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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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12 Proto-Central Chadic Vowels

Three vowel phonemes are proposed here for Proto-Central Chadic: *a, *i and *ɨ. This is a significant departure from previous analyses of Proto-Central Chadic vowels (Barreteau 1987b; Wolff 1983a), which reconstruct a system based on two central vowels.

The vowel *ɨ is often considered to be epenthetic in individual languages, i.e. as not existing in the underlying form of a word. Here it will be treated as a vowel phoneme, largely for pragmatic reasons. It plays an important role in many phonological processes, and these can be described with greater clarity by considering *ɨ as a phoneme. Establishing the status of this vowel is difficult with living languages, and with reconstructed languages it is not possible to reach a reliable conclusion. For further discussion see section 12.4. The notation *ɨ is used for Proto-Central Chadic and for all the reconstructed proto-languages within Central Chadic, though in some languages the realisation may have been [ə].

At this stage, reconstructions are fairly tentative, since very little is known about sound changes affecting vowels that have taken place in the history of Central Chadic.

The phonemes *a and *ɨ are relatively stable, though in some groups changes in vocalisation patterns have resulted in a change in the placement of the vowels. In a number of groups, vowels are lowered in the final syllable before a pause, and it is often this pre-pausal or isolation form that is cited in dictionaries and word lists. This can lead to masking of the contrast between these two vowels in word-final position. However, in some languages the underlying form can be found in non-phrase-final forms.

The phoneme *i is more varied in its reflexes. In some languages it has the reflex /ə/, in others it is /i/, and in many cases it has merged with either *ɨ or *a.

There is no evidence in the data for the existence of a back-rounded vowel such as *u in Proto-Central Chadic.

In the following sections we will first look at the different underlying vowel systems found in Central Chadic, and then give evidence for reconstructing each

of the three Proto-Central Chadic vowel phonemes. The full data used in the reconstructions can be found at <http://centralchadic.webonary.org/>.

12.1 Vowel Systems

There are two basic vowel systems that form the basis for the phonemic vowel systems in today's Central Chadic languages. The first is the two vowel system (*a and *ɪ), which is found primarily in the Vowel Prosody languages. The second is the three vowel system (*a, *ɪ and *i), which is found in Consonant Prosody languages and Mixed Prosody languages.

In Vowel Prosody languages Proto-Central Chadic *i has merged with one of the two other vowels. The *i was not reanalysed as the palatalization prosody, except in the Musgum group. The merger may have been triggered by the widespread presence of front vowel harmony, which resulted in underlying /ɪ/ being realised as [i]. This would have reduced the contrastive environments of the *i/*ɪ distinction, leading to the contrast being lost in all environments.

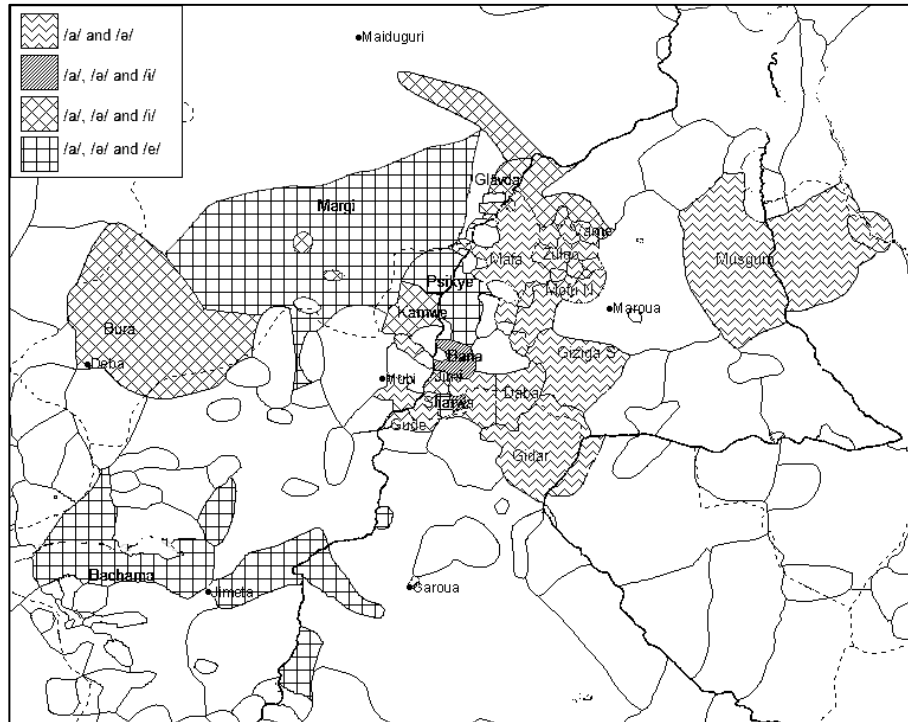
The three vowel system is found in three subtypes. These subtypes are defined by the reflexes of *i, which may be /i/, /e/ or /ə/. There can be added a fourth subtype where *i has merged with *ɪ, creating a two-vowel system, though without the vowel harmony associated with the two-vowel system found in the Vowel Prosody languages.

