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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4 Studies on Central Chadic Phonology

In this section we will be looking at how knowledge about the phonology of Central Chadic languages has developed in the academic world. First we will look at the main issues that have been addressed, and then we will review the main publications on Central Chadic languages, as well as general works on Chadic that cover Central Chadic historical linguistics and phonology.

4.1 Linguistic Issues

There are a number of linguistic issues that are important to the research on Central Chadic languages. These include questions about the existence and behaviour of 'prosodies', questions about the number of underlying vowels, questions as to the status of schwa as a full or epenthetic vowel, questions about the existence and analysis of palatalized and labialized consonants, and questions about the analysis of pre-nasalized consonants. A brief summary of the research on these issues will be presented in the following sections.

4.1.1 Prosodies

Many branches of linguistics have adopted their own terminology, and Chadic studies is no exception. The term 'prosody' has come to be used to refer to a phonemic unit affecting a syllable, morpheme or word that causes phenomena such as the fronting of vowels or the labialization of consonants. The term was first used in this way by Mohrlang in his analysis of Higi 'Vectors, Prosodies, and Higi Vowels' (Mohrlang 1971).

The most common prosodies in the literature are the palatalization prosody (often denoted as PAL) and the labialization prosody (LAB). Some have also included a pre-nasalization prosody, though this analysis no longer receives any support.

In this study we will be distinguishing between prosodies (which are phonemic units), and their effects (such as vowel harmony or the modification of consonants).

4.1.2 How Many Underlying Vowels?

Many Central Chadic languages have a large variety of surface vowels, which can be analysed as being the result of combinations of a small number of underlying vowels and prosodies. Early studies tended to propose too many

underlying vowels, with later studies reducing the number. In one analysis, it was shown to be theoretically possible to reduce the number of underlying vowels to zero, and to predict the surface vowels just from the consonants, prosodies and tone (Barreteau 1988).

4.1.3 The Status of Schwa

One issue in the study of individual languages is the status of schwa. In many languages schwa has been analysed as an epenthetic vowel (e.g. Mofu (Barreteau 1988), Buwal (Viljoen 2009)), i.e. a vowel that is not present in the underlying form. In other studies it is treated as a full vowel (e.g. Bana (Hoffman 1990), Mbuko (T. Smith and Gravina 2010)).

The analysis of the status of schwa is problematic at the level of an individual language, and is much more so when attempting to reconstruct vowels for an historic language. It is also a subject about which linguistic theory has much to say, and to address the theoretical issues in a deep way is beyond the scope of this study. However, a brief word is necessary.

There are three types of vowel that are referred to as epenthetic, differentiated according to whether they are phonetic, phonological or lexical. A phonetically epenthetic vowel, or intrusive vowel, is simply a sound introduced to make an unpronounceable sequence pronounceable.

A phonologically epenthetic vowel is one that does not appear in the underlying form of a morpheme, but is inserted to satisfy phonological criteria, such as syllabification rules, and is then subject to phonological processes such as vowel harmony or conditioning by adjacent consonants.

A lexically epenthetic vowel, or zero vowel, is one that exists in the underlying form of a morpheme, but which is not realised phonetically in all environments. In other words, it is present structurally but not necessarily phonetically. This zero vowel can be treated as a phoneme.

All three types of epenthetic vowel exist in Central Chadic languages.

In this study we shall take a practical approach. We shall be talking a lot about the historic changes in the realisation of schwa, its behaviour under the influence of vowel harmony or local conditioning, and about whether it can be reconstructed for the different ancestor languages. For ease of notation and clarity of description, we shall refer to schwa almost always as a phoneme.

However, this does not imply that we are taking a particular position concerning its epenthetic status.

There will be further discussion of the status of schwa in Proto-Central Chadic in section 12.4.

4.1.4 Palatalized and Labialized Consonants

Palatalized and labialized consonants have been analysed in a number of different ways. In some analyses they are treated as phonemes. However they have also been analysed as the result of the effect of prosodies, either acting at the morpheme/word level or else at the syllable level.

