term for 'thousand' is commonly attested as **a-kpi*. Its less common by-form is **pim*.

Table 4.89: Kwa stems and patterns for ‘100’ and ‘1000’

	‘100’	‘100’	‘100’	‘100’	‘1000’	‘1000’
*Ga-Dangme	làfá		ò-há		à-kpé	
*Gbe				40*2+20	à-kpé	
*Ka-Togo	lafa?				a-kpe	
*Na-Togo	lofa	20*5	u-ga		a-kpi	pim?
Nyo						
*Agneby		20*5	ja		a-kpi	
Attié			ja		a-kpi	
Awikam				àkpá ˈ-2		
Alladian		20*5				
Potou-Tano						
Potou			ya			
Tano						
Western			è-vá/è-yǎ	átá	a-kpi	
Central						
Akanic			ɔ-ha			a-píḿ
Bia			ya		a-kpi	
Guang	lafa				kpi(N)	pim
Krobu			yǎ			
Ega		20*5				

Table 4.90 lists provisional Proto-Kwa reconstructions based on the evidence discussed above.

Table 4.90: Proto-Kwa numeral system (*)

1	di-kpo	7	6+1
2	ɲɔ, **di?	8	4PL, kwe/kye
3	ta	9	10–1?
4	na	10	fo/wo, bula, du
5	nu(n), ton	20	10*2, ko
6	golo/kolo, kua, ciɛ	100	20*5, lofa, ja/gya?
		1000	kpi, pim

The remaining roots and patterns are probably innovations that developed separately within a branch/language. They may help to adjust the internal classification of the Kwa languages.

4.3 Ijo

According to traditional classification, the Ijo family is comprised of the Ijaw languages and the Defaka language. Some scholars express doubts as to whether the latter indeed belongs to this family. According to Roger Blench, "The Ijo languages constitute a well-founded group, but the membership of Defaka (constituting Ijoid) remains problematic. Defaka has numerous external cognates and might be an isolate or independent branch of Niger-Congo which has come under Ijo influence" (Blench 2013).

Ijaw languages consist of the Eastern and the Western groups (the latter is sometimes called Central).

The following reconstruction is based on the evidence of all three Ijo branches (Table 4.91).

Table 4.91: Proto-Ijo numeral system

	Defaka	*East	*West	**Ijo
1 (qualifying)	gbérí	gbérí	?	?
1 (counting)	?	ŋ̀gèi	kènɪ	*n-kèni
1 in 6 (5+1)	–	die/ie	die/zie	*die
2	mààmà	màmì	maamʊ	*mamV
3	táátó	tárú	tărʊ	*tató
4	nɛ́ì	i-neĩ	nɛ́ín/nóín	*nɛ́ín
5	túúnɔ̀	sɔ́nɔ́	sɔ̃nɔ̃-rɔ̃	*túnɔ́
6	mààngò	5+1	5+1	*5+1
7	5+2	5+2	5+2	*5+2
8	5+3	4+4	4+4	*4+4
9	5+4	5+4	5+4?	*5+4
10	wóì	ójí/àtìé	ójí	*(w)ójí
15	10+5	jìé	dié	*dié
20	síì	sí	síí	*síí

Both qualifying and counting terms for 'one' are attested in the Eastern Ijo languages (e.g. in Ibani). The Defaka form may be a borrowing. An unexplained allomorph for 'one' is attested as a part of the term for 'six' in Ijaw (?).

The root for 'two' (**mam*) is an Ijo innovation. It has no parallels outside this language family. Its phonetic similarity to several other forms is a mere coincidence, e.g. *ma-* in the Jaad (Atlantic) *maaɛ* does not belong to the root and can be

explained as a class prefix. The lexical meaning 'twin, pair' (as attested in Nembe (East) according to (Kaliai 1964)) may underlie the Ijo term. However, no reliable parallels for this term with the meaning 'twin, pair' are establishable in NC.

The root for 'three' is apparently of NC origin, with its most archaic form attested in Defaka.

The term for 'four' is undoubtedly a reflex of the NC root.

The term for 'five' probably goes back to the NC root **tan(o)*. As in the case of 'three', its most archaic form is found in Defaka.

The terms for 'six', 'seven', and 'nine' follow the common patterns ('5+1', '5+2', and '5+4' respectively).

The Ijaw term for 'eight' must have derived from 'four' by means of partial reduplication (**ni-néín*). This pattern is reconstructable on the Proto-NC level and will be discussed at length in the next chapter.

A specific counting term for 'ten' is reconstructable in the Eastern Ijo languages (**àtìé*). The Defaka form is comparable to those found in the Ijaw languages.

A special form for 'fifteen' is reconstructable in Ijaw (**dié*), cf. e.g. the Nembe evidence: *dìé-èsí* '300' ('15*20'). This form may go back to Ijaw **ɗíɛ̀* 'divide; separate into parts; split or break up into parts; share', 'distribute, donate', cf. Nembe *ɗìɛ̀*, Ibani (Koelle 1963[1854]) *dìè-, dié.*

As in a number of other languages that belong to different families within NC, a special form is attested for the term for 'twenty' (**síí*). The term itself has several functions. It serves as a basis for a number of other terms for tens (also in Defaka), e.g. '40=20*2', … '100=20*5'. The Ijaw terms for 16–19 are based on it as well, e.g. '16=20–4', etc.

4.4 Kru

Our analysis of the Kru numerals is based on nearly forty sources representative of five major groups and eleven major subgroups of the family. Preliminary reconstructions of the pertinent numerical terms (by sub-group) are represented in commented tables below.

4.4.1 'One', 'Two' and 'Three'

As in the majority of the NC languages the term for 'three' is the most persistent: the root **taa(n)* can be reliably reconstructed for Proto-Kru.

Table 4.92: Kru stems for '1'-'3'

	'1'	'1'	'1'	'2'	'2'	'3'
Aizi		mu̱mɔ̱	yre	i-ʃɪ		i-ta
Eastern						
Bakwe/Wané	ɗô			sô		ta
Bete/Godié		ɓlo/gbolo		sɔ		ta
Dida/Neyo		bolo		só		ta
Kodia		gbɤlɤ/ɓɤlɤ		sɔː		taː
Kuwa	dee			sɔ̃r		tãã̀
Seme	dyuɔ̃		byɛ́ɛ̃		nĩ	tyáār
Western						
Bassa[14]	doo	(g)boo?		sɔ́		tã
Grebo[15]	do(o)			sɔ̃́	hwə̃/hɔ̃	taa(n)
Klao/Tajuasohn	do			son		tan
Wee[16]	due/too			sɔn		taan

The same is applicable to the root for 'two' reconstructed as **so(n)* in Proto-Kru (isolated forms are attested in the Seme and Grebo sub-groups only). It should be noted that in general the Seme numeral system is peculiar in many respects. These peculiarities (e.g. Seme being the only language with a full set of primary terms covering the sequence from 'one' to 'ten') may be due to the isolated status of the language. In his recent article entitled "Le sèmè/siamou n'est pas kru" Vogler argues that Seme is not a Kru language (see Vogler 2015). On the basis of a comparison between Kru, Gur and Mande (Samogo) morphology and lexicon he concludes that Seme is either remotely related to the Mande languages or represents a separate branch of Niger-Congo. As we hope to demonstrate below, Seme shows systematic correspondences with neither Kru nor Mande (including the contact Mande languages – Samogo and Jowulu).

'One'. It is likely that the root **do* should be reconstructed on the Proto-Kru level. However, there is enough evidence for reconstructing the alternative root **(g)bolo.*

[14]Bassa, Dewoin, Gbii.

[15]Grebo, Krumen, Glio-Oubi.

[16]Wee is a Western Kru group which includes (among other languages) Sapo, Krahn, Nyabwa, Wobe.

4.4.2 'Four' and 'Five'

Table 4.93: Kru stems for '4' and '5'

	'4'	'4'	'4'	'5'	'5'	'5'
Aizi			yeɓi	yu-gbo		
Eastern						
Bakwe/Wané		hɪɛ̃[4]	mɾɔ̄ː	g͡bɔ̀ə̀, ŋʷũ		
Bete/Godié			mʊ-wana	gbu/gbi		
Dida/Neyo	na			gbí		
Kodia	na			ⁿgbɤ		
Kuwa	ɲìjɛ̀hɛ					wàyɔ̀ɔ
Seme			yur			kwɛ̃l
Western						
Bassa	hɪ̀̃-nyɛ(n)				h-mm	
Grebo		hɛn		gbə	mm	hun
Klao/Tajuasohn	nyìɛ̀	hɛn			mù, hoom? (< m?)	
Wee	nyìɛ				mm	

The forms for 'four' in the left column apparently are the reflexes of the NC root that is preserved in its archaic form **na* in Eastern Kru, whereas in Western Kru it changes into *nyìɛ̀*.

Two major forms are observable for 'five', namely **gbə/ gbo* and **mm* (Western).

4.4.3 'Six' to 'Nine'

It is immediately apparent that these numerals already followed the pattern '5+X' in Proto-Kru. As noted above, the Seme forms are innovations.

Table 4.94: Kru stems and patterns for '6'-'9'

	'6'	'6'	'7'	'7'	'8'	'8'	'8'	'9'	'9'	'9'
Aizi		fɔ	fri+2				patɛ			fi
Eastern										
Bakwe/Wané	5+1		5+2		5+3			5+4		
Bete/Godié	5+1		5+2		5+3			5+4		
Dida/Neyo	5+1		5+2		5+3			5+4		
Kodia	5+1		5+2		5+3			5+4		
Kuwa	5+1		5+2		5+3			5+4		
Seme		kpa̰a̰		kĩĩ			kprɛ̃ɛ̃			kɛ̃l/kal
Western										
Bassa	5+1		5+2		5+3			5+4		
Grebo	5+1		5+2		5+3			5+4		
Klao/Tajuasohn	5+1		5+2			4PL			10−1	
Wee	5+1		5+2		5+3			5+4		

4.4.4 'Ten' and 'Twenty'

The root *kʊgba* is attested beside the common NC root for 'ten' (**pu/fu*) in Eastern and Kuwa. The root for 'twenty' is attested as *golo* in both Eastern and Western.

4.4.5 'Hundred' and 'Thousand'

All Kru sub-groups are characterized by the lack of a primary term for 'hundred'.

The form for 'thousand' in Western Kru was borrowed from the Mande languages. A primary term for '400' (**dwi*) that developed in Eastern Kru served as the basis for a rare pattern for 'thousand' attested in these languages ('400*2+200').

The reconstruction of the Proto-Kru numeral system is given in Table 4.95.

Table 4.95: Proto-Kru numeral system (*)

1	do, (g)bolo	7	5+2
2	so(n)	8	5+3
3	taa(n)	9	5+4
4	na	10	pu, kʊgba?
5	gbə/gbo, mm	20	golo
6	5+1	100	20*5
		1000	400*2+200

Table 4.96: Kru stems for ‘10’ and ‘20’

	‘10’	‘10’	‘20’	‘20’	‘20’
Aizi	bɔ		gu		
Eastern					
Bakwe/Wané	pɔ̀, bu?		grɔ̀, gˀlɔ		
Bete/Godié		kʊ́gba	gwlʊ́/gɔlɔ		
Dida/Neyo		kʊ́gba	glʊ́/góló		
Kodia		kʊgba	ɡ̊alo		
Kuwa		kowaa		10*2	
Seme	fu				kār
Western					
Bassa	ɓaɖa-bùè, puuɛ, vu			<10	
Grebo	pu		gōrō/wlɔ̀		
Klao/Tajuasohn	pue/punn		wlòh-2		quilar-2
Wee	pue/bue		gwlʊ-2		kwela 2

Table 4.97: Kru stems and patterns for ‘100’ and ‘1000’

	‘100’	‘100’	‘1000’	‘1000’	‘1000’
Aizi		juyugbo			
Eastern					
Bakwe/Wané	20*5		400*2+20*10		
Bete/Godié	20*5		400*2+200		
Dida/Neyo	20*5		400*2+200		
Kodia					
Kuwa		kɔ̀lɛh?		100*10	
Seme	20*5				lit: ‘goat one’
Western					
Bassa	20*5				borrowed
Grebo	20*5				borrowed
Klao/Tajuasohn	20*5				borrowed
Wee	20*5				?

4.5 Kordofanian

The evidence of about twenty Kordofanian languages does not permit reconstructing the Proto-Kordofanian numeral system (assuming that Proto-Kordofanian existed). Comprehensive data for each of the four major groups is represented below (Table 4.98). Forms and patterns traceable in at least two groups are in bold. The forms are grouped within the lines in a more or less ad hoc manner, e.g. there is no special reason to believe that Talodi **lu(k)/ li(k)* 'one' corresponds to the forms with initial **t-/ʈ-** attested in other groups.

The systematic presence of the final velar **-k** in some of the terms can also be found in the Atlantic languages (especially in North Atlantic).

The term for 'ten' appears in numerous forms in the Kordofanian languages, which is rare. At the same time, no root for 'ten' is represented in at least two languages simultaneously. Moreover, nearly every language in a group has its own term for 'ten'.

Table 4.98: Kordofanian numerals 1–5

	*Heiban	*Katla	*Rashad	*Talodi	*Kordofanian
1	kwɛ-(ʈ)ʈɛ(k)	ʈí-ʈʌk	-tta	lu(k)/li(k)	**ʈe(k)/lu(k)**
1	ŋɔ-(ʈ)ʈɔ	ʌ-ʈeen/ʈɪɪn			**ʈɔ(n)**
1	*-lel?			tleidi	**lel/led?**
2		cik/heek	(k)ko(k)		**kok/kek/cik**
2	-can /-ɽan, rɔm			we-ɽʌk/-tta	(can/ɽan, rak, rɔm)
3	tɔɽɔl/ʈeɽel	ʈʌʈ	tta	wa-ʈʈak	**tat/tèɽ/ʈak**
3	-ɽɪcɪn/-gɪtʃɪn	i-hwʌy			(ɽitin/ɽicin, hwʌy)
4	k(w)ɔ-ɽɔŋɔ/ma-ɽŋan/-rlon/-ɬɽʊ		ya-rem/wa-rʊm	-ɽandɔ	**-ɽɔŋ/-ɽandɔ/-ranto/-rʊm?**
4		ʌ-gʌlʌm/i-hʌlʌm		kekka	(-gʌ́lʌ̀m, kekka)
5	tʊ-dìní/-ðɛnɛ	i-duliin			**dinin/dulin?**
5	ŋer-/ɲer-		*ɲer-		**ŋer-/ɲer-**
5		ɟɔ-gbəlɪn	wʊ-ram, ma	'hand'-'1', ki-liəgum	('hand', ...)

Table 4.99: Kordofanian numerals >5

	*Heiban	*Katla	*Rashad	*Talodi	*Kordofanian
6	5+1	<5	ɲere(-r/-l/-y) (< *5+1?)	5+1	**5+1**
6	3+3? 3PL				(3+3)
7	5+2	5+2	5+2	5+2	< A5+2
7	4+3	3PL+1			(4+3, 3PL+1)
8	duuba(ŋ)		dubba/tuppa		**dubba**
8	5+3, 4 redupl.?			5+3, 4 redupl.	**5+3**, 4 **redupl**.
8	bɔ	t̪áŋgìl/t̪ɪŋɛrɛy			(bɔ, ʈəŋi-)
9	10−1	10−1	10−1		**10−1**
9	5+4	ɟʌ́lbʌ̀ʈín (<5?)		5+4	**5+4**
10	di/ɗì/ri	*t̪ʌʌ, ɔ-rɔ	kʊ̄-man (5PL)	ma-tu(l)	?
10		rakpac, i-hedʌkun	fəŋən (fə-ŋən?)	tiəʈum, n̪ipʈa, gurruŋ)	?
20	10*2	10*2	10+10	10*2	10*2
20	tuʈí (‘grain’), ‘big figure’			‘body’, (a-rial, a-(na)ttu)	(’body’, ...?)
100	20*5, < Arabic	10*10	10*10	10*10, 20*5	10*10, 20*5
1000	Arabic, 20*2*10	absent	10*10*10	ɑ-ðɑɾ	?

A primary term for ‘eight’ is distinguishable[17] in the Heiban and Rashad languages.

[17]I used data from the following Kordofanian languages and dialects: Aceron, Dagik, Heiban, Jomang, Katla, Koalib, Lafofa, Laro, Logol, Lumun, Moro, Nding, Orig, Rere, Shirumba, Tagoi, Talodi, Tegali, Tegem, Tima, Tira, Tocho, Utoro, Warnang.

4.6 Adamawa

Adamawa is the most divergent of the NC families. The variety of numeral systems attested in the Adamawa languages confirms this statement. This can be observed not only in cases of forms that belong to different groups, but often within groups and sub-groups as well, which makes the reconstruction of its numeral system quite problematic. In other words, it is not a rare case that small Adamawa branches consisting of only a pair of languages show incomparable forms. Some examples are in order here.

Let us compare the terms from 'one' to 'ten' in the Kim branch that is commonly attributed to the Mbum-(Day) group (Greenberg 14) (Table 4.100).

Table 4.100: Numerals in the Kim branch

	Besme	Kim
1	mōndā/mbírāŋ	ɗú
2	tʃírí	zí
3	hā̰sī (hā̰-sī?)	tā
4	ndày	ndà
5	ndìyārá	nūwḛ̄y
6	māngùl	mènèngāl
7	ɗīyārā	ɓēálā/ɓēálār
8	ndā-sì (4+3?)	tīmāl/wá-zì-zí(10−2)
9	nòmīnā	làmāɗō/wá-zì-ɗú (10−1)
10	wàl	wòl

Only the terms for 'four', 'six', and 'ten' are comparable in these systems.

The Longuda language constitutes a separate branch of Waja-Jen (Greenberg 10). The table below gives an overview of the first ten numerical terms as attested in two dialects of Longuda (Table 4.101). The evidence for both dialects was collected by the same scholar (Ulrich Kleinewillinghöfer[18]). Morphological analysis of the forms is given according to Longurama of Koola (Longuda1) and Wala Lunguda (Longuda2).

Although we are dealing with two dialects of the same language, the roots for 'one', 'two', 'three', 'six', and 'ten' attested in them are different. At the same time, the terms covering the sequence from 'six' to 'nine' follow patterns com-

[18] https://mpi-lingweb.shh.mpg.de/numeral/Niger-Congo-Adamawa.htm

Table 4.101: Longuda numerals

	Longuda1	Longuda2
1	laa-twɛ̀	naa-khal
2	nàà-kwɛ́	naaa-shir
3	nàà-tsə́r	naa-kwáí
4	nèé-nnyìr	naa-nyìr
5	nàà-nyɔ́	nàà-nyó
6	tsààtən	na-khí-nà-kwáí (2*3)
7	í-néé-nyìr i-nàà-tsə́r(4+3)	nyi-na-kwáí (4+3)
8	nyíí-tìn (<4?)	nyí-thìn (<4?)
9	é-nàà-nyɔ́ í-néé-nyìr(5+4?)	nyi-na-nnyó (4+5)
10	koo	nɔ̂m

monly attested elsewhere. Thus the differences between these dialects appear to be greater than those between the languages within Mande or Bantu families. This raises the question as to whether a Proto-Kim or Proto-Longuda reconstruction is indeed relevant.

Moreover, the reconstruction is additionally hindered by the fact that numerical terms in the majority of the Adamawa languages are subject to the alignment by analogy more frequently than in other NC languages. General considerations regarding this problem can be found in Chapter 3. This is of special significance for the Adamawa languages since it affects etymological interpretations. The evidence from a number of languages belonging to the Duru sub-group of Leko-Nimbari (Greenberg 4) may serve as a case study (Table 4.102).

Table 4.102: Duru numerals

	Peere	Doyayo	Gimme	Gəunəm	Vɔmnəm	Momi	Longto
1	də́ə	gbúnú	wɔɔna	mani	màn	muzoz	wə́ŋŋá
2	i**ro**	éérɛ́	idti**gè**	tɛ**k**	ètên	ìttə́z	sittó
3	tãã**ro**	taarɛ	taa**gè**	taarə**k**	tãán	tàáz	tãã**bó**
4	na**ro**	násɔ	náà**gè**	náárə́**k**	nānnò	náz	nab**bó**
5	núuno	nooné	nɔɔnì**gè**	nɔɔnɔ̀**k**	gbà náárò	gbanáá	nɔ̃ɔ̃mó
6	nón-də́ə	nɔ̀ɔn-gbúnú	nɔn**gè**	nɔɔ-waŋgə	gbāā-sə̀ mâl	bámbə**z**	sáámɛ

Matching final segments of the first few numerical terms in each of these languages are highlighted in red. I agree with Larry Hyman that "it might not be analogy, rather the use of a marker" (p.c.) but it should be noted that though these segments are different in each case (i.e. they do not match even within a pair of languages), they are present in each language under discussion.

In Mumuye-Yandang, which is another branch of Leko-Nimbari (Greenberg 5), an additional sub-morpheme (-t) is attested that is not present in Duru (Table 4.103).

Table 4.103: Analogical alignments in Mumuye-Yandang

	Mumuye	Bali	Yendang (dial.)
2	zi**ti**	i-ye	í-nī
3	ta:**ti**	taa**t**	tâ:**t**
4	dɛ̀:**tì**	naa**t**	nâ:**t**

The following conclusions with regard to the Proto-Duru numeral system can be reached upon the basis of this evidence. First, the final segments (whatever their phonetic difference) should not be viewed as a hinderance to the comparison of numerical terms. This means that Momi *tàáz* 'three' can (and should be) compared to Longto *tããbó*. The question of whether their final segments should be analysed as morphemes or sub-morphemes is of secondary importance for our purposes. At the same time, the quality of the second consonant in Proto-Leko-Nimbari is obscure, so we have to reconstruct the form as **taa*X, where X is an unknown consonant.

As demonstrated above, numerical terms are exceptionally divergent within the family. In addition to this, systematic (diversified) alignment by analogy is often employed in the languages under study. Both factors make the reconstruction a challenging task, even though an attempt at reconstruction of the Adamawa numerals by a highly competent scholar is available (see Boyd 1989). His results, however, are of limited relevance for our comparative purposes, as the following example shows. According to Boyd, the Proto-Adamawa term for 'one' is to be reconstructed as **ku-di-n* (the root **di*) with **kwin* being its later development. His ideas on how this proto-form is reflected in particular branches of the Adamawa family are summarized in the table below (Table 4.104). Notations in the first column refer to Grinberg's grouping of the Adamawa languages.

Table 4.104: **kwin-* reflexes in Adamawa according to Boyd

	*Proto	Reflexes
G1	kwin	kun
G1	kwin	kwaan
G2	kwin	gu-(a)s(a)
G4	kwin	gun, gbun, bin, wun-ga, guu
G5	kwi(t)	gbet, gorV
G5	kwin	in(d)i
G6	kwin-k	soŋ
G7	kwin	indi > fa-ndi
G8	kwin-kwin	bimbimi
G8	kwi(n)	gwi > ju
G9	kwin	tsuŋ/tsiŋ, cɔŋ
G10	kwi-t	> kwat > kal
G13	kwit	ɓuru, gulu
G13	kwit	> kwat > bara(k)
G13	kwin	ʈoŋ
G14	kwin	ɗu
Day	kwin-k	ngoŋ
Day	kwin	(k)wan > mɔn

Even if Boyd's reconstruction of the Proto-Adamawa form is correct, a diachronic interpretation that impies an etymological relationship between *bimbimi*, *cɔŋ*, *ɗu* and *gbet* does not fit the purpose of our integral comparative study of NC numerical terms because it can be used to justify nearly any etymological connection. In view of this, the Adamawa numerical terms will be treated in the same way as those from the preceding language families. First, the main forms of the numerical terms will be established, with no attempt at tracing them down to a provisional proto-form. Then the numeral systems of each of the Adamawa branches will be studied separately. Finally, an integral analysis of the available evidence pertaining to each of the terms will be offered. This approach will enable us to treat the Fali languages and even Laal together with the Adamawa languages, although their relationship to the latter is often questioned (in the case of Laal, doubts are raised as to whether it belongs to NC at all).

4.6.1 Fali-Yingilum (G11)

It should be noted that after a nasal, *-r-* in the Fali forms regularly corresponds to *-N-* in those of Yingilum, cf. '5' Fali *kɛ̱rɛw* ~ Yingilum *kɛ́ɲàu*, '7' *jɔ̱rɔ̱s* ~ Yingilum *jáɲàs*. An alignment by analogy is probably attested in the terms for 'three' and 'four' (**taaX* > *taan* may have changed by analogy with **naan*).

Table 4.105: Fali-Yingilum numerals

1	kpolo/bʌlo (< *lo?)	7	jɔ̱rɔs
2	cuk, gbara	8	4 redupl.
3	taan (< taaX)	9	10–1/ŋgʌs kàm(kàn) k͡pòlò 'rest hand one'
4	naan	10	ra
5	kɛ̃rɛw	20	10*2
6	yira/yilo	100	< Fula
		1000	< Fula

4.6.2 Kam (Nyimwom, G8)

Table 4.106: Kam numerals

1	bi̱i̱ (Meek: bimbini) (< *b-ii?)	7	jùp yi-raak (6,2 - 'second six'?)
2	yi-raak (i-ra)	8	sâl
3	càr	9	níízaa
4	nár (< *naX)	10	bóò
5	ŋwún	20	kpáímí ,*ǹkpǫ́
6	jù:p	100	20*5
		1000	?

Within the NC context, a reversive alignment by analogy may be considered: **na*X '4' > *nar* by analogy with **car* '3'. As Boyd rightfully observes, in the case of 'one' it is often unclear whether the initial consonant is a part of the root, or a reflex of the noun class prefix.

The term for 'seven' simulates the pattern '7=6+2' (this phenomenon is not infrequent in NC). Sometimes (e.g. in some of the Mande languages) this impression is due to the fact that the term for 'six' originally derived from '5+'. Over

time, an innovation replaced the original term for ‘five’, which was only preserved in the derived term for ‘six’. Alternatively, the term for ‘seven’ could be explained as ‘the other six’ (or ‘a big six’ is some languages), as perhaps in Kam, assuming that *jù:p* does not go back to the term for ‘five’.

