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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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In some Mixed Prosody languages, the palatalization prosody may be realised either as vowel harmony, or by the palatalization of consonants, depending on which consonants are present in the word. Other Mixed Prosody languages may favour vowel harmony or consonant palatalization, but for the proto-languages of the groups it is necessary to reconstruct a mixed prosody system.

In this chapter we will take a detailed look at the phonologies of the languages in each of the three Mixed Prosody groups, focussing on the underlying vowels, and labialized and palatalized consonants, and examining whether a palatalization prosody should be reconstructed. (There is no data that would make a labialization prosody something to consider.) For each group, we will present a reconstruction of these aspects of the phonology of the proto-language of the group.

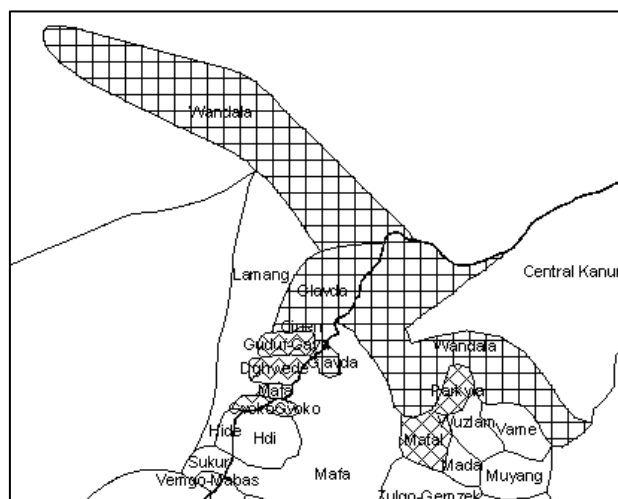
7.2 The Mandara Group

The Mandara Group consists of about eight languages divided into three subgroups:

- 1) Matal, Podoko (Parkwa)
- 2) Mandara, Malgwa (a dialect of Mandara), Glavda
- 3) Dghwede, Gvoko, Guduf, Cineni

The data comes largely from Podoko (Swackhamer 1981; Zagba, Jarvis, and Siddi 1986), Matal (Branger in progress), Mandara (Fluckiger and Whaley n.d.), Malgwa (Löhr 2002; Löhr 2005), Glavda (Rapp and Benzing 1968; Rapp and Muehle 1969; Nghagyiva n.d.; Owens n.d.) and Dghwede (Frick 1977).

The following map shows the locations of the Mandara group languages and the subgroups of Mandara.



Map 25 - Mandara group

The Mandara group is included here amongst the Mixed Prosody languages, not so much for the behaviour of the individual languages but for the behaviour of the languages in the group as a whole and for the behaviour of the proto-language. We will see that Podoko and Matal are true Mixed Prosody languages, with the palatalization prosody being realised either on consonants or on vowels according to the types of consonant and vowel in the word. For Mandara, Malgwa and Glavda the system is closest to a Consonant Prosody system, though in a more restricted way than for the Consonant Prosody languages we looked at earlier. Dghwede is closer to a Vowel Prosody language, though without possessing a full vowel harmony system.

All the languages have at least three underlying vowel phonemes, which is in keeping with the Consonant Prosody languages rather than the Vowel Prosody languages with their two vowel systems.

The Mandara group is possibly the most important group within Central Chadic for shedding light on the development of the different phonological systems.

7.2.1 *Podoko*

Podoko (Swackhamer 1981) has a phonological system which includes labialized velars, four underlying vowel phonemes and a palatalization prosody which affects vowels and laminal consonants. There are no other labialized consonants, and there are no phonemic palatalized consonants.

The palatalization prosody in Podoko functions as a mixed prosody.

7.2.1.1 Vowels

Swackhamer identifies four vowel phonemes in Podoko, /a/, /ə/, /i/ and /u/. However, only the three vowels /a/, /ə/ and /i/ play a full role in the phonology and grammar of the language. (Interestingly, a distinction is made in the published lexicon (Zagba, Jarvis, and Siddi 1986) between [i] and [ə], though there is no mention of such a distinction in the phonology.)

Before a pause, all vowels are neutralised to /a/, with the exception of /u/ which is not found in this position. (Pre-pausal neutralisation of vowels to /a/ is a widespread phenomenon within Central Chadic.)

- (110) Class with /a/
- | | | |
|-------------|-------------------------|----------|
| /kəda/ | [k ^ə da] | ‘dog’ |
| /kəda majá/ | [k ^ə damajá] | ‘my dog’ |
- Class with /ə/
- | | | |
|-------------|-----------|-------------|
| /zulə/ | [zulá] | ‘priest’ |
| /zulə majá/ | [zulmajá] | ‘my priest’ |
- Class with /i/
- | | | |
|---------------------------|------------|-----------|
| /da ^ɪ gi/ | [daŋa] | ‘cane’ |
| /da ^ɪ gi majá/ | [daŋimajá] | ‘my cane’ |

These three vowels also play a role in the verb morphology. In the following examples, the final vowel on the verb root marks the aspect or the direct object.

- (111) /a bəkə baka/ [aɓak̄baka] ‘it is done (unmarked)’
 /a baka baka/ [aɓakabaka] ‘he did it’
 /baki məná/ [bakiɲná] ‘he’s doing’

The phoneme /u/ does not play the same sort of grammatical roles in the language, and is characterised by Swackhammer as being a ‘lesser developed’ phoneme.

7.2.1.2 Palatalization

According to Swackhammer, there is a word-level palatalization prosody in Podoko, which is realised in different manners according to the types of segments within the word. She distinguishes four categories.

The first category consists of those words containing a laminal consonant and at least one /ə/ vowel. In this case, palatalization primarily affects the laminal consonants, with a slight effect on /ə/.

- (112) /tsətsəma^y/ [tʃⁱtʃ^oma] ‘firewood’
 /gətsəka^y/ [gⁱtʃⁱka] ‘entrance hut’
 /dzəba^y/ [dʒⁱba] ‘species’

The second category covers those words containing a laminal consonant, but no /ə/ vowels. Here palatalization affects both the laminal consonants and the /a/ vowels.