The two-vowel system is found almost exclusively in the Vowel Prosody languages. All other languages are based on a three-vowel system. Amongst the three-vowel systems, the system where *i has the reflex /i/ is the most common, with the systems with *i having the reflex /e/ or merging with /ɪ/ being less common.

Map 33 below shows the distribution of the different vowel systems.

12.2 Reconstructing *i

We will show that a Proto-Central Chadic vowel *i can be reconstructed by presenting detailed reconstructions of four roots, and summary reconstructions for a further eleven roots. In the Vowel Prosody languages *i has merged with one of the other two vowels, and so these languages do not assist with reconstructing *i. Instead we must focus on the Consonant Prosody and Mixed Prosody languages, which use a three-vowel system.



Map 33 - Vowel systems

It should also be emphasised that front vowel harmony in Vowel Prosody languages is not a reflex of **i*, except in a few isolated cases. This gives us a basis for deciding whether to reconstruct a root with **i* or with the palatalization prosody in cases where the evidence from Consonant Prosody and Mixed Prosody languages is ambiguous. If there is no widespread vowel harmony in the word in the Vowel Prosody languages, then we should reconstruct **i*. If there is widespread vowel harmony in these languages, then we should reconstruct the palatalization prosody.

For example, the root **ɪni* 'work' is not palatalized in Vowel Prosody languages, except for some languages of the Mofu group. However, there is a front vowel reconstructed in three of the Consonant Prosody groups and one of the Mixed Prosody groups. Therefore the root is reconstructed with **i*, and not the palatalization prosody. In this section we will present the reconstructed forms for each group, arranged according to their phonological types.

Consonant Prosody		Mixed Prosody		Vowel Prosody			Kotoko	
Bata	ɬini	Lamang	ɬina	Mofu	ɬir	Daba	ɬin	K. South
Higi	ɬini	Sukur	ɬin	Maroua	ɬira	Mafa	-	K. Centre
Margi	ɬir	Mandara	ɬiri	Hurza	ɬina	Musgum	-	K. North
				Tera	ɬina	Gidar	-	K. Island

Table 172 - Reflexes of Proto-Central Chadic *ɬinɪ 'work'

By way of contrast, the root *ɬimɪɗʸ 'ear' carries the palatalization prosody in many groups, both in Vowel Prosody languages, Mixed Prosody languages and Consonant Prosody languages. For this reason, the palatalization prosody is reconstructed, and not a front vowel.

Consonant Prosody		Mixed Prosody	Vowel Prosody				Kotoko		
Bata	ɬimi ^y	Lamang	ɬimɪŋ	Mofu	ɬimaj	Daba	ɬimiʔ ^y	K. South	sime
Higi	ɬimi	Sukur	ɬimaj	Maroua	ɬimɪɗ ^y	Mafa	ɬimad ^ɸ	K.	ɬimi
Centre									
Margi	ɬimi ^y	Mandara	ɬimi ^y	Hurza	ɬimaj	Musgum	ɬima ^w	K. North	ɬim

Table 173 - Reflexes of Proto-Central Chadic *ɬimɪɗʸ 'ear'

We will begin by reconstructing four widely-attested individual roots containing *i. In each case we will provide data for the reconstructed form for the proto-language of each group before combining the proto-forms to establish the Proto-Central Chadic form. We will then present a number of other roots containing *i, supported by the reconstructions of the group proto-languages.

12.2.1 *pitsi 'sun'

The Proto-Bata root is reconstructed as *fitɪ. Note that *i has the reflex /ə/ in Sharwa, /i/ in Jimi and /e/ in Tsuvan. Proto-Central Chadic *ts→t in Proto-Bata.

- (319) Tsuvan fete
 Sharwa fətə
 Jimi fitə-n

The Proto-Higi root is reconstructed as *vitsi. The post-alveolar laminals in the data are due to the following /i/. The initial *v is the reflex of Proto-Central Chadic *p. The *i has moved to word-final position. This phenomenon is found sporadically in several languages, and affects *a as well as *i.

- (320) Bana v(ə)tʃi
 Kamwe-Futu vitʃi
 Kamwe-Nkafa vetʃi
 Kirya vətʃi
 Psikye vətʃi

The Proto-Margi root is reconstructed as *pitsi. As with the Proto-Higi root, the *i has moved to word-final position.

- (321) Bura ptʃi
 Kilba pətʃi
 Margi S pətʃi

The Proto-Mandara root is reconstructed as *fatsi^ʏ. The Podoko entry is surprising. It should have initial /f/ and final /i/. This may be a local borrowing from Mafa or the Hurza group.

- (322) Podoko patsə
 Glavda fatʃi
 Dghwede fitʃe
 Malgwa vatʃija

The Proto-Lamang root is reconstructed as *fiti.

- (323) Lamang fiti
 Hdi fitik

In Sukur, the sole language of its group, the word for sun is pis.

There is therefore evidence from all of the Consonant Prosody and Mixed Prosody languages for the presence of *i in the Proto-Central Chadic root.

