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The phonology of Proto-Central Chadic : the reconstruction of the phonology and lexicon of Proto-Central Chadic, and the linguistic history of the Central Chadic languages

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11 Proto-Central Chadic Prosodies

11.1 Introduction

In this chapter we shall be looking at the origins of prosodies in Central Chadic languages. We will first reconstruct a palatalization prosody for Proto-Central Chadic. In some languages this is realised as front vowel harmony, and in others it is realised through the palatalization of consonants. We will then show that a labialization prosody need not be reconstructed for Proto-Central Chadic, and that the labialization prosody in Vowel Prosody languages, and labialized labials in Consonant Prosody languages all come from the reanalysis of the labialization component of labialized velars.

We will be reconstructing the vowel system of Proto-Central Chadic in chapter 12. This vowel system consisted of just three vowels: *a, *i and *ɨ. However it is important to note that the prosodies and labialized consonants play possibly a greater role than the underlying vowels in determining the surface vowels in the present-day Central Chadic languages.

11.2 The Palatalization Prosody

We have seen that in both the Vowel Prosody languages (see section 5.4) and the Consonant Prosody languages (see section 6.6.4) there is a word-level prosodic palatalization feature. In the Consonant Prosody languages, palatalization is primarily realised on consonants, whereas in the Vowel Prosody languages it is primarily realised in the form of vowel harmony. In the Mixed Prosody groups the prosody may affect vowels or consonants (see sections 7.2.7.1 and 7.4.1).

In this section we shall show that the two types of palatalization prosody are reflexes of a single palatalization prosody that existed in Proto-Central Chadic. We shall also take a detailed look at how the prosody is realised in the different groups within Central Chadic. We will conclude by proposing a description of the realisation of the palatalization prosody in Proto-Central Chadic and describing how it developed in different ways to produce the systems that exist today.

11.2.1 *Reconstructing the Palatalization Prosody for Proto-Central Chadic*

In this section we will reconstruct an abstract palatalization feature, denoted PAL, for Proto-Central Chadic. In order to show the presence of PAL in roots reconstructed for Proto-Central Chadic, we will show that the palatalization prosody is present in the roots reconstructed for a range of the proto-languages of the groups within Central Chadic. For the Vowel Prosody proto-languages, PAL is realised as front vowel harmony, and for the Consonant Prosody proto-languages it is realised as palatalization of individual consonants. In the Mixed Prosody languages the realisation may follow either of these two patterns according to the rules of the individual languages. For the Kotoko languages there is no palatalization prosody, with the prosody appearing to simply have been lost at a point after the Kotoko proto-languages split from Proto-Central Chadic North.

In order to demonstrate that the palatalization prosody can be reconstructed for Proto-Central Chadic, we will present full data on four widely attested roots. We will later give summary data justifying the reconstruction of palatalization in a further sixteen roots.

Palatalized roots account for around 20% of the reconstructed lexicon of Proto-Central Chadic. This compares with around 14% of roots containing *j, around 14% containing *i and around 23% containing *r, the most common consonant phoneme.

In order to be considered as Proto-Central Chadic roots, reflexes have to appear in at least five of the groups within Central Chadic, and should include groups from both the North and South sub-branches. To eliminate *wanderwörter*, the consonantal sound changes need to be consistent with the regular sound changes established for the groups within Central Chadic.

In the data, the palatalization prosody will be represented by a superscript ‘*y*’ placed after the word. All reconstructions are my own. The full data used in the reconstructions can be found at <http://centralchadic.webonary.org/>.

In most cases, these palatalized consonants cause the fronting of the following *ɪ to [i]. In Tsuvan, the final /a/ is the pre-pausal form of *ɪ.

Language	UF	Intermediate	SF
Tsuvan	mətsəna ^y	məts ^ɰ əna	mətʃine
Sharwa	tsinə ^y	ts ^ɰ inə	tʃinə
Gude	sənə ^y	s ^ɰ ənə	ʃinə
Jimi	sənə ^y	s ^ɰ ənə	ʃənə-n
Bata	səna ^y	s ^ɰ əna	ʃine

Table 114 – Reflexes of Proto-Bata 'nose'

The Proto-Higi root is reconstructed as *hɪts^ɰin. The palatalization prosody isn't reconstructed for Proto-Higi, though the presence of the palatalized laminal in the reconstructed form indicates that the prosody was present at an earlier point in the language's history. In most cases, the vowel following the palatalized laminal has been fronted.

The initial *h has been lost in three languages and compensated for by the prefixed /n/. In Bana it has the reflex /k/. The final *n has been lost in the Kamwe dialects due to the common process of final consonant deletion (see section 3.3.12).

Language	UF	SF
Kamwe Nkafa	nts ^ɰ ɪ	ntʃi
Kamwe Futu	nts ^ɰ ɪ	ntʃi
Kirya	ns ^ɰ in	nʃin
Bana	ks ^ɰ ən	kʃən

Table 115 - Reflexes of Proto-Higi 'nose'

The Proto-Margi root is reconstructed as *h^wɪtsir^y. Note that in Proto-Margi, word-final *n→r. The palatalization prosody is realised in the form of palatalization of the laminal consonant. This palatalized consonant fronts the following vowel. The initial *h^w has been lost in all languages except Bura. In Margi the loss is compensated for by the addition of /m/. In Bura *h^w has the reflex /k^w/, with the labialization being realised as [u].

Language	UF	Intermediate	SF
Bura	k ^w ətsər ^y	k ^w əts ^ɿ ər	kutʃir
Margi	mitsər ^y	mits ^ɿ ər	mtʃir
Kilba	tsər ^y	ts ^ɿ ər	tʃir
Margi South	tsər ^y	ts ^ɿ ər	tʃir

Table 116 - Reflexes of Proto-Margi 'nose'

In the Vowel Prosody groups, the primary realisation of PAL is the fronting of the vowels in the word. In many of these languages the fronting does not apply to /ə/, but only to /a/. However in some languages – including most of the languages of the Mofu and Mafa groups – there is pre-pausal lowering of the final vowel from /ə/ to /a/, which feeds the application of the prosody, resulting in [e] in the surface form.

In almost all of the languages of these groups, the palatalization prosody also palatalizes the laminal consonants in the word. See the description of this phenomenon in Moloko in section 5.2.4 for an example.

The Proto-Mofu root is reconstructed as *h^witir^y. Final *n has become *r.

Language	UF	SF
Ouldeme	h ^w ə ⁿ dar	hu ⁿ dar
Mada	h ^w ə ⁿ dar ^y	h ⁿ dœr
Muyang	hə ⁿ dar ^y	hi ⁿ dir
Moloko	hə ⁿ dar ^y	hə ⁿ der
Merey	hətar ^y	həter
Gemzek	hətar ^y	həter
Zulgo	hətar ^y	hitir
Dugwor	mətar ^y	məter
Mofu North	hatar	hatar
Mofu-Gudur	hatar ^y	heter

Table 117 - Reflexes of Proto-Mofu 'nose'

Note that in Muyang the vowel in the final syllable is raised before a pause. In all the other languages except for Ouldeme, Zulgo, Gemzek and Merey this vowel is lowered. In Muyang and Zulgo /ə/ is fronted by the palatalization prosody, whereas it is unaffected in the other languages. The [œ] in Mada is due to the back-rounding effect from /h^w/ combining with the fronting effect of the palatalization prosody to produce a front-rounded vowel. There has been a non-systematic change t→ⁿd in the languages of the Tokombere subgroup (Ouldeme, Muyang, Mada and Moloko).

The Proto-Hurza root is reconstructed as $*h^witsan^y$. (Note that final /n/→ŋ.) The palatalization prosody has resulted in the fronting of vowels and in the palatalization of the laminal consonant. In Vame $*h^w$ has lost its labialization, but in Mbuko $*h^w$ has lost the $*h$ component and retained the labialization as /w/, which has then metathesized with /ts/.

Language	UF	SF
Vame	hətsan ^y	hətʃeŋ
Mbuko	tsəwan ^y	tʃœŋ

Table 118 - Reflexes of Proto-Hurza 'nose'

The Proto-Daba root is not easy to reconstruct. The final $*n$ →r change in three of the reflexes is not a feature of the Daba group, and may be evidence of borrowing from a language such as Mofu-Gudur, though the form does not resemble any neighbouring language. The Daba and Mbudum reflexes display the evidence of the palatalization prosody that we would expect, however there is no evidence for palatalization in this root from the other languages. For the Proto-Daba form we will take the Daba entry $*mitsin^y$ as being the least likely to have been influenced by borrowing. (The apostrophe in the data is taken as a misprint, rather than as a glottal stop.)

