

OCCASIONAL PAPERS

in the study of

SUDANESE LANGUAGES

No. 9

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Partners in Language Development

There are a number of institutions and individuals who are interested in research on languages in Sudan and there is a need to make research presently being done available to others. The purpose of these Occasional Papers is to serve as an outlet for work papers and other useful data which might otherwise remain in private files. We hope that Sudanese and non-Sudanese linguists alike may profit from such a series of papers.

Manuscripts for the series are welcomed. A clear, hard copy following the format of the pages in this volume should be sent to the editors for consideration.

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Contents of volumes 1-8 is located on the last 2 pages.

Preface to Volume 9

It is encouraging to see this collection of papers with a common theme of Orthography Development. Orthography development in Sudanese languages continues to be a live issue, and it will remain a key issue for decades to come.

Linguistic analysis and description is one of the major gifts that the academic linguistic world can bring to the language communities of Sudan. The survival of Sudanese languages will be in the hands of the speakers themselves and the choices they make, but documentation of linguistic analyses of these languages will increase the range of options that the speakers have.

What we have here is 'work in progress' – there are no complete answers, and there is a great deal of research still to be undertaken. But what we can see here represents what is being undertaken now, and indicates that research will continue.

The importance of linguistic research

Linguistic research is critical for the development of Sudanese languages. By development I mean the way that the language communities of the Sudan are choosing to use their own language. Language choices are being made everyday by individuals in their homes, their village and town communities, their places of worship, their classrooms – in the whole range of human activities. These choices are often made without conscious thought and with a limited knowledge base. The decisions being made are currently of critical importance in the area of the written form of the language. Without adequate linguistic research the choices are limited – and some, having tried, have come to believe that their language cannot be adequately written. The kind of linguistic research and description represented in these papers will encourage conscious thought and provide data for these decisions.

The importance of documentation

One of the dangers facing all researchers, and maybe linguists in particular, is to carry out research but fail to adequately document that research. Maybe the major factor that discourages documentation is that the research is never complete, and we are always looking for that additional data and that additional insight which will radically improve the analysis. These papers represent a healthy lack of finality – they are not presenting The Complete Answer to Writing Sudanese Languages. There is no complete answer, but a continual groping towards a better way of writing Sudanese languages.

In these papers there are several recurrent issues which highlight where the better way might lie.

Tone – does it need to be represented?

One of these issues is that of tone. Does tone need to be represented in the orthographies of Sudanese languages? The indications from these papers are mixed – as the decisions for individual languages will be mixed. But each language community will need sooner or later to grapple with the question and make clear decisions. The papers in this volume, and similarly documented research, provide important data to inform that decision process.

Should the orthography represent the surface or underlying?

Another key issue raised in many of these papers, and underlying many of them, is the question of which level of the language should the orthography represent? The practice in the

past years has been to represent a surface level – a practice largely based on the practical consideration that this was all that was possible for the non-native speakers of the language who were making the decisions. Decisions were largely made based upon the then current understanding of phonology. As the science of linguistics has developed, so the options for representation have increased. One particular area reflected in these papers is that of representation of the vowels. With greater understanding of vowel phonology, including vowel harmony, the options available to the communities has been expanded. Further research in the area of writing is important for the development of Sudanese languages – and especially research carried out by mother-tongue speakers who bring insights not available to the outside researcher.

How can the orthography balance the linguistic and the sociolinguistic factors?

The decisions being made in writing Sudanese languages are influenced by many factors, including not just the linguistic but also the sociolinguistic. This is highlighted in the papers by Asmaa Mohamed Ibrahim Ahmed and by Muhammad Jallal Ahmed Hashim. The choice of scripts for Sudanese languages is largely a sociolinguistic one – and one that generates rhetoric when raised. But this issue must be faced by the language communities in Sudan. If Arabic is the national language, and as such a key to full participation in the life of the nation, then how can mother-tongue literacy and education best prepare the learner for Arabic?

How do we know when an orthography is adequate?

The issues raised by these papers, and by the research represented, are concerned with improving the way that Sudanese languages are written. That is to say, developing adequate orthographies. But how is anybody to know when an orthography is adequate?

These papers highlight areas where the question is especially relevant. Is the language adequately represented without representing tone? Does the surface or underlying form more adequately represent the language?

Before these questions can be answered, they must be refined.

Adequate for whom?

Generally speaking, the people making decisions about orthography are the educated members of the community. These individuals are in the best position to be able to use a poor orthography – in other words, what may be adequate for the bilingual mother-tongue speakers, may be hopelessly inadequate for the beginning reader. The beginning reader requires more information to be represented in the orthography than the fluent reader. This should make us careful in recommending that a feature, such as tone for example, not be represented.

Criteria for adequacy

So what is needed is some criteria to be established for determining the adequacy of orthographic representations. The papers in this volume indicate where adequacy needs to be examined. What is needed now is some agreement on adequacy and some procedure for testing adequacy. I look forward to a volume of OPSL that addresses this issue.

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January 2004

THE SOUNDS AND TONES OF FUR

Constance Kutsch Lojenga

Christine Waag

1 Introduction

1.1 The language

FUR is a Nilo-Saharan language spoken in the Dar Fur province in Western Sudan, bordering on Chad. The speakers call their language [pɔɔr], and they call themselves [pɔɔra], Fur people.

Fur is listed by Greenberg (1966:130) as an isolate, one of the six main branches of Nilo-Saharan.

Among the more recent attempts at classifying the Nilo-Saharan language phylum, Bender (1996, 2000) and Ehret (2001) differ in their ways they place Fur in the tree.

Bender (1996: 60,64; 2000:44-45,55) does not place Fur as high up in the Nilo-Saharan family tree as did Greenberg. It is a subgroup on the same level as Maban, Central Sudanic, East Sudanic and Kunama. He also mentions that Fur should no longer be considered a complete isolate, since one of the 'Mimi' languages, also called Amdang (so far unstudied) is a variety of Fur.

Ehret (2001:88) also places Fur much deeper in the Nilo-Saharan family tree, though differently from Bender. After a main division into Koman and Sudanic, the latter branches out into Central Sudanic and Northern Sudanic. Northern Sudanic, in turn, is subdivided into Kunama and Saharo-Sahelian. FOR, as he calls the language, is one of the subgroups of Sahelian.

Bender (1983) estimates the population at 500,000. The speakers themselves give an estimate of 900,000, which sounds very plausible, nearly 20 years later.

1.2 Previous Work on the Language

Jakobi (1990:7-13) gives an extensive documentation of previous work done on Fur. We will cite only those works which have points of interest relating to the vowel and tone systems.

Meinhof wrote various articles documenting languages from Sudan. One of those is Fur, which, in his days, was called Kondjara (Meinhof 1917/18).

A Grammar of the Fur language was written by Beaton, and published in the Linguistic Monograph Series at the University of Khartoum in 1968. The study dates from 1937. He does not give a phonological analysis, but presents the alphabet for his transcription on one page. The rest of his work concerns the grammar of the language: morphology and syntax.

Jernudd (1983) has written a short article entitled *Phonetic Notes on Tone and Quantity in the Fur Language*. It contains exactly this: some observations on tone and length in Fur at a phonetic level.

Jakobi (1990) wrote *A Fur Grammar*. She treats phonology, morphophonology and morphology; a section on tone is included.

With respect to the phonology of the language, Meinhof, Beaton and Jakobi have different views. Meinhof (1917/18:119) presents the language as having nine different vowel qualities, whereby front and back vowels come in pairs of two, as if it were a regular nine-vowel ATR-harmony system. However, he immediately goes on to say that semantic contrast cannot be proven between each set of two vowels, which would reduce the system to five contrastive vowels. Beaton presents eight vowels in his alphabet. Jakobi analyses the language as having five vowels. We have felt that this language deserves some more documentation and will present the results of our phonological analysis in this article.

1.3 This Article

The phonology as described in this article is based on a corpus of about one thousand lexical items, mostly nouns and adjectives, collected during two one-month long sessions with a group of Fur people, in 2002 and 2003. We also have a certain amount of data on verbs; however, since the morphological structure of verb forms contains as yet many secrets, we have not included verb forms in our examples other than in the section on grammatical tone.

In the following sections, we present the details of the phonological analysis. After a section on Syllable and Word Structure, we subsequently treat Consonants, Vowels, and Tones. A section on symbols proposed for a practical alphabet is added at the end.

The data for the present article and the analysis of the intricacies of the vowel and tone systems were collected in collaboration with the following people: Nyarta Kujâk Beetío, Boo'ŋ Kwě Arbâb Yúnis, Garíny Daa Têrre, and Toór Ilmân, whom we thank for sharing their knowledge of their language.

2 Syllable and Word Structure

Fur has both open and closed syllables, which can be short or long. Most monomorphemic words consist of one or two syllables, whereby most combinations of open and closed, and short and long syllables are possible. There are also three-syllable nouns.

Syllable Structures:

Open syllables: (C)V, (C)VV

Closed syllables: (C)VC, (C)VVC

Closed syllables with long vowels, (C)VVC, exclusively occur as monosyllabic words; there are no polysyllabic monomorphemic nouns containing a (C)VVC syllable.

Word Structures of Nouns:

a. monosyllabic nouns:

V	ú	cow	(one example only)
VV	uu	word	(one example only)
CV	-		
CVV	rɔɔ	well, river, stream, lake, sea	
VC	ŕr	giraffe	
VVC	aar	stick of firewood	
CVC	sɔg	day	
CVVC	buúl	hippopotamus;	dúal moon, month

b. disyllabic nouns:

two open syllables:

V.CV	utú	fire
VV.CV	aásu	chin
CV.CV	dulé	sun
CVV.CV	dáálí	tongue
VV.CVV	úúníe	wild dog, sp.
CVV.CVV	tuumíe	anvil

open syllable followed by closed syllable:

V.CVC	ɔɾɔm	hut
CV.CVC	pagus	maize
CVV.CVC	daagul	termite hill

closed syllable followed by open syllable:

VC.CV	aldí	story
CVC.CV	burtó	watermelon

two closed syllables:

VC.CVC	áŋgír	elephant
CVC.CVC	tómbɔl	drum

3 Consonants

3.1 Inventory of Contrastive Consonants

Fur has a straightforward inventory of only 18 contrastive consonants, of which one, the /h/, can be considered marginal.

The obstruents present a voiced-voiceless contrast, except for the palatal one, where the voiceless counterpart of /j/ is lacking. The sonorants present an oral – nasal contrast.

	bilabial	alveolar	palatal	velar	glottal
stops vl.	p	t		k	
stops vd.	b	d	j [dʒ]	g	
fricatives vl.		s			(h)
fricatives vd.		z			
sonorants nasal	m	n	ɲ	ŋ	
sonorants oral	w	l, r	y		

Contrast between the 17 main consonants is proven by the following set of words.

Labial:

paar	tool for cutting grass
baap	valley
maâl	gin
waar	wild tree, sp.

Alveolar:

taar	leg
daara	public place in the village
saab	fence around the house
zaab	canine teeth
nááj	grain of sorghum, millet
laame	slime
raal	spinal cord

Palatal:

jáára	leopard
ɲááb	skin on boiled milk
yáa	woman

Velar:

kaam	thief
gaâr	sheet of paper
ɲááj	sand

The glottal fricative /h/ is very rare. So far, it has only been attested in the following words.

hamu	steam, vapour
hěrra	radiance, light

An initial /h/ is optionally pronounced in the distant demonstrative hĩllâ ~ ĩllâ.

Even though the name of the language is generally known as Fur, there is no /f/ in our consonant inventory. When listening to the language spoken, one will notice an amount of fluctuation between [p], [f], [pf], [ɸ], and [pɸ]. Jakobi (1990:18), has chosen /f/ as the basic phoneme, and has placed it with the voiceless stops in her consonant chart. She states that this phoneme "/f/ is most frequently realised by the fricative [f] and rarely by the optional phonetic variants [ɸ] and [p]." Beaton (1968) uses both <f> and the <p> in his transcription. In word-initial position, he only uses the <f>; the <p> is used word-medially in words which we have analysed as having a lengthened /p/ across syllable boundaries: he writes *apa* 'big' where we have *appâ* (1968:5,10). The speakers of the language with whom we did the research claim that they really have the [p] only. The variant pronunciations with a bilabial or labiodental fricative or affricate are heard word-initially by people who have learnt Arabic according to our informants. Monolingual speakers only pronounce [p] in their opinion. Further observation of those phonetic details is necessary in the home area. The name of the language, Fur, is also following the Arabic pronunciation. In the language itself, it is pronounced /pɔɔr/.

3.2 Distribution

All consonants may occur in word-initial position¹. Most consonants may occur in syllable-final position and in C₂-position between two vowels. However, it seems that there is hardly any contrast between voiced and voiceless obstruents in syllable-final position.

The voiceless bilabial stop /p/ is not found in syllable-final or word-final position. In syllable-final position before another syllable, /b/ is unreleased (ǎbˈdər 'grass, sp. '), and in syllable-final position prepausally, /b/ is devoiced; however with nouns, the plural form shows clearly an underlying voiced stop (kataɓ – kataba 'shoulder').

With the alveolars, the situation seems to be the reverse. The voiceless /t/ frequently occurs syllable- and word-finally (pərɛt – pərɛt-a 'sandal'); there is only one example of /d/ in word-final position, an obvious loan word from Arabic: laad 'Sunday' (< el-aHad). In word-medial position between vowels, both /t/ and /d/ occur. For some words, there is individual variation between /t/ and /d/ in final position: bɔt – bɔt-a 'rope' in variation with bɔd – bɔd-a, and mɪt – mɪt-a 'gourd for measuring sorghum' in variation with mɪd – mɪd-a.

As for the palatal stop: there is no voiced/voiceless contrast, not even in initial position.

With respect to the velar stops, /k/ never occurs syllable-finally. In that position only /g/ is found, once again, unreleased when another syllable follows (tɔgˈtɔgɛ 'bird, sp. ') and devoiced prepausally (rɔɔg – rɔɔg-a 'pebble'). In other positions, the two occur contrastively.

The same can be said for /s/ and /z/. The voiceless fricative occurs in all positions; the voiced one mostly occurs word-initially, and is found so far only once as variant pronunciation of /s/ in ɔnzɔr ~ ɔnsɔr 'mane of horse or donkey'.

All sonorants have been attested in word-final position before pause, including the semi-vowels –y and –w which may occur in both syllable- and word-final position (see also 4.2).

Labial

-p	-	
-b	katab	shoulder
-m	dɛɛm	town
-w	dɪw	goat

¹ Thus automatically means that we disagree with Jakobi in her analysis of [z] and [y] as allophones of one phoneme (1990:19). We have several words beginning with /y/, as well as with /z/.

Alveolar

-t	gambut	container of woven palm leaves
-d	laad	Sunday (< Arabic)
-s	bíís	cat
-z	-	
-n	tiin	ankle
-l	buúl	hippopotamus
-r	ángír	elephant

Palatal

-j	gurâj	cyst
-ɲ	turaɲ	charcoal
-y	duy	pus

Velar

-k	-	
-g	rɔɔg	pebble
-ŋ	ɲééŋ	scorpion

3.3 Consonant Sequences

Since Fur has closed syllables as well as open syllables, and because there are many disyllabic or polysyllabic words, there are many consonant sequences across syllable boundaries. First of all, we look at geminate consonants: a sequence of two identical consonants across syllable boundaries. Secondly, the first consonant may be a nasal, the second an oral consonant: those are generally pronounced at the same place of articulation. And finally, we look at other combinations where, in most cases, the first one is an oral sonorant.

3.3.1 Geminate Consonants

Geminate consonants are found word-medially. The following have been attested in nouns or adjectives (adjectives are given as example only when no nouns were available in our corpus).

-pp-	appâ	big
-bb-	nabbâl	bow
-mm-	lummê	delicious (of liquids)
-ww-	diwwo	new
-tt-	táttáago	grasshopper, sp.
-dd-	búddé	grasshopper, sp.
-ss-	kussê	rough
-zz-	-	

-nn-	bunnu	grass, sp.
-ll-	sallôg	plant, sp.
-rr-	kerra	salt
-jj-	-	
-ɲɲ-	raɲɲâ	sour
-yy-	puyyâ	bitter
-kk-	dɔkkɛ	flat stone for cooking kisra (kind of crepe)
-gg-	agga	bird, sp.
-ŋŋ-	ɔŋŋal	four

3.3.2 Nasal plus Consonant

Nasal-plus-Consonant combinations across syllable boundaries within a morpheme, compound, or even across word boundaries in a sentence tend to assimilate to the place of articulation of the non-nasal consonant. The following are examples of such combinations within words.

-m.p-	ampâr	ampâr-a	friend
-m.b-	jîmbîr	jîmbîr-a	needle
-n.t-	nunti	kunti	tree, sp.
-n.d-	bɔndɛ	bɔndɛ-ŋa	upper lip
-n.s-	n-ansú	k-ansu	breast
-n.z- ~ -n.s-	ɔnzɔr ~ ɔnsɔr	ɔnzɔr-a ~ ɔnsɔr-a	mane (of horse, donkey)
-ɲ.j-	bɪrɪɲjâl	bɪrɪɲjâl-a	onion
-ŋ.k-	-		
-ŋ.g-	zɔŋgɔbɛ	zɔŋgɔbɛ-ŋa	jaw

In some cases, a non-assimilated form exists next to an assimilated form.

