Issues in the Historical Phonology of Chadic Languages

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- Chadic within Afroasiatic

- Typology: Root and pattern (functions of vowels in grammar)

- Historical grammar: The role of "frozen" determiners

2. Synchronic analysis

- Competing phonological analyses of vowel systems in Central Chadic languages: Purely segmental analysis vs. prosodic analysis (PAL & LAB prosodies)
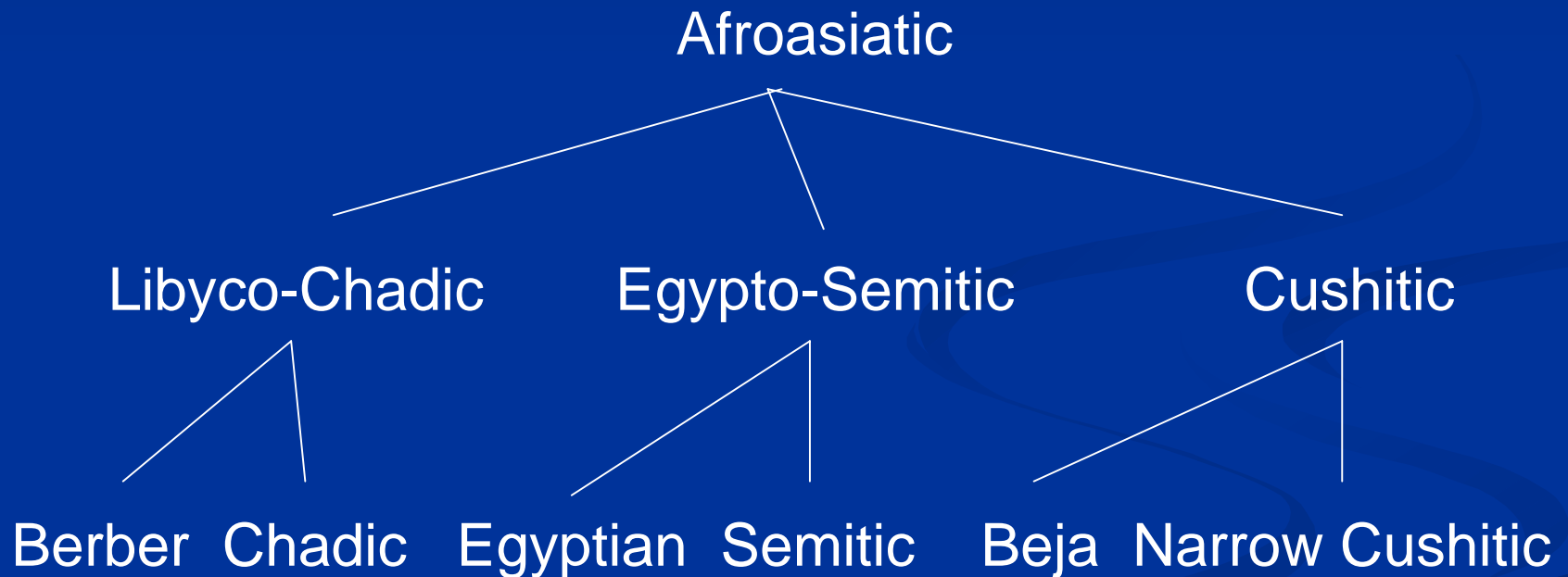
3. Diachronic analysis

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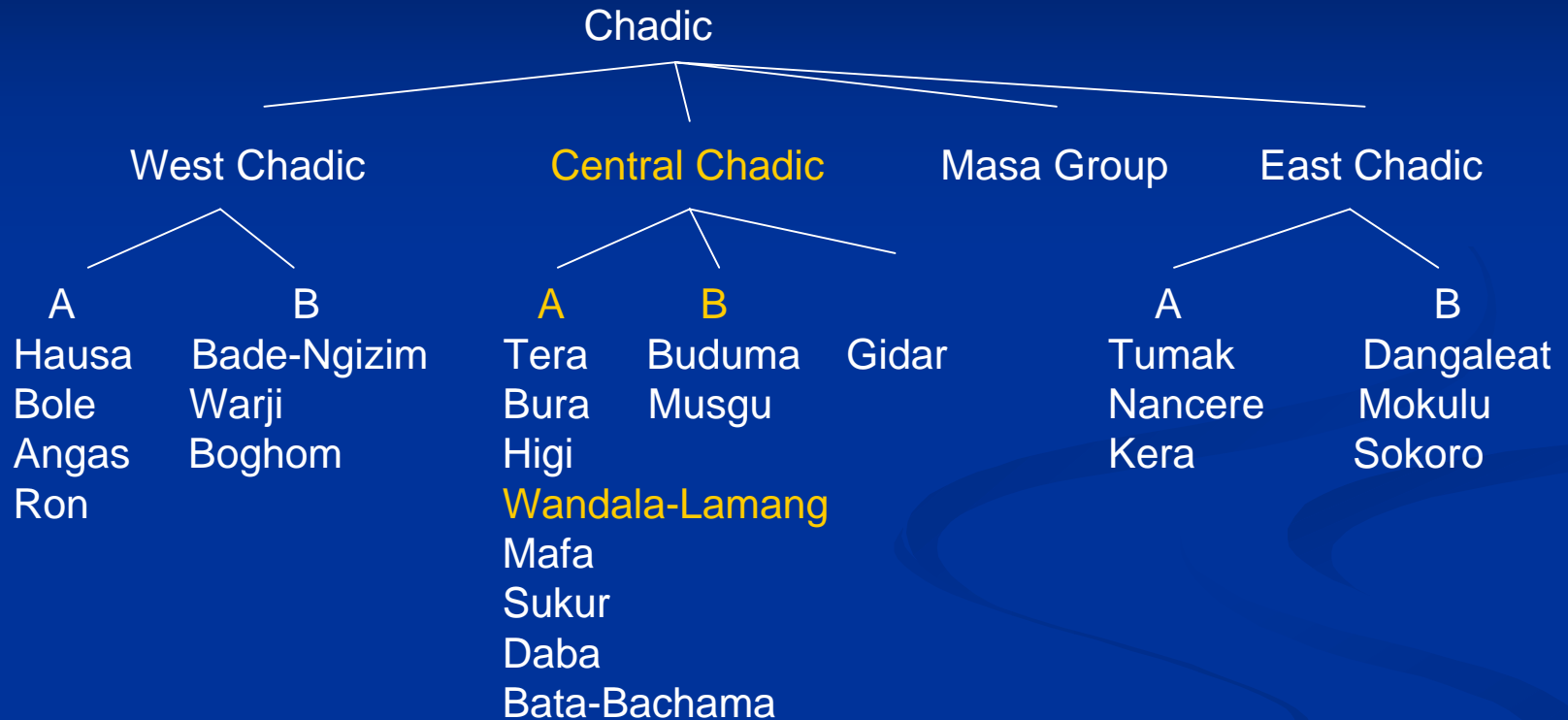
Part 1:
Introduction

- Chadic within Afroasiatic

- Typology: Root and pattern (functions of vowels in grammar)
  - verbal morphology: *pluractional verb stems*
  - nominal morphology: *internal noun plurals*

- Historical grammar: "frozen" determiners
  (& their effect on vowel qualities within the phonological word)