Language	UF	SF
Daba	mətsən ^y	mitʃi'n
Mbudum	ntsur ^y	ntʃur
Buwal	mtsər	mtsar
Gavar	mtsər	mtsər

Table 119 - Reflexes of Proto-Daba 'nose'

The Proto-Maroua root is also difficult to reconstruct from the internal evidence. The two Giziga reflexes exhibit labialization, whilst the Mbazla reflex exhibits palatalization. This is understandable if the entries are compared to the Proto-Central Chadic root $*h^witsin^y$, but implies that the languages in this group did not inherit the root from the same source. It is not immediately obvious what the sources for the different reflexes might be. The Proto-Maroua root is listed as $*hitin^w/*kitin^y$ to reflect this uncertainty.

Language	UF	SF
Giziga South	hətən ^w	hutun̩
Giziga North	hətən ^w	huton
Mbazla	kətən ^y	kitin̩

Table 120 - 'nose' in the Maroua group

The Proto-Mafa root is reconstructed as *h̥itsan. The palatalization prosody has been lost in this root.

Language	UF	SF
Cuvok	hətan	hətaŋ
Mafa	hətsan	hətsan

Table 121 - Reflexes of Proto-Mafa 'nose'

There is a Proto-Tera root, tentatively reconstructed as *h̥in, though it is not clear if this is a reflex of Proto-Central Chadic *h̥^witsin^y.

Language	UF	SF
Tera	xən	xən
Ga'anda	həraja	həraja

Table 122 - Reflexes of Proto-Tera 'nose'

The Gidar entry is /əŋkən/, which does not carry the palatalization prosody, and is unlikely to be cognate.

There is no reflex of this root in the Musgum group.

The three groups of Mixed Prosody languages express palatalization in different ways. In the Mandara and Sukur groups, palatalization is expressed through palatalization of laminals or in some cases through vowel harmony. It is not possible to reconstruct palatalization within the Lamang group.

The Proto-Mandara root is reconstructed as *h̥itiri^y. Without a laminal consonant in the root, likely evidence for palatalization is hard to locate. The Matal form and the front vowels in Dghwede may be the only signs of possible palatalization in Proto-Mandara. Note that the initial *h̥ has the reflexes zero, /f/, /k/ and /x/.

Language	UF	SF
Matal	tir ^y	tir
Podoko	fətərə	fətərə
Mandara	kətarə	əktare
Malgwa	kətare	əktare
Glavda	xitir	xitir
Dghwede	xətirə	xtire

Table 123 - Reflexes of Proto-Mandara 'nose'

The Sukur root is palatalized. As the only language of the group, this is taken as the form for Proto-Sukur. Palatalization is realised as the palatalization of the laminal consonant.

(298) /sən^y/ [ʃən] 'nose'

The Proto-Lamang root is reconstructed as *hĩtsĩŋ. The *i in Proto-Lamang may a reflex of palatalization.

Language	UF	SF
Lamang	hətsĩŋ	htsĩŋ
Hdi	hətsĩŋ	hətsĩŋ

Table 124 - Reflexes of Proto-Lamang 'nose'

The Kotoko groups have not retained the palatalization prosody. It is possible that a final front vowel may be an indication of the effect of palatalization in the history of the languages (see section 8.3.3).

The Proto-Kotoko South root is reconstructed as *hĩtsĩne.

Language	SF
Mazera	hitʃĩne
Zina	hiskini

Table 125 - Reflexes of Proto-Kotoko South 'nose'

The Proto-Kotoko Centre root is reconstructed as *hisini.

Language	SF
Lagwan	xsini
Mser	asin

Table 126 - Reflexes of Proto-Kotoko Centre 'nose'

The Proto-Kotoko North root is reconstructed as *tsihin. The /k/ in Malgbe is a reflex of *h. In Mpade the *h and *ts have metathesized.

Language	SF
Afade	tsin
Maltam	sin
Malgbe	skin
Mpade	hasan

Table 127 - Reflexes of Proto-Kotoko North 'nose'

The Kotoko Island group consists of the single language Buduma. The word for 'nose' is /tsənaj/.

Putting together the roots constructed for the proto-languages of each group, we have the following evidence for the reconstruction of Proto-Central Chadic 'nose' h^witsin^y.

Group	Root	Group	Root	Group	Root
Bata	tsini ^y	Margi	h ^w itsir ^y	Kotoko Island	tsinaj
Daba	mitsin ^y	Mandara	hitiri ^y	Kotoko North	tsihin
Mafa	hitsan	Mofu	h ^w itir ^y	Kotoko Centre	hisini
Tera		Maroua	hitin ^w , kitin ^y	Kotoko South	hitsine
Sukur	sin ^y	Lamang	hitsin ^y	Musgum	
Hurza	h ^w itsan ^y	Higi	hits'in	Gidar	

Table 128 - Reflexes of Proto-Central Chadic 'nose'

11.2.1.2 *sih^wani^y 'dream'

In the Consonant Prosody languages, the palatalization is realised primarily on the laminal *s in the root.

The Proto-Bata root is reconstructed as $sini^y$. Palatalization has been lost in this root in Gude and Jimi.

Language	UF	Intermediate	SF
Bata	$səri^y$	$s^ləri$	$ʃiri$
Sharwa	$sinəʔə^y$	$s^lənəʔə$	$ʃinəʔə$
Gude	$sənij$	$sənij$	$səniː$
Jimi	$sini$	$sini$	$sini-n$

Table 129 - Reflexes of Proto-Bata 'dream'

The Proto-Higi root is reconstructed as $*s^jiwin$. Note that loss of final consonants is a feature of Bana and Kamwe-Futu. The palatalization prosody is not reconstructed for Proto-Higi, but the presence of $*s^j$ in the root is indicative of palatalization earlier in the history of the word.

Language	UF	SF
Kamwe-Futu	$səwa$	$səwo$
Bana	$s^ləw$	$ʃiw$
Kirya (verb)	$s^ləwə$	$ʃiwu$
Kirya (noun)	$s^lən$	$ʃin$

Table 130 - Reflexes of Proto-Higi 'dream'

The Proto-Margi root is reconstructed as $*sɪʔ^wini^y$. The Kilba entry displays palatalization, but there is no palatalization in the Bura entry.

Language	UF	Intermediate	SF
Bura	$səwəni$	$səwəni$	$suni$
Kilba	$səʔ^wəni^y$	$s^jəʔ^wəni$	$ʃiʔuni$

Table 131 - Reflexes of Proto-Margi 'dream'

In the Vowel Prosody languages the primary realisation of palatalization is as fronting of the vowels. In many languages, laminal consonants are also palatalized.

The Proto-Daba root is reconstructed as *sini^ʸ. In all the languages except for Daba there is partial or total reduplication.

Language	UF	SF
Daba	sənə ^ʸ	sini
Mbudum	səsən ^ʸ	səsin
Buwal	saŋsaŋ ^ʸ	seŋseŋ
Gavar	ʃiŋʃiŋ	ʃiŋʃiŋ

Table 132 - Reflexes of Proto-Daba 'dream'

Note that palatalization has been lost in Gavar (see section 5.3.2.2), and therefore the underlying form is given in terms of the segments of the language. The palatalized laminals are a clear sign that the palatalization prosody existed in this root at an earlier point in its history.

The Proto-Mafa root is reconstructed as *siwina^ʸ. Only the Mafa entry is palatalized in this case.

Language	UF	SF
Mafa	nsəwəna ^ʸ	ɲfuwine
Cuvok	səwana	suwana

Table 133 - Reflexes of Proto-Mafa 'dream'

The Proto-Mofu root is reconstructed as *siwna^ʸ. Three of the languages have a prefix /m/, which is possibly a nominaliser.

Language	UF	SF
Mofu North	masənay ^ʸ	mesənej
Dugwor	məsna ^ʸ	məʃne
Merey	məsuna ^ʸ	məsune
Gemzek	suna ^ʸ	ʃyne
Zulgo	suna	suna

Table 134 - Reflexes of Proto-Mofu 'dream'

For the Maroua, Hurza, Tera, Musgum and Gidar groups, data is only available for one language in each group. In each case the root carries the palatalization prosody (in Tera it is not known if the palatalization prosody exists or if the front vowels are the result of an historic process). These forms are taken as the forms of the proto-languages until further data becomes available.

Group	Language	UF	SF
Maroua	Giziga N	məsən ^y	məsin
Hurza	Mbuko	səwna ^y	syne
Tera	Tera	zine	zine
Musgum	Mulwi	hijni ^y	hi:ni
Gidar	Gidar	is:ina ^y	is:ine

Table 135 - 'dream' in further Vowel Prosody languages

In the Mixed Prosody languages, we expect to see palatalization realised in most cases by palatalization of *s as /ʃ/. This is the case with this root for most of the Mandara group languages, but the root is absent in Sukur and palatalization has been completely lost in this root in the Lamang group.

The Proto-Mandara root is reconstructed as sɪh^wani^y. Palatalization has only been retained in Mandara and Malgwa.

Language	UF	SF
Podoko	səh ^w ani	səh ^w ani
Mandara	sənə ^y	ʃəne
Malgwa	səne ^y	ʃine
Glavda	sɪ ^ŋ ga	sɪ ^ŋ ga

Table 136 - Reflexes of Proto-Mandara 'dream'

There is no cognate in the Sukur data.

