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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/.

The following map shows the geographical distribution of the phonological types.
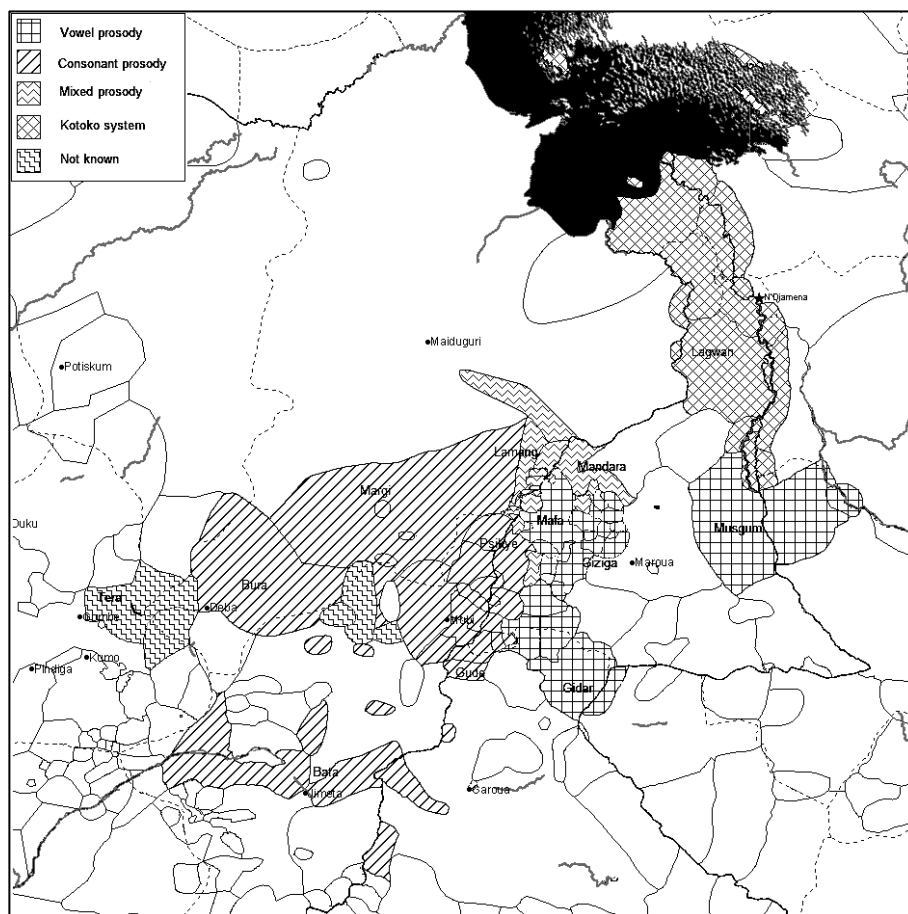
Map 29 - Phonological types

11.2.1.1 *hʷɨtsɨn ʸ 'nose'

In the three Consonant Prosody groups the palatalization prosody affects the laminal consonant *ts, resulting in a voiceless post-alveolar affricate.

The Proto-Bata root is reconstructed as *tsɨnɨ ʸ. In three of the languages *ts has the reflex /s/. Under palatalization, /ts/ and /s/ are realised as [tʃ] and [ʃ].

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

Language	UF	Intermediate	SF
Tsuvan	mətsəna ^y	məts^jəna	mətʃine
Sharwa	tsɨnə ^y	ts^jɨnə	tʃinə
Gude	sənə ^y	s^jənə	ʃinə
Jimi	sənə ^y	s^jənə	ʃənə-n
Bata	səna ^y	s^jəna	ʃine

Table 114 – Reflexes of Proto-Bata 'nose'

The Proto-Higi root is reconstructed as *hɨts^jɨn. 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 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^jɨ	ntʃi
Kamwe Futu	nts^jɨ	ntʃi
Kirya	ns^jɨn	nʃin
Bana	ks^jən	kʃən

Table 115 - Reflexes of Proto-Higi 'nose'

The Proto-Margi root is reconstructed as *hʷɨtsɨr ^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 *hʷ has been lost in all languages except Bura. In Margi the loss is compensated for by the addition of /m/. In Bura *hʷ has the reflex /kʷ/, with the labialization being realised as [u].

Language	UF	Intermediate	SF
Bura	kʷətsər ʸ	kʷəts ʲər	kutʃir
Margi	mɨtsər ʸ	mɨts ʲər	mtʃir
Kilba	tsər ʸ	ts ʲər	tʃir
Margi South	tsər ʸ	ts ʲər	tʃir

<div align="center">**Table 116 - Reflexes of Proto-Margi 'nose'**</div>

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 *hʷɨtɨr ʸ. Final *n has become *r.

Language	UF	SF
Ouldeme	hʷəⁿdar	huⁿdar
Mada	hʷəⁿdar ʸ	hⁿdœr
Muyang	həⁿdar ʸ	hiⁿdir
Moloko	həⁿdar ʸ	həⁿder
Merey	hətar ʸ	həter
Gemzek	hətar ʸ	həter
Zulgo	hətər ʸ	hitir
Dugwor	mətar ʸ	məter
Mofu North	hatar	hatar
Mofu-Gudur	hatar ʸ	heter

<div align="center">**Table 117 - Reflexes of Proto-Mofu 'nose'**</div>

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 /hʷ/ 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 *hʷɨtsan 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 *hʷ has lost its labialization, but in Mbuko *hʷ 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

<div align="center">Table 118 - Reflexes of Proto-Hurza 'nose'</div>

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 *mɨtsɨn 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

<div align="center">Table 119 - Reflexes of Proto-Daba 'nose'</div>

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 *hʷɨtsɨn 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 *hɨtɨn ʷ/*kɨtɨŋ ʸ to reflect this uncertainty.