-m.s- ~ -n.s-	namsáɲ ~ nansáɲ	kamsa ~ kansa	feather
-m.t- ~ -n.t-	numti ~ nunti	kumti ~ kunti	tree, sp.

This nasal assimilation does not apply in reduplicated forms.

bɪrɪɲbɪrɪɲ	bɪrɪɲbɪrɪɲ-a	wild cat, sp.
kutɪɲtɪɲ	kutɪɲtɪɲ-á	bird, sp.

When the sequence of two consonants across syllable boundaries consists of two nasals, they may be of different places of articulation.

m.ɲ	n-ɪmɲá	k-ɪmɲa	hyrax
m.ɲ	dɔmɲa	dɔmɲa-ŋa	island

3.3.3 Other -C.C- combinations

Most other –C.C- combinations across syllable boundaries consist of an oral sonorant as C₁, followed by any other oral non-sonorant. Most frequent are the combinations -r.C- and -l.C-; there are a number of –w.C- examples, and a rare –y.C- example. There are no specific restrictions on combinations of place of articulation nor on combinations of different features for voicing. With reduplicatives, any combination is possible.

The following lists of examples are not exhaustive.

-r.C-

dir.bo	kind of shelter
dór.té	clay dish
bar.da	grass, sp.
kór.jé	vervet monkey
er.gəl	clay wall of hut
d-ar.ma	skin
gudûr.ne	edible plant, sp.
bôr.ɲə	fox

-l.C-

d-ol.pá	horn
píl.píl	hot pepper (< Arabic)
bal.da	wooden beam
bal.jug	edible plant, sp.
ul.gu	wattle, dewlap
d-il.mo-ŋ	bracelet

-w.C-

gaw.dé	tree, sp. with edible fruit
aw.né	stirring stick
tíw.rí	animal fat
k-iw.li	ribs
k-aw.ga	bark, shell

-y.C-

day.dây	hanging storage place
dây.tên	name of month: Moharan

There are just a few examples of other C.C combinations across syllable boundaries, some being reduplicatives.

əb.dər	grass, sp.
kós.bər	plant, sp.
wít.wít	bird, sp.
rug.rugɛ	bird, sp.

3.4 Nasal Harmony

For most nouns, plural is marked by the suffix *-a* or *-ŋa* only: *-a* is used following a consonant, and *-ŋa* following a vowel, or sometimes following an oral sonorant (*r*, *y*, *w*).

A number of nouns, however, have, in addition to that, an alternation in the first consonant, whereby ***d-*** is used for singular and ***k-*** for the plural, with or without the regular suffix plural marking. A suffix *-(n)ta* may mark plural, too, in such words.

d-alan	k-alan-a	child(ren) of one's sister
d-arma	k-arma	skin
d-ɛwá	k-ɛwá-ŋá	fresh cow dung
d-ɛwer	k-ɛwér-tá	porcupine

When, however, the first consonant following the initial *d-* is a nasal, the *d-* assimilates, and changes to *n-*.

n-úŋí	k-úŋí	eye
n-uun	k-uun	bull
n-ínó	k-ínó-ŋá	meat
n-ansú	k-ansu	breast
n-ima	k-ima-nta	shadow

This process of nasal harmony does not, however, trigger nasalisation on the intervening vowel.

The initial *d-* does not harmonise when the next nasal is a separate morpheme:

the possessive suffix *-ŋ*

d-íí-ŋ	k-íí-ŋ	your(s), 2sg. poss.
d-áí-ŋ	k-áí-ŋ	our(s), 1pl. poss.

the singulative suffix *-ŋ*

d-íí-ŋ	k-íí-ŋá	root
--------	---------	------

The initial *d-* does not change into a nasal when it is part of the root.

dɔmbɔɛ	dɔmbɔɛ-ŋa	book
dɛɛm	dɛɛm-a	town

4 Vowels

4.1 Vowel Inventory

Various authors have quoted different vowel inventories for Fur.

Meinhof (1917/18:119) presents nine vowels for Kondjara, though he expresses his doubts as to whether contrast can be proved.

Jakobi (1990:43) analyses the language as having a five-vowel system.

Beaton (1968:1) transcribes the language with eight vowels. Tucker (1966:219) quotes Beaton's eight vowels: *i, e, ε, a, ɔ, o, u*, and a central vowel *ə*.

Our own analysis has revealed a system of eight contrastive vowels. It is a symmetrical system with ATR harmony. Rather than following Beaton's transcription, we posit [+ATR] and [-ATR] variants of the [+high] vowels, mutually exclusive in root morphemes, and interacting with the other vowels in a system of ATR vowel harmony. In addition, there is a [+ATR] central vowel, like Beaton's /ə/, which has been attested unambiguously in a limited number of words so far. The [+ATR] allophonic realisations of the [-high] vowels /ε/ and /ɔ/ are [e] and [o]. They are written as such in the data in this article whenever they occur in a [+ATR] word. There is also contrast between short and long vowels.

		front	central	back
[+high]	[+ATR]	i		u
	[-ATR]	ɪ		ʊ
[-high]	[+ATR]	[e]	ə	[o]
	[-ATR]	ε	a	ɔ

The words containing only [+ATR] vowels /ə/ are the following:

əbdər	grass, sp.
dəbəg	tree, sp.
dəgər	palate
gərəŋgərəŋ	Adam's apple
kəgər	snake, sp.
kərəmətəg	special part of roof frame
kərgəb	cave, hole

In addition, the [+ATR] vowel /ə/ also occurs in a number of words which end in a high [+ATR] vocoid [i] or [u], which we have opted to treat as consonants, /y/ and /w/.

bəw	axe
təw	waterpot

əw	two
gəw	round hat
yəwyəw	one string of a rope

dəy	oil
dǎy	ant
dây	lalob tree
dáy	he-goat
wəy	pain

There are no exact minimal pairs between /ə/ and /a/ in the polysyllabic words. The closest pairs we have found are the following:

kərgəb	cave, hole	karâb	animal
dəbəg	tree, sp.	gadag	bird, sp.
əbdər	grass, sp.	ampâr	friend

With words ending in –w or –y, there are some minimal pairs, however.

bəw	axe	baw	pond
təw	waterpot	taw	salamander
dăy	ant	dăy	grass, gen.

The following pairs of words demonstrate the contrast between the [+ATR] and the [-ATR] high vowels.

/i/	tindil	rubbish heap	pírí	place of blacksmith	biis	manure
/ɪ/	tɪndɪl	tree, sp.	pírí	leg	bíís	cat
/u/	túúrú	squirrel, sp.	kuur	moss, sp.	kuru	knee
/ʊ/	túúrú	ant, sp.	kuur	wild cat, gen.	kurú	tree, gen.

The following are examples to show the contrast between the non-high vowels:

/ɛ/	ɛɛ	direction	pɛɛr	worm, sp.
/a/	árá	wild tree, sp.	paar	tool for cutting grass
/ɔ/	ɔɔ	road	pɔɔr	Fur language

Contrast between short and long vowels is shown by the following examples.

i – ii	ɲíre	cotton plant
	diire	insect

ɪ - ɪɪ	pírí	leg
	bífrí	grasshopper, sp.
ɛ - ɛɛ	ɲét	all
	ɲɛ̃t	incisor
a – aa	jaré	husband
	baare	salamander, sp.
	namu [n̩amu]	cold, flu
	naamu [n̩̩amu]	crocodile
ɔ – ɔɔ	tɔŋ	house
	bɔɔŋ	leather band of sheath
ʊ - ʊʊ	súru	right side
	zuuru	bird, sp.
u – uu	múru	ingredients for wine
	muurú	lion

There are no examples of an unambiguously long vowel /ə/.

4.2 VV Sequences

Since Fur has a systematic contrast between long and short vowels, the language has both short and long syllables. Sequences of two different vowels are considered on the same level as long vowels, and form long syllables, too. Some occur in open CVV-syllables, some in closed CVVC syllables.

$V_1 = i / ɪ$

[-ATR]		[+ATR]	
kíá	mosquitoes	dio	stomach
sîâm	Ramadan month	píe	rabbit

$V_1 = u / ʊ$

[-ATR]		[+ATR]	
duâ	headpad	duó	person
dúal	moon, month	súe	bellows

However, vowel sequences ending in a [+high] vowel, [+ATR] or [-ATR] present a problem. On the one hand, they could be seen as a long CVV syllable, on the other hand, the final [+high] vocoid could function as a consonant, thus forming a short closed syllable CVC, ending in -y or -w. We have opted for the latter.

An argument against this could conceivably be the fact that they form their plural mostly with -ŋa, which is the regular plural marking for words ending in a vowel. However, the sonorant /r/ in syllable-final position can also be followed by the plural suffix -ŋa.

kóór	kóor-ŋá	war
tír	tír-ŋá	path
sóor	sóor-ŋa	back (body part)
bára	bár-ŋa	brother

In addition, there are some reduplicated words which unambiguously have /y/ or /w/ syllable- and word-finally. Interpreting CVi/CVu as CVy or CVw would fit those existing patterns.

daydây	daydây-a	storage place
kayawkáyaw	kayawkáyaw-a	wild plant, like onion

Both /y/ and /w/ occur lengthened across syllable boundaries, which means that the first one is found syllable-finally.

puyyâ	bitter
diwwô	new

/y/ and /w/ closing a short syllable.

duy	-	pus	(* dui)
dəytên		name of month: Moharan	(* dəitên)

dɪw		goat	(* dɪu)
d-awra	k-awra-nta	leftover porridge	(* daura – kauranta)

Some words consisting of a long CVVC syllable contain two unlike vowels in which the second one is a [+high] vowel. In those words, the [+high] vowel is not considered /y/ since the final C already occupies that position, and since there are no syllable-final consonant sequences.

bam	elder brother
ŋaîl	grass, sp.

Finally, there are a few words which must be seen as having a Cw sequence followed by a single vowel, rather than CuV or CūV. The first vocalic element is so short, that it is clearly of a different nature than CuV or CūV. The consonant is a velar stop in every instance.

kwa (plural of duó)	people
kwě / kwă	child, small ones (diminutive) sg/pl
gwiît ~ wiît	thread

4.3 Vowel Harmony

The inventory of contrastive vowels can be divided into two sets: five [-ATR] vowels: /ɪ/, /ɛ/, /a/, /ɔ/, and /u/, and three [+ATR] vowels: /i/, /u/, and /ə/.

In this section, we will look at ATR vowel harmony as it manifests itself within the word, i.e. the cooccurrences and cooccurrence restrictions between vowels occurring within the same word. Vowel harmony across morpheme boundaries in certain derivational and inflectional paradigms is beyond the scope of this article on the basic phonology of the language.

4.3.1 [-ATR]

The following are examples of the possible combinations of [-ATR] vowels in monomorphemic disyllabic words. There seem to be no systematic gaps in the possible combinations of the [-ATR] vowels, though some are not (yet) attested, and others are rare.

I-ɪ	kɪlí	armpit
I-ɛ	ɪɾɛ	a person who is poor in clothes
I-a	nɪma	shadow, shade
I-ɔ	sɪɔ	excrement (one example only)
I-u	-	
ɛ-I	dɛrí	porridge (one example only)
ɛ-ɛ	pége	anteater
ɛ-a	kɛwa	blood
ɛ-ɔ	mɛrsɔ	limping, one-legged (one example only)
ɛ-u	dɛɾu	wild tree, sp.
a-ɪ	dági	tooth
a-ɛ	jaré	husband
a-a	ájá	paternal aunt
a-ɔ	âwrɔ	tree, sp.
a-u	darú	bone

ɔ-ɪ	tɔɔrí	finger (one example only)
ɔ-ɛ	kɔɛ	eagle, sp.
ɔ-a	bɔra	milk
ɔ-ɔ	kɔɔ	water
ɔ-ʊ	-	
ʊ-ɪ	úrɪ	star
ʊ-ɛ	pule	mudwhasp
ʊ-a	juda	forest
ʊ-ɔ	-	
ʊ-ʊ	kurú	tree, gen.

4.3.2 [+ATR]

Vowel harmony within the word in Fur must be seen as a surface assimilatory process which is gradient and depends on the rate of speech as well as the direction in which the assimilatory process takes place: it is stronger when it is anticipatory, i.e. applies from right to left than vice-versa. The [-high] [-ATR] vowels /ɛ/, /a/, and /ɔ/ assimilate *more* when they precede an underlying [+ATR] vowel /i/ or /u/, *less* when they follow a [+ATR] vowel /i/, /u/, or /ə/, and *not at all* when in turn they are followed by the plural suffix -a or -ɲa.

There is only a limited amount of possible combinations of different vowels in [+ATR] words. The sections below will treat subsequently the vowels /ɛ/ and /ɔ/ in [+ATR] environment, the vowel /a/ in [+ATR] environment, words containing the [+ATR] vowel /ə/, and words with the combination of /i/ and /u/.

4.3.2.1 The Vowels /ɛ/ and /ɔ/ in [+ATR] Environment

The [+ATR] realisation of /ɔ/, when preceding a [+ATR] vowel /u/ is approximately [o], which must be considered as allophonic variant of /ɔ/. Our corpus does not contain words with /ɛ/ followed by a [+ATR] vowel.

pɔgûr	[pogûr]	wild tree, sp.
tógórum	[tógórum]	white ant

Both /ɛ/ and /ɔ/ can follow the [+ATR] vowels /i/ and /u/: all four combinations, i - ɛ, u - ɛ, i - ɔ, u - ɔ are attested. The vowels /ɛ/ and /ɔ/ in this position will undergo ATR-assimilation to the [+ATR] /i/ or /u/ especially in fast speech, but this left-to-right assimilation is not as strong as the right-to-left assimilation shown above. When followed by the plural morpheme -ɲa, these vowels are definitely pronounced [-ATR] [ɛ] and [ɔ] again.

i - ε

níre	[níre]	pl. níre-ŋa	cotton
zílme	[zílme]	pl. zílme-ŋa	fish, sp.

u - ε

umé	[umé]	pl. umé-ŋá	fog, mist
gurbêt	[gurbêt]	pl. gurbêt-a	wild cat, sp.

i - ɔ

d-íló	[díló]	pl. k-íló	[kíló]	ear
d-ító	[dító]	pl. k-ító-ŋá		stone

u - ɔ

kúró	[kúró]	pl. kúró-ŋá	crow
púgó	[púgó]	pl. púgó-ŋá	mountain
duó	[duó]	-	person

4.3.2.2 The Vowel /a/ in [+ATR] Environment

Even though the [+ATR] assimilatory process with the vowel /a/ is in principle the same as with the vowels /ε/ and /ɔ/, there is an extra complication in that the vowel /a/ has a potential phonemic [+ATR] counterpart /ə/.

The realisation of /a/ in [+ATR] words is not necessarily identical to /ə/. The difference may be minimal when the assimilation is anticipatory, but is often more clearly discernable when /a/ follows a [+ATR] vowel /i/ or /u/. We are therefore transcribing this [+ATR] realisation of /a/ differently from the underlying [+ATR] vowel /ə/, namely as /a̠/ with the IPA subscript [+ATR] symbol.

arí	[a̠rí]	forehead	baru	[ba̠ru]	country
táarí	[táa̠rí]	funeral place	maapu	[ma̠apu]	buffalo

When following /i/ or /u/, the ATR-assimilation is less strong. Only one example of a disyllabic word with the combination i – a has been found so far; some more in longer words. Followed by the plural suffix –ŋa, the preceding /a/ shows no real signs of ATR assimilation any more.

siwa	[siwa̠]	pl. siwa-ŋa		a specific woman's hairstyle
ángûrŋa	[ángûrŋa̠]	pl. ángûrŋa-ŋa	[ángûrŋa-ŋa̠]	tree, sp.
kúlíkulíisa	[kúlíkulíisa̠]	pl. kúlíkulíisa-ŋa		eagle, sp.

4.3.2.3 Words with /ə/

There are just a handful of words where the vowel /ə/ in the first syllable functions as the vowel-harmony trigger, causing some degree of ATR-assimilation to a non-identical vowel in the following syllable. In all cases, the first syllable ends in a semivowel, /y/ or /w/, which could be seen as a [+ATR] vocalic element at a phonetic level. The vowel of the second syllable is underlyingly /ɛ/ or /ɔ/, assimilating in fast speech to the [+ATR] quality of the first syllable.

bəwtêṇ	[bəwtêṇ]	hoe
dəwɾɛ	[dəwɾɛ]	woman's hairstyle
wəyyɛ	[wəyyɛ]	ten
dəyyɛ	[dəyyɛ]	Zo Al-Hajja, 12 th month; proper name masculine
kəwɫɔ	[kəwɫɔ]	wind
kəwɫɔ	[kəwɫó]	dry cow dung

4.2.3.4 The Vowels /i/ and /u/

Combinations of the [+ATR] vowels /i/ and /u/ only occur in the order /u/ as V₁ and /i/ as V₂.

juri	clothing
urí	female sheep
núnjɪ	eye

5 Tone

5.1 The Basic Tone System

The information on tone in Tucker (1966:219) is minimal: he quotes some "lexical tone doublets" from Meinhof: kòrò 'water', and kòrɔ 'monkey', probably implying that there are two contrastive tones in the system.