4.6.3 Leko-Duru-Mumuye (G4, G2, G5)

This group is often labeled Leko-Nimbari. Here we follow Raimund Kastenholz and Ulrich Kleinewillinghöfer, who note that “The term ‘Nimbari’ should not to be used as a classificatory term, nor should the scarce and surely in large parts erroneous data be given central significance in any comparative approach to Adamawa languages” (Kastenholz & Kleinewillinghöfer 2012).

4.6.3.1 Duru (G4)

Table 4.107: Duru numerals

1	də́ə, gbúnú, wə́-ŋŋá/wɔɔna/dá(ŋ)gá/*nge, man(i)/*mal	7	5+2, (gútambe, 6+’odd’, də́msàrà, 4+3)
2	du/ru/to, te/re	8	4PL/4+4, 5+3,(< Hausa)
3	tããtó/tããro	9	‘ one finger is left ‘, nɨ́ŋsɨ́nè, 5+4, 10−1
4	natό/naró (< *naX)	10	bōʔ, kob/kop/fób
5	núno/nɔɔnɨ̀, gbà náárò/gbanáá, sáá	20	gbɛg/gbàhsɨ́ (=’staff’), *wɔ́ɔ́g (’head’), zul/zur (‘head’), (10*2, ráárò, jùgúyɔ),
6	gúú, 5+1	100	tɛmere < Fula, 20*5
		1000	uzinere < Fula, (dukə)

This table provides an overview of forms and patterns attested in eleven sources for this sub-group. This degree of variety is not normally attested within a single sub-group, which raises doubts as to whether these languages should be grouped together.

4.6.3.2 Leko (G2)

Our study of this sub-group is based on the evidence of two languages. The summary table above is not descriptive of the language-specific mechanisms of the alignment by analogy. An overview of the numerical terms covering the sequence from 'two' to 'five' by language is provided in Table 4.109.

Table 4.108: Leko numerals

1	nɨ́ŋa/níiá (<ŋa?)	7	5+2
2	nnú, ra?, *-i?	8	5+3, < Hausa
3	toorà/toonú	9	5+4,' one is left '
4	naarà/nɛɛr-əb	10	kób/kóp
5	núúnà/núnn-ub	20	nɛd níi gbɛd, laa-1
6	nôŋgôs/núŋgɔ́ɔs	100	20*5, < Fula
		1000	20*10?,< Fula

Table 4.109: Analogical alignments in two Leko languages

	Kolbila (Zurá)	Samba Leko
2	in**nú**	ii**rà**
3	too**nú**	too**rà**
4	nɛɛr**əb**	naa**rà**
5	núnn**ub**	núún**à**

Apparently, the terms from 'three' to 'five' in these two languages are related to each other. At the same time, two groups of terms ('2–3' and '3–4') with an alignment by the ultima are observable in Kolbila. This is applicable to a group of Samba Leko terms as well, namely '2–4' (possibly also '5'; the fact that the Samba Leko terms are adjusted by both the vowel quality and the tone is noteworthy). This means that the seemingly unrelated roots for 'two' may have derived from a common etymon (still unknown to us) by means of alignment by analogy. The source form of 'two' remains obscure. Assuming that it was similar to the one reconstructed for the Duru sub-group (e.g. **ru*), it is likely that the same form is to be reconstructed for Leko as well: **ru* > Kolbila *nu* by analogy with *toonu* '3' ; **ru* > Samba Leko *rà* by analogy with *toorà* '3'. However, the evidence in favor of this reconstruction is inconclusive. Alternatively, the initial vowel of the term for

'two' (*ii-/in-) may reflect the source root, while the final segment is potentially explained via an alignment by analogy with '3'.

4.6.3.3 Mumuye-Yandang (G5)

Table 4.110: Numerals in Mumuye-Yandang

1	ɓīntī/ɓini (*< nti/ni?) , gbétè	7	5+2
2	ziti, ye, nī	8	5+3
3	taat	9	5+4
4	naat	10	kop/kob
5	mă:ni, nɔng/ghìnān	20	mba-1, kar-1, mim-1
6	5+1	100	20*5
		1000	derived

This sub-group is represented by three languages that show different forms of 'two'. The terms for 'three' and 'four' are adjusted by analogy. Studying them in a wider NC context reveals that the final consonant in 'four' was adjusted by analogy with 'three'. The alignment itself must have occurred already at the Proto-Mumue-Yandang level, which explains our provisional reconstructions suggested for this proto-language in the table above.

No evidence pertaining to the Nimbari numerals is available to us. The forms of 'one' given by Boyd (Boyd 1989) are noteworthy (Nimbari *(n)yeme/ geme/ (ʒeme?)*).

4.6.4 Mbum-Day (G13, G14, G6, Day)

4.6.4.1 Bua (G13)

This is very divergent branch that has been poorly documented. I'd like to thank Pascal Boyeldieu who has provided me with his personal data on Ɓa (Bua) and Lua (Niellim), as well as some other rare sources. The main forms and patterns are shown in Table 4.111.

Numerals in the Bua group can be presented as follows (Table 4.112)

Table 4.111: Bua numerals

	Fanya Niellim		Tunya Bua		Zan Gula	Kulaal	Bolgo	Koke
1	do/lo	ɓúdū/ ɓúrū	sèlì	gúlu	sammā, saado	ʈóŋ	ba(k)ra, silla	barak
2	i-ru/ li-ru	ndīdí/ ndīrí	à-rī	i-li/í-rī:	ɾis:i/lissi	rɔ̀k	lēti, retè	lēdi
3	taro	tērí	à-tā	í-tēr	to:ɾi	tòòs	teri	tēri
4	nagi/ naro	niã̄:ní/ néni	à-nā	í-pāw/ paõ	na:sɪ	nòrɔ̰̀	har	hār
5	lugni	lùní	à-lōnī	í-lwār	tɛ(r)	lúŋ	tisso	tisó
6	kaba	tá:r	nānò	tā̰r	5+1	lú-én-ʈóŋ	tipsi	dípsil
7	5+2	longa	lúlú	lṵ̄r	5+2	lú-é-rɔ̀k	5+2	tiglén
8	<4	3+4, <Bagirmi	kɔ̀ntã̰	<*4 PL?	5+3		orhor (4 redupl.), 5+3	4 redupl.
9	10-X	<Bagirmi	à-tī	lór-lor	5+4	sàkɔ́línnòrɔ̰̀	diar, 6+3	jār
10	teba	<Bagirmi, hulō̰a	kùtù	húlil/ lor-poo	filo:le/ filori	yíppà	do(k)	dog
20	10*2	doksap	10*2	<10PL	ʊ-fa:lɛ		a-rep, a-hun, tehu	
100		ro/ru	à-rū	a-ru	< Arabic	míà/míè		ae léd
1000		dubu	dūbú	dubu	< Arabic	hálìf		ae har

Table 4.112: Bua numerals (summarized)

1	*do, *de?, bara(k), (ʈóŋ)	7	5+2, 3+4, lúlú/lòŋgɔ̄/lur, (tiglen)
2	*di, *ri?, *ru?, (rɔ̀k), (rete)	8	4 redupl., 5+3
3	tar/tori/teri	9	ti, jar, 5+4, 10-X
4	na/nagi/niani, har	10	do(k), (kùtù), (filo:le), (yíppà), (teba)
5	luni/loni/*lu,tɛ(r), *kɔn?, (tiso)	20	10*2, do-ksap, fa:lɛ, (a-rep), (a-hun)
6	5+1, tá:r, (nānò), (kaba), tipsi	100	ro/ru
		1000	< Bagirmi

4.6.4.2 Kim (G14)

The first ten terms of Besme and Kim are given in the table above (Table 4.100). The term for 'twenty' in these languages follows the pattern '10*2', whereas the Kim term for 'hundred' is borrowed from Arabic. The Besme term for 'hundred' is borrowed from the French *sac* 'sack', whereas the term for 'thousand' is borrowed from Bagirmi.

4.6.4.3 Mbum (G6)

Table 4.113: Mbum numerals

1	mbew/mbiew, bɔ̄ɔ̄ŋ/búónó/bóm/vaŋno	7	10–3, rɪŋ, (rënām, tàrnā́gà)
2	seɗe/sere, gwa/ɓɔ̀-gë, ɓà-tì	8	10–2, nama/namma/nènmàʔä
3	say	9	10–1, doraŋ
4	nìŋ, nai	10	boo, dʒama/dʒémà, (dùɔ, hù-wàlë)
5	ndiɓi/ndēɓē/dūwēe/dápì	20	10*2, '2 hands', 10+10
6	ze(y)/ye(a), (tɔ́tɔ́klɔ́, bì-gírò)	100	sɔ́ɗ/sɔt, < Fula, < Arabic
		1000	'sac', bag', < Fula, < Bagirmi

This sub-group is represented by a dozen languages. Unlike Leko-Duru-Mumue no alignment by analogy is attested. Some forms of 'two' are of unclear morphological structure.

4.6.4.4 Day

Table 4.114: Day numerals

1	ngɔ̄ŋ́, *mon	7	4+3
2	dīí	8	4 redupl.?
3	tà	9	'lacking one'
4	ndà, *bī-yām	10	mɔ̰̀
5	sɛ̄rì	20	10*2
6	5+1	100	tù
		1000	< Bagirmi

This branch is comprised of an isolated language. Its attribution to Mbum-Day has been a subject of scholarly debate. The form **mon* '1' is postulated on the basis of *sērì mòn* 'six', whereas the reconstruction of **bīyām* (**bī-yām*?) '4' is based on *bīyām tà* 'seven'.

4.6.5 Waja-Jen (G9, G10, G1, G7)

4.6.5.1 Jen (G9)

Table 4.115: Jen numerals

1	kwín/*ʃín/tsɨng	7	5+2
2	ráb/*re, bwə-ng, bwa-yung	8	4PL, 5+3
3	gbunuŋ, bwa-tə	9	5+4
4	net, bwa-nyə	10	ʃóób, bwa-hywə
5	nóob/*na, bwa-hmə/*hwĩ	20	fa-1, ngwu-1
6	5+1	100	20*5
		1000	ʃik-1, 20-fe

This branch is represented by two languages: Burak and Jenjo (Dza). The evidence from this group is among Boyd's best arguments for the reconstruction of **kwin* (< **ku-di-n*) 'one'. The primary term *li* (*bwa-li*) 'fifteen' is attested in Jenjo. Accordingly, the term for 'sixteen' follows the pattern '15+1' (*bwali ji tsɨng*). Interestingly, in Burak the term for 'hundred' is *li* (*li kwín*).

The form **hwĩ* 'five' is traceable in Jenjo compound terms covering the sequence from 'six' to 'nine' (*hwĩ-tsɨng* 'six', *hwĩ-yung* 'seven', etc.) as is the corresponding Burak form **na* 'five' (*naa-ʃín* 'six', *náá-re* 'seven', *ná-tát* 'eight'). The form **re* 'two' is observable in *náá-re* 'seven', whereas **ʃín* 'one' is traceable in *naa-ʃín* 'six'.

4.6.5.2 Longuda (G10)

The evidence for the first ten numerals in two Longuda dialects can be found in the table above (Table 4.101). The term for 'twenty' in these languages follows the pattern '10*2'. The forms of 'hundred' are *pùlò(wé)/phulewe*.

Table 4.116: Waja numerals

1	w-in/d-in/kw-an/g-ɛɛn/*k-un?	7	ni-bir/ni-ber/ni-bil/ni-bi(y)
2	yɔ́-rɔ́b/rɔɔp/yob/yo, (su)	8	na-rib/na-lib/na-rub (4*2)
3	taat, kunuŋ, (bwanbí)	9	10–1, teer/teet/tɔɔrɔ
4	naat, (gwár)	10	kɔ́b/kub/kwab/kpop/kwu
5	nu(ŋ), (fwá:d)	20	10*2, ‘2 hands’
6	nu-kun (<5+1?)	100	<10?, wɔn, (bwa-tigɛ)
		1000	kʊ̃ʊ̃l, nèe/kú-néŋ, 100*10, bi-kate, tedu

4.6.5.3 Waja (G1)

Some languages in this sub-group are characterized by a sub-morphological alignment of the terms for ‘three’ and ‘four’ well-attested in Adamawa: Dadiya ***tal*** ‘3’ ~ ***nal*** ‘4’, Bangunji (dial.) 1 ***táát*** ‘3’ ~ ***náát***‘4’, Bangunji (dial.) 2 ***taar*** ‘3’ ~ ***naar*** ‘4’, Tula (Kɨtule) *jí-t:**à*** ‘3’ ~ *já:-**nà***‘4’. As a result, these terms are treated as minimal contrastive pairs in the paradigm. Within the NC context, forms with the final *-t* should be considered prototypical in the case of both terms. This means that **naa*X ‘four’ (final consonant unknown) may have evolved into **naat* by analogy with ‘three’ in Proto-Waja. Later, an innovative form for ‘three’ developed in Awak and Waja: Awak *kunúŋ*, Waja *kunoŋ*. The Dijim-Bwilim *bwanbí* is apparently an innovation.

Interestingly, the froms for ‘six’ attested throuought the sub-group resemble the Awak and Waja forms for ‘three’. However, the forms for ‘six’ can be explained as ‘5+1’ (assuming that they include an allomorph of **kun* ‘one’).

4.6.5.4 Yungur (G7)

The terms for ‘twenty’, ‘hundred’ and ‘thousand’ are attested in only one source (Kaan (Libo)) out of the eight sources available for this branch, hence they are quoted in brackets. Morphological analysis of the terms for ‘one’ and ‘two’ is unclear: **fV* may be a reflex of the original noun class prefix.

4.6.6 Laal

Finally, let us turn to the Laal numeral system. Laal’s attribution to the Adamawa languages (as well as its attribution to NC) is debatable. Today it is assumed that

Table 4.117: Yungur numerals

1	fini/fandi/pɔ́ndɔ́ŋ (< *ndi?), wunú	7	nbutu
2	raap, fətə/fiicì (< *tə/ci?)	8	4 redupl.
3	táákɔ́n/(tɑɑrɔ́n)	9	5+4
4	kurun	10	bú(u), (kutun)
5	wonon/wonun	20	(10*2)
6	mindike	100	(-ru)
		1000	(100*10)

it is an isolated case within Niger-Congo. Comparative study of its numerical terms may shed light on its genealogical relationship (Table 4.118).

Table 4.118: Numerals in Laal

1	ɓɨ̀dɨ́l (ɓɨ̀-dɨ́l?)	7	5+2
2	ʔīsī (ʔī-sī?)	8	4 redupl.
3	māā	9	yàŋjáŋ
4	ɓīsān (ɓī-sān?)	10	tūū
5	sāb, *swa-	20	10*2
6	cìcààn	100	10-'big'
		1000	< Baguirmi < Hausa

As in many other NC languages, the major problem with Laal numerals is the obscurity of their morphological structure. Pascal Boyeldieu established that traces of noun class suffixes are observable in Laal forms as their comparison to SG and PL forms show (see Boyeldieu 1982). However, as I tried to demonstrate elsewhere (Pozdniakov 2010), some traces of noun class prefixes had been preserved in this language as well. At this point, it seems reasonable to set the alternative variants aside for further comparison.

What follows is an attempt to synthesize the Adamawa evidence.

4.6.7 Proto-Adamawa

4.6.7.1 'One'

The main forms are given in Table 4.119.

Table 4.119: Adamawa stems for ‘1’

	‘1’	‘1’	‘1’	‘1’	‘1’	‘1’	‘1’	‘1’
Fali			*-lo					
Kam	b-ii							
Leko								
Duru		dəə		-(ŋ)gá/-na?/*nge	gbúnú	man(i)/*mal		
Leko				nɨŋa/níiá (<ŋa?)				
Mumuye		ɓī-ntī/ɓi-ni (*< nti/ni?)						gbétè
Mbum								
Bua		*dɛ	*do				bara(k)	ʈóŋ, *si?
Kim			ɗú			mōndā	mbírāŋ	
Mbum					bɔ̄ɔ̄ŋ/búónó			mbew/mbiew
Day				ngɔ̄ŋ́		*mon		
Waja								
Jen	kw-ín/*ʃ-ín/ts-ing (< *in)							
Longuda								khal, twɛ̀
Waja	w-in/d-in/g-ɛɛn/*k-un?							
Yungur		fi-ni/fa-ndi/pə́-ndəŋ (< *ndi?)			wunú			
Laal		ɓɨ̀dɨ́l (ɓɨ̀-dɨ́l?)						

In accordance with Boyd's hypotheses discussed above, the forms in the first two columns may be related in view of the reconstruction of the root **di* (possibly also **-in*), the noun class prefix **ku-* and the suffix **-n* (**ku-di-n* '1')

The last column lists forms that are attested in one of the branches only. The roots that can be tentatively reconstructed as **do*, **nga/ngɔ*; **(g)bunuand* and **mon* are noteworthy.

4.6.7.2 'Two'

The main forms of this root are quoted in Table 4.121. The grouping of forms is admittedly not substantiated enough. The variety of forms within this family is striking, even when unrestricted phonetic grouping is applied.

4.6.7.3 'Three'

Comparative evidence for this root points to its reconstruction as **taat* (with further alignment by analogy within each of the branches). As in the other NC families, the root is exceptionally stable, in contrast to the roots for 'one' and 'two' that demonstrate a wide variety of forms. A shared innovation in Jen and Waja (attested in Burak, Awak and Waja) is noteworthy.

Table 4.120: Adamawa stems for '3'

Fali-Yingilum	taan (< taaX)				
Kam	càr				
Leko-Duru-Mumuye					
Duru	tāātó/tāāro				
Leko	toorà/toonú				
Mumuye	taat				
Mbum-Day					
Bua	tar/tori/teri				
Kim	tā			hą̄sī	
Mbum	say				
Day	tà				
Waja-Ɉen					
Jen	bwa-tə	gbunuŋ			
Longuda	tsə́r		kwáí		
Waja	taat (bwanbí)	kunuŋ			
Yungur	táákə́n/(tɑɑrə́n)				
Laal					māā

Table 4.121: Adamawa stems for ‘2’

	‘2’	‘2’	‘2’	‘2’	‘2’	‘2’	‘2’	‘2’	‘2’
Fali-Yingilum						gbara	cuk		
Kam	yi-raak (i-ra)								
Leko-Duru-Mumuye									
Duru		du/ru, to		te/re					
Leko	ra?		ii-/in-?					nnú	
Mumuye			ye		ziti			nī	
Mbum-Day									
Bua		*ru, (rɔ̀k)	di/ri		(rete)				
Kim				zí	tʃírí				
Mbum				ɓà-tì	seɗe/sere	gwa/ɓɔ̀-gë			
Day			dīí						
Waja-Ƒen									
Jen	ráb/*re,								bwə-ng, bwa-yung
Longuda					shir	kwɛ́			
Waja	yɔ́-rɔ́b/rɔɔp/yob/yo						(su)		
Yungur	raap			fətə/fiicì (< *tə/ci?)					
Laal				ʔīsī (ʔī-sī?)					

4.6.7.4 'Four'

Table 4.122: Adamawa stems for '4'

Fali-Yingilum	naan				
Kam	nár				
	(< *naX)				
Leko-Duru-Mumuye					
Duru	natɔ́/narɔ́				
	(< *naX)				
Leko	naarà/nɛɛr-əb				
Mumuye	naat				
Mbum-Day					
Bua	na/nagi/niani			har	
Kim			ndà(y)		
Mbum	nai	nìŋ			
Day			ndà		*bī-yām
Waja-Ƒen					
Jen	net	bwa-nyə			
Longuda	nnyìr/nyìr				
Waja	naat			gwár	
Yungur					kurun
Laal					ɓīsān
					(ɓī-sān?)

The main NC form **na*X is predominant here, its second consonant being subject to alignment by analogy. The same root is likely to be reconstructed at the Proto-Adamawa level as well.

4.6.7.5 'Five'

The main root (*nun*) may be the same as in the Gur languages and may be etymologically related to the term for 'hand'. It is likely that the isolated forms quoted in the rightmost column go back to similar terms as well. The Jen root *hmə* could be a borrowing from Chadian Arabic: *xamsa* '5'. The Mbum forms *ndēɓē/ dūwēe* may be influenced by Fula (*jowi* 'five').

Table 4.123: Adamawa stems for '5'

Fali-Yingilum		kɛ̃rɛw		
Kam	ŋwún			
Leko-Duru-Mumuye				
Duru	núno/nɔɔn̰i,			gbà náárò/gbanáá, sáá
Leko	núúnà/núnn-ub			
Mumuye	nɔng/ghìnān			măːni
Mbum-Day				
Bua				luni/loni/*lu,tɛ(r), *kɔn?, (tiso)
Kim	nūwe̱y		ndìyārá	
Mbum			ndiɓi/dūwēe/dápì	
Day				sɛ̄rì
Waja-ɟen				
Jen	nóob/*na	-hmə/*hwĩ		
Longuda	nyɔ́			
Waja	nu(ŋ)			fwáːd
Yungur	wo-non/wo-nun			
Laal				sāb, *swa-

4.6.7.6 'Six'

Table 4.124: Adamawa stems and patterns for '6'

Fali-Yingilum				yira/yilo
Kam		jù:p		
Leko-Duru-Mumuye				
Duru	5+1	gúú		
Leko				nɔ̂ŋgɔ̂s/núŋgɔ́ɔs
Mumuye	5+1			
Mbum-Day				
Bua	5+1			tá:r, (nānò), (kaba), tipsi
Kim				māngùl/mènèngāl
Mbum				ze(y)/ye(a), tɔ́tɔ́klɔ́, bì-gírò
Day	5+1			
Waja-Jen				
Jen	5+1			
Longuda			tsààtən	2*3?
Waja	nu-kun (<5+1?)			
Yungur				mindike
Laal			cìcààn	

The most frequently attested pattern is '5+1'. However, there is a great variety of isolated forms (see the last column). The similarity between the Laal and Longuda forms is noteworthy; both may go back to Chadian Arabic *sit:e* 'six'. The Kim (and also Yungur?) form could be a borrowing from Bagirmi (*mìká* '6').

4.6.7.7 'Seven'

Table 4.125: Adamawa stems and patterns for '7'

Fali-Yingilum					jɔ̱rɔs
Kam			'second six'		
Leko-Duru-Mumuye					
Duru	5+2	4+3	6+'odd'		gútambe, dəmsàrà
Leko	5+2				
Mumuye	5+2				
Mbum-Day					
Bua	5+2	3+4			lúlú/lòŋgɔ̄/lur, (tiglen)
Kim				ɓēálā/ɓēálār	dĩyārā
Mbum					10−3, rɪŋ, rënām, tàrnā́gà
Day		4+3			
Waja-Jen					
Jen	5+2				
Longuda		4+3			
Waja				ni-bir/-bil/ -bi(y)	
Yungur					nbutu
Laal	5+2				

As in the case of 'six', the predominant pattern ('5+2') for 'seven' is rather plain. It co-exists with a variety of isolated forms of uncertain etymology.

4.6.7.8 'Eight'

Table 4.126: Adamawa stems and patterns for '8'

Fali-Yingilum	4 redupl.			
Kam				sâl
Leko-Duru-Mumuye				
Duru	4PL/4+4	5+3		< Hausa
Leko		5+3		< Hausa
Mumuye		5+3		
Mbum-Day				
Bua	4 redupl.	5+3		
Kim	ndāsì (4PL?)		wázìzí (10−2)	tīmāl
Mbum			10−2	nam(m)a/nènmàʔä
Day	4 redupl.?			
Waja-ɟen				
Jen	4PL	5+3		
Longuda				nyíthìn
Waja	4*2			
Yungur	4 redupl.			
Laal	4 redupl.			

The pattern '8=4 redupl.' is to be reconstructed at the Proto-Adamawa level.

4.6.7.9 'Nine'

Table 4.127: Adamawa stems and patterns for '9'

Fali-Yingilum		10–1/ŋgʌs kàm(kàn) kpòlò 'rest hand one'	
Kam			níízaa
Leko-Duru-Mumuye			
Duru		'one finger is left', nɨ́ŋsɨ́nè, 5+4, 10–1	
Leko	5+4	'one is left'	
Mumuye-Yandang	5+4		
Mbum-Day			
Bua	5+4	10-X	ti, jar
Kim		10–1	nòmīnā
Mbum		10–1	doraŋ
Day		'lacking one'	
Waja-ɟen			
Jen	5+4		
Longuda	5+4		
Waja		10–1	teer/teet
Yungur	5+4		
Laal			yàŋjáŋ

A primary term for 'nine' was apparently non-existent in Proto-Adamawa. A comparison between Bua *diar* and Kanuri *ləɣár* may be suggestive if a borrowing is considered. The same applies to the terms for 'nine' in Waja (*tɔɔrɔ*) and Hausa (*tara*).

4.6.7.10 'Ten'

Two alternative roots for 'ten' (Table 4.128) are distinguishable (**boo* and **kob* attested in four and two groups respectively). The root *d*(*u*)*o* is observable in two Mbum-Day sub-groups. Finally, the root *kutu*(*n*) is found in two languages, namely in Tunya (Bua) and Kaan (Yungur). Assuming that *ku-* is a class prefix, this root may prove to be related to *tūū* (Laal).

Table 4.128: Adamawa stems for '10'

Fali-Yingilum						ra
Kam	bóò					
Leko-Duru-Mumuye						
Duru	bō?,	kob/kop/ fób				
Leko		kób/kóp				
Mumuye		kop/kob				
Mbum-Day						
Bua			do(k)	kùtù		(filoːle), (yíppà), (teba)
Kim					wàl/ wòl/ wàr/ *wèy	
Mbum	boo		dùɔ		hù-wàlë	dʒama/ dʒémà
Day	mo̰					
Waja-ɟen						
Jen		ʃóób				bwa-hywə
Longuda		koo/kù				nôm
Waja		kɔ́b/kub/ kwab/ kpop/ kwu				
Yungur	bú(u)			kutun		
Laal				tūū		

4.6.7.11 'Twenty'

The term for 'twenty' (Table 4.129) in the Duru languages either follows the pattern '20=10*2' or goes back to the lexical roots for 'head' and 'staff'. The Niellim term *do-ksap* was likely borrowed from Bagirmi *dùg sap* 'twenty'.

