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ON VOWEL SYSTEMS IN CHADIC: A TYPOLOGICAL OVERVIEW

0. Introduction

My interest in Chadic vowel systems was aroused - some 35 years ago - by the discovery that Tangale, a West Chadic language spoken in what is today the Bauchi State of N. Nigeria, displays a vowel harmony system comprising five tense and four (or five) lax vowel qualities (Jungraithmayr 1957, 1970). On the other hand, Mandara, a member of the Central group, spoken in Cameroon, has been identified by H. Mirt (1969) as a 2 vowel system language, comprising a high central (ə) and a low central vowel (a). This marked contrast between two extreme types of very differently structured vowel systems within the Chadic language family gradually brought about - in the sixties and seventies - an increasing interest in the distribution and history of vowel systems in Chadic. In 1966, the question whether vowels could be reconstructed for Proto-Chadic was raised and answered in the negative (Newman & Ma 1966). On the contrary, vocalic phonemes increasingly appeared to be of merely morphological/grammatical nature (Newman 1975) and for some languages were to be predictable as part of grammatically conditioned phonological patterns (Tourneux 1978).

Parallel to these views, however, there was also a growing belief in the reconstructability and lexical nature of vowels and their systems in Chadic as has been demonstrated by various studies (Schuh 1978, Newman 1977 and Wolff 1983b). The most recent work on the nature of vowels and their systems in Central Chadic is that by D. Barreteau (1987). An overall typological characterization of Chadic vowel systems has recently been attempted in the framework of a mere general analysis of the historical situation of the Chadic language family, entitled "Centre and Periphery: Chadic Linguistic Evidence and its Possible Historical Significance" (Jungraithmayr 1991a). Therein a marked opposition between vowel systems - i.e. number of vowels, their qualities and morphosyntactic behaviour - observed in languages of the western and eastern periphery on the one hand and in languages of the more central groups on the other hand has been stated.

1. The instability of vowel qualities in Central Chadic

A fundamental opposition between the languages of the 'Central nucleus', i.e. the Lamang, Mandara and Mafa-Mofu groups, and the vast majority of the remaining Chadic languages, i.e. the rest of Central Chadic as well as the Western and Eastern Chadic languages, consists in the basic difference in the behaviour of the vowel qualities within morphemic and morphosyntactic frames. In non-Central-nucleus languages an *a* is and remains an *a*, with its immutable qualities and semantic properties, irregardless of its consonantal and/or morphosyntactic environment, e.g.

Hausa: *d'áakii* 'hut'
d'áakiináa 'my hut'

On the other hand, in Central-nucleus languages the A vowel phoneme has at least three different modes of realization, i.e. three differently coloured shades, namely, e.g. in Giziga, *a*, *e* and *ə*. Of course, the same applies to *i* and *u*, so that in principle, these languages may have only three vocalic phonemes at most, i.e. *a*, *i*, *u*, because the other possible qualities/shades - *ɛ*, *ɔ*, *ɪ*, *ʊ*, *ə*, *ʌ* - are required for the intrinsic variability system which is operated within the entire consonant/vowel phoneme system of a given language.

In Giziga (Lukas 1970:7f.), vowel qualities are classified in two types, that is in 'Pausalformen' (pre-pausal forms) and 'Kontextformen' (contextual forms). Lukas recognizes *a*, *e* and *o* as pre-pausal vowels and *ə*, *i* and *u* as contextual vowels. He quotes the following examples:

	Pre-pausal form	Contextual form
'to want'	<i>wad'</i>	<i>wud'(ə)</i>
'to buy'	<i>hedak</i>	<i>hedək</i>
'that of'	<i>nga</i>	<i>ngə</i>

Cf. the following phrase:

?i wudə nge hedək ta

'I want to buy not' (I don't want to buy).