1.1 Chadic within Afroasiatic

- The Afroasiatic Language Phylum

Afroasiatic

Libyco-Chadic Egypto-Semitic Cushitic

Berber Chadic Egyptian Semitic Beja Narrow Cushitic

1.2 The Chadic language family

Chadic
- West Chadic
  - A: Hausa, Bole, Angas, Ron
  - B: Bade-Ngizim, Warji, Boghom
- Central Chadic
  - A: Tera, Bura, Higi, Wandala-Lamang, Mafa, Sukur, Daba, Bata-Bachama
  - B: Buduma, Musgu
  - Gidar
- Masa Group
- East Chadic
  - A: Tumak, Nancere, Kera
  - B: Dangaleat, Mokulu, Sokoro

1.3 Vowels and their function in grammar

Afroasiatic/Chadic Morphology: *Root and pattern*

E.g. verbal morphology: Lamang root *k-l-   'to take, pick'

Patterns (& affixes):

/kla/	[kəla]	simple verb stem
/kl-u/	[kəlo]	simple verbal noun
/k-a-la/	[kala]	pluractional (I) verb stem
/k-a-l-u/	[kolo]	pluractional (I) verbal noun
/k-a-l-a-la/	[kalala]	pluractional (II) verb stem
/k-a-l-a-l-u/	[kololo]	pluractional (II) verbal noun
/k-a-la+k-a-la/	[kalaka:la]	pluractional (III) verbal noun
/k-a-la+k-a-la/	[kàlákálá]	perfect I
	[kàlàkàlá]	perfect II (inchoative, incompletive)

1.4 Lexical & grammatical patterns

- **Vocalisation pattern** (internal): **lexical** function

"zero-vocalization"	Lamang:	/nɣa/	[nəɣa]	'to see'
"**a-**vocalization"	Lamang:	/naɣa/	[naɣa]	'to love'

Note that in Lamang, all verb stems end in /a/.

In a language like Central Chadic Mulwi (Tourneux 1978), vocalization may be entirely predictable depending on the word class usage of the root such as derived adverb or verbal noun.

- **Vocalization pattern** (internal): **grammatical** function (synchronic)

"**a-**infixation" vs. "ablaut"	Lamang:	/nɣa/	[nəɣa]	'to see'
		/n-a-ɣa/	[naɣa]	'to see (many)'
	cf.	/naɣa/	[naɣa]	'to love'

1.5 Functional redesignation of patterns

Some West and East Chadic languages have developed binary systems of verb stem formation in which "internal **a**" ablaut and consonant reduplication look deceivingly identical to Semitic forms in terms of surface appearance. Strikingly, many Chadic languages have re-assigned such marked verb stems to their inflexional "aspect system" (bi- or trinary):

	preterite	*imperfect*	
Akkadian	**ikbit**	**ikabbit**	'become heavy'

	perfect	*imperfect*	
Migama	**ʔápìlé**	**ʔàpàllá**	'wash'
Mubi	**ʔēwít**	**ʔūwát**	'bite'
Ron (Daffo)	**mot**	**mwaát**	'die'

1.6 Final vowels: lexical or grammatical function?

- In some Chadic languages, final /a/ relates to verb valency, in others it appears to be lexical (phonological verb classes).

- Hausa simple verbs illustrating Proto-Chadic vowel classes

  Note that with simple verbs of the Low-High (L-H) tone melody class, all non-low vowel verbs are transitive (e.g. **sàyí** 'to buy'), while all low-vowel verbs are intransitive (e.g. **fìtá** 'to go out')!

HAUSA	non-low vowel class: final **[i ~ u] < * /ə/**	low-vowel class: final **/a/**
non-assimilated **[i]**	L-H **sàyí** < ***sàyə́** 'to buy' H-L **táashì** < ***táasə̀** 'to get up'	L –H **fìtá** 'to go out' H-L **ɗáfà** 'to cook'
assimilated **[u]**	H-L **gúdù** < ***gʷə́də̀** 'to run away'	

1.7 Internal *pluractional* formations (1)

	prefixal reduplication	*-a- infixation	suffixal reduplication
W-Chadic:			
Miya		və̀rkə́ <> v-à-rké 'to give birth' kàfə̀ <> k-àa-fà 'to send'	
Bole	ɓò̀ltu <> ɓò-ɓòltu 'to break'		ɗolu <> ɗòl-l-u 'to swallow'
Bade	ə̀bdu <> pàbdu ə̀fku <> fàafku	< *b-à-bdu 'to ask' < *f-àa-fku 'to enter'	
		gàfu <> g-àa-fə̀-f-u 'to catch'	
Ron (Sha)		lîg <> ly-á-g-â-g 'to lick'	

1.7 Internal *pluractional* formations (2)

	prefixal reduplication	*-a- infixation	suffixal reduplication
C-Chadic:			
Mandara		m̀tsá <> m-à-tsá 'to die'	
Ga'anda	ɗəs <> ɗə-ɗ-a-s 'to sit'		
Lamang		kəla <> k-a-la <>	k-a-la-la 'to take'
Kera	gar- <> kar- < *g-gar- 'to plant'		
Kwang	baye <> paye < *b-baye 'to enter'		
E-Chadic:			
Mubi		dèrésé <> d-à-r-á-sé 'to kneel down'	
Mukulu	niiré <> ni-niiré 'to push'		
Migama			maato <> mat-t-o 'to die'

1.8 Internal noun plurals

Assessing the structural and historical status of so-called "internal **a**" plurals is rather difficult from a methodological point of view. Synchronically it is hard if not impossible to tell infixation of **-a(a)-** or other vowels from ablaut-type or umlaut-type vocalic changes.

West Chadic

Ron	**shôm**, pl. **shwăm**	'horn'
Bade	**də̀m**, pl. **dàm**	'tree'

Central Chadic

Podoko	**dəhələ**, pl. **dahali**	'girl'
Logone	**hlin**, pl. **hlan**	'tooth'

East Chadic

Jegu	**colkom**, pl. **colkam**	'chin'
Mubi	**irin**, pl. **aran**	'eye'

1.9 The role of "frozen" determiners

- Frozen/petrified PC determiners tend to fuse with noun stems (due to semantic bleaching)

- Such frozen determiners may become the source of "prosodies" (cf. below)

1.10 "Frozen" DET with noun plurals (1)

- ***-W   (also in combination with "internal a" and reduplication)**

West

Bade	*ə̀zgəl*	*ə̀zgàala-u*	'foot'
Hausa	*karee*	*kàrna-u*	'dog'
Karekare	*tùumà*	*tùumam[i]yà-u*	'mortar'
Miya	*shim*	*shímámà-w*	'farm'
Ngizim	*ŋgàs*	*ŋgàsa-u*	'spear'

East

Kera	*às̀rá*	*k-àsrá-w*	'antelope'
Tumak	*gùblí*	*gùblà-w*	'ram'
Bidiya	*miidò*	*mída-w*	'man'

1.10 "Frozen" DET with noun plurals (2)

- ***-Y (also in combination with "internal a" and reduplication)**

West

Hausa	*birìi*	*bìra-i*	'monkey'
Ron/Bokkos	*wur*	*wurá-y*	'house'
Karekare	*wàci*	*wakà-i*	'goat'
Bole	*kòorì*	*koor-e*	'farm'

Central

Gisiga	*aw*	*awa-y*	'goat'
Bachama	*samwa*	*samw-e*	'rope'
Musgu	*kusum*	*kusuma-y*	'mouse'
Kotoko	*lìigà*	*lìigà-i*	'crocodile'
Buduma	*cégan*	*céganâ-i*	'scorpion'

1.10 "Frozen" DET with noun plurals (3)

East

Somrai	*dogoro*	*dogora-i*	'dog'
Jegu	*pòt*	*pòt-è*	'arm'
Mubi	*gìr*	*gar-é*	'house'
Dangaleat	*diwò*	*diwà-i*	'fly'
Bidiya	*reera*	*rerè-y*	'song'
Migama	*ʔìjìma*	*ʔèjjèm-ì*	'thorn'