Table 4.129: Adamawa stems and patterns for '20'

Fali-Yingilum	10*2				
Kam					*ǹkpǫ́, kpáímí
Leko-Duru-Mumuye					
Duru	10*2			gbɛg/ gbàhsɨ́ ('staff'), *wɔ́ɔ́g ('head'), zul/zur ('head')	ráárò, jùgúyɔ
Leko			laa-1		nɛd níi gbɛd
Mumuye					mba-1, kar-1, mim-1
Mbum-Day					
Bua	10*2		fa:lɛ		do-ksap, a-rep, a-hun
Kim	10*2				
Mbum	10*2	'2 hands', 10+10			
Day	10*2				
Waja-Jen					
Jen			fa-1		ngwu-1
Longuda	10*2				
Waja	10*2	'2 hands'			
Yungur	10*2				
Laal	10*2				

4.6.7.12 'Hundred'

Table 4.130: Adamawa stems and patterns for '100'

Fali-Yingilum					< Fula
Kam	20*5				
Leko-Duru-Mumuye					
Duru	20*5				< Fula
Leko	20*5				< Fula
Mumuye	20*5				
Mbum-Day					
Bua				ro/ru	
Kim					< Arabic
Mbum			sɔ́ɗ/sɔt		< Fula, < Arabic
Day			tù		
Waja-Jen					
Jen	20*5				
Longuda					pùlò(wé)/phulewé
Waja		<10?			wɔn, bwa-tigɛ
Yungur				(-ru)	
Laal		10-'big'			

The fact that this term was massively borrowed (most likely simultaneously) from Fula and Arabic suggests that it was lacking in Proto-Adamawa. It can be assumed that the root *ru* attested in Bua and Yungur is also a borrowing, this time from Bagirmi *àrú* 'hundred'.

4.6.7.13 'Thousand'

Table 4.131: Adamawa stems and patterns for '1000'

Fali-Yingilum		< Fula
Kam	?	
Leko-Duru-Mumuye		
Duru		< Fula, < Hausa
Leko	20*10?	< Fula
Mumuye	?	
Mbum-Day		
Bua		< Bagirmi
Kim		< Bagirmi
Mbum	'sack', bag'	< Fula, < Bagirmi
Day		< Bagirmi
Waja-Jen		
Jen	ʃik-1, 20-fe	
Longuda	?	
Waja	kʊʊl, nèe/kú-néŋ, 100*10, bi-kate, tedu	
Yungur	(100*10)	
Laal		< Baguirmi, < Hausa

The term for 'thousand' was massively borrowed from Fula, Bagirmi and Hausa, which points to its absence in the proto-language.

4.7 Ubangi

What follows is a preliminary analysis of the evidence of five separate language groups including Ubangi-Banda, Gbaya-Manza-Ngbaka, Ngbandi, Sere-Ngbaka-Mba (A. Ngbaka-Mba, B.Sere), and Zande.

4.7.1 Banda

The form *gba* 'ten' is traceable in the Mbanza (Mabandja) terms for tens.

Table 4.132: Numerals in Banda

1	bàlē (bà-lē?)	7	5+2
2	biʃi (bi-ʃi?)	8	5+3, ngebeɗeɗe
3	vɔ-tɑ	9	5+4, 8+1
4	và-nā	10	mó-rófō, bu-fu, 'two hands ',all the fingers',*gba
5	mī-ndū	20	'one person', 'the whole person', 'body-person-all'
6	5+1, gɑzɑlɑ	100	ngàmbɔ̀/ngbàngbɔ̀,'five persons' , < Sango , < Lingala?
		1000	< French 'sack', < Lingala?

4.7.2 Gbaya-Manza-Ngbaka

Table 4.133: Numerals in Gbaya-Manza-Ngbaka

1	*kpɔ́k/kpóm ;ndáŋ	7	*5+2
2	*bùà, *l̰íítɔ̀; bùwá (bù-wá?)/vàχ, -too	8	*5+3; 4PL
3	*tàr(à)	9	*5+4;kùsì
4	*nár(á)	10	*ɓú/ɓú-kɔ̰́
5	*mɔ̀ɔ̀rɔ́/mɔ̀r-kɔ̰́	20	*10*2
6	*5+1, (gàzɛ̀lɛ̀)	100	*gɔ́m-màá ; < Lingala
		1000	< French 'sack', < Lingala

Ives Moñino's reconstructions (Moñino 1995) are quoted in the table under an asterisk. Selected noteworthy forms are also included.

In the diachronical perspective, the forms **l̰íítɔ̀* and **bùà* 'two' probably included noun class prefixes. They go back to **-too* and **-wa* respectively (cf.*vàχ* '2' in Gbaya Mbodomo).

In his discussion of **mɔ̀ɔ̀rɔ́* Moñino states that "La variante **mɔ̀ɔ̀rɔ́* semble être une contraction de **mɔ̀r-kɔ̰́*, dans laquelle on peut reconnaître l'élément *kɔ̰́* 'main' … " (Moñino 1995: 655). He also makes the folowing observation regarding the reconstruction of the term for 'ten': "**ɓú* 'dix' est en relation avec **ɓú* 'façonner, faire un cercle, joindre les mains'; la série partielle *ɓú-kɔ̰́* est encore plus explicite, et décrit le geste qui accompagne l'énonciation du chiffre 10 chez tous les locuteurs" (Moñino 1995: 656).[19] This is an important point, especially in view of the relatively frequent occurrence of *bu* in the NC languages and the possible etymological relationship between **ɓú* and phonetically similar forms attested in other branches. However, such a relationship would be doubtful within Moñino's etymological hypothesis.

The following etymology is suggested for 'hundred' by Thomas Elvis Guenekean: "The word *gɔ̀̀m* means 'cut' or 'gathered' and *n͡mà:* means 'things'."[20] According to Moñino, the form literally means 'frapper-l'une l'autre (les mains)' (Moñino 1995: 657).

4.7.3 Ngbandi

The Ngbandi and Yakoma evidence points toward the reconstruction outlined in the table below (Table 4.134).

Table 4.134: Numerals in Ngbandi

1	kɔ(i)	7	mbara-mbara
2	sɛ	8	miambe/myɔ̀mbè
3	ta	9	gumbaya
4	siɔ/syɔ	10	sui, bàlé
5	kɔ̃/kṵ̄	20	10*2
6	mana, mèrɛ̄	100	ngbangbo
		1000	< Lingala, Arabic

[19] However, in some Gbaya languages, these forms differ by tone: Gbaya (Roulon-Doko) ɓú '10' ~ ɓu 'to tap; to applaud, to roll'.

[20] https://mpi-lingweb.shh.mpg.de/numeral/Gbaya-Bossangoa.htm

4.7.4 Sere-Ngbaka-Mba

Since the languages within this group are extremely divergent, it seems reasonable to treat the evidence from its two major sub-groups separately.

Ngbaka-Mba (Table 4.135)

Table 4.135: Numerals in Ngbaka-Mba

1	kpó-/kpáà-, ɓa-wɨ, ɓī-nì/bì-rì, ú-ma	7	5+2, (mā-nāníkà, lɔ̀-rɔzi, zyálá, sáɓá), sílànā/sélènā/ʃíēnā (<4?)
2	bīʃ-ì/ɓī-sī, ɓi-né/bí-de, gbwɔ̀	8	sɛ́nā (2*4?), gba-dzena/ mā-dʒɛ́nà, (5+3, 10−2)
3	ba-ta/ba-la	9	5+4, 10−1, (me-newá)
4	ba-na/ba-ɗa/ba-la	10	nzò kpā̰(‘head-hand’)/àngbà, a-busa
5	bu-ruwe/bu-luve/θuwe, ʔeve/ve/vue	20	10*2
6	ʃí-tà/si-ta (2*3), mā-ɗíà/ká-zyá, 5+1	100	< Sango, < Lingala, 20*5, (mya, kʉ́lɔ́, kpode, ngūndāngū)
		1000	gyu, kutu, < Arabic, < French (‘sack’), 100*10

Sere (Table 4.136)

Table 4.136: Numerals in Sere

1	njɛ̃e	7	5+2
2	so	8	5+3
3	táʔò	9	5+4
4	nàʔò	10	ɓɪ̃̀-kürü , muʔɓì (‘on hands’)
5	vo	20	‘kill-person-one’
6	5+1	100	‘kill-persons-five’, < Arabic
		1000	100*10

Sere-Ngbaka-Mba (Table 4.137)

Table 4.137: Sere-Ngbaka-Mba numeral system (*)

1	kí-lī, sa	7	5+2
2	ī-jō/ī-yō/úé	8	5+3
3	bíá-tá/ā-tā	9	5+4
4	lu, bīà-ngì ~ bīà-mà	10	ŋgbɔ̄/bà-wē
5	ì-sìbē/bī-sùè	20	‘people one’
6	5+1	100	ndɔŋgbʉ́, ngbàngbù< Sango
		1000	sákì/sākè (< Sango < French)

4.7.5 Proto-Ubangi

The evidence pertaining to each of the numerical terms is summarized below.

4.7.5.1 ‘One’

Table 4.138: Ubangi stems for ‘1’

Banda	bàlē (bà-lē?)				
Gbaya-Manza-Ngbaka		kpɔ́(k)/(kpémɔ́ŋ)			
Ngbandi		kɔ(i)			
Sere-Ngbaka-Mba					
Ngbaka-Mba	ɓī-nì/bì-rì	kpó- /kpáà-		ɓa-wɪú-ma	
Sere			njɛ̃e		
Zande	kí-lī				sa

Two competing roots (**le/ne* and **k(p)o(k)*) are distinguishable here.

4.7.5.2 'Two'

Table 4.139: Ubangi stems for '2'

Banda	biʃi (bi-ʃi?)			
Gbaya-Manza-Ngbaka		bùwá (bù-wá?)/vàχ	-too	
Ngbandi	sɛ			
Sere-Ngbaka-Mba				
Ngbaka-Mba	bī-ʃì/ɓī-sī	gbwɔ̀		ɓi-né/bí-de
Sere			so	
Zande				ī-jō/ī-yō/úé

The only root widely attested within this family is **si/ʃi*.

4.7.5.3 'Three' and 'four'

Table 4.140: Ubangi stems for '3' and '4'

	'3'	'4'	'4'
Banda	vɔ-tɑ	vɑ̀-nɑ̄	
Gbaya-Manza-Ngbaka	tààr	náár	
Ngbandi	ta		siɔ/syɔ
Sere-Ngbaka-Mba			
Ngbaka-Mba	ba-ta/ba-la	ba-na/ba-ɗa/ba-la	
Sere	táʔò	nàʔò	
Zande	bíá-tá/ā-tā		lu, bīà-ngì ~ bīà-mà

The roots for 'three' and 'four' can be securely reconstructed as **taar* and **naar* respectively (with an alignment by analogy applied).

4.7.5.4 'Five'

Table 4.141: Ubangi stems for '5'

Banda	mī-ndū		
Gbaya-Manza-Ngbaka		mɔ̀r-(k)ɔ́	
Ngbandi		kɔ̃/kṵ̄	
Sere-Ngbaka-Mba			
Ngbaka-Mba	bu-ruwe/-luve/θuwe	ʔeve ~ ve/vue	
Sere		vo	
Zande			ì-sìbē/bī-sùè

The Proto-Ubangi form is unclear, since the term for 'five' is based on the lexical root meaning 'hand' (**kɔ*) in two groups out of five. The only root whose attestations are not limited to a single group is **du(w)/lu(w).*

4.7.5.5 'Six'

Table 4.142: Ubangi stems and patterns for '6'

Banda	5+1	gɑ-zɑlɑ	
Gbaya-Manza-Ngbaka	5+1	gà-zɛ̀lɛ̀	
Ngbandi			ma-na, mɛ̀-rɛ̄
Sere-Ngbaka-Mba			
Ngbaka-Mba	5+1	mā-ɗía/ká-zyá	ʃí-tà/si-ta (2*3)
Sere	5+1		
Zande	5+1		

In addition to forms that follow the common pattern '6=5+1', a number of other forms of uncertain etymology are attested in the first two groups (and possibly in Sere-Ngbaka-Mba as well, assuming that our morphological analysis of pertinent forms is correct).

4.7.5.6 'Seven'

Table 4.143: Ubangi stems and patterns for '7'

Banda	5+2	
Gbaya-Manza-Ngbaka	5+2	
Ngbandi		mbara-mbara
Sere-Ngbaka-Mba		
Ngbaka-Mba	5+2	mā-nāníkà, lè-rəzi, zyálá, sáɓá, sílànā/sélènā/ʃíēnā (<4?)
Sere	5+2	
Zande	5+2	

The variety of forms attested in Ngbaka-Mba is noteworthy.

4.7.5.7 'Eight'

Table 4.144: Ubangi stems and patterns for '8'

Banda	5+3		ngebeɗeɗe
Gbaya-Manza-Ngbaka	5+3	4PL	
Ngbandi			miambe/myɔ̀mbè
Sere-Ngbaka-Mba			
Ngbaka-Mba	5+3	sɛ́nā (2*4?)	g͡ba-dzena/mā-dʒɛ́nà, 10–2
Sere	5+3		
Zande	5+3		

4.7.5.8 'Nine'

Apparently, at the family level the common pattern '5+' should be assumed for the terms from 'six' to 'nine'. Isolated forms attested in groups and sub-groups are quoted here (as well as in the cases of other families) in order to collect exhaustive evidence for further etymological analysis. Moreover, a small chance that the Niger-Congo proto-form is traceable within only a single branch should not be ignored.

Table 4.145: Ubangi stems and patterns for ‘9’

Banda	5+4	8+1
Gbaya-Manza-Ngbaka	5+4	kùsì
Ngbandi		gumbaya
Sere-Ngbaka-Mba		
Ngbaka-Mba	5+4	10–1, (me-newá)
Sere	5+4	
Zande	5+4	

4.7.5.9 ‘Ten’

Table 4.146: Ubangi stems for ‘10’

Banda	bu-fu	*gba	mó-rófō, ‘ two hands’, ’all the fingers’
Gbaya-Manza-Ngbaka	‘personne’ (’joindre les mains’)		
Ngbandi			sui, bàlé
Sere-Ngbaka-Mba			
Ngbaka-Mba		nzò-kpa̰ ’head’-‘hand’)/à-ngbà	a-busa
Sere			ɓĩ̃-kürü, ‘on hands’
Zande		ŋgbɔ̃/bà-wē	

The reconstruction of the term for ‘ten’ is so problematic that it raises doubts as to whether it was present in Proto-Ubangi at all. In view of the convincing internal etymology suggested by Ives Moñino, the root **bu* alternating with **pu* and **fu* in some of the NC families is an unlikely candidate. The reconstruction of **gba/ kpa* is worth considering. However, the root may not be primary.

4.7.5.10 'Twenty'

Table 4.147: Ubangi stems and patterns for '20'

Banda	'one person', 'the whole person', 'body-person-all'	
Gbaya-Manza-Ngbaka		10*2
Ngbandi		10*2
Sere-Ngbaka-Mba		
Ngbaka-Mba		10*2
Sere	'kill-person-one'	
Zande	'people one'	

Two reconstruction possibilities are available here, i.e. the pattern '20=10*2' commonly attested in NC, and a derivation from the lexical term meaning 'person'.

4.7.5.11 'Hundred'

Table 4.148: Ubangi stems and patterns for '100'

Banda	ngàmbɔ̀/ngbàngbò	'five persons'< Sango, < Bangala (< Lingala?)
Gbaya-Manza-Ngbaka		'cut/gathered'-'things'? 'clap hands'?, < Lingala
Ngbandi	ngbangbo	
Sere-Ngbaka-Mba		
Ngbaka-Mba		< Sango, < Lingala, 20*5, (mya, kʉ́lɔ́, kpode, ngūndāngū)
Sere		'kill-persons-five', < Arabic
Zande	ngbàngbù < Sango	'ndɔ̄ŋgɓʉ́

Most of the forms are apparent borrowings which suggests that the term for 'hundred' was absent in Proto-Ubangi.

4.7.5.12 'Thousand'

The absence of the term for 'thousand' in Proto-Ubangi is even more evident than the absence of the term for 'hundred.'

Table 4.149: Ubangi stems and patterns for '1000'

Banda	< French, < Lingala?	
Gbaya-Manza-Ngbaka	< French, < Lingala, tɔ́màỳ	
Ngbandi	< Lingala, < Arabic	
Sere-Ngbaka-Mba		
Ngbaka-Mba	< Lingala, < Arabic, < French, 100*10	gyu
Sere	1000*10	
Zande	< Sango < French	

4.8 Dogon and Bangime

A step-by-step reconstruction of Dogon numerals does not seem reasonable because the family is relatively homogeneous. In addition, the formal differences between the numerical terms do not seem to correlate with the internal genealogical classification of the Dogon languages. The table below offers an overview of the pertinent data (Table 4.150) and is followed by a brief commentary.

Table 4.150: Dogon numerals

1	túrú/tumɔ, ti(i)	7	suli/soli/soye
2	lɛ́(y)/lɔ́(y)/nɛ́(y)/nɔ́(y)	8	gá(a)rà, sagi, sele (< Mande?)
3	taan	9	túwɔ́
4	nay(n), kɛɛso	10	pérú/pɛ́lú
5	núnɛ́ɛ́(n)/nŭ:(yn)/nûm	20	10*2
6	kuro/kule	100	80 (síìŋ/súŋ) +20, < Fula
		1000	800 (múɲú) +200

'**One**': Najamba-Kindige: *kúndé* '1', Mombo *yè:tá:ŋgù* '1'.

‘**Two**’: The forms with the nasal **n-** attested in several dialects are variants of the basic form with ***l-**. It should be noted that the final palatal element is systematically attested in other numerical terms, e.g. in Ben Tey (Table 4.151).

Table 4.151: Final palatal in ‘2’

2	yěy	6	kúròy
4	nǐ:y^{n}	7	súy^{n}ɔ̀y^{n}
5	nùmǔy^{n}	8	gá:rày

Regardless of whether this element is a morpheme or not, we are certainly dealing with a phonetic alignment by the final segment. Thus the final **-y** should not be reconstructed even in those forms that show its presence in the majority of languages.

‘**Three**’: This is a persistent form with only minor modifications applied to it (e.g. *taandu*, *taali*).

‘**Four**’: This is the only term for which the final palatal (probably nasalized) is potentially reconstructable. If so, systematic alignments by analogy attested in final segments of other numerals are probably based on the form of ‘four’. The root *kɛɛso/ ké:jɔ́/ ké:jɛ̀y/ cézɔ̀/ yè-cézɔ́* is probably an innovation (see, however, Jeff Heath who argues for its archaic nature.[21]) The term may be etymologically connected to the term for ‘eighty’, cf. Najamba-Kindige *sîm*, *kɛ̀:sǔm*, Tommo So *kɛ̀ɛ̀súm* and a number of other related forms (Yorno So *dɔ̀gɔ̀-sǔm*’80’, “Dogon hundred”, Valentin Vydrin, p.c., Perge Tegu *dɔ̀gɔ̀-sǔŋ* ‘80’, Yanda Dom *sìŋ* ‘80’ etc.).

‘**Five**’: The etymological connection of this term with the lexical root meaning ‘hand’ *nùmà/ nùmó/ nùmɔ́/ nǒỹ* is immediately apparent.

‘**Six**’ **and** ‘**seven**’: These are probably primary terms.

‘**Eight**’: The root *sagi* attested in Najamba and Yanda Dom was probably borrowed from Mande. The forms *sila, seele* observable in a number of dialects may

[21] http://dogonlanguages.org

be related to it. The root *gá(a)rà* is commonly attested in the majority of languages of this group, sometimes with a partial reduplication (Donno So/Yorno So/Toro So *ga-gara/ga-gira*). Partial reduplication is a popular means of deriving 'eight' from 'four' commonly attested throughout NC. In view of the fact that the Dogon counting system is based on 8, this root should probably be compared to *gàrá,* meaning 'big, large, a large quantity, a lot, go beyond (limit), more, to a greater extent'. Tonal differences may be neglected in this case, especially since the derived forms tend to be formally marked, e.g. tonally.

'**Hundred**': The basic 'large number' in Dogon is 'eighty' rather than 'hundred', so this meaning should probably be reconstructed for *siiŋ/suŋ*. In view of this, the fact that the term for 'hundred' was borrowed from Fula in nearly all Dogon languages is not a coincidence.

'**Thousand**': Similarly, the root *muɲu* (var. *mùsú* / *mùdʒú*) '800' incorporated into the pattern '1000=800+200' is reconstructed in Dogon.

The Bangime numeral system should also be considered here, since most of the numerical terms attested in this isolated language are comparable to those found in Dogon (Table 4.152).

Table 4.152: Bangime numerals

1	tòré/tĭyɛ́ (in counting)	7	kĭjé
2	jíndò	8	sàágín (< Mande?)
3	táárù	9	tɛ́gò
4	nìjɛ́	10	kúré
5	nŭndí	20	tàáw̃á
6	kĕré	100	tɛ̀ɛ̀mèdéré (< Fula)
		1000	mŭʒú

As in Dogon, the terms covering the sequence from 'six' to 'nine' are primary. An isolated root for 'forty' (also represented in some of the Dogon languages) is attested in Bangime. Interestingly, the root is the same as the one found in some of the Mande languages, cf. Bangime *dɛ̀vɛ́*, Dogulu Dom (Dogon) *dɛ̀ɛ́*, Mombo (Dogon) *dɛ̂ː*, Marka Dafing *dɛbɛ*, Bozo *dɛ̀bɛ́/ lɛ́wɛ̀*, Bamana *dɛ̀bɛ́*.

The root for 'ten' does not correspond to the one attested in Dogon. The latter finds a direct parallel in Boko (East Mande *kuri* 'ten'.

4.9 Gur

It should be noted that the Gur languages are extremely divergent in the majority of their numerical terms (including those that prove to be fairly persistent in other families). The approach we took for the evidence studied above (i.e. the establishing of the most common forms and their further comparison to the data from other branches) may not appear fruitful in the case of the Gur languages.

To deal with the problem, we are going to use the classification of the Gur languages found in *Ethnolog*, namely A. Bariba, B. Central, C. Kulango, D. Lobi, E. Senufo, F. Teen, G. Tiefo, H. Tusia, I. Viemo, J. Wara-Natioro.[22] The Gur family comprises nearly a hundred languages. In terms of the classification outlined above, their distribution is uneven. Seven groups (Bariba, Kulango, Lobi, Teen, Tiefo, Tusia, Viemo) have an isolated language as their only member. Similarly, Wara-Natioro is represented by only three idioms. This means that the majority of the Gur languages are split between the two remaining groups, i.e. Senufo and Central. The former is comprised of about fifteen languages and is relatively homogenous. Its affiliation to Gur is often considered doubtful. Compared to Central, which embraces the majority of the Gur languages (nearly seventy), this group is relatively small. Two major sub-groups are identifiable within Central, i.e. Northern (38 languages) with Oti-Volta (33 languages) as the dominant branch and Southern (31 languages) with its dominant branch of Grusi (23 languages). In other words, 71 of the Gur languages (out of a total of 91) belong to either Oti-Volta, Grusi or Senufo. In addition to that, there are more than ten branches represented by a single isolated language each. No evidence points to their possible affiliation with the major branches or to their inter-relationship. The same can probably be said about several isolated languages affiliated (often uncritically) with the Central group (the Bwamu, Kurumfe, Dogoso-Khe, Gan-Dogosé, and Kirma-Tyurama branches). This already complex picture gets even more sophisticated in view of the following:

1. Branches represented by one or two languages (e.g. Buli-Konni, Notre, Yom-Nawdm) are distinguishable even within the most reliably established bodies of genetically related languages of this family.

2. According to Ulrich Kleinewillinghöfer (p.c.), who is a renowned expert in both Gur and Adamawa comparative linguistics, a border between these

[22] This classification is accepted here with slight modifications based on recent studies. For instance, Dyan and Lobi are treated as members of the same branch.

two families is not clear at all. This means that some of the Gur branches may prove to be more closely related to Adamawa.

Our reconstruction of the Gur numeral system is based on nearly 120 sources that vary in regards to the evidence they offer (cf. our considerations above). By addressing one of the most problematic cases (i.e. the reconstruction of the Gur term for 'one') we hope to work out a general approach that will eventually allow further comparison of the Gur evidence to that of other NC families.

4.9.1 'One'

The table below lists several forms of the term for 'one' in smaller Gur branches (Table 4.153).

Table 4.153: Diversity of stems for '1' in Gur

Gurma	Grusi-Eastern	Grusi-Western
Akaselem: m̀-bá	Bago-Kusuntu: ŋʊ̀rʊ̀kpákpá	Chakali: díɡímáná
Bimoba: yènn	Chala: -re-, -dʊ́ndʊ̀lʊŋ	Deg: beŋ-kpaŋ/kpee
Miyobe: n-ni (-sɛ)	Delo: daale	Phuie: déò/dùdúmí
Nateni: -cɔ̃, dèn	Kabiye: kʊ́-yʊ́m	Sisaala: kʊ̀-bàlá/dìáŋ
Ngangam: mi-kpìɛkm	Lama: kó-ɖə́m	Winyé: n-do

A brief study of these examples raises doubts as to whether the Gur numeral system is reconstructable at all (not to mention the Grusi-Northern system or those of the more isolated Gur branches).

Even if we consider one syllable roots of the CV(C)-type only, the impression will remain that every concievable root for 'one' is attested in the Gur languages. However, none of these roots is traceable in at least half of the Gur groups. This situation is reflected in the matrix below (Table 4.154).