Beaton (1968:2) states: "the Fur language is also tonal, but I have made no attempt to represent tones in this script, because I consider a multiplicity of signs and accents only adds to the confusion in learning a language that is difficult enough already, and the tones are best learned from the lips of a native".

Jernudd (1983) presents more an acoustic study of Fur tones, in which he clearly states, though, that "the number of For tones is three". These three tones are contrastive according to him, but he has no minimal triplets on monosyllables nor on disyllables. On the latter, he often has H.M and L.M sequences, whereas L.H and H.L sequences - a "two-step contrast of tone" as he calls it - are not attested. Several of his Mid examples have LH or L.H in our data. He interprets the personal pronouns subject,

which he uses for frames, as having a Mid tone; in my data, they have a High tone.

Jakobi concludes that the three level tones which Jernudd recognised are "realizations of two contrasting tones, H and L." (Jakobi 1990:50).

Our observations agree with those of Jakobi, namely that the underlying system contains two contrastive tones, L and H. (The third tone which Jernudd has heard may be the surface realisation of a downstepped H tone.) There are also various falling and rising contour tones, which can be seen as LH, HL, and H¹H sequences on one short or long syllable. Sequences of L, H, LH and HL tones alternate and there is hardly any downdrift. However, there is downstep in certain morphotonological environments which are beyond the scope of this article.

With respect to tone-bearing units: short syllables (both open and closed: (C)V(C)) can be said to consist of one mora and can contain a maximum of two tones; long syllables (both open and closed: (C)VV(C)) consist of two morae and can carry up to three tones on the surface.

Before presenting some minimal pairs, which confirm the status of the two contrastive tones and their lexical function, we present some sets of comparable mono- and disyllabic nouns with the regular four or five most common tonal melodies. This means four tonal melodies for monosyllabic monomoraic nouns: H, L, HL, and LH, and for those with at least two morae an additional LHL melody (long monosyllabic and all disyllabic nouns). In addition, other tonal melodies may be found on polysyllabic words, whereby contour tones on non-final syllables are equally possible. Some examples of these are given below, following the more common five tonal melodies.

The following are monomorphemic nouns. Those ending in a vowel mostly take the suffix -ŋa to mark the plural; those ending in a consonant usually take the suffix -a for their plural, though those ending in a sonorant may also take -ŋa. The plural morphemes -a and -ŋa are toneless. Their surface tone is predictable: if the last mora of the noun or adjective carries a level H or level L tone, that tone spreads on to the plural suffix; if the last mora of the noun carries a HL falling contour, this contour splits up and the last part of the contour is realised on the suffix. The reverse, a LH tone on a final syllable or mora, has not been attested.

tɔŋ	tɔŋ-a	house
	↙	
L	L	
ɲééŋ	ɲééŋ-á	scorpion
↘	↘	
H	H	
pûl	pûl-a	groundnut
↘	↘	
HL	HL	

buól	buól-á	hippopotamus
 LH	 LH	

karâb	karâb-a	animal
 LHL	 L.HL	

CVC-nouns

H	sát ~ sôt	sát-á ~ sôt-á	red cap
L	tɔŋ	tɔŋ-a	house
HL	pûl	pûl-a	groundnut
LH	dăy	dăy-ŋá	grass

CVV-nouns

H	díá	kíá-ŋá	wound
L	rɔɔ	rɔɔ-ŋa	river, well, stream, lake, sea
HL	yáa	yáa-ŋa	woman
LH	pié	pié-ŋá	lie
LHL	duâ	duâ-ŋa	headpad
but also:			
LHL	wũo	wũo-ŋa	flour

CVVC-nouns

H	ŋééŋ	ŋééŋ-á	scorpion
L	leɛl	leɛl-a	donkey
HL	kíim	kíim-a	set of round bracelets
LH	buól	buól-á	hippopotamus
LHL	geêŋ	geêŋ-a	ankle of animal

CV.CV-nouns

H.H	máŋá	máŋá-ŋá	gums
L.L	kɔna	-	name
H.L	péla	péla-ŋa	wing
L.H	kurú	kurú-ŋá	tree
LH.L	wěle	wěle-ŋa	market
LH.H	wăŋá	wăŋá-ŋá	firefly

CVV.CV-nouns

H.H	júúrú	júúrú-ŋá	brain
L.L	bɛɛda	bɛɛda-ŋa	bamboo
H.L	kááru	kááru-ŋa	(finger/toe) nail, hoof
L.H	tɔrí	tɔrí-ŋá	finger
LH.L	d-ɔ́pɛ	k-ɔ́pɛ-ŋa	wild tree, sp.
HL.L	yúuyu	yúuyu-ŋa	flock of birds

CV.CVC-nouns

H.H	kímín̩	kímín̩-á	chick
L.L	katab	katab-a	shoulder
H.L	dégər	dégər-ə	palate
L.H	kawíl	-	grass, sp.
L.HL	karâb	karáb-a	animal

CVC.CV-nouns

H.H	dórté	kórté-ŋá	clay dish
L.L	burra	burra-ŋa	dove, sp.
H.L	bórgɔ	bórgɔ-ŋa	oesophagus
L.H	bórrá	bórrá-ŋá	forest
LH.L	zǎrti	zǎrti-ŋa	sling for throwing stones
LH.H	kǎwló	kǎwló-ŋá	dry cow dung

CVC.CVC-nouns

H.H	n-ándúr	k-ándúr-á	shell
L.L	tindil	tindil-a	rubbish heap
H.L	tómbɔl	tómbɔl-a	drum
L.H	telméɲ	telméɲ-á	grass, sp.
L.HL	nabbâl	nabbâl-a	bow
LH.L	gǔmboɲ	gǔmboɲ-a	dove, sp.

CV.CV.CV-nouns

H.H.H	-		
L.L.L	lebeja	lebeja-ŋa	dove, sp.
H.H.L	rín̩lé	rín̩lé-ŋa	lizard, sp.
H.L.H	bórəkó	bórəkó-ŋá	salamander, sp.
L.H.H	kabúró	kabúró-ŋá	locust, sp.
L.H.L	ɲamúro	ɲamúro-ŋa	spider

5.2 Lexical Function of Tone

The lexical function of tone has already been mentioned and exemplified in Tucker and Bryan (1966:219) and also in Jakobi, who cites the same tonal minimal pair as do Tucker and Bryan, and adds some others.

In fact, the lexical function of tone in Fur is quite heavy. The two words quoted by Tucker and Bryan (from Meinhof) and by Jakobi, kərɔ and kəró are in fact part of a minimal triplet. In the other examples, sometimes both singular and plural forms form tonally contrastive pairs.

singular	plural		
kəɾɔ	-	water	(locative: kəɾɔ́)
kəɾɔ́	kəɾɔ́ŋá	monkey	
kǎɾɔ	kǎɾɔŋa	parrot	
gɛra	gɛraŋa	type of container	
gɛrá	gɛráŋá	grass, sp.	
waar	waara	wild tree, sp.	
wáár	wáárá	snake, sp.	
pírí		leg	
pírɪ		hundred	
durú		upper arm	
dúru		soot	
duá	duáŋá	eagle	
duâ	duáŋa	headpad	
wúo	wúoŋa	grandfather	
wũo	wũoŋa	flour	
kɪná		border (pl. kɪnáŋá)	
kíná		lice (sg. nínáŋ)	
keréŋá		traditional boat, pl. (sg. keré)	
kereŋa		tree, sp., pl. (sg. kereŋ)	

5.3 Grammatical Function of Tone

In addition to the lexical function, tone also has a grammatical function in Fur. So far, two domains can be cited where tonal contrasts signal grammatical differences.

1. Locative nouns may only differ from the regular citation form by their tonal melody², e.g.:

tɔŋ	house	tɔ́ŋ	in the house
tɪndɪl	rubbish heap	tɪ́ndɪl	on the rubbish heap
zalda	rock	záldá	on the rock

² Fur has two morphological means of expressing a locative: by a suffix -lé, or by tone (cf. also Jakobi 1990:121-122).

ṛṛ	well	ṛṛ	at the well
baru	country	barú	in the country
kṛṛ	water	kṛṛ	in the water
dṛṇá	hand	dṛṇa	in the hand
dúló	hole	dúlo	in the hole
yṛrá	hill	yṛra	on the hill
kurú	tree	kúru	in the tree

2. In the verbal system, a number of tonal contrasts have been noted, marking differences in tense/aspect or in person. However, this is not something which occurs regularly in every verb paradigm, but occasionally, and in unpredictable ways.

Some examples:

kurto	dig, 3sg. Past	kurtó	dig, 3sg. Subjunctive
kúrtó	dig, 1pl. Past	kúrto	dig, 1pl. Subjunctive
ṛṇṇ	sit, 1sg. Past	ámı	eat, 1sg. Past
ṛṇṇ	sit, 3sg. Past	amí	eat, 3sg. Past
jaá	put, 2sg. Past	jéépəl	jump over, 2sg. Present
jáá	put, 3sg. Past	jéépəl	jump over, 3sg. Present
usṛṇṇ	sow, 1sg./3sg. Past	kawe	do, 3pl. Present
usúṇṇ	sow, 1sg. Subjunctive	káwe	do, 3pl. Past
úsúṇṇ	sow, 3sg. Subjunctive		
ísó	collect, 1sg. Past	kəllə	pull, 3sg./1sg. Past
iso	collect, 3sg. Past	kélló	pull, 3sg. Subj.
íso	collect, 1sg. Subj.	kəlló	pull, 1pl. Subj.
isó	collect, 3sg. Subj.		

6 Alphabet

The following are the graphemes that have been proposed for writing Fur.

Consonants

		bilabial	alveolar	palatal	velar	glottal
stops	vl.	p	t		k	
stops	vd.	b	d	j	g	
fricatives	vl.		s			h
fricatives	vd.		z			
sonorants	nasal	m	n	ny	ŋ	
sonorants	oral	w	l, r	y		

Vowels

		front	central	back
[+high]	[+ATR]	i		ɯ
	[-ATR]	i		u
[-high]	[+ATR]		ɤ	
	[-ATR]	e	a	o

Tones

There are two level tones, high and low, and two contour tones, rising and falling.

High tone is marked by an acute accent:	nyéén	'scorpion'
Low tone is unmarked in the orthography:	elle	'village'
Falling tone is marked by a circumflex:	pâl	'groundnut'
Rising tone is marked by a wedge:	ŭr	'giraffe'

Contour tones on long vowels are split into their two constituent parts:

H + L	páal	big male domestic animal (cow, horse, goat, sheep)
L + H	buúl	hippopotamus

A contour tone consisting of a sequence of three tones, LHL on a long syllable is split in L (absence) on the first vowel, followed by HL (circumflex) on the second vowel, because the final L spreads on to the plural morpheme.

L + HL	giîm	small mosquito
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The *alphabetical order* of vowels and consonants is as follows:

a ạ b d e g h i ị j k l m n ny ŋ o p r s t u ɯ w y z

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Issues in Toposa Orthography

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1. INTRODUCTION

1.1. CLASSIFICATION AND LOCATION

Toposa is classified as Eastern Nilotic and belongs to a dialect continuum normally referred to as Teso-Turkana, which consists of the following members:

Toposa (Sudan), Jie (Sudan), Turkana (Kenya), Nyangatom/Dongiro (Ethiopia)

Karimojong (Uganda), Dodos (Uganda), Jiye (Uganda), Teso (Kenya and Uganda)

Toposa is spoken by up to 200,000 people in the extreme Southeastern corner of Southern Sudan.¹

1.2. TOPOSA ORTHOGRAPHY IN ITS SOCIO-POLITICAL CONTEXT

As listed above, the members of Teso-Turkana dialect chain extend over four sovereign states which makes a joint approach to matters of orthography, education and language development virtually impossible as each of these states employs a different mix of languages as national language and/or languages approved in primary education, so dialects tend to be very different with regard to loan words.² Furthermore, each country has a different approach to alphabet standardization and the use of special characters and the marking of voiceless vowels.³

The development of more widely approved standards has been further impeded by poor infrastructure across the entire area of Teso-Turkana, lack of cross-border contact, mutual hostility between groups, general instability in Northeastern Uganda and the civil war in Sudan which has severely affected the entire Toposa territory. Over the last two decades, the Toposa have seen a number of administrative changes while Kapoeta town changed hands twice and the administrative center for all of Southern Sudan has been established at Narus which has brought the Toposa into contact with members of other ethnic groups they had never met with before 1991.

Literacy work based on linguistic research and involvement of the Toposa community began in the early eighties. As a result, in 1986 a group of educated Toposa refugees formed a language committee and decided on the most important spelling conventions for their language. These rules were published in a Spelling Guide and have undergone very little revision since then.⁴

2. THE MAIN ISSUES IN TOPOSA ORTHOGRAPHY

The main issues any Toposa writing system has to consider are:

- Special characters: palatal and velar nasals and palatal affricate
- Vowel harmony
- Voiceless vowels
- Tone
- Phonemic vs. morphophonemic spelling
- Word division
- Contractions
- Diphthongs, glides, palatalization and labialization
- Punctuation

These will be considered now in the above order.

2.1. PALATAL AND VELAR NASALS AND PALATAL AFFRICATE

There seems to be consensus among the educated Toposa to represent the palatal and velar nasals and the palatal affricate as follows:

[ɲ] -> <ny> <Ny>

[ŋ] -> <ŋ> <ŋ>

[tʃ] -> <c> <C>

This agrees with the practice found in all earlier Toposa publications.⁵ However, where the symbols for the velar nasals are not available in the character sets installed on a particular computer, writing the velar nasal as <ng/Ng> is perfectly acceptable.⁶

2.2. VOWEL HARMONY

Toposa has nine fully voiced vowels falling into two harmony sets (Schröder, H. & M. C. Schröder 1987), however only the symbols <a, e, i, o, u> are known and used in Toposa.⁷

There are four reasons against introducing the differentiation between two sets of vowels:

1. While there are clearly phonetic differences between [+ATR] and [-ATR] vowels and a few minimal pairs can be found, most speakers don't seem to be consciously aware which set a particular vowel belongs to and, as tests have shown, are finding it difficult to mark this distinction consistently when writing.
2. The [±ATR] quality of roots changes depending on affixation, in nouns as well as in verbs. Many affixes interact and are themselves subject to complex harmony changes. This means that both roots and affixes often occur in several phonetic shapes.⁸ In other words: what appears on the surface is very different from what happens underlyingly.⁹
3. Readers seem to find no serious difficulty in reading fluently and pronouncing word forms correctly when reading texts written with only five vowels.
4. In all neighboring dialects only the five vowels <a, e, i, o, u> are used.

2.3. VOICELESS VOWELS

All nine vowels also occur devoiced in prepause contexts where they contrast with their voiced counterparts or zero (Schröder, M. C. & H. Schröder 1987). A number of morphemes consist of nothing but a high voiceless vowel, so the functional load involved is very high.

However, only high voiceless vowels [ɪ̥/ɪ̥] and [ʊ̥/ʊ̥] can have morphemic status, the awareness of the quality of the voiceless mid vowels [e̥/e̥] and [o̥/o̥] and of the low vowel [ḁ] is rapidly changing among the younger generation: either these vowels are no longer perceived at all (especially [ḁ]), or they are reinterpreted as copying the quality of the preceding vowel, for example:

nye-ris̥a “cheeta” ɲi-ris̥a-e “cheetah” (root *ris̥a~ris̥a)

The morphology is clear, the root changes from *ris̥a* to *ris̥a* before the plural suffix *-e*. However, among the younger generation, the singular form is usually reinterpreted as *nyeris̥i* where the final voiceless vowel has lost its distinctive quality and merely copies the root vowel.

Together with their Language Committee, the Toposa community decided to introduce the writing of voiceless vowels in 1986, however with the restriction that they were to be written only where the phoneme also constitutes a morpheme.

It was decided to mark voiceless vowels with an underline. Consider the following examples involving the reflexive suffix *-i*, the allative suffix *-u* (motion towards the speaker), and the abstract suffix *-u*:

tabany	“shave!”	
tabany _i	“shave yourself!”	
topet	“kick!”	
topet _u	“kick this way!”	
nyalilim	“I am not cold”	
nyalilim _u	“coldness”	
taram _u	[taram ^w]	“drive in my direction”
taram _u naalo	[taram ^u naalo]	“drive in my direction here” ¹⁰

This decision made Toposa the first member of the Teso-Turkana dialect chain to introduce the writing of voiceless vowels and this was a major improvement. However, the writing of the actual underlying shape of many nominal and verbal roots remained deficient. Consider the following examples:

<i>spelling</i>		<i>underlying form</i>
tabany	“shave!”	tabanya _a
topet	“kick!”	topete _e
nyamoru - ṇamor	“stone SG/PL”	nyamoru - ṇamor _u
nyabul - ṇabulyo	“drum SG/PL”	nyabuli _i - ṇabulyo

Sentiments among the younger generation have changed during the last decade and many people have opted to write all occurrences of underlying voiceless vowels, as in the underlying forms presented above.