Language	UF	SF
Giziga South	hətən ʷ	hutuŋ
Giziga North	hətan ʷ	huton
Mbazla	kətən ʸ	kitiŋ

Table 120 - 'nose' in the Maroua group

The Proto-Mafa root is reconstructed as *hɨtsan. 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 *hɨn, though it is not clear if this is a reflex of Proto-Central Chadic *hʷɨtsɨn 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 *hɨtɨrɨ 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 *h has the reflexes zero, /f/, /k/ and /x/.

Language	UF	SF
Matal	tɨr ʸ	tir
Podoko	fətərə	fətərə
Mandara	kətarə	əktare
Malgwa	kətare	əktare
Glavda	xɨtɨr	xɨtɨr
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 *hɨtsiŋ. The *i in Proto-Lamang may a reflex of palatalization.

Language	UF	SF
Lamang	hətsiŋ	htsiŋ
Hdi	hətsiŋ	hətsiŋ

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 *hɨtsɨne.

Language	SF
Mazera	hɨtʃɨne
Zina	hiskini

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

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

Language	SF
Lagwan	xsɨni
Mser	asɨn

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

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

Language	SF
Afade	tsɨn
Maltam	sɨn
Malgbe	skɨn
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' hʷɨtsɨn ʸ.

Group	Root	Group	Root	Group	Root
Bata	tsɨni ʸ	**Margi**	hʷɨtsɨr ʸ	**Kotoko Island**	tsɨnaj
Daba	mɨtsɨn ʸ	**Mandara**	hɨtɨrɨ ʸ	**Kotoko North**	tsɨhɨn
Mafa	hɨtsan	**Mofu**	hʷɨtɨr ʸ	**Kotoko Centre**	hɨsɨni
Tera		**Maroua**	hɨtɨn ʷ, kɨtɨŋ ʸ	**Kotoko South**	hɨtsɨne
Sukur	sɨn ʸ	**Lamang**	hɨtsɨŋ	**Musgum**	
Hurza	hʷɨtsan ʸ	**Higi**	hɨtsʲɨn	**Gidar**	

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

11.2.1.2 *sɨhʷani 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 sɨni ʸ. Palatalization has been lost in this root in Gude and Jimi.

Language	UF	Intermediate	SF
Bata	səri ʸ	sʲəri	ʃiri
Sharwa	sɨnəʔə ʸ	sʲɨnəʔə	ʃinəʔə
Gude	sənij	sənij	səniː
Jimi	sini	sini	sini-n

Table 129 - Reflexes of Proto-Bata 'dream'

The Proto-Higi root is reconstructed as *sʲɨwɨn. 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 *sʲ in the root is indicative of palatalization earlier in the history of the word.

Language	UF	SF
Kamwe-Futu	səwa	səwo
Bana	sʲəw	ʃiw
Kirya (verb)	sʲəwə	ʃiwu
Kirya (noun)	sʲən	ʃin

Table 130 - Reflexes of Proto-Higi 'dream'

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

Language	UF	Intermediate	SF
Bura	səwəni	səwəni	suni
Kilba	səʔʷəni ʸ	sʲəʔʷəni	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 *sɨnɨ 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 *sɨwɨna ʸ. Only the Mafa entry is palatalized in this case.

Language	UF	SF
Mafa	nsəwəna ʸ	nʃuwine
Cuvok	səwana	suwana

Table 133 - Reflexes of Proto-Mafa 'dream'

The Proto-Mofu root is reconstructed as *sɨwna 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	ʒine
Musgum	Mulwi	hɨjnɨ [y]	hiːni
Gidar	Gidar	ɨsːɨna [y]	isːine

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 sɨhʷani [y]. Palatalization has only been retained in Mandara and Malgwa.

Language	UF	SF
Podoko	səhʷani	səhʷani
Mandara	sənə [y]	ʃəne
Malgwa	səne [y]	ʃine
Glavda	sɨⁿga	sɨⁿga

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 *sɨwani.

Language	UF	SF
Lamang	səwaŋa	suwaŋa
Hdi	suni	suni

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 *sɨwane.

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 *sɨhʷani ʸ.

Group	Root	Group	Root	Group	Root
Bata	sɨni ʸ	**Margi**	sɨʔʷɨni ʸ	**Kotoko Island**	
Daba	sɨnɨ ʸ	**Mandara**	sɨhʷani ʸ	**Kotoko North**	saware
Mafa	sɨwɨna ʸ	**Mofu**	sɨwna ʸ	**Kotoko Centre**	sɨwane
Tera	zine	**Maroua**	mɨsɨn ʸ	**Kotoko South**	
Sukur		**Lamang**	sɨwani	**Musgum**	hɨjnɨ ʸ
Hurza	sɨwna ʸ	**Higi**	sʲɨwɨn	**Gidar**	ɨssɨna ʸ

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

11.2.1.3 *kɨrɨp 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 *kɨrɨfɨ 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 /kʷ/ transfers the labialization component onto the following /ɨ/ as [u]. In Tsuvan there was a consistent *r→l change.