The first figure refers to the number of groups where a form is attested (with a maximum of 10 groups), whereas the second one refers to the number of languages. Thus, **B-I** denotes a form comprising a voiced labial consonant (b, w or m) and a front vowel that is attested in five languages within three groups (Central, Lobi-Dyan and Senufo) (Table 4.155).

The remaining forms are quoted below as an illustration of their extreme divergency.

Table 4.154: Distribution of the CV(C)- forms for '1' in the Gur languages

	I	A	U
P (p/f)	–	–	–
B (b/w/m)	3/5	1/4	1/1?
T (t)	1/1	2/2	–
D (d/l/r/n)	3/16	–	3/13
C (c/s)	–	–	1/1
J (j/y/ny)	1/18	1/1	1/1
K (k/h/x)	2/5	1/2	2/4
G (g/ŋ)	1/5	1/1	1/1

Table 4.155: BI- forms for '1' in Gur (3 groups, 5 languages)

béé	Ditammari	B. Central	1. Northern	C. Oti-Volta	ii. Eastern
bìè-	Lobi	D. Lobi-Dyan			
bɛ̃̀g	Dyan	D. Lobi-Dyan			
nì-bín	Cebaara	E. Senufo			
nan-bin	Shempire	E. Senufo			

(1) a. **BA** (1/4) (Table 4.156).

Table 4.156: BA- forms for '1' in Gur (1 group, 4 languages)

M̀-bá	Akaselem	B. Central	1. Northern	C. Oti-Volta	Gurma
bàa	Konkomba	B. Central	1. Northern	C. Oti-Volta	Gurma
mi-ba	Ngangam	B. Central	1. Northern	C. Oti-Volta	Gurma
ǹ.-bá/-bɔ́	Ntcham	B. Central	1. Northern	C. Oti-Volta	Gurma

b. **BU** (1/1): only *pú-wò* (possibly *púw-ò*, **PU?**) in Wara (J.Wara-Natioro)

c. **TI** (1/1): only *tía* in Baatonum (A.Bariba)

d. **TA** (2/2) (Table 4.157).

Table 4.157: TA- forms for '1' in Gur

ta, taà, tãã̀	Kulango (dial.)	C.Kulango
tani	Teen (dial.)	F.Teen

e. **DI** (3/15) (Table 4.158).

Table 4.158: DI- forms for '1' in Gur

dè	Bwamu (Boore)	B. Central	1. Northern	A. Bwamu	
nni	Miyobe	B. Central	1. Northern	C. Oti-Volta	iii. Gurma
dèn	Nateni	B. Central	1. Northern	C. Oti-Volta	iii. Gurma
lé	Khe Southern	B. Central	2. Southern	A. Dogoso-Khe	
í-lèŋ	Khisa	B. Central	2. Southern	C. Gan-Dogose	
re-	Chala	B. Central	2. Southern	D. Grusi	i. Eastern
dííŋ	Paasaal	B. Central	2. Southern	D. Grusi	iii. Western
déò	Phuie	B. Central	2. Southern	D. Grusi	iii. Western
dìáŋ	Sisaala (dial.)	B. Central	2. Southern	D. Grusi	iii. Western
dìɛ́n	Sisaala (dial.)	B. Central	2. Southern	D. Grusi	iii. Western
diigɛ	Tampulma	B. Central	2. Southern	D. Grusi	iii. Western
déiŋ	Kirma	B. Central	2. Southern	E. Kirma-Tyurama	
dɛ̃ɛ̃n-	Turka	B. Central	2. Southern	E. Kirma-Tyurama	
nɔ̀-ni	Karaboro (dial.)	E. Senufo			
dɛ̃̀	Tiefo (dial.)	G. Tiefo			

f. **DU** (3/13) (Table 4.159)

Table 4.159: DU- forms for '1' in Gur

dòǔ	Bwamu	B. Central	1. Northern	A. Bwamu	
dòòn	Bwamu	B. Central	1. Northern	A. Bwamu	
dò	Láá Láá	B. Central	1. Northern	A. Bwamu	
rʊ	Chala	B. Central	2. Southern	D. Grusi	i. Eastern
kà-lʊ̀	Kasem (dial.)1	B. Central	2. Southern	D. Grusi	ii. Northern
kà-lʊ	Kasem (dial.)2	B. Central	2. Southern	D. Grusi	ii. Northern
è-dù	Lyele	B. Central	2. Southern	D. Grusi	ii. Northern
ù-dù	Northern Nuni	B. Central	2. Southern	D. Grusi	ii. Northern
nə̀-dʊ̀	Southern Nuni	B. Central	2. Southern	D. Grusi	ii. Northern
n-do	Winyé	B. Central	2. Southern	D. Grusi	iii. Western
nú-nu	Nafaanra	E. Senufo			
dũde	Viemo	I.Viemo			

g. **CU** (1/2): only *mà-cɔ́* in Nateni (Central: 1. Northern: C.Oti-Volta: iii. Gurma

h. **JI** (1/19) (Table 4.160)

Table 4.160: CI- forms for '1' in Gur

yéŋ/ wà-ɲī	Buli	B. Central	1. Northern	C. Oti-Volta	i. Buli-Koma
yɛ̃n	Mbelime	B. Central	1. Northern	C. Oti-Volta	ii. Eastern
yènn	Bimoba	B. Central	1. Northern	C. Oti-Volta	iii. Gurma
yèn-	Gurma	B. Central	1. Northern	C. Oti-Volta	iii. Gurma
jènǹ	Moba	B. Central	1. Northern	C. Oti-Volta	iii. Gurma
bõ-ɣén	Birifor (dial.)	B. Central	1. Northern	C. Oti-Volta	iv. Western
bo-yæn	Birifor (dial.)	B. Central	1. Northern	C. Oti-Volta	iv. Western
bõ-yen	Dagaara (dial.)	B. Central	1. Northern	C. Oti-Volta	iv. Western
yén-	Dagaara (dial.)	B. Central	1. Northern	C. Oti-Volta	iv. Western
yén	Farefare	B. Central	1. Northern	C. Oti-Volta	iv. Western
yé	Moore	B. Central	1. Northern	C. Oti-Volta	iv. Western
bɔ́-ŋjìŋ	Wali	B. Central	1. Northern	C. Oti-Volta	iv. Western
yín	Dagbani (Dagomba)	B. Central	1. Northern	C. Oti-Volta	iv. Western
yɪn-	Hanga	B. Central	1. Northern	C. Oti-Volta	iv. Western
yín	Kamara	B. Central	1. Northern	C. Oti-Volta	iv. Western
yén-	Kantosi	B. Central	1. Northern	C. Oti-Volta	iv. Western
yín	Mampruli	B. Central	1. Northern	C. Oti-Volta	iv. Western
nyə̌ŋ	Yom (Pila)	B. Central	1. Northern	C. Oti-Volta	v. Yom-Nawdm

i. **JA** (1/1) – only *à-yà?* in Safaliba (B. Central: 1. Northern: C.Oti-Volta: iv. Western)

j. **JU** (1/1) – only *yòn* in Waama (B. Central: 1. Northern: C.Oti-Volta: ii. Eastern)

k. **KI** (2/5) (Table 4.161)

Table 4.161: KI- forms for '1' in Gur

n̩-hén	Nawdm	B. Central	1. Northern	C. Oti-Volta	v. Yom-Nawdm
kpee	Deg	B. Central	2. Southern	D. Grusi	iii. Western
kpéé	Vagla	B. Central	2. Southern	D. Grusi	iii. Western
nì-kǐ	Sìcìté Senufo	E. Senufo			
nìŋ-kìn	Supyire Senufo	E. Senufo			

l. **KA** (1/2) (Table 4.162)

Table 4.162: KA- forms for '1' in Gur

beŋ-kpaŋ	Deg	B. Central	2. Southern	D. Grusi	iii. Western
kpáŋ	Vagla	B. Central	2. Southern	D. Grusi	iii. Western

m. **KU** (2/3) (Table 4.163)

Table 4.163: KU- forms for '1' in Gur

kpò	Khe (dial.)	B. Central	2. Southern	A. Dogoso-Khe
tì-kpó?	Dogose	B. Central	2. Southern	C. Gan-Dogose
t^{h}i-ḳpo	Kaansá	B. Central	2. Southern	C. Gan-Dogose
nú-kú	Toussian (dial.)	H. Tusia		

n. **GI** (1/5) (Table 4.164)

Table 4.164: GI- forms for '1' in Gur

niŋ-gbe	Palaka Senufo	E. Senufo
nī-gbe	Nyarafolo Senufo	E. Senufo
ni-gỳ̃/ni-gĩ	Mamara Senufo (Minyanka)	E. Senufo
nin-gin	Shempire Senufo	E. Senufo
nu-gbe	Tagwana Senufo	E. Senufo

o. **GA** (1/1) – only *nuŋ-gba* in Djimini Senufo (E. Senufo).

p. **GU** (1/1) – only *gbú* in Northern Khe (B. Central: 2. Southern: A. Dogoso-Khe).

The only lacuna in this presentation is due to the lack of forms with voiceless labial consonants (this, however, may not prove true in the case of Wara-Natioro, as we hope to demonstrate below). It should be noted that the general distribution pattern is that a single form is attested in one branch out of ten, three forms are found in both two and three branches, and none of the forms is recorded in four or more branches. This makes an attempt at tracing them down to a source form (with its further comparison to the evidence of the other families) unreasonable.

In view of the genetic classification of the Gur languages and the considerations presented above, the optimum solution to the problem probably lies within separate reconstructions of numerals in the following sixteen Gur branches that belong to ten major language groups of this family, assuming that each of them may shed some new light on the reconstruction of the Niger-Congo numeral system:

1. Bariba
2. Central: 1. Northern: A. Bwamu
2. Central: 1. Northern: B. Kurumfe
2. Central: 1. Northern: C. Oti-Volta
2. Central: 2. Southern: A. Dogoso-Khe
2. Central: 2. Southern: C. Gan-Dogose
2. Central: 2. Southern: D. Grusi
2. Central: 2. Southern: E. Kirma-Tyurama
3. Kulango
4. Lobi-Dyan
5. Senufo
6. Teen
7. Tiefo
8. Tusia
9. Viemo
10. Wara-Natioro.

Numerical terms as attested in each of these branches will be examined below.

Table 4.165: Bariba numerals

1	tiā	7	5+2
2	ru	8	5+3
3	i-ta	9	5+4
4	ǹ-nɛ	10	wɔ-kuru
5	nɔ̀ɔbù	20	yɛndu
6	5+1	100	20*5
		1000	fɔ̀rɔ̀tɔ?

4.9.2 Bariba

4.9.3 Central Gur

4.9.3.1 Northern Central Gur

4.9.3.1.1 Bwamu

Table 4.166: Bwamu numerals

1	do	7	5+2
2	ɲū	8	5+3
3	tĩ	9	dl̃iní/dènú
4	náa	10	pílú/píru/ˀɓúrúù
5	hò-nú	20	ɓóní/ɓénle/kēwēníì
6	5+1	100	kʰĩminù (< Mande keme)
		1000	100*10, muaseé

4.9.3.1.2 Kurumfe

4.9.3.1.3 Oti-Volta

i. Buli-Koma (Table 4.168)

ii. Eastern (Table 4.169)

Please note the extreme divergency of languages within this branch: the variety of forms presented in the table above are attested in only four languages, i.e. Biali, Ditammari, Mbelime and Waama.

Table 4.167: Kurumfe numerals

1	dom	7	pɛ̃ɛ̃
2	hĩĩ	8	tɔɔ
3	tãã	9	fa
4	nãã	10	fɪ
5	nɔm	20	sofe (<10?)
6	hʊrʊ	100	bɛrʊ
		1000	tʊsrɪ < from Moore

Table 4.168: Buli-Koma numerals

1	yéŋ (adj.), ní (count)	7	yòpɔ̄āī, pṍî
2	yè, li	8	nāāniŋ/à-níì (<* 4 redupl., 4PL?)
3	tà	9	nèūk/ŋ̀wɛ́
4	nààsì/nísà	10	pī/bâŋ
5	nù	20	10*2
6	yùèbì/óbìŋ	100	kòòk, kobɪga/bóɾà
		1000	< Engl.

Table 4.169: Eastern Oti-Volta numerals

1	cərə, béé, dèǹnì (counting), yɛ̃nde/yòn, *de	7	pèléī/bérén, yīēkà/nyiekɛ, doodɛ̄ (6+1)
2	dyā, déé, diání/dɛɛni, yēdē/yɛ́ndí	8	nēī/nɛ̃́ī/ni/ninyɛ̃̄
3	tâati/tâadi/tāārī	9	wáī/wɛi/wɛ̄
4	naa(si)	10	pwígə/pííkà/piíkɛ/piitɛ , *pi
5	num(mu)/nun	20	10*2
6	kūà/kuɔ, dūo, hə̃̀dwàm, kpàrùn	100	kòɣə/kookɛ/kɔ́úkpà/kɔ̀ɔ̀tà
		1000	túsírè

iii. Gurma (Table 4.170)

Table 4.170: Gurma numerals

1	bá, yènn(do), den (isol.: ni, cɔ̃)	7	lòlé/lèlé (isol.: sɛ́ɛ́i, yehì)
2	le/dɛ́/tɛ́	8	ni(n)
3	tà	9	wɛ̀ʔ/wɛ́ɛ/wɔ́ì/wáī
4	nà(hì)	10	píík/pʷíʔ/fi/pita
5	mù/nùm̀/nu(pũ)/ŋùn	20	10*2 (isol.: kòó, mùŋ̀kú < mande?)
6	loòb/luu, kɔ̀dì/kouulű	100	kúb (isol.: pílɛ, kɔ̀ta)
		1000	< kùtùkú ‘sack’, borrowing

iv. Western (Table 4.171)

Table 4.171: Western Oti-Volta numerals

1	yen/yin, dam?, (dàkő?)	7	yopoi (< yo-poi?)
2	yi(?)	8	nii(n)
3	ta	9	way/wey
4	naasi/naar/nãan	10	pia/pie
5	nú	20	10*2
6	yobu	100	kob/kɔɔ
		1000	tur/tudi (borrowed?)

v. Yom-Nawdm (Table 4.172)

Table 4.172: Yom-Nawdm numerals

1	hén, nyə̌ŋ-/nyə̌rɣə-	7	lèblé? (<6?), 5+2
2	li/ɾé?/*rɣa?	8	nì:ndí; 10−2
3	ta/tâ?	9	wɛ́?, 10−1
4	naa/nɛ̀ɛ̀sə̀	10	?rí?, fɛɣa
5	nu	20	2PL
6	m̀ɾò:ndí (X+1?), lèèwə̀r	100	lɛ́mú, wʊr-

Proto-Oti-Volta The evidence of five Oti-Volta branches (isolated forms excluded) is summarized in Table 4.173.

Table 4.173: Numerals in Proto-Oti-Volta

	i. Buli-Koma	ii. Eastern	iii. Gurma	iv. Western	v. Yom-Nawdm	***Proto-Oti-Volta**
1	yéŋ, ní	dènnì, yɛ̃nde/yòn, *de	yènn(do), den, ni	yen/yin, dam	hén, nyə̌ŋ	**den/yen, ni, de?**
2	yɛ̀, li	déɛ́(ni), yēdē	le/dɛ́	yi(ʔ)	li/ɾéʔ/*rɣa?	**li/yi**
3	tà	tâati	tà	ta	ta	**ta(t)**
4	nààsì	naa(si)	nà(hì)	naasi	naa/nɛ̀ɛ̀sə	**naa(si)**
5	nù	nun	nùm̀/nu/ŋùn	nú	nu	**nu**
6	yùèbì/óbìŋ	dūo	loòb/luu	yobu	lèèw-ər	**lob/ yob**
7	yòpɔ̄āī, pɔ́ɔ̀	doodē (6+1)	lòlé/lèlé	yopoi	lèblé?	***lob-le (6+1)? poi(n)?**
8	nāāniŋ/ à-níì	nɛ̀ɛ́í/ni/ ninyɛ̃	ni(n)	nii(n)	nì:ndí	**ni**
9	nèūk/ŋ̀wɛ́	wáī/wɛi/ wɛ̄	wɛ̀ʔ/wɛ́ɛ/ wáī	way/wey	wɛ́ʔ	**wey/ weʔ**
10	pī	pwígə̄/ píìkà/*pi	píìk/pʷíʔ/ fi	pia/pie	fɛɣa	**pi(k)**
20	10*2	10*2	10*2	10*2	2PL	**10*2**
100	kòòk, kobɪga	kòɣə̄/ kookɛ/ kɔ́úkpà	kúb	kob/kɔɔ	lɛ́mú, wʊr-	**kob, kook**

The reconstruction of the Oti-Volta numeral system is surprisingly unproblematic. In addition to the expectedly persistent reflexes of 'three' and 'four', homogeneous forms for 'two', 'five', and 'ten' are noteworthy. The term for 'eight' seems to be based on 'four' (either via the partial reduplication or according to the '4PL' pattern). In addition to that, Oti-Volta is characterized by the presence of the primary (homogeneous) forms of 'six', 'eight', and 'nine'. The forms of 'seven' are probably derived and follow the pattern '6+1'. It appears that the derivative form **lob-le* > *lole* is already reconstructable at the Proto-Oti-Volta level.

4.9.3.2 Southern Central Gur

4.9.3.2.1 Dogoso-Khe

Table 4.174: Dogoso-Khe numerals

1	kpò, lé	7	5+2
2	jɔ(n)	8	5+3
3	thɔ	9	5+4
4	dáa	10	kpélé
5	nɔ(n)	20	cúkúrì/gʊ̀ʊ̀sì
6	5+1	100	20*5
		1000	kpɛ́

The forms pertaining to these languages that are not present in the main databases are quoted according to Kerstin Winkellmann in (Miehe; Reineke; Winkelmann 2007b: 181–210). Although the numerals attested within the two languages of this group are quite persistent, Kerstin Winkellmann stresses their grammatical difference: " ... while Dɔgɔ-sʊ uses noun suffixes, sʊ-Khe is a prefixing language " (Winkellmann 2007d: 209).

4.9.3.2.2 Gan-Dogose

Table 4.175: Gan-Dogose numerals

1	kpo/po, (lèŋ)	7	5+2
2	yɔ̰/ɲɔ̰/ʤɔ̃̀ŋ	8	5+3
3	sáa̰/tʰɔ̀ʔ	9	5+4, 10−1
4	ɲee/ì-yḭḭ, (á-dàa)	10	(kpoogo, gbùnè, kpélé, sí-nɔ̃y - 5PL)
5	mwã/wà̰a, nɔ̃̀n	20	gbeere, (tʃúkúrì)
6	5+1	100	20*5
		1000	kpíɛ 'a goat'

Three of the languages belonging to this branch show too many forms, suggesting that we are dealing with a heterogeneous branch. In view of its numerical terms, it is not immediately apparent why this branch has been singled out.

4.9.3.2.3 Grusi

i. *Eastern Grusi (Table 4.176)

Table 4.176: Eastern Grusi numerals (*)

1	ɖə́m/lʊ̀m/yʊ́m, re/ɔ́ɖe	7	lʊbɛ, 6+1, 4+3, 10−3
2	la/lɛ̀	8	4 redupl., 4PL, 10−2, toozo, (k͡pɛ̀ɛ̀rɛ̀)
3	tòòsó/tooro	9	10−1, isolated forms
4	násá/naara	10	fu, (nʊ́á - 5PL, sàlá)
5	nʊ́/nʊ́ŋ, kpásì/gbā́nzì	20	ko/kuo/koowu, (sao, nɛɛ́lɛ̀, 10*2)
6	loɖò/looro/lèèjò, (3PL)	100	20*5, < Ewe, ('guinea fowl')
		1000	kòtòkó, kpoŋ

ii. *Northern Grusi (Table 4.177)

Table 4.177: Northern Grusi numerals (*)

1	du/lu, (téngí)	7	pɛ̀, (4+3, 5+2)
2	le/lə/(ɲìí)	8	nānā (4 redupl.), (lyɛlɛ, bàndá)
3	tɔ̀/twà/cɔ́ɔ̀	9	nʊ̀gʊ, nìbu, (10-X)
4	na/nīān/nàas	10	fúgə́, (fo)
5	nu	20	10*2, (sāpʊ̄ā, 10+10, swéní)
6	dʊ̀, (5+pi)	100	bi, (zɔ̆m)
		1000	mʊ̀rʊ̀

iii. *Western Grusi (Table 4.178)

Table 4.178: Western Grusi numerals (*)

1	kpáŋ/kpee, bala, do/deo/dííŋ/digi	7	lʊp,pɛ́ɛ́/piɛ , 5+2
2	lɛ/nɛ/lìɛ	8	córí/kyórí, 5+3, (pɔɔ)
3	toro	9	nɛ́mɛ́/nìbí, 10−1, 5+4
4	naa/naasi/naare	10	fi
5	nue/nwɔ́/nɔ̀ŋ	20	mɛ́rɛ́, mʊgɔ́ (< Mande?), (máágí, toko, ma-cu?)
6	lʊ̀rʊ̀/*lug/dʊ̀, 5+1, (go)	100	kɔ̀wá/kɔ̀ɔ́, zɔ́lɔ́, lafa
		1000	gboŋ/bʊ́í

The most probable *Proto-Grusi reconstructions based on the roots attested in at least two Grusi branches are summarized in the table below (Table 4.179).

Table 4.179: Proto-Grusi numeral system (*)

1	do/du/lu, de/re	7	pɛ/lʊ-pɛ/lʊ-bɛ, 5+2
2	lɛ/le/ne/ɲi	8	4 redupl.
3	toro/toso/tɔ	9	10–1, nibi/nibu (ni-bi/bu?)
4	naare/naasi/na	10	fu/fi
5	nu/nʊ	20	10*2?
6	dʊ/lo-ɖo/lo-ro, 5+1	100	20*5? bi? kɔwa/kɔɔ?
		1000	kpoŋ/gboŋ

4.9.3.2.4 Kirma-Tyurama

Table 4.180: Kirma-Tyurama numerals

1	déiŋ/dẽẽná	7	5+2
2	hấĩ/hãl	8	5+3
3	síɛi/siɛl	9	5+4, 10–1
4	na(a)	10	nűősɔ̀/cíŋcíelùó
5	di	20	kómòrré/guř
6	5+1	100	gundi, 20*5
		1000	200*5, 800+200

4.9.4 Kulango

The source form of the term for ‘one’ with a nasalized vowel is reconstructed on the basis of the evidence presented by Stefan Elders (2007: 323). As we have seen, the Gur term for ‘five’ is reconstructed as **nu* on the basis of the evidence provided by the groups discussed above. It should be noted that this form goes back to the lexical root meaning ‘hand’ (Kulango *nu-gò*). The term for ‘ten’ in Kulango is a reduplicated **nu*, whereas a different root is attested for ‘five’. It is also noteworthy that the terms for ‘two’, ‘three’, ‘hundred’ and ‘thousand’ are borrowed from Mande.

Table 4.181: Kulango numeral system

1	ta(a) < *ta̰a̰	7	5+2
2	bila(< Mande), nyʊʊ̀	8	5+3
3	sããbe (< Mande)	9	5+4
4	na	10	nuunu (< *5redupl.), *ji/yi
5	tɔ	20	yipì-/dʒipi-
6	5+1	100	kɛmɛ̀ (< Mande)
		1000	wulo (< Mande)

4.9.5 Lobi-Dyan

According to Anthony Naden's classification (Naden 1989), these languages belong to different groups of the Gur languages, so their evidence will be presented separately.

"More recent classifications (Labouret and Manessy) regarded Lobi (Lobiri) and Ja̰a̰ne as closely related" (Miehe & Tham 2007: 212) (Table 4.182).

Table 4.182: Lobi-Dyan numerals

	Lobi	Dyan	*Lobi-Dyan
1	bìɛ̀l, *do	bɛ̃g/ɓɛ̰̃(ŋ)kù/bɪɛle, *dṵ	bɪɛ̀l, *dò
2	nyɔ̀/nɔ̀	nyɔ̃̀	nyɔ̀(n)
3	tʰɛ̌r	thɛ̃̌s(i)	thɛ̃̌s(i)/tʰɛ̌r
4	nɑ́	nɑ̰̀ɑ̰̀	nɑ́
5	mɔ̀ì/*mà	dìèmà, *mɔ̀lɔ̀	mɔ̀ì/*mà/*mɔ̀lɔ̀, dìèmà,
6	5+1	5+1	5+1
7	5+2	5+2	5+2
8	5+3	5+3	5+3
9	10−1	10−1	10−1
10	nyʊ̀ɔ́r	ni-kpo	ni-kpo, nyʊ̀ɔ́r
20	kpèle	ceeru	kpèle, ceeru
100	tàmâ	tàmúgú	tàmâ
1000	gbʊ̀lanɪ	100*10	gbʊ̀lanɪ, 100*10

4.9.6 Senufo

Table 4.183: Senufo numerals

1	nɔ̀n-, ni-ŋgbe/nuŋgba, nìkɨ̀/ningin	7	5+2, 6+1
2	sin/soin/sun/syen	8	5+3, 6+2
3	tɑ̃ɑ̃/taàr	9	5+4, 10−1, 6+3
4	tésyàr/sīcērɛ̄/tityere	10	kɛ
5	bwa/bwɔ, guru/kuru (<‘fist’), guno, (nɔ)	20	gbèɲ/g͡bēy, fulo, toko/togo, nafa, isolated forms
6	kwaɲ̀/kwāy, gbaara, gɔlɔŋ , 5+1, (nõli)	100	20*5, lafa (< Kwa)
		1000	200*5, (gben-, bɔlɔ, pwoo, sakere)

Many of the forms are quoted in brackets, i.e. they are isolated forms attested within the Senufo group comprising about fifteen idioms. As in a number of other Gur branches, the last syllable/segment of a numerical term often represents a coordinating noun class suffix. Below is an excerpt from the table showing the inflection of numerals by class in Tenyer (Syer variety), as published by Klaudia Dombrowsky-Hahn in (Miehe; Reineke; Winkelmann 2007a:420) (Table 4.184).