- (113) /dzada^y/ [dʒɛdɛ] ‘ring’
 /katsa^y katsa^y/ [kɛtʃɛkɛtʃɛ] ‘rag’
 /badzak^wada^y/ [bedʒɛk^wɛdɛ] ‘tail’

The third category consists of words without laminal consonants, but with at least one /ə/. All the vowels are fronted.

- (114) /bəgəna^y/ [bⁱgⁱnɛ] ‘mucous’
 /bəlma^y/ [bⁱlɛ] ‘potash’
 /dəgəla^y/ [dⁱgⁱlɛ] ‘dirt’
 /təla^y/ [tⁱlɛ] ‘egg’

The final category consists of those words without laminal consonants and without /ə/. In this case, the /a/ vowels are fronted, and there may be audible palatalization of alveolar stops and nasals.

(115)	/da ^ɣ /	[d ⁱ ɛ]	‘eye’
	/mada ^ɣ /	[mɛd ⁱ ɛ]	‘witch’
	/kada ^ɣ /	[kɛd ⁱ ɛ]	‘granary’
	/ʒa ^m ba ^ɣ /	[ʒɛ ^m bɛ]	‘corner’
	/bɛrnawa ^ɣ /	[bɾɾɛwɛ]	‘man without beard’
	/ ⁿ da ^ɣ /	[ⁿ d ⁱ ɛ]	‘to swallow’

In all except the first case (example (112)), the palatalized words exhibit vowel harmony, and the surface forms are similar to those found in Vowel Prosody languages, such as the languages of the neighbouring Mofu group. However the situation in (112) cannot be explained by a Vowel Prosody analysis, where the prosody affects all vowels.

It should be noted that neither the vowel [ɛ] nor the palatalized consonants (such as [tⁱ] and [dⁱ]) are phonemic. All of these are due to the presence of the palatalization prosody.

7.2.1.3 Summary

We have seen that Podoko phonology mixes features of both Vowel Prosody and Consonant Prosody systems. The vowel system is closer to the three vowel systems of the Consonant Prosody languages, and may have originated as just such a three vowel system, with /u/ being a more recent innovation. The palatalization prosody behaves in different ways according to the segments in the word. It can act as a vowel prosody, with primary effect being on the vowels, or it can be more like a consonant prosody and be realised primarily on the laminal consonants.

7.2.2 Matal

Data for Matal comes from an unpublished word list and phonology sketch (Branger in progress). The phonological system is similar to that of Podoko. In particular, the palatalization prosody is a Mixed Prosody, sometimes realised by palatalization of consonants, and sometimes by fronting of vowels.

Matal has a set of labialized velar consonants, but no other labialized or palatalized consonants.

The vowel system consists of the vowel /a/, along with an epenthetic vowel. Surface back-rounded vowels are the result of conditioning of these vowels by labialized consonants or /w/. Surface front vowels are due to conditioning by /j/ or are the result of the palatalization prosody. For clarity of representation, the epenthetic vowel is included as /i/ in the underlying forms that are cited.

The vowel system can be described typologically as a two-vowel system, i.e. of the same type as the system found in the Vowel Prosody languages. This differs from the three-vowel system in Podoko.

The palatalization prosody is expressed either on consonants or on vowels, according to the following rules:

- If there is a laminal in the word, the laminal is palatalized
- If there are no laminal consonants, but there are alveolar consonants, the palatalization prosody can be expressed either by the palatalization of an alveolar consonant, or by fronting of the vowels, or by both
- If there are no laminal or alveolar consonants in the word, the vowels are fronted

Where a consonant is palatalized, adjacent vowels may also be fronted. Likewise, labialized velar consonants can also cause adjacent vowels to be rounded.

In the following table, the first three items show the palatalization of laminals. Items 4 and 5 show situations where an alveolar consonant is palatalized, and items 6 and 7 show cases where the alveolar consonant is not palatalized and vowel fronting takes place. The final item shows the situation where there are no laminal or alveolar consonants and vowel fronting takes place (initial /a/ is not affected by vowel fronting.)

Gloss	UF	Intermediate	SF
head louse	atats ^y	atatʃ	atatʃ
leg	asik ^y	aʃik	aʃik
firewood	sabijak ^y	ʃabijak	ʃabijak
sibling	dada ^y	dʰadʰa	dʰadʰa~dʰɛdʰa
camel	ʒig ^w imij ^y	ʒʲig ^w imij	ʒʲygumi
fish	kilfi ^y	kilfi	kilfi
elbow	vilak ^w	vilek ^w	vilek ^w ~vilœk ^w
hole	aʃik ^y	aʃik	aʃik

Table 75 - Palatalization in Matal

7.2.3 Mandara

Mandara, Malgwa and Glavda form a subgroup within the Mandara group. The three languages have similar phonological systems.

Information on Mandara comes from a lexicon and an orthography statement (Fluckiger and Whaley 1981; Fluckiger and Whaley n.d.). The orthography statement includes good information on the phonology of Mandara.

The vowel system of Mandara comprises three basic phonemes, /a/, /i/ and /ə/, with /a:/ and /u/ occurring in a limited number of words. /ə/ is realised as [e] in the final syllable of a word. Word-final /a/ is realised as [ə] in mid-phrase.

Mandara has a set of labialized velar phonemes, but no other labialized phonemes. There is a set of palatalized laminal consonants and palatalized velar consonants, but very few palatalized alveolar consonants.

The three basic vowel phonemes can follow any unpalatalized consonant. Likewise, there is no restriction on which vowels can follow palatalized consonants. This indicates that the vowels do not condition the preceding consonant

No palatalized velar consonants are found in words containing an unpalatalized laminal. This is consistent with the behaviour of a word-level palatalization

prosody, where the palatalization is primarily realised on laminal consonants, but if none are present it is realised on a velar consonant. As with Glavda (see section 7.2.5), it can be seen from comparative data that the palatalized velars are in fact the realisations of the palatalization on an alveolar consonant (see ‘meat’ and ‘cry’ below). The near absence of phonetic palatalized alveolar consonants in Mandara is due to this process.