In fact, in many cases the range of vowel quality variability is not only twofold but even threefold, as the following examples taken from the vocabulary in Lukas, op. cit., show:

	Pre-pausal form	Contextual forms	
		weakened form	syncopated form
'big feast'	<i>mugudlom</i>	<i>mugedlom</i>	<i>mogdlom</i>
'to die'	<i>mut</i>	<i>mets</i>	<i>mts</i>
'brother'	<i>sukum</i>	<i>*səkum</i>	<i>skum</i>
'body'	<i>vo, vu</i>	<i>və</i>	<i>v</i>
'cause'	<i>vur</i>	<i>ver</i>	<i>vr</i>
'outside'	<i>vra</i>	<i>vre</i>	<i>vri</i>
'to stand up'	<i>tlkad'</i>	<i>tlked'</i>	<i>*tlkd-</i>
'to take away'	<i>tsertlak</i>	<i>*tsertlek</i>	<i>tsertlk</i>
'to lift'	<i>puk</i>	<i>*pek</i>	<i>pk</i>
'compound'	<i>hay</i>	<i>hiy (hii)</i>	-
'to close'	<i>grats</i>	<i>gritə</i>	<i>gerts</i>
'to throw'	<i>tsak</i>	<i>*tsək, *tsik</i>	<i>tsk</i>
'to count'	<i>tlof</i>	<i>tləf</i>	<i>tlf</i>
'to regard' (Mi)	<i>pur</i>	<i>pir</i>	<i>pr</i>

	Pre-pausal form	Contextual forms	
		weakened form	syncopated form
'eye'	<i>re</i>	<i>ri</i>	<i>?ər (= r?)</i>
'two'	<i>cew</i>	<i>ciw</i>	<i>cu (= cw)</i>

According to Lukas (1970:8) the change from the pre-pausal variety of a vowel phoneme to its contextual and further to the syncopated variety takes place under regular conditions which, however, we will not present here: "Der Wechsel in den Vokalen vollzieht sich mit großer Regelmäßigkeit..."

For Gude, a Bata-Bachama group Chadic language with basically two vowel phonemes (*ə*, *ʌ*), Hoskison (1983:15) has introduced the notion of 'vowel coloring' into the field of vowel research in Central Chadic. "In a narrow phonetic description of Gude short vowels, we find that a complete continuum of vowel timbre qualities (colors) occurs ranging from front unrounded to back rounded. The color of vowels is predictable ...", i.e. their colour depends on the nature and quality of the surrounding consonants:

Labiovelarized consonants --> labiovelarized vowels (back and round),

Palatalized consonants --> palatalized vowels (front and unrounded).

Hoskison (1983:15) who refers to a similar situation in certain Caucasian languages summarizes his findings in Gude "by saying that vowels are basically colorless but assimilate the coloring of contiguous consonants". His table of short vowel phones may illustrate this:

	uncoloured	with one contiguous palatalized consonant	with two contiguous palatalized consonants
high short vowel	<i>i</i>	<i>ɪ</i>	<i>i</i>
non-high short vowel	<i>ʌ</i>	<i>ɛ</i>	<i>e</i>
	uncoloured	with one contiguous labiovelarized consonant	with two contiguous labiovelarized consonants
high short vowel	<i>i</i>	<i>u</i>	<i>u</i>
non-high short vowel	<i>ʌ</i>	<i>ɔ</i>	<i>o</i>

As early as 1968, at the 17th German Congress of Orientalists in Würzburg, Heide Mirt astonished the audience by postulating only two vowel phonemes for Mandara, another Central nucleus language, namely *ə* and *a*, and by explaining the other vowel phonemes occurring in the notes and texts collected by J. Lukas as allophonic variants resulting from assimilatory processes or positional influences: "Die anderen vokalischen Phone lassen sich sowohl als Assimilationsprodukte als auch als Varianten erklären" (Mirt 1969:1097). Mirt was able to prove that six vowel phones can be reduced to two vowel phonemes:

[ə]

/ə/ [ɪ] (in palatal environment)

[u] (in velar environment)

[a]

/a/ [e] (in palatal environment)

[o] (in velar environment)