The only Kotoko group where this root is attested is the Kotoko South Group. In this group there is no evidence of *i. The Proto-Kotoko South root is reconstructed as *fatsa. In this group, *ts always has the reflex /tʃ/.

- (324) Mazera fatʃa
 Zina avatʃa

In the Vowel Prosody languages, we do not expect to find palatalization of the root. However the palatalization prosody is reconstructed for the Daba group. The Proto-Daba root is reconstructed as *pitsi^ʏ. With roots containing *i, there

is often sporadic reinterpretation of the front vowel as the palatalization prosody. Since the root is consistently non palatalized in the other Vowel Prosody groups, we can consider the palatalization in the Daba group to be the exceptional case.

- (325) Daba /pits^y/ [pitʃ]
 Buwal /pas^y/ [peʃ]
 Gavar /piʃ/ [piʃ]
 Mbudum /pis^y/ [piʃ]

In the other Vowel Prosody languages, the palatalization prosody is not reconstructed. The Proto-Hurza root is reconstructed as *pats.

- (326) Mbuko pats
 Vame apas

The Proto-Mafa root is reconstructed as *pats.

- (327) Mafa pats
 Cuvok pas

The Proto-Maroua root is reconstructed as *pas.

- (328) Giziga N pas
 Mbazla pas

The Proto-Mofu root is reconstructed as *pats.

- (329) Ouldeme fat
 Muyang fat
 Moloko fat
 Zulgo pat
 Gemzek pat
 Merey həpat
 Dugwor pat
 Mofu N pas
 Mofu Gudur pas

The Proto-Musgum root is reconstructed as *futij.

- (330) Vulum futi:
 Mulwi futi:
 Mbara futaj
 Muskum fasa

The three Consonant Prosody groups and the three Mixed Prosody groups provide evidence for reconstructing *i. The palatalization prosody is absent from all except one of the Vowel Prosody groups, which is consistent with a reconstruction containing *i, and argues against reconstructing the palatalization prosody. The Proto-Central Chadic root is therefore reconstructed as *pitsi.

Consonant Prosody	Mixed Prosody	Vowel Prosody		Kotoko
Bata fiti Higi vitsi	Lamang fiti Sukur pis	Mofu pats Maroua pas	Daba pits ^y Mafa pats	K. South fatsa K. Centre
Margi pitsi	Mandara fatsi ^y	Hurza pats Tera fida	Musgum futij Gidar	K. North K. Island

Table 174 - Reflexes of Proto-Central Chadic 'sun'

12.2.2 *tira 'moon'

This root was reconstructed for Proto-Chadic as *təra (Newman 1977a). It is reconstructed for Proto-Central Chadic with *i as the first vowel. It is only present in about half of the groups of Central Chadic, but these groups cover both the North and South sub-branches.

In the Mixed Prosody and Consonant Prosody languages we expect to find a reflex of the front vowel *i in the data. This is indeed the case for Proto-Lamang, Proto-Mandara and Proto-Higi, though the Sukur data is difficult to interpret.

The Proto-Lamang root is reconstructed as *tila.

- (331) Lamang təre
 Hdi tili

The Proto-Mandara root is reconstructed as *tila.

- | | | | | |
|-------|---------|------|----------------------|---------|
| (332) | Dghwede | tile | /tili/ | |
| | Glavda | kʲla | /tɪla ^ʲ / | (tʲ→kʲ) |
| | Malgwa | təre | /təɾə/ | |
| | Mandara | təre | /təɾə/ | |
| | Podoko | təra | /təɾa/ | |

The Proto-Higi root is tentatively reconstructed as *tiri. (The lack of published phonologies for many languages in this difficult group makes understanding the vowel correspondences difficult.)

- | | | |
|-------|-------------|------|
| (333) | Psikye | trə |
| | Kamwe Nkafa | təɾə |
| | Kamwe-Futu | təɾo |
| | Kirya | təri |
| | Bana | tir |

The Sukur word is /tja/.

The root is present in two Kotoko groups. In both cases the front vowel /e/ is present in the reconstructed root.

The Proto-Kotoko Centre root is reconstructed as *tedĩ. The change *r→ɖ here and in Kotoko North is irregular. /l/ is expected.

- | | | |
|-------|--------|------|
| (334) | Lagwan | tedĩ |
| | Mser | tedĩ |

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

- | | | |
|-------|--------|------|
| (335) | Mpade | tedĩ |
| | Malgbe | tedĩ |
| | Afade | dedĩ |

In the Vowel Prosody languages, we expect *i to have merged with one of the other vowels. We do not normally expect to find the palatalization prosody. With this root, the palatalization prosody is only present in the Musgum group.

The Proto-Musgum root is reconstructed as *t̥ila^y.

- (336) Mbara /t̥ila^y/ tile
 Vulum /t̥ila^y/ tle
 Muskum /k̥ila^y/ kile

The Proto-Daba root is reconstructed as *tira.

- (337) Gavar ɲtra
 Buwal ɲt̥era
 Mbudum nt̥era
 Daba t̥era
 Mazagway Hidi t̥era

The Gidar word is t̥ila.

The Proto-Tera root is reconstructed as *tera.