Table 4.184: Tenyer numerals (a fragment)

Class SG	u	li	ke	te dim.
‘one’	nun	nuni	nuŋ	nunge
Class PL	pi	ki	yi	te dim.
‘two’	syob ~ syou	syã	syii	syimbi
‘three’	trab	tar	tar	tarbi
‘four’	tikyireb	tihyɛr	tihyɛr	tihyɛrbi

This presentation illustrates how problematic defining the numerical roots can be.

4.9.7 Teen

Table 4.185: Teen numerals

1	tani	7	5+2
2	nyor	8	5+3
3	sanr	9	10−1
4	nan	10	pɔrwɔ
5	tɔ	20	toko
6	5+1	100	20*5
		1000	danyɛ

4.9.8 Tiefo

Table 4.186: Tiefo numerals

1	dɛ̃̀	7	5+2
2	jɔ̃	8	5+3
3	sɑ́	9	5+4
4	ʔuʔɔ́/ŋɔɔ	10	támú, kɛ̃
5	kɑ̀	20	kpã
6	5+1	100	20*5
		1000	waga (< Mande)

4.9.9 Tusia

Table 4.187: Tusia numerals

1	nɔ́nkì, *nɑ̃̃ŋ	7	5+2
2	nínɔ́, *nĩ̃ŋ	8	5+3
3	tɔ́nɔ́	9	5+4
4	ńyɑ́h/jɑ̃	10	gbãm/*gbɔ̃/bwɔ̀
5	k(w)lɔ́	20	túkúrí, *tiki
6	5+1	100	20*5, kwɛ̌
		1000	< píy ‘goat’, nɑ́ʔ’cow’

4.9.10 Viemo

Table 4.188: Viemo numerals

1	dũde, *dun-	7	5+2?
2	niinĩ	8	4*2, 5+3
3	sãsĩ	9	10−1
4	jumĩ	10	kwɔmũ
5	kuɛge, *kɔ̲	20	fɛrɛyɔ
6	5+1	100	tãmõ
		1000	vie-?

4.9.11 Wara-Natioro

It should be noted that the most important evidence pertaining to this group is relatively recent. In his publication of the comparative lexical list Tasséré Sawadogo noted that Faniagara is radically different from both Wara and Natioro (Sawadogo 2002). Its similarity index with the Natioro and Wara dialects is 12 and 30 percent respectively (the SIL list? idem., p. 15). Thus he had every reason to postulate the existence of an isolated language (Palɛn) in the Wara-Natioro group.

Since the data collected by Tasséré Sawadogo is absent from the major databases that are now incorporated into the RefLex database by Guillaume Segerer, it seems reasonable to present it below for each Wara-Natioro-Paleni idiom in order to suggest the reconstruction of numerical terms within each of the three sub-groups and within the group as a whole (Table 4.189).

According to other sources, the forms *wǎ/ nwõ, sɔ* are attested in Wara-Natioro for 'twenty'. The patterns '20*5' and '400*2+200' are attested for 'hundred' and 'thousand' respectively.

[23]Regarding the Natioro forms for 'one' André Prost remarks: '*puwolo* (après un substantif: *kaaba)*' (Prost 1968: 78). Thus, the opposition between the Wara and Natioro forms of 'one' reflected in the table may be purely functional (for Wara Prost quotes the *puwo* and *kapo* forms).

Table 4.189: Wara-Natioro-Paleni numerals

		'1'	'2'	'3'	'4'	'5'
Natioro	Dinaoro	ká:bà	ŋ́ndí́	táe	ŋnáe	sùsú
Natioro	Timba	ká:bà	ŋ́ndí	tá	nā́	sùsú
Natioro	Kawara	kābà	ŋ̀̃dí	tá	ná	sùsú
*Natioro		ká:bà (ka-ba?)[23]	ŋ́ndí	tá(é)	ná (é)	sùsú
Wara?	Sourani	pɔ́	bɔ̌	tā́	nàsá	sùsú
Wara	Negeni	kàpó	bǒ	tī́:	nā́:sṹ	sùsú
Wara	Niansogoni	pɔ́:wò	bǒ	tí:	ná:só	sùsú
*Wara		pɔ́	bǒ, *nī̃ntó	tā́(i)	naaso	sùsú,
Palɛn	Faniagara	káfā	bá	tā́:ré	ná:ré	sùsú
*Palɛn	Faniagara	ká-fā	bá, *nī́nté	tā́:ré	ná:ré	sùsú, *si/sɔ
Wara-Natioro-Paleni		**ba/fa, pɔ**	**nī́nté, bǒ**	**ta(r)i**	**na(r)i**	**sùsú, sV**
		'6'	'7'	'8'	'9'	'10'
Natioro	Dinaoro	ŋzàbɔ́	té:ndé	nā́ŋgànā́ŋgánì	kâwó	pwɔ̀:
Natioro	Timba	ŋ̀zà:bɔ́	dé:ndí	nánŋgánáŋgánì	kāwɔ̀mṹ	pwɔ́:
Natioro	Kawara	nsàbɔ́	tèndí	nànŋgānànŋgádí	kàwṹmò	pɔ́
*Natioro		nsàbɔ́ (sa-1?)	téndí	4+4	kawo	p(w)ɔ́
Wara?	Sourani	sùrpɔ́	sūrùdó	sī̃ntā́	sī̃n:á	kā̃n:sú
Wara	Negeni	sírípò	sī́nī̃ntó	sī̃ntí	sīn:á:sṹ	kā̃:sā́
Wara	Niansogoni	sírìpò	sùrùntó	sī:ntí:	sín:ā́:sṹ	kā̃:sā́
*Wara		si-1	si-2	si-3	si-4	kā̃:sā́
Palɛn	Faniagara	sī́nífà	sī́nínté	sɔ̄tá:ré	sɔ̄n:á:ré	fɔ́
*Palɛn	Faniagara	si-1	si-2	sɔ̄-3	sɔ̄-4	fɔ́
Wara-Natioro-Paleni		**5+1**	**5+2, téndí?**	**5+3, 4+4**	**5+4, kawo?**	**p(w)ɔ/fɔ, kā̃:sā́?**

4.9.12 Proto-Gur

4.9.12.1 'One'

The main forms of 'one' reconstructable in sixteen branches of Gur are as follows (Table 4.190).

Table 4.190: Stems for '1' in Gur

A. Bariba				tiā	
B. Central:	do				
1. Northern					
A. Bwamu					
B. Kurumfe	dom				
C. *Proto-Oti-Volta		den/yen, de?			ni
Southern		le	kpò		
A. Dogoso-Khe					
C. Gan-Dogose		lèŋ	kpo/po		
D. *Proto-Grusi	do/du/lu	de/re			
E. Kirma-Tyurama		déiŋ/dẽẽná			
C. Kulango				ta(a) < *tā̰à̰	
D. Lobi-Dyan	*dò				
E. Senufo			ni-ŋgbe/nu-ŋgba		nìkɛ̀/ningin
F. Teen				tani	
G. Tiefo		dɛ̃			
H. Tusia					nɔ́nkì
I. Viemo	dũde, *dun-				
J. Wara-Natioro-Paleni			pɔ		

An attempt to reconstruct a Proto-Gur form is probably not reasonable at this point, since all the forms quoted above are important for comparative purposes.

4.9.12.2 'Two'

Table 4.191: Stems for '2' in Gur

	'2'	'2'	'2'	'2'	'2'
A. Bariba	ru				
B. Central:					
1. Northern					
A. Bwamu	ɲū				
B. Kurumfe				hĩĩ	
C. *Proto-Oti-Volta		li/yi			
Southern					
A. Dogoso-Khe	jɔ(n)				
C. Gan-Dogose	yɔ̰/ɲɔ̰/dʒɔ̃ŋ				
D. *Proto-Grusi		lɛ/le	ne/ɲi		
E. Kirma-Tyurama				hɑ́ĩ/hãl	
C. Kulango	nyʊʊ̀				bila (< Mande)
D. Lobi-Dyan	nyɔ̀(n)				
E. Senufo					sin/soin/ sun/syen
F. Teen	nyor				
G. Tiefo	jõ				
H. Tusia			nínɔ́, *nĩ̂ŋ		
I. Viemo			niinĩ		
J. Wara-Natioro-Paleni			nĩ́nté		bŏ

Apparent isolates and obvious borrowings are presented in the rightmost column.

4.9.12.3 'Three' and 'Four'

Table 4.192: Stems for '3' and '4' in Gur

	3	3	4	4
A. Bariba	i-ta		ǹ-nɛ	
B. Central:				
1. Northern				
A. Bwamu	tĩ		náa	
B. Kurumfe	tãã		nãã	
C. *Proto-Oti-Volta	ta(t)		naa(si)	
Southern				
A. Dogoso-Khe	thɔ		dáa	
C. Gan-Dogose	sa̰a̲/tʰɔ̰ʔ		ɲee/ì-yi̲i̲, (á-dàa)	
D. *Proto-Grusi	toro/toso/tɔ		naare/naasi/na	
E. Kirma-Tyurama	síɛi/siɛl		na(a)	
C. Kulango		sããbe (< Mande)	na	
D. Lobi-Dyan	thɛ̀̃s(i)/tʰɛ̌r		nā́	
E. Senufo	tɔ̀ã̀ã/taàr			tésyàr/sīcɛ̄rɛ̄/ tityere
F. Teen	sanr		nan	
G. Tiefo	sā́			ʔuʔɔ́/ŋɔɔ
H. Tusia	tɔ́nɔ́		ńyā́h/jã̄	
I. Viemo	sãsĩ			jumĩ
J. Wara-Natioro-Paleni	ta(r)i		na(r)i	

The reflexes of the most persistent NC roots are observable in the majority of the branches.

4.9.12.4 'Five'

Table 4.193: Stems for '5' in Gur

	'5'	'5'	'5'	'5'	'5'
A. Bariba	nɔ̀ɔbù				
B. Central:					
1. Northern					
A. Bwamu	hò-nú				
B. Kurumfe	nɔm				
C. *Proto-Oti-Volta	nu				
Southern					
A. Dogoso-Khe	nɔ(n)				
C. Gan-Dogose	nɔ̃̀n	mwã/ wa̰a			
D. *Proto-Grusi	nu/nʊ				
E. Kirma-Tyurama				di	
C. Kulango			tɔ		
D. Lobi-Dyan		mɔ̀ì/*mà/ *mɔ̀lɔ̀		dièmà	
E. Senufo	guno, (nɔ)	bwa/ bwɔ			
F. Teen			tɔ		
G. Tiefo					kɑ̃̀
H. Tusia					k(w)lɔ́
I. Viemo					kuɛge, *kɔ̰
J. Wara-Natioro-Paleni			sùsú, sV		

The etymological relationship of **nu* '5' and 'hand', is attested in Central Gur and possibly in Bariba and Senufo. Isolated bases may go back to this meaning as well. At the same time, the base preserved in Kulango, Teen and possibly Wara-Natioro-Paleni is comparable to **tan* found in BC and some other families.

4.9.12.5 'Six' and 'Seven'

Table 4.194: Stems and patterns for '6' and '7' in Gur

	'6'	'6'	'7'	'7'	'7'
A. Bariba	5+1		5+2		
B. Central:					
1. Northern					
A. Bwamu	5+1		5+2		
B. Kurumfe		hʊrʊ		pɛ̃ɛ̃	
C. *Proto-Oti-Volta		lob/yob		poi(n)?	*lob-le (6+1)?
Southern					
A. Dogoso-Khe	5+1		5+2		
C. Gan-Dogose	5+1		5+2		
D. *Proto-Grusi	5+1	dʊ/lo-ḍo/lo-ro	5+2	pɛ/lʊ-pɛ/lʊ-bɛ	
E. Kirma-Tyurama	5+1		5+2		
C. Kulango	5+1		5+2		
D. Lobi-Dyan	5+1		5+2		
E. Senufo	5+1,	kwaɲ/kwāy, gbaara, nõli	5+2		6+1
F. Teen	5+1		5+2		
G. Tiefo	5+1		5+2		
H. Tusia	5+1		5+2		
I. Viemo	5+1		5+2?		
J. Wara-Natioro-Paleni	5+1		5+2		téndí?

The patterns *'6=5+1' and *'7=5+2' can be safely reconstructed at the Proto-Gur level. The exeptionally wide range of forms for 'six' attested in Senufo is noteworthy.

4.9.12.6 'Eight' and 'Nine'

Table 4.195: Stems and patterns for '8' and '9' in Gur

	'8'	'8'	'8'	'9'	'9'	'9'
A. Bariba	5+3			5+4		
B. Central:						
1. Northern						
A. Bwamu	5+3					dĩiní/dènú
B. Kurumfe			tɔɔ			fa
C. *Proto-Oti-Volta			ni			wey/we?
Southern						
A. Dogoso-Khe	5+3			5+4		
C. Gan-Dogose	5+3			5+4	10−1	
D. *Proto-Grusi		4 redupl.			10−1	nibi/nibu (ni-bi/bu?)
E. Kirma-Tyurama	5+3			5+4	10−1	
C. Kulango	5+3			5+4		
D. Lobi-Dyan	5+3				10−1	
E. Senufo	5+3		6+2	5+4	10−1	6+3
F. Teen	5+3				10−1	
G. Tiefo	5+3			5+4		
H. Tusia	5+3			5+4		
I. Viemo	5+3	4*2			10−1	
J. Wara-Natioro-Paleni	5+3	4+4		5+4		kawo?

In addition to the common patterns '8=5+3' and '9=5+4', alternative ones are attested for 'eight' and 'nine' ('8=4 redupl.' and '9=10−1' respectively).

4.9.12.7 'Ten'

Table 4.196: Stems for '10' in Gur

A. Bariba		wɔ-kuru			
B. Central:					
1. Northern					
A. Bwamu	pílú/píru/ ˀɓúrúù				
B. Kurumfe	fɪ				
C. *Proto-Oti-Volta	pi(k)				
Southern					
A. Dogoso-Khe	kpélé				
C. Gan-Dogose		kpoogo	nõy - 5PL		gbùnè, kpélé, sí-
D. *Proto-Grusi	fu/fi				
E. Kirma-Tyurama			nṹs̃ɔ̃		cíŋcíelùó
C. Kulango					nuunu (< *5 redupl.), *ji/yi
D. Lobi-Dyan		ni-kpo	nyɔ̀ɔ́r		
E. Senufo				kɛ	
F. Teen	pɔrwɔ				
G. Tiefo				kɛ̃	támú
H. Tusia					gbãm/ *gbɔ̃/ bwɔ̀
I. Viemo		kwɔmũ			
J. Wara-Natioro-Paleni	p(w)ɔ/fɔ				kǎ:sǎ?

This term exhibits a variety of isolated (and possibly non-primary) forms. The main form has a voiceless labial as its initial consonant.

4.9.12.8 'Twenty'

Table 4.197: Stems and patterns for '20' in Gur

	'20'	'20'	'20'	'20'	'20'
A. Bariba					yɛndu
B. Central:					
1. Northern					
A. Bwamu		ɓóní/ ɓénle/ kēwēníì			
B. Kurumfe	sofe (<10?)				
C. *Proto-Oti-Volta	10*2				
Southern					
A. Dogoso-Khe		gʊ̀ʊ̀sì	cúkúrì		
C. Gan-Dogose		gbeere	tʃúkúrì		
D. *Proto-Grusi	10*2?				
E. Kirma-Tyurama		guř			kómòrré
C. Kulango					yipì-/ dʒipi-
D. Lobi-Dyan		kpèle	ceeru		
E. Senufo		gbèɲ/ gbēy,		toko/ togo	fulo, nafa
F. Teen				toko	
G. Tiefo					kpã
H. Tusia			túkúrí		*tiki
I. Viemo					fɛrɛyɔ
J. Wara-Natioro-Paleni					wǻ/nwõ, sɔ

In view of the great variety of forms and patterns attested for this term, the existence of the term for 'twenty' in Proto-Gur is uncertain.

4.9.12.9 'Hundred'

Table 4.198: Stems and patterns for '100' in Gur

A. Bariba	20*5				
B. Central:					
1. Northern					
A. Bwamu					kʰ͂ĩminù (< Mande keme)
B. Kurumfe				bɛrʊ	
C. *Proto-Oti-Volta			kob, kook		
Southern					
A. Dogoso-Khe	20*5				
C. Gan-Dogose	20*5				
D. *Proto-Grusi	20*5?		kɔwa/kɔɔ?	bi?	
E. Kirma-Tyurama	20*5			gundi	
C. Kulango					kɛmɛ̀ (< Mande)
D. Lobi-Dyan		tàmâ			
E. Senufo	20*5				lafa (< Kwa)
F. Teen	20*5				
G. Tiefo	20*5				
H. Tusia	20*5		kwɛ̌		
I. Viemo		tãmõ			
J. Wara-Natioro-Paleni	20*5				

4.9.12.10 'Thousand'

No evidence supports the reconstruction of the term for 'thousand' in this family.

Table 4.199: Stems and patterns for ‘1000’ in Gur

A. Bariba			fɔ̀rɔ̀tɔ?	
B. Central:				
1. Northern				
A. Bwamu		100*10	muaseé	
B. Kurumfe				tʊsrɪ (< Moore)
C. *Proto-Oti-Volta				
Southern				
A. Dogoso-Khe	kpɛ́			
C. Gan-Dogose	kpíɛ ‘a goat’			
D. *Proto-Grusi			kpoŋ/ gboŋ	
E. Kirma-Tyurama		200*5, 800+200		
C. Kulango				wulo (< Mande)
D. Lobi-Dyan		100*10	gbɔ̀lanɪ	
E. Senufo		200*5	gben-, bɔlɔ, pwoo, sakere	
F. Teen			danyɛ	
G. Tiefo				waga (< Mande)
H. Tusia	< píy ‘goat’, nɑ̃́ˀ ’cow’			
I. Viemo	vie-?			
J. Wara-Natioro-Paleni		400*2+20		

4.10 Mande

The intermediate step-by-step reconstructions available for the Mande languages in **Vydrinms**'s Mande Etymological Dictionary and in Vydrin 2007[24] has made treatment of the data easier.

The genetic classification of Mande, outlined in the latter work, will serve as the basis for our analysis. This classification differs from the one suggested by Kastenholz and is accessible via *Ethnologue* (**SimonsFenning2018**). According to V. Vydrin,

> Its major innovations, in comparison with that of Kastenholz, are the following:
>
> - the Susu–Jalonke group is put together with the Southwestern group, rather than with Kastenholz's "Central Mande" (in fact, it is a return to the proposal of André Prost 1958);
> - Soninke–Bozo, Samogho and Bobo are no longer considered as branches of the same genetic unit (Kastenholz's "Northwestern Mande"), but rather as independent groups inside Western Mande;
> - the Mokole group is put together with Vai–Kono, rather than with Manding;
> - in the Southern Mande group, Mwan is separated from Wan and put together with the Guro–Yaure subgroup;
> - San (Samo) is put together with Bisa, rather than with Busa-Boko.' (Vydrin 2016: 110).

Let us note an important fact: the numeral system of Jowulu differs considerably in certain points both from other Samogho languages and from Mande languages in general. It is interesting to outline that in R. Kastenholz's classification (based on the method of shared innovations, rather than on lexicostatistics) Jowulu is given a special status, more precisely, the first split in his Northwestern Mande branch (Bozo-Soninke + Bobo + Samogo + Jowulu).

Our further analysis will be based on the evidence from twelve branches of Mande represented in Figure 4.1.

[24] I would like to thank V. Vydrin for his suggestions and comments on the preliminary draft of this chapter.

Figure 4.1: Mande languages

4.10.1 'One'

Table 4.200: Mande stems for '1'

Manding	*dɔ́	*kélen			
Jogo-Jeri	*do	*kɛlɛ (?)			díé(n)/dúlì
Mokole	*dɔ́ndɔ̀	*kéle̲			
Vai-Kono	*dɔ́ndɔ	*N-kélen			
Susu		*kédén	nde/ǹdá		
SWM		*gìláaŋ	*tà		
Bozo-Soninke		kuɔn/ kɛnɛ/ ke̲/ko̲		sa̲na̲	bane, fie
Bobo			tàlá/tèlé		
Dzuun (Samogo)		*ké		*so/sɔʔi/ swɛ̃	
Jowulu			tẽẽna/ tenŋ		
SE-Eastern	*do	gɔ̀rɔ́/ gôon?			
SE-Southern	*dǫ́				

Vydrin's preliminary reconstructions, as well as isolated forms resulting from the analysis of the numerical terms, are marked with an asterisk [*].

The isoglosses for 'one' suggest the existence of two alternative roots (**dǫ́* and **kelen*) attested in both major Mande groups. The latter root is distinguishable under the assumption that the forms with a voiced velar attested in the Eastern branch of the South-Eastern group (Matya Samo *gɔ̀rɔ́*, Southern Samo (Maka) *gôon*) are related to the **k**-forms found in Western Mande.

The next two roots, if related, may be suggestive with regard to the classification of Western Mande (otherwise, they probably represent similar unrelated forms). It should be noted that the root *ǹdá* (Susu *nde* 'one, certain', *ndende* 'anybody, whoever; nobody', Jalonke *ǹdá* 'certain') attested, according to Vydrin, in Susu-Jalonke may be related to **dọ*. The determiner **dọ́*, which can be reconstructed at the Proto-Mande level, goes back to the root **do*.

The rightmost column of the table embraces the isolated forms.

4.10.2 'Two'

Table 4.201: Mande stems for '2'

Manding	*fìlá
Jogo-Jeri	*fàlá
Mokole	*fìla
Vai-Kono	*fèLá
Susu	*fìdíń
SWM	*fèelé
Bozo-Soninke	pɛ̀ːndé, fíllò
Bobo	pálà
Dzuun (Samogo)	fíː(kí)
Jowulu	fúúli
SE-Eastern	*pela
SE-Southern	*pìì-lāŋ

A common root for 'two' that may be tentatively recorded as **pila / fila* is attested in all Mande branches. Its precise phonetic reconstruction is beyond the scope of our investigation. The reader can refer to the works of specialists in the historical phonetics of Mande. A reference designation that will enable us to compare this root to the evidence of the other NC families is sufficient for our reconstruction purposes.

4.10.3 'Three'

The common root **sakpa/ sagba/ sawa* is represented in all Western branches. The relationship between some of the forms attested in the Eastern group (Southern Samo (Maka) *sɔ̄ɔ̄*, Matya Samo *tjɔwɔ*) remains uncertain. The Jowulu form is especially peculiar. It should be noted that the forms of some numerical terms

Table 4.202: Mande stems for '3'

Manding	sàbá	
Jogo-Jeri	sègbá/sigbù	
Mokole	sàwa/saba	
Vai-Kono	sàkpá/sagba/sáwa	
Susu	sàxán/sàqáŋ/sawa	
SWM	sàwá/sāaɓā	
Bozo-Soninke	síkkò, sike	
Bobo	sàà (?)	
Dzuun (Samogo)	ʒiʔi/ʒì:gī ´/ʃwɛ̀/ɣei	
Jowulu	bʒei < *jɔnŋ/i?	
SE-Eastern	sɔɔ/cɔ́w?	ʔààkɔ̃
SE-Southern		*yààká

Table 4.203: Jowulu numerals

Source	'1'	'2'	'3'	'4'	'5'
Hochstetler (1996)	tẽẽna	fuuli	**b**ʒei, *dʒɔ̃	**p**ʃɪrɛˡ	tãã
Djilla et al. (2004)	tenŋ	fúúli	byàŋ, *jɔ̀n	pyiiraŋ	táánŋ
Carlson (1993)	tɛ̰̀ɛ̰̀nì	fuˈuˈlī	byāḭ̄, *jɔ̰̄ɔ̰̄	piˈiˈrēī	ta̲ˈa̲ˈ
Prost (1958)	têna	fole	dyue, *dyô	piœe	tâ
Source	'6'	'7'	'8'	'9'	'10'
Hochstetler (1996)	tãmãnɪ	dʒɔ̃m-pʊn	ful-pʊn	tẽm-pʊn	**b**ʒĩĩ
Djilla et al. (2004)	táán-mání	jɔ̀n-pɔnni	fuuli-pɔnni	ten-pɔnni	byìnŋ
Carlson (1993)	ta̲ˈa̲ˈ-mānī	jɔ̰̄ɔ̰̄-poˈnì	fuˈl-poˈnì	tɛ̰̀ɛ̰̀-poˈnì	byḭ̀
Prost (1958)	ton-te	dyômpônô	filepônô	têpônô	bî

differ significantly depending on the source. Our study is based on four Jowulu sources that provide the following evidence[25] (Table 4.203).

The terms for 'seven', 'eight' and 'nine' follow the pattern '3,2,1+'to lose'' respectively (cf. their inaccurate interpretation in Hochstetler, see §4.10.9), hence the reconstruction of the term for 'three' with the initial palatal (**jɔ̀n*). The forms quoted in Jowulu for 'three', 'four', and 'ten' are uncommon. If we were dealing

[25] Hochstetler (1996); Djilla et al. (2004); Carlson (1993); Prost (1958).

with a language with a noun class system, we would have to conclude that a noun class marker (CL19?) with two allomorphs (**p-** and **b-** before voiced and voiceless respectively) is traceable in the pertinent forms. However, we are dealing with a language that undoubtedly belongs to Mande, so no class-related morphemes can be involved. This leaves the presence of the initial labial in the term for 'three' unexplained. A borrowing from Gur or Kru cannot be assumed since these languages lack the comparable forms. The only plausible solution is the alignment of 'three' and 'four' by analogy with 'ten' where it must have been originally present.

A special term for 'three' appears in South-Eastern. In Eastern it can be reconstructed as **ʔààkɔ̃* or possibly ***ʔàà-(kɔ̃)*, cf. Bisa *kakɔ́*, Boko *ʔààɔ̃* (in Koelle 1963[1854] *áá-ɣo̲*), Bokobaru (Zogbẽ) *ʔààgɔ̃*, Busa *ʔààkɔ̃*, Maya Samo *kàakú*, Kyanga *ʾāà:*, and Shanga *ʔà*. The latter reconstruction is supported by the fact that the terms for 'three' and 'four' share the ultima, cf. the data are presented in Table 4.204.