In 1980, E. Wolff et al., proceeding from H. Mirt's study, presented their findings on seven further Mandara group languages, i.e. Dghwede, Glavda, Gvoko, Gwara, Kdupe ('Guduf'), Lamang and Padkwa (Paduko) (Wolff/Hauenschild/Labahn 1981) according to which three short vowel phonemes only, i.e. *i*, *a*, *u*, exist in this language group. Wolff et al., in describing vowel quality shifts in these languages, operate with the notion of 'vowel harmonizing' within the monomorphemic lexical base ("not ... to be confused with 'vowel harmony' which operates across morpheme boundaries"), i.e. "extensive assimilations of vowels by other vowels ... the vowels assimilate to each other, none of the affected vowels retains its original phonetic value (sic!), cf. Lamang /awi/ > [ewe] 'mouth', /agu/ > [ogo] 'goat', etc." (Wolff et al. 1981:262).

The basic principles of the above approach have even been applied to a 'Middle East' Chadic language, namely to Sibine in 1979 (Barreateau and Jungraithmayr 1982). There it was proposed to interpret [e] as /y/ and [o] as /w/ thus reducing the actual number of 7 surface vowels (cf. Jungraithmayr 1978:179) to only three, namely /ə/, /ɪ/ and /a/. D. Barreateau in 1984 (published in Barreateau 1987:161-191) summarizes our knowledge of vowels and vowel systems in Central Chadic as follows:

"Lorsqu'on aborde les voyelles dans les langues tchadiques [he means 'tchadiques centrales'], on est immédiatement frappé par l'extrême richesse des réalisations phonétiques en même temps que par la disparité des systèmes. Dans l'analyse des langues particulières, il n'est pas rare de relever de nombreuses variantes, variantes libres, variantes contextuelles selon la position des voyelles dans la syllabe, dans le mot, dans la phrase, ou variantes conditionnées par l'environnement consonantique. En bref, on note une grande complexité des systèmes vocaliques par rapport à une relative stabilité des consonnes." (Barreateau 1987:161). This characterization is certainly well grounded for Central Chadic and particularly for Central-nucleus Chadic (see above) but it is not applicable to Western and Eastern, particularly peripheral Chadic, as the title of Barreateau's paper seeks to imply ("Du vocalisme en tchadique").

2. The stability of vowel qualities in Peripheral Chadic

The last sentence of Barreateau's quotation is misleading. There he opposes "complexité des systèmes vocaliques" to "une relative stabilité des consonnes". The vowel systems of both, Central as well as peripheral West-Eastern Chadic languages display a high degree of complexity but each in its own, very specific manner. Whereas Central nucleus languages excel in a wealth of vocalic shades and colourings with highly complex compatability systems based, however, on 2-3 fundamental vowel phonemes only, peripheral Chadic languages, specially Ron on the Nigerian Plateau and Migama, Mubi, Bidiya, Mokilko, etc. in the Abu Telfan and Guéra regions of Eastern Chad, display systems comprising the 'classical' 5 vowel qualities *a*, *e*, *i*, *o*, *u* which do not show any phonetic variability. Here, vowel change is not a phonological process caused by morphophonological and morphosyntactic factors as we have seen in Central nucleus languages, but is an active part of morphological processes which contribute essentially to the make-up of a grammatical system. Compare for instance

		Infinitive stem	Perfective stem	Imperfective stem
Mubi 'to burn'	sg pl	<i>fògóny</i> <i>fàkkány</i>	<i>fúgùny</i> <i>fékkîny</i>	<i>fúgòòny</i> <i>flkkâny</i>
Migama 'to fall'	sg pl	<i>sùubò</i> <i>sùbbò</i>	<i>sùùbé</i> <i>sùbbé</i>	<i>sòbáa</i> <i>sòbòkká</i>
Mokilko 'to divide'	sg pl		<i>dìikidá</i> <i>dìkkidá</i>	<i>dòkkidé</i> <i>dòkkidé</i>

Ron-Daffo: 'rat' *kùsùm* (sg.) : *kùsàm* (pl.)
 'slave' *mōór* (sg.) : *mwāār* (pl.)
 'to die' *mōt* (perfv.) : *mwāāt* (imperfv.)

In these languages change of vowel quality is always functional whereas in the Central nucleus languages different vowel colouring is (today) of a mere phonetic nature. (It must be emphasized that the situation in certain other Central languages, e.g. in Uldeme (de Colombe 1988) is even more complex probably displaying both types of vowel behaviour at the same time!)