There were some attempts to transfer a successful analysis from one language to another, not closely-related language. However it has become apparent that the relationship between palatalized and labialized consonants and the prosodies differs substantially across the Central Chadic languages. This relationship will be the subject of the bulk of the rest of this study.

4.1.5 Pre-nasalized Consonants

Pre-nasalized consonants have also been the subject of varied analyses. The number of NC sequences treated as phonemes has varied, with some analyses allowing for syllabic nasals, and others treating almost all such sequences as single phonemes. In some cases the presence of the pre-nasalization component has been attributed to the effect of a pre-nasalization prosody, though this analysis is no longer used. None of the analyses treat these systematically as CC sequences.

More recent analyses have typically settled on five pre-nasalized phonemes: /^{m}b/, /^{n}d/, /^{n}dz/, /^{ŋ}g/ and /^{ŋ}g^{w}/.

4.2 Literature Review

This section presents an historical view of the advances made in the study of Central Chadic languages, in particular focussing on the developments made in the understanding of Central Chadic phonologies. We will be looking at the major publications in chronological order.

4.2.1 A Grammar of the Margi Language (Hoffmann 1963)

This grammar by Carl Hoffmann represents the first formal description of a Central Chadic language. The second and third reference grammars of Central

Chadic languages did not appear until twenty years later (Wolff 1983b; Hoskison 1983).

In terms of the phonology, Margi excited interest due to the inclusion of a set of labio-coronal consonants in the phonemic inventory (e.g. /p͡t̪/). Also of note was the large number of palatalized and labialized consonants and a huge wealth of pre-nasalized consonants. Hoffmann's analysis found six phonemic vowels and 96 phonemic consonants, though he added that there may be more for which he did not yet have data!

This unusual situation provoked further analysis of the data by other linguists (Schuh 1971; Maddieson 1987). Maddieson's analysis reduced Hoffmann's six vowel inventory to just two (/a/ and /ə/), and allowed phonemic palatalized and labialized consonants and homorganic voiced pre-nasalized consonants, but treated the other pre-nasalized consonants and the labio-coronal consonants as CC sequences, thus removing them from the inventory.

4.2.2 Higi Phonology (Mohrlang 1972)

Mohrlang's phonology of Higi builds on an earlier analysis presented as a conference paper by Hoffmann (Hoffmann 1965), and on his own paper 'Vectors, Prosodies, and Higi Vowels' (Mohrlang 1971), the first published work to make use of the notion of prosodies in the analysis of a Central Chadic language. Mohrlang includes three prosodies in his analysis: labialization, palatalization and pre-nasalization. He used the analysis to explain labialized consonants, palatalized consonants, pre-nasalized consonants and labio-coronal combinations as the result of the application of these prosodies. Thus sequences such as [pt] and [mt] are analysed as /^{w}t/ and /^{nw}t/ respectively, with the superscript ^{w} and ^{n} representing the labialization and pre-nasalization prosodies. These prosodies affect syllables rather than entire morphemes. The way that the prosody is expressed depends on the type of the consonant.

(77)	/xa ^{w}/	[x^{w}a]	'bench'
	/ta ^{w}/	[pta]	'leather skin'
	/ʃa ^{w}/	[^{w}ʃa]	'things'
	/ne ^{w}/	[^{m}nɛ]	'salt'
	/ta ^{y}/	[t^{j}a]	'sweet beer'
	/me ^{y}/	[m^{j}ɛ]	'ladies'
	/dza ^{n}/	[^{n}dza]	'to sit'
	/tse ^{n}/	[^{n}tsɛ]	'eye'

For the vowel system, he proposes four phonemic vowels in word-final position: /i/, /e/, /ɛ/, /a/, reduced to three in word-medial position. He also raises the thorny question of the treatment of schwa. He posits the existence of a phonemic schwa vowel in word-medial position, which reduces to a transition break or zero in certain environments.

The use of prosodies in the analysis was proposed in order to simplify the consonantal system. A straight segmental analysis would have had to include large sets of pre-nasalized, palatalized and labialized consonants. Analysing individual syllables as carrying combinations of prosodies vastly reduced the number of phonemes required.