The Lamang group data does not show evidence of the effect of palatalization. The Proto-Lamang root is reconstructed as *siwani.

Language	UF	SF
Lamang	səwəŋa	suwəŋa
Hdi	sunɪ	sunɪ

Table 137 - Reflexes of Proto-Lamang 'dream'

This root has reflexes in two of the Kotoko groups. There is no palatalization prosody in the Kotoko groups.

The Proto-Kotoko Centre root is reconstructed as *siwane.

Language	SF
Lagwan	swane
Mser	sware

Table 138 - Reflexes of Proto-Kotoko Centre 'dream'

The Proto-Kotoko North root is reconstructed as *saware.

Language	SF
Mpade	sware
Malgbe	yaware

Table 139 - Reflexes of Proto-Kotoko North

'dream'

We can reconstruct the Proto-Central Chadic root 'dream' as *sih^wani^y.

Group	Root	Group	Root	Group	Root
Bata	sini ^y	Margi	siɽ ^w ini ^y	Kotoko Island	
Daba	sini ^y	Mandara	sih ^w ani ^y	Kotoko North	saware
Mafa	siwina ^y	Mofu	siwna ^y	Kotoko Centre	siwane
Tera	zine	Maroua	misin ^y	Kotoko South	
Sukur		Lamang	siwani	Musgum	hiɲni ^y
Hurza	siwna ^y	Higi	s ⁱ iwɪn	Gidar	issina ^y

Table 140 - Reflexes of Proto-Central Chadic 'dream'

11.2.1.3 *kirip^y 'fish'

In this root there are no laminal phonemes, so the realisation of the palatalization prosody in the consonant prosody languages is more varied. In Proto-Bata the prosody is realised on one of the consonants of the word according to the prioritisation rules of the language (see section 6.3.4.3). In Proto-Higi, palatalization is realised only on laminal consonants, though in this and some other cases the Proto-Higi *i is the reflex of the prosody. In Proto-Margi, the palatalization prosody exists, and is realised on laminals or velars. With this root we would expect to see the velar *k palatalized.

The Proto-Bata root is reconstructed as *kirifi^y. In this group the palatalization prosody is realised primarily as palatalization of one or more of the consonants. For this item, either the /f/ or the /r/ is palatalized depending on the language. Note that for Tsuvan the initial /w/ affects the following vowel, and for Sharwa

the initial /k^w/ transfers the labialization component onto the following /i/ as [u]. In Tsuvan there was a consistent *r→l change.

Language	UF	Intermediate	SF
Tsuvan	wəlfə ^y	wəlf ^ɸ ə	wulfi-n
Sharwa	k ^w irəfi ^y	k ^w ir ^j əfi	kur ^j əfi
Gude	hərəfə ^y	hərəf ^ɸ ə	hərəfi-nə
Jimi	hərəfə ^y	hər ^j əfə	hər ^j əfə-n
Bata	qərfa: ^y	qər ^ɸ a:	qər ^ɸ e:

Table 141 - Reflexes of Proto-Bata 'fish'

Several languages in the Bata group have nominal suffixes that are either obligatory for all nouns or just for feminine nouns. These are not included in the underlying forms and are separated by a hyphen in the surface form.

The Proto-Higi root is reconstructed as *kəlipi. We have not reconstructed the palatalization prosody for Proto-Higi. Instead, the *i in the reconstructed root may be evidence of the influence of palatalization at an earlier stage of the word's history, possibly created by the palatalization of the preceding *l by the palatalization prosody.

Language	UF	SF
Bana	kəlipə	k(ə)lipə
Psikye	kələpə	kələpə
Kirya	kəripə	kəɾipə
Kamwe-Futu	kələpə	kələpə

Table 142 - Reflexes of Proto-Higi 'fish'

The /ɾ/ in Kirya is described as being 'not a true retroflex but pronounced with the tongue towards the alveolar ridge' (Blench and Ndamsai 2009b, 79) As such it may be the reflex of *r^j.

The Proto-Margi root is reconstructed as *kilfi^ʏ. In this group the palatalization prosody is realised primarily on laminal consonants, or if not, then on another consonant of the word. With this root we expect the *k to be palatalized, which is the case in two of the languages. In the other languages palatalization may have been lost, or the *f may have been palatalized, though the palatalization is inaudible due to the final *i.

Language	UF	SF
Bura	k ^h ilfa	kilfa
Margi	k ^h ifi	kyifi
Margi S	kalfi	kalfi
Kilba	kalfi	kalfi

Table 143 - Reflexes of Proto-Margi 'fish'

As we have seen in the previous sub-sections, in the Vowel Prosody languages the primary realisation of the palatalization prosody is the fronting of the vowels in the root. In the absence of laminal consonants, there is no palatalization of consonants in this root. Note that the reconstructed high vowel for group proto-languages is always notated as *i.

The Proto-Daba root is reconstructed as *kilif^ʏ. Note that Gavar no longer has an active palatalization prosody.

Language	UF	SF
Daba	kələf ^ʏ	kilif
Mbudum	kələf ^ʏ	kəl:if
Buwal	ŋkələf ^ʏ	ŋkələf
Gavar	ŋkilif	ŋkilif

Table 144 - Reflexes of Proto-Daba 'fish'

The Proto-Mafa root is reconstructed as *kilaf^ʏ.

Language	UF	SF
Mafa	kələf ^ʏ	kilef
Cuvok	kələf ^ʏ	kələf

Table 145 - Reflexes of Proto-Mafa 'fish'

The Proto-Maroua root is reconstructed as *kilif^y.

Language	UF	SF
Mbazla	kələf ^y	kilif
Giziga North	kələf ^y	kilef
Giziga South	kələf ^y	kilif

Table 146 - Reflexes of Proto-Maroua 'fish'

The Proto-Mofu root is reconstructed as *kilif^y.

Language	UF	SF
Zulgo	kələf ^y	kilif
Ouldeme	kələf ^y	kəlif
Gemzek	kələf ^y	kəlef
Mofu North	kələf ^y	kəlef
Moloko	kələf ^y	kəlef
Merey	kələf ^y	kəlef
Dugwor	kələf ^y	kəlef

Table 147 - Reflexes of Proto-Mofu 'fish'

For the Hurza, Tera, Musgum and Gidar groups, a reflex of this root is only available in one language in each group. In all of these languages except Tera the word carries the palatalization prosody.

Group	Language	UF	SF
Hurza	Mbuko	kilaf ^y	kəlef
Tera	Tera	jɪrvɪ ^w	jurvu
Musgum	Vulum	hilif ^y	hilif
Gidar	Gidar	kilfi ^y	kilfi

Table 148 - 'fish' in other Vowel Prosody languages

In the Mixed Prosody languages, the palatalization prosody may be realised as palatalization of one of the consonants, or else by fronting of vowels.

The Proto-Mandara root is reconstructed as *kɪlɪfɪ^ʸ. The palatalization prosody is evident only in the Glavda entry, where it is realised on /k/. (See section 7.2.5 for a description of the behaviour of the palatalization prosody in Glavda.) The underlying form given is the segmental form after the effect of the prosody.

Language	UF	SF
Podoko	kələfə	kɪləfə
Mandara	kələfə	kəlfe
Malgwa	kələfə	kəlfe
Glavda	kʲɪlɪf	kɪlf
Dghwede	kələfə	klfe

Table 149 - Reflexes of Proto-Mandara 'fish'

The Proto-Lamang root is reconstructed as *kɪlɪpɪ. There is no palatalization prosody in Proto-Lamang, but the final *i is support for its presence earlier in the history of the word.

Language	UF	SF
Lamang	kələpɪ	kəlpi
Hdi	kəlɪpɪ	kəlɪpɪ

Table 150 - Reflexes of Proto-Lamang 'fish'

In Sukur the root is [kɪrɪf] /kɪrɪf^ʸ/.

Amongst the Kotoko groups, the root is only found in Kotoko South, where the Proto-Kotoko South form is reconstructed as *kɪlɪfɪ.

Language	SF
Mazera	kɪlfə
Zina	həlɪfə

Table 151 - Reflexes of Proto-Kotoko South 'fish'

From these we can reconstruct Proto-Central Chadic 'fish' as *kɪrɪpɪ^ʸ.

Group	Root	Group	Root	Group	Root
Bata	kɪrɪfɪ ^ʸ	Margi	kɪlɪfɪ ^ʸ	Kotoko Island	
Daba	kɪlɪf ^ʸ	Mandara	kɪlɪfɪ ^ʸ	Kotoko North	
Mafa	kɪlɪf ^ʸ	Mofu	kɪlɪf ^ʸ	Kotoko Centre	
Tera	jɪrvɪ ^w	Maroua	kɪlɪf ^ʸ	Kotoko South	kɪlɪfɪ
Sukur	kɪrɪf ^ʸ	Lamang	kɪlɪpɪ	Musgum	hɪlɪf ^ʸ
Hurza	kɪlɪf ^ʸ	Higi	kɪlɪpɪ	Gidar	kɪlɪfɪ ^ʸ

Table 152 - Reflexes of Proto-Central Chadic 'fish'

11.2.1.4 * $\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$ 'tooth'

In the Consonant Prosody languages, the palatalization prosody is realised on one of the consonants of the root. In most cases it is realised on * ɛ , often resulting in /j/.