This is more consistent as it represents the underlying root shapes in many cases more faithfully. Years of testing has shown that writing the voiceless vowel clearly helps readers to better recognize which root is intended, while leaving it off sometimes creates confusion.¹¹

moru ~ mor _u	“rock”
buly ~ bul _i	“drum”
pete ~ pete _e ~ pet	“kick” ¹²

An area that is also under reconsideration is the writing of all those cases where voiceless vowels occur phrase-medially, i.e. they are pronounced as more voiced (but not as fully voiced as normal voiced vowels), such as when the question marker *-a* is appended, or in compounding, as is commonly the case with numerals:

nyekokolani _i	“a thief”
nyekokolan ⁱ a?	“a thief?”
ṇikani _i	“five”
ṇikan ⁱ -kaapei	“five and one [= six]”

The above instances could theoretically be written as

nyekokolani-a, nyekokolania, nyekokolani_i a or nyekokolani_i-a
 ṇikani-kaapei, ṇikanikaapei, ṇikani_i kaapei or ṇikani_i-kaapei

Deviating from the earlier choices of <nyekokolani-a> and <ɲikani-kaapei> the consensus seems to have shifted towards writing <nyekokolanị-a> and <ɲikanị-kaapei>.

2.4. TONE

Tone in Toposa is grammatical rather than lexical. Tone patterns extending over phonological words mark case in nouns and tense in verbs. Therefore tone seems to carry a high functional load when one constructs minimal pairs out of context. In normal syntactical environments however, there are seldom any ambiguities. The following reasons could be adduced against the introduction of writing tone:

- There is no perceived need for doing so.
- No other dialect in Teso-Turkana marks tone.¹³
- Attempts at marking tone have not been very successful in the past; it seems difficult for Toposa writers to mark tone consistently.
- The average reader has no problem reading a text that has not been marked for tone as the intended case is also indicated by the syntactical position of a word, and the tense of a verb usually becomes clear from the context.

It has been suggested that tense could be marked on the last syllable of the verb with an acute, irrespective of the tone on that particular syllable, but this idea never caught on with a small test group. More research and testing may be necessary in this area.

2.5. PHONEMIC VS. MORPHOPHONEMIC SPELLING

A number of nominal and verbal prefixes have phonologically conditioned allomorphs. Should these be written phonemically or morphophonemically? For example, the verbal class prefix {to-} has an optional allomorph /ta-/ before roots with /a/, and the class prefix {ki-} has an optional allomorph /ku-/ before CVC roots with either /u/ in the nucleus or /w/ as the first consonant:

to-nyam ~ ta-nyam	“eat (intr.)”
ki-muj ~ ku-muj	“eat (trans.)”

In the same way, the gender prefix {ɲi-} of masculine and diminutive plural nouns has an optional allomorph /ɲu-/ if the following root begins with /w/ or has /u/ in the nucleus of the first root syllable.

ɲi-tuɲa ~ ɲu-tuɲa	“people”
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The formative prefix {ki-} of verbal nouns (“infinitives”) has an optional allomorph /ku-/ under the same conditions:

nya-ki-waɲ ~ nya-ku-waɲ	“praising ox”
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Some Toposa speakers favor the morphophonemic option, however, the majority preferred the phonemic spelling and want to write <ta-, ku-, ɲu-, -ku-> in all instances where possible. Further testing and discussion with Eastern Toposa speakers will be necessary before a final decision is made as the degree of assimilation is slightly stronger in Western Toposa.

It should also be borne in mind that in some words the assimilation has become so complete that it is no longer reversible,¹⁴ for example:

nuukwa	“thorns”	(*ɲiukwa/*ɲikukwa)
ɲuumwa	“sorghum, dura”	(*ɲiumwa/*ɲimumwa)
kuuduni	“they gathered”	(*kiuduni/*kiwuduni)
nyakuuma	“wedding”	(*nyakiuma/*nyakiwuma)
kuwaɲ	“sing ox-song!”	(*kiwaɲ)
nyakuwat	“blessing”	(*nyakiwat)
taram	“beat”	(*toram)

2.6. WORD DIVISION

2.6.1. LOCATIVE CONSTRUCTIONS

Across the entire dialect chain, the writing of locative constructions varies widely, an indication that the setting of standards in this area has been difficult, and not only for Toposa.

Word division in locative phrases presents a number of challenges for the following reasons:

Firstly, in locative constructions, locative prefixes take the place of gender-number prefixes,¹⁵ but they are not as closely joined to the following root as the gender-number prefixes:

- (1a) Eyokokɪ aʌɲ nye-kitoe “I see the tree.”
 (1b) Mini aʌɲ lo-kitoe “I am going to the tree.”

Secondly, in certain constructions, two locative elements are joined together (either *ka-lo-* ‘masculine’ or *ka-na-* ‘feminine’). These appear to be more closely joined to each other than to the root that follows:

- (1c) Abuni aʌɲ ka-lo-kitoe “I am coming from the tree.”
 (1d) Eboyi aʌɲ ka-lo-kitoe “I am sitting at the tree.”

A further complication arises from the fact that proper nouns behave very differently. Instead of the gender-number prefix proper nouns have a vocative prefix that has the same shape as the locative prefix:

- (2a) Eyokokɪ aʌɲ lo-yoro “I see (river) Loyoro.”
 (2b) Mini aʌɲ lo-yoro “I am going to Loyoro.”
 (2c) Abuni aʌɲ ka-lo-yoro “I am coming from Loyoro.”
 (2d) Eboyi aʌɲ ka-lo-yoro “I am sitting at Loyoro.”¹⁶

Finally, a number of proper nouns do not have a vocative prefix at all. Compare the following group with data sets (1) and (2):

- (3a) Eyokokɪ aʌɲ siɲaita “I see (river) Singaita.”
 (3b) Mini aʌɲ siɲaita “I am going to Singaita.”
 (3c) Abuni aʌɲ ka-lo-siɲaita “I am coming from Singaita.”
 (3d) Eboyi aʌɲ ka-lo-siɲaita “I am sitting at Singaita.”

Regarding place names in groups (2) and (3), the problem of where to mark capitalization is added to the question of how to join (or separate) the locative elements.¹⁷

At this point it will be instructive to look at how word division was handled in earlier Toposa literature, and how it is handled in present day literature in Karimojong and Turkana.¹⁸

	<i>Toposa 1946</i>	<i>Kar. 1974</i>	<i>Kar. 1976</i>	<i>Turkana 2001</i>
<i>1b</i>	lo kitoe	lokitoē	lo kitoe	lokitoē
<i>1c+d</i>	ka lo kitoe	alokitoē	alo kitoe	alokitoē
<i>2b</i>	lo Yoro	Loyoro	Loyoro	---
<i>2c+d</i>	ka lo Yoro	a Loyoro	a Loyoro	---
<i>3b</i>	Siṇaita	Siṇaita	Siṇaita	Siṇaita
<i>3c+d</i>	ka lo Siṇaita	alo Siṇaita	alo Siṇaita	alo Siṇaita

Evaluation: There are two joining and two splitting strategies. The best way out of the conflict seemed to go with the native speakers' intuition. The modern Toposa consensus clearly favors the following:

<i>1b</i>	lokitoē	"to the tree"
<i>1c+d</i>	kalo kitoe	"at/from the tree"
<i>2b</i>	Loyoro	"to the Loyoro [river]"
<i>2c+d</i>	ka Loyoro	"at/from the Loyoro [river]"
<i>3b</i>	Siṇaita	"to the Siṇaita [river]"
<i>3c+d</i>	kalo Siṇaita	"at/from the Siṇaita [river]"

No matter which solution is chosen, none would result in a tidy pattern without exceptions. The advantage of the current solution is that (1c+d) are parallel to (3c+d), and that the shapes of the place names *Loyoro* and *Siṇaita* remain constant in all contexts. The case for joining *kalo* is strong as it is supported by both Karimojong 1976 and Turkana 2001, even though Turkana has decided to also join the locative markers to the following nominal root, a solution rejected by Toposa writers.

2.6.2 POSSESSIVE CONSTRUCTIONS

In possessive constructions in which the possessive pronoun follows the possessed noun, there are two levels of association between noun and pronoun. The normal possessive pronoun is an isolated word. In certain frequent constructions, however, noun and pronoun have become fused (and in the case of several kinship terms the nominal root has been assimilated to the following pronoun), for example:

<i>isolated noun</i>		<i>possessive phrase</i>	<i>meaning</i>
nyakai	"hut"	nyakai keṇe	"his hut"
amae	"uncle"	amaakaṇ	"my uncle"
ito	"mother"	itekeṇe	"his mother"
lokoku	"son"	lokookeṇe	"his son"

The Toposa have opted to write ordinary possessive phrases with separate words and frozen constructions as joined together.¹⁹

There are constructions in which a noun is preceded by a gender prefix and the word *ka* which are in a close phonological association with the following noun. These constructions should probably be separated by a space (or a hyphen):

nyeka nyabityaṇu	"one of craziness"	(nyeka-nyabityaṇu)
ṇika Lopyemu	"those of Lopyemu"	(ṇika-Lopyemu)

As with locative constructions above, joining too many elements would create a problem with capitalization here also: **nyekanyabityaṇu* and **ṇikalopyemu* (or even **ṇikaLopyemu*) seem not acceptable.

Constructions in which the locative *ni* is joined to a possessive pronoun function as one word and should be written together:

nikaŋ	“at my place”
nikoni	“at your place”
nikene	“at his place”

Also constructions in which only a gender prefix (*nye- nya- ŋi- ŋa- lo- lu- na-*) is joined to a possessive pronoun, these function as one word and should be written together:

nyekaŋ	“that of mine”
ŋikene	“those of his”
nakoni	“that of yours”
lukece	“those of theirs”

2.6.3 CONSTRUCTIONS INVOLVING QUANTIFIERS

There are some constructions in which an indefinite quantifier like *nyece* “another”, *nyidio* “some” or *nyamodio* “any” is used together with a noun. In these cases the noun drops its gender prefix and is in close phonological association with the preceding quantifier. Toposa speakers indicated that these constructions should be written as divided rather than joined:

nyece kile	“another man”
nyace paaran	“one/another day”
nyamodio kimuj	“any food”
nyidio bore	“something”

2.7. CONTRACTED FORMS

2.7.1. CONTRACTIONS IN REDUPLICATIONS

There are many roots which are historically reduplications of the CV-CV type, but synchronically these roots are assimilated to their prefixes:

<i>surface form</i>	<i>underlying form</i>	<i>meaning</i>
nyaasikini	nyasisikini	“to leave”
toosiki	toosisiki	“leave!”
naapu	napupu	“hedgehog”
naase	nasese	“striped”

Western Toposa clearly prefer to write the contracted forms.

2.7.2. CONTRACTIONS IN COMPOUNDS

In some compound names the elements are contracted, for example:

Morukeerisi	(moru ka nyerisi = mountain of the leopard)
Morukaakuju	(moru ka nyakuju = mountain of God)

Such compounds are written in their contracted form. Another option would be to use an apostrophe (as in English “can’t” for “cannot”). This would leave us however with the question of whether to write the length following <k’> or leave it to the reader to supply the lengthening automatically:

Moru k’ Erisi	~	Moru k’ Eerisi
Moru k’ Akuju	~	Moru k’ Aakuju

2.8. DIPHTHONGS, GLIDES, PALATALIZATION AND LABIALIZATION

This is an area where more groundwork needs to be done. It seems that all sorts of vowel sequences occur, both mixed with glides and without glides. There is contrast between (hypothetical data):

tua
twa
tuwa

Often glides are elided in speech, should they be written? Look at the root *ya “to take/bring”, for example:

yau “bring!”
eaio “it will be taken away”

This area is extremely complex and needs more investigation.

2.9. PUNCTUATION

Awareness of the need for a set of rules on how and where to set comma, colon, quotation marks and the like is minimal at the moment and not part of instruction in primary schools in Kapoeta district. The following areas should be investigated:

- a) To what extent should we follow the English pattern?²⁰
- b) Should sequential verbs in narratives all be separated by comma?

It could be argued that in some cases a sequential verb merely modifies the preceding one rather than constituting a new action, in such cases we suggest not to use comma:

Tonyou, tolimoki tem, ... (He got up, he told [him and] said, ...
he-rose he-told he-said

3. CONCLUSION

Orthographies never exist in complete isolation, they usually interact with neighboring dialects and are influenced by national languages, trade languages and the language policies of national governments. This is true of Toposa and the other members of the Teso-Turkana dialect chain in very special ways.

Orthographies cannot afford to remain static if they want to address the felt needs and perceptions of those who use them, as inevitably all languages undergo constant change. The desire of the Toposa community to write more voiceless vowels is a good example.

Even though governments and linguistic consultants can help a community to formalize the rules of how their language should be written and taught, ultimately the community itself must decide, and these decisions need to be revised time and again as the language continues to change and evolve.

APPENDIX: GRAPHEME CHART

The Toposa graphemes currently in use can be charted as follows:

p	t	c	k	i	ị	o	ọ
b	d	j	g	e	ẹ	u	ụ
	s			a	ạ		
m	n	ny	ŋ				
	l						
	r						
w		y					

Note that all consonants, except <w/y> of course, also occur in labialised and palatalized forms. These are simply written as <pw, py, tw, ty, cw, cy> etc.

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NOTES

- ¹ Figures in publications vary widely, and the UN-sponsored census witnessed by the author in 1984 cannot be considered reliable as there were not enough enumeration books available on one hand, while on the other hand the enumerators had a vested interest in inflating the numbers.
- ² Toposa loans used to be mostly from Arabic, but the Toposa community has recently decided to replace Arabisms with suitable Toposa equivalents. Many established ecclesiological loans derive from Italian as the earliest missionaries in the area were the Verona Fathers from Italy.
- The majority of Turkana loans are from Kiswahili, a few from English. Nyangatom loans are mostly from Amharic. Karimojong loans come from Kiswahili, a few from Buganda, ecclesiological terms are mostly Italian. Teso loans are either Kiswahili or English as it is spoken on both sides of the Kenya-Uganda border. Dodos, Jiye in Uganda and the Jie of Sudan have not been examined for the purposes of this paper.
- ³ For example, the Kenyan government's guidelines force the Turkana people to write the velar nasal, which is the most frequent consonant in their language, as a trigraph <'ng> (parallel to Kiswahili), and there is no recognition of the urgent need to mark voiceless vowels.
- Apart from governments, local churches and missionaries also influence orthography design. For example, in the case of Karimojong, the writing of voiceless vowels was rejected by a UBS consultant (who had no linguistic training) on the grounds that in a totally unrelated language in Kenya the writing of extra vowels had led to confusion. This unfortunate decision left the current ecumenical translation project of the entire Bible with a seriously underdifferentiated writing system.
- ⁴ The revisions concerned mostly the writing of more voiceless vowels (see section 2.2.) and questions of word division (see section 2.6.).
- Based on this orthography the following materials were produced: Alphabet Book, Primer 1, Reader 1, Reader 2, Teacher's Handbook, and a Spelling Guide. All these are in the process of being revised to reflect the shift in preferences that have taken place since 1986. As the original Committee is no longer active, the relay baton has been taken up by a team of dedicated Toposa men based in Uganda, developing literature for their community under the capable leadership of James Lokuuda Kadanya who has kindly proofread and advised on this description of the current state of affairs in Toposa spelling.
- ⁵ This also agrees with the standard used in all Karimojong publications. Turkana however uses <ch> instead of <c>, presumably due to English influence, and <ng> as a simplified version of Kiswahili <'ng>. The use of <ŋ> is not acceptable to the Kenyan education authorities.
- ⁶ As was already the custom during the days when most people used typewriters and adding special characters to a machine was difficult and uncommon.
- ⁷ The symbol <ë> introduced by some missionaries in the 1930ies was based on a wrong perception and was never accepted by the Toposa community.
- ⁸ This problem could theoretically be overcome by using the symbols <ë, ĭ, ö, ü> (which are also used in other Sudanese languages for this purpose). Such a solution would have the advantage that the basic graphic shape of the vowels is retained, irrespective of what harmony-changing processes are working together to derive a particular verb or noun form. Introducing new phonetic symbols <ɛ, ɪ, ɔ, ʊ> is clearly not advisable for Toposa as it would introduce many different graphic shapes for most verbal and nominal roots and suffixes.