However the syllable-prosody analysis was disadvantageous in that it obscured many of the phonological processes in the language. This approach was only attempted on two further occasions, in the analysis of Zulgo (Haller 1980) and Bana (Hoffman 1990). Only in the case of Bana, where palatalization was analysed as a syllable-level prosody, did the analysis appear at all productive (see section 6.5.1).

4.2.3 Notes on the Phonology of Gude (Hoskison 1975)

Gude is a language of the Bata group spoken on both sides of the Cameroon-Nigeria border. Hoskison's MA thesis built on his earlier paper 'Prosodies and Verb Stems in Gude' (Hoskison 1974) and was later incorporated into his doctoral dissertation 'A Grammar and Dictionary of the Gude Language' (Hoskison 1983).

In contrast to Mohrlang's analysis of the typologically related Higi (Mohrlang 1972), Hoskison treated palatalization and labialization as features of consonants in Gude, present as such in the underlying representation. He describes 56 phonemic consonants in total, 23 'plain' consonants, 11 labio-velarised consonants (all of which are modifications of labial or velar consonants) and 22 palatalized consonants.

Hoskison noted that phonetically pre-nasalized consonants were of two types: those consisting of a voiced stop preceded by a homorganic nasal; and those where the non-nasal component was either voiceless or a fricative, or else the nasal was not homorganic. Rather than analysing these situations differently (as the situation merits), Hoskison chose to treat them all as tautosyllabic NC sequences.

For the vowels, Hoskison posits four phonemes: /ɨ/, /a/, /ɨː/, /aː/. These phonemes are conditioned by adjacent labialized and palatalized consonants to produce a variety of surface vowels.

Of particular interest is the palatalization strategy adopted by Gude for marking motion-to-speaker on verbs. Motion-to-speaker is marked by the fronting of the final vowel, and also the palatalization of one or more consonants of the root. The consonants to be palatalized are chosen according to a hierarchy, where the sibilants, /ɗ/ and /n/ are chosen first, but when absent the palatalization falls on other coronal consonants, or if they are absent then on non-coronal consonants. This is the first recorded instance of palatalization functioning as a morphological feature.

4.2.4 Daba (parler de Pologozom): Description phonologique (Lienhard and Giger 1975)

Lienhard and Giger's phonology is of note as probably the first description of vowel harmony in a Central Chadic language. The terminology of prosodies is used, with morphemes able to carry either the palatalization prosody, the labialization prosody or no prosody. The prosodies cause the fronting or back-rounding of vowels, but do not affect the consonants.

A single morpheme cannot carry both palatalization and labialization prosodies. However prosodies can spread from roots to affixes and vice versa, which can result in a word that carries both prosodies. For instance, if the root carries the labialization prosody and the affix carries the palatalization prosody, both prosodies will spread across the word, and the word will carry both the palatalization and the labialization prosodies.

Amongst the consonant phonemes they included a set of pre-nasalized voiced stops.

Only two underlying vowels are proposed: /ə/and /a/. /ə/ is treated as a phoneme, though one which may be deleted in certain environments (e.g. following /r/ in a medial syllable).

4.2.5 Y-prosody as a morphological process in Ga'anda (Ma Newman 1977)

Ma Newman describes processes occurring in Ga'anda that make use of the palatalization prosody. Two processes are described, one for creating the noun

stem used with certain affixes and the other affecting the verb stem in various inflected forms.

Nouns belong to one of two classes, the T class or the Y class. With Y class nouns, the stem is palatalized for singular nouns followed by a determiner. Any central vowels in the stem are fronted, but front and back vowels are unaffected. The consonant /s/ becomes /ʃ/ and /ŋ/ becomes /j/.

(78)	ʔal-tsa	'bones'	ʔel-a	'a bone'
	naf-tsa	'people'	nef-a	'a person'
	ɓəɓ-tsa	'breasts'	ɓiɓ-a	'a breast'
	ɬəm-tsa	'names'	ɬim-a	'a name'
	ʃemeɗ-tsa	'spirits'	ʃemeɗ-a	'a spirit'
	kutər-tsa	'chiefs'	kutir-a	'a chief'
	wassan-tsa	'squirrels'	weʃʃen-a	'a squirrel'
	xəraŋ-tsa	'noses'	xirej-a	'a nose'

Verbs are palatalized in the second and third persons singular. The palatalization follows the same rules as for nouns.