Language	UF	Intermediate	SF
Tsuvan	wəlfə ʸ	wəlfʲə	wulfi-n
Sharwa	kʷɨrəfɨ ʸ	kʷɨrʲəfʲɨ	kurʲəfi
Gude	hərəfə ʸ	hərəfʲə	hərəfi-nə
Jimi	hərəfə ʸ	hərʲəfə	hərʲəfə-n
Bata	qərfaː ʸ	qərfʲaː	qərfʲeː

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 *kɨlipɨ. 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	kəɽipə
Kamwe-Futu	kələpə	kələpə

Table 142 - Reflexes of Proto-Higi 'fish'

The /ɽ/ 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 *rʲ.

The Proto-Margi root is reconstructed as *kɨlfi ʸ. 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	kʲɨlfa	kilfa
Margi	kʲɨfi	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 *ɨ.

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

Language	UF	SF
Daba	kələf ʸ	kilif
Mbudum	kələf ʸ	kəlːif
Buwal	ŋkəlaf ʸ	ŋkəlef
Gavar	ŋkilif	ŋkilif

Table 144 - Reflexes of Proto-Daba 'fish'

The Proto-Mafa root is reconstructed as *kɨlaf ʸ.

Language	UF	SF
Mafa	kəlaf ʸ	kilef
Cuvok	kəlaf ʸ	kəlef

Table 145 - Reflexes of Proto-Mafa 'fish'

The Proto-Maroua root is reconstructed as *kɨlɨf ʸ.

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

Table 146 - Reflexes of Proto-Maroua 'fish'

The Proto-Mofu root is reconstructed as *kɨlɨf ʸ.

Language	UF	SF
Zulgo	kələf ʸ	kilif
Ouldeme	kələf ʸ	kəlif
Gemzek	kəlaf ʸ	kəlef
Mofu North	kəlaf ʸ	kəlef
Moloko	kəlaf ʸ	kəlef
Merey	kəlaf ʸ	kəlef
Dugwor	kəlaf 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	kɨlaf ʸ	kəlef
Tera	Tera	jɨrvɨ ʷ	jurvu
Musgum	Vulum	hɨlɨf ʸ	hilif
Gidar	Gidar	kɨlfɨ 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 *kɨlɨfɨ 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	kɨləfə
Mandara	kələfə	kəlfe
Malgwa	kələfə	kəlfe
Glavda	kʲɨlɨf	kilf
Dghwede	kələfə	klfe

Table 149 - Reflexes of Proto-Mandara 'fish'

The Proto-Lamang root is reconstructed as *kɨlɨpi. 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	kələpi	kəlpi
Hdi	kəlipi	kəlipi

Table 150 - Reflexes of Proto-Lamang 'fish'

In Sukur the root is [kirif] /kɨrɨf ʸ/.

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

Language	SF
Mazera	kɨlfa
Zina	həlfə

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

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

Group	Root	Group	Root	Group	Root
Bata	kɨrifɨ ʸ	**Margi**	kɨlfi ʸ	**Kotoko Island**	
Daba	kɨlif ʸ	**Mandara**	kɨlɨfɨ ʸ	**Kotoko North**	
Mafa	kɨlaf ʸ	**Mofu**	kɨlif ʸ	**Kotoko Centre**	
Tera	jɨrvɨ ʷ	**Maroua**	kɨlif ʸ	**Kotoko South**	kɨlfɨ
Sukur	kɨrɨf ʸ	**Lamang**	kɨlɨpi	**Musgum**	hɨlif ʸ
Hurza	kɨlaf ʸ	**Higi**	kɨlipɨ	**Gidar**	kɨlfɨ ʸ

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

11.2.1.4 *ɬɨɗɨn 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 *ɗ, often resulting in /j/.

The Proto-Bata root is reconstructed as *ʣinɨ ʸ. Proto-Central Chadic *ɬ→ʣ in Proto-Bata, and in most languages of the Bata group, Proto-Bata *ʣ→l. In The palatalization prosody is realised on the /n/, except in Bata where it is realised on the /l/.

Language	UF	Intermediate	SF
Tsuvan	ʣəna ʸ	ʣənʲa	ʣine
Sharwa	linə ʸ	linʲə	linʲə
Gude	lɨnɨ ʸ	lɨnʲɨ	linʲi-nə
Jimi	linə ʸ	linʲə	linʲə-n
Bata	lɨn ʸ	lʲɨn	lin-to

Table 153 - Reflexes of Proto-Bata 'tooth'

The Proto-Higi root is reconstructed as *ɬinɨ. There are no active prosodies in Proto-Higi. The *i in the reconstructed root may originate in an earlier application of the palatalization prosody to *ɗ, as *ɗʲ→j, followed by *ɨjɨ→i.

Language	SF
Kamwe-Futu	ɬino
Kirya	ɬaj
Bana	ɬini
Psikye	ɬənə

Table 154 - Reflexes of Proto-Higi 'tooth'

The Proto-Margi root is reconstructed as *ɬɨr ʸ. The palatalization prosody is realised on the *ɬ. Note that in Proto-Margi, word-final *n→r. In the Margi group there is a common, but not universal, change *ɬʲ→hʲ.