Masa

Masa	*dut(-na)*	*duta-i(-na)*	'calabash'

1.10 "Frozen" DET with noun plurals (4)

"determiner" *-n
  (always with final –i, also with "internal a" and reduplication)

West

Hausa	*fùree*	*fùrà-nn-ii*	'flower'
Pa'a	d*atsi*	*datsaa-n-i*	'worthless'

Central

Gude	*tsa(-nə)*	*tsa-ny-i(-nə)*	'fence'
Kotoko	*fə̀skə̀*	*fàskà-ny-e*	'goat'

East

Mukulu	*dibe*	*dibbà-n-i*	'termite'
Somrai	*mije*	*mije-n-i*	'stranger'

Masa

Musey	*hleg-*	*hlege-n-i*	'chicken'

1.10 "Frozen" DET with noun plurals (5)

"determiner" *-k
  (always with final –i, also with "internal a" and reduplication)

West
  Hausa   *goonaa*   *goonaa-k-ii*   'farm'

Central
  Podoko   *dəgwədzəmə*   *dagwadzama-k-i*   'he-goat'

East
  Mukulu   *sùblo*   *sùblà-g-i*   'guinea-fowl'

Masa
  Musey   *ŋgus(-na)*   *ŋgusu-g-i(-na)*   'tree'

1.10 "Frozen" DET with noun plurals (6)

"determiner" *-ɗ
(always with final –i, also with "internal a")

West
Ngizim	*gə̀msə̀-k*	*gə̀msà-ɗ-i-n*	'man'

Central
Margi	*ŋkwà*	*ŋkwà-ʼy-ì*	'girl'
Kotoko	*she*	*shaa-ɗ-e*	'hand'
Gidar	*bèknè*	*bèknè-ɗ-i*	'elephant'

1.11 Quality changes affecting vowels

Pluractional verb stems

- ■ *"internal -a-"*
  - Replacive strategy
  - Insertive strategy

1.12 Replacive strategy

West

Angas	*cen*	*can*	'to cut'
Miya	*vɜ̀rkɜ́*	*vàrká*	'to give birth'

Central

Lamang	*kla*	*kala*	'to take'
	ghəmbasa	*ghambasa*	'to laugh'
Wandala	*mtsa*	*matsa*	'to die'
Zulgo	*zɜ̀m*	*zama*	'to eat'
	sɜ̀kəm	*sakama*	'to buy'
Podoko	*səkw*	*sakw*	'to buy'
Ga'anda	*kə*	*kə-ka* (CV-redupl.)	'to bite'
	mər	*mat*	'to die'
Bachama	*mbʉra*	*mbar-a*	'to extinguish fire there'

East

Mubi	*ríib-í*	*ráb-é*	'to stir'
	jùub-í	*jàb-é*	'to squat down'
	dèrès-é	*dáràs-é*	'to kneel down'
	sògòd-é	*ságád-é*	'to put in'

1.13 Insertive strategy

West

Angas		*pus*	*pwas*	'to shoot'
Sura		*sù*	*swa*	'to run'
Ron/Daffo	(*habitative*)	*ɓâk*	*ɓáàk*	'to break'
	(*pluractional*)	*ɓil*	*ɓyǎl*	'to draw water'
Ron/Kulere		*duk*	*dwáak*	'to beat'
Miya		*kàfə̀*	*kàafà*	'to send'
Saya		*nàt*	*náat*	'to tie'

Central

Bachama	(*allative*)	*píir-á*	*pyáar-á*	'to thatch there'
Gude		*la*	*laala*	'to cut'

East

Dangaleat		*bàkàl-*	*bakaal-*	'to eat soft food'

1.14 Vowel changes

- The infix *-a- undergoes (partial) assimilation to lexical vowel of the verb base.

Central	Bachama	*pír*	*pyéer*	'to thatch'
		tùúlə̀	*tòólə̀*	'to chew'

- With the insertive strategy, the synchronic result may be simply vowel lengthening.

West	Saya	*kə̀p*	*kə̀ə̀p*	'to weave'
		cìm	*cíim*	'to call'
Central	Gude	*mətə*	*məətə*	'to die'
East	Bidiya	*bákàl*	*bákàal*	'to eat dry food'
		regèm	*regèem*	'to boil grain'
		ʔoyóokòl	*ʔoyóokòol*	'to lisp'

1.15 Summary & Outlook

- **Root & Pattern Structure**
  Vowels are indicative of morphological patterns

UNMARKED	MARKED
lexical	*grammatical*
singular	*plural (nouns)*
simplex	*pluractional~habitative/frequentative (verbs)*

  [Note that only one of the forms may incidentally „survive" language change]

- **Morphology allows all kinds of affixing**
  - (pre- &) suffixing may give way to UMLAUT-like phenomena (distant assimilation)
  - infixing ("internal a") may give way to ABLAUT-like phenomena

- **Shallow phonological rules affect vowels in both quantity (lengthening) and quality** (e.g. lowering with "internal a")

- **"Frozen" DETs occur and may trigger UMLAUT ("prosody") effects;**
  in the case of DET *-Y and *-W final diphthongs *ay and *-aw may monophthongize to yield mid vowels [e] and [o]

End of Part 1

(Introduction)

Part 2:
Synchronic analysis

- Competing phonological analyses of Central Chadic languages (vowel systems)

- Purely segemental analysis

- Prosodic analysis: PAL & LAB prosodies

2.1 Central Chadic vowel systems

- Generally speaking, a much larger number of *synchronic* vowel phonemes reflect a much smaller number of *abstract underlying* and/or *historically reconstructable* vowels to the extent that, as is the case with certain Central Chadic languages, only a single vowel ***/a/*** can be safely reconstructed internally that would contrast with its absence in syllable peak positions.

- In languages of this type, all other (ten or more) surface vowels can be said to reflect - at least historically! - either **[i]** or **[u]** syllabifications of the approximants **/y/** and **/w/**, or assimilatory raising of **/a/** to **[e]** or **[o]** in [+high] phonological environments (but also assimilatory lowering of **/i/** to **[e]** and **/u/** to **[o]** in [+low] phonological environments) – or, independently, represent pro- and epenthetic vowels insertion (plus subsequent phonetic "colouring") .

- Languages of this type pose considerable theoretical and methodological challenges for both synchronic description and historical reconstruction.

2.2 From underlying to surface (1)

- **<u>Approximant syllabification</u>**

Lamang   **C₁C₂a**-base   **/wma/   [uma]**   'to marry'
pluractional formation with "internal **a**"
                                         /w-a-ma/   [wama]   'to marry many times'

Lamang   **VC₁C₂** bases   **/agw~agu/ [ogo]**   'goat' (PC *a(w)ku)
                                         /awy~awi/ [ewe]   'mouth' (PC *ba)

(i) low-vowel raising in initial position resulting from high vowel distant assimilation

/a/ > [o] /__C[o]~/u/
/a/ > [e] /__C[e]~/i/

(ii) simultaneous high vowel lowering in final position resulting from distant low-vowel assimilation

[u] > [o] / /a/~[o]C__

[i] > [e] / /a/~[e]C__

2.2 From underlying to surface (2)

- Positional "colourings" of pro- and epenthetic vowels (short high and central vowels).

- The combination of pro-/epenthetic vowel plus approximant may yield phonetically long vowels, despite the absence of phonological vowel length, cf.