(79)	kar-	ə ker-ən	'you (s) refused'
	fəɗ-	ə fiɗ-ən ɬi^{m}bira	'you (s) beat a drum'
	taxs-	kə texʃ-ən	'you (s) should prepare'

For the nouns, the palatalization prosody is said to originate in a now-defunct nominal class marker. Following on from Gude, this is the second language in which there is published evidence for the palatalization prosody acting as a morphological process.

4.2.6 The Phonology of Dghwede (Frick 1977)

In this paper, which is only the fifth published work on phonology in Central Chadic, Frick describes Dghwede, a language of the Mandara group. Amongst the consonants she includes a set of pre-nasalized voiced stops and a set of labialized velar consonants. There are three vowel phonemes /i/, /a/ and /u/, plus the schwa vowel, described as a 'transition' rather than as a phoneme.

Frick finds no vowel harmony in Dghwede. The vowel /i/ causes a preceding alveolar sibilant to be realised as an alveolo-palatal sibilant. The notion of prosody is not used in the analysis, nor is it required to explain the data.

4.2.7 Reconstructing Vowels in Central Chadic (Wolff 1983a)

In this paper, Wolff addresses the task of reconstructing the vowels in Central Chadic, which he describes as 'one of the most difficult and challenging tasks of Chadic comparative linguistics'.

Following work done on individual languages which introduced the concept of 'prosodies' into Central Chadic phonology (Mohrlang 1971; Ma Newman 1977), Wolff included prosodies in his analysis as phonological units distinct from vowels or consonants. He posited two prosodies, palatalization and labialization, which work along with two underlying vowels *ə and *a to create the ranges of surface vowels found in individual languages.

He showed for languages of the Mandara and Lamang groups that any conventional search for vowel correspondences using a straightforward application of the comparative method would fail to yield 'satisfactory results'. The following table (from Wolff), shows the considerable variation in the surface vowels for two roots.

Language	'nose'	'ear'
Dghwede	xtire	ɬeme
Glavda	xtɨra	hʲimia
Gvoko	xtor	ɬuwo
Guduf	xtere	ɬime
Lamang	xtsini	ɬəməŋi
Podoko	ftra	ɬama
Mandara	əktare	ɬəma

Table 15 - Comparing vowels in the Lamang and Mandara groups

Wolff presented four hypotheses which together account for the vowel system of Proto-Wandala-Lamang (the ancestor of a group of languages corresponding to Newman's Mandara group, but not considered to be a single group in Gravina (2007a)). In the first hypothesis he proposed a single underlying vowel phoneme *a and an epenthetic vowel, which worked alongside the approximants *j and *w to produce the system of six surface vowels. The second proposed a distinction between a-vocalised and zero-vocalised roots, based on the presence or absence of *a before the final consonant of the root. The third stated that many lexical items were formed from a base plus petrified affixes, some of which were labio-velar consonants and gave rise to rounded vowels. (He expanded on this concept later (Wolff 2006), see section 4.2.11.) The fourth hypothesis was that there was some form of marking in the nominal

system of the ancestor language which contained a palatal or palatalized segment. This segment became an integral part of the nominal system of the daughter languages and was manifested in the form of a palatalization prosody.

The result of this analysis is that, in comparing Central Chadic languages, it is important to focus on the presence of approximants, labio-velar consonants and palatalization more than on the quality of individual vowels. This is probably the most important paper that has been written on the subject of Central Chadic phonology. Most of Wolff's ideas will feature in the rest of this study: The relationship between labio-velar consonants and rounded vowels will be discussed in section 11.3 and the role of palatalization will be discussed in section 11.2, though both will feature all the way through the study. There is a difference in the analysis of the underlying vowel system. Where Wolff had a two-way distinction between *a and schwa/zero, here I will give evidence for a three-way distinction between *a, *i and schwa/zero.