Language	UF	SF
Bura	ɬər ʸ	hʲir/ɬir
Margi	ɬər ʸ	hʲir
Kilba	ɬər ʸ	hʲir
Margi S	ɬər ʸ	hʲir

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 *ɬɨr ^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	aɬar	aɬar
Mada	aɬar	aɬar
Moloko	aɬar	aɬar
Muyang	aɬər	aɬər
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 *ɮɨɗaŋ ^y. This is one of the few groups where the *ɗ has not been lost.

Language	UF	SF
Buwal	ɮəɗaŋ ^y	ɮəɗeŋ
Gavar	ɮəɗaŋ ^y	ɮiɗeŋ

Table 158 - Reflexes of Proto-Daba 'tooth'

The Proto-Maroua root is reconstructed as *ɬɨn ^{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 *ʒan ^{y}.

Language	UF	SF
Cuvok	ʒan ^{y}	ʒeŋ
Mafa	ʒana ^{y}	ʒene

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	ʒin	ʒin

Table 161 - 'tooth' in other Vowel Prosody groups

In the Mixed Prosody groups, the Proto-Mandara root is reconstructed as *ɬɨrɨ ^{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 /-ɗa/ to the root, but no explanation is apparent.

Language	UF	SF
Podoko	ɬirə	ɬirə
Mandara	ɬarə	ɬarə
Malgwa	ɬare	ɬaːre
Glavda	ɬɨrɨɗa	ɬrɗa
Dghwede	ɬirə	ɬire

Table 162 - Reflexes of Proto-Mandara 'tooth'

The Sukur entry is [ʒʲin] /ʒɨn ^{y}/. Here the palatalization prosody is still present.

The Proto-Lamang root is reconstructed as *ɬidiŋ. The Lamang group is the second of the two groups that give evidence for reconstructing *ɗ 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	ɬidiŋ
Hdi	ɬiʔiŋ

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, *ɬ→s.

Group	SF
Zina	sin
Mazera	sine

Table 164 - 'tooth' in Proto-Kotoko South

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

Group	SF
Lagwan	ɬɨni
Mser	sɨr

Table 165 - 'tooth' in Proto-Kotoko Centre

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

Group	SF
Afade	ɬɨr
Malgbe	ɬɨr
Mpade	ʃan

Table 166 - 'tooth' in Proto-Kotoko North

In Buduma, the only language of the Kotoko Island group, the word is *hənaj*. In Buduma *ɬ→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' *ɬidɨn 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	ɮinɨ ʸ	**Margi**	ɬɨr ʸ	**Kotoko Island**	hɨnaj
Daba	ɮɨɗaŋ ʸ	**Mandara**	ɬɨrɨ ʸ	**Kotoko North**	ɬɨr
Mafa	ɮan ʸ	**Mofu**	ɬɨr ʸ	**Kotoko Centre**	ɬɨni
Tera	ɮin	**Maroua**	ɬɨn ʸ	**Kotoko South**	sin
Sukur	ɮɨn ʸ	**Lamang**	ɬiɗɨŋ	**Musgum**	ɬɨŋ
Hurza	ɬahan	**Higi**	ɬinɨ	**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 *ɨ. 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 *ɗ there may have been a change *ɗ→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' *rɨwɨtsʸ

Group	Root	Group	Root	Group	Root
Bata	rɨtɨ ʸ	**Margi**		**Kotoko Island**	
Daba	lɨwɨts ʸ	**Mandara**	lɨwtsɨ ʸ	**Kotoko North**	
Mafa	rɨwats ʸ	**Mofu**	lɨwɨt ʸ	**Kotoko Centre**	
Tera		**Maroua**	lɨwɨts ʸ	**Kotoko South**	
Sukur	ruts	**Lamang**	liti	**Musgum**	lɨwɨt ʸ
Hurza	rɨwats ʸ	**Higi**	lɨtwɨ	**Gidar**	

(300) 'meat' *ɬɨwɨɗ ʸ

Group	Root	Group	Root	Group	Root
Bata	ʒɨwɨ ʸ	**Margi**		**Kotoko Island**	hu
Daba	ʒɨj ʸ	**Mandara**	ɬɨwɨɗ ʸ	**Kotoko North**	ɬɨw
Mafa	ʒɨwaɗ ʸ	**Mofu**	ɬɨw	**Kotoko Centre**	ɬɨw
Tera	ʒu	**Maroua**		**Kotoko South**	asu
Sukur	ɬɨwɨɗ ʸ	**Lamang**	ɬɨʔʷi	**Musgum**	ɬɨwɨt
Hurza	ɬɨwaɗ ʸ	**Higi**	ɬɨj	**Gidar**	ɬɨwɨ

(301) 'pus' *wɨrɨɗ ʸ

Group	Root	Group	Root	Group	Root
Bata	rɨwɨɗ ʸ	**Margi**	lɨʔʷɨ	**Kotoko Island**	
Daba	wɨlaɗ ʸ	**Mandara**	lɨwɨɗ	**Kotoko North**	
Mafa	wɨrɨɗ ʸ	**Mofu**	walɨɗ ʸ	**Kotoko Centre**	
Tera	ra	**Maroua**	lilɨɓ ʷ	**Kotoko South**	
Sukur	mɨru	**Lamang**		**Musgum**	alu
Hurza	ɗɨrɨw ʸ	**Higi**	lɨʔʷɨ	**Gidar**	wɨlɨ ʸ