Wandala C_1C_2a-base (with frozen determiner *-y)

*/yra+y/ 'head'

(i) prothetic schwa is regularly inserted before an initial consonant cluster

*/yra-y/ > *[ə]yray 'head'

(ii) prothetic schwa plus approximant result in a phonetically long surface vowel

(iii) final diphthong monophthongizes to mid vowel

*/yra-y/ > *[ə]yray > [iire] 'head'

Hausa (segmental sequence */-aw-/ > [-oo-])

*d-wk- > */dáwkì/ > [dóokìi] 'horse'

pl. /dàw-àa-k-áy/ 'horses'

2.3 Challenging questions

- Are approximants (y, w) and high vowels (i, u) different phonemes or simply distributional allophones of the same two phonemes: /y~i/ and /w~u/?

- Are internal mid vowels (e, o) phonemes in their own right or are they distributional allophones of either /a/ or the [+high] phonemes (/y~i/ and /w~u/)?

- Are final mid vowels (e, o) phonemes in their own right or are they monophthongized allophones of diphthongs /ay~ai/ and /aw~au/ (likely resulting from DET suffixes *-Y and *-W)?

- Are all short non-low vowels (schwa, i, u) automatically pro- or epenthetic in nature, or are they, at least in certain instances, phonetic reductions of full vocoids (/a/, /y~i/, /w~u/) – possibly in unstressed syllables?

- Are all phonetically long vowels predictable in terms of combinations of vowel plus approximant or vowel+vowel (cf. insertive "internal a" strategy) - if not representing manifestations of stress?

- *How many synchronic vowels (phonemes) are there in a given language?*
  Could it be more than just one, namely /a/?
  Does a 1-vowel-system merit to be called a "system"?
  Are we dealing with "vowels" in such languages in the first place, or should we rather refer to such as "vocoid" systems?
  What does all this mean (A) for cross-linguistic typology, and (B) for historical reconstruction of the common proto-language?

2.4 The Prosody Approach (1)

Fictitious field situation in Northern Nigeria/Cameroon & fictitious dialogue between field linguist and Ali, speaker of a Central Chadic language.

Linguist:	OK, Ali, can we meet again tomorrow morning?
Ali:	*ákwé*!
Linguist:	Can we also meet in the afternoon?
Ali:	*ákwé*!
Linguist:	And in the evening we go to greet the chief?
Ali:	*ákwé*!

Linguist's entry to field diary (same day):

"In Ali's language, there appears to be a particle *ákwé* indicating consent."

2.4 The Prosody Approach (1.1)

Entry to field diary (grammar notes) a few weeks or months later:

■ "In this language the phonology is such that the English loan 'Okay' is re-analysed as involving the effect of prosodies:

■ The feature [+round] of the initial vowel [o] becomes detached from the vowel and functions as *LAB Prosody*; as such, it is phonetically realised on the velar obstruent: /k/ => [kw] (note that labialized /kʷ/ has phonemic status in the language); the initial vowel, now devoid of the feature [+round], surfaces as /a/ which is, most probably, *the only underlying vowel* in this language;

■ the final diphthong (or monophthong) of the loanword 'Okay' corresponds to the common underlying final /a+y/ in this language, which is regularly *monophthongised* and becomes phonetically realised as [e].

■ Therefore, according to the language's phonological rules, the most natural way to say 'Okay' is to pronounce it [ákwé]."

2.4 The Prosody Approach (2)

- The prosody approach was originally developed in order to account for peculiarities of Central Chadic phonological systems which pose problems for adequate synchronic descriptions of the vowel and consonant inventories of individual languages. The first Central Chadic languages for which the prosody approach was used for *synchronic* description, were

  Higi (Hoffmann 1965, Mohrlang 1971, 1972, Barreteau 1983)

  Gude (Hoskison 1974, 1975).

- The prosody approach, however, can also be used for the historical comparison of languages. The first exploitation of the prosody approach for *diachronic* work within Central Chadic was conducted

  for the *Wandala-Lamang* Group (Wolff 1981, 1983).

2.4 The Prosody Approach (3)

"Most Central Chadic languages make use of prosodic features like palatalisation, labialisation and nasalisation – and they do so in very different ways. These features affect the whole word, consonants and vowels alike, or they affect the consonants more and the vowels less, or the other way round. The exact conditions when they do what are not always clear.

...In certain languages like in Munjuk, voicing of consonants is also a prosodic feature of the word: all consonants of the word are either voiceless or voiced.

...The kind of underlying analysis which we propose by isolating prosodic features from [segmental] phonemic features allows unified accounts of quite divers phonological systems such as those of Higi and Gisiga, Wandala and Daba, or Muzgu and Podoko. It is essentially the effects of prosodies that make the difference between these languages, which share a common basic system."

Daniel Barreteau (1983: 273ff.)

2.4 The Prosody Approach (4)

- In particular, we shall be looking at palatalization and labialization as "prosodies" in Chadic. In traditional segmental phonology, palatalization and labialization are viewed as localised and attached to a segmental phonemic unit, creating "palatalized" and "labialized" consonants: **/ C^y /** or **/ C^w /.** By prosodies we mean "long components" (as they have been and still are called sometimes), i.e. features that have as their domain at least a syllable, but more often the whole word.

- Prosody marking conventions (common usage in Central Chadic linguistics):

syllable domain / **.** ___ **.** / :   / **.**$^{+y}$CV**.** /   palatalized syllable
                                           / **.**$^{+w}$CV**.** /   labialized syllable

word domain: *LAB*   *PAL*

C V. C V. – CV.
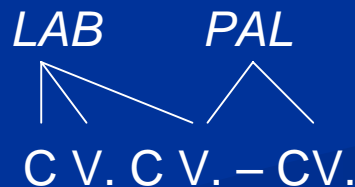
2.4 The Prosody Approach (5)

- Some Central Chadic languages, in particular, have developed LABialization and PALatalization prosodies, partly at least stemming from umlaut/distant assimilation effects, that would apply to vowels and some consonants across the whole phonological word. The likely historical origin of such prosodies are historically reconstructable markers which carried the feature [+high], but also LAB or PAL consonants that are part of the root, e.g.
Lamang root *ɣʷ-dz-f- 'bone' plus petrified determiner *-y:

<p style="text-align:center">[+high,+rd]   [+high,-rd]</p>

(i) epenthetic vowel insertion *ɣʷ[ə]. dz[ə]. f +*-y

(ii) prosody creation   LAB   PAL

<p style="text-align:center">*+ʷɣp. dzə. +ʸ-y.</p>

(iii) prosody expansion   LAB   PAL

<p style="text-align:center">C V C V C V</p>

(iv) phonetic realization   [ɣʷù dʒ ì f ì]

2.4 The Prosody Approach (6)

Still on **Lamang** *ɣ^w[ə].dz[ə].f +*-y   >   [ɣ^w ù dʒ ì f ì]   'bone'

- The palatalization of C$_2$ **/dz/** > [dʒ] is distantly triggered by the petrified determiner suffix ***-y** which also affects epenthetic **[ə]** of the 2nd syllable which subsequently becomes realized as **[i];**

- further, the underlying approximant of the determiner suffix ***-y** is syllabified to **[i]** in final syllable nucleus position.

- The labialization feature which was already inherent in the initial consonant /ɣ^w/ spreads onto the syllable nucleus (epenthetic schwa) with a rounding effect on the epenthetic vowel ("schwa colouring").

Nota bene:

- In particular suffixed determiners (that may have become petrified) which carried the feature [+high] ([±round]) trigger such prosodic umlaut changes;

- this also explain the general observation that the full set of (often five "expected") vowel qualities
  a, e (< *ay), o (< *aw), i (< *y), u (< *w)
  may well occur in word-final position, but not elsewhere.