Gloss	Proto-Mandara	UF	Intermediate	SF
to hatch	tsiɬa ^y	tsaɬə ^y	ts ^j aɬə	tʃaɬe
hearth	liwtsi ^y	əɬtsa ^y	əɬts ^j a	əɬtʃa
meat	ɬiwid ^y	ɬəwa ^y	ɬ ^j əwa	h ^j uwa
to cry	tiwa ^y	təwa ^y	t ^j əwa	k ^j uwa

Table 76 - Palatalization in Mandara

The phonology of Mandara therefore includes a system of at least three underlying vowels /a/, /i/ and /ə/, along with a word-level palatalization prosody affecting underlying laminal and alveolar consonants, and a set of labialized velar consonants. Since there are no situations where the palatalization prosody takes the form of vowel harmony, Mandara is effectively a Consonant Prosody language.

7.2.4 Malgwa

Malgwa is classified in the Ethnologue (Lewis 2009) as one of the dialects of Mandara. The Mandara data in the previous section comes from the area around Mora in Cameroon, whereas Malgwa is spoken in Nigeria. Information on Malgwa comes from work by Löhr (Löhr 2002; Löhr 2005).

Malgwa has the same restrictions as Mandara on the distribution of palatalized consonants. We can again analyse the palatalization of consonants as coming from a word-level prosody.

As with Mandara, Malgwa also possesses a set of labialized velar consonants.

The most significant difference between Mandara and Malgwa is in the vowel system. Löhr counts six vowel phonemes, /i/, /e/, /a/, /o/, /u/ and /ə/. All except /ə/ are noted as phonetically long vowels. In particular, the vowel [e] is far more widely distributed than in Mandara, where it occurs only in word-final position.

The Malgwa /i/ ([i:]) is equivalent to the Mandara /i/, with Malgwa [i] being either a /ə/ influenced by a neighbouring palatalized consonant, or else the result of borrowing. The following table gives the surface forms for words in Mandara and Malgwa where the Malgwa entry contains [i] or [i:]. The last four show how [i] in Malgwa is the result of conditioning.

Gloss	Mandara	Malgwa
blow	fik ^w a	fi:k ^w a
eye	itʃa	i:tʃe
five	iʒəbe	i:ʒəbe
grasshopper	iwa	i:we
hare	navire	navi:re
head	ira	i:re
porcupine	tʃətfəh ^w e	tʃitʃiha
crocodile	k ^l ərwe	kirwe
dream	ʃəne	ʃine
shame	ʒərəwe	ʒirwe

Table 77 - /i/ in Mandara and Malgwa

In a number of Malgwa words, [e] has resulted from conditioning of /a/ by an adjacent palatalized consonant.

Gloss	Mandara	Malgwa
bone	h ^l ah ^l e	h ^l eh ^l e
guinea fowl	ʒabəra	ʒebre
sheep	k ^l awe	k ^l ewe
squirrel	jaje	jeje
eye	itʃa	i:tʃe

Table 78 - [e] in Malgwa

This does not account for all the data, but it gives an indication that the Malgwa vowel system may have developed from the simpler Mandara vowel system.

7.2.5 Glavda

There is little published on Glavda, the only available data coming from a published lexicon (Rapp and Benzing 1968; Rapp and Muehle 1969) and two works on morphology (Rapp 1966; Buba and Owens 2007). Buba and Owens include a brief summary of the phonology. There are also two unpublished wordlists (Owens n.d.; Nghagyiva n.d.).

The surface vowel system consists of [a], [i], [ɪ], [ɛ] and [u], along with [o], which may only be confined to loan words. All of these except [i] have both long and short forms. (None of the published works present an analysis of the vowel system.)

The velar consonants phonemes all have labialized counterparts.

There are three categories of palatalized consonant. Firstly, there are the palatalized laminal consonants, realised as post-alveolar consonants, such as [ʃ]. Secondly, there are the phonetically palatalized consonants such as [dʲ]. Thirdly, there are the palatal consonants such as [ç], which can be seen to be the realisations of palatalized velars, e.g. /xʲ/.

There are restrictions on which consonants can be found in the same word, which leads to the possibility of a prosodic analysis for palatalization in Glavda. A phonetically palatalized non-laminal consonant is never found in a word containing unpalatalized laminal consonants. When a phonetically palatalized consonant appears in a word, it is typically the leftmost consonant of the word that is palatalized.

We can propose that there is a consonant palatalization prosody in Glavda which falls on a laminal consonant, where present. If no laminal consonant is present, then the first available consonant in the word is palatalized (labialized consonants and approximants cannot be palatalized).

Gloss	Proto-Mandara	UF	Intermediate form	SF
leg	siki ^y	sigə ^y	sʲiga	ʃiga
navel	zi ^m bi ^y	za ^m ba ^y	zʲa ^m ba	ʒa ^m ba
hatch	tsi ^l a ^y	tsa ^l ə ^y	tsʲa ^l ə	tʃa ^l -ga
fly (insect)	ⁿ dziwiɖ ^y	ⁿ dziwɖa ^y	ⁿ dzʲiwɖa	ⁿ dzuja
fish	kili ^f i ^y	kilfa ^y	kʲilfa	ki:lfa
tail	k ^w itili ^y	x ^w itila ^y	x ^w itʲila→x ^w ikʲila	xukʲla
ear	ɬimi ^y	ɬimi ^y	ɬʲimi→xʲimi	çimi

Table 79 - Palatalization in Glavda

In Glavda, along with Mandara and Malgwa, palatalized alveolar consonants are realised as palatalized velar consonants, as in the entries for ‘tail’ and ‘ear’.

It should be noted that palatalized consonants are not the result of conditioning by adjacent front vowels. In the following examples, palatalized consonants are found adjacent to central vowels.