- ⁹ This might also explain the difficulty native speakers have to make a conscientious distinction when writing, as the harmonizing processes seem to take place at the subconscious level.
- ¹⁰ The voiceless vowel in phrase medial position is written as voiceless (with underline), even though in this environment it is clearly voiced. The reader makes this change automatically.
- [m^w] is phonetically a bilabial nasal produced with rounded lips. In medial position, the vowel in [m^u] (which is devoiced in prepause) is realized as a voiced vowel, but shorter than a vowel that has an underlying voiced vowel.
- ¹¹ Writing voiceless vowels as full vowels (as Karimojong publications do), creates even worse problems for readers, they almost always stumble at these points.
- ¹² Note that not all voiceless vowels become more prominent when suffixes are added. Especially in the conjugation of verbs the voiceless vowel may become deleted.
- ¹³ This is not a strong argument. Toposa also decided to introduce voiceless vowels as the first member of Teso-Turkana.
- ¹⁴ While this has been tested for Western Toposa, for Eastern Toposa this still needs to be confirmed.
- ¹⁵ These prefixes are:

<i>gender-number prefixes</i>			<i>locative prefixes</i>	
<i>masculine</i>	<i>diminutive</i>	<i>feminine</i>	<i>masculine</i>	<i>feminine</i>
SG nye-	nyi-	nya-	lo-	na-
PL ŋi-	ŋi-	ŋa-	-/-	-/-

- ¹⁶ This holds true only of proper nouns that designate inanimates, i.e. place names and plant names. Names that refer to people or animals require a different construction with *nika* ‘to the place of’ or *kani-ka-* ‘at/from the place of’.
- ¹⁷ Theoretically, the following possibilities exist:
- | | | |
|-------------------|---------------------|--------------------|
| <i>Group 1c+d</i> | <i>Group 2c+d</i> | <i>Group 3c+d</i> |
| nye-kitoe ‘tree’ | Lo-yooro ‘L.-River’ | Siŋaita ‘S.-River’ |
| A kalokitoe | A Kaloyoro | A Kalosiŋaita |
| B ka lokitoe | B ka Loyoro | B ka Losiŋaita |
| C kalo kitoe | C kalo Yoro | C kalo Siŋaita |
| D ka lo kitoe | D ka lo Yoro | D ka lo Siŋaita |
- ¹⁸ We have consulted Toposa Bible Stories published by the Verona Fathers in 1946, the Karimojong New Testament published by the United Bible Societies in 1974, the Karimojong New Testament published by the Catholic Press in 1976, and the Turkana Bible published by the Kenyan Bible Society in 2001.
- The examples, of course, were charted in analogy to other constructions found. as these proper nouns do not occur in the Biblical texts. Since no NT place name has a built-in locative prefix *lo-* or *na-*, we have looked at how “Nazareth” was handled which in the Karimojong translations it is treated as if it had the feminine locative prefix, in Turkana it is always referred to as “he village Nazareth” and therefore could not be used as an example.
- ¹⁹ Another good option would have been to put a hyphen between noun and pronoun for all fused forms:

amaa-kaŋ “my uncle” ite-keŋe “his mother” lokoo-keŋe “his son”

- ²⁰ This may not be obvious to most English speakers, but other Indo-European languages differ in several respects, to mention but a few possible alternatives:
- Should commas be put where there are phonological pauses or strictly to separate clauses?
- Should direct speech be preceded just by comma or by colon?
- Should each change of speaker in a conversational exchange be marked by a new paragraph or should the response be part of the same paragraph?
- Should the opening quotation marks of a longer speech be repeated at the beginning of each new paragraph or be left off? (This is probably the most misleading and puzzling convention for non-native readers in English texts.)

A JOURNEY IN ORTHOGRAPHY EVALUATION MY OTUHO EXPERIENCE

John Duerksen

In late 2001, I was asked to do an evaluation of the orthography being used in the forthcoming Otuho New Testament (NT). The evaluation was needed because the spelling in the NT did not match that being used in the literacy materials currently being produced. It was felt that the NT and literacy materials needed to be written using the same spelling rules in order to have consistency in Otuho materials and to be able to train readers who could read the NT.

Although my task was to evaluate the spelling of the NT text, as my colleague Leoma Gilley most aptly wrote, “Orthography is not just about sounds and letters, it is also about spelling rules and consistency and readability.” That was in fact what I found. Although spelling differences could be explained, the overall picture of Otuho orthography involves “spelling rules and consistency and readability” and the personalities of those involved in producing material in Otuho. This article is a description of the issues with which I struggled and why these issues are problematic in an orthography.

The task was to evaluate what was found in the Otuho text being produced by the UBS team. I have not done linguistic research on the Otuho language and have had to rely on others who have studied the language.¹ My particular focus was to find and evaluate the differences between the UBS spelling in the translated material and the literacy team spelling as found in the literacy materials.

A summary of Otuho phonology

Otuho is a member of the Lotuko-Maa languages of the Nilo-Saharan, Eastern Nilotic family. Other related languages are Dongotono, Lango (of Sudan), Loppit and Lokoya. Other more distantly related languages are Maasai, Ngasa and Samburu; and Bari, Kakwa, Mandari together with Teso, Karamojong, Toposa, Turkana and Nyangatom.

Consonants

The inventory of consonants includes:

Voiceless and voiced stops: p, b, tt /t/, d, c, j, k and g

Nasals: m, n, ny, ng

Fricatives: f, t /θ/, s, h

Semi-Vowels and Laterals: w, y, l, r

¹ Some linguistic research on Otuho was undertaken by Heather Cotes of SIL from 1983-1985. In 1985 her article, *Otuho Phonology and Orthography*, was printed in OPSL no. 4. Richard Watson, also of SIL, contributed much to the orthography developments in the late 1990s (mostly documented in personal files). Other references are: Arber, H. A. *A Simple Lotuko Grammar and Lotuko Vocabulary*. 1936; and Muratori, Carlo. *Grammatica Lotuxo Part I & II and English Bari-Lotuxo-Acoli Vocabulary*. Okaru: Catholic Mission Printing Press. 1948.

The notable consonant feature is the presence of fortis consonants that occur syllable initial and are written as double consonants: tt, dd, k (fortis form of h), nn, ll, rr, ww, yy. Fortis consonants are spelled with apostrophe in word initial position: 't, 'd, k, 'n, 'l, 'r, 'w, 'y.

Labialized (CuV) and/or Palatalized (CiV) consonants may also occur in syllable initial position. They are written 'Cu' and 'Ci' respectively, e.g., aciaŋ [âciân] / aciaŋi 'animal / animals'; adîôrô 'rats'; agualiti / aguali 'necklace ring'; edohuo 'clouds'.

Vowels

Otuho is a five vowel system with vowel sets differentiated by Advanced Tongue Root. +ATR vowels are called "Heavy"/"Strong" vowels and –ATR vowels are called "Light"/"Weak" vowels. The /a/ is neutral in the system. The –ATR vowels are written with a "cap" (circumflex), thus the two sets are +ATR [i, e, o, u] and –ATR [î, ê, ô, û].

Written word	English meaning	Example
emeri	bell	obo emeri ana
êmêrî	gum	obo êmêrî ana
odik	cloudy	buo inyi odik oloŋ alîa
ôdîk	enduring	buo inyi ôdîk oloŋ alîa

There is vowel harmony within a word with +ATR usually spreading from right to left, i.e., +ATR suffixes affect the root and +ATR roots affect the prefixes. For example, the +ATR plural suffix /-i/ affects the singular root: ôbêyôk 'fox' and obeyohi 'foxes' [ôbêyôk-i].

The vowels may also be either Short or Long. Long vowels are written doubled.

Tone

There is lexical and grammatical tone in Otuho. There are three levels of tone (High, Mid, Low), but none have been marked in the literacy orthography. However, the UBS translation team has begun marking the High tone on positive commands with an acute accent on the first syllable and the Low tone on negative commands with a grave accent.

Syllable and Word Shapes

Otuho may have open (CV) and closed (CVC) syllables with labialisation and/or palatalization on the syllable initial consonant. A single vowel (V) may occur word initial. Words usually consist of several syllables. Prefixes and suffixes are common.

Otuho orthography development

Otuho was a Role A language and thus had an orthography developed prior to 1980.² The initial orthography was written with few of the important phonological contrasts denoted in the orthography; particularly the lack of capping to indicate ATR and lack of fortis consonants.

² At the Rejaf Conference in 1928, Role A languages were slated for development of literacy materials. The orthography for Otuho was developed under Muratori.

In 1983, under the Institute of Regional Languages (IRL), capping was added to indicate -ATR (Light) vowels.³ Basic literacy materials were produced using this orthography.

In 1998, attempts were made to alter the orthography, particularly by those revising the translation of the Otuho New Testament (NT). There was an agreement that “reduced capping” (limiting the number of caps that occur on a word) could to be used in the NT.

In late 2001, SIL was asked to evaluate the spelling used in the Otuho NT in order to understand how compatible the spelling would be with the literacy materials being used and produced. After a few months of evaluation and discussion it was agreed that no capping is to be used in the NT.⁴

The 2001 Evaluation report

The purpose of the evaluation report was to give a summary / overview of the spelling used in the Otuho NT being done by UBS. Since the spelling system to be used was new and different from the 1983 orthography, and since it has not been seen in print before, it was felt that an explanation of the UBS spelling rules was needed so that literacy personnel could prepare materials for readers. Since the UBS team had not documented their spelling rules, the evaluation was undertaken to determine what spelling system was being followed and to draw some conclusions as to what it may look like and document what the particular spelling rules might be.

The validity of the orthography being used was not part of the evaluation, but only to explain what was being done. Validity of the orthographic systems was done in the 1983 and 1998 meetings by the Otuho people. The evaluation was simply to summarize what translation team had done.

The report showed that inconsistency in spelling was a major problem and aimed to give a summary of problem areas in the spelling and to show where there was a needs for more explanation and examples in order to help others to understand and use the spelling system accurately. Since it was felt that the spelling used in the NT would have a great influence on the spelling system used in general in the Otuho language, it was important that all literate Lotuho are able to understand and use the spelling system of the NT. A document was needed which consistently explained the spelling rules and gave examples.

It is often felt that the marking of Light vowels was the only issue involved in the new spelling system since the decision in 1998 was to reduce the marking system for the forthcoming translation. However, other spelling rules had been implemented in the UBS spelling system and these other rules needed to be recognized and explained.

Since there was no explanation of the spelling system being used, it was difficult to evaluate the text since there is no “standard” (spelling guide/rules) against which the words

³ The addition of the capping character to vowels came about when some Otuho people held a conference in Torit Mission in November 1982 and in April 1983.

⁴ The UBS team calls this un-capped spelling “the current orthography used by Otuho population” since the full-marking system used in literacy materials has not, in their estimation, been learned by the Otuho people.

could be compared. One could only look how words had been written in the current text and deduce the rules from the words found. In the report some guesses had to be made as to what should be the “true” spelling of words.

The evaluation was based on words found in the translated text of Matthew-Romans was received from UBS in September 2001. The text consisted of 7500+ unique words (found in a wordlist). First, an interlinear of the first fourteen chapters of Luke was done. These chapters had been previously printed and thus thought to be most consistent in spelling. The interlinear process entered many words into a dictionary. Full-marked forms (as used in the literacy materials) were included when known.

Extracts from the report are given in the Appendix of this article. The examples given in the report were not extensive but are representative of the types of spelling rules and problems. In the examples, the left column represented a best “guess” of the “correct” spelling (suffixes may not have been marked consistently), followed by a short gloss, then the word(s) as found in the text. The number of occurrences of a word were found in parentheses following a word, e.g., (12). If known, the full-marked form was given at the end of the line. [Text found between hyphens, e.g., **-bolôr-**, indicated the root of a word.]

The 2001 UBS spelling rules

At the time of the evaluation, the interpretation of the 1998 spelling agreement was still “developing”. The following is a listing of the interpretations as presented during the time of research.

- 30 Aug 2001 meeting: only the vowel in the last syllable of a word would be marked with a cap if the word is “weak”.
- 17 September 2001 meeting: The prefix would not be marked. The last vowel of the root would be marked if the underlying vowel quality of the root was Light. The last vowel of each suffix would be marked if its underlying quality was Light.
- 11 Oct 2001: (John Duerksen’s suggestion) Mark the 1st cappable vowel of the root. Do not mark prefixes nor suffixes (unless minimal pairs are discovered).
- 17 October 2001 e-mail: marking all roots and the suffixes that are Light; roots are marked with one cap on the last cappable vowel.

In addition to the spelling conventions as adopted in 1982, the last UBS interpretation of the 1998 decision was “**marking the root morphemes and the suffixes that are Light; root morphemes are marked with one cap on the last cappable vowel**”. According to the UBS team, this rule embodied the decision of 1998. However, there were additional assumptions which surfaced in the discussions with the team. For example, the “underlying” form of the root was to be marked. The concept of “underlying form” was undefined and needed explanation, particularly since the full-marked literacy orthography uses “surface” form marking. Another example was the degree to which suffixes were to be marked. It was unclear what suffixes were to be marked, i.e., all suffixes, the last suffix,

last vowel of last suffix, etc. In addition, no mention was made of the introduction of tone marks on **hé-** and **hè-** in the text and their meaning.⁵

Summary Comments from Evaluation report

Although in general, many words in the sample text were marked with a cap, many words which contained Light vowels are not capped. In one of the initial meetings with the UBS team (30 August 2001), they acknowledged that *words that can only have one meaning were not marked at all, irrespective of whether they were "weak" or "strong"*. This meant that most “common” words were left unmarked. Examples of this were found in the first section of the report. See *General Application of Writing Light Words*. in the extract of the report in the Appendix.

Another area of concern was the lack of consistency in writing the same word the same way each time. The second section of report, *Inconsistency in writing same word*, gave examples of this area.

The third area was the marking of suffixes. This was probably the major area where there were problems. If suffixes were to be marked, then one expected to see one cap on the Light root and caps on suffixes. One would thus expect, for example, that all plural nouns have their Light root and plural suffix marked, and even more prevalent, most verbs should have the root marked along with (all) the Light suffixes. The general finding was that one cap was used per word, either on the root or on the suffix, but not both. Only 36 words (out of 7500+) had more than one cap. See the results in the section in the report, *Marking Suffixes*, and the final section, *Words with Multi-Caps*. The rule also did not indicate the degree of marking for suffixes, i.e., all suffixes, the last suffix, last vowel of last suffix, etc.

The fourth area involved marking the “underlying” form. The concept of the “underlying” form was that the root should be marked in the same way, irrespective of the influence of vowel harmony (changes due to suffixes).⁶ The underlying form of the root was the form which is in the “mind” of the speaker, not necessarily the form which is pronounced (surface form).

Since the use of the underlying form was a new concept not found in the full-marked orthography, it was expected that this would be one of the least defined areas of the

⁵ It may be helpful to refer to two documents for further discussion on these issues:

1) Richard Watson’s notes from September 1998 “Otuho Orthography - [ATR] and Tone Considerations”: Summary notes from a meeting to discuss rules within a reduced marking system. His summary of comments about how Light/Heavy vowels function together with vowel harmony are of interest. [1998 09 Watson orth summary notes.doc]

2) Victor’s response on behalf of UBS – March 2003 “Otuho Spelling Guides: An Outline Of 1998 Otuho Orthography Rules”: Gives a brief overview of orthography development in Otuho, a short critic of the 1983 orthography, summary of the 1998 meeting on reduced marking orthography and a summary of the current rules for reduced marking. [2002 03 Victor UBS reply.doc]

⁶ Richard Watson seemed to be talking about the use of underlying forms when he said, “When the sound of a morpheme varies predictably because of adjoining morphemes, it is usually best to maintain its normal spelling.” [Watson document, *Otuho Orthography [ATR] and Tone Considerations*, 1998]

orthography with the implications of marking an “underlying” form being immense. [The minutes of the 1998 meeting no mention of using underlying forms or surface forms.] Examples of the lack of marking the underlying form could be found in the section in the report, *Writing Underlying Form*. An additional problem was that of determining the “boundaries” of the root. For example, was the plural suffix of a noun considered to be part of the root? The question was often raised as to whether a non-linguist speaker could recognize the “root morpheme”.

The fifth area, the use of tone marks on **hé-** and **hè-**, was not mentioned in any previous orthography statement and was new in the UBS spelling system. The general rules seem to be that “negative actions” are marked with grave tone (**hè-**) and positive actions with acute tone (**hé-**). The **he-** prefix can also be used to mark dependent clauses (?).

Two other areas, not specifically related to the 1998 decision, were the writing of *Strong and Weak Consonants* and the writing of *Short and Long Vowels*. They were mentioned in the report since they are areas that needed to be defined and explained in more detail in the spelling rules. These were part of the 1982 orthography decision.

The final area was that of *Vowel loss across word boundaries*. Again, although not specially related to the 1998 decision, vowel loss was mentioned in the report since it was an area of concern that needed to be defined and examples given in the spelling rules. In general, nouns that begin with **e-** lose the initial **e-** when they occur following **’tê** “from”.

Observations

The following are several observations that I have gained from going through the evaluation process and writing the report. Some observations are of general nature while others are very specific to Otuho.

Division over orthography development

It quickly came to the surface that we were working with two distinct groups of individuals who were developing Otuho materials each in a different orthography. The two groups were a) those producing the literacy materials with full-marking and b) those producing the translation with reduced marking. Little had been accomplished in bringing these two groups together to achieve an unified orthography. Each group had valid reasons for their position on the orthography issues and in some ways this reflects the significant difficulties there are in developing orthographies for languages in which there are morphology changes due to (ATR) vowel harmony. It is beyond the scope of this article to dwell on the division of these two groups. The point I wish to raise here is that the whole process was greatly affected and hampered by the division. A lack of common goals and a working unity among those involved in the orthography development process can only hinder the process. An atmosphere of cooperation and compromise are needed to achieve a working orthography for a language.