- (338) Tera tera
 Nyimatli t̥jera
 Hwana ⁿd̥ere

From these groups, we can reconstruct the Proto-Central Chadic root as *tira, though the location of the *i in the root is not clear. *i appears in word-final position in Proto-Higi, probably as a result of a vocalisation change triggered by the loss of the final /a/. The absence of the palatalization prosody in most of the Vowel Prosody groups supports the reconstruction of *i rather than the palatalization prosody. The following table summarises the forms for the group proto-languages.

Consonant Prosody	Mixed Prosody	Vowel Prosody			Kotoko
Bata	Lamang t̥ila	Mofu	Daba t̥ira		K. South
Higi t̥iri	Sukur t̥ja	Maroua	Mafa		K. Centre ted̥i
Margi	Mandara t̥ila	Hurza	Musgum t̥ila ^y		K. North ted̥i
		Tera tera	Gidar t̥ila		K. Island

Table 175 - Reflexes of Proto-Central Chadic 'moon'

12.2.3 **vida* 'hare'

The Proto-Bata root is reconstructed as **vidi*.

- | | | |
|-------|--------|----------|
| (339) | Tsuvaṇ | viti-kən |
| | Jimi | vidə-n |

The Proto-Higi root is reconstructed as **vira*.

- | | | |
|-------|------------|-------------------------------------|
| (340) | Kirya | pitə (possibly borrowed from Margi) |
| | Kamwe-Futu | vira |
| | Bana | vəle |

The Proto-Margi root is reconstructed as **pita*.

- | | | |
|-------|---------|------|
| (341) | Kilba | pita |
| | Margi S | pitu |
| | Margi | pitə |
| | Bura | pti |

The Proto-Mandara root is reconstructed as **vida*.

- | | | |
|-------|---------|---------|
| (342) | Glavda | vi:da |
| | Podoko | vira |
| | Malgwa | navi:re |
| | Mandara | navire |

For the Lamang group we only have the root *vilak^w* for Hdi. The final /*k^w*/ is a petrified suffix in Lamang.

For Sukur we have the word [vil'a] /*vila*/.

This root is not attested in the Vowel Prosody languages or the Kotoko languages.

This gives the Proto-Central Chadic root **vida*.

Consonant Prosody		Mixed Prosody		Vowel Prosody		Kotoko
Bata	vidi	Lamang	vila	Mofu	Daba	K. South K. Centre K. North K. Island
Higi	vira	Sukur	vila	Maroua	Mafa	
Margi	pita	Mandara	vida	Hurza Tera	Musgum Gidar	

Table 176 - Reflexes of Proto-Central Chadic 'hare'

12.2.4 **ɪni* 'work'

The Proto-Bata root is reconstructed as **ɪni*.

- (343)
- | | |
|--------|----------|
| Bata | len-to |
| Gude | ɬənə |
| Tsuvan | ɬini-kən |
| Jimi | ɬinə-n |
| Sharwa | ɬən |

The Proto-Higi root is reconstructed as **ɪni*. As with the other Proto-Higi roots, it is difficult to determine the position of the vowel **i* in the reconstruction.

- (344)
- | | |
|-------------|------|
| Psikye | ɬənə |
| Bana | ɬəni |
| Kirya | ɬənə |
| Kamwe-Nkafa | ɬənə |
| Kamwe-Futu | ɬinə |

The Proto-Margi root is reconstructed as **ɪr*. The proto-language of the Margi, Mandara and Mofu groups underwent **n*→*r* in word-final position, though changes in the placement of the vowels has resulted in **r* appearing in medial position at later points in the history of the word.

- (345)
- | | |
|-------|--------|
| Margi | ɬər |
| Kilba | ɬəra |
| Bura | ki-ɬir |

The Proto-Mandara root is reconstructed as *ɬiri.

- (346)
- | | |
|---------|------|
| Glavda | ɬəra |
| Malgwa | ɬəra |
| Dghwede | ɬəra |
| Podoko | ɬəri |

In the Lamang group we only have the Hdi ɬəna. For Sukur we have ɬən. For Tera we have ɬəna.

In the Vowel Prosody languages we do not normally expect to find a reflex of *i, either as a front vowel or as front vowel harmony. This is the case with the Daba group, but unusually there is a front vowel in Giziga Marva in the Maroua group. In the Mofu group there is evidence of the palatalization prosody, but with most languages the form given is a nominalisation of the verb ‘to work’ and the palatalization prosody is part of the nominalisation morpheme. For this reason, the palatalization prosody is not reconstructed for Proto-Mofu.

The Proto-Daba root is reconstructed as *ɬin. The low vowel in Buwal is a pre-pausal form of /ə/ (see section 5.3.2).

- (347)
- | | |
|-------|-----|
| Buwal | ɬan |
| Gavar | ɬən |

The Proto-Maroua root is reconstructed as *ɬira. The Giziga Marva root is unusual in that we expect to find vowel harmony in the Maroua group languages. In both roots we would expect the final *n to be preserved. The /r/ indicates that the root is likely to have been borrowed from the Mofu group.