4.2.8 A grammar of the Lamang language: gwàd làmàn (Wolff 1983b)

In terms of its grammar, Lamang is amongst the most complex of the Central Chadic languages, and its phonology likewise presents difficulties. This is in part due to the fact the Lamang has neither a neat system of vowel harmony, such as found in Daba, nor a clear system of consonant prosodies as found in Gude. We will be including Lamang amongst the Mixed Prosody languages (see chapter 7), a set of languages located between and to the north of the vowel prosody and consonant prosody areas.

Wolff analyses Lamang as having a set of labialized consonants, but no palatalized consonants. He also includes a set of pre-nasalized voiced stops in the phonemic inventory.

Two possible analyses are given for the vowel system. In one there are four vowel phonemes, /i/, /a/, /u/ and /ə/. Under this analysis /ə/ is accorded phonemic status. In the other, [ə] is treated as epenthetic rather than phonemic, and a diphthong is added to the inventory, notated as /aY/, with allophones [e] and [o].

4.2.9 Du vocalisme en tchadique (Barreteau 1987b)

In this paper, Barreteau notes the extreme level of variation in the vowel systems of Central Chadic languages, and also the wide variety of methods used to analyse them. He states that only three features are needed for the analysis of the vowel systems of the Cameroonian Central Chadic languages: A segmental feature 'laxness' (French 'relâchement') and two prosodies, palatalization and labialization.

The lax (i.e. [+lax]) vowels are short, high and often interpreted as epenthetic. The tense vowels ([-lax]) are longer, low and more stable. In other words this feature corresponds to a distinction between two degrees of openness, or, more essentially, differentiates /ə/ and /a/. The palatalization prosody causes the fronting of vowels, and the labialization prosody causes the rounding of vowels.

Barreteau identifies seven different phonological systems amongst the Central Chadic languages of Cameroon. These differ in whether there is a [lax] feature, whether there is a palatalization prosody, whether there is a labialization prosody, whether the labialization prosody can co-occur with the palatalization prosody, and in how much the lax vowel is affected by the prosodies.

For example, the most complex system (attributed to Mafa, Zulgo, Daba and Gidar) is analysed as follows:

	+PAL		-PAL	
	-LAB	+LAB	-LAB	+LAB
+lax	i	y	ə	u
-lax	e	œ	a	o

A less complex system without the labialization prosody is found in languages such as Mofu-Gudur. Here the vowels are distinguished only by the features [lax] and [PAL].

	+PAL	-PAL
+lax	i	ə
-lax	e	a

Barreteau goes on to propose that the [±lax] distinction is better understood as a vocalisation contrast. In other words, the lax vowel is best treated as epenthetic, and the real contrast is between the presence and the absence of a vowel. This distinction therefore is structural rather than segmental. In a later

work (Barreteau 1988), he goes further, showing that for Mofu-Gudur it is possible to eliminate vowels completely from the underlying representation, and to determine the presence of a full vowel from the tones of the word. He presents this as a possible analysis, but does not claim this as the most desirable analysis. The important thing to note is that for languages such as Mofu-Gudur the underlying forms need only draw upon a single vowel phoneme and at most two prosodies.

Whilst Barreteau's analysis is extremely powerful for most Cameroonian Chadic languages, it does not extend to languages such as Gude where vowel harmony plays no role. Under his system, Gude is analysed as not having the features PAL and LAB, but only the feature [lax]. This accounts for Gude's system of two underlying vowels /a/ and /ə/, but does not address the role of palatalization and labialization on consonants in producing surface front and back-rounded vowels. There is a gap in his analysis when it comes to describing languages where PAL and LAB are primarily realised on consonants.

In terms of the phonological systems found in Central Chadic, Barreteau's typology works well for the Vowel Prosody languages (see chapter 5), but is insufficient for treating Consonant Prosody languages, or languages of the Mixed Prosody or Kotoko types.

4.2.10 Palatalization in West Chadic (Schuh 2002)

Whilst focussing on West Chadic, Schuh takes as his starting point the existence of a widespread process of 'morphological palatalization' in Central Chadic. By 'morphological palatalization' Schuh means a palatalization feature that affects segments throughout an entire morpheme. He cites examples such as Podoko (Swackhamer 1981) where palatalization produces vowel fronting as well as palatalization of certain consonants, and Gude (Hoskison 1974) where palatalization affects certain consonants in a root. He speculates that this morphological palatalization might be a feature of Proto-Central Chadic, and identifies this as an area lacking in Chadic research at that time. The paper goes on to propose that this feature was also shared with West Chadic, and thus has a deep history within Chadic.