The Proto-Bata root is reconstructed as * $\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$. Proto-Central Chadic * $\text{ɛ} \rightarrow \text{ɛ}$ in Proto-Bata, and in most languages of the Bata group, Proto-Bata * $\text{ɛ} \rightarrow \text{l}$. In The palatalization prosody is realised on the /n/, except in Bata where it is realised on the /l/.

Language	UF	Intermediate	SF
Tsuva	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$
Sharwa	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$
Gude	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$
Jimi	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$
Bata	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$

Table 153 - Reflexes of Proto-Bata 'tooth'

The Proto-Higi root is reconstructed as * $\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$. There are no active prosodies in Proto-Higi. The * ɛ in the reconstructed root may originate in an earlier application of the palatalization prosody to * ɛ , as * $\text{ɛ}^y \rightarrow \text{j}$, followed by * $\text{ij} \rightarrow \text{i}$.

Language	SF
Kamwe-Futu	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$
Kirya	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$
Bana	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$
Psikye	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$

Table 154 - Reflexes of Proto-Higi 'tooth'

The Proto-Margi root is reconstructed as * $\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$. The palatalization prosody is realised on the * ɛ . Note that in Proto-Margi, word-final * $\text{n} \rightarrow \text{r}$. In the Margi group there is a common, but not universal, change * $\text{ɛ} \rightarrow \text{h}$.

Language	UF	SF
Bura	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$
Margi	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$
Kilba	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$
Margi S	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$	$\text{ɛ}^y\text{ɪ}^y\text{ɪ}^y$

Table 155 - Reflexes of Proto-Margi 'tooth'

In the Vowel Prosody groups, the primary realisation is the fronting of the vowels in the word.

The Proto-Mofu root is reconstructed as *ɬir^y. Note that in the Tokombere subgroup (Ouldeme, Mada, Moloko and Muyang), palatalization has been lost. In the Meri subgroup (Merey, Gemzek, Zulgo and Dugwor) *ɬ→ɮ in this and several other roots.

Language	UF	SF
Ouldeme	ɬar	ɬar
Mada	ɬar	ɬar
Moloko	ɬar	ɬar
Muyang	ɬər	ɬər
Merey	ɮar ^y	ɮer
Gemzek	ɮar ^y	ɮer
Zulgo	ɮər ^y	ɮir
Dugwor	ɮar ^y	ɮer
Mofu North	ɬar ^y	ɬer
Mofu-Gudur	ɬar ^y	ɬer

Table 156 - Reflexes of Proto-Mofu 'tooth'

The Proto-Hurza root is reconstructed as *ɬahan. Note that word-final /n/→[ŋ] in Mbuko. Palatalization has been lost in this group.

Language	UF	SF
Vame	ɬahan	ɬahan
Mbuko	ɬan	ɬaŋ

Table 157 - Reflexes of Proto-Hurza 'tooth'

The Proto-Daba root is reconstructed as *ɮɪɖaŋ^y. This is one of the few groups where the *ɖ has not been lost.

Language	UF	SF
Buwal	ɮɪɖaŋ ^y	ɮɪɖeŋ
Gavar	ɮɪɖaŋ ^y	ɮɪɖeŋ

Table 158 - Reflexes of Proto-Daba 'tooth'

The Proto-Maroua root is reconstructed as *ɬin^ʸ. In this group, final /n/ is realised as [ŋ] consistently in Mbazla, and sporadically in the Giziga dialects.

Language	UF	SF
Giziga South	ɬən ^ʸ	ɬiŋ
Giziga North	ɬən ^ʸ	ɬin
Mbazla	ɬən ^ʸ	ɬiŋ

Table 159 - Reflexes of Proto-Maroua 'tooth'

The Proto-Mafa root is reconstructed as *ɟan^ʸ.

Language	UF	SF
Cuvok	ɟan ^ʸ	ɟeŋ
Mafa	ɟana ^ʸ	ɟene

Table 160 - Reflexes of Proto-Mafa 'tooth'

For the Musgum, Gidar and Tera groups, data is only available from individual languages. Tera is the only language showing evidence of palatalization, though it is not known if the palatalization prosody exists in Tera.

Group	Language	UF	SF
Musgum	Vulum	ɬiŋɬiŋ	ɬiŋɬiŋ
Gidar	Gidar	ɬaja	ɬaja
Tera	Tera	ɟin	ɟin

Table 161 - 'tooth' in other Vowel Prosody groups

In the Mixed Prosody groups, the Proto-Mandara root is reconstructed as *ɬiri^ʸ. As with Proto-Higi, the *i could be taken as evidence for an earlier palatalization prosody. Note that final *n→r in Proto-Mandara. Glavda has added /-ɖa/ to the root, but no explanation is apparent.

Language	UF	SF
Podoko	ɬirə	ɬirə
Mandara	ɬarə	ɬarə
Malgwa	ɬare	ɬa:re
Glavda	ɬiriɖa	ɬrɖa
Dghwede	ɬirə	ɬire

Table 162 - Reflexes of Proto-Mandara 'tooth'

The Sukur entry is [ɟʲin] /ɟin^ʸ/. Here the palatalization prosody is still present.

The Proto-Lamang root is reconstructed as *ɸidɪŋ. The Lamang group is the second of the two groups that give evidence for reconstructing *ɸ in the root. Proto-Lamang did not have a palatalization prosody, but the *i vowels in the reconstructed form are the reflexes of the palatalization prosody in an earlier form of the word (see section 7.3.5).

Group	SF
Lamang	ɸidɪŋ
Hdi	ɸiʔɪŋ

Table 163 - 'tooth' in Proto-Lamang

In the Kotoko groups, there is a front vowel in Proto-Kotoko South and Proto-Kotoko Centre, consistent with the presence of the palatalization prosody at an earlier point in the history of the word.

The Proto-Kotoko South root is reconstructed as *sin. In this group, *ɸ→s.

Group	SF
Zina	sin
Mazera	sine

Table 164 - 'tooth' in Proto-Kotoko South

The Proto-Kotoko Centre root is reconstructed as *ɸini.

Group	SF
Lagwan	ɸini
Mser	sir

Table 165 - 'tooth' in Proto-Kotoko Centre

The Proto-Kotoko North root is reconstructed as *ɸir.

Group	SF
Afade	ɸir
Malgbe	ɸir
Mpade	fan

Table 166 - 'tooth' in Proto-Kotoko North

In Buduma, the only language of the Kotoko Island group, the word is *hənaɟ*. In Buduma *ɸ→s→h.

Putting together the roots constructed for the proto-languages of each group, we have the following evidence for the reconstruction of Proto-Central Chadic

'tooth' *ɬidɪn^y. Direct support for the palatalization prosody comes from nine of the groups, and indirect support from a further four groups.

Group	Root	Group	Root	Group	Root
Bata	ɬini ^y	Margi	ɬir ^y	Kotoko Island	hinaj
Daba	ɬidaŋ ^y	Mandara	ɬiri ^y	Kotoko North	ɬir
Mafa	ɬan ^y	Mofu	ɬir ^y	Kotoko Centre	ɬini
Tera	ɬin	Maroua	ɬin ^y	Kotoko South	sin
Sukur	ɬin ^y	Lamang	ɬidɪŋ	Musgum	ɬiŋ
Hurza	ɬahan	Higi	ɬini	Gidar	ɬaja

Table 167 - Reflexes of Proto-Central Chadic 'tooth'

11.2.2 Further Data for the Palatalization Prosody

This section presents data for the reconstruction of the palatalization prosody in a further sixteen Proto-Central Chadic roots. Here the proto-forms are given for each of the groups where the root is attested.

In order to reconstruct the palatalization prosody for a given root, we need the palatalization prosody to be present in most of the proto-languages of the groups within Central Chadic where the palatalization prosody exists, within representation from the different sub-branches and different phonological types. There are some groups where the palatalization prosody is not reconstructed for the group's proto-language, namely the Higi and Lamang groups, and the four Kotoko groups. In these cases we look for evidence of the palatalization prosody in other ways. So in Proto-Higi we expect to see palatalization of laminal consonants, where present. In Proto-Lamang we expect to find *i in the final syllable for roots where the only vowels in the root are *i. In Proto-Kotoko South and Centre, there may also be front vowels, but in Kotoko North and Island the palatalization prosody has been lost and there may be no trace.

For the groups where palatalization is reconstructed for the proto-language, in roots containing *d there may have been a change *d→j, but no other evidence of the palatalization prosody. And there are always exceptions where the palatalization prosody has been lost for a particular root in a particular language.