The need for Spelling Rules

Like many languages, neither the translation team nor the literacy team had fully written out and implemented a consistent set of spelling rules. Although general rules were adopted at meetings (1982/3 and 1998), there were not comprehensive documents explaining the spelling systems nor giving examples. In each group there were individuals who seemed to understand and were able to write works “correctly” but this ability had not been written in a manner so that others could clearly follow it.

It was also clear that there were varying interpretations of the general decisions (rules) that had been adopted at the community orthography meetings. What seemed to be very clear for one person was interpreted differently by another person. Shades of meaning differences were common. Each person had their own underlying assumptions. Some had made additions to the community decisions. All said, it was clear that there was a need for a detailed explanation of the rules that contained examples of the various word forms that exist. With such a document, rules could be more clearly applied and thus resulting in great uniformity in the spelling. Owing to the lack of such documents, there was inconsistency in spelling due to a lack of understanding and implementing the rules. Texts from both systems (literacy and translation) had inconsistencies.

Is Capping an issue?

How important is capping (marking ATR value) in Otuho? In the end, the translation and literacy teams came to an agreement that word in the translation would NOT be capped. This sounds like a big loss (concerning orthography development) but, in my opinion, will probably be acceptable except for a few grammatical items (and lexical contrast). Minimal word contrast are found in text because the word patterns are relatively long and/or contrasting words very rare. In context, ATR value takes on a relatively low functional load. Given the overall picture of word structure and contextual usage, marking ATR is less important than marking other features even though the feature is distinct and present in the phonology. In addition, one cannot ignore the fact that Otuho people were reading Otuho without caps prior to 1983 and that the translation team claims that this is a workable orthography still in use by many Otuho people.

Using the wrong base for capping

One of the claims made by the translation team was that the wrong vowel type (Light) was chosen to be marked (capped). According to the phonological system on the language, the Heavy (+ ATR) vowel is the “marked” vowel and vowel harmony is initiated by Heavy vowels. In vowel harmony, Light vowels can become Heavy; Heavy vowels do not become Light. It can be agreed that the choice of marking the Light vowel was perhaps unfortunate but, without a major reorientation of the orthography and literacy materials, little can be done to change that choice. At this point, the “cap” represents Light (-ATR) vowels.⁷

⁷ Choosing an alternative mark for + ATR is a possible alternative to the cap for -ATR. E.g., one could use a dieresis for marking + ATR vowels.

Writing Underlying forms

Another issue which arose during my investigation was the variance in vowel harmony between speakers. In long words with Light roots and Heavy suffixes, the degree of vowel harmony extending from the suffix through the root varied among speakers. Therefore the surface pronunciation becomes difficult to pin down since it varies among speakers.⁸

It is thought that one way to get around this dilemma is to write the “underlying” form of the word, i.e., what is in the mind of a speaker instead of what comes out of the mouth. This issue of writing surface pronunciation or “underlying” forms remains a major problem. It's not an easy one. Can a non-linguist speaker of the language identify root forms? How much linguistic knowledge is required to write the root form? Many questions can be raised concerning both sides of the issues and go beyond the scope of this article. The point here is that some were interpreting the spelling rules as involving the use of “underlying” forms. For Otuho, this needs to be clearly studied and defined if it is to be implemented in the spelling rules. Otuho could probably learn such a system but it would require much text that is written consistently.

Tone: all, partial, none

More study needs to be done on tone, particularly as it relates to grammatical differences. Like ATR value, since the words are long and contrasting lexical items rare, there are few minimal word with regard to tone. However, it cannot be denied that there are lexical and grammatical items which are only differentiated by tone. A system for handling tone would be in order for Otuho.

The translation team has initiated (tone) marks on the he- prefix to indicate positive and negative action. This is certainly a step forward. The current problem is that the spelling rules regarding these marks is undefined and examples have not been listed for others. The current system is *ad hoc*. More work needs to be done regarding whether both the acute and grave marks need to be used. One mark might suffice. Also, rules need to be defined for when the mark might conflict with the use of the cap mark (on the same vowel).

Consistency in writing same sound with same symbol

One of the basic concepts in orthography is that the same sound (phoneme) should be written with the same symbol. Currently the Fortis consonants are written with a different symbol when word initial. This is a minor problem since what is perhaps more important is that the fortis (strong) consonant is distinguished from the weaker form.

Word boundaries

As with most languages, vowel loss across word boundaries needs to be explained for a language so that the text can be written consistently by all.

⁸ Watson's notes: “It seems that the first syllable or two of a long root may sound light even if the root is heavy, i.e. the heavy quality increases to the end of the root. This leads to the hypothesis that the heavy quality is applied to the last syllable and only spreads leftward one syllable and, perhaps, lightly for one more.” [Watson document, *Otuho Orthography [ATR] and Tone Considerations*, 1998]

Summary / Conclusion

Working through the Otuho orthography problems was a challenge. The greatest challenge was that of bringing together those involved in the process and helping them to arrive at a unified decision concerning orthography development for Otuho. The problems of how to most practically write a language like Otuho remain, particularly the issues of the whether to write the surface forms or underlying forms. The solution of not writing caps [not marking ATR] helps to avoid the issue but it will come with a cost. It is hoped that that cost is not too high for the Otuho people and that they will be able to read and write their language in an easy manner and use the written form of their language for the benefit of all.

APPENDIX

Extracts from “Preliminary Evaluation of Spelling used in Otuho NT”

In the examples, the left column represented the best “guess” of the “correct” spelling (suffixes may not have been marked consistently), followed by a short gloss, then the word(s) as found in the text. The number of occurrences of a word were found in parentheses following a word, e.g., (12). If known, the full-marked form was given at the end of the line. [Text found between hyphens, e.g., **-bolôr-**, indicated the root of a word.]

Summary

General Application of Writing Light Words

When we first met with UBS team (30 August 2001), they admitted that they were not capping common words. Here are some common words which were found to be uncapped.

<u>Best Guess</u>	<u>Gloss</u>	<u>Word in Sample (No. of Occur.)</u>	<u>Full-marking</u>
ettê	<i>and, then</i>	ette (3338)	êttê or ette
nyîa	<i>was, past</i>	nyia (2759)	nyia
ahodê	<i>truly</i>	ahode (79)	ahôdê
bebê	<i>very</i>	bebe (314)	bêbê
errê	<i>things</i>	erre (751)	êrrê
hûna	<i>these</i>	huna (147)	hûna
lamonyê	<i>owner, lord</i>	lamonye (359)	lamônyê
nî	<i>I</i>	nî (1219) ~ nî (1)	nî
olôn	<i>day</i>	olon (143)	ôlôn
onô	<i>be of</i>	ono (799)	ônô
orrohô	<i>spoil</i>	orroho (108)	ôrrôhô
’tô	<i>one</i>	’to (1621)	’tô

Inconsistency in writing same word

Generally, the same word is written consistently throughout the text. However, here are some examples of the same word written in different ways.

<u>Best Guess</u>	<u>Gloss</u>	<u>Word in Sample (No. of Occur.)</u>	<u>Full-marking</u>
arriaî	<i>many</i>	arriaî (5) ~ arriai (238)	arriaî
ekoî	<i>path</i>	ekoî (2) ~ ekoi (86)	êkôî
hohoî	<i>we, us</i>	hohoî (618) ~ hohoi (2)	hôhôi
inêf	<i>you catch</i>	inêf (5) ~ inef (24)	înêf
obô	<i>another</i>	obô (18) ~ obo (884)	ôbô and obo
onîtêk	<i>days</i>	onîtêk (4) ~ onitek (179)	onitek
woyô	<i>descendant</i>	woyô (11) ~ woyo (36)	wôyô

Marking of Suffixes

The marking of suffixes is probably the major area where there are problems. It is undefined as to what suffixes are Light and how those suffixes are to be marked. There are several factors involved in marking suffixes.

It is not always clear what is the suffix and what is the root. It would be helpful to have some spelling rules to help the user to know where a root ends and where the suffix begins. This is essential to be able to mark the root correctly, i.e., on the last cappable vowel of the root.

It is also unclear as to which suffixes are Heavy and which suffixes are Light. The quality of the suffix is not always clear due to the influence of vowel harmony (which has been largely ignored in Otuho language analysis). Like with roots, the question of writing the surface value or underlying value of the suffix remains.

It is also unclear how suffixes are to be marked: on all Light vowels in the suffixes, on the last Light vowel of a suffix, on the last Light vowel of last suffix, etc. [In my “guess” of their spelling, I have chosen to mark all Light suffixes.]

If suffixes are to be marked, then one expects to see multiple caps on words: one cap on the Light root and caps on suffixes. The general finding was that one cap was used per word, either on the root or on the suffix, but not both. Only 36 words (out of 7500+) had more than one cap.

Below are listed some examples of suffixes being marked. This is only a portion of the suffixes found on nouns and verbs.

NOUN SUFFIXES

<u>Best Guess</u>	<u>Gloss</u>	<u>Word in Sample (No. of Occur.)</u>	<u>Full-marking</u>
-î	<i>plural suffix on nouns</i>		
elulûŋ	<i>crowd</i>	elulûŋ (177)	êlûlûŋ
elulûŋî	<i>crowds</i>	elulûŋî (43)	êlûlûŋî
ilulûŋ	<i>in/to crowd</i>	ilulûŋ (17)	îlûlûŋ

VERB SUFFIXES

<u>Best Guess</u>	<u>Gloss</u>	<u>Word in Sample (No. of Occur.)</u>	<u>Full-marking</u>
-î	<i>they</i>		
abahî	<i>they hit, beat</i>	abahi (7)	abahî
abañî	<i>they fear</i>	abañi (71)	abañî
-arû			
ababalarû	<i>walking</i>	ababalaru (1)	ababalarû
-îta			
eyaba / eyabîta	<i>report</i>	eyaba (7) / eyabîta (4)	êyaba / êyabîta

Writing Underlying Form

The value of writing of the “underlying” form is the second major area which is left undefined in the spelling system. Although not specifically stated in the general spelling rule, the UBS team has repeatedly stated that they wish to mark the underlying form of the root.

As previously stated, since this is a new concept not found in the fully-marked orthography, great care needs to be taken to clearly explain what is meant by “underlying” form and examples need to be given to help new writers know how to identify and write the underlying form.

Writing of the underlying form is best seen in the verbal system. Presumably, if one is writing the underlying form of the verb root, then that written form should be written the same in all occurrences of that verb, irrespective of the influence of (Heavy) suffixes. Below are examples of several verbs showing how they have been written.

<u>Best Guess</u>	<u>Gloss</u>	<u>Word in Sample (No. of Occur.)</u>	<u>Full-marking</u>
-leyê-	<i>appear</i>		
oleyê	<i>make signs (?)</i>	oleyê (2)	oleyê
oleyêî	<i>appear</i>	oleyêî (1)	oleyêi
oleyêrê	<i>he appear</i>	oleyêrê (1)	ôlêyêrê

Is **leyehî** the root in these words?

aleyêhîno	<i>appearance</i>	aleyêhîno (13)	aleyehino
etaleyêhî	<i>I appear</i>	etaleyêhî (2)	etaleyehi
etaleyêhîna	<i>revelations</i>	etaleyêhîna (6)	etaleyehina
ileyêhîno	<i>he appears</i>	ileyêhîno (4)	ileyehino
italeyêhî	<i>cause to ...</i>	italeyêhî (8)	italeyehi
italeyêhîna		italeyêhîna (5)	italeyehina
italeyêhîni		italeyêhîni (11)	italeyehini
italeyêhîniêrê		italeyêhîniêrê (2)	italeyehiniere
italeyêhîniêrêk		italeyêhîniêrêk (1)	italeyehinierek

Best Guess	Gloss	Word in Sample (No. of Occur.)	Full-marking
leyêhîno	<i>he appear</i>	leyêhîno (3)	leyehino
oleyêhîneî	<i>they ...</i>	oleyêhînei (1), oleyêhîneî (2)	oleyehinei
oleyêhîniê		oleyêhinie (1)	oleyehinie
oleyêhîniêrê		oleyêhiniere (1)	oleyehiniere
oleyêhîno	<i>he appear</i>	oleyêhîno (26)	oleyehino
-ttêr-	<i>to begin</i>		
ettêrî		etterî (21)	êttêrî
ettêrîo		etterîo (4)	etterio
ettêrîta		etterîta (24)	êttêrîta
ittêr		itter (5)	îttêr
ittêrî		itteri (2)	îttêrî
ittêrîê		itterie (24)	itterie
ittêrîêrê		itteriere (2)	itteriere
ittêrîo		itterio (69), itterrio (1)	itterio
lettêrî	<i>first one</i>	letterî (1)	lêttêrî
tettêrî	<i>beginning</i>	tetterî (36), tettêrî (1), têttêrî (1)	têttêrî
hèttêrîêtê	<i>don't begin</i>	hèttêrîete (1)	hetteriete
-bolôr-	<i>be great</i>		
bobolôrôrô		bobolororô (2)	bôbôlôrôrô
abobolôrôrô	<i>be great</i>	abobolôrôrô (1)	abôbôlôrôrô
ibobolôrôrô		ibobolororô (2)	îbôbôlôrôrô
obobolôrôrô		obobolororô (6)	ôbôbôlôrôrô
obobolôrôrôî		obobolororoî (1)	ôbôbôlôrôrôî
obobolôrûno		obobolôrûno (1)	oboboloruno
abolôrôk		abolôrok (1)	abôlôrôk
obolôrôk		obolorôk (1), obolôrok (1)	ôbôlôrôk
bolôrî		bolôri (4)	bolori
abolôrî	<i>greatness</i>	abolôrî (1), abolorî (2), abolôri (5)	abolori
ibolôrî		ibolôri (2)	îbolori
obolôrî		obolôri (11)	obolori
hètabolôrîo	<i>do not be ...</i>	hètabolorio (1)	hètabolorio
itabolôrî		itabolôri (1)	îtabolori
itabolôrûna		itabolôrûna (1)	îtaboloruna
itabolôrûnî		itabolôrûni (2)	îtaboloruni
itabolôrûnîêrêk		itabolôrûnierek (1)	îtabolorunierek
obolôrôrî		obolororî (1), obolorôri (1)	ôbôlôrôrî
-hûm-	<i>be fervent; be careful; perform</i>		
ihûm	<i>to sacrifice</i>	ihum (84)	îhûm
ihûma		ihuma (9)	îhûma
ihûmatatî		ihumatatî (2), ihumatati (1)	îhûmata tî
ehûmanî	<i>priest</i>	ehumani (45)	êhûmanî / êhûma nî
héhûmata	<i>should be ...</i>	héhumata (1)	hêhûmata
hèhûmata	<i>should not be ...</i>	hèhumata (1)	h'êhûmata

The principle of writing the underlying form can also be seen in the nouns, particularly when “adding” a suffix to the (singular) noun.

<u>Best Guess</u>	<u>Gloss</u>	<u>Word in Sample (No. of Occur.)</u>	<u>Full-marking</u>
aarî	<i>water</i>	aarî (56)	aarî
arîak	<i>waters</i>	ariak (2) Is ariak Light??	arîak / ariak
abôi	<i>net</i>	aboi (9), aboî (1)	abôi / aboi
abôyô	<i>nets</i>	aboyo (6), aboyô (5)	abôyôô / abôyô
obeyôk	<i>fox</i>	(not found)	ôbêyôk
olobeyôk	<i>that fox</i>	olobeyok (1)	ôlôbêyôk
obeyôhi	<i>foxes</i>	obeyohi (2)	obeyohi
awolô	<i>dove</i>	awolô (2), awolo (1), awalo (1)	awôlô
awolôsîn	<i>doves</i>	awolôsîn (1), awolosin (1)	awolosin
??	<i>enemy</i>	amiottononi (1), amiottononi (4), amîottononi (1)	amiottononi
amiorôk	<i>enemies</i>	amiorôk (19)	amîôrôk

The question of writing the underlying form of the suffixes also remains.

Use of hé-, hè- and he-

The UBS team has introduced both acute and grave marks on the prefixes **he-**. The general rule seems to be that “negative actions” are marked with grave tone (**hè-**) and positive actions with acute tone (**hé-**). The **he-** may also be unmarked in dependent clauses. As seen in the following example, the marking is inconsistent.

hèbaŋ	<i>don't fear</i>	hèbaŋ (2), hebaŋ (6)	hebaŋ
hèbaŋata	<i>don't fear</i>	hèbaŋata (12), hebaŋata (5), hébaŋata (1)	hebaŋata
hèbiaŋata	<i>have you not</i>	hèbiaŋata (12), hebiaŋata (3), hébiaŋata (2)	hebiaŋata
hefuahi	<i>leave, send</i>	hefuahi (8)	hefuahî
héfuahi		héfuahi (4)	hêfûahî
hèfuahi		hèfuahi (1)	hefuahî

Strong and Weak Consonants

Writing Strong and Weak consonants is not new in the 1998 decision. They are mentioned here since they are areas that need to be defined and explained in more detail in the spelling rules. These are part of the 1982 orthography decision.