This conclusion is shared in this study, where we will show that palatalization as a feature was present at least as far back as Proto-Central Chadic (see section 11.2).

4.2.11 Suffix petrification and prosodies in Central Chadic (Lamang-Hdi) (Wolff 2006)

In this paper, Wolff uses the prosodic approach to attempt reconstructions of Proto-Lamang-Hdi. To do this he makes use of the notion of suffix petrification. Following from work by Schuh on the evolution of determiners in Chadic (Schuh 1983), Wolff proposes that certain palatalization and labialization phenomena in Lamang and Hdi can be explained by positing the presence of petrified nominal suffixes –y and –w in the reconstructed forms for Proto-Lamang-Hdi.

4.2.12 A Timeline of Central Chadic phonological studies

Here I present a timeline of all the publications relating to the phonologies of individual Central Chadic languages to date.

Language	Group	Title	Reference
Margi	Margi	A Grammar of the Margi Language	(Hoffmann 1963)
Higi	Higi	A Tentative Analysis of the Phonology of Higi	(Hoffmann 1965)
Higi	Higi	Vectors, prosodies, and Higi vowels	(Mohrlang 1971)
Ga'anda	Tera	Downstep in Ga'anda	(Ma Newman 1971)
Higi	Higi	Higi phonology	(Mohrlang 1972)
Gude	Bata	Prosodies and Verb Stems in Gude	(Hoskison 1974)
Gude	Bata	Notes on the phonology of Gude	(Hoskison 1975)
Daba	Daba	Daba (parler de Pologozom): description phonologique	(Lienhard and Giger 1975)
Dghwede	Mandara	The phonology of Dghwede	(Frick 1977)
Ga'anda	Tera	Y-prosody as a morphological process in Ga'anda	(Ma Newman 1977)
Muskum	Musgum	Une langue tchadique disparue : Le Muskum	(Tourneux 1977)
Mulwi	Musgum	Le Mulwi ou Vulum de Mogroum (Tchad) : Phonologie - Eléments de grammaire	(Tourneux 1978a)
Zulgo	Mofu	Phonology of Zulgo	(Haller 1980)

Language	Group	Title	Reference
Podoko	Mandara	From consonants to downstep in Podoko	(Anderson and Swackhamer 1981)
Podoko	Mandara	Podoko Phonology	(Swackhamer 1981)
Ouldeme	Mofu	Phonologie quantitative et étude synthématique de la langue ouldeme: langue tchadique du Nord Cameroun	(de Colombel 1982)
Higi	Higi	Phonémique et Prosodie en Higi	(Barreteau 1983)
Gude	Bata	A Grammar and Dictionary of the Gude Language	(Hoskison 1983)
Bura	Margi	The analysis of complex phonetic elements in Bura and the syllable	(Maddieson 1983)
Lamang	Lamang	A grammar of the Lamang language: gwàd làmàn	(Wolff 1983b)
Mbara	Musgum	Les Mbara et leur langue (Tchad)	(Tourneux, Seignobos, and Lafarge 1986)
Margi	Margi	The Margi vowel system and labiocoronals	(Maddieson 1987)
Mofu-Gudur	Mofu	Description du mofu-gudur	(Barreteau 1988)
Mafa	Mafa	Lexique mafa	(Barreteau and le Bléis 1990)
Bana	Higi	A preliminary phonology of Bana	(Hoffman 1990)
Munjuk	Musgum	Lexique pratique du Munjuk des rizières : Dialecte de Pouss (Français-Munjuk, Munjuk-Français)	(Tourneux 1991)
Buduma	Kotoko Island	A Phonological Description of Yedina (Buduma), language of Lake Chad	(McKone 1993)
Ouldeme	Mofu	La langue ouldémé, Nord-Cameroun	(de Colombel 1997)
Moloko	Mofu	The Vowel System of Moloko	(Bow 1999)
Dugwor	Mofu	Phonologie du Dugwor	(Ousmanou 1999)
Mbuko	Hurza	The phonology of Mbuko	(Gravina 1999)