(299) 'hearth' *riwits^y

Group	Root	Group	Root	Group	Root
Bata	riti ^y	Margi		Kotoko Island	
Daba	liwits ^y	Mandara	liwtsi ^y	Kotoko North	
Mafa	riwats ^y	Mofu	liwit ^y	Kotoko Centre	
Tera		Maroua	liwits ^y	Kotoko South	
Sukur	ruts	Lamang	liti	Musgum	liwit ^y
Hurza	riwats ^y	Higi	litwi	Gidar	

(300) 'meat' *ɰiwid^y

Group	Root	Group	Root	Group	Root
Bata	ɰiwi ^y	Margi		Kotoko Island	hu
Daba	ɰij ^y	Mandara	ɰiwid ^y	Kotoko North	ɰw
Mafa	ɰiwad ^y	Mofu	ɰw	Kotoko Centre	ɰw
Tera	ɰu	Maroua		Kotoko South	asu
Sukur	ɰiwid ^y	Lamang	ɰi ^w i	Musgum	ɰiwit
Hurza	ɰiwad ^y	Higi	ɰij	Gidar	ɰwi

(301) 'pus' *wirid^y

Group	Root	Group	Root	Group	Root
Bata	riwid ^y	Margi	li ^w i	Kotoko Island	
Daba	wilad ^y	Mandara	liwid	Kotoko North	
Mafa	wirid ^y	Mofu	walid ^y	Kotoko Centre	
Tera	ra	Maroua	li ^l i ^b w	Kotoko South	
Sukur	miru	Lamang		Musgum	alu
Hurza	d̥iriw ^y	Higi	li ^w i	Gidar	wili ^y

(302) 'fly (insect)' *dziwid^y

Group	Root	Group	Root	Group	Root
Bata	dzi ^l i ^y	Margi	tsid̥i ^y	Kotoko Island	hadzu
Daba	dziwid ^y	Mandara	ⁿ dziwid ^y	Kotoko North	ts'iwi
Mafa	dziwaj	Mofu	dziwaj	Kotoko Centre	ziwid
Tera		Maroua	dzidziwid ^y	Kotoko South	dzadzwi
Sukur	dziwid ^y	Lamang	ziwdi	Musgum	diwaj
Hurza	dziwaj	Higi	z ^l iwid	Gidar	zikda ^y

(303) 'to suck' *siwi^b^y

Group	Root	Group	Root	Group	Root
Bata	sib ^y	Margi	sibi ^y	Kotoko Island	tsetsabu
Daba	sa ^b ^y	Mandara	busa ^y	Kotoko North	s'afu
Mafa	sasi ^b w	Mofu	siwi ^b	Kotoko Centre	s'afi
Tera		Maroua	subi	Kotoko South	
Sukur		Lamang	bisaj	Musgum	susubi ^y
Hurza	susa ^b ^y	Higi	bisi, s ^l i ^b i	Gidar	issiba ^w

(304) 'scorpion' *h₁ridz^y

Group	Root	Group	Root	Group	Root
Bata	hiradzi ^y	Margi	hida ^y	Kotoko Island	
Daba	ridzi ^y	Mandara	radzi ^y	Kotoko North	
Mafa	haradz	Mofu	hirida ^y	Kotoko Centre	
Tera		Maroua	arats ^y	Kotoko South	
Sukur	^m birdaj	Lamang	rida	Musgum	hiridiw
Hurza	ridza ^y	Higi		Gidar	hirzija

(305) 'mortar' *h₁idzin^y

Group	Root	Group	Root	Group	Root
Bata	ⁿ dziri ^y	Margi	ⁿ dzir ^y	Kotoko Island	adzin
Daba	ⁿ dzar ^y , dzidzaŋ ^y	Mandara	dziri	Kotoko North	
Mafa		Mofu	dzira, dzidzaŋ ^y	Kotoko Centre	zin
Tera		Maroua	dzidziŋ ^y	Kotoko South	
Sukur	dzimdzi ^y	Lamang		Musgum	diŋ
Hurza	dzira ^y , dzi ⁿ dzan ^y	Higi	ⁿ dzir	Gidar	

(306) 'string' *ziwid^y

Group	Root	Group	Root	Group	Root
Bata	za ^w i	Margi	siwid	Kotoko Island	
Daba		Mandara	zawad	Kotoko North	sire
Mafa		Mofu	ziwad ^y	Kotoko Centre	sadī
Tera	zoo	Maroua	ziwid ^y	Kotoko South	
Sukur	zi ^b i ^y	Lamang	zi ^w i	Musgum	
Hurza	zawaj	Higi	zi ^w i	Gidar	

(307) 'leg' *siraj

Group	Root	Group	Root	Group	Root
Bata	sidī	Margi	sil	Kotoko Island	
Daba	sasalaj	Mandara	sira	Kotoko North	sali
Mafa	sasalaj	Mofu	salaj	Kotoko Centre	
Tera	sara	Maroua	sir, sar	Kotoko South	
Sukur		Lamang	sila	Musgum	
Hurza	siraj	Higi	sira	Gidar	

(308) 'tail' *k^witir^y

Group	Root	Group	Root	Group	Root
Bata	h ^w itiri	Margi		Kotoko Island	
Daba	k ^w ital ^y	Mandara	k ^w itili ^y	Kotoko North	
Mafa	h ^w adar, fitar ^w	Mofu	h ^w itil ^y	Kotoko Centre	
Tera		Maroua		Kotoko South	
Sukur	tur	Lamang	h ^w itil	Musgum	
Hurza	k ^w itar ^y	Higi		Gidar	kitir ^w

(309) 'navel' *zi^mb^wid^f

Group	Root	Group	Root	Group	Root
Bata	zi ^m b ^w id ⁱ ^y	Margi	si ^m b ^w id ⁱ w ^y	Kotoko Island	
Daba		Mandara	zi ^m bi ^y	Kotoko North	sa ^m bu
Mafa	zimal ^y	Mofu	zi ^m bal ^y	Kotoko Centre	
Tera		Maroua		Kotoko South	
Sukur		Lamang	zi ^m bid ^f	Musgum	
Hurza		Higi	zi ^m b ^w id ^f	Gidar	

(310) 'eye' *tsi ^y

Group	Root	Group	Root	Group	Root
Bata	dzi ^y	Margi	ntsa ^y	Kotoko Island	
Daba	ⁿ dza ^y	Mandara	ji ⁿ tsa ^y	Kotoko North	tsi
Mafa		Mofu		Kotoko Centre	si
Tera		Maroua		Kotoko South	
Sukur	is	Lamang		Musgum	
Hurza		Higi	nts ⁱ	Gidar	

(311) 'hole' *vigi^d ^y

Group	Root	Group	Root	Group	Root
Bata		Margi		Kotoko Island	
Daba		Mandara	vigi ^y	Kotoko North	
Mafa	vavad ^y	Mofu	vid ^f ^y	Kotoko Centre	
Tera		Maroua	vigi ^d ^y	Kotoko South	
Sukur	vud ^f	Lamang		Musgum	
Hurza		Higi		Gidar	viva ^w

(312) 'tongue' *ɣanad^y

Group	Root	Group	Root	Group	Root
Bata	gana ^y	Margi	gar ^y	Kotoko Island	
Daba	ganad ^f	Mandara		Kotoko North	
Mafa		Mofu		Kotoko Centre	
Tera	ɣina	Maroua		Kotoko South	
Sukur	ɣanaɟ	Lamang	ɣaniɟ	Musgum	
Hurza		Higi	ɣaniɟ	Gidar	

(313) 'porcupine' *dzimik^w ^y

Group	Root	Group	Root	Group	Root
Bata	di ^m aʔa ^y	Margi		Kotoko Island	
Daba	zimin ^y	Mandara	di ^m biki	Kotoko North	
Mafa	di ^m bak ^w ^y	Mofu	damdzak ^w	Kotoko Centre	
Tera		Maroua		Kotoko South	
Sukur	dzimik ^y	Lamang	di ^m bik ^w	Musgum	
Hurza		Higi	ts ⁱ imik ^w	Gidar	

(314) 'porcupine' *tsih^wid^y

Group	Root	Group	Root	Group	Root
Bata		Margi	mitsa	Kotoko Island	
Daba		Mandara	tsitsih ^{wa} ^y	Kotoko North	
Mafa		Mofu	tsihad ^y	Kotoko Centre	
Tera		Maroua		Kotoko South	
Sukur		Lamang		Musgum	
Hurza	mitsah	Higi		Gidar	

11.2.3 The Realisation of the Palatalization Prosody in Proto-Central Chadic

Having reconstructed the palatalization prosody as a phonological category for Proto-Central Chadic, we need to consider what phonetic form it may have taken in Proto-Central Chadic. A solution is proposed here, but other options are also likely. The possibilities include vowel harmony, consonant palatalization, a mixed prosody, or simply a segment, such as a /j/ or /i/ which became reanalysed as a word-level feature. The option we will propose is that the palatalization prosody originated as a final /j/, and developed into a mixed prosody.