- (116) ^mba:ʒa 'to be unripe'
 fa:ra 'to be thin'
 tʃatʃa 'louse'
 dʒalapa 'mud block'

In most of the data, [ɛ] co-occurs with [ɨ] or [i], but there are rare instances of it co-occurring with [a]. It is possible that there is some form of vowel harmony, though [ɛ] is a rare phone itself, and it is difficult to reach a conclusion without further analysis.

In pre-pausal position, [a] is the only vowel to occur, apart from a very few exceptions in the data. It is possible that the situation is similar to Podoko, where all underlying vowels are neutralised to [a] before a pause (see section 7.2.1.1).

In Glavda palatalization can provisionally be analysed as a prosody which is primarily realised on the laminal consonants, or if no laminal consonants are present on the first available consonant of the root. The vowel system consists of at least the three phonemes /a/, /i/ and /ɨ/, along with /u/ and /ɛ/ which have less definite status. In effect, Glavda is a Consonant Prosody language.

7.2.6 *Dghwede*

Information on Dghwede comes from work by Frick (1977; 1978).

Frick distinguishes three vowels in word-final position, /a/, /i/ and /ə/. Their surface forms are conditioned by whether they occur mid-phrase or before a pause. The surface forms are as follows:

	Mid-phrase	Pre-pause
/a/	[ə]	[a]
/i/	[i]	[e]
/ə/	[ə] or transition	[e]

Table 80 - Dghwede vowels

There is also a fourth phoneme /u/ which is found in word-medial position. This is probably a vocalisation of *w.

There is a set of labialized velar consonant phonemes, but no other labialized consonants.

There is a set of phonetic palatalized laminal consonants. These are conditioned by a following underlying front vowel /i/ (but not by a following pre-pausal /ə/ realised as [e]).

Frick states that, although it might appear at first sight that there is vowel harmony, there is no vowel harmony in Dghwede. One co-occurrence restriction that she notes is that there are no words where the vowels in the final two syllables are *a-i*, though there are numerous instances of *i-a*.

Thus the phonology of Dghwede has an underlying three-vowel system (extended to include /u/). There is no evidence of any word-level palatalization prosody. Dghwede is not a Consonant Prosody language, as the only palatalized consonants are those conditioned by an adjacent front vowel. Nor is it a Vowel Prosody language. Although there are restrictions on the distribution of the vowels, these restrictions are insufficient to result in vowel harmony.

Dghwede is the only one of the four languages in its subgroup for which we have access to data. Data from Gvoko, Guduf or Cineni would help in clarifying whether the languages in this subgroup have developed from a Mixed Prosody, Consonant Prosody or a Vowel Prosody system.

7.2.7 *Reconstruction*

In this section we will reconstruct the basic vocalic and prosodic system for Proto-Mandara. We have seen that all the languages in the Mandara group (except Matal) have at least three vowels – two central and one front – and all (except Dghwede) can be analysed as possessing a word-level palatalization prosody that causes the palatalization of laminals and other consonants, and in some cases the fronting of vowels. We will determine if these features can be reconstructed for Proto-Mandara.

7.2.7.1 **Palatalization**

It is not straightforward to reconstruct the palatalization prosody for Proto-Mandara. There are a number of roots where palatalization occurs in Glavda, Malgwa and Mandara, however it is not easy to find roots where there is also evidence from Podoko and Matal. In Dghwede there is no palatalization prosody, and palatalized laminals are due to the influence of a following front vowel, so there is no direct evidence for the palatalization prosody. However, the presence of front vowels themselves may be an indication of the presence of the palatalization prosody in Proto-Mandara.

In carrying out the reconstructions, we will propose the existence of the palatalization prosody where there is support (from the presence of the prosody or front vowels) from at least two of the subgroups of the Mandara group. In these cases, the loss of the prosody in the other languages is more likely than its sporadic creation in the languages where it is present, though this could have occurred as a result of contact with languages from outside the Mandara group. Further data from languages such as Guduf, Cineni and Gvoko would help clarify the situation.

The following table gives some roots where palatalization can be reconstructed. The underlying form is given, and in the more complex cases an intermediate form is given showing the form after the application of the prosody to the segments.

Gloss	Proto-Mandara	Dghwede	Glavda	Malgwa	Podoko	Matal
ear	ɬimi ^y	/ɬəmi/	/ɬimi ^y /	/ɬəma ^y /	/ɬəmə/	/ɬim/
		ɬəme	/ɬʲimi/ hʲimi	/ɬʲəma/ hʲima	ɬəmə	ɬəm
fish	kilifi ^y	/kələfə/	/kilifi ^y /	/kələfə/	/kələfə/	/kilifi ^y /
		klfe	/kʲilif/ kilf	kəlfə	kiləfə	kilfi
hearth	liwtsi ^y		/litsa/	/lətsa ^y /	/ləwtsə ^y /	/lits/
			iltsa	əltʃa	lutʃə	ləts
navel	zi ^m bi ^y	/zi ^m bə/ zi ^m be	/za ^m ba ^y /	/za ^m ba ^y /	/zə ^m bə ^y /	zi ^m bə
sun	fatsi ^y	/fitsə/	/fatsi ^y /	/vatsəja ^y /	/patsə/	/afats/
		fitʃe	fatʃi	vatʃija	patsə	afats

Table 81 - Palatalization in Proto-Mandara

7.2.7.2 Vowels

There is more variation in the reflexes of the vowels in the Mandara group than in other groups, and it is harder to establish the vowels of the Proto-Mandara roots with a high degree of confidence.

For *i the data is largely consistent.