- (348)
- | | |
|------------------|------|
| Giziga Marva | ɬira |
| Giziga Moutourwa | ɬra |

The Proto-Mofu root is *ɬir.

- (349)
- | | | |
|------------|-------------------------|--------|
| Ouldeme | /aɬər/ | aɬər |
| Moloko | /ɬərala ^y / | ɬərele |
| Gemzek | /mə-ɬar ^{-y} / | məɬər |
| Merey | /mə-ɬar ^{-y} / | məɬər |
| Dugwor | /mə-ɬar ^{-y} / | məɬər |
| Mofu-Gudur | /ɬəra/ | ɬəra |

The Proto-Central Chadic root is reconstructed as *ɬini.

Consonant Prosody	Mixed Prosody	Vowel Prosody		Kotoko
Bata ɬini	Lamang ɬina	Mofu ɬir	Daba ɬin	K. South
Higi ɬini	Sukur ɬin	Maroua ɬira	Mafa	K. Centre
Margi ɬir	Mandara ɬiri	Hurza ɬina	Musgum	K. North
		Tera ɬina	Gidar	K. Island

Table 177 - Reflexes of Proto-Central Chadic 'work'

Evidence for reconstructing *i in this root is found in five of the six Consonant Prosody and Mixed Prosody groups. As expected, it is absent from the Vowel Prosody groups and there is no vowel harmony.

12.2.5 Other roots

Here we present summary data for the reconstruction of a number of other roots containing *i. To establish the presence of *i we are looking for the appropriate vowel (mostly front vowels) in the three-vowel languages (the Consonant Prosody and Mixed Prosody languages), and for the absence of the palatalization prosody in the Vowel Prosody languages.

(350) *vid 'night'

Consonant Prosody	Mixed Prosody	Vowel Prosody		Kotoko
Bata vidɪ	Lamang rɪvidɪ	Mofu hɪvid	Daba vidɪ? ^w	K. South livin
Higi vid	Sukur vid	Maroua avid ^w	Mafa vad, livan	K. Centre nvade
Margi v ^w ɪdɪ	Mandara vidɪ	Hurza luvad	Musgum dɪvid ^y	K. North fade
		Tera vidki	Gidar dɪdɪ	K. Island

Newman's Proto-Chadic reconstruction for 'night' is *bædɪ. There was a regular change *b→v in Proto-Central Chadic.

(351) *hikin 'three'

Consonant Prosody	Mixed Prosody	Vowel Prosody	
Bata mahikin Higi maxkin	Lamang hikina Sukur maakin	Mofu mahkir Maroua makir, maakan	Daba mahkad Mafa mahkar
Margi maakir	Mandara hkiɗe	Hurza maakan Tera mahkan	Musgum Gidar

This root is absent in the Kotoko languages. Most languages have prefixed /ma-/ to the root. In many languages the initial *h has been lost, often resulting in compensatory lengthening of the preceding /a/. Newman's Proto-Chadic reconstruction is *k^(w)ən.

(352) *siwiɓ^y 'to suck'

Consonant Prosody	Mixed Prosody	Vowel Prosody		Kotoko
Bata siɓ ^y	Lamang bisaj	Mofu siwiɓ	Daba saɓ ^y	K. South
Higi biɓi, s'iɓi	Sukur	Maroua suɓi	Mafa sasiɓ ^w	K. s'afi
Margi siɓi ^y	Mandara busa ^y	Hurza susaɓ ^y	Musgum susuɓi ^y	K. s'afu
		Tera	Gidar issiɓa ^w	K. tsetsabu
				Island

This root is reconstructed with both *i and the palatalization prosody.

Evidence for the palatalization prosody comes from its reconstruction in the Vowel Prosody groups Daba, Hurza and Musgum, and in the Bata, Margi and Mandara groups. Evidence for *i comes from the Bata, Higi, Margi and Lamang groups, and possibly from the Maroua group, though *i is unexpected here.

(353) *sih^wani^y 'a dream'

Consonant Prosody		Mixed Prosody	
Bata	si ^y ni ^y	Lamang	siwani
Higi	s ^j iwin	Sukur	
Margi	si ^h w ^w ini ^y	Mandara	sih ^w ani ^y

Vowel Prosody				Kotoko	
Mofu	siwna ^y	Daba	si ^y ni ^y	K. South	
Maroua	mi ^y sin ^y	Mafa	siwina ^y	K. Centre	siwane
Hurza	siwna ^y	Musgum	hi ^y jni ^y	K. North	saware
Tera	zine	Gidar	issina ^y	K. Island	

This root is complex, in that it contains *i, the palatalization prosody, and a labialized consonant. The evolution of the forms can be seen in the genetic tree in Figure 2 below.

The first changes to the root take place at the Major Group level. In Proto-Higi-Lamang, the palatalization prosody is realised as palatalization on the *s. In Proto-Mafa-Daba, which does not have *i in its inventory, the *i has merged with *a. The same process has taken place at the group level in Proto-Mofu, and *i has merged with *i in Proto-Musgum.

In many major groups, *h^w has the reflex *w, and in others it has the reflex *h. In some groups the phoneme has been lost completely.