The phonological reanalysis of a suffix such as *j may have been triggered by a situation such as exists in Mafa, a Vowel Prosody language from the Mafa group (Barreteau and le Bléis 1990). Here, the imperfective is marked by the suffix /-j/ for verb stems that end in a vowel, but when the verb stem ends in a consonant, this suffix is reanalysed as a palatalization prosody. This prosody fronts the vowels of the word, and palatalizes any laminal consonants in the word, if present.

Gloss	Stem	Imperfective
to tremble	gudza	gudzaj
to divide	kəɟa	kəɟaj
to wash	pan	pan-j → pan ^y → pen
to climb	təv	təv-j → təv ^y → tiv

Table 168 - /j/reanalysis in Mafa

This sort of situation may provide an explanation for the origin of palatalization, as resulting from the reanalysis of an underlying final *j. This reanalysis could apply to any suffix *j, or to any word-final *j not preceded by a full vowel.

The presence of numerous reconstructed roots with final *i makes it unlikely that final *i was the source of the palatalization prosody.

It remains to give a hypothesis for its realisation. It would make sense for the Proto-Central Chadic realisation to combine an effect on the vowels of the word with an effect on the consonants, making it natural for the prosody to have developed along different paths in different groups.

Amongst the present-day systems, there are two where the palatalization affects both vowels and consonants, making them good candidates for the Proto-Central Chadic palatalization prosody. Firstly there is the system used in many of the Vowel Prosody languages where palatalization affects the vowels and the laminal consonants, as in Moloko (see section 5.2) or Mafa (see section 5.3.5.2). The second possibility is the system found in three of the Mixed Prosody languages, where palatalization is realised (broadly speaking) either on laminal consonants, or else on vowels if there are no laminal consonants. This system occurs in Podoko (see section 7.2.1.2), Matal (see section 7.2.2) and Sukur (see section 7.4.1).

This second system is the preferred option, as it seems most likely to lend itself to developing into both Consonant Prosody and Vowel Prosody types. In the Consonant Prosody languages, the vowel harmony realisations would have been lost, and replaced in some languages by extending the consonant palatalization system. In the Vowel Prosody languages, the palatalization of laminals has been largely retained, but vowel harmony takes place whether or not laminal consonants are present.

11.2.4 Reflexes of the Palatalization Prosody

In this section we shall look at the reflexes of the palatalization prosody in the different groups in Central Chadic. So far we have broken down the Central Chadic languages and proto-languages into four phonological types: Consonant Prosody, Vowel Prosody, Mixed Prosody and Kotoko. In this section we will look at further sub-types, and give a hypothesis as to the developmental stages that led to each sub-type. The following diagram shows the development of the different forms of the palatalization prosody.

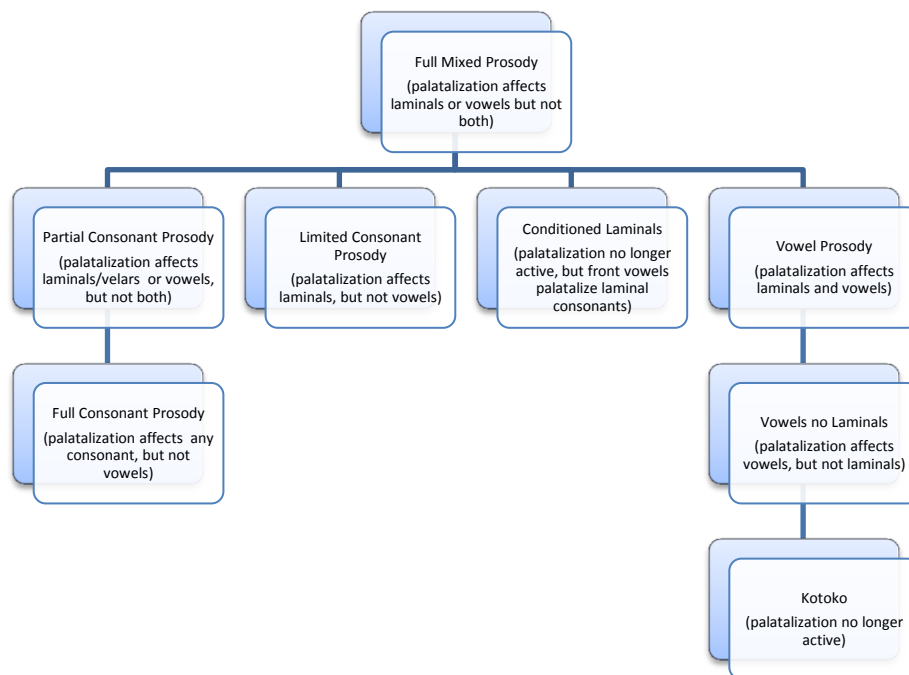


Figure 1 - Development of reflexes of the palatalization prosody

Our hypothesis is that the palatalization prosody started as a Mixed Prosody, affecting laminal consonants, or fronting vowels where no laminal consonants were present.

11.2.4.1 The development of phonological sub-types

Three Mixed Prosody languages – Sukur (Sukur group) and Podoko and Matal (Mandara group) – kept this system, which we shall name the Full Mixed Prosody system.

In a few languages, the palatalization of laminals was lost as an effect of the palatalization prosody, but retained as a conditioning effect of front vowels on adjacent laminal consonants. This Conditioned Laminals system is the system of the Lamang group, and also of Dghwede in the Mandara group.

From the original Mixed Prosody system, three types of Consonant Prosody system developed. Some languages kept the palatalization of laminals, but lost

the vowel-fronting effect of the palatalization prosody. This system, which we shall name the Limited Consonant Prosody system, was the system of Proto-Higi and is preserved in Psikye within that group.

In other languages the palatalization prosody developed to affect non-laminal consonants in words where there was no laminal. This was perhaps to compensate for the loss of vowel harmony by finding an alternate method for realising palatalization. The first stage may have been to extend palatalization to allow the palatalization of alveolars or velars - the Partial Consonant Prosody system - which is used in three subgroups: Margi and Kilba in the East subgroup of the Margi group; Mandara, Malgwa and Glavda in the Mandara subgroup of the Mandara group, and Bana and Kirya within the Bana group.

The next stage in development was to extend the palatalization prosody to allow it to affect any consonant, the Full Consonant Prosody system. This is the system of the Bata group languages, and also of Bura in the Margi group and the Kamwe languages (Higi, Kamwe Futu and Kamwe Nkafa) in the Higi group.

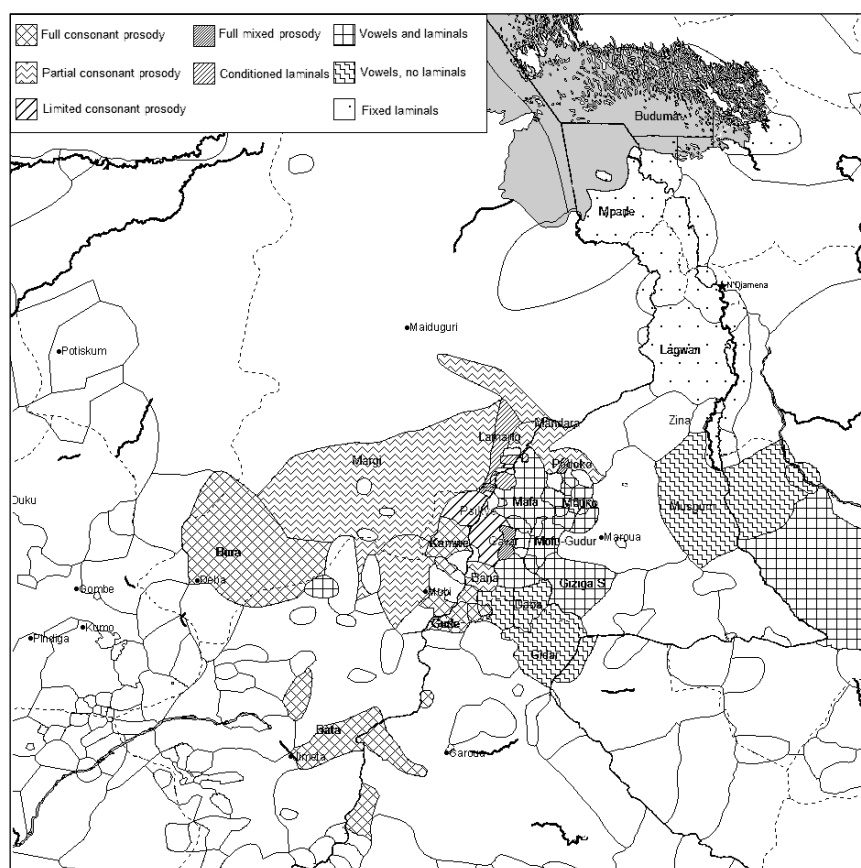
Each stage of development may have limited the conditions under which vowel harmony was applied. In the Full Mixed Prosody system, vowel harmony applies where there are no laminal consonants. In the Partial Consonant Prosody system, palatalization could be applied to velars, and so vowel harmony may only have applied when there were neither laminals nor velars in the word, though this type of prosody is unattested amongst present-day languages. Once the Full Consonant Prosody had developed and palatalization could be applied to any consonant, there were no environments where vowel harmony was needed to show the presence of the palatalization prosody.