Gloss	Proto-Mandara	Dghwede	Glavda	Malgwa	Mandara	Podoko	Matal
arm	dɪva	dəva	dɪva	ərva	ərva		
belly	h ^w idɪ	/x ^w ədə/ x ^w də	/x ^w idə/ xudə	/h ^w ədə/ hudə	/h ^w ədə/ hudə	/h ^w ədə/ hudə	/h ^w id/ h ^w əd
to die	mitsa	/mətsa/ mtsə	/imtsi/ imtsi- ga	/mətsa/ mtsə		/mitsa ^y / mɪtʃe	/mits/ mits
hole	vigi ^y	/fəkə/ fke	afka	əvəge	əvəge	vige	/afik ^y / afik
to untie	pila		pɪl-ga	pəla	pələ	pəla	pil

Table 82 - *i in Proto-Mandara

For *a, we must look for occurrences of /a/ that are not in word-final position. In pre-pausal position all the languages in the group neutralise the vowels to some extent, and many of the citation forms in the data are the pre-pausal forms. Good phonemic data from more languages is needed to be able to reconstruct word-final vowels in this group. At present, we can reconstruct *a in word-medial position.

In most of the following examples, the underlying and surface forms are identical. Where this is not the case, the underlying form is given in /.../.

Gloss	Proto-Mandara	Dghwede	Glavda	Mandara	Podoko	Matal
guinea fowl	zabira ^y		/zabira ^y / zabra	/zabəra ^y / zabəra	/za ^m bəra/ za ^m bəra	/zavər/ zavər
left	ʒaba	ʒaʔa	ʒaba	ʒaba	ʒabi	
bone	ʔaʔi	ʔaʔa	ʔaʔa	/ʔaʔə ^y / h ^l ah ^l e	ʔaʔə	ʔaʔʔ
thorn	adaki		taka	dakə	takə	atak

Table 83 - *a in Proto-Mandara

For *i there is reasonably good evidence for reconstructing the vowel for Proto-Mandara. For Dghwede, it seems that front vowels may be reflexes both of *i and of the palatalization prosody (see also Table 81). In Matal, *i has been lost.

Gloss	Proto-Mandara	Dghwede	Glavda	Malgwa	Mandara	Podoko	Matal
to blow	fik ^w a	fəge	fafik ^w a	fi:k ^w a	fik ^w a	fik ^w a	
bow	lika		la:ya	əlke	əlka	lika	alak
five	ʒidɛm	ʒibe	ʒiba	i:ʒəbe	iʒəbe	ʒamə	əʒəw
hare	vida		vi:da	navi:ra	navirə	vira	

Table 84 - *i in Proto-Mandara

Most languages include /u/ in their phonemic inventories, though it is less common than the other vowels and plays less of a functional role in the grammar of the languages. There are a few words where *u can be reconstructed for Proto-Mandara. In all cases *u comes from Proto-Central Chadic *w or a labialized velar.

Gloss	Proto-Central Chadic	Proto-Mandara	Dghwede	Glavda	Mandara	Podoko	Matal
four	wɪfɑɗ	ufadɪ	fide	ufadɑ		ufadə	ufad
to fry	siwra	sula		sil-ga	səla	sula	
grinding stone	wivɪn	uvira	vəra	va:ra	uvəra	mavarə	vəl
hedgehog	h ^w isis	ususa			ususa		

Table 85 - *u in Proto-Mandara

Although /e/ exists in some of the languages in contrast with /i/, the data from the group does not give any evidence that this distinction existed in Proto-Mandara.

7.2.7.3 Summary

For this interesting and difficult group, we can propose that the proto-language had a phonological system that included four underlying vowels and a palatalization prosody.

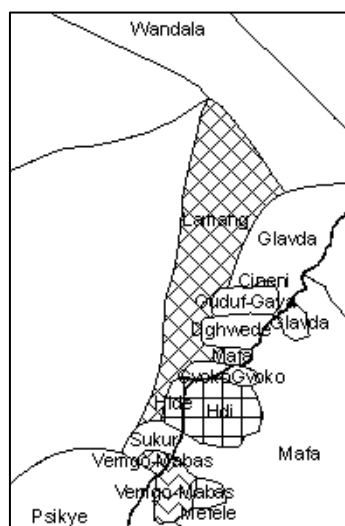
The languages in the group show a diverse range of realisations of the palatalization prosody. It is realised primarily as a consonant prosody in Glavda, Malgwa and Mandara. In Podoko and Matal it is realised either as a consonant prosody or as vowel harmony, according to the segments of the

word. In Dghwede, the palatalization prosody has been fossilized as vowel fronting, approaching vowel harmony.

7.3 The Lamang Group

7.3.1 Overview

The Lamang Group consists of three languages, Lamang, Hdi and Mabas, located around the Cameroon-Nigeria border as shown in the following map.



Map 26 - Lamang group

There are reference grammars for Hdi (Frajzyngier and Shay 2002) and Lamang (Wolff 1983b), a phonology of Hdi (Langermann 1994), a comparative phonology (Langermann 1991) and two lexicons for Hdi (Eguchi 1971; Bramlett 1996). Wolff has also published several comparative papers on languages of the Lamang group and its neighbours (and indeed on Central Chadic). One in particular (Wolff 2006) addresses the question of the role of prosodies in Lamang and Hdi. Mabas has not yet been studied, except for a sociolinguistic survey (Hamm 2004).

There is a balance between what can be deduced from the languages by internal analysis, and what can be inferred from historical and comparative studies. Wolff describes the vowel system of Lamang as 'dynamically

developing from one with few underlying vowels to one with a greater number of distinctive vowel segments, as the result of a still on-going process involving the phonologizing of distributional variants as well as the incorporation of [+foreign] segmental units into the Lamang phonological system' (Wolff 1983b, 46–47). The same is true for Hdi. Both languages have vowel systems that exhibit features characteristic of the behaviour of prosodies, but which have developed from this to a point where they are best treated segmentally without recourse to an analysis based on prosodies.

There are a number of reasons for the resulting complex systems. There is evidence of vowel harmony in the history of the languages. In addition, many of the present-day vowels are the reflexes of the approximants /w/ and /j/, or are the result of the vocalisation of the labialization component of labialized consonants. These vowels will not necessarily follow any vowel harmony in the original word. Hdi and Lamang also make extremely sparse use of /ə/, permitting consonant clusters that other Central Chadic languages do not permit. This reduces the number of vowels in a word, and consequentially reduces the potential evidence for vowel harmony.