(302) 'fly (insect)' *dzɨwɨɗ ʸ

Group	Root	Group	Root	Group	Root
Bata	dzɨʔɨ ʸ	**Margi**	tsɨɗɨ ʸ	**Kotoko Island**	hadzu
Daba	dzɨwɨɗ ʸ	**Mandara**	ⁿdzɨwɨɗ ʸ	**Kotoko North**	ts'ɨwi
Mafa	dzɨwaj	**Mofu**	dzɨwaj	**Kotoko Centre**	zɨwɨɗ
Tera		**Maroua**	dzɨdzɨwɨɗ ʸ	**Kotoko South**	dzadzwi
Sukur	dʒɨwɨɗ ʸ	**Lamang**	ziwɗi	**Musgum**	dɨwaj
Hurza	dzɨwaj	**Higi**	zʲɨwiɗ	**Gidar**	zɨkɗa ʸ

(303) 'to suck' *sɨwiɓ ʸ

Group	Root	Group	Root	Group	Root
Bata	siɓ ʸ	**Margi**	siɓɨ ʸ	**Kotoko Island**	tsetsabu
Daba	saɓ ʸ	**Mandara**	ɓusa ʸ	**Kotoko North**	s'afu
Mafa	sasɨɓ ʷ	**Mofu**	sɨwɨɓ	**Kotoko Centre**	s'afɨ
Tera		**Maroua**	suɓi	**Kotoko South**	
Sukur		**Lamang**	ɓisaj	**Musgum**	susuɓɨ ʸ
Hurza	susaɓ ʸ	**Higi**	ɓisɨ, sʲiɓɨ	**Gidar**	ɨssɨɓa ʷ

(304) 'scorpion' *hɨrɨdz ʸ

Group	Root	Group	Root	Group	Root
Bata	hɨradzɨ ʸ	**Margi**	hɨda ʸ	**Kotoko Island**	
Daba	rɨdzɨ ʸ	**Mandara**	radzɨ ʸ	**Kotoko North**	
Mafa	haradz	**Mofu**	hɨrɨda ʸ	**Kotoko Centre**	
Tera		**Maroua**	arats ʸ	**Kotoko South**	
Sukur	ᵐbɨrdaj	**Lamang**	rɨda	**Musgum**	hɨrɨdɨw
Hurza	rɨdza ʸ	**Higi**		**Gidar**	hɨrzɨja

(305) 'mortar' *hɨdzɨn ʸ

Group	Root	Group	Root	Group	Root
Bata	ⁿdzɨrɨ ʸ	**Margi**	ⁿdzɨr ʸ	**Kotoko Island**	adzin
Daba	ⁿdzar ʸ, dzɨdzaŋ ʸ	**Mandara**	dzɨrɨ	**Kotoko North**	
Mafa		**Mofu**	dzɨra, dzɨdzaŋ ʸ	**Kotoko Centre**	zɨn
Tera		**Maroua**	dzɨdzɨŋ ʸ	**Kotoko South**	
Sukur	dzɨmdzɨr ʸ	**Lamang**		**Musgum**	dɨŋ
Hurza	dzɨra ʸ, dzɨⁿdzan ʸ	**Higi**	ⁿdzir	**Gidar**	

(306) 'string' *zɨwɨɗ ʸ

Group	Root	Group	Root	Group	Root
Bata	zaʔʷɨ	**Margi**	sɨwiɗ	**Kotoko Island**	
Daba		**Mandara**	zawaɗ	**Kotoko North**	sɨre
Mafa		**Mofu**	zɨwaɗ ʸ	**Kotoko Centre**	saɗɨ
Tera	zoo	**Maroua**	zɨwɨɗ ʸ	**Kotoko South**	
Sukur	zɨɓɨ ʸ	**Lamang**	zɨʔʷi	**Musgum**	
Hurza	zawaj	**Higi**	zɨʔʷɨ	**Gidar**	

(307) 'leg' *sɨraj

Group	Root	Group	Root	Group	Root
Bata	sɨɗɨ	**Margi**	sil	**Kotoko Island**	
Daba	sasalaj	**Mandara**	sɨra	**Kotoko North**	sali
Mafa	sasalaj	**Mofu**	salaj	**Kotoko Centre**	
Tera	sara	**Maroua**	sir, sar	**Kotoko South**	
Sukur		**Lamang**	sɨla	**Musgum**	
Hurza	sɨraj	**Higi**	sɨra	**Gidar**	

(308) 'tail' *kʷɨtɨr ʸ

Group	Root	Group	Root	Group	Root
Bata	hʷɨtɨrɨ	**Margi**		**Kotoko Island**	
Daba	kʷɨtal ʸ	**Mandara**	kʷɨtɨlɨ ʸ	**Kotoko North**	
Mafa	hʷadar, fɨtar ʷ	**Mofu**	hʷɨtil ʸ	**Kotoko Centre**	
Tera		**Maroua**		**Kotoko South**	
Sukur	tur	**Lamang**	hʷɨtɨl	**Musgum**	
Hurza	kʷɨtar ʸ	**Higi**		**Gidar**	kɨtɨr ʷ

(309) 'navel' *zɨᵐbʷiɗ

Group	Root	Group	Root	Group	Root
Bata	zɨᵐbʷɨɗɨ ^{y}	**Margi**	sɨᵐbʷɨɗɨw ^{y}	**Kotoko Island**	
Daba		**Mandara**	zɨᵐbɨ ^{y}	**Kotoko North**	saᵐbu
Mafa	zɨmal ^{y}	**Mofu**	zɨᵐbal ^{y}	**Kotoko Centre**	
Tera		**Maroua**		**Kotoko South**	
Sukur		**Lamang**	ziᵐbiɗ	**Musgum**	
Hurza		**Higi**	zʲɨᵐbʷiɗ	**Gidar**	