In all three of these sub-types, the Consonant Prosody system had to develop before vowel harmony was lost. If this were not the case, and vowel harmony was lost first, there would only be an indication of the presence of the palatalization prosody on words containing laminals, and therefore no reason for the languages to need to apply palatalization elsewhere.

Moving in a different direction, the original Mixed System developed to produce the Vowel Prosody system, with two sub-types. Initially, the palatalization prosody developed to affect the vowels in the word, even when a laminal was present. This resulted in simultaneous vowel harmony and palatalization of laminals - the Vowels and Laminals System. This is the system used in the Mafa

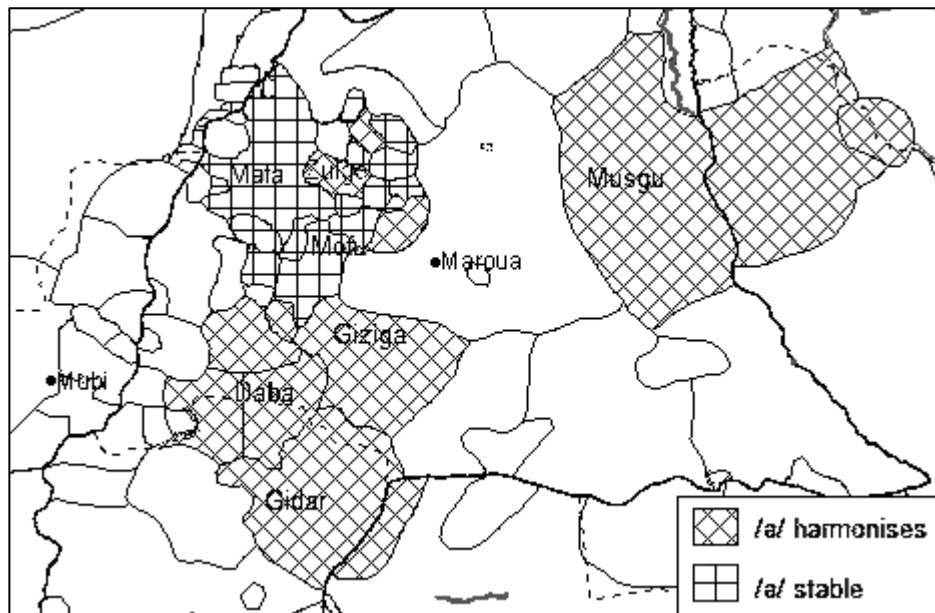
In some languages, the palatalization of laminals was lost, resulting either in no palatalization of laminals or else fixed palatalization of, for example, the laminal affricates. This Vowels, no Laminals system is used in Musgum and Mbara in the Musgum group, Gidar in the Gidar group, Daba (and possibly Mazagway Hidi) in the Daba group and Mbuko in the Hurza group. This differs from the situation in Lamang and Dghwede where the laminals are conditioned by adjacent front vowels.

The following map shows the distribution of the different prosody sub-types.



Map 30 - Phonological sub-types

In the Vowel Prosody languages, vowel harmony initially affected only underlying /a/, but in some languages from both sub-types it developed to also affect /ə/. This was the case in the languages of the south-east of Central Chadic: Gidar in the Gidar group, Muskum and Mbara in the Musgum group, the Maroua group, and in all of the Daba group except Buwal and Gavar, as well as in Zulgo and Ouldeme in the Mofu group. The following map shows the geographical distribution of the harmonisation of /ə/.



Map 31 - Harmonisation of /ə/

This covers all of the Central Chadic languages except for the Kotoko languages, where there is no active palatalization prosody. There are two possibilities. Either the palatalization prosody was lost in the Kotoko languages, or else it never developed. If the palatalization prosody never developed, this implies that the Kotoko languages were a genetically distinct unit at an early time, which goes against the genetic evidence from the regular changes affecting consonants.

The best explanation is to propose that the Kotoko groups originally followed the Vowel Prosody system, in particular the Vowels, no Laminals system, but that vowel harmony was lost in an areal process affecting the Kotoko groups.

We can see a few indications of possible reflexes of the palatalization prosody in the vowels of some Kotoko languages. From this system, vowel harmony was lost. The loss may have been motivated by the influence of the Kanuri six vowel system, and the borrowing of many Kanuri words which had no vowel harmony.

11.2.4.2 The origins of the phonological types

The original mixed prosodic system of Proto-Central Chadic was probably still in place comparatively recently, at a time shortly before the formation of the proto-languages of the groups. In other words, at this time all the languages had a palatalization prosody that palatalized laminal consonants and caused vowel harmony. There is great consistency in the phonological type within each group, allowing for the phonological type of the proto-language of each group to be established. However, it is not possible to establish the phonological type of the ancestor languages of the group proto-languages, since the phonological type of the group proto-languages corresponds to geography more than genetics.

The Vowel Prosody system appears oldest in the south-east of the Central Chadic area. In Proto-Musgum and Proto-Gidar it has developed to the point where the palatalization and labialization prosodies can both be reconstructed for the proto-language of each group, and labialized velars and palatalized laminals have been lost completely. If the Vowel Prosody system originated there, it would then have spread into Proto-Maroua, Proto-Mofu, Proto-Mafa and Proto-Daba.

The Consonant Prosody system appears oldest in Proto-Bata, where it has developed the most. It may have originated there, spreading into Proto-Higi and Proto-Margi.

The remaining Mixed Prosody group proto-languages retained the original system, and the Consonant Prosody and Vowel Prosody systems didn't begin to take hold until the group proto-languages had split into their subgroup proto-languages or even the present-day languages. For this reason, the languages in the Mandara group do not consistently follow the same phonological type, but have developed more or less independently.

This situation is illustrated by the Mofu, Mandara and Margi group proto-languages, which share a common ancestor, Proto-Margi-Mandara-Mofu (which

we shall abbreviate to Proto-MMM) but are of three different types. Proto-Mofu was a Vowel Prosody language, Proto-Margi was a Consonant Prosody language, and Proto-Mandara was a Mixed Prosody language.

Proto-MMM would have retained the original Mixed Prosody system. After it had split into Proto-Mofu, Proto-Mandara and Proto-Margi, Proto-Mofu adopted the Vowel Prosody system, which was inherited by its descendants. Proto-Margi split into two languages, Proto-Margi West and Proto-Margi East. The Consonant Prosody system developed in both of these subgroup proto-languages, though it only developed into the Full Consonant Prosody in Proto-Margi West or its descendants (e.g. Bura). In the Mandara group – which is distant from the origins of the Vowel Prosody and Consonant Prosody systems – the Vowel Prosody and Consonant Prosody systems arrived after the proto-language of the group had split into sub-groups and individual languages, and the systems have only had an effect in individual languages, if at all. Most of the Mandara group languages have retained a Mixed Prosody system.

With this scenario, there is a problem in understanding how the Vowel Prosody system reached Ga'anda, which is well to the east of the other Vowel Prosody languages. The Vowel Prosody system may have been a separate innovation in Ga'anda.

It is interesting to note that the Vowel Prosody system is also present in the West Chadic language Miya and may also have affected other West Chadic A languages (Schuh 2002). Miya is spoken in an area well to the West of any Central Chadic language, so contact is unlikely to explain the presence of a vowel harmony system there. This could be an indication that the palatalization prosody existed as far back as Proto-Chadic and developed independently as a Vowel Prosody system in parts of West Chadic, but was lost elsewhere.

There is also a vowel harmony system in the East Chadic language Kera (Pearce 2003), though with somewhat different characteristics. Amongst the languages of the Masa branch of Chadic vowel harmony has not been reported, at least for Lame (Sachnine 1982) and Musey (Shryock n.d.).

11.3 The Emergence of Labialization in Central Chadic

11.3.1 Overview

The only labialized elements in Proto-Central Chadic were the set of labialized velar consonants. Proto-Central Chadic did not have either a labialization prosody or a set of labialized labial consonants. However, the labialization prosody is now present in some of the Vowel Prosody languages, and labialized labials are present in some of the Consonant Prosody languages. In this section we will show that both of these features originate in the reanalysis of the labialization component of a lost Proto-Central Chadic labialized velar phoneme.

11.3.2 Labialized Velar Phonemes

Proto-Central Chadic had a series of labialized velar phonemes. These are present in almost all Central Chadic languages, and can be easily reconstructed (Gravina 2007a). Some examples are given here, and more can be found in section 10.6. Full data can be found at <http://centralchadic.webonary.org/>.