<u>Best Guess</u>	<u>Gloss</u>	<u>Word in Sample (No. of Occur.)</u>	<u>Full-marking</u>
itarrohojo	<i>speak blasphemy</i>	itarrohojo (13) ~ ittarrohojo (1)	itarrohojo / ittarrohojo
itarroho ??	<i>spoil</i>	itarroho (6) ~ ittarroho (1)	îtarrohô / îttarrôhô
hohotohunik	<i>add eight</i>	hohotohunik (1), hohottohunik (3)	hohottohunik
attarani	<i>tie</i>	attarani (2), atarani (3) -ttar-	ataranî
ayafajin	<i>moons, months</i>	ayafajin (17), ayyafajin (1)	ayafajin
batisimo	<i>baptism</i>	batisimo (103), battisimo (2), batismo (1), batsimo (1)	battisimo
chananiere	<i>put</i> ehananiere	chananiere (3), chananierre (1)	-hana-

An initial Strong consonant needs special attention, but are often not written.

'tê	<i>through, from</i>	tê (761) ~ te (3)	'tê and 'te
'dêê	<i>quietly</i>	dee (10), dêê (2)	'dêê
'daŋ	<i>all</i>	'daŋ (1165), daŋ (4)	'daŋ
'tadî	<i>shall</i>	'tadî (48), tadî (37)	'tadî

Short and Long Vowels

Writing Short and Long vowels is not new in the 1998 decision. They are mentioned here since they are areas that need to be defined and explained in more detail in the spelling rules. These are part of the 1982 orthography decision. This does not seem to be a major problem.

waatî	<i>of people</i>	waatî (1) ~ watî (295)	watî
aafê	<i>yes!</i>	aafê (15), aafe (1), afê (6), afe (1)	aafê
afeê	<i>basket</i>	afee (2)	afêê
afeêhien	<i>baskets</i>	afeehien (9)	afehien
ifeêjin	<i>in baskets</i>	ifejin (1)	ifejin
anî	<i>I, me</i>	anî (2), ani (253)	anî
nanî	<i>me</i>	nanî (275)	nanî
aanî	<i>hand</i>	aanî (35)	aanî
haanî	<i>hand</i>	haanî (1), hani (16)	hanî
ihaanî	<i>in hand</i>	ihani (2)	îhanî
naanî	<i>hand</i>	naanî (1)	naanî

Vowel loss across word boundaries

Vowel loss across word boundaries has not been explained in the spelling system. This is not a problem unique to the 1998 decision. The problem is seen most often following the preposition 'tê "from".

<u>Best Guess</u>	<u>Gloss</u>	<u>Word in Sample (No. of Occur.)</u>	<u>Full-marking</u>
'tê elulûŋ	<i>from crowd</i>	tê luluf (2)	tê êlûlûŋ
elume	<i>grave</i>	elume (9)	elume
'tê elume	<i>from grave</i>	'tê lume (4)	te lume
		têlume (1)	
edou	<i>heaven</i>	edou	edou
'tê edou	<i>from heaven</i>	tê dou (22)	te dou
		'tedou (1)	
		tedou (12)	
		têdou (3)	

This vowel loss may also occur following other words or with other prefixes, e.g., following **ette**.

Kingdom of heaven **Olobie ette dou (22)** ette dou

Words with Multi-Caps

Of the 7500+ words in the wordlist from sample text, 36 words have more than one cap. Most of these words are verbs where a suffix was marked in addition to the root. Since there are so few words with multi-caps, it can be deduced that in most cases either the root or a suffix has been marked, but not both.

In this list of multi-capped words, there are often multiple spellings for the same word (shown below the multi-capped spelling). Some words show the root to be marked and in other spellings, only the suffix is marked.

It can also be seen that not all suffixes (within the same word) are capped; only one suffix has been marked.

None of these words require multiple caps (caps on the suffixes) to distinguish them from another word.

<u>Best Guess</u>	<u>Gloss</u>	<u>Word in Sample (No. of Occur.)</u>	<u>Full-marking</u>
abobolôrôrô	<i>be great</i>	abobolôrôrô (1)	-bolôr- abôbôlôrôrô
abolôrî	<i>greatness</i>	abolôrî (1)	-bolôr- abolori
		abolorî (2)	
		abolôri (5)	
adiôtôî	<i>stand up</i>	adiôtôî (1)	-diôt- adiôtôî
		adiotôî (1)	
cf: adiôtô	<i>stand up</i>	adiotô (2)	adiôtô

<u>Best Guess</u>	<u>Gloss</u>	<u>Word in Sample (No. of Occur.)</u>		<u>Full-marking</u>
anîamaî cf: anîama	<i>be hungry</i> <i>hunger</i>	anîamaî (1) anîama (1) aniama (2)	-nîam-	aniamaî aniama
ekîanarî	<i>parables</i>	ekîanarî (1) ekîanari (2)	-kîan-	êkîanarî
hekîanaî	<i>while speaking</i>	hekîanaî (1) hékîanaî (2)	-kîan-	hêkîanaî
hèṇôtônîa	<i>don't judge</i>	hèṇotônîa (1)	-ṇôt-	hèṇotonia
hétudîtaî	??	hétudîtaî (1)	??	hêtûdîêtaî
hotodûahî	<i>be quiet</i>	hotodûahî (1) hotodûahi (1)	-dûa-	hôtôdûahî
hotodûaî	<i>be quiet</i>	hotodûaî (1) hotoduaî (2)	-dûa-	hôtôdûaî
idîaharaî	<i>they leave</i>	idîaharaî (4) idiaharaî (6)	-dîah-	idiaharaî
idîahatî	<i>leave</i>	idîahatti (1) idiahatti (2)	-dîah-	idiahattî
idîahatî	<i>not happy</i>	idîahatî (1)		idiahatî
iduhûnîa	<i>take</i>	iduhûnîa (1)	-dûh-	îdûhûna
igîamaî	<i>work</i>	igîamaî (14)	-gîam-, -gêm-	îgîamaî
igîamatî	<i>work</i>	igîamatî (3) igîamati (2)	-gîam-, -gêm-	îgîamatî
ihîanatî	<i>read, count</i>	ihîanatî (1)	-hîan-, -hen-	îhîanatî
ihîatî	<i>you-all dance</i>	ihîatî (1) ihîati (1)	-hî-	îhîatî
ikîanaî	<i>they speak</i>	ikîanaî (58)	-kîan-	îkîanaî
ikîanarî	<i>speak</i>	ikîanarî (1) ikîanari (30)	-kîan-	îkîanarî

Best Guess	Gloss	Word in Sample (No. of Occur.)		Full-marking
ikîanati	<i>speak</i>	ikîanati (6) ikîanati (3)	-kîan-	îkîanati
ikikîanaî	<i>speak</i>	ikikîanaî (1)	-kîan-	îkîkîanaî
ikikîanaraî	<i>speak</i>	ikikîanaraî (1)	-kîan-	îkîkîanaraî
ikikîanati	<i>speak</i>	ikikîanati (2) ikikîanati (1)	-kîan-	îkîkîanati
îlîahaî	<i>they are near</i>	îlîahaî (9)	-lîah-	îlîahaî
jîhataî ???	<i>to you-all</i>	jîhataî (1) jihataî (302)		jihataî
odîahaî	<i>they were sad</i>	odîahaî (1)	-dîah-	idiahaî
odiôtôî	<i>stand up</i>	odîotoî (2) odiotoî (7)	-diôt-	ôdîôtôî
odiôtôtî	<i>stand up</i>	odîototî (1)	-diôt-	ôdîôtôtî
odûahîneî	<i>be quiet</i>	odûahineî (1)	-dûa-	ôdûahineî
odûaî	<i>be quiet (pl)</i>	odûaî (2) oduaî (4)	-dûa-	ôdûaî
oleyêhîneî	<i>they are visible</i>	oleyêhineî (2) oleyêhinei (1)	-leyê- -leyehî-	oleyehinei ??
orîamarîk	<i>refuse</i>	orîamarîk (1)	-rîam-	ôrîamarîk
talîalông ???	<i>next day</i>	talîalông (1)		talîôlông
têtaî ???	<i>you</i>	têtaî (2) tetaî (11)		tê taî
tettêrî	<i>beginning</i>	têtterî (1) tetterî (36) tettêri (1)	-ttêr-	têttêrî

In the Full-Marked forms given by an Otuho speaker, the forms contain either 1) all Light vowels, 2) all Heavy vowels or 3) Heavy vowels to the left of a final Light -î vowel. The following exceptions are noted:

- a) ôdûahinei “*be quiet*” mixed form, i.e., it has Light vowels to the left of Heavy vowels,
- b) îbolori “*be great*” mixed form,
- c) hebîaṇata “have you not” mixed form,
- d) words beginning with **îta-** may have Heavy vowels to the right of the **îta-** prefix: îtabolori, îtaboloruna, îtabolorunierek

Kadugli-Krongo

by

Ed Hall and Marian Hall

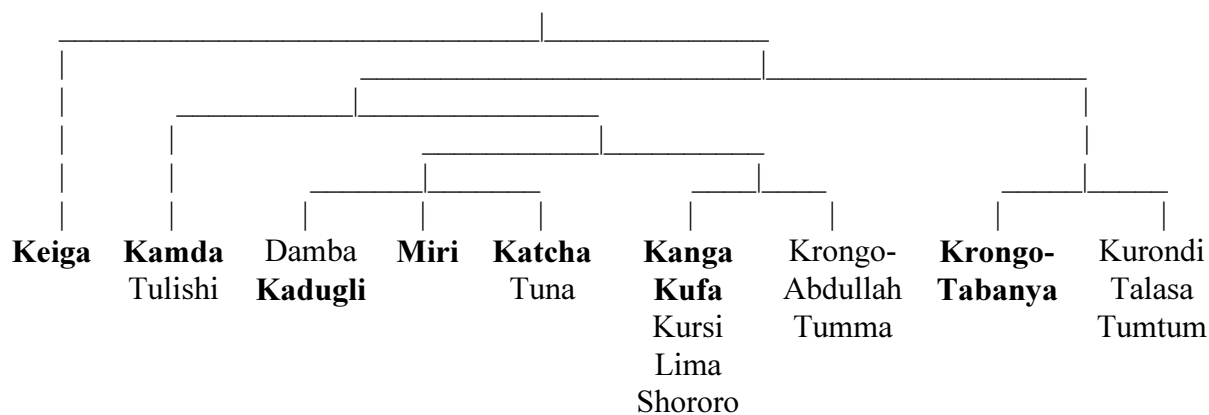
1. Introduction

1.1 Kadugli-Krongo Relationships

The Kadugli-Krongo language family consists of a number of closely related languages and dialects. This was first identified as such by MacDiarmid and MacDiarmid (1931), and they named it "Talodi-Kadugli". Stevenson (1956-57) renamed the family "Kadugli-Krongo", and he also investigated the internal relationships between its members. More recently Schadeberg (1989) has continued these studies, and has suggested several names for the language family, the most innovative of which is "Kadu". This word occurs widely within this group of languages and means "people".

In this article, "Kadugli-Krongo" or the "Kadugli-Krongo languages" will be used to refer to all the languages within the family. When reference is only being made to those languages for which alphabets have been developed, the term "languages" will be used.

Based on a preliminary lexicostatistical analysis Schadeberg (1989) suggests the following interrelationships between the nine language units that had been proposed by Stevenson.. The listing within each unit is not exhaustive. The names used here are those which have commonly been used in the literature and they are arranged alphabetically. Those for which alphabets have been developed are in bold print.



Dafalla (2000) made a phonological comparison of 179 cognates in Kadugli, Kamda, Kanga, Katcha, Keiga, Kufa, Miri, Shororo-Kursi and Tulishi. Her findings support the general relationships for these languages outlined above. The highest lexical similarity shown by her results was 73%, and the remainder ranged between 61% and 31%.

The external linguistic relationships of Kadugli-Krongo are not yet proven. Greenberg (1955) classified it in the Kordofanian family of Niger-Kordofanian. He later stated that "(Kadugli-

Krongo) shows considerable divergence from the remainder (of Kordofanian)...", and there is now a general consensus that it does not belong there. Another suggestion has been to place Kadugli-Krongo in Nilo-Saharan, where "the lexical and grammatical similarities linking ... (it) are in no way inferior to those that have been adduced for a number of other language groups." (Schadeberg (1981)). A third suggestion is that Kadugli-Krongo is an isolate, with no clear relationships to any other language family.

1.2 Development of Kadugli-Krongo Alphabets

The homelands of the speakers of the Kadugli-Krongo languages lie along the south-western edge of the Nuba Mountains in South Kordofan Province. The total number of speakers, based on the 1955-56 census figures, was estimated at just over 90,000 by Tucker and Bryan (1966). Stevenson (1956) already noted that in the Kadugli census area, which includes many speakers of the Kadugli-Krongo languages, there was a higher percentage of Nubas who claimed not to speak a Nuba language at home, than in any other census areas except those of Tegale. At the time of writing, probably the majority of speakers of the Kadugli-Krongo languages have migrated or been displaced to other parts of Sudan, and it is clear that the proportion of those who presently speak a Nuba language in their homes has decreased significantly.

Krongo-Tabanya was the first Kadugli-Krongo language for which an alphabet was established. This was developed by Eric Hansford of the Sudan United Mission in about 1931/32. It was revised in 1950. A translation of the New Testament and several other books have been published using this orthography. Roland Stevenson developed an alphabet for Katcha prior to 1956. This was revised by Samir Bulus and Jo Ogilvie in 1996 and subsequently. Several books have been published using it. Development of alphabets for Kadugli, Kanga, Keiga and Kufa began in 1994, and for Kamda and Miri in 1996. A few books have been published in each of these languages using these alphabets. The alphabets that were developed during the 1990's are generally phonemic, and use the same grapheme to represent the same phoneme for each language, as far as possible. This was felt to be helpful in enabling closely related languages and dialects to read each other's written materials. It was also intended to facilitate any transition should two or more groups decide that they would benefit from using the same alphabet and spelling with the aim of having a common orthography and literature.

2. Consonants

2.1 List of Consonant Phonemes and Graphemes

The chart below shows the inventory of consonant phonemes for each of the Kadugli-Krongo languages for which an alphabet has been developed. The upper and lower case graphemes used in the alphabets of each of the languages are also listed as they relate to that language's inventory of phonemes. A blank against any phoneme shows that that phoneme has not been found to occur in the language. Graphemes in brackets, eg. (D d), represent allophones, which are usually the voiced plosives. A question mark indicates that the phoneme is likely to occur, but that the evidence to establish its occurrence is insufficient at present.

Phonemes	Graphemes							
	Keiga	Kamda	Kadugli	Miri	Katcha	Kanga	Kufa	Krongo
Explosives								
p	P p		P p		P p	P p	P p	p
t	T t	T t	T t	T t	T t	T t	T t	t
ʈ	Th th	Th th	Th th	Th th	Dh dh	Th th	Th th	d
c	C c	?		C c	C c			c
k	K k	K k	K k	K k	K k	K k	K k	k
ʔ			'	'	'	'	ʔ	'
b	B b	B b	B b	B b	B b	B b	B b	b
ɖ					(D d)	D d	D d	(d)
ɗ						Dh dh	Dh dh	(d)
ʃ	J j	J j	J j	J j	J j	J j	J j	(j)
g					(G g)	G g	G g	(g)
Implosives								
ɓ		'B 'b	'B 'b	'B 'b	'B 'b	B b	'B 'b	b
ɗ	Dh dh	'D 'd	'D 'd	'D 'd	'D 'd	'D 'd	'D 'd	ɗ
f	?	?	?	?	?	?	?	?
Fricatives								
f	F f	F f	F f	F f	F f	F f	F f	f
s	S s	S s	S s	S s	S s	S s	S s	s
ʃ						Sh sh	Sh sh	?
h		H h						
v						V v	V v	
z				Z z		Z z	Z z	
ʒ						Zh zh	Zh zh	
Nasals								
m	M m	M m	M m	M m	M m	M m	M m	m
n	N n	N n	N n	N n	N n	N n	N n	n
ɲ	Ny ny	Ny ny	Ny ny	Ny ny	Ny ny	Ny ny	Ny ny	ɲ
ŋ	Ng ng	(ng)	Ng ng	Ng ng	Ng ng	Ng ng	Ng ng	ŋ
Continuants								
l	L l	L l	L l	L l	L l	L l	L l	l
r	R r	R r	R r	R r	R r	R r	R r	r
w	W w	W w	W w	W w	W w	W w	W w	w
j	Y y	Y y	Y y	Y y	Y y	Y y	Y y	y
Long Consonants (two examples)								
t̪:	tt	tt	tt	tt	t/tt	tt	tt	t̪
t̪:	thth	thth	thth	thth	dh/dhth	thth	thth	d

2.2 Noteworthy Consonant Features

2.2.1 Voicing of explosives and fricatives

The Kadugli-Krongo languages have six points of articulation for explosives: labial, dental, post-alveolar (retroflex), palatal, velar and glottal. In the languages for which alphabets have been developed, voiced and voiceless plosives occur for all pre-glottal points of articulation. Voicing of plosives has only been found to be contrastive for Kanga and Kufa. In all of the languages explosive phonemes are voiced in an environment with an adequate level of voicing both preceding and following them. An environment consisting of nasals and/or full vowels always produces voicing. This conditioning operates across word boundaries as well as within words (examples 1 and 2).