2.4 The Prosody Approach (7)

Cf. examples from two very closely related languages:

Lamang	**[ɣènè]**	'tongue'
Hdi	**[ɣàník]**	'tongue'

- Under synchronic purely segmental analysis:

Lamang	**[ɣènè] < /ɣe.ne./**	assumption: /e/
Hdi	**[ɣàník] < /ɣàník/**	assumption: /a/, /i/

- Under synchronic prosodic analysis:

Lamang	**[ɣènè] < /⁺ʸɣa.⁺ʸna./**	assumption: /a/, Y-prosody
Hdi	**[ɣàník] < *ɣa.n[i]k < /ɣa.⁺ʸnk./**	assumption: /a/, Y-prosody

- Under diachronic segmental analysis:

Lamang	**[ɣènè] < *ɣana(-y-ki)**	assumption: DET *(-Y)-k(V)
Hdi	**[ɣàník] < *ɣana(-y)-k(i)**	assumption: DET *(-Y)-k(V)

2.4 The Prosody Approach (8)

- Under diachronic prosodic analysis:

PAL   PAL

Lamang *ɣana(-y-ki) > [ɣènè]   Hdi *ɣan[ə](-y-)k(i) > [ɣàník]

- PALatalisation prosody affects the whole word in Lamang by fronting and raising /a/ to [e] in both syllables. (Language-specific)

- In Hdi, only the final syllable is affected by PALatalisation in terms of fronting and raising /ə/ to [i], the vowel /a/ in the 1st syllable, however, is not affected. (Language-specific)

- The ultimate source of PAL is the diachronic DET suffix (or suffix combination) *(-Y)-k(V) which triggers UMLAUT (with subsequent complete or partial loss of source affix): Lamang /a/ > [e], Hdi [ə] > [i].

Cf. Germanic UMLAUT   German   Mann <> Männ-er
                        English   man <> men   < *man-ir (?!)

2.5 Typological & analytical challenges

- Vowel systems in Central Chadic provide challenges to linguistic theory and methodology.

- There are five sets of analytical and descriptive problems which can be handled by four interrelated theoretical modules:

A. The phonological status of the vowel schwa

B. The role and function of "Ø-vocalisation" vs. "a-vocalisation" (synchronic & diachronic)

C. The phonological status of /y/ and /w/ as opposed to /i/ and /u/

D. The status and history of mid vowels and of word-final diphthongs

E. The effects of prosodies (such as LABialization and PALatalization), which may affect single segments, syllables, or whole words

1. *Epenthesis theory*

2. *Vocalization theory*

3. *Weak radical theory*

4. *Prosody theory*

2.6 Competing synchronic analyses (1)

■ When we look at the particular phonetic vowel inventories and the phonological status of vowels in Lamang-Hdi, we are stunned by the observation that the three major grammatical sources do not agree even on the number of vowel phonemes in the language.

983a) offers two alternative descriptions for Lamang

ion A: three monophthongs plus one diphthong (excluding schwa),

on B: four monophthongs (including schwa).

994) has only two vowels (including schwa),

e five monophthongs (also including schwa).
 differences by different authors must be an indication as to the existence of of some heavy theoretical and methodological issues involved in the on of underlying vowels in these languages!

2.6 Competing synchronic analyses (2)

- Varying vowel system analyses for Lamang-Hdi by different authors

Lamang (Wolff 1983a)		Hdi (Langermann 1994)	Hdi (F/Sh 2002)
A (preferred)	B		
/i/ /u/	/i/ /u/ /ə/	/ə/	/i/ /u/ /ə/
/a/ +diphthong /aY/ (word-final only)	/a/	/a/	/e/ /a/

2.6 Competing synchronic analyses (3)

- **Vocalic variation in Lamang-Hdi according to different authors**

  Lamang and Hdi appear to be characterised by heavy overlap of vocalic allophones

Lamang (Wolff 1983)   Hdi (Langermann 1994)   Hdi (F/Sh 2002)
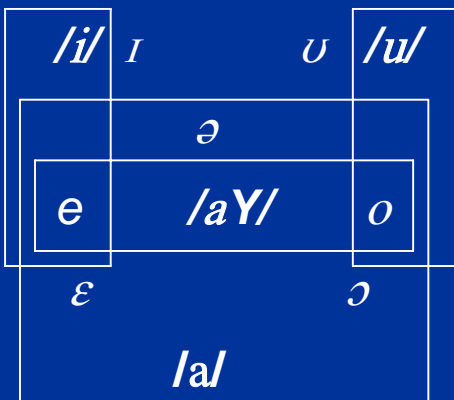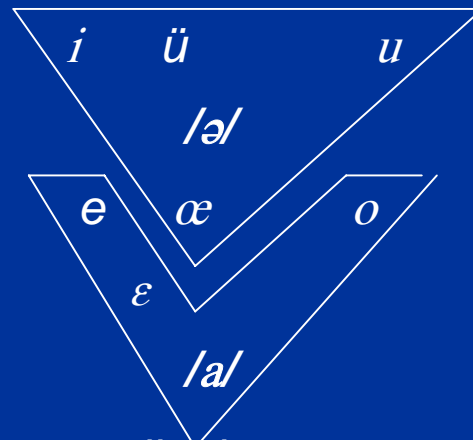
allophones (A)   allophones   allophones (?)
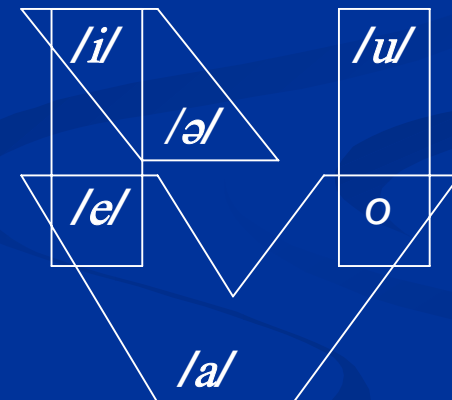
2.6 Competing synchronic analyses (4)

The salient questions are:

- How have all these phonetic (surface) vowels emerged, no matter what their phonemic status in the synchronic system, from possibly just one underlying vowel /a/

  (a) in synchronic abstract / underlying phonological representation?

  (b) in diachronic terms, i.e. in the common proto-language?

- This is where our four theoretical modules come in:
  1. Epenthesis theory
  2. Vocalization theory
  3. Weak radical theory
  4. Prosody theory

2.7 Epenthesis theory

- One of the difficult questions in analysing Central Chadic vowel systems concerns the phonological status of "schwa" [ə].

- Some authors consider schwa a full vowel phoneme in a given language, other authors, as we do here, claim that schwa and all its conditioned variants are fully predictable *pro- and epenthetic* vowels, and as such they merit no status for underlying phonological representation nor for historical reconstruction as vowels.

- Short high and central vowels, including round front vowels (IPA ɪ, i, ʊ, u, y, œ, ə, ʌ etc.), are – always or at least sometimes - manifestions of pro- and epenthetic vowels ("schwa").

2.8 Weak Radical theory

- The *weak radical theory* is based on the observation that high vowels [i] and [u] are in complementary distribution with their approximant counterparts /y/ and /w/.

- [i] and [u] only occur in syllable nucleus position, the approximants elsewhere; their vocalic or consonantal characteristics vary according to distribution within the syllable.

- Thus, we say that /y/ and /w/ function as "weak radical" consonants in Chadic (cf. the notion in Afroasiatic/Semitic studies).

- We therefore claim that [i] and [u] do not represent different phonemes but are distributional allophones of /y/ and /w/.