(315) *k^wizin ‘grass’

Group	Root	Group	Root	Group	Root
Bata	k ^w izini	Margi	k ^w isar	Kotoko Island	
Daba		Mandara	k ^w iziri ^y	Kotoko North	
Mafa	kizan ^y	Mofu	k ^w izir ^y	Kotoko Centre	
Tera	wizin	Maroua	gizir ^y	Kotoko South	
Sukur		Lamang	k ^w izir	Musgum	
Hurza	g ^w idzaɗ ^y	Higi	g ^w izin	Gidar	

(316) *g^wivih ‘field’

Group	Root	Group	Root	Group	Root
Bata	v ^w i	Margi	fak ^w	Kotoko Island	
Daba		Mandara	g ^w ivih	Kotoko North	
Mafa		Mofu	g ^w ivih	Kotoko Centre	
Tera		Maroua	g ^w iva	Kotoko South	
Sukur		Lamang	wivah	Musgum	
Hurza	g ^w ivih	Higi	wivih	Gidar	

(317) *h^wid 'belly'

Group	Root	Group	Root	Group	Root
Bata		Margi		Kotoko Island	
Daba		Mandara	h ^w idɪ	Kotoko North	
Mafa	h ^w adɪ	Mofu	h ^w idɪ	Kotoko Centre	
Tera	h ^w ira	Maroua	wuru	Kotoko South	
Sukur	h ^w idɪ	Lamang	hudɪ	Musgum	war
Hurza		Higi	h ^w idɪ	Gidar	

*ɣ^w is a rare phoneme, and has been completely lost in a number of languages.

(318) *ɣ^wipa 'flour'

Group	Root	Group	Root	Group	Root
Bata	h ^w ipɪ	Margi	ip ^w ɪ	Kotoko Island	
Daba	ɲfa	Mandara	k ^w ipɪ	Kotoko North	
Mafa	g ^w ifa	Mofu	g ^w ipa	Kotoko Centre	
Tera		Maroua	hapa	Kotoko South	
Sukur	p ^w a	Lamang	h ^w ipaw	Musgum	
Hurza	hi ^m biga	Higi	ɣ ^w ipɪ	Gidar	gipa

11.3.3 Labialized Labial Phonemes

Labialized labial phonemes developed in many Consonant Prosody languages. However these did not exist in Proto-Central Chadic, but developed through the transfer of labialization from a lost labialized velar or from *w.

Gloss	PCC	Language	Word	Language	Word
charcoal	ɣ ^w ivɪn ^y	Vame	huvan /h ^w əvan/	Hdi	v ^w ani
faeces	ɣ ^w ivi	Hdi	ɣuvi	Kirya	v ^w i
five	h ^w itif	Lamang	x ^w tafa	Jimi	tef ^w ə
flour	ɣ ^w ipa	Podoko	pəh ^w a	Sharwa	p ^w ə
four	wipadɪ	Psikye	wufadə /wifadə/	Gude	ənf ^w ada
tree	h ^w ip	Dugwor	h ^w af	Bura	nf ^w a

Table 169 - Development of labialized labials

The table shows a number of Proto-Central Chadic roots containing either a labialized velar or *w. The languages in the middle section have retained the Proto-Central Chadic labialized velar. In the languages in the right hand section, the velar has been lost, but the labialization component has been retained, and has transferred to a labial consonant. This process has resulted in the creation of labialized labial phonemes in many Consonant Prosody languages.

For example, in the second item the Proto-Central Chadic voiced velar fricative has been lost in Kirya: $*\gamma^w i vi \rightarrow^w i vi$. The labialization then moves onto the labial consonant and the initial $*i$ is lost: $*^w i vi \rightarrow v^w i$.

In the majority of cases where labialization has moved to a labial, the original labialized velar or $*w$ was in word-initial position.

This process only took place in languages where the palatalization Consonant Prosody was already in existence and had resulted in the creation of palatalized consonants. The extension in the set of labialized consonants was an analogous process.

11.3.4 The Labialization Prosody

The same process that resulted in the creation of labialized labials in Consonant Prosody languages also resulted in the creation of the labialization prosody in Vowel Prosody languages. The labialization prosody is the phonological element present in many Vowel Prosody languages which is realised by the back-rounding of the vowels in a morpheme or word. In most cases the velar consonants in the word are also labialized. (There are a few known instances of labialization acting solely as a consonant prosody without affecting the vowels, and these are restricted to particular morphemes in Mbuko from the Hurza group (T. Smith and Gravina 2010) and Merey from the Mofu group (Gravina 2007b)).

The labialization prosody in Vowel Prosody languages developed in a similar way to the labialized labial phonemes in Consonant Prosody languages. In this case, the labialization component from a labialized velar or $*w$ was reanalysed as a prosody, resulting in the back-rounding of the vowels in the word. The labialization prosody developed quite recently. There are many cases where there are two closely related languages, one of which has the labialization prosody whilst the other does not.

The following table shows the development of the labialization prosody from labialized velars in Mbuko. Under labialization /a/ is realised as [u] in non-final syllables.

	PCC	Vame		Mbuko	
Gloss		UF	SF	UF	SF
fire	*hak ^w	ak ^w a	ak ^w a	aka ^w	ukɔ
charcoal	*ɣ ^w ivɪn ^y	h ^w əvaŋ	huvaŋ	avan ^w	uvɔŋ
field	*g ^w ivɪh	k ^w əvak	kuvak	gəva ^w	guvɔŋ
blind	*ɣ ^w irip	ɣ ^w əlaf	ɣulaf	həraf ^w	hurɔf

Table 170 - Development of the labialization prosody in Mbuko

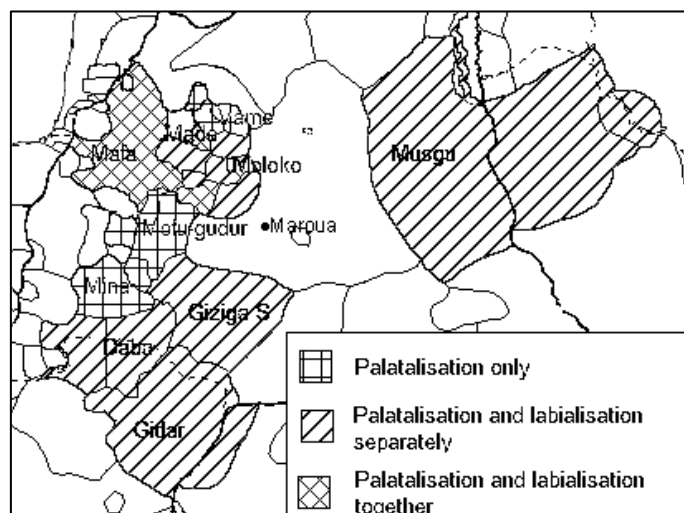
The following table shows the development of the labialization prosody in some words in Merey.

	PCC	Mofu N		Merey	
Gloss		UF	SF	UF	SF
meat	*ɬiwɪd ^y	ɬaw	ɬaw	ɬa ^w	ɬɔ
person	* ⁿ dɪw	ⁿ daw	ⁿ daw	ⁿ da ^w	ⁿ ɔ
ten	*kirɪw	k ^w əraw	kuraw	kəra ^w	kurɔ
rock	-	h ^w atak ^w am	h ^w atak ^w am	hatakam ^w	hɔtɔkɔm
hyrax	-	h ^w ətsam	hutsam	hətsam ^w	hutsɔm

Table 171 - Development of the labialization prosody in Merey

The labialization prosody only developed in the Vowel Prosody languages where the palatalization prosody was already present. Whilst there are many Vowel Prosody languages which have the palatalization prosody but no labialization prosody, there are no languages that have the labialization prosody but no palatalization prosody. The explanation is that the palatalization prosody existed first, and the labialization prosody developed by analogy. Where the labialization prosody exists, most languages do not allow morphemes to carry both the prosodies at the same time. However there are at least three languages – Mofu North and Mada from the Mofu group, and Mafa from the Mafa group – where morphemes can carry both prosodies.

The following map shows the distribution of these vowel prosody types.



Map 32 - Distribution of vowel prosodies

11.3.5 Summary

Proto-Central Chadic had a set of labialized velar phonemes. In many cases, a word-initial labialized velar fricative was lost, though the labialization component remained. This labialization component was reanalysed in two different ways, according to whether the palatalization prosody was following a Vowel Prosody or a Consonant Prosody system. In Vowel Prosody languages, the labialization was reanalysed as a labialization prosody, and back-rounded the vowels in the word. In Consonant Prosody languages, the labialization was transferred to a labial consonant, where one was present, creating a set of contrastive labialized labial consonants.

These labialization processes took place after the processes that led to the palatalization prosody developing into Vowel Prosody and Consonant Prosody types (see section . As with front vowel harmony (see section 11.2.3), back-rounding vowel harmony most probably originated in the south-east of the Central Chadic area, where it is reconstructable for Proto-Musgum (see section 5.3.3.1), and labialized labials originated in the south-west in Proto-Bata (see section 6.3.4.2). Proto-Musgum, Proto-Bata and Proto-Margi

(labialized labials) are the only three groups where labialization features can be reconstructed to the group's proto-language.