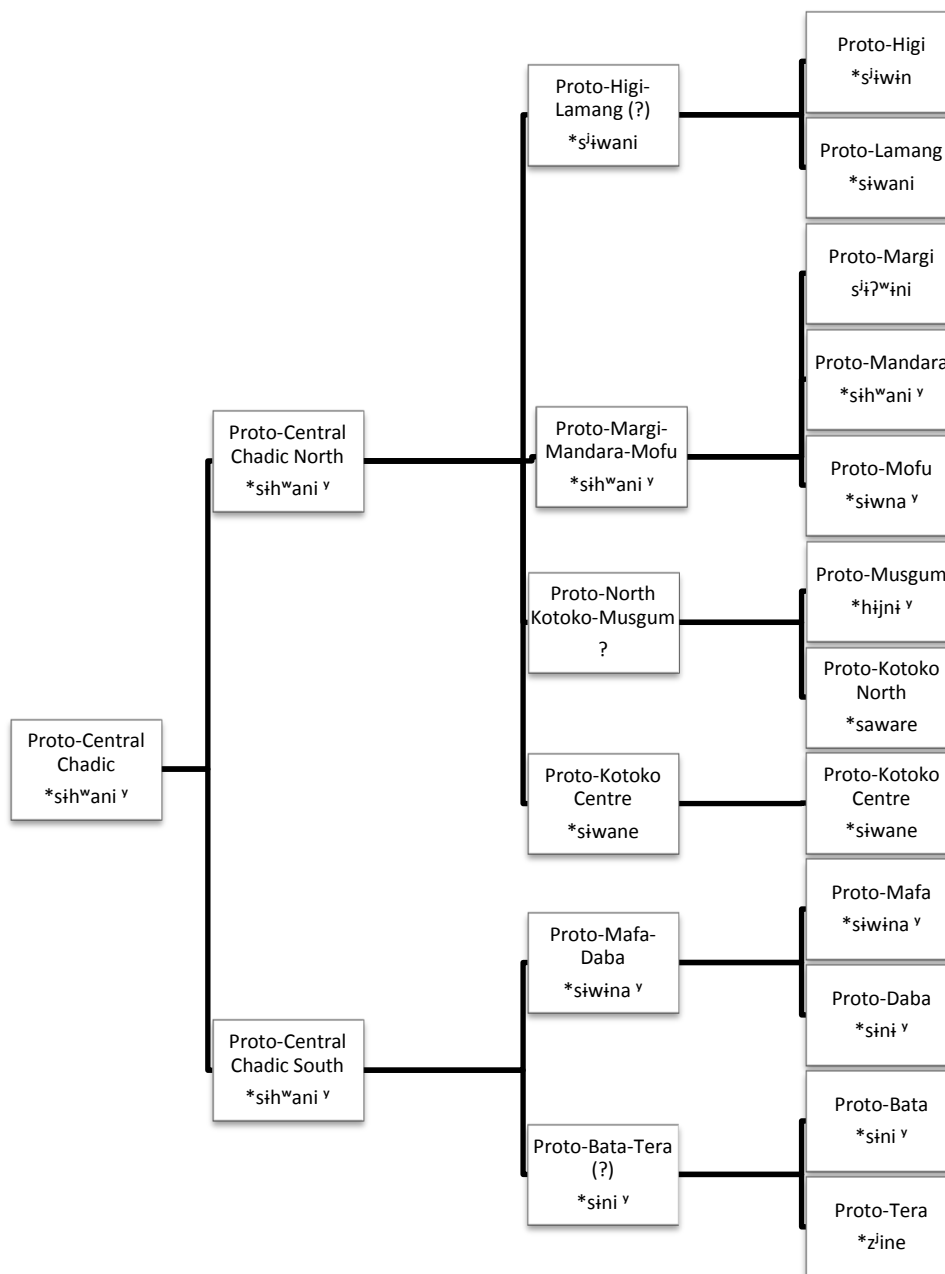


Figure 2 - Evolution of 'dream'

(354) *kiri 'dog'

Consonant Prosody	Mixed Prosody	Vowel Prosody		Kotoko
Bata	Lamang kiri	Mofu kira	Daba	K. South
Higi kili	Sukur kira	Maroua kiri ^y	Mafa kida	K. Centre kile
Margi kila	Mandara kida	Hurza kila	Musgum	K. North kilew
		Tera	Gidar kira	K. Island kili

The root for 'dog' has probably come into most Central Chadic languages from Kanuri *kəri*, or from an earlier Nilo-Saharan source. It is instructive to note how the /i/ has been incorporated as *i, showing that this phoneme was in existence at the time of borrowing.

(355) *tip 'to spit'

Consonant Prosody	Mixed Prosody	Vowel Prosody		Kotoko
Bata tif	Lamang tif	Mofu tif	Daba tif ^y	K. South
Higi tifi	Sukur tifa	Maroua tif ^w	Mafa ⁿ dzif ^y	K. Centre tif
Margi tifa	Mandara tifa	Hurza tifa	Musgum tif ^w	K. North tafi
		Tera	Gidar	K. Island

The front vowel in this root is supported by evidence from the Bata, Higi, Margi, Sukur and Mandara groups. The palatalization prosody is present in the Mafa and Daba group reconstructions, which is not to be expected.