In Mubi - cf. the above example - the shift from the *o*-vocalization to the *u*-vocalization of the verbal stem *fògóny* -> *fúgùny* is not a mere phonetic alternation conditioned by some (though regular) phonosyntactic factor as it may occur in languages like Giziga, etc., but indicates a morphological change

from the infinitive (or verbonominal) to the finite perfective stem. The same is true of the *a/e* ablaut in the first syllable of the plural form; cf. *fàkkány / tékkány*.

In Mokilko, the different vocalization of *sòʔúrú* (m.) and *sòʔòró* (f.) is the feature distinguishing the masculine from the feminine form of the adjective 'long'. Within the verbal sphere, the *u : o* opposition marks the perfective : Imperfective aspect distinction. Cf. the following examples, also with other vocalic oppositions:

Perfective	Imperfective	
ʔúkké	ʔókké	'to run'
ʔùndá	ʔòndé	'to suck'
dʔé	déʔú	'to look for'
dílkidá	dòokidé	'to divide, share'
gʔzè ¹	kázà	'to tell'
ʔindá	ʔúntó	'to die'.

In Migama, the vocalic opposition *u : o* - as well as *i : e* - carries the same functional load as in Mokilko; cf. the following examples:

sùpiré	sòpòrrá	'to whiten'
sùrdé	sòròd'dá	'to shave'
ʔúkidýé	ʔókód'dýá	'to tan'
zírpe	zéréppá	'to sniff'
ʔibiné	èbènná	'to know'.

As in Mubi, such ablaut oppositions (together with consonantal gemination) also serve in the formation of nominal plurals, e.g.

Singular	Plural	
ʔitín	ʔèttènná	'nose'
ʔijimá	ʔèjjèmmi	'thorn'
búdýúr	bùd'dýorri	'tree sp.'
pùtiurú	pòttòrri	'area, space'.

¹ Also *kízè* which is, however, the subjunctive form.

It is certainly significant and noteworthy that, as we can see, especially in Migama, vowel ablaut processes are often accompanied by the feature of consonantal gemination in peripheral Chadic languages. On the contrary, in Central nucleus languages consonant gemination does not seem to play any significant role, neither phonetically/phonologically nor morphologically. For Lamang see Wolff (1983a:49): "Geminate consonants are rather infrequently heard in Lamang utterances". As to Gude we learn that "consonant length ... is not phonemic." (Hoskison 1983:9).

3. The two intermediary vowel system type zones ('Middle West' and 'Middle East')

The languages situated between the western and the eastern periphery on the one hand and the central nucleus on the other may - at least for our purpose - be termed 'Middle West' (or 'Near West') and 'Middle East' (or 'Near East'), respectively. In essence we are dealing here with the following groups:

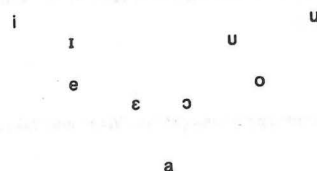
	'Middle West'		'Middle East'
(a. West)	Angas-Sura	(a. East)	Sokoro
	Bole-Tangale		Sumray-Miltu
	North-Bauchi		Kwang-Kera
	South-Bauchi		Nancere-Gabri
	Bade-Ngizim		
(b. Central)	Tera	(b. Central)	Masa
	Bura-Margi		Musgu
			Kotoko-Yedina

As may be seen from the above list, 'intermediary' languages - in the context of our analysis - traditionally belong either to the Western/Eastern branches of Chadic or to the Central branch; in view of their identical or similar systems of vowels and their behaviour they may, however, be grouped together here from a typological viewpoint. Statistically, these languages seem to be united in that they do not display less than five short oral vowels, normally having either six (*a, e, i, o, u + ə*) or seven (*a, e, i, o, u + ε, ɔ or + ə, ʌ*) whereby the fact that languages displaying *t w o* centralized vowel qualities, namely *ə* and *ʌ* appears to be restricted to the 'Middle East' and not to occur in the 'Middle West' would deserve closer attention.