Table 4.204: Final morphemes in the Boko-Busa numerals

	Boko	Boko (Koelle 1963[1854])	Bokobaru	Busa
'3'	ʔàà-ɔ̃	áá-ɣo̲	ʔàà-gɔ̃	ʔàà-kɔ̃
'4'	síí-ɔ̃	síí-ɣo̲	síí-gɔ̃	ʃíí-kɔ̃

It should be noted that in these languages, the syllable in question is also present in the terms for 'eight' that are built according to the pattern '5+3' (cf. e.g. Bobo Karu *sɔ́r-ààgɔ̃*). Here we may be dealing with alignment by analogy, possibly with an additional final morpheme of uncertain meaning. It should be stressed that the ultima in 'three' and 'four' is never the same in the Eastern subgroup of the South-Eastern languages, whereas the medial velar is only attested in 'three' but not in 'four'. Assuming that the forms of the two Eastern branches are related, the term for 'three' can be reconstructed as **ʔààkɔ̃/yààká*, whereas the term for 'four' may be interpreted as resulting from the alignment by analogy with the forms of 'three' attested in the Eastern branch of South-Eastern Mande. The evidence in favor of its etymological connection with **sakpa* is inconclusive.

4.10.4 'Four'

An easily recognizable NC form (**nàání/ nããi*) can be reconstructed in Western Mande, whereas in South-Eastern Mande it is replaced with an innovation

Table 4.205: Mande stems for ‘4’

Manding	*náani	
Jogo-Jeri	náani	
Mokole	náani	
Vai-Kono	náánì	
Susu	náání	
SWM	*náánì	
Bozo-Soninke	na:na/nàtā́/nà:rá/naxat-	
Bobo	náà/nìā̄	
Dzuun (Samogo)	nũ̃i/naai/nà:lɛ́	
Jowulu		pʃɪrɛˡ <ʃɪrɛˡ?
SE-Eastern		sì/sííkɔ̃
SE-Southern		*yìì-sı̰ı̀yı̰́: zı̰̀ɛ́/yíì-sīɛ̄

(*s̰ı̀yı̰́). This innovation may also be attested in Jowulu.

4.10.5 ‘Five’

Table 4.206: Mande stems for ‘5’

Manding	dúuru/loolu	*wo (cf. ‘7’)	
Jogo-Jeri	sóólò/sóolo		
Mokole	lɔ́ɔlu	*wo (cf. ‘7’)	
Vai-Kono	dúʔu/sóó(ʔ)ú		
Susu	suuli/sùlù	*fò (cf. ‘7’)	
SWM	dɔ́ɔ́lú/lɔ́ɔ́lu	*wɔ/ngɔ̀	
Bozo-Soninke		kɔ́lɔ́hɔ̀/kárágò	
Bobo		kɔ̄/kóò	
Dzuun (Samogo)			nṵ̀
Jowulu			tãã
SE-Eastern	*sodu: sɔ́ɔ́ro/sɔ́ɔ̀		
SE-Southern	sɔ́ɔ́ɗú/sólú		

There is a correspondence between **d**-/ **l**-/ **s**- within Western Mande, hence the Eastern forms with the initial **s**- should not necessarily be treated separately. A discussion of the exact phonetic reconstruction is better left to specialists in the

field. For our purposes, it is sufficient to record that the Proto-Mande root for 'five' is reconstructed as *dúuru/ sɔ́ɔ́ru*.

However, the root(s) **wo, *ko* are traceable in the compound numerical terms attested in Western Mande. They may be etymologically related to the lexical root meaning 'hand' (Vydrin, p.c.; cf. Proto-South-Mande **kɔ* 'hand'). The latter may be a NC root, cf. e.g. the term for 'hand' in Proto-Gbaya (*kɔ̰́*), Dida (Kru) (*kɔ̄*) and in other languages.

The Jowulu and Samogo forms are peculiar. As we hope to demonstrate in the next chapter, two alternative roots for 'five' can be reconstructed for NC, namely **tan/ ton* and **nu(n)*. Both roots are directly attested in these marginal groups. Is this enough to reconstruct the terms for 'five' traceable in NC for the Mande languages? We will return to this question in the last chapter of the book.

4.10.6 'Six'

Table 4.207: Mande stems and patterns for '6'

Manding	wɔ́rɔ (5+1)	
Jogo-Jeri	mɔ̀ɔ̀dó (5+1?)/mì:lù	
Mokole	wɔ́ɔrɛ/wɔyɔ (5+1)	
Vai-Kono	wɔ́ɔlɔ/wɔɔrɔ (5+1)	
Susu	sénní (5+1?)	
SWM	*5+1	
Bozo-Soninke	goro? (5+1?)	tűmù/tũmi
Bobo	5+1	
Dzuun (Samogo)		t(s)ů̃mɛ̃́/tsìì
Jowulu	5+1	
SE-Eastern	5+1	
SE-Southern	5+1, wáŋ?	

The reconstruction of the Mande term for 'six' is problematic. The root *t(s)um* is worth considering, since it is attested in both Bozo-Soninke and Samogo (the root found in Susu is probably isolated). Its reconstruction at the Proto-Mande level is, however, unlikely. The common pattern '6=5+1' is attested in both major branches. The root *wɔrɔ* is non-primary and eventually goes back to the aforementioned pattern (or to the pattern '6'='hand'+1' to be precise). This hypothesis is supported by the forms of 'seven' as well.

4.10.7 'Seven'

Table 4.208: Mande stems and patterns for '7'

Manding	x+2	
Jogo-Jeri	ma+2	
Mokole	x+2	
Vai-Kono	5+2	
Susu	5+2	
SWM	5+2	
Bozo-Soninke	ɲérù/jeeni	
Bobo	5+2	
Dzuun (Samogo)	ɲɛ̃ːnű̀ (<5?)/ɲɛ̀ɛ̀	
Jowulu		3+'to lose'
SE-Eastern	5+2	
SE-Southern	5+2	

A few remarks are in order before we turn to the discussion of the term for 'seven'. In the majority of the Mande branches, the term represents a compound. Its second element goes back to the term for 'two', cf. e.g. Jula *wólonfìlà* '7', *fìlà* '2'.

The relationship between the terms for 'six' and 'seven' is based on alignment by analogy. This bond sometimes results in unification of the terms, so that sources may explain 'seven' as '6+1' (despite the fact that 'two', not 'one', is manifestly present in 'seven'). This interpretation has become recurrent for the Mokole languages. According to Phillip Logan,[26] the Kuranko evidence is as follows: *wɔrɔnfila* ('**6+1**') (?! *–K.P.*), *wɔrɔ* '6', *fila* '2', *kelen* '1'. The same idea is applied to Lele (cf. Marc Gebhard:[27] *wɔrɔŋ kela ('6+1')*,[28] *wɔɔrɔ* '6', *fela* '2', *kelɛŋ* '1') and Kakabe (cf. Daria Mishchenko:[29] *wórɔwila* ('**6+1**'), *wɔ́ɔrɔ* '6', *fila* '2', *kélen* '1'). Other scholars are more reserved, stating that 'Kono has a decimal system with special construction for 7'.[30] It is, however, quite evident that the forms in

[26] https://mpi-lingweb.shh.mpg.de/numeral/Kuranko.htm

[27] https://mpi-lingweb.shh.mpg.de/numeral/Lele-Mande.htm

[28] According to Vydrine (2009), the Lele term for 'seven' is *wórɔncɛla* (or *wɔyɛnkela* in the Southern dialect, https://mpi-lingweb.shh.mpg.de/numeral/Jowulu.htm) *núú ɠ̄bɔyɔ́ngo* '20' ('person finished', https://mpi-lingweb.shh.mpg.de/numeral/Mende.htm)

[29] https://mpi-lingweb.shh.mpg.de/numeral/Kakabe.htm

[30] Raimund Kastenholz, https://mpi-lingweb.shh.mpg.de/numeral/Kono.htm

question follow the pattern '5+2' (or at least 'X+2' with X being an unidentified component).

It is not a mere coincidence that the interpretation outlined above is recurrent in the Mokole languages, where the forms of 'six' and 'seven' have become partially unified. In a number of languages from other groups that have etymologically related terms for 'six' and 'seven', these terms differ in their second consonant, cf. Bamana (Manding): *wólonwula* '7', *wɔ́ɔrɔ* '6'.

In both groups of South-Eastern Mande the patterns '5+1' and '5+2' for 'six' and 'seven' respectively are still clearly recognizable (Table 4.209).

Table 4.209: Stems for '6' and '7' in South-Eastern Mande

	'5'	'1'	'6'	'2'	'7'
SE: Eastern: Busa	sɔ́o	do	sɔ́o-do	pia	soo-pia
SE: Southern: Beng	sɔ́-ŋ	do	sɔ́-do	pla-ŋ	sɔ́-pla

Taking all of this into consideration, the most likely evolution scenario for 'six' and 'seven' is as follows:

- At the most archaic Proto-Mande level the terms for 'six', 'seven' (and also 'eight' as we hope to demonstrate below) followed the pattern 'X+1,2,3' respectively. The X-element in this pattern possibly represented an archaic root with the meaning 'hand' (?) **ko*(**N-ko* > **go/wo*?).
- Proto-Mande developed the root **dúuru/ sɔ́ɔ́ru* '5'.
- This new root served as the basis for the South-Eastern Mande terms for 'six', 'seven' and 'eight'.
- In Western Mande this process is only attested in single languages, e.g. in Vai (*sóóʔú* '5', *sɔ̂ŋ lɔ̀ndɔ́* '6' (*lɔ̀ndɔ́* '1'), *sɔ̂ŋ fɛ̀ʔá* '7' (*fɛ̀ʔá* '2')) and Looma (*dooluo* '5', *dɔzita* '6', *dɔfela* '7', *dɔ́sáwà* '8').
- The majority of the Western Mande languages retained the inherent forms for 'six' and 'seven', but their derivational motivation became unapparent (at least in the case of the first component, cf. Bandi *ndɔ̀ɔ́lú(ŋ)* '5', but *ngɔ̀hítáŋ* '6' (*hítàŋ* '1') and *ŋgɔ̀félàŋ* '7' (*feelé* '2') in contrast to Looma).
- This factor conditioned the partial unification of the terms for 'six' and 'seven' (by analogy) in some of the Western Mande languages (Mokole in particular).

4.10.8 'Eight'

Table 4.210: Mande stems and patterns for '8'

Manding	séegi/séki/séyi		
Jogo-Jeri		ma+3	
Mokole	séɛn/saɛn/seyi		
Vai-Kono	séi/séin	5+3	
Susu		5+3	
SWM		wá-yákpá/ wɔ-yaagba/ ngɔ̀sákbá(n) (5+3)	
Bozo-Soninke	segi-/seegu		
Bobo	sɛ́kì/tʃèkí		
Dzuun (Samogo)			kàà, 4pl
Jowulu			2+'to lose'
SE-Eastern		*5+3	síŋe, kíwísí (<4)
SE-Southern		sáà-gā/sálààkā/ sɔ̀làá/sé-yā̰ (5+3?)	

The pattern '8=4*2'/'4PL' commonly found in the majority of the families discussed above is barely attested in Mande. Meanwhile, the phonetic similarity between *naai* '4' ~ *ŋaai(n)* '8' (attested in the majority of the Samogo dialects) is hardly an accident.

The etymology of *kàà* (not found outside Seenku) is unknown.

The pattern '5+3' is inconclusive, because it often developss independently in various languages. The interpretation of the main Mande root (tentatively described as *seki/ segi*) is uncertain. On the one hand, its current forms suggest that this root can be reconstructed not only for Proto-Western Mande, but for Proto-Mande as well (cf. South-Eastern forms, in particular *sáà̰gā* '8'). On the other hand, such reconstruction is hindered by at least two issues.

Firstly, the second velar in the South-Eastern Mande forms does not belong to the root. It is part of a reduced segment that goes back to the term for 'three' (cf. Tura *yä̰ká* '3'), whereas the first segment goes back to the term for 'five' (cf. Tura *sőlű*, *sőőlű*, *sűlű*). The comparative analysis of the forms of 'eight' attested in

the South-Eastern Mande languages (not quoted here in detail) strongly suggests that the South-Eastern Mande pattern for 'eight' is '5+3'.

Secondly, this reconstruction is problematic from a typological point of view. As has been demonstrated above, our evidence prevents us from reconstructing primary roots for 'six' and 'seven'. In terms of typology, a primary root for 'eight' would look highly unusual in this context. Such a root could be expected in those few numeral systems where 'eight' is a basic numeral (just like 'twelve' is a basic numeral in some of the Benue-Congo numeral systems described above, hence '100=12*8+4'). However, 'eight' has never been a basic unit of counting in Mande systems. The existence of a primary term for 'forty' (assuming that 'forty' is '8*5') in some of the Mande languages could be interpreted as a hint at a special status of 'eight'. However, this is not supported by any real evidence.

This raises a question about the etymology of the Western Mande term for 'eight' (*seki/ segi*). Its resemblance to the term for 'three' (especially in Bozo and Soninke, cf. Jenaama Bozo *síkɛ̀ɛ̃́* '3' ~ *sèkːí* '8') may be suggestive here. Is there enough evidence to reject the hypothesis that 'eight' in the Proto-Western Mande was built according to the pattern '8=plus 3' (this would assume a counting reference to 'five')?

Despite the doubts expressed above, these forms are worth comparing to other forms of 'eight' attested in other NC families.

4.10.9 'Nine'

Table 4.211: Mande stems and patterns for '9'

Manding		kɔ̀nɔntɔ (10–1?)	
Jogo-Jeri	ma+4		
Mokole		kɔ̀nɔndɔn (10–1?)	
Vai-Kono	5+4	kɔ̀nɔ́ntɔn	
Susu	5+4		
SWM	5+4	10–1	
Bozo-Soninke			kàpːí/káfì/kabi
Bobo		kɔ̀rɔ̀nɔ̂ŋ	
Dzuun (Samogo)			kjèːrɔ́/kleːlo/kùòmɛ̀
Jowulu		1+'lose'	
SE-Eastern	5+4	10–1	
SE-Southern	5+4		

Two competitive patterns are distinguishable here ('9=5+4' and '9=10–1'). In some of the branches (e.g. SWM, Vai-Kono) they are attested side-by-side.

At the same time, these patterns cannot be postulated for some of the languages without additional support. The pattern '9=10–1' seems to be apparent in South-Eastern Mande and some of the SWM languages only, cf. Boko '9': *kɛ̂̀okwi* (lit: 'tear away 1 (from) 10'), *kwi* '10' ; in Busa '9': *kɛ́ndo/kɪ̣́ndokwi* (lit: 'tear away 1 (from) 10'), *kwi* '10', *do* '1'; in Bandi (SWM) *taá-vu* '9', *ìtá(ŋ)* '1', *púu* '10'. According to Robert Carlson (Carlson 1993: 30), the terms from 'seven' to 'nine' in Jowulu follow the pattern '1–3' + 'lose' (*fɔ́nì*), i.e. *jɔ̃̀ɔ̃́-pɔ́nì* '7', *fúl-pɔ́nì* '8', and *tɛ̂̀ɛ̂́-pɔ́nì* '9' (note that these terms are misinterpreted as 3+4, 2*4, 5+4[31] by Lee Hochstetler).

check accents on ɔ

The root *kònonto/kɔ̀nɔndɔ(n)* attested in Manding and Mokole is unclear and deserves discussion by specialists. On the contrary, the forms interpreted as the combination of '5+4' in the table below seem to be quite transparent (Table 4.212).

Table 4.212: '9 = 5+4' in Mande

Language	'9'	'5'	'4'
Kyanga	sòòʃí	sɔ́ɔ́rū	ʃíí
Tura	sɔ́ɪ̀sɛ̄	sólú	jɪ̀sɛ̄
Susu	sólómánáání	súlí	náání
Vai	sɔ̂ŋ náánì	sóó(ʔ)ú	náánì
Bobo Madare	kórónɔ̃̀	kóò	náà

This section, however, is not unproblematic. The Jogo-Jeri non-primary terms for '6–9' are formed by two components. The second (i.e. the terms for 'one', 'two', 'three' and 'four' respectively) is easily recognizable, whereas the etymology of the first (**ma-**) is unclear.

4.10.10 'Ten'

This term is especially interesting in light of the fact that the distribution of the isoglosses of 'ten' served as the basis for Maurice Delafosse's early classification of the Mande languages including the *Mande-tan* and *Mande-fu* groups. These two roots are indeed the main Mande roots with this meaning. However, their distribution does not correspond to the two major branches of Mande as they are distinguished today. The root **tan* is indeed found in all groups of the Western

[31] https://mpi-lingweb.shh.mpg.de/numeral/Jowulu.htm

Table 4.213: Mande stems for ‘10’

Manding	*tán	*bî	
Jogo-Jeri	táà(n), ta		
Mokole	tán	*bí	
Vai-Kono	tâŋ		
Susu	*tòngó	fùú	
SWM		*puu	
Bozo-Soninke	tan/téeŋ/cɛmi		
Bobo		fɔ̃	m̩ḿ̩
Dzuun (Samogo)	t(s)eũ/ceũ		
Jowulu			bʒĩĩ/byìnŋ
SE-Eastern		*fu/*vu (≺* pu)	kwi/kuri, wókòì
SE-Southern		*bù	gɔ́ɔ̂(dō),kɔ̀ŋ sɔ́jɔlú,

branch except for Bobo and SWM. However, the attestations of the root **pu*/*fu* are not limited to South-Eastern and extend to a number of the Western branches such as Bobo, SWM, Susu (and possibly Manding-Mokole, assuming that its reflex denotes tens in compound numerals). Isolated forms attested in South-Eastern and in peripheral Western languages are noteworthy.

The reconstruction of **pu*/*fu* for Proto-Mande and the interpretation of **tan* as the Proto-Western Mande innovation seem well-founded.

The etymology of **tan* is obscure. Its similarity to the locally attested root **tan* (cf. Soninke *tàán* ‘foot, leg’; ‘wheel’; ‘time’ (when counting), Bozo Tieyaxo *tɔn* ‘foot, leg’; ‘time’ (when counting), Bozo Hainyaxo *tă*, Bozo Tiemacewe *taʷa*, Bozo Sorogama *taba*) is likely a coincidence. Lexical roots with the meaning ‘foot’ are attested in NC numeral systems, usually as a basis for the non-compound terms for ‘fifteen’. The logic behind this development is simple: ‘ten’ is ‘two hands’, ‘twenty’ means ‘man’, i.e. ‘two hands and two feet’, hence ‘fifteen’ is ‘foot’. This seems to be the case for Boko and Busa, where a non-compound term for ‘fifteen’ (*gɛ̀̃o/ gɛ̀̃ro*) is attested (hence ‘16=15+1’ in these languages). This root is etymologically related to ‘foot, leg’ in Duungoma (Samogo) *gɛ̃*, Dan *gɛ̂* , Mano *gɑ̀* (it should be noted that within Mande a non-compound root for ‘fifteen’ is also attested in Ligbi, cf. *tígán / tiga* ‘15’, *tígá-ló* ’16).

In addition, a similarity to the term for ‘one’ as attested in some of the languages must be a coincidence.

A hypothesis assuming a semantic shift *NC **tan* '5' > Proto-Western-Mande *tan* '10' in parallel with the development of the Mande innovation **dúuru/ sɔ́ɔ́ru* 'five' seems to be a better explanation.

It bears reminding that the Bokobaru root *kuri* 'ten' (cf. also Boko *kúúli* recorded by Koelle) has a direct parallel in the isolated Bangime language (*kúré*).

4.10.11 'Twenty'

Table 4.214: Mande stems and patterns for '20'

Manding	<'human'?		
Jogo-Jeri			ɟālāmə̀/kèlɛ̀mó
Mokole	<'human'?		
Vai-Kono	<'human'	10*2	
Susu	<'human'		
SWM	<'human'?	10*2	
Bozo-Soninke		10*2	
Bobo			kpòró, córɔ̀
Dzuun (Samogo)	<'human'		fwɛ́
Jowulu			kɔ̃ne/kɔnninŋ
SE-Eastern		10*2	kèè-/ka
SE-Southern	<'human'[32]	10*2	yɔ

There is every reason to believe that the term for 'twenty' was based on the lexical root(s) meaning 'human person' at the Proto-Mande level. The etymology of some of the isolated forms presented in the table should be sought with this in mind.

4.10.12 'Hundred'

check keng/kai

The root *kɛmɛ*, widely attested throughout Western Africa, is noteworthy. Its original semantics deserve a separate study: it is well known that in some languages this root can be used for 'sixty' or 'eighty' and not for 'hundred' (the archaic Bamana counting system: *mànìnkèmɛ* '60', *bámanankèmɛ / kèmɛ* '80', *kèmɛ ní mùgan* '100' (80+20)) (Vydrin & Perekhvalskaya 2015: 360).

[32] Mende *núú ɠɓɔyɔ́ngɔ* '20' ('person finished'). https://mpi-lingweb.shh.mpg.de/numeral/Mende.htm

Table 4.215: Mande stems and patterns for ‘100’

Manding	*kɛ̀mɛ́	
Jogo-Jeri	čɛ̌mé/tʃímí	20*5
Mokole	kɛ̀mɛ	
Vai-Kono	kɛmɛ	
Susu	kɛ̀mɛ́	
SWM	kɛmɛ(ŋ)	Kpelle: <‘head’ (ŋwúὴ)
Bozo-Soninke	kame/keme	‘islam’-60
Bobo		ɟɔ̄(lì)/zɔ̀(lʊ́)
Dzuun (Samogo)		20*5, 80+20
Jowulu		‘rope’*5
SE-Eastern		*20*5
SE-Southern	*kɛ̀mɛ́?	kɛ̀ɛ̄ŋ/kɑ̀ɑ̄ɨ́, la/lú

4.10.13 ‘Thousand’

The roots for ‘thousand’ attested in the Mande languages were borrowed from by the Western African languages. The original meaning of the Mande root *wáa/wága* may be ‘a basket of cola nuts’ (Perekhvalskaja, Vydrin & Perekhvalskaya 2015: 361), cf. Bamana *wágá* ‘panier à colas’, Bobo *wágá* ‘panier qui sert à transporter les colas ou wòlōwágá.’

Table 4.217 gives an overview of Mande forms and patterns that will be used for further comparison to the evidence of other families (Table 4.209).

Table 4.216: Mande stems and patterns for ‘1000’

Manding	wúlú/wúli	wáa/wá/ wà/wága	bà
Jogo-Jeri	búlí, wúlú (< manding)		
Mokole		wàa/wá/ waga	
Vai-Kono	wúl		
Susu	wúlù/wúlì		
SWM	wùlù	wála/wáá	
Bozo-Soninke	gulu	waxa	(’islam’)-muso, wúdzɰ̃nè
Bobo			
Dzuun (Samogo)		gbàˀà, baa	bi ‘goat’, 800+200, <juula
Jowulu		waˈaˈ	800+200
SE-Eastern		wàà ‘200’	200*5,vûû, ‘dúú, pàdí, pə, boro
SE-Southern	wúlù/wlű/ gblű̱ (?)	*wágá: wáá	kpi , kɛn

Table 4.217: Numerals in Proto-Mande

1	do, kelen	7	wɔ-X-fila (‘hand’+2?)
2	pila/fila	8	seki/segi (<‘plus’-3?)
3	sakpa/sagba/sawa, ʔààkɔ̃/yààká?	9	kònonto/kɔ̀nɔndɔ(n) (10–1, 5+4)
4	náání/nɑ̃ɑ̃i	10	pu/fu, tan (< *‘5’?)
5	dúuru/sɔ́ɔ́ru, wo? ko? **tan? (> ‘10’?), nṹ?	20	<‘human’
6	wɔrɔ (wɔ-rɔ? ‘hand’+1?), t(s)um?	100	kɛmɛ, 20*5
		1000	wulu, wa(g)a

4.11 Mel

A narrow definition of the Mel family is preferred here (in accordance with the classification of the Atlantic languages suggested in (Pozdniakov & Segerer 2017). This family comprises two compact language groups, namely Northern (Temne, Landuma, and all Baga languages except for Baga Fore and Baga Mboteni, namely Baga Koba, Baga Maduri, Baga Sitemu and others) and Southern (Kisi, Sherbro, Mani, and Krim). Sua, Limba and Gola are not included within the Mel family and are viewed as isolated NC languages. The numeral systems of the two Mel groups comprised of the distant languages are treated separately below.

4.11.1 Southern Mel

Table 4.218: South Mel numerals

	Kisi	Sherbro	Bullom	Mani (Bullom So)	Krim
1	pìlɛ̀ɛ́/pilɔ, *pum?	bul	(nim)-bul	nìm-búl	yì-mo̲
2	díŋ/C-íŋ/C-ɔ́ŋ,danyõ	tɪŋ	(nin)-tsiŋ/tiŋ	nìn-cɔ́ŋ	yì-ɣɪn/yèèn, dím
3	ŋg-àá/y-àá	ræ	(niin)-ra	nìn-rá	yì-ɣa/gàà
4	hìɔ́lú	hyo̲l	(nii)-hiɔɔl	nìŋ-nyɔ́l/-nyɔ́l	yì-hĭo̲n
5	ŋùɛ̀ɛ́nú	mɛn	(nii)-man	nìmán < niN-wán?	yì-wɛn/n-wén
6	5+1	5+1	5+1	5+1	5+1
7	5+2	5+2	5+2	5+2	5+2
8	5+3	5+3	5+3	5+3	5+3
9	5+4	5+4	5+4	5+4	5+4
10	tɔ́	wāŋ	waan	wàm	wāŋ/wàn
20	bídìí(ŋ)/bélé	‘finished it is man’	u-tɔɔŋ	ù-tɔ̀ŋ	<‘person’
100	< Mande	< English		pé, < Susu	
1000	< Mande	< English		< Susu	

Noun class markers are usually positioned as suffixes in Kisi. However, the first numerical terms in this language have noun class prefixes, which makes the forms look inconsistent, cf. *mùúŋ/ mìɔ́ɔ́ŋ / ŋìɔ́ɔ́ŋ / dìíŋ, tìɔ́ɔ́ŋ/là-tìɔ́ɔ́ŋ* 'two'.