(356) *h^wid 'stomach'

Consonant Prosody	Mixed Prosody	Vowel Prosody	
Bata	Lamang h ^w id ^f	Mofu h ^w id ^f	Daba
Higi h ^w ir	Sukur h ^w id ^f	Maroua wiri ^w	Mafa h ^w ad ^f
Margi	Mandara h ^w id ^e	Hurza	Musgum war
		Tera h ^w ira	Gidar

Here support for *i comes from Proto-Higi in the Consonant Prosody languages, and from the final vowel in Proto-Lamang and Proto-Mandara. The

reconstruction for Proto-Tera comes from a single language, but supports this reconstruction. As expected, the palatalization prosody has not been reconstructed for any of the Vowel Prosody languages. The root is absent from the Kotoko languages.

(357) *hadik ‘thorn’

Consonant Prosody	Mixed Prosody	Vowel Prosody		Kotoko
Bata dihi	Lamang tiki	Mofu hadak	Daba	K. South
Higi tiki	Sukur dzik ^y	Maroua	Mafa hitak	K. Centre
Margi	Mandara adaki	Hurza adak	Musgum hadak ^y	K. North
		Tera ⁿ deki	Gidar	K. Island

Evidence for *i comes from the Bata, Higi, Lamang and Mandara groups, and possibly from the Tera and Sukur groups. Only one of the Vowel Prosody languages has the palatalization prosody.

(358) *piri ‘butterfly’

Consonant Prosody	Mixed Prosody	Vowel Prosody		Kotoko
Bata piri	Lamang	Mofu pila	Daba pula	K. South
Higi pili	Sukur pir	Maroua pila	Mafa	K. Centre
Margi pir	Mandara pala	Hurza pala ^y , pira	Musgum	K. North
		Tera pir	Gidar pala ^w	K. Island

12.3 Reconstructing *a

*a is largely stable and has /a/ as its reflex in most groups. Reconstruction of *a is justified where most group proto-languages have /a/ in the relevant position, with representation from both the North and South sub-branches.

(359) *dzavɪn ‘guinea fowl’

Group	Root	Group	Root	Group	Root
Bata	zav ^w ɪn	Margi	tsivir	Kotoko Island	
Daba	zavɪn	Mandara	zabira ^y	Kotoko North	tsafan
Mafa	zapan	Mofu	dzavir	Kotoko Centre	zavan
Tera	tsivan	Maroua	tsivɪn ^w	Kotoko South	dzavaŋ
Sukur	zabɪn	Lamang	zivɪn	Musgum	tšaavan ^y
Hurza	zavɪn	Higi	zivɪn	Gidar	zamvɪna

For this root, twelve of the eighteen groups have /a/ as the first vowel.

(360) *dɪwah 'breast, milk'

Group	Root	Group	Root	Group	Root
Bata	ɪ ^w a	Margi	ɪiwa	Kotoko Island	
Daba	ɪ ^w a	Mandara	wiɓa	Kotoko North	eɪ ^w i
Mafa	wa	Mofu	dɪwah	Kotoko Centre	iwi
Tera	ɓiɓi	Maroua	dɪwa	Kotoko South	
Sukur	ɪ ^w a	Lamang	dɪwa	Musgum	
Hurza		Higi	ɪ ^w a	Gidar	

In this root the initial *d has been lost in many groups, often becoming /ɪ/. This has combined with the *w, forming either /ɪ^w/ or fusing to become /ɓ/. All groups except for Kotoko North and Centre have /a/ as the final vowel.

(361) *vija 'rainy season'

Group	Root	Group	Root	Group	Root
Bata	va ^y	Margi	vija	Kotoko Island	
Daba	vija	Mandara	vija	Kotoko North	
Mafa	vija	Mofu	vija	Kotoko Centre	
Tera		Maroua	vija	Kotoko South	
Sukur	vi	Lamang	vija	Musgum	pija
Hurza	vija	Higi	vija	Gidar	

In this extremely stable root with mostly regular reflexes, the final vowel is almost consistently /a/.

(362) *siwra 'to fry'

Group	Root	Group	Root	Group	Root
Bata	siri	Margi	sula	Kotoko Island	
Daba	sar	Mandara	sula	Kotoko North	sɪl
Mafa	sara	Mofu	sawla	Kotoko Centre	
Tera	zur	Maroua	sula	Kotoko South	
Sukur	siwra	Lamang	sula	Musgum	sisal
Hurza	siwla	Higi	sɪli	Gidar	

In several groups the *w has been reanalysed as a vowel, or lost completely. In the groups of Central Chadic North there was a consistent change *r→l.

12.4 Reconstructing *i

*i is the most common of the three vowels. *i is chosen for the proto-phoneme, rather than *ə, for two reasons. Firstly, [i] is the most common realisation of the vowel in the different languages. Secondly, there are some languages where [ə] is the reflex of *i, and to use *ə would risk being confusing.