In general, these two intermediary zones are typologically marked by the feature 'vowel quality stability' (VQS) thus adhering in this respect to the phonological Western/Eastern languages.

3.1. The special case of Tangale ('Interferential Chadic')

A special case within the Middle West intermediary zone is represented by the unique vowel system of Tangale (*taŋle*) which comprises the following nine (probably originally even ten) short oral vowels:



This situation is in complete contrast to the one met with in the other Bole-Tangale languages, e.g. generally a 5- or at the most 6-vowel system. There can be no doubt that this unique innovative development in a Chadic language surrounded almost exclusively by Adamawa languages has been triggered off by an obviously intensive contact with one of them. U. Kleinewillinghöfer has demonstrated in his recently completed doctoral dissertation on Waja that this neighbouring Western Adamawa language not only displays exactly the same type of vowel system as Tangale but both languages also share an identical type of vowel harmony (Kleinewillinghöfer 1991; Jungraithmayr 1957, 1971, 1991b).

Another structural speciality of Tangale which is hardly found anywhere else in Chadic is the fact that morpheme final segments in this language are severely threatened by 'clipping' or apocopational processes (cf. Jungraithmayr 1987 and 1990), e.g.

	Final form	Contextual forms	
		Weakened form	Reduced form
'to die'	<i>mudɛ</i>	<i>mud-</i>	<i>mu-</i>
		e.g.	e.g.
		<i>mudɔ</i> 'died'	<i>muɪ</i> 'dead'.

Because of all these "irregular" features hardly typical of Chadic as a whole, I propose to mark Tangale with the label 'Interferential Chadic'.

3.2 The special case of Sibine

The vowel system of Sibine, the language of the Sumray people, spoken in central Southern Chad, has first been analysed as comprising seven short oral vowel qualities (Jungraithmayr 1978) but was later

reanalysed after applying a 'Central nucleus vowel system analysis' as a 3-vowel language (Barreateau & Jungraithmayr 1982):

Ju. 1978	Ba./Ju.1982
<i>i</i> <i>e</i> <i>u</i>	<i>e</i>
<i>ə</i> <i>ʌ</i> <i>o</i>	<i>ʌ</i>
<i>a</i>	<i>a</i>

In this last contribution *i* and *u* are interpreted as realizations of an underlying /yə/ and /wə/, respectively; in the same way as *e* and *o* are considered to go back to /yʌ/ and /wʌ/, respectively.

This methodological approach will possibly have to be applied to the other members of the Sumray-Miltu group, also displaying the two centralized qualities *ə* and *ʌ*, e.g. Ndam (Broß 1988), as well. Sibine and its related languages may thus have to be recognized in future as a 'Middle Eastern' layer of the Central nucleus type.

4. Conclusions

Generally speaking, vowels in the west and the east are immutable qualities irregardless of environmental influences, (self-sufficient and irreducible) often playing an important role in morphology and charged with well defined grammatical functions (marking nominal and verbal plural as well as verbal aspect stems, etc.). On the other hand, vowel qualities in languages of the 'Central nucleus' are generally of a highly vague and 'floating' nature, strongly dependent on external, environmental features and their impact on them; especially the prosodic features 'palatalization' and 'labialization' exert a determining influence on the respective realization of the vowel qualities in Central nucleus Chadic. As Hoskison (1983:15) puts it: "[In Gude]... vowels are basically colorless but assimilate the coloring of contiguous consonants."

As a whole, the following general linguistic evaluation of the opposing vowel system types in Chadic may be formulated:

The more functional load and morphological weight vowels have to carry - as it is the case in West-East peripheral Chadic - the less flexible they can afford to be in phonological/phonetic respect. On the other hand, the less morphological weight they are charged with - as in the Central nucleus languages - the greater their phonetic/phonological and phonosyntactic variability may be (cf. Jungraithmayr 1991a).

A last word, about the role that typology may play in the comparative-historical study of languages:

"En reconstruction, l'utilisation correcte de la typologie est à la fois une procédure de contrôle et une procédure de découverte." (Haudry ²1984:6).

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