(310) 'eye' *tsɨ ^{y}

Group	Root	Group	Root	Group	Root
Bata	dzɨ ^{y}	**Margi**	ntsa ^{y}	**Kotoko Island**	
Daba	ⁿdza ^{y}	**Mandara**	jɨtsa ^{y}	**Kotoko North**	tsɨ
Mafa		**Mofu**		**Kotoko Centre**	sɨ
Tera		**Maroua**		**Kotoko South**	
Sukur	is	**Lamang**		**Musgum**	
Hurza		**Higi**	ntsʲɨ	**Gidar**	

(311) 'hole' *vɨgɨɗ ^{y}

Group	Root	Group	Root	Group	Root
Bata		**Margi**		**Kotoko Island**	
Daba		**Mandara**	vɨgɨ ^{y}	**Kotoko North**	
Mafa	vavaɗ ^{y}	**Mofu**	vɨɗ ^{y}	**Kotoko Centre**	
Tera		**Maroua**	vɨgɨɗ ^{y}	**Kotoko South**	
Sukur	vuɗ	**Lamang**		**Musgum**	
Hurza		**Higi**		**Gidar**	vɨva ^{w}

(312) 'tongue' *ɣanaɗ ^{y}

Group	Root	Group	Root	Group	Root
Bata	gana ^{y}	**Margi**	gar ^{y}	**Kotoko Island**	
Daba	ganaɗ	**Mandara**		**Kotoko North**	
Mafa		**Mofu**		**Kotoko Centre**	
Tera	ɣina	**Maroua**		**Kotoko South**	
Sukur	ɣanaj	**Lamang**	ɣanɨj	**Musgum**	
Hurza		**Higi**	ɣanɨj	**Gidar**	

(313) 'porcupine' *dzɨmɨkʷ ^{y}

Group	Root	Group	Root	Group	Root
Bata	dɨmaʔa ^{y}	**Margi**		**Kotoko Island**	
Daba	zɨmɨn ^{y}	**Mandara**	dɨᵐbɨkɨ	**Kotoko North**	
Mafa	dɨᵐbakʷ ^{y}	**Mofu**	damdzakʷ	**Kotoko Centre**	
Tera		**Maroua**		**Kotoko South**	
Sukur	dzɨmɨk ^{y}	**Lamang**	diᵐbikʷ	**Musgum**	
Hurza		**Higi**	tsʲɨmɨkʷ	**Gidar**	

(314) 'porcupine' *tsɨhʷɨɗ ʸ

Group	Root	Group	Root	Group	Root
Bata		**Margi**	mɨtsa	**Kotoko Island**	
Daba		**Mandara**	tsɨtsɨhʷa ʸ	**Kotoko North**	
Mafa		**Mofu**	tsɨhaɗ ʸ	**Kotoko Centre**	
Tera		**Maroua**		**Kotoko South**	
Sukur		**Lamang**		**Musgum**	
Hurza	mɨtsah	**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	kəɠa	kəɠaj
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.
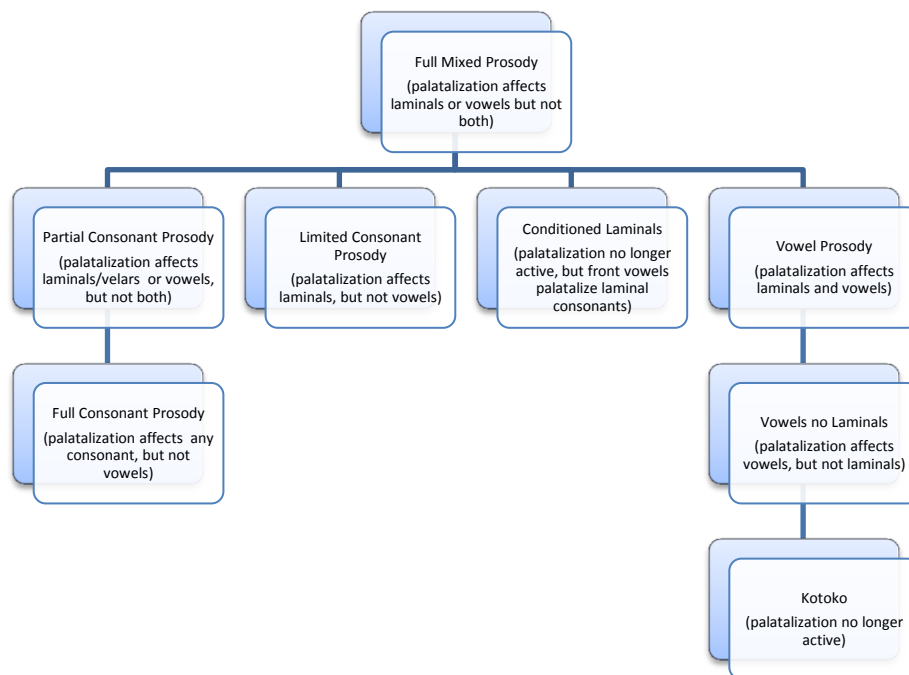
It remains to give a hypothesis for its realisation. It would make sense for the Proto-Central Chadic realisation to combine an effect on the vowels of the word with an effect on the consonants, making it natural for the prosody to have developed along different paths in different groups.