7.3.2 *Vowel systems*

A variety of vowel systems have been proposed.

For Hdi, Langermann (1994) gave a two vowel analysis (/a/ and /ə/), with prosodies of palatalization and labialization used to account for the different surface forms. The prosodies are described as acting at the syllable level. It is not immediately apparent what the motivation is for such an analysis. Frajzyngier and Shay (2002) propose six vowels (/a/, /ə/, /i/, /e/, /u/ and /o/), though /o/ only occurs in loan words and /e/ is rare and may possibly also be a loan phenomenon. The analysis is essentially segmental in nature. In the Hdi orthography (Bramlett et al. 2000), five vowels are used (/a/, /ə/, /i/, /e/ and /u/).

For Lamang, Wolff (1983b) gives two possible analyses, one with four vowels (/a/, /u/, /i/ and /ə/) and one with three vowels /a/, /u/, /i/ and a diphthong, notated as /aY/. He describes a complex system of interaction between the vowels in a word, leading to the more varied system of surface vowels. The system involves harmonisation of vowels in some cases, but is not a true vowel prosody system. Vowel harmony is a local feature affecting some neighbouring vowels, and not a morpheme-level feature.

We will now compare the data for Lamang and Hdi, and view this data in the wider context of Central Chadic.

7.3.3 *Extended roots*

One of the features of the Lamang group is the existence of petrified suffixes on some nouns resulting in extended roots in the present-day languages. These suffixes need to be recognised and ignored when reconstructing roots for Proto-Lamang.

There are numerous examples of identical or near identical forms between the two languages. The forms given are phonemic, at a segmental level.

Gloss	Proto-Lamang	Lamang	Hdi
cow	ʔa	ʔa	ʔa
crocodile	kiram	kəram	kəram
face	kima	kəma	kəma
girl	mak ^w a	mak ^w a	mak ^w a
hunger	maja	maja	maja
hut	higa	xga	həga
millet	hija	xija	hija
nose	hitsiŋ	htsiŋ	hətsiŋ
oil	riɖi	rəɖi	rəɖi
scorpion	riɖa	ərɖa	rəɖa
tooth	ʔidiŋ	ʔidiŋ	ʔiʔiŋ

Table 86 - Shared roots in the Lamang group

Schuh (1983) and Wolff (2006) describe a process whereby historic noun gender markers have become petrified onto the noun root. In many cases, Hdi has retained a petrified noun suffix *-k. This petrified suffix can safely be ignored in reconstructing the roots for Proto-Lamang.

Gloss	Proto-Lamang	Lamang	Hdi
egg	ʔiʔi	ʔiʔi	ʔiʔik
fly (insect)	ziwɖi	zidi	zidi ^w k
hearth	liti	liti	litik
night	riviɖi	riviɖi	rəviɖik
sun	fiti	fiti	fitik
tongue	ɣaniɟ	ɣene	ɣanik

Table 87 - Petrification of *-k in Hdi

In other roots, Lamang has retained a suffix **-a*, which can also be ignored in the reconstructions.

Gloss	Proto-Lamang	Lamang	Hdi
bird	d̥ɨjak	d̥ɨjaka	d̥ɨjak
sheep	tiwak	tuwaka	tuwak
woman	marak ^w	marak ^w a	marak ^w

Table 88 - Petrified **-a* in Lamang

7.3.4 Back-rounded vowels

There are many instances of [u] in the data. Some originate from the vocalisation of the labialization component of a labialized velar at some point in the history of the languages. Where [u] is attested in both Lamang and Hdi, **u* is reconstructed for Proto-Lamang.

Gloss	Proto-Central Chadic	Proto-Lamang	Lamang	Hdi
belly	h ^w id̥	hud̥i	xud̥i	hud̥i
faeces	y ^w ɨvi	yuv̥i	yuv̥i	yuv̥i
seed	h ^w ir̥ip	hulfa	hulfa	hulfa

Table 89 - [u] from consonant labialization in the Lamang group

Other instances of [u] come from the process whereby /i^w/ or /wi/ → u. In these cases **u* is also reconstructed for Proto-Lamang where [u] is found in both Lamang and Hdi.

Gloss	Proto-Central Chadic	Proto-Lamang	Lamang	Hdi
grinding stone	wiv̥in → wib̥in	buna	buna	buna cf. uv̥əra (Mandara)
horn	d̥ir̥im → d̥il̥iw	duli	duli	duli cf. d̥ir̥aw (Glavda)
tree	h ^w ip̥ → fwi	ufu	ufu	fu cf. waf (Mafa)
fry	siw̥ra → siw̥la	sula	sula	sulaj cf. saw̥la (Gemzek)

Table 90 - Vocalisation of **w* in the Lamang group

In some cases, this process has only taken place in Lamang. In Hdi the /w/ is retained either as a segment in a CC cluster, or else has transferred onto another consonant as labialization (Bramlett et al. 2000).

In the following examples, the /w/ in the Hdi data can be realised as labialization of the preceding consonant, or as a CC sequence.

Gloss	Proto-Lamang	Lamang	Hdi
child	wizaŋ	uzaŋa	zwaŋ
field	wivah	uvaha	vwah
four	wifaɗ	ufada	fwad

Table 91 - Mixed reflexes of *w in the Lamang group

The vowel [o] is very rare in both languages, especially in Hdi. Where Lamang has [o], Hdi has [u]. In Lamang, [o] occurs primarily in word-final position. It only occurs in non-final position in words where there is a word-final [o]. In word-final position, the [o] results from underlying /aw/ or /C^wa/. *o is not reconstructed for Proto-Lamang.