The terms for 'hundred' and 'thousand' were probably absent in Proto-South-Mel. The similarity between Kisi *tɔ́* 'ten' and Bullom-Mani *tɔ̀ŋ* 'twenty' is noteworthy. 'Twenty' may follow the pattern '20=10PL'. If so, the original *tɔ̀ŋ* 'ten' should be viewed as an early borrowing from Western Mande (**tan* '10'). In this case, **wan* '10' is an innovation (probably based on **wan/wen* 'five') that developed in South Mel after Kisi had separated. The numeral system of modern Kisi exhibits no significant changes from the forms described by Koelle. It includes the form *ŋam-puum* '6' (Tucker Childs: *ŋɔ̌ŋpúm*) that may have retained an archaic allomorph of 'one' (**pum*). The forms that will be used for further comparison are summed up in the table below (Table 4.219).

Table 4.219: Proto-South Mel numeral system (*)

1	pìlɛ̀/pilɔ (< *lɛ/lɔ?), bul, mɔ	7	5+2
2	tsiŋ/tiŋ	8	5+3
3	ra	9	5+4
4	hiɔl	10	5PL? , < *West Mande?
5	wan/wen	20	'person', 10PL?
6	5+1	100, 1000	absent

4.11.2 Northern Mel

A higher degree of homogeneity observable in these languages allows an instant reconstruction of their numeral system at the Proto-Nothern Mel (Table 4.220)

Table 4.220: Proto-Northern Mel numeral system (*)

1	-in	7	5+2
2	-rəŋ	8	5+3
3	-sas	9	5+4
4	-ŋkɨlɛ/-nlɛ	10	tɔfʌt (< tɔ-f-ɔt?)/pu , wɨtʃɔ?
5	kə-ʈamaʈ (< * kə- ʈa 'hand'?)	20	10*2, kə-gba (< *bay/bey 'chief'?)
6	5+1	100, 1000	absent

4.11.3 Proto-Mel

The table below gives an overview of South Mel and North Mel forms (Table 4.221).

Table 4.221: Proto-Mel numeral system (*)

1	-in,< *lɛ/lɔ?	7	5+2
2	díŋ/tsiŋ/tiŋ, -rəŋ	8	5+3
3	*tat (> sas, ra)	9	5+4
4	hiɔl, -ŋkɨlɛ/<-nlɛ?	10	*pu/fu, 5PL?
5	wan/wen, <'hand'	20	'person', 10PL?
6	5+1	100, 1000	absent

4.12 Atlantic

Our step-by-step reconstruction of numeral systems in the Atlantic languages will be based on their classification suggested in Pozdniakov & Segerer 2017 (forthcoming) that distinguishes two main groups within the Atlantic family, namely Northern and Bak.

4.12.1 Northern

The numeral systems of Northern Atlantic are treated below by sub-group.

4.12.1.1 Cangin

Table 4.222: Proto-Cangin numerals (*)

1	no	7	5+2
2	nak	8	5+3
3	haj/ʔéeyə	9	5+4
4	nik-iɭ < *nak-iɭ?	10	sabbo (< Fula), da:ŋkah
5	jat (<'hand'), ʔi:p	20	10*2
6	5+1	100, 1000	< Wolof? Fula?

Some of the reconstructions presented above are not immediately apparent and are in need of additional commentary. A detailed discussion of each of them

would be impossible here, so we will take the reconstruction suggested for ‘four’ (*nik-il*) as a sample.

At first glance, the forms of ‘four’ attested in the Cangin languages have nothing in common. Two of the five Cangin languages have *kinil* ‘four’ (Ndut-Palor), whereas in the remaining three (Laala, Noon, and Safin) *nikis* is used in this function. The easiest solution to the problem would be to postulate two alternative forms for this group. However, as the evidence of comparative-historical phonetics suggests, the final **-l** in Ndut-Palor regularly corresponds to the final **-s** in Laala-Ndut-Safin (Table 4.223).

Table 4.223: l ~ s regular correspondence in Cangin

*-l	‘eye’	‘black’	‘road’	‘four’
Ndut	ʔi**l**	suu**l**	wa**l**	kini**l**
Palor	ʔi**l**	suu**l**	waa**l**	kini**l**, eni**l**
Laala	kɔ**s**	*susu**s**	wa**s**	niki**s**
Noon	kwa**s**	*suju**s**	wa**z**	nigi**s**
Safin	xa**s**	*suzu**s**	wa**s**	niki**s**

This fact alone urges closer examination of the forms quoted above. Further analysis shows that a fossilized noun class prefix **kV-** is present in some of the Palor numerals, cf. ***ka**-nak* ‘deux’, ***ke**-jek* ‘trois’, ***ki**-nil* ‘quatre’, ***k**ip* ‘cinq. At the same time, the suffix **-Vs** is observable in the Noon numerals, cf. *jet-**us*** ‘five’. This evidence combined suggests the following development of the forms for ‘four’ (Table 4.224).

Table 4.224: Development of **nik-Vl* ‘4’ in Cangin

Proto-Cangin	***nik-Vl**		
Laala/Noon/Safin	*nik-**Vs**		**nikis**
Ndut/Palor	*k**i**-nik- Vl	k**i**-nik-il	**kinil**

4.12.1.2 Nyun-Buy

Numerical terms are highly divergent within this sub-group, so it seems reasonable to treat them by branch (Table 4.225).

Table 4.225: Nyun-Buy numerals

	Nyun	Buy (Kobiana, Kasanga)
1	duk	tee(na), -anɔʔ
2	nak	naŋ
3	lal	taar
4	ren(d)-ek	sannaŋ
5	ci-lax (<'hand'), -məkila	ju-roog (<'hand'?)
6	5+1	5+1
7	5+2	5+2
8	5+3	4+4
9	5+4	5+4
10	ha-lax (<'hands')	5PL, ntaajã
20	<'king'	< Mande, 10*2
100	< Mande	< Mande, < French
1000	< Mande	ŋ-kontu < Portuguese[33]

The pattern '5'='hand' ~ '10'='hands' is immediately apparent in Nyun. In the case of Buy, it can be accepted only under the assumption that the derived term for 'five' became phonetically distant from its source form, cf. Kasanga *ji-rek*, Kobiana *ji-hak* 'hand' (these forms must be related to Nyun *ci-lax* 'hand'). In any case, the Kasanga term *ŋaa-roog* follows the pattern '5PL' that uses the same plural noun class as the one attested in *ŋa-rek* 'hands'.

The forms for 'ten' attested in Joola Ejamat (Atlantic Bak) *si-ntaaja* is important for the diachronic interpretation of the Kobiana form *ntaajã*. The evidence suggests that the latter was probably directly borrowed from Joola[34] (as was *-anɔʔ* 'one').

4.12.1.3 Jaad-Biafada

The forms of 'one' (*ɲi/ nɛ*) are distinguishable in the compound numerals, cf. Jaad *ŋka-inɛ* '6' ('5+1'), Biafada *mpaaji nyi* '7' ('6+1'), etc. The term for 'five' goes back to the lexical root meaning 'hand' (Biafada *gə-bəda*, Jaad *ko-bəda*).

[33] Guillaume Segerer (p.c.).

[34] According to Guillaume Segerer (p.c.) it is possible that the Ejamat and Kobiana forms both come from Manjak.

Table 4.226: Jaad-Biafada numerals

1	nnəmma, *ɲi/nɛ/-inɛ, -kkã	7	5+2, 6+1 (< Manjak)
2	ke, ma-ae	8	5+3, wose/wase
3	jo/tʃaw	9	5+4, leberebo
4	n(n)e/nnihi	10	(p)po
5	bəda (<'hand')	20	10*2
6	5+1, paaji (< Manjak), ŋka-?	100, 1000	< Fula

4.12.1.4 Tenda

The reconstruction of the Proto-Tenda numerals (**Pozdniakovmstenda**) is based on a comparative analysis of five Tenda languages: Basari, Tanda, Bedik, Bapen, Konyagi.

Table 4.227: Tenda numerals (*)

1	ɓɑt, ndi/riye/diye/iye, mbɔ	7	5+2
2	ki	8	5+3
3	taʈ	9	5+4
4	nə̀x	10	poxw
5	mbəɗ (<'hand'), cɔ/njɔ	20	10*2
6	5+1	100, 1000	< Fula, < Mande

The etymology of the Konyagi term for 'five (*mbəɗ*) is based on the Jaad-Biafada evidence (these languages belong to the same sub-group as Tenda).

4.12.1.5 Fula-Sereer

The numerical terms are highly divergent within this sub-group, so it seems reasonable to treat them by language (Table 4.228).

The fact that the Seerer terms covering the sequence from 'two' to 'five' have the same final segment is noteworthy. This could potentially be interpreted as a special morpheme or as a sub-morpheme that resulted from alignment by analogy. This discussion will be resumed below. Here it can only be stated that the

[35]Reviewing my first version of the book, Guillaume Segerer has advanced a new interesting etymology for Fula: *jow-i* '5' = *jun-ngo* <*jow-ngo* 'hand'. His hypothesis is quite possible.

Table 4.228: Fula-Sereer numerals

	Fula	Sereer
1	goʔo	leŋ
2	ɗiɗi	ɗik
3	tati	tadik
4	na(y)i	nahik
5	jo(w)i[35]	ɓe-tVk
6	5+1	5+1
7	5+2	5+2
8	5+3	4+4
9	5+4	5+4
10	sapp-o	xarɓ-
20	noogas/noogay	10*2
100	teeme-	< Fula
1000	< Mande, < Hausa	< Wolof?

morphological analysis of the Sereer term for 'five' (*ɓe-tVk*) suggested in the table below is not immediately apparent and is thus debatable. Within this approach the element **ɓe-** is interpreted as a noun class prefix despite the fact that such a class is lacking in Sereer. Complex issues pertaining to the reconstruction of the term for 'five' will not be treated here. We shall only note that the plural animate class is reconstructable as **ɓe-** (class 2) in Proto-Fula-Sereer.

4.12.1.6 Wolof

Table 4.229: Wolof numerals

1	CL-enn	7	5+2
2	ñaar (< *CL-(X)aar)	8	5+3
3	ñ-ett (< *CL-(X)ett)	9	5+4
4	ñ-ent (< *CL-(X)en(i)t)	10	fukk
5	jurom	20	< 'person', 10*2
6	5+1	100, 1000	< Fula, < Mande

The Wolof term for 'one' exhibits the agreement in noun class, cf. *k-enn nit* 'one person', *g-enn garab* 'one tree', *f-enn* 'somewhere', *l-enn* 'something', etc. The same can be applied to the terms covering the sequence from 'two' to 'four' as demonstrated in Pozdniakov 2015: 82. Nothing is known about the original radical of the root (assuming there was one) since it was replaced by a noun class consonant.

Speaking of 'twenty', it should be said that the form *nit(t)* (apparently related to the lexical root *nit* 'person') is widely used alongside the common Wolof pattern '10*2'.

4.12.1.7 Nalu-Baga Fore-Baga Mboteni

This sub-group is the most problematic within Northern Atlantic. Admittedly, the evidence pertaining to their classification as Northern is inconclusive. Moreover, the sub-group itself is highly heterogeneous, which affects its numeral systems as well. The pertinent data for each of these languages is provided below (Table 4.230).

Table 4.230: Numerals in Nalu, Baga Fore and Baga Mboteni

	Nalu	Baga Fore	Baga Mboteni
1	deːndɪk	ki-ben	mbɔ́
2	bi-lɛ	ci-di	sà-lɛ́
3	p-aat	ci-tɛt	n-dɛ́r
4	bii-naaŋ	ci-nɛŋ	í-nà
5	teedoŋ (< tɛ́ 'hand'?)	su-sɑ(n)	ì-rìβɛ̌, *ba(x)?
6	5+1	5+1	5+1
7	5+2	5+2	5+2
8	5+3	5+3	5+3
9	5+4	5+4	5+4
10	5*2, *a-lafaŋ?	ɛ-tɛ-lɛ (<'hands'+2)	tɛ̀n (< '*hand'?)
20	10*2	10*2	10*2
100	m-laak	bɔ-1	< Mande
1000	m-ɲaak (100pl?) < Susu	tɛngbeŋ-1	?

4.12.1.8 Proto-Atlantic North

The prospects for the reconstruction of the Proto-North Atlantic numerals are discussed below.

4.12.1.8.1 'One' (Table 4.231)

Table 4.231: Numerals for '1' in Northern Atlantic

Cangin		no		
Nyun				duk
Buy		nɔʔ		tee(na)
Jaad-Biafada	*ɲi/nɛ			nnəmma,pakkã
Tenda	di(ye)		mbɔ	bat
Fula-Sereer	leŋ			goʔo
Wolof	-enn			
Nalu	deendik		mbɔ́	ki-ben

Isolated forms are quoted in the rightmost column. Direct parallels to some other forms are attested in Cangin – Buy (*nɔʔ*) and Konyagi – Baga Mboteni (*mbɔ*). The most common root is **di(n)/ li(n)/ ye(n)/ ne(n)* (assuming that these forms are related).

4.12.1.8.2 'Two', 'Three' and 'Four' (Table 4.232)

Table 4.232: Numerals for '2'-'4' in Northern Atlantic

	'2'	'2'	'2'	'2'	'3'	'3'	'4'	'4'
Cangin	nak					haj	nik-iɭ < nak-iɭʔ	
Nyun	nak				lal			ren(d)-ek
Buy	naŋ				taar			sannaŋ
Jaad-**Biafada**			ke			jo/caw	n(n)e(hi)	
Tenda			ki		taʈ		næx	
Fula-**Sereer**		ɗik			tati(k)		na(y)i(k)	
Wolof				X-aar	X-ett		X-en(i)t	
Nalu		di/lɛ			tɛt/tat		naaŋ/nɛŋ/na	

The forms of 'two' in Tenda-Jaad-Biafada can be explained as a shared innovation, since these two branches belong to the same sub-group. The forms quoted

in the two leftmost columns could be related, but the pertinent evidence is inconclusive. The roots **nak* and **di(k)* are reserved for further comparison.

As in the majority of other NC branches, the terms for 'three' and 'four' (tentatively recorded as **taţ* '3' and **nak* '4') are fairly consistent in North Atlantic. Thus it appears that the terms for 'two' and 'four' are the same (or phonetically similar) across the languages of this branch. Cangin is the only language that does not comply with the additional distribution, because in the case of Cangin both terms are reconstructed as **nak*. Interestingly, the form of 'four' bears a suffix, hence it could potentially be explained as a derivative of 'two'. At the same time, the root *nak* 'four' is reminiscent of one of the most persistent NC roots with this meaning.

In Jaad-Biafada we find the root **jow/caw* '3'. This is undoubtedly an innovation in the group which is represented by a remarkable isogloss. This is therefore an argument in favour of interpreting this group as part of the northern branch of the Atlantic family: Biafada *-njo / bíí-co/ bií-yo* '3', Jaad *ma-cao/ ma-caw/ má-cɔu* '3'. It is possible that we are dealing with an ancient borrowing of Proto-Jaad-Biafada from Mande (from *saba* 'three').

In theory, it is possible that forms attested in the Cangin languages (*ka-hay / * ʔe-jɛʔ*), also originated from the Mande form (likely weakened to **habi / hawi*).

In this case, we find either reflexes of the Proto-NC form **tath* or borrowings (taking into account very ancient forms) – from the Mande languages in numerous Northern Atlantic languages.

4.12.1.8.3 'Four'

The root **na(h)i-k* can be securely reconstructed for Proto-Northern Atlantic. As has been demonstrated above, the initial **ñ-** of the Wolof term is a reflex of a noun class prefix that replaced the initial radical of the root. The final -t in the Wolof term probably resulted from the alignment by analogy with the term for 'three' that ends in -t, cf. **ñ-eenk* ? ⟶ *ñ-eent* '4' by analogy with *ñ-ett* '3'.

4.12.1.8.4 'Five' (Table 4.233) and the terms from 'six' to 'nine'

The North Atlantic languages are characterized by the term for 'five' being systematically derived from the lexical root meaning 'hand'. Interestingly, this development seems to post-date the replacement of the original root for 'hand' by an innovation in the majority of the branches. At least four independent formations of this kind are attested within eight branches (cf. the evidence quoted in the leftmost column of the table). Both Tenda and Jaad-Biafada terms for 'five'

Table 4.233: Numerals for ‘5’ in Northern Atlantic

Cangin	jat (<‘hand’)			ʔiːp	
Nyun	ci-lax (<‘hand’)				-məkila
Buy			ju-roog		
Jaad-Biafada	bəda (’hand’)				
Tenda	mbəɗ (<‘hand’?)	co/njo			
Fula-Sereer		jo(w)i	* ɓe-tVk		
Wolof		jurom			
Nalu	teedoŋ/*tee (‘hand’?)			ribə(l)	su-sa(n), *ba(x)?

are of common ancestry: they seem to have developed from the root **ɓəda* at the Proto-Jaad-Biafada level, since both languages belong to the same sub-group. This probably indicates that the pattern based on the term for ‘hand’ was used in the languages that belong to the Northern group at the proto-level (possibly as an alternative to the inherent NC root for ‘five’). In view of this, the formal alterations of ‘five’ are easily explained as those automatically caused by the replacement of the inherent term for ‘hand’ by an innovation. As we hope to demonstrate in the next chapter, the derivational pattern ‘hand’ > ‘five’ is surprisingly rare in the NC languages. It is barely attested, for example, in Benue-Congo, thus being characteristic of the North Atlantic languages (and the Atlantic languages on the whole, see below).

In view of this, the reflexes of the inherent NC root for ‘five’ could have been preserved in only a minority of North Atlantic branches. The roots **jo/ co*, **tVk/ rog* and **rib/ ʔiːp* unrelated to the term for ‘hand’ deserve special attention within this context.

The pattern ‘5+’ (‘hand’+) can be securely reconstructed for the terms covering the sequence from ‘six’ to ‘nine’. The uncommon pattern ‘7=6+1’ attested in Biafada was borrowed from one of the Manjak languages (Atlantic Bak), as was the derived term for ‘six’ (*mpaaji*).

4.12.1.8.5 ‘Ten’ and ‘Twenty’ (Table 4.234)

Table 4.234: Numerals and patterns for ‘10’ and ‘20’ in Northern Atlantic

	‘10’	‘10’	‘10’	‘20’	‘20’	‘20’
Cangin			< Fula, daːŋkah	10*2		
Nyun		<‘hands’			<‘king’	
Buy		5PL	ntaajã	10*2		< Mande
Jaad-Biafada	(p)po			10*2		
Tenda	pəxw			10*2		lapɛm
Fula-Sereer			sapp-o, xarɓ-	10*2		noogas/noogay
Wolof	fukk			10*2	‘person’	
Nalu		5*2	*a-lafaŋ?	10*2?		

With the evidence of the three branches, the reconstruction of the term for ‘ten’ (tentatively recorded as **pok*) seems secure. Its attestations are admittedly limited, apparently due to its replacement with derived terms based on ‘five’ (‘hand’). This reconstruction is also supported by the presence of the final velar: as we have seen, it is reconstructable in a number of other numerical terms at the proto-level.

The pattern for ‘twenty’ is reconstructable as ‘20=10*2’. Particular derivates based on the typologically widely attested patterns (’20’ <‘person’, 20 <‘king’) seem to have formed independently.

4.12.1.8.6 ‘Hundred’ and ‘thousand’

The evidence points to the absence of these terms in Proto-North Atlantic. Attested forms are borrowings from ‘influential’ languages such as Fula, Wolof, Manding, Hausa (in the case of Niger Fulfulde). Interestingly, the terms in question are already borrowings in some of these source-languages.

4.12.1.8.7 Proto-North Atlantic numeral system (Table 4.235)

Table 4.235: Proto-North Atlantic numeral system (*)

1	di(n)/li(n)/ye(n)/ne(n), mbɔ	7	5+2
2	di(k), nak	8	5+3
3	taʈ	9	5+4
4	nak	10	pok
5	<‘hand’, jo, tVk/rog, rib/ʔi:p	20	10*2
6	5+1	100, 1000	absent

4.12.2 Bak

4.12.2.1 Joola languages

Over a hundred sources covering the numeral systems of fifteen major Joola dialects have been made available to us courtesy of Guillaume Segerer. His collection of evidence may be labeled a ‘dialect atlas’ of numerical terms. These terms often exhibit significant variations not only in their phonetics but in the inventory of lexical roots as well.[36] The name Joola pertains to a group of at least seven related languages (including Bayot). A study of their numeral systems may help set a clearer distinction between these languages. Moreover, it might shed some light on their (hitherto unclear) internal classification.

Numerical terms as attested in ten major Joola languages are discussed below.

4.12.2.1.1 ‘One’ (Table 4.236)

Table 4.236: Joola numerals for ‘1’

Bliss Banjal	Kasa Mlomp	Fogny Karon	Keeraak Ejamat	Bayot Kwaatay
-anɔʔ	-anor	-anor	-anor	
-anor	-anor	-anor	-anor	
	(akon)	əkon		(akon)
	(ta)			don
			yinka, (sia)	fɛnɛŋ

[36] I wish to express my gratitude to G. Segerer for his assistance with regard to the dialectal attribution of sources.

The main form is reconstructed as *-*anor*, with the initial vowel forming a part of the root. The only languages where this root is not present are Bayot (*don* '1') and Kwaatay (*fɛnɛŋ* '1'). The root *ǝkon* with a vocalic opening (sporadically attested in Kasa and Bayot) is found in Fogny alongside *-*anor*.

4.12.2.1.2 'Two', 'three' and 'four' (Table 4.237)

Table 4.237: Joola numerals for '2'-'4'

Bliss Banjal	Kasa Mlomp	Fogny Karon	Keeraak Ejamat	Bayot Kwaatay
'2'				
si-lubəʔ	si-ɬubɤʔ	(liba)	sɪ'subə	ʔi-ɾigəʔ/tɪgga
si-rubə	sɪ-subəl	su-supək/ɕi-ɕipəkʰ	si-lu:bɜʔ	sɪ'subə
'2'				
si-gabaʔ	si-gäbä, (ku-mɛntɛn)	si-gäbäʔ	si-gäbä	
'3'				
si-həəji	si-hɤ:ɟiʔ	si-feegiir/si-fe:ɟiʔ	sɪ-hə:jɪ	i-fiigiʔ/i-fəəʒi
gu-fɪ:gɪr/si-fɤɟiɾ	sɪ-hə:jɪl	si-hə:ci:l	si-həəji, (fu-fooateen)	ki-hɤ:ɟiʔ
'4'				
si-bäkir	si-bä:kiɽ/si-bäkiʔ	si-bäkiɾ/si-ba:ci:r	si-bacir	sɪ-bɐɣɪɾ
si-baagir	sɪ-bacɪl	ɕɪ-päkil/si-ba:ci:l	si-bäkir	ki-bäkir

Two alternative roots for 'two' are attested in Joola, namely **si-ɬubəʔ* and a relatively wide-spread **si-gabaʔ*.

The term for ‘three’ goes back to **si-feegir*, with its reflexes being attested in all dialects.

The term for ‘four’ is securely reconstructed as **si-bääkiɣ*.

4.12.2.1.3 ‘Five’ and ‘ten’ (Table 4.238)

Table 4.238: Joola numerals for ‘5’ and ‘10’

Bliss Banjal	Kasa Mlomp	Fogny Karon	Keeraak Ejamat	Bayot Kwaatay
‘5’				
hu-tɔk fu-tɔk	hu-tɔk^{h}	fu-tɔk/u-sɔk ɪ-ɕäk^{h}/i-sak	hu-tɔk fu-tɔk/hu-ʂok	o-to/ɔ-ɬɔ/ɔ-rɔ hu-tɔk
‘5’				
	(naa-suan) ŋaa-suwaŋ			
‘5’				
 *tən		*fu-tam		
‘10’				
ku-ŋɛn <‘hands’ gu-ɲɛn <‘hands’	ku-ŋɛn <‘hands’	ku-ŋɛn <‘hands’	ku-ŋɛn <‘hands’ ku-ŋɛn <‘hands’	
‘10’				
	sɛ-bɛɛs ‘hands’	ŋaa-suwan		gu-tie(pɔkɔ) ‘hands’ su-moŋu/su-ŋɔmu ‘hands’

The Banjal form **tən* (reconstructed on the basis of the compound numerical terms) and the (related?) Fogny form *fu-tam* attested in a source dating to the seventeenth century (d'Avezac 1845) are of special interest.

The Mlomp form of 'five' (sporadically attested in Kasa as well) is identical to the Karon form for 'ten' (*ŋaa-suwan* in both cases). The etymology of these forms is unclear. At the same time, the majority of the forms for 'ten' (but not for 'five' as in the majority of the North Atlantic languages) go back to the lexical root meaning 'hands'. To illustrate this point, the lexical stems for 'hand' in the Joola languages are quoted in the table (Table 4.239).

As can be deduced from the presentation above, at least four lexical roots for 'hand' that serve as a basis for the terms for 'ten' are distinguishable in Joola. Interestingly, the source roots and the numerical terms that depend on them are not necessarily the same within a language. The main root is **ku-ŋɛn/ ku-ɲɛn* '10' <'hands'. At the same time, *bɛɛs* 'hand' yields *sɛ-bɛɛs* 'ten' in Mlomp. This derivative is not attested in in Kasa and Karon where *bɛɛs* 'hand' alternates with *ŋɛn/ ɲɛn* 'hand'. The base **ka-ʈe* 'hand' attested in Bayot and Kasa yields *gu-tie-* in Bayot. Finally, *ɛ-mɔŋu* 'hand' > *su-moŋu* 'ten' in Kwaatay (also *ɛ-ŋɔmu* 'hand' > *su-ŋɔmu* 'ten' with a metathesis).