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.

```
                         ┌─────────────────────────┐
                         │    Full Mixed Prosody    │
                         │  (palatalization affects │
                         │  laminals or vowels but  │
                         │         not both)        │
                         └─────────────────────────┘
```

Partial Consonant Prosody (palatalization affects laminals/velars or vowels, but not both)	Limited Consonant Prosody (palatalization affects laminals, but not vowels)	Conditioned Laminals (palatalization no longer active, but front vowels palatalize laminal consonants)	Vowel Prosody (palatalization affects laminals and vowels)

Full Consonant Prosody (palatalization affects any consonant, but not vowels)

Vowels no Laminals (palatalization affects vowels, but not laminals)

Kotoko (palatalization no longer active)

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

group, Mofu group and Maroua group, and in Mina, Mbudum and Buwal in the Daba group, Muskum in the Musgum group and Ga'anda in the Tera group.

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.
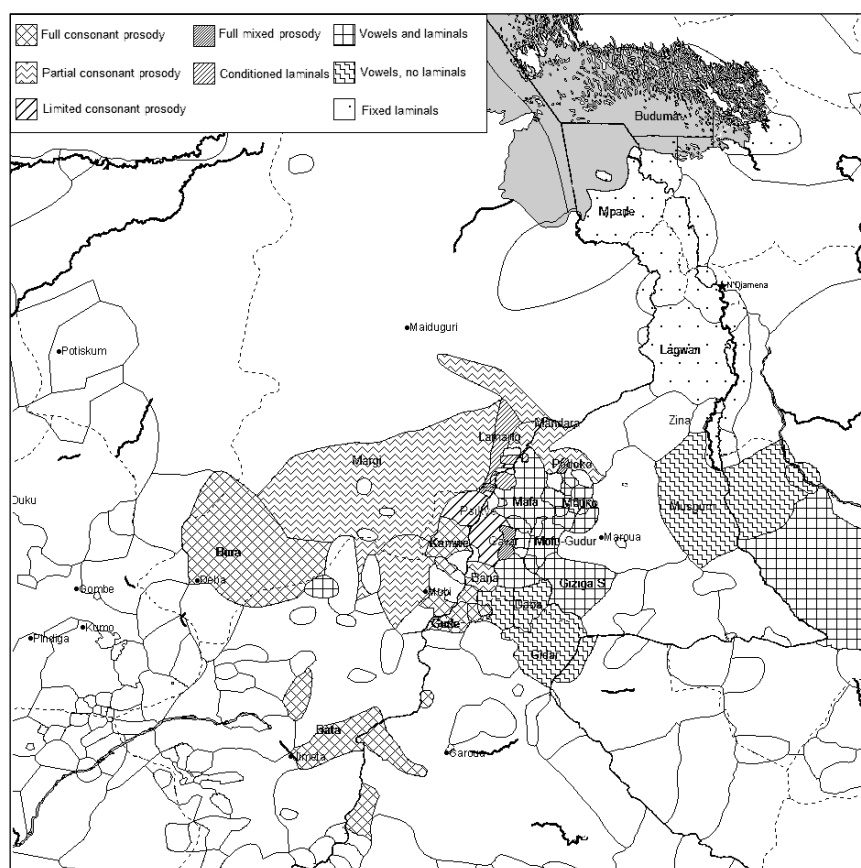
Map 30 - Phonological sub-types

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/.
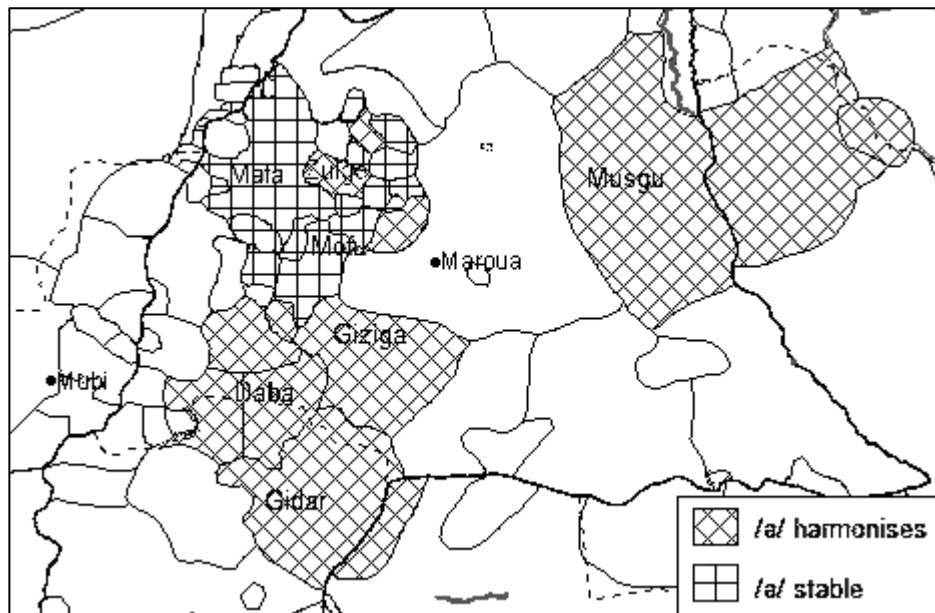
Map 31 - Harmonisation of /ə/

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) *kʷɨzin 'grass'