Gloss	Proto-Central Chadic	Proto-Lamang	Lamang	Hdi
arm	dzi ^y vi ^y	dzi ^y viw	/dzəvaw/ dzəvo	/dzəvəw/ dzəvu
beer	ɣ ^w izi ^m →ɣ ^w izi ^w	ɣuzi ^w	/ɣuzaw/ ɣuzo	/ɣuzəw/ ɣuzu
flour	ɣ ^w i ^y pa	h ^w i ^y paw	/hupaw/ hwpo	/hupəw/ hupu
goat	ɗawik→ak ^w i	ag ^w i	/ag ^w a/ ogo	/g ^w ə/ gu

Table 92 - Creation of [o] in Lamang

7.3.5 Front vowels and palatalization

In Lamang and Hdi, laminals are palatalized by a following front vowel. They are not phonemic, and are not due to the influence of a word-level palatalization prosody. No other palatalized consonants are recorded, except for /ʔⁱ/.

The vowel [e] is rare, particularly in Hdi. It cannot be reconstructed for Proto-Lamang, and its origins appear to be diverse.

Gloss	Proto-Central Chadic	Proto-Lamang	Lamang	Hdi
dog	kiri	kiri	kəre	kəri
monkey	-	vidzi	vdze	vədzi
moon	tira	tila	təre	tili
mouth	maj	waj	ewe	
squirrel	hajay		jaɣe	
bow	rigid ^y	liyed	leye	ləyed
girl	dayilij	dayali	dayele	dayali
path	tsivid ^y	tivij	təve	təvi
tongue	yanad ^y	yanij	ylene	yanik

Table 93 - [e] in the Lamang group

The vowel /i/ can be reconstructed for Proto-Lamang.

Gloss	Proto-Lamang	Lamang	Hdi
belly	hudī	xudī	hudī
dog	kiri	kəre	kəri
moon	tila	təre	tili
night	rividī	rvidī	rəvidik
sun	fiti	fiti	fitik
thorn	tiki	tiki	teki

Table 94 - Reconstructing /i/ in the Lamang group

There is some evidence of front vowel harmony, though such evidence needs to be treated with caution. The evidence from internal data is not enough to propose vowel harmony for any language in the group. External evidence is useful in understanding the distribution of vowels in these languages. In the following table we see that the palatalization prosody in Proto-Central Chadic has led to vowel harmony in some cases in Lamang, Hdi and their proto-language, but in other cases has not. The harmonisation of /ə/ is sporadic rather than systematic.

Gloss	Proto-Central Chadic	Proto-Lamang	Lamang	Hdi
broom	sɪmɪt ^y	sɪʔ ^w it	siwit	suʔit
fish	kɪrɪp ^y	kɪlɪpi	kəlpi	kəlɪpi
fly (insect)	dziwid ^y	ziwdɪ	zɪdɪ	zɪdɪk ^w
hearth	rɪwɪts ^y	liti	liti	litik
horse	pɪrɪs ^y	pɪlis	pəlisi	pəlɪs
nose	h ^w ɪtsɪn ^y	hɪtsɪŋ	xtsɪni	hətsɪŋ
tooth	ɸɪdɪn ^y	ɸɪdɪŋ	ɸɪdɪŋ	ɸɪʔɪŋ

Table 95 - Vowel harmony in the Lamang group

This apparent vowel harmony has only been found in roots reconstructed for Proto-Central Chadic with the palatalization prosody, and which contain only the vowel *i. Even in these restricted cases, we find instances of /ə/. It is not possible to determine from the data whether there was vowel harmony in Proto-Lamang, or if the palatalization prosody was realised as /i/ in the final syllable, and this vowel has influenced the preceding vowels of the word. This second option, where limited vowel harmony is an innovation in Lamang and Hdi, best fits the data.

7.3.6 Summary

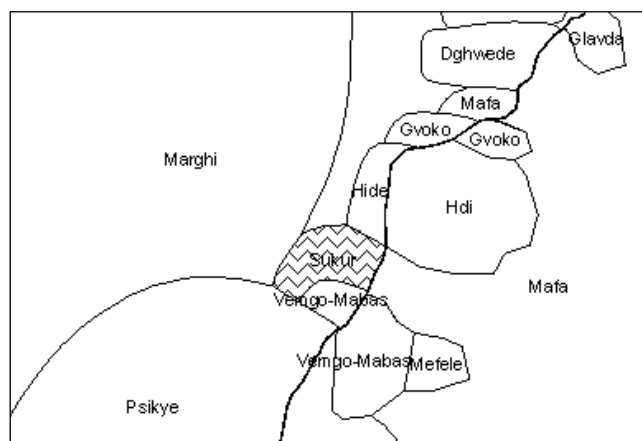
The Lamang group is classed here amongst the Mixed Prosody languages, though the complexities of the phonologies of the individual languages are such that few of the features of either Vowel Prosody languages or Consonant Prosody languages are present. Instead, we have fossilized remnants of the Vowel Prosody, and a retention of the core vowel system typical of Consonant Prosody languages.

There is good evidence that Proto-Lamang had a four vowel system (including the innovation *u), which is an extension of the vowel system of the Consonant Prosody languages. However there is no evidence for a consonant palatalization prosody, and only weak evidence for a possible vowel palatalization prosody.

7.4 The Sukur Group

The Sukur group only has one language, Sukur. Data for Sukur comes from two wordlists (David 1996; Waida and Thomas 2011). With only one language in the group, there is no possibility of doing comparative reconstructions to determine a proto-language for the group. Instead we will identify the key phonological features of Sukur and see how they relate to the different phonological systems so far presented.

Sukur is bordered by languages from four different groups: Margi (Margi), Lamang (Lamang, Hdi and Mabas), Mafa (Mafa) and Higi (Psikye).



Map 27 - Sukur

7.4.1 Palatalization

Sukur has a palatalization prosody that is a mixed prosody, affecting either consonants or vowels. It functions in a similar way to the palatalization prosody in Podoko and Matal (Mandara group – see sections 7.2.1.2 and 7.2.2).

From the data available it can be seen that consonants from all places of articulation may be palatalized. However, only palatalized laminal consonants appear consistently in the roots that are reconstructed for Proto-Central Chadic. Other consonants may have become palatalized due to reanalysis of the palatalization component of a palatalized consonant, or the influence of a preceding /i/.