As noted above, the root *ɛ-ntaaja* attested in Keeraak and Ejamat was possibly incorporated into Kobiana (North Atlantic). This root, admittedly very rare in the Joola cluster, is the only primary one for 'ten' and as such it deserves special attention (especially in view of its later replacement with the derivatives based on 'hand').

4.12.2.1.4 'Twenty', 'hundred', and 'thousand'

Two apparent derivational patterns are used for the term for 'twenty' in the Joola languages:

<'king': Bliss *a-yuy*, Banjal *ə-vi/ə-vvi*, Kasa *a-yi/ ɔ-ji*, Karon *əwi*, Bayot *ə-y*;

<'person': Kasa *an / bu-k-an*, Fogny *ka-banan* 'person finished'.

In Kwaatay the term for 'twenty' is based on 'mouth' (*bu-tum-an*).

The terms for 'hundred' and 'thousand' are borrowings from Mande or 'influential' Atlantic languages (often either Fula or Wolof) in the majority of the dialects, cf. *keme/teme* '100', *wuli, juni* '1000'.

In conclusion it should be added that the Joola terms covering the sequence from 'six' to 'nine' follow the common pattern '5+'.

Table 4.239: Joola stems for ‘hand’

Bliss Banjal	Kasa Mlomp	Fogny Karon	Keeraak Ejamat	Bayot Kwaatay
‘**hand**’				
ka-ŋɛn(ak)	ka-ŋɛn	ka-ɲen(ak)/ka-ŋɛn	ka-ŋɛn	
ga-ɲɛn/ka-ɲɛn(ak)		ka-ɲɛn	ka-ŋɛn(ak)	ka-ŋyɛn(ak)
‘ ‘**hand**’				
	e-bɛɛs			
ɛ-pɛs	ɛ-bɛɛs	ɛ-pɛs/ɛ-bɛs		
‘**hand**’				
				ɛ-mɔŋu/ɛ-ŋɔmu
‘**hand**’				
	ka-seʔ			ka-te/ga-te/ʈe/kə-se
‘**hand**’				
bu-lɛhɛj		ɛ-lɛcɛs		
‘hand’		‘upper arm’		
bi-lɛfɛj			bu-lɛfec ‘inner hand’	
‘**hand**’				
ka-ʂɛɲum(əku)			kə-ləɲum ‘hand’	

4.12.2.2 Manjak languages

This branch is represented by three closely related languages (Manjak, Mankanya, Pepel). Numerical terms attested in them are presented in the table below (Table 4.240).

Table 4.240: Manjak numerals

1	lɔɔl(e)/lɔŋ	7	6+1, jand/jaanʔ/ cand (Pepel)
2	-təb/-təw, -puguʈ/pugus (Pepel)	8	4PL, koas/ʊʌs
3	wa-(y)anʈ/wa-jenʈ/ jens	9	10−1, (8+1)
4	baakər/wakər	10	5PL (‘hands’), (n)taaja/taaya, taim (Pepel)
5	ɲɛɛn (‘hand’)	20	10*2
6	paagi/paaji	100	< French
		1000	kʊnt

As can be gleaned from the table, the Manjak stems for numerals are very different from those attested in Joola. At the same time, morphological and lexical evidence strongly suggests that these two branches are genetically the closest and belong to the same Bak sub-group.

This implies that the numeral system of one of these branches must have undergone systematic innovations. We will reserve our conclusions until the evidence from the other Bak sub-groups, i.e. Balant and Bijogo, is reviewed.

4.12.2.3 Balant

Despite the fact that Balant is usually treated as one language, we will present the evidence of Balant Ganja and Balant Kentohe separately (Table 4.241), because the difference between these two idioms is of key importance to our study.

The opening sequence of the Ganja terms is quoted according to Creissels & Biaye 2015. They form the most reliable part of the presentation. A few remarks pertaining to the differences in these Balant dialects are in order. First of all, the Balant Kentohe terms for ‘one’, ‘two’, ‘three’ and ‘six’ exhibit a final homorganic nasal of uncertain origin. The forms attested by Koelle in the 19th century sources suggest that we are dealing with a morpheme **-n** not assimilated to a preceeding consonant by point of articulation. Secondly, Koelle’s evidence speaks in favor of ‘six’ being a base for a larger group of numerical terms. According to him, not only ‘eight’ and ‘nine’ but also ‘ten’ followed the pattern ‘6+’.

Table 4.241: Balant numerals

	Balant Ganja	Balant Kentohe
1	hɔ́dà/wɔ́dā/-ɔdaʔ, bɔ́ɔ́díbɔ́/wɔdibɔ (counting)	-ɔɔdn/hoːdn/fóóda
2	sìbí/-sebe	-sɪbm/-sebm/g-ʃíibn (Koelle 1963[1854])
3	hàbí/yààbiĩ̀	-habm/káábn (Koelle 1963[1854])
4	tàllá/tàhàlā	-tasla/tahla/táʃiila (Koelle 1963[1854])
5	jùíf/jéèf	cɪf/ʻ-cef/kiif ~ ciif (Koelle 1963[1854])
6	fááj/faac	mfaacɲ/faad (Koelle 1963[1854]), 5+1
7	6+1	6+1, 5+2
8	táhtállà/tāntàhlā (4 redupl.), 6+2	5+3, 6+2 (Koelle 1963[1854])
9	jíntàllá/jīntàhlā (5+4)	5+4, 6+3 (Koelle 1963[1854])
10	jímmín/jīnmīnn (<5?)	cɪfmɪn/f-cef meen (<5?), 6+4 (Koelle 1963[1854])
20	10*2	<ʻperson’
100	gèmé/kɛmɛ (borrowed)	<ʻ5 persons’
1000	wílí (borrowed), kont	f-koːnti

4.12.2.4 Bijogo

Let us examine an analysis of the Bijogo numeral system found in (Segerer 2002). According to him, the term for ‘one’ is *nɔɔd* (“cette forme est retenue pour l’énumération abstraite”, ibid. 171). His interpretation of *-**d** as the only true reflex of the etymon (with other segments ensuring the grammatical agreement) is immediately convincing, cf. the following examples quoted by him (ibid. 171):

(2) a. *o-to ɔ-nɔɔd* ‘a person’
b. *e-booʈi ɛ-nɛɛd* ‘a dog’
c. *u-gbe u-nɛɛd* ‘a road’
d. *ka-jɔkɔ n-ka-d* ’a house’
e. *ŋɔ-katɔ ŋ-ŋɔ-d* ’a fish’.

Table 4.242: Bijogo numerals

	Bijogo Kagbaga (Bubaque)	Bijogo (other dialects)
1	n-ɔɔd (*-d)	
2	n-somb (Segerer, p.c.), n-sombɛnt̪	sòòbɛ́/súngb/cuuwɛ, ndank (Kamona)
3	ɲ-ɲɔ-ɔkɔ (<‘fingers’)	
4	ya-agɛnɛk	
5	n-de-ɔkɔ (dɛ ‘to finish’, -ɔkɔ ‘hand’)	nu-duβ-ɔkɔ (Kamona)
6	5+1	
7	5+2	
8	5+3	
9	5+4	
10	n-ruakɔ (ru ‘to rise’, -ɔkɔ ‘hand’)	
20	o-joko (‘person’), -ansak-o-to (‘to finish’+‘somebody’)	ŋɔjɛt oto (Kamona), Koelle 1963[1854]: ría̲a̲kɔ́ɔ̰́to/ŋórembaʃóóto
100	20*5	
1000	kuntu	

Segerer justly observes that ‘La forme générale de l’élément ayant pour valeur ‘un (autre)’ est donc **(V)-n-pC-d**, où **pC** est le préfixe de classe du nom déterminé’ (ibid. 171).

He also quotes the form *dideeki* ‘seul’ (var. *deeki* ‘tout seul’). A variant of this form probably appears as *èd̪ìgɛ́/ néédigɛ/ módiigɛ* ‘one’ in Wilson and Koelle.

As demonstrated by Segerer, the term for ‘three’ (*ɲ-ɲɔɔkɔ*) is a Bijogo innovation of a cultural origin, cf. SG *ɲɔ-ɔkɔ* - PL of *nɔ-ɔkɔ* ‘finger’ (dim. <*kɔ-ɔkɔ* ‘hand’): ‘Un roi bijogo ne se déplace jamais sans l’attribut symbolique de sa fonction, consitué par une sculpture de bois et de corne … Cet objet, nommé u-ran kɔ-ɔkɔ, represente une main à trois doigts’ (ibid. 172). It should be noted that this root is attested in all Bijogo dialects and is already accounted for by Koelle (*-ɲɔ́ɔ́gɔ*).

As established by Segerer, the same root is attested as *ɔkɔ* in the terms for ‘five’ and ‘ten’.

4.12.2.5 Proto-Bak

Now we will compare the Bak numerals.

4.12.2.5.1 'One' (Table 4.243)

Table 4.243: Bak numerals for '1'

Joola	**don**	-anor, ǝkon, fɛnɛŋ, yinka, (sia), (ta)
Manjak	lɔɔl(e)/**lɔŋ**	
Balant		-ɔdaʔ
Bijogo	***d**	-eḏ̀gɛ

A comparison of the terms quoted in the leftmost column yields the form that can be tentatively recorded as **don*. The rightmost column gives an overview of roots attested in only one out of four branches.

4.12.2.5.2 'Two' (Table 4.244)

Table 4.244: Bak numerals for '2'

Joola	si-ɬubəʔ	si-gabaʔ
Manjak		-təb/-təw, puguʈ/pugus
Balant	sɪbɪ/-sebe	
Bijogo	sòòbɛ́/súngb/cuuwɛ	

The leftmost column presents the root attested in three sub-groups. It is traceable to **ɬubəʔ*.

4.12.2.5.3 'Three' and 'four' (Table 4.245)

For the first time in our step-by-step analysis of numeral systems in the numerous NC families we observe the existence of a separate root for 'three' in each of the branches of a language group.

The term for 'four' exhibits an isolated Joola-Manjak innovation as well as isolated innovations in Balant and Bijogo.

Table 4.245: Bak numerals for ‘3’ and ‘4’

	‘3’	‘4’	‘4’
Joola	si-feegir	si-bääkiʈ	
Manjak	wa-(y)anʈ/wa-jenʈ/jens	baakər/wakər	
Balant	habi/yabi		tasala/tahala
Bijogo	ɲ-ɲɔ-ɔkɔ (<‘fingers’)		ya-agɛnɛk

4.12.2.5.4 ‘Five’ (Table 4.246)

Table 4.246: Bak numerals for ‘5’

Joola		fu-tɔk, tən?, ŋaa-suwaŋ? (cf. ‘10’)
Manjak	ɲɛɛn (‘hand’) (cf. Joola ‘10’)	
Balant		jìíf/jéèf
Bijogo	n-de-ɔkɔ (dɛ ‘to finish’, -ɔkɔ ‘hand’)	

The pattern ‘hand’ > ‘5’ is traceable within two branches. However, the roots involved are different in each case. Numerous isolated forms are grouped together in the rightmost column.

4.12.2.5.5 The terms from ‘six’ to ‘nine’ (Table 4.247)

Table 4.247: Bak numerals and patterns for ‘6’-’9’

	‘6’	‘6’	‘7’	‘8’	‘9’
Joola	5+1		5+2	5+3	5+4
Manjak		paagi/paaji	6+1, jand/jaan?/cand	4PL, koas/ʊʌs	10−1, (8+1)
Balant		fááj/faac	6+1	4 redupl., 6+2	6+3, 5+4
Bijogo	5+1		5+2	5+3	5+4

The form **paag/paaj* 'six' is a common Manjak-Balant isogloss.[37] It is not surprising that the primary term for 'six' attested in these languages served as the basis for the '7=6+1' pattern. This pattern received further development in Balant where it was employed for terms up to 'ten' (i.e. '10=6+4') according to the 19th century sources. At the same time, the archaic pattern '8=4PL'/'8=4 redupl.' is attested in these languages alongside the pattern '8=6+2'.

4.12.2.5.6 'Ten' (Table 4.248)

Table 4.248: Bak numerals for '10'

Joola	ɛ-ntaaja[38]	ku-ŋɛn/ɲɛn 'hands'	'hands' (bɛɛs, moŋu/ŋɔmu, tie)	ŋaa-suwan
Manjak	(n)taaja/taaya		5PL ('hands')	taim
Balant Bijogo			n-ruakɔ (ru 'to rise', -ɔkɔ 'hand')	jímmín, 6+4

In addition to the common pattern '10 = 'hands'', both branches share a common root (*ntaaja*) that could be interpreted as a shared Proto-Joola-Manjak innovation.

4.12.2.5.7 'Twenty', 'hundred' and 'thousand'

The term for 'twenty' is based on the lexical root meaning 'person' in all of the branches (except for Manjak, where it was replaced with the pattern '20=10*2'). The same development is observable in Balant Ganja as well.

The terms for 'hundred' and 'thousand' are most likely borrowings. However, the origin of *kont/kunt* 'thousand' attested in three of the Bak branches deserves special discussion (in North Atlantic this root (*ŋ-kontu*) is found in both of the Buy languages).

[37] Guillaume Segerer is right to note (p.c.) that the Manjak-Balant form **paag-* '6' may be ralated to Joola **-feegir/-həəji* '3'

[38] The stem is attested only in Joola Feloup, so, it seems to be borrowed from Manjak.

4.12.2.5.8 Overview of the Bak numerical terms (Table 4.249)

Table 4.249: Bak numerals

1	don/lɔŋ, -anor, ǝkon	7	6+1, 5+2, jand/jaanʔ/ cand (Pepel)
2	ɬubǝʔ, -tǝb/-tǝw, -puguʈ/pugus	8	4PL/4 redupl., ʊʌs
3	feegir, yanʈ/jenʈ, habi/yabi	9	5+4, 10−1, 6+3
4	baakǝr/wakǝr, tasala/tahala	10	5PL (‘hands’), (n)taaj, taim, -suwan
5	‘hand’, tɔk, tǝn?	20	‘person’, 10*2
6	paag/paaj, 5+1	100	borrowed
		1000	kʊnt (borrowed?)

4.12.3 North Atlantic and Bak Atlantic numerals in the comparative perspective

It should be stressed that the Atlantic family is among the most divergent within Niger-Congo. Some of the numerical terms in both of the Atlantic groups exhibit a variety of forms potentially explained as Proto-NC reflexes. Moreover, the comparative evidence presented in Tables 4.227 (Proto-North-Atlantic) and 4.241 (Proto-Bak-Atlantic) points to the near total absence of common roots present in both groups. The only exception to this is the root *tɔk/ tVk* ‘five’.

In view of this, the only available solution would be the study of the Atlantic evidence within a wider NC context (i.e. in contrast to the reconstructions available for other NC families). A comparison of the intermediate reconstructions within the macro-family will be offered in the next chapter.

4.13 Isolated languages vs. Atlantic and Mel

According to the traditional classification outlined in Sapir 1971, Limba, Sua and Gola belong to the Atlantic languages. However, as we tried to demonstrate in Pozdniakov & Segerer 2017 (forthcoming) this hypothesis is as ill-grounded today as it was half a century ago.

An overview of the pertinent data for each language is presented in the tables below.

4.13.1 Sua

Table 4.250: Sua numerals

1	sɔn	7	5+2
2	cen	8	5+3
3	b-rar	9	5+4
4	b-nan	10	tɛŋi
5	sɔŋgun	20	10*2
6	5+1	100	kɛmɛ
		1000	uŋ-kɔntu

4.13.2 Gola

Table 4.251: Gola numerals

1	guùŋ	7	5+2
2	tì-yèe/tī-el/cel	8	5+3
3	taai/tāāl	9	5+4
4	tii-nàŋ	10	ziìyà
5	nɔ̀ɔ̀nɔ̀ŋ	20	kpɛ̀(w)ùŋ
6	5+1	100	20*5
		1000	< English

4.13.3 Limba

Table 4.252: Limba numerals

1	ha-nthe	7	5+2
2	ka-le/kaa-ye	8	5+3
3	ka-tati	9	5+4
4	ka-naŋ	10	kɔhi
5	ka-sɔhi	20	10*2
6	5+1	100	kɛmɛ, wuli (borrowed)
		1000	wulu (< Mande)

This chapter includes 250 tables presenting the evidence by group, branch or sometimes a dialect of a certain language. Among them are summary tables that provide an overview of the numerical terms in twelve major families of Niger-Congo and in a number of isolated languages. Our attempt at reconstructing the Proto-Niger-Congo numeral system on the basis of this comprehensive evidence will be presented in Chapter 5.

References

Blench, Roger. 2004. *The Benue-Congo languages: A proposed internal classification*. Cambridge. (working document not a draft paper).

Blench, Roger. 2012. *Supposing we have been completely wrong about the shape of early Niger-Congo roots?* Cambridge. Ms.

Blench, Roger. 2013. *Niger-Congo: An alternative view*. http://www.rogerblench.info/Language/Niger-Congo/General/Niger-Congo%20an%20alternative%20view.pdf. Ms.

Blench, Roger. n.d. *Fam wordlist and etymological commentary*. Cambridge. Ms.

Blench, Roger & Barau Kato. 2012. *The Təsu language of Central Nigeria and its affinities*. Cambridge. Ms.

Bouquiaux, Luc. 1962. A propos de numération: L'emploi du système décimal et du système duodécimal dans la langue birom (nigéria septentrional). *Africana linguistica Tervuren* 1. 7–10.

Boyd, Raymond. 1989. Number systems in the adamawa branch of Niger-Congo. *African Languages and Cultures* 2(2). 149–173.

Boyd, Raymond. 1999. A linguistic sketch of tiba (gà), part 1. Afrika und übersee, 82: 1-17, part 2. *Afrika und Übersee* 82. 213–249. . Hal-00323718v3.

Boyeldieu, Pascal. 1982. *Deux études laal (Moyen-Chari, tchad)*. Berlin: Dietrich Reimer Verlag.

Carlson, Robert J. 1993. A sketch of jo: A mande language with a feminine pronoun. *Mandenkan* 25. 1–109.

Connell, Bruce A. 1991. *Phonetic aspects of the Lower-Cross languages and their implications for sound change*. University of Edinburgh dissertation.

Creissels, Denis & Séckou Biaye. 2015. *Le balant ganja: Phonologie, morphosyntaxe, liste lexicale, textes*. Dakar: IFAN.

d'Avezac, Armand. 1845. Notice sur le pays et le peuple des Yébous en Afrique. *Mémoires de la Société Ethnologique* 2. 1–196.

Dettweiler, Stephen H. & Sonja G. Dettweiler. 1993. *Sociolinguistic survey of the Duka (Hun-Saare) people*. Ilorin. http://www.sil.org/silesr/2003/silesr2003-014.pdf. Ms. [electronic version dated 2003].

Dimmendaal, Gerrit Jan. 1978. *The consonants of Proto-Upper Cross and their implications for the classification of the Upper Cross languages*. Department of African Languages, State University of Leiden dissertation.

Djilla, Mama, Bart Eenkhoorn & Jacqueline Eenkhoorn-Pilon. 2004. *Phonologie du jôwulu ("samogho"): Langue mandé du Mali et du burkina faso*. Köln: Rüdiger Köppe Verlag.

Elders, Stefan. 2007. Kulango. In Gudrun Miehe, Brigitte Reineke & Kerstin Winkelmann (eds.), *Noun class systems in Gur languages. Southwestern Gur languages (without Gurunsi)*, vol. 2007, 292–330. Köln: Rüdiger Köppe.

Hochstetler, Lee. 1996. Enquête linguistique sur le duungoma: Une langue samogo parlée au burkina faso et au mali. *Mandenkan* 31. 1–57.

Janssens, Baudoin. 1994. Étude comparative du thème *-poko 'un, autre' dans le bantou de zone A et des Grassfields. *Africana linguistica* XI. 93–104.

Kaliai, M. H. I. 1964. *Nembe-English dictionary*. (R. Blench ed. 2008).

Kastenholz, Raimund & Ulrich Kleinewillinghöfer. 2012. *Nimbari as a language name*. https://www.blogs.uni-mainz.de/fb07-adamawa/files/2012/06/Nimbari.pdf.

Koelle, Sigismund Wilhelm. 1963[1854]. *Polyglotta africana, or a comparative vocabulary of nearly three hundred words and phrases in more than one hundred distinct African languages*. London: Church Missionary House.

Miehe, Gudrun & Florian Tham. 2007. Lobiri. I. 211–237.

Moñino, Yves. 1995. *Le proto-gbaya: Essai de linguistique comparative historique sur vingt-et-une langues d'afrique centrale*. Paris: Editions Peeters pour l'Société des Études Linguistiques et Anthropologiques de France (SELAF) avec le concours du Centre National de la Recherche Scientifique (CNRS).

Naden, Anthony Joshua. 1989. Gur. In John T. Bendor-Samuel (ed.), *The Niger-Congo languages: A classification and description of africa's largest language family*, 140–168. Lanham MD, New York & London: University Press of America. By arrangement with the Summer Institute of Linguistics (SIL).

Pozdniakov, Konstantin. 2010. *Laal: an isolate language?* Paper presented at the Workshop 'Language Isolates in Africa', Lyon, December 3-4, 2010.

Pozdniakov, Konstantin. 2015. Diachronie des classes nominales atlantiques: Morphophonologie, morphologie, sémantique. In Denis Creissels & Konstantin Pozdniakov (eds.), *Les classes nominales dans les langues atlantiques*, 54–102. Köln: Rüdiger Köppe Verlag.

Pozdniakov, Konstantin & Guillaume Segerer. 2017. Genealogical classification of Atlantic languages. In Friederike Lüpke (ed.), *Oxford guide to the world's languages: Atlantic*. Oxford: Oxford University Press.

Prost, André. 1958. Quelques notes sur le don (samogho). *Bulletin de l'Institut Fondamental d'Afrique Noire* 20-3/4. 612–623.
Prost, André. 1968. *Deux langues voltaïques en voie de disparition: Le wara et le natioro*. Dakar: Université de Dakar.
Sapir, J. David. 1971. West atlantic: An inventory of the languages, their noun class systems and consonant alternation. In Thomas A. Sebeok (ed.), *Linguistics in sub-Saharan Africa* (Current trends in linguistics 7), 45–112. The Hague & Paris: Mouton & Co.
Sawadogo, Tasséré. 2002. *Rapport d'enquête sur le natioro*. Electronic document.
Segerer, Guillaume. 2002. *La langue bijogo de bubaque (guinée bissau)*. Louvain, Paris: Editions Peeters.
Vanhoudt, Bettie. 1994. *L'expression de "un" dans la numération référentielle en protobantou*. Tervuren.
Vogler, Pierre. 2015. *Le sèmè / siamou n'est pas kru. <hal-01182225>*.
Vydrin, Valentin. 2007. South mande reconstruction: Initial consonants. In *Aspekty komparativistiki-2. Orientalia et classica XI: Trudy instituta vostochnykh kul'tur i antichnosti*, 409–498. Moscow: Izdatel'stvo Rossijskogo Gosudarstvennogo Gumanitarnogo Universiteta.
Vydrin, Valentin. 2016. Toward a Proto-Mande reconstruction and an etymological dictionary. *Faits de langues* 48. 109–123.
Vydrin, Valentin & Elena Perekhvalskaya. 2015. Sistemy schislenija v jazykakh mande (системы счисления в языках манде) [counting systems in mande languages]. In Alexander Zheltov (ed.), *Afrikanskij sbornik - 2015 (африканский сборник - 2015) [African collection – 2015]*. 356–377. St. Petersburg: Muzej antropologii i etnografii RAN (Kunstkamera).
Vydrine, Valentin. 2009. Esquisse de la langue lélé (groupe mokolé). *Mandenkan* 45. 29–104.
Williamson, Kay Ruth Margaret. 1989. Benue-Congo overview. In John T. Bendor-Samuel (ed.), *The Niger-Congo languages: A classification and description of africa's largest language family*, 247–274. Lanham MD, New York & London: University Press of America. by arrangement with the Summer Institute of Linguistics (SIL).
Williamson, Kay Ruth Margaret. 1992. Some Bantu roots in a wider context. In Erwin Ebermann, E. R. Sommerauer & K. E. Thomanek (eds.), *Komparative Afrikanistik: Sprach-, geschicht- und literaturwissenschaftliche Aufsätze zu Ehren von Hans G. Mukarovsky anlasslich seines 70. Geburtstages*, 1–2. Wien: Afro-Pub.

Winkelmann, Kerstin. 2007a. Akasele. In Gudrun Miehe, Brigitte Reineke & Kerstin Winkelmann (eds.), *Noun class systems in Gur languages. Southwestern Gur languages (without Gurunsi)*, vol. 2012, 407–424. Köln: Rüdiger Köppe.

Winkelmann, Kerstin. 2007b. Khe. In Gudrun Miehe, Brigitte Reineke & Kerstin Winkelmann (eds.), *Noun class systems in Gur languages. Southwestern Gur languages (without Gurunsi)*, vol. 2007, 181–193. Köln: Rüdiger Köppe.

Name index

Language index

The numeral system of Proto-Niger-Congo

This book proposes the reconstruction of the Proto-Niger-Congo numeral system. The emphasis is placed on providing an exhaustive account of the distribution of forms by families, groups, and branches. The big data bases used for this purpose open prospects for both working with the distribution of words that do exist and with the distribution of gaps in postulated cognates. The distribution of filled cells and gaps is a useful tool for reconstruction.

The first chapter of this book is devoted to the study of various uses of noun class markers in numeral terms. The second chapter deals with the alignment by analogy in numeral systems. Chapter 3 offers a step-by-step reconstruction of number systems of the proto-languages underlying each of the twelve major NC families, on the basis of the step-by-step-reconstruction of numerals within each family. Chapter 4 deals with the reconstruction of the Proto-Niger-Congo numeral system on the basis of the step-by-step-reconstructions offered in Chapter 3. Chapter 5 traces the history of the numerals of Proto-Niger-Congo, reconstructed in Chapter 4, in each individual family of languages.