2.9 Vocalization theory (1)

- It is helpful to group lexical morphemes in Chadic according to vocalization patterns. Two still largely productive basic vocalization pattern must be distinguished:

Ø-vocalization

the morpheme contains no phonemic vowel in non-final positions, the root is "vowelless" (disregarding the final vowel for the time being)

a-vocalization

at least one non-final syllable nucleus in the phonetic representation of the morpheme is filled by the only phonemic vowel of the system: /a/.

This a-vocalization pattern may carry overt morphological information, such as pluralization in both verbal and nominal morphology.

2.9 Vocalization theory (2)

- Patterns in Lamang & Hdi: Both lexical and grammatical contrasts are built on the two vocalization patterns.

Lamang

Lexical	Ø-vocalization	/nɣa/ [nəɣa]	to see
	a-vocalization	/naɣa/	to want, desire
Grammatical	Ø-vocalization	/nɣa/ [nəɣa]	to see
	a-vocalization	/n-a-ɣa/	to see many

Hdi

Lexical	Ø-vocalization	/ᵐbɗay/ [mbəɗai]	to count
	a-vocalization	/ᵐbaɗay/ [mbaɗai]	to walk
Grammatical	Ø-vocalization	/nɣ á/ [nəɣá]	to see (sg object)
	a-vocalization	/n-á-ɣà/	to see (pl objects)

2.10 Prosody theory

The "Prosody-in-Central Chadic"-theory allows to describe and explain in a unified manner some highly irritating observations:

- a multitude of phonetic vowels can be reduced to at least two synchronically underlying phonemic vowels (often represented by the pair */ə/ : */a/), possibly, and most likely, to only one: */a/;

- several vowels within a root or stem (cf. notion of "phonological word") tend to share most if not all phonological features;

- such "harmonisation" in terms of LABialisation and/or PALatalisation tends to affect not only vowels, but also consonants.

- All this together can best be ascribed to *prosodies*, which affect a syllable, often the word as a whole ("prosodic word" or PBU "prosody bearing unit"). For instance, phonetic mid vowels emerge from underlying /a/ under the effect of palatalization (giving phonetic [e]) and labialization (giving phonetic [o]), sometimes via intermediate diphthongs /ay/ and /aw/. Under the effect of prosodies, also epenthetic vowels receive their conditioned "colouring": fronting under palatalization prosody ([ɪ]), and rounding under labialization prosody ([ʊ]).

End of Part 2

(Synchronic analysis)

Part 3:

Diachronic analysis & lexical reconstruction

3.1 Prosodies & reconstruction (1)

How many vowels in Proto-Chadic?

- Whereas many West and East Chadic languages appear to have straightforward vowel systems with usually 5 to 7 contrastive vowel qualities, some Central Chadic languages seem to have two-vowel systems in which the phonemic low vowel */a/* contrasts with a phonemic non-low vowel (schwa, usually symbolized by */ə/*) unless this schwa is entirely predictable in terms of pro- and epenthesis - which would leave us with one phonemic vowel only!

- The existence of such diverse systems has so far disallowed reliable reconstructions of vowels for PC. According to Newman 1977, PC can be reconstructed as having had at most four phonemic vowels (*__i, *u, *ə, *a__) and possibly only two, *ə and *__a__.

- Based on additional evidence from Central Chadic languages, a one-vowel analysis with *__a__ as the only phonemic vowel in the system would appear to be a plausible option. This theoretical option will be further investigated.

3.1 Prosodies & reconstruction (2)

ASSUMPTION: *PC (if not PAA) was a proto-language with one vowel (/*a/) or none.*

- This links up with a far reaching diachronic theory [Diakonoff et al.] on "AFRASIAN" as representing a historical language type with no "vowels" in the narrow sense, but rather with "vocoids" plus a set of "syllabification rules" instead. A theory of this kind appears to be called for in order to allow the comparative method also to work in Afroasiatic!

- If, however, we were able also to identify this historical/underlying vowel **a** with a (pharyngeal?) approximant in the proto-language (PC, if not PAA), then Chadic (if not Afroasiatic) could be said to be historically "vowelless".

- On the other hand, *la/* appears to be the only vowel that may carry length which could be an indication as to the "true vowel" nature of short and long **a/*aa** in Chadic. Unless, however, we assume that an explanation is feasible like in the case of "long" high or mid vowels which historically reflect monophthongization of diphthongs:

ay	>	[e(e)]	əy	>	[i(i)]
aw	>	[o(o)]	əw	>	[u(u)]
aH	>	[a(a)] ?	əH	>	???

3.1 Prosodies & reconstruction (3)

■ Note the impossibility to arrive at regular sound correspondences (based on classical comparative method) between vowels with closely related languages of the Wandala-Lamang group:

Cf.   'nose'   'ear'

Dghwede	x t	i	r	e		ɬ	e	m	e	
Glavda	x t	ə	r	a		hy	i	m	i	a
Gvoko	x t	o	r			ɬ	u	w	o	
Gwara	a kʷc	i	n			ɬ	i	m	i	
Guduf	x t	e	r	e		ɬ	i	m	e	
Lamang	x ts	i	n	i		ɬ	ə	m	ə	ŋ i
Podoko	f t	ə	r	a		ɬ	a	m	a	
Wandala	ə k t	a	r	e		ɬ	ə	m	a	

(Solution to be presented later.)

3.1 Prosodies & reconstruction (4)

- 1st diachronic hypothesis:

  PALatalization and LABialization are reconstructable as prosodies for at least Proto-Central Chadic (if not for PC). In other words, languages with synchronic prosodies would reflect **retention (archaism)** from rather earlier stages of Chadic linguistic history.

- 2nd diachronic hypothesis:

  Prosodies in Central Chadic languages, where they occur, can be attributed to recent phonological processes of desegmentalization of segmental phonemes, consonants and/or vowels. It is, therefore, possible to **internally reconstruct** the segmental sources of these prosodies and describe the diachronic processes of *prosodic expansion* from segment to the syllable and, finally, the word in terms of rather shallow phonological rules.

3.1 Prosodies & reconstruction (5)

- Combining both diachronic hypotheses:

Possibly, the proto-language had a phonological inventory of the kind that would allow both LABialization and PALatalization prosodies to emerge, i.e. from palatal(ized) and/or labial(ized) consonants and approximants.

Under such assumption, maximally one vowel would need to be reconstructed for the proto-language.

This would mean that some Chadic languages have historically segmentalized these archaic prosodies in the shape of fuller inventories of vowels (through phonemicization of allophones) so that we could speak of "vocalogenesis" in Chadic, or at least in parts of Chadic.

In terms typological evolution, we could then speak of two types of Chadic languages:
(a) languages of the prosody type (mainly Central Chadic)
(b) languages of the vowel system type

3.1 Prosodies & reconstruction (6)

The theory of "prosody creation & prosody expansion"

- The diachronic process leading to the synchronic existence of PAL and LAB prosodies shall be discussed in terms of *prosodic expansion*. By this I mean that these prosodies (in the sense of "long components") develop from segmental sources (/y/, /w/, /C^w/) in three stages:

  > stage 1: creation of prosody features from segments

  > stage 2: expansion of prosody feature onto syllable(s) or word

  > stage 3: loss of segmental source of prosody through either de-segmentalization (word-initial), apocopation (word-final), or metathesis & vowels coalescence

- The processes representing stages 1 and 2 appear to be no longer productive and must synchronically be treated as *lexicalized* where they have occurred.

- Apparently, our languages are presently undergoing the stage 3 processes: the different speech varieties, recorded by different authors over a period of almost 40 years (more than 70 years, if we start with Meek's *Tribal Studies in Northern Nigeria*, 1931), tend to show different developments with regard to the same lexical items.