- (117) 'hare' /vila/ [vil^ha] cf. Proto-Higi *vira (palatalization transferred from the front vowel)

In Consonant Prosody languages, there is a distributional rule where palatalized non-laminal consonants cannot co-occur with unpalatalized laminal consonants. We find the same distributional rule in Sukur.

If we look at the Proto-Central Chadic roots reconstructed with the palatalization prosody, we can see the following processes have taken place in Sukur:

- Any laminal consonants are palatalized, and in most cases *ɗ→j
- If no laminal consonants are present, the vowels in the word are fronted

The first five items in the table below illustrate the palatalization of laminal consonants. Items 4-6 show the palatalization of *ɗ→j. Items 7-10 show the fronting of vowels where the palatalization has not attached to a consonant, including the cases where *ɗ is present, but is not palatalized. Phonetic data is given from both of the sources cited above. The Proto-Sukur form is taken as the Sukur Underlying Form derived from the two data sources.

Gloss	Proto-Central Chadic	Proto-Sukur	Segmental	David	Waida
elephant	dziwin ^y	dziwan ^y	dʒiwan	dʒuwan	dʒiwan
nose	h ^w itsin ^y	sin ^y	ʃɪn	ʃɪn	ʃɪn
porcupine	dʒimik ^{w y}	dʒimik ^y	dʒimik	dʒimək	dʒimək
fly (insect)	dʒiwɪɗ ^y	dʒiwɪɗ ^y	dʒiwij	dʒuwi	dʒui
string	zɪwɪɗ ^y	zɪbi ^y	zɪbij	zɪbi	zɪbi
meat	ɬiwɪɗ ^y	ɬiwɪɗ ^y	ɬiwij	ɬuwij	ɬui
tooth	ɬɪɗɪn ^y	ɬɪn ^y	ɬɪn	ɬjin	ɬɪn
fish	kirɪp ^y	kirɪf ^y	kirif	kirif	kirif
razor	pɪɗak ^{w y}	pɪɗɪk ^{'w y}	pɪɗɪk ^{'w}	pɪɗæk'	pɪɗɪk'u
wind	hɪmɪɗ ^y	mɪɗ ^y	mɪɗ	mɪɗ	mɪɗ

Table 96 - Palatalization in Sukur

Note that the /b/ in the entry for 'string' is due to the merging of *ɗ with *w. There is also a regular change *ɬ→ɬj in Sukur (and in all the Central Chadic South groups). /i/ is fronted to [i] following a palatalized laminal or adjacent to /j/. Adjacent to /w/ it is realised as [u]. The differing transcriptions for item 1 come where these two processes are in competition.

This palatalization prosody behaves in a manner similar to that of Podoko (see section 7.2.1.2) and Matal (see section 7.2.2). However the analysis must remain provisional until a full study of the phonology is available.

7.4.2 Labialization

In Sukur, velar and labial consonants may be labialized, along with the laminals and the alveolar plosives. In almost all groups within Central Chadic we find labialized velars, and labialized labials are found in most languages of the Consonant Prosody type. However labialized laminals and alveolars are unusual, and are elsewhere found only in the Kamwe and Kirya languages of the Higi group (see sections 6.5.4 to 6.5.6), which are geographically close, but not direct neighbours.

In some cases the origin of the labialized consonant can be seen from cognates in other languages. In the following table, the Sukur data shows what may either be a CC sequence, or else a labialized consonant. The cognates given contain either /w/ or a labialized velar. Where there was a labialized velar, the velar has been lost in Sukur and the labialization transferred to another consonant. Where there was *w, the *w has merged with another consonant.

(118)	twā	‘skin’	cf. Psikye x ^w əta
	mīdwan	‘rat’	cf. Podoko madəwanə
	dwa	‘to swear’	cf. Gude wudə
	zwa	‘beer’	cf. Lamang yuzo (from *y ^w iziw)

7.4.3 Vowels

We have seen that /i/ in Sukur can be the result of the palatalization prosody (see Table 96). However we cannot attribute all occurrences of /i/ to the palatalization prosody. In the data there are a number of words where /i/ is present in words with an unpalatalized laminal. According to the rules for palatalization described in the previous section, this should not occur. If the word is palatalized then the laminal will be palatalized. The vowels will only be fronted if they follow a palatalized consonant or if there are no laminal consonants in the word. The following words – many of which are well-attested Central Chadic roots – do not obey these rules:

(119)	ḡis	‘to laugh’
	gis	‘calabash’
	mis	‘urine’
	pis	‘sun’
	si ^m but/fu ^m but	‘hair’
	misəm	‘garden’
	vinzəŋ	‘mosquito’
	^m bizəm	‘owl’

This provides evidence for analysing /i/ as a separate phoneme in Sukur.

The vowel [u] is widely attested in the data. However, the fact that Sukur possesses labialized versions of almost all consonant phonemes permits any sequence [Cu] to be analysed as /C^wə/. It is therefore not clear if /u/ is a phoneme in Sukur.

7.4.4 *Summary*

For Sukur we have a phonological system that includes large numbers of labialized and palatalized consonants. However the evidence implies that many of the palatalized and labialized consonants are recent innovations, and that the earlier system only included palatalized laminals, labialized velars, and probably labialized labials.

There is a palatalization prosody that affects laminal consonants in a word, or if none are present, then /ə/ is fronted to [i].

The vowel system comprises /a/, /i/ and /ə/. /u/ may also be a phoneme, or may be the result of /ə/ conditioned by a labialized consonant.

7.5 Conclusion

The languages belonging to the Mixed Prosody groups have diverse ways of expressing the palatalization prosody. In Mandara, Malgwa and Glavda, the system is almost identical to that found in many Consonant Prosody languages, where palatalization is realised as palatalization of a consonant. In Podoko, Matal and Sukur, palatalization is expressed either as consonant palatalization or as vowel harmony, depending on the consonants and vowels in the word. Dghwede, Lamang and Hdi have developed to the point where there is no longer an active palatalization prosody in the language.