Language	Group	Title	Reference
Mada	Mofu	Dictionnaire mada	(Barreteau and Brunet 2000)
Buduma	Kotoko Island	Grammatik des Buduma: Phonologie, Morphologie, Syntax	(Awagana 2001)
Mbuko	Hurza	Features of a Chadic language: the case of Mbuko phonology	(Gravina 2001)
Bata	Bata	Bata Phonology: A Reappraisal	(Boyd 2002)
Hdi	Lamang	A grammar of Hdi	(Frajzyngier and Shay 2002)
Malgwa	Mandara	Die Sprache der Malgwa (Nárá Málgwa)	(Löhr 2002)
Gidar	Gidar	Esquisse Phonologique du Kada (Gidar)	(Noukeu 2002)
Zina	Kotoko South	Consonant-tone interaction in Zina Kotoko	(Odden 2002a)
Gemzek	Mofu	Gemzek Phonology	(Gravina 2003)
Cuvok	Mafa	Etude phonologique du cuvok et principes orthographiques	(Ndokobaï 2003)
Mafa	Mafa	Aspect in Mafa	(Ettlinger 2004)
Gavar	Daba	Etude phonologique du Gavar	(Noukeu 2004)
Mina	Daba	A grammar of Mina	(Frajzyngier, Johnston, and Edwards 2005)
Mpade	Kotoko North	Esquisse de la phonologie lexicale du Mpade (langue tchadique centrale groupe B)	(Mahamat 2005)
Zina	Kotoko South	The unnatural phonology of Zina Kotoko	(Odden 2005)
Lagwan	Kotoko Centre	Phonology of Lagwan (Logone-Birni Kotoko)	(Ruff 2005)
Bura	Margi	Bura Phonology and Orthography	(Warren 2005)
Gidar	Gidar	A Grammar of Gidar	(Frajzyngier 2007)
Zina	Kotoko South	The unnatural tonology of Zina Kotoko	(Odden 2007)
Bura	Margi	Bura phonology and some suggestions concerning the orthography	(Blench 2009b)

Language	Group	Title	Reference
Kirya	Higi	An Introduction to Kirya-Konzəl	(Blench and Ndamsai 2009b)
Buwal	Daba	A Phonology of Buwal	(Viljoen 2009)
Vame	Hurza	A Phonological sketch of the Plata dialect of the Vamé language	(A. Kinnaird 2010)
Muyang	Mofu	The Phonology of Two Central Chadic Languages	(T. Smith and Gravina 2010)
Mbuko	Hurza	The Phonology of Two Central Chadic Languages	(T. Smith and Gravina 2010)

4.3 Summary

After fifty years of study, many of the questions about Central Chadic phonology have been resolved. Within the consonant inventory almost all languages are described with at least five 'places' of articulation: labial, alveolar, laminal (a term coined to describe the alveolar sibilants (Roberts 2001)), velar and labialized velar. There is a set of pre-nasalized voiced stops and a set of glottalised consonants, normally implosive. Open questions concern the status of palatalized consonants and labialized consonants other than labialized velars and the presence or absence of certain individual phonemes such as the velar implosive, velar nasal and the voiced lateral fricative.

In describing the vowel systems of Central Chadic languages, there is a marked difference between the languages displaying vowel harmony and those which don't. For those with vowel harmony, there is general agreement that at most two phonemic vowels /a/ and /ə/ are required, along with the palatalization prosody and in some cases the labialization prosody. At dispute is whether schwa should be treated as phonemic or not.

In the languages which do not display vowel harmony, most analyses only require two or three underlying vowels, with the status of schwa again being in question. Whereas for the languages with vowel harmony the prosodic analysis has proved highly successful as a theoretical framework, there does not seem to be any overarching theory to explain the functioning of labialization and palatalization in these languages. There is also a lack of an overall understanding of the nature of Proto-Central Chadic phonology, and of how it developed into such diverse systems.

Studies in the development of Central Chadic tone systems are at a very early stage.