3.2 Low level reconstructions (1)

- The Lamang-Hdi language continuum, i.e. the lowest level of language comparison (target: Proto-Lamang-Hdi PLH)

In particular we will look out for

- Ø-vocalised roots   + Ø-prosody
- a-vocalised roots   + Ø-prosody
- Ø-vocalised roots   + Y-prosody
- a-vocalised roots   + Y-prosody
- Ø-vocalised roots   + W-prosody
- a-vocalised roots   + W-prosody
- Ø-vocalised roots   + combined W- and Y-prosody
- a-vocalised roots   + combined W- and Y-prosody

3.2 Low level reconstructions (2)

VERBS

- In Lamang-Hdi, simple (i.e. non-extended/-derived) verbs appear to always begin with a consonant (i.e. in anything but /a/, including approximants, which function as "weak radical consonants"); verbs lexically end in /a/.

- Final vowels other than /a/ signal grammatical or derivational-thematically motivated morphological "extension":

    - final /-u ~ -w/ may be (a) the surface reflex of (one of at least two) derivational extension suffixes (autobenefactive, source orientation), or (b) indicate the grammatical form of "verbal noun";

    final /-i ~ -y/, only occurring in Hdi, is a conditioned (F/Sh 116) allomorph of the same verbal noun marker.

  Note that [ə] may occur in verb-final position as the result of (a) full-vowel reduction or (b) as epenthetically inserted vowel; schwa never occurs before pause.

- There is some indication of infix(es) *-y/i- ("movement away"/"separation"?) and possibly *-w/u- ("source orientation"?) – acc. To F/Sh 2000: 115)

3.2 Low level reconstructions (3)

NON-VERBS

- There is strong indication that non-verbs, in particular nouns, show petrified traces of an ancient but synchronically obsolete former system of marking by suffixes in Lamang-Hdi. This marking system could have included word-final /-a/, /-i ~ y/, /-k(a)/, /-kʷa/, /-na/, /-ŋ/, and possibly more (cf. Schuh 1983 for elements and the historical sources of, the old Chadic determiner system).

- Characteristically, such petrified suffixes tend to be present in one language and absent in another, even in varieties of the same language. This is true for group-internal comparisons as well as across Chadic as a whole, i.e. compared with proposed PC reconstructions.

3.2 Low level reconstructions (4)

Petrified non-verbal suffixes in L-H:

*-a

*-y

*-w

*-k(V)

*-kʷ(V)

*-ŋ(V)

- These reconstructable markers have become defunct over time. After losing their semantics and grammatical functions ("bleaching"), they ended up as petrified root material.

- These ancient modifiers obviously occupied different positions to the right of the noun, and were able to combine within certain limits.

3.2 Low level reconstructions (5)

- Reconstructed system of modifier suffixes in Lamang-Hdi

stem formation	modifier-1	modifier-2	mod-1 + mod-2
simple stem	Ø		
mod. stem type 1:	*-a *-y *-w		
mod. stem type 2:	Ø	*-k[V] *-k^w[V] *-ŋ[V]	
1+2 mod. stem type:	*-y	*-k[V]	*-y*-k[V]
		*-k^w[V]	*-y -k^w[V]
	*-a	*-k^w[V]	*-a -k^w[V]
		*-k[V]	*-a -k[V]
		*-ŋ[V]	*-a -ŋ[V]-

3.2 Low level reconstructions (6)

■ Prosodic effect of suffix *-y affecting the whole word in Lamang, with weak radical syllablification only in Hdi (Langermann: PAL prosody on final syllable only)

Gloss	*segmental reconstruction*	*prosody creation*	*prosody expansion*		
			Lamang	Hdi (Eguchi)	Hdi (Langermann)
'sauce'	*ɗØ l -y	PAL ↖ *ɗə.l y.	PAL ⋀ ɗílí		
	*ɗa l –y	PAL ↖ *ɗa. l y.		PAL ⟍ ɗàlí	PAL ǀ /ɗa.ʸlə/ [ɗali]

3.2 Low level reconstructions (7)

Gloss	segmental reconstruction	prosody creation	prosody expansion		
			Lamang	Hdi (Eguchi)	Hdi (Langermann)
'tongue'	*ɣ a n a -y	PAL ↖ *ɣa.na-y	PAL ∧ ɣènè		
	*ɣ a n -y –k(V)	PAL ↖ *ɣa.nyk.		PAL ＼ ɣàník	PAL ǀ /ɣa.ʸnək/ [ɣanik]

3.2 Low level reconstructions (8)

- Prosodic effect of suffix *-y affecting the whole word in both Lamang and Hdi, incl. umlaut

Gloss	*segmental reconstruction*	*prosody creation*	*prosody expansion* Lamang	Hdi (Eguchi)	Hdi (Langermann)
'thorn'	*t Ø k –y	PAL ↖ *t[ə]k i	PAL ∧ tíkí		
	*t a k –y	PAL ↖ *t a k i		PAL ∧ tékì	PAL ∧ ʸta.ʸkə [teki]

3.2 Low level reconstructions (9)

Gloss	segmental reconstruction	prosody creation	prosody expansion		
			Lamang	Hdi (Eguchi)	Hdi (Langermann)
'dirt'	*r ɓ Ø ɬ (-y)	PAL ▼ rɓ[ə]ɬ(i)		PAL rɓíɬ	PAL /rə.ʸɓəɬ/ [rɓiɬ]
	*r ɓ a ɬ (-y)	PAL ▼ *rɓ a ɬ (i)		PAL rɓèɬ	

3.2 Low level reconstructions (10)

- Lamang: no prosody effect;
- Hdi: metathesis of word-initial /w/, assimilation of *-y~i > [-u] under LAB prosody

Gloss	*segmental reconstruction*	*prosody creation*	*prosody expansion* Lamang	Hdi (Eguchi)	Hdi (Langermann)
'wound'	*w l k –y	LAB PAL ↑ ↑ *w[ə] l k y	LAB PAL wúlkí		
	*l w k –y [*metathesis*]	LAB PAL ↑ ↑ *l w k –y			LAB PAL /ʷlə.ʷkə/ [luku]

3.2 Low level reconstructions (11)

- Lamang: no prosodic effect;
- Hdi: metathesis

Gloss	segmental reconstruction	prosody creation	prosody expansion		
			Lamang	Hdi (Eguchi)	Hdi (Langermann)
'elephant'	*g y w -a	PAL LAB		LAB PAL	
	*g w y -a	*gy.wa.		gʷíʼá	
		PAL LAB	PAL LAB		
	*g y w -a -ŋ[a]	*gy.wa.ŋ	gìwàŋ		
				LAB PAL	LAB PAL
	*g w y -a -ŋ[a]			gʷìʼáŋ	/ᴺʷgəʼaŋ/ [gʷìʼaŋ]

3.2 Low level reconstructions (12)

- Lamang: prosody assimilation under PAL /w/ > /y/;

- Hdi: (a) weak radical syllabification (Eguchi),
  (b) labialisation + palatalisation prosody (Langermann)

Gloss	*segmental reconstruction*	*prosody creation*	*prosody expansion*		
			Lamang	Hdi (Eguchi)	Hdi (Langermann)
'hair'	*s w d –y*	LAB PAL		LAB PAL	
		↑ ↑			
		s w. d y.		*sùdí*	
			LAB>PAL		LAB PAL
			ʃídí		/ᵞʷsə.ʸdə/ [sʷidi]

3.2 Low level reconstructions (13)

- "Weak" radical consonant /w/ + petrified suffix *-y

Gloss	*segmental reconstruction*	*prosody creation*	*prosody expansion*		
			Lamang	Hdi (Eguchi)	Hdi (Langermann)
'broom'	*s w t -y	*LAB PAL* ↑ ↑ *sw[ə]t-y* *LAB PAL* ↑ ↑ *s[ə]w[ə]t-y*	*LAB PAL* *swítí* *LAB PAL* *siwit*		*LAB PAL* ʷʸ*sət [suyt~s* ʷ*yt]*