In many individual languages this vowel is analysed as being epenthetic, and not having phonemic status. This is primarily due to the fact that its presence is predictable in these languages, in other words, that it doesn't contrast with its absence. However, for Proto-Central Chadic we analyse *ɪ as a full vowel phoneme, based on the following arguments.

For Proto-Central Chadic, from the reconstructed roots we can see that words are made up almost entirely of CV syllables. Words do not begin with a vowel, so there is no possibility of establishing a contrast between the presence and absence of *ɪ in this environment. Word-medially there are only six CC sequences recorded – *markɪd^ɣ 'six', *mbɪwran 'tamarind', *ŋg^wɪrhak 'crow', *siwra 'to fry', *siwra 'two', *zirwa^ɣ 'shame' – all either /wr/ or /rC/, which are natural environments for *ɪ-deletion. There is no contrast between *ɪ and zero in this environment either. Only in word-final position is there a possibility of finding such a contrast. Many of the reconstructed words end with a consonant, but there are also a small number of words that have been reconstructed with a final vowel and in some cases that vowel is most probably *ɪ. This presents the possibility of contrast between *ɪ and zero, though it may equally turn out that these final *ɪ vowels disappear as the quality of the data improves. With things as they stand, it is more consistent with the data to analyse *ɪ as a phoneme rather than as an epenthetic vowel.

However *ɪ is treated, the essentially CV nature of Proto-Central Chadic syllables indicates that there is a vowel slot following each consonant in the underlying form. The structural requirement for these slots to be filled has resulted in a strong tendency for Central Chadic vowels to move between slots diachronically, or for these vowel slots to be filled from sources such as the labialization of consonants. It is rare for a vowel slot to be left unfilled. It is also noticeable that it is rare for the approximants *w and *j to be vocalised, both historically and also in the morphophonemics of present-day languages. This is indicative of the strength of the CV structure.

This gives two viable analyses. The first is to reconstruct *ɪ as a phoneme. The second is to reconstruct vowel slots following each consonant, some of which may be empty at an underlying level and are filled by [ɪ]. The two analyses are essentially equivalent. Whether *ɪ is analysed as a phoneme or as an epenthetic vowel, the existence of these vowel slots must be maintained in the reconstructed forms.

The following examples are given as evidence for the reconstruction of *i for Proto-Central Chadic. There are, of course, many instances of *i in the reconstructions given in the evidence for *a and *i.

(363) *kir 'to steal'

Group	Root	Group	Root	Group	Root
Bata	hir	Margi	hila	Kotoko Island	
Daba	hil	Mandara	ɣil	Kotoko North	hir
Mafa	kir	Mofu	kil	Kotoko Centre	ɣ ^w ij
Tera		Maroua	h ^w il	Kotoko South	hila
Sukur	kir	Lamang	ɣila	Musgum	hil
Hurza	kira	Higi	ɣili	Gidar	ihala

(364) *mits 'to die'

Group	Root	Group	Root	Group	Root
Bata	mit	Margi	mita	Kotoko Island	mati
Daba	mits	Mandara	mitsa	Kotoko North	madi
Mafa	mitsa	Mofu	mit	Kotoko Centre	mit
Tera	mit	Maroua	muta	Kotoko South	mara
Sukur	ɲ ^w is	Lamang	mita	Musgum	midɪ ^y
Hurza	mits	Higi	miti	Gidar	imta

(365) *kidim 'crocodile'

Group	Root	Group	Root	Group	Root
Bata	kirim	Margi	karam, him	Kotoko Island	
Daba		Mandara	kirwi ^y	Kotoko North	
Mafa	kirdam, gidam	Mofu	kirim, gidam	Kotoko Centre	
Tera		Maroua	hirim ^w	Kotoko South	
Sukur	kilim	Lamang	kiram	Musgum	hirim ^w
Hurza	gidam	Higi	kilim	Gidar	

(366) *ɣin 'head'

Group	Root	Group	Root	Group	Root
Bata	ɣini	Margi	kir	Kotoko Island	
Daba		Mandara	ɣira	Kotoko North	
Mafa	jaŋ, gid	Mofu	ɣir	Kotoko Centre	
Tera		Maroua	jiŋ, hir	Kotoko South	
Sukur		Lamang	ɣiŋ	Musgum	
Hurza		Higi	ɣin	Gidar	

12.5 Distribution

There are no roots reconstructed with word-initial vowels, and word-final vowels are rare. *a occurs in word-final position in a number of roots. *i and *ɪ also occur in word-final position, but less frequently. All vowels are found word-medially.

*ɪ is the most common of the vowels (64%), followed by *a (27%) and *i (9%).

12.6 Conclusion

One of the key conclusions of this study is that the vowel system is made up of three vowels *a, *i and *ɪ. There is no contrast in length. This is in contrast with the two vowel system (/a/ and /ə/) proposed for many Central Chadic languages and for Proto-Central Chadic (Barreteau 1987b; Wolff 1983a), and the four vowel system (/i/, /a/, /u/ and /ə/) proposed for Proto-Chadic (Newman 1977b).