Group	Root	Group	Root	Group	Root
Bata	kʷɨzinɨ	**Margi**	kʷɨsar	**Kotoko Island**	
Daba		**Mandara**	kʷɨzɨrɨ ʸ	**Kotoko North**	
Mafa	kɨzan ʸ	**Mofu**	kʷɨzɨr ʸ	**Kotoko Centre**	
Tera	wɨzɨn	**Maroua**	gɨzɨŋ ʸ	**Kotoko South**	
Sukur		**Lamang**	kʷɨzɨŋ	**Musgum**	
Hurza	gʷɨdzaɗ ʸ	**Higi**	gʷɨzɨn	**Gidar**	

(316) *gʷɨvɨh 'field'

Group	Root	Group	Root	Group	Root
Bata	vʷɨ	**Margi**	fakʷ	**Kotoko Island**	
Daba		**Mandara**	gʷɨvɨh	**Kotoko North**	
Mafa		**Mofu**	gʷɨvɨh	**Kotoko Centre**	
Tera		**Maroua**	gʷɨva	**Kotoko South**	
Sukur		**Lamang**	wɨvah	**Musgum**	
Hurza	gʷɨvɨh	**Higi**	wɨvɨhɨ	**Gidar**	

(317) *hʷiɗ 'belly'

Group	Root	Group	Root	Group	Root
Bata		**Margi**		**Kotoko Island**	
Daba		**Mandara**	hʷɨɗɨ	**Kotoko North**	
Mafa	hʷaɗ	**Mofu**	hʷɨɗ	**Kotoko Centre**	
Tera	hʷira	**Maroua**	wuru	**Kotoko South**	
Sukur	hʷɨɗ	**Lamang**	hudʲi	**Musgum**	war
Hurza		**Higi**	hʷiɗ	**Gidar**	

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

(318) *ɣʷɨpa 'flour'

Group	Root	Group	Root	Group	Root
Bata	hʷɨpɨ	**Margi**	ɨpʷɨ	**Kotoko Island**	
Daba	ŋfa	**Mandara**	kʷɨpɨ	**Kotoko North**	
Mafa	gʷɨfa	**Mofu**	gʷɨpa	**Kotoko Centre**	
Tera		**Maroua**	hapa	**Kotoko South**	
Sukur	pʷa	**Lamang**	hʷɨpaw	**Musgum**	
Hurza	hɨᵐbɨga	**Higi**	ɣʷɨpɨ	**Gidar**	gɨpa

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	ɣʷɨvɨnʸ	Vame	huvan /hʷəvan/	Hdi	vʷani
faeces	ɣʷɨvi	Hdi	ɣuvi	Kirya	vʷi
five	hʷɨtif	Lamang	xʷtafa	Jimi	tefʷə
flour	ɣʷɨpa	Podoko	pəhʷa	Sharwa	pʷə
four	wɨpaɗ	Psikye	wufaɗə /wɨfaɗə/	Gude	ənfʷaɗa
tree	hʷɨp	Dugwor	hʷaf	Bura	nfʷa

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: *ɣʷɨvi→ʷɨvi. The labialization then moves onto the labial consonant and the initial *ɨ is lost: *ʷɨvi→vʷi.

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.

Gloss	PCC	Vame		Mbuko	
		UF	SF	UF	SF
fire	*hakʷ	akʷa	akʷa	aka ʷ	ukɔ
charcoal	*ɣʷivin ʸ	hʷəvaŋ	huvaŋ	avan ʷ	uvɔŋ
field	*gʷivɨh	kʷəvak	kuvak	gəva ʷ	guvɔ•
blind	*ɣʷɨrɨp	ɣʷəlaf	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.

Gloss	PCC	Mofu N		Merey	
		UF	SF	UF	SF
meat	*ɬiwɨɗ ʸ	ɬaw	ɬaw	ɬa ʷ	ɬɔ
person	*ⁿdɨw	ⁿdaw	ⁿdaw	ⁿda ʷ	ⁿdɔ
ten	*kɨrɨw	kʷəraw	kuraw	kəra ʷ	kurɔ
rock	-	hʷatakʷam	hʷatakʷam	hatakam ʷ	hɔtɔkɔm
hyrax	-	hʷətsam	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.
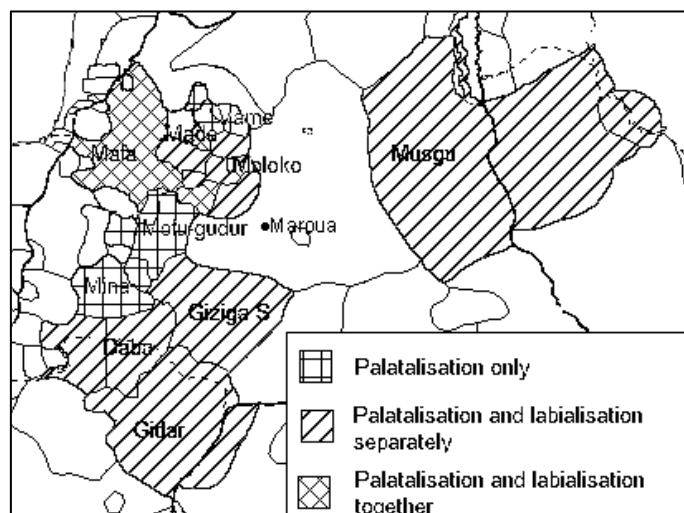
Map 32 - Distribution of vowel prosodies

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.