3.2 Low level reconstructions (14)

- Labialisation prosody (< VN suffix) affecting underlying /a/ in Lamang

Gloss	*segmental reconstruction*	*prosody creation*	*prosody expansion*		
			Lamang	Hdi (Eguchi)	Hdi (Langermann)
'dance' (VN)					
		Ø			
	s k a l a-W	**skala-W*		*skálá*	
		LAB	*LAB*	*LAB*	*LAB*
	s kʷ a l a-W	**skʷala-W*	*skʷol-o*	*skál-ú*	*skaʷlə [skalu]*

3.2 Low level reconstructions (15)

- Labialisation prosody, arising from a velar obstruent, affecting epenthetic vowels

Gloss	*segmental reconstruction*	*prosody creation*	*prosody expansion*		
			Lamang	Hdi (Eguchi)	Hdi (Langermann)
'young man'					
	*d xʷ Ø l	LAB	LAB		
	*d xʷ l	dxul			
			LAB		
			dùxùl		
		LAB		LAB	
	*d xʷ a l	d xʷ a l		dùxâl	
				LAB	LAB
				dùxʷál	ʷdəʷxal [duxʷal]

3.2 Low level reconstructions (16)

- Palatalisation prosody (only Hdi)

Gloss	*segmental reconstruction*	*prosody creation*	*prosody expansion*		
			Lamang	Hdi (Eguchi)	Hdi (Langermann)
'louse'		PAL ↑		PAL ⋀	PAL ⋀
	*ts Ø ts –y	*ts[ə]ts-y		cící	ʸtsə ʸtsə [tʃ itʃ i]
		PAL ↑			PAL ⋀
	*ts a ts(a) –y	*tsats-y			[tʃ ɛ tʃ i]
		Ø			
	*ts a ts a	*tsatsa	tsátsá		

3.2 Low level reconstructions (17)

- Word-initial /w/ metathesis: weak radical syllabification vs. LAB

Gloss	segmental reconstruction	prosody creation	prosody expansion		
			Lamang	Hdi (Eguchi)	Hdi (Langermann)
'four'					
	*w f a ɗ (-a)		ùfáɗã		
		LAB ↑		LAB /	LAB |
	* f w a ɗ (a)	*fwaɗ(a)		fʷáɗ	ʷfaɗ [fʷaɗ]
'field'					
	*w v a x (-a)		úvàxà		
		LAB ↑		LAB |	LAB |
	* v w a x (a)	*vwax(a)		vʷáx	ʷvaxa [vʷaxa]

3.2 Low level reconstructions (18)

- Lamang: simplification by assimilation/"prosody switch" w > y;
- Hdi : labialization + palatalization prosody (Langermann)

Gloss	segmental reconstruction	prosody creation	prosody expansion		
			Lamang	Hdi (Eguchi)	Hdi (Langermann)
'hair'		*LAB PAL* ↑ ↑		*LAB PAL* | ╱	*LAB PAL*
	s w d –y	*swd-y*		*sùdí*	ʸ ʷsə ydə [sʷidi]
		PAL ↑ ↗	*PAL PAL*		
	> *s y d –y*	*syd-y*	*sídí ~ʃídí*		

3.3 Back to START: The "impossible task" of group-level reconstruction in W-L

- Note the impossibility to arrive at regular sound correspondences (based on classical conmparative method) between vowels with closely related languages of the Wandala-Lamang group:

Cf.	'nose'	'ear'
Dghwede	x t i r e	ɬ e m e
Glavda	x t ə r a	hy i m ia
Gvoko	x t o r	ɬ u w o
Gwara	a kʷ c i n	ɬ i m i
Guduf	x t e r e	ɬ i m e
Lamang	x ts i n i	ɬ ə m ə ŋ i
Podoko	f t ə r a	ɬ a m a
Wandala	ə k t a r e	ɬ ə m a

3.4 PWL reconstructions

		LAB	*PAL*		*PAL*
PWL		*a-Kʷ-t(a)ra(-y) 'nose'*			*ɬ(a)ma(-y) 'ear'*
Dghwede	PAL	x t i r e		PAL	ɬ e m e
Glavda	Ø	x t ə r a		PAL	hy i m i-a
Gvoko	LAB	x t o r		PAL > LAB *m > w	ɬ u w o
Gwara	LAB+PAL	a-kʷ c i n		PAL	ɬ i m i
Guduf	PAL	x t e r e		PAL	ɬ i m e
Lamang	PAL	x ts i n i		Ø	ɬ ə m ə -ŋ i
		x c i ŋ		PAL	ɬ i m i -ŋ
Podoko	LAB (*Kʷ > f)	f t ə r a		Ø	ɬ a m a
Wandala	Ø	ək t a r e		Ø	ɬ ə m a

4. Summary & Conclusions (1)

- **Prosodies affecting vowels**

  In addition to the only „true" vowel /a/ and syllabified approximants /y~i/ and /w~u/, LAB and PAL (single or combined) are responsible for phonetic (surface) vowels such as [e, ɛ, y] and [o, ɔ, œ] as much as for the "colouring" of pro- and epenthetic schwa [ʊ, ɪ, ə, ʌ] across a number of Central Chadic languages.
  - This is true for synchronic abstract phonological representation.
  - The corresponding rules are language specific.
  - Such languages have ONE UNDERLYING VOWEL at most (/a/).

- **Prosodies affecting consonants**

  LAB and PAL also affect consonants if and only if the language's phonological inventory allows for labialized and/or palatalized consonantal phonemes /Cʷ, Cʸ/ or allophones [Cʷ, Cʸ].

4. Summary & Conclusions (2)

- **Conclusions regarding reconstruction of labialized and palatalized consonants for the proto-language**

Cf. Newman (1977: 11): *PC almost certainly had palatalized and labialized velars (k^y, g^w, etc.) … their correctness in individual [reconstructions] will ultimately <u>depend on decisions regarding the PC vowel system</u>. PC may also have had palatalized and labialized bilabials (b^y, f^w, etc.) such as occur, for instance, in Margi and Higi [i.e. Central Chadic languages]. As far as the palatals (c, 'J, etc.) are concerned, we can assume that they were present in PC, either as palatalized alveolars (i.e. c = t^y) or as separate palatal series defined in terms of a distinct position of articulation.*

If so, then these C^y and C^w consonants (plus approximants/"vocoids") could be the ultimate sources of LAB and PAL, thus providing for the existence of a multitude of phonetic surface vowels without an underlying true vowel system!

4. Summary & Conclusions (3)

- **Conclusions regarding the reconstruction of vowels for the proto-language**

Following from the assumptions regarding the ultimate phonological inventory of the proto-language in terms of "vocoids"/approximants, C^y and C^w type phonemes and/or allophones, and a set of syllabification rules (involving pro- and epenthesis, weak radical syllabification, etc.), the proto-language could be assumed to have had ONLY ONE VOWEL, namely *a (possibly allowing for phonemic length: *a < > *aa).

On the other hand, the source of *a may ultimately be a non-vowel "vocoid", such as a laryngeal approximant *ʔ/*H, and the occurrence of reflexes of *aa may stem from same or similar sources as long *ii and *uu (which are largely predictable, including realisation of [stress], and need not be reconstructed as such).

In that case, the proto-language would have been truly VOWELLESS.

The End

Thank you for your interest in ongoing research on Chadic and Afroasiatic typological and historical linguistics at Leipzig University.