	<u>Phonetic</u> (Tone is phonetic)	<u>Orthographic</u>	<u>English gloss</u>	<u>Language</u>
1	$\dot{t}\dot{o}?$ $\dot{n}a:\dot{d}\dot{o}?$	to naato	"seasonal stream" "seasonal streams"	(Miri)
2	$\dot{t}\dot{i}f\dot{e}^1\dot{g}\dot{i}t:\dot{a}?$ $\dot{a}s:\dot{n}k^1:\dot{t}:\dot{a}$	tife kitta assik kitta	"stay here!" "move here!"	(Keiga)

However, consonant clusters with any other voiced consonant may not cause the explosive to be voiced, depending on the language concerned. Examples from Keiga are shown in 3.

3	$b\grave{a}rt\acute{u}^1\grave{a}$ $\grave{a}l^1t\acute{e}:n\acute{e}?$	bartuwa alteene	"horse" "bags made from hide"	(Keiga)
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The voicing of fricatives is much more variable between speakers, and is generally less pronounced than for explosives. It occurs most strongly in an environment that includes a nasal.

2.2.2 Consonant Sequences

The range of consonant sequences is restricted in the Kadugli-Krongo languages. The most frequently occurring sequences are geminates (see 2.2.3) and nasal plus non-nasal clusters. Homorganic nasals can occur before almost all explosives, implosives and fricatives. The orthographies treat nasal plus non-nasal clusters as sequences of two phonemes. Non-homorganic nasal plus non-nasal clusters occur in several of the languages (example 4). The approximants, /r/ and /l/ also frequently occur as the first member of a sequence in some of the Kadugli-Krongo languages. As the initial consonant in a sequence is in the coda of its syllable, it is lengthened (see 5.1). Some orthographies have written this as contrastively long, especially for nasals. The nasal in a word-initial consonant cluster is treated as a syllabic nasal, as in example 5.

4	$\dot{k}\dot{u}w\dot{a}n\dot{d}\dot{a}l\dot{i}$ $\dot{k}\dot{a}m^1\dot{d}\dot{u}j\dot{a}$	kuwantalix kamtuxnya	"Abdim's Stork" "k. o. crop beetle"	(Kadugli)
5	$\dot{n}^1\dot{d}\dot{i}$	ndix	"k.o. tree"	(Kufa)

2.2.3 Length

Lengthened forms of most consonants occur as geminates. These consist of the coda of one syllable with the co-articulated onset of the following syllable, so they are significantly longer than the corresponding short consonants. Geminate explosives are always voiceless. The orthographies developed during the 1990's have written lengthened forms of consonants as a doubling of the grapheme, though where this is already a digraph a corresponding trigraph has been used in some cases (examples 6-8). Earlier orthographies have not clearly shown this distinction, and Krongo-Tabanya seems to use the single graphemes both word initially for the short phonemes and word medially for the geminates.

6	<i>mùḍúʔ</i> <i>múḍ:ùʔ</i>	mutu muttu	one shell of a bivalve horse	(Kamda)
7	<i>ˈkɔle</i> <i>ˈsɔl:ɛ</i>	kole solle	"left-handed person" "fish spear"	(Kufa)
8	<i>ˈfaŋa</i> <i>ˈbaŋ:a</i>	fanga bangnga	"shelter" "pangolin"	(Kanga)

2.2.4 Infrequently Occurring Consonants

A number of consonants rarely occur in these languages. These infrequent consonants include, /p/, /c/ and /f/. The cluster of labial plosives, /p/, /b/ and /ɓ/, are probably in a state of change, leading to the loss of /p/, and the loss of contrast between /b/ and /ɓ/. The implosion on /ɓ/ is generally weak. It appears that the contrast with explosive /b/ has been lost altogether in Keiga, and this is reflected in the orthography. In Kamda, Katcha, Keiga and Miri, /c/ contrasts word initially with /ʃ/, though /c/ has the less frequent occurrence. In the other languages /c/ does not occur, except possibly in Kadugli. The corresponding implosive, /f/, is even less frequent, and has not so far been distinguished in any alphabet.

2.2.5 Consonants Restricted to a Few Languages

The phoneme inventory of the Kadugli-Krongo languages is fairly uniform. The occurrence of voiced explosive dental, post-alveolar and velar phonemes in Kanga and Kufa has been mentioned in section 2.2.1. Several fricative consonants only occur in one or a small group of related languages. In Kamda, /h/ is a commonly occurring consonant both word initially and intervocally. It generally corresponds to /f/ in the other languages. The palatal fricatives, /ʃ/ and /ç/, occur commonly in Kanga and Kufa.

2.2.6 Glottal Stop

Word final consonants are very restricted in most of the languages. Many do seem to have a contrast here between a word-final glottal closure and the absence of any final consonant. The speakers of Kamda were very conscious of an audible word-final breathiness in the latter case.

This has been reflected in the orthography as a word final <h>, which in fact probably shows the absence of a word-final glottal closure (example 9). If so, it is a good solution, as [h] does occur in the language as a consonant, and the absence of a word-final glottal closure is much less frequent than its occurrence .

- 9 ¹*t̥k:i?* **tikki** "to say" (Kamda)
 ¹*t̥k:i* **tikkih** "to be mature"

Apart from the word final position, the occurrence of a glottal stop is quite restricted. In all of the languages it occurs word medially between two identical vowels in three or four of the free pronouns. In Kufa, and probably Kanga, it serves to indicate an intensified form of the descriptive verbs (example 10).

- 10 ¹*al:ʊ* **allu** "it is good" (Kufa)
 ¹*aʔl:ʊ* **aʔllu** "it is very good"

3. Vowels

3.1 List of Vowel Phonemes and Graphemes

The chart below shows the inventory of vowel phonemes for each of the Kadugli-Krongo languages for which an alphabet has been developed, except Krongo-Tabanya. A blank against any phoneme shows that that phoneme does not occur in the language. The graphemes used in the alphabets of each of the languages are listed as they relate to the inventory of phonemes of that language.

Phon-eme	Keiga	Kamda	Kadugli	Miri	Katcha	Kanga	Kufa	Krongo
[- ATR] Vowels								
ɪ	I i	I i	I i	I i	I i	I i	I i	
ɛ	E e	E e	E e	E e	E e	E e	E e	
a	A a	A a	A a	A a	A a	A a	A a	
ʊ	U u	U u	U u	U u	U u	U u	U u	
ɔ	O o	O o	O o	O o	O o	O o	O o	
[+ATR] Vowels								
ĩ	Ĭ ĭ	Ix ix	Ix ix	Ix ix	Ĭ ĭ	Ix ix	Ix ix	
e	Ě ě	Ex ex	Ex ex	Ex ex	Ě ě	Ex ex	Ex ex	
ə	A a	Ax ax	A a	(Ax ax)	A a	A a	A a	
u	Ü ü	Ux ux	Ux ux	Ux ux	Ü ü	Ux ux	Ux ux	
o	Ö ö	Ox ox	Ox ox	Ox ox	Ö ö	Ox ox	Ox ox	
Long Vowels (two examples)								
ʊ:	U u	Uu uu	Uu uu	Uu uu	Uu uu	Uu uu	Uu uu	
u:	Üü üü	Uxux uxux	Uxux uxux	Uux uux	Üü üü	Uxux uxux	Uxux uxux	

3.2 Notable Vowel Features

3.2.1 Advanced Tongue Root

There are up to ten different vowels in the Kadugli-Krongo languages. These can be arranged into two sets, with up to five vowels in each. The distinction between these sets is based on an articulatory process which is probably similar to the advanced tongue root feature which has been demonstrated for other African languages. The more commonly occurring vowels are those where the articulators are in the relaxed position, where the advanced tongue root feature is not operating ([-ATR]). These have been written in most of the alphabets with the normal five English vowel letters. The [+ATR] vowels have been shown either by an umlaut over the corresponding [-ATR] vowel or by a digraph formed from the [-ATR] vowel followed by <x>. The letter <x> was chosen so that there would be the possibility of adding diacritics over the vowels if these were needed for features such as tone or stress. It is also easy to produce, its shape is similar to that of the other vowels and it does not otherwise occur in any of the alphabets so would not cause any confusion with <x> acting as a consonant. Examples of contrast for [±ATR] are given in examples 11 and 12.

11	<i>lil:ī</i> <i>lil:i</i>	lilli lilli	"pacify!" "sing!"	(Keiga)
12	<i>fū'dɔne</i> <i>fu'done</i>	fudone fuɔdhoxnex	"bush baby" "grey Monitor lizard"	(Kanga)

The Kamda and Miri orthographies presuppose a ten vowel system, though the evidence for a contrast between the [±ATR] forms of the central vowel [a] has only been conclusively established in Kamda and Keiga, with a very few [+ATR] examples. Kadugli, Kanga, Katcha Keiga and Kufa presuppose a nine vowel system, with no contrast on the central vowel. Reh (1986) distinguishes six vowels for Krongo-Tabanya. Evidence for the 10 vowel contrast in Keiga is given in example 13.

13	<i>'kɑ:rāŋ</i> <i>'kə:rəŋ</i> <i>'kɛ:rɛ?</i> <i>'kɛ:rək</i> <i>'kɪ:dɪ</i> <i>'kɪ:rɪŋ</i> <i>'kɔ:rɔk</i> <i>'kɔ:rók</i> <i>'tʊ:lʊ?</i> <i>'kʊ:rúk</i>	kaarang * keere këërək kiiti kīirīng koorok köörök tuulu küürük	"crack in the soil" "calabash horn" "blade" "homestead" "pound!" "disruption" "transported" "chicken" "female name" "female name"	(Keiga)
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*[ɑ] and [ə] are not distinguished in the orthography, and as yet no decision has been made about the spelling of words with phonemic [ə].

3.2.2 Lengthening of Vowels

Length on vowels is contrastive. It is indicated in the Krongo-Tabanya alphabet by a colon (:) following the short vowel grapheme. In all of the other alphabets a doubling of the grapheme for the short vowel is used (examples 14 and 15). Resulting quadrigraphs are reduced to trigraphs in some cases.

14	$\begin{matrix} 'fìgà \\ 'fì:gà \end{matrix}$	$\begin{matrix} \text{shiga} \\ \text{shiiga} \end{matrix}$	$\begin{matrix} \text{"farm"} \\ \text{"milk"} \end{matrix}$	(Kufa)
15	$\begin{matrix} \grave{o}gè? \\ '\grave{o}:gè? \end{matrix}$	$\begin{matrix} \text{oxkex} \\ \text{ooxkex} \end{matrix}$	$\begin{matrix} \text{"guinea fowl (coll.)"} \\ \text{"k.o. tree"} \end{matrix}$	(Miri)

Long vowels in speech can also result when the consonant between two identical short vowels is dropped. This occurs particularly for "g" between non-front vowels (example 16). The orthographies aim to represent the full currently spoken form of such words.

16	$\begin{matrix} 'súgúđé? \\ 'sú:đé? \end{matrix}$	suxkuxtex	"bottle shaped gourd"	(Miri)
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3.2.3 Diminished Vowels

Under certain, as yet unknown, conditions vowels may be greatly reduced in length and/or intensity. Where the quality of these can be ascertained they are shown as a normal short vowel, as in the Keiga example 17. But where this is not possible, only the resulting sequence of two consonants is written (example 18), and in fact these diminished vowels may best be treated as open transition between the two consonants.

17	$\begin{matrix} r\grave{u}k:\grave{o}\eta \\ \grave{a}r\grave{a}k:\grave{o}\eta \end{matrix}$	$\begin{matrix} \text{rukkong} \\ \text{arukkong} \end{matrix}$	$\begin{matrix} \text{"a stay"} \\ \text{"he stayed"} \end{matrix}$	(Keiga)
18	$'f\grave{a}r\grave{a}n\grave{e}?$	farne	"shadow of living things"	(Keiga)

3.2.4 Vowel Sequences

The interpretation of glides to the high front and high back vowels in word final position is unclear. In some orthographies these are interpreted as semi-vowels, while in others they are interpreted as a sequence of the semi-vowel plus its corresponding vowel as in examples 19 and 20. In Kamda <aayi> "throat" and <aaye> "he died" show no significant differences in the duration or loudness of their phonemes.

19	$k\acute{a}:w$	kaw	"person"	(Krongo)
20	$\begin{matrix} \acute{a}:y \\ '\acute{a}:i? \end{matrix}$	$\begin{matrix} \text{ay} \\ \text{aayi} \end{matrix}$	$\begin{matrix} \text{"throat"} \\ \text{"throat"} \end{matrix}$	$\begin{matrix} \text{(Krongo)} \\ \text{(Kamda)} \end{matrix}$

4 Suprasegmental Features

4.1 Vowel Harmony

Some kind of vowel harmony, based on the [\pm ATR] feature, seems to operate in some of the languages. This is reflected in their spelling systems, with the vowels in any given root all normally being from either the [+ATR] or [-ATR] set as in example 21.

21	<i>¹ni:sò?</i>	niiso	"ear"	(Keiga)
	<i>¹ni:sò</i>	nĩisö	"hand"	

Harmony with affix vowels is often difficult to determine, and is not shown consistently.

The operation of a vowel harmony system does give the possibility of reducing the number of vowel contrasts. But it is also clear that the use of only five graphemes would give serious under-representation. As noted at the beginning of the vowel section, the recently developed orthographies distinguish 9 or 10 of the 9 or 10 possible contrasts.

Vowel harmony, on the basis of other vowel features, also operates between roots and some affixes and between words and some prepositions. For example, in most languages, the vowel in the locative preposition "k+vowel" tends to assimilate to the first vowel feature in the following word (example 22).

22	<i>kà sàk</i>	ka sak	on the nest	(Miri)
	<i>kì dî?</i>	ki 'dix	in the house	
	<i>kì nâ?</i>	ki nya	on the mountain	

These morphophonemic differences are reflected in some orthographies, whereas it would be possible to use a common spelling of such affixes or function words in such cases.

4.2 Tone

The tone system has not been fully analysed for any of the Kadugli-Krongo languages. Reh (1983) establishes High and Low tone for Krongo-Tabanya and states that it is significant both lexically and grammatically. At grammatical level she found that it could distinguish the completive and incompletive aspects of verbs, as well as the frequentative form, along with one example for the singular and plural forms of the noun for "thing".

The other Kadugli-Krongo languages that we have studied also have two tones, with a considerable amount of pitch conditioning. A few words in Kamda and in Kadugli seem to have a mid pitch also. In all of the languages there are only a limited number of lexical contrasts based on tone (example 23). Tone probably carries a greater grammatical functional load. Besides the grammatical categories of verbs mentioned by Reh (example 24), tone has also been found to distinguish several subject and object pronouns in Katcha (example 25).

23	¹ <i>na:ra</i> ¹ <i>na:ra</i>	nyaara nyaara	"female cousin" "thorn fence (pl.)"	(Kufa)
24	¹ <i>ad:ò</i> ¹ <i>ad:ó</i>	a'd'do a'd'do	"follow!" "he is following"	(Kadugli)
25	⁰ <i>η:ò</i> ⁰ <i>η:ó</i>	ungngo ungngo	we exclusive (subject and object) we exclusive (indirect object)	(Katcha)

Tone contrasts have not been shown in any of the Kadugli-Krongo orthographies.

5 Segmental Features

5.1 Syllable structure

Syllables in the Kadugli-Krongo languages have the following basic structure

(Onset) Nucleus (Coda)

The nucleus can be filled by a long or short vowel, and word initially in some languages by a syllabic nasal. Long vowels do not usually occupy the nucleus of closed syllables. The onset can be filled by any short consonant. The coda can be filled by almost any consonant, when it forms the first half of a geminate. It can also be filled by any consonantal sonorant, word medially. The duration of a consonant filling a non-word final coda is significantly longer than the duration of the same consonant filling a non-word initial onset, for most consonants.

5.2 Elision

A significant amount of elision of vowels and of some consonants occurs between words in the spoken forms of these languages. To what extent these should be incorporated into the writing system is an ongoing aspect of the development of some of the orthographies. The Krongo alphabet shows many of these with a hyphen replacing an elided vowel (example 26). More recently developed alphabets aim to show the full form of each word before elision has occurred, in most cases. Where elision of vowels is involved, this approach tends to presuppose that certain units are words, such as prepositions, but they in fact may be case markers.

26	-	baku:r m-o:gufoja	"incense"	(Krongo)
	-	a:ba ma mur	"oil of myrrh"	

The number of word final consonants ranges from Keiga, where 7 possibilities have been found, to Kufa where there are none. Word final consonants tend to be weakly articulated, especially k, which is the most widely occurring. Such consonants are often dropped in the spoken form of the language, but they are represented in the written form (example 27).

27 'lànìbè lak m kibe "a goat's hut" (Keiga)

6. Major Spelling Challenges

The overall spelling challenge for this group of languages is to determine which, and to what extent, the wide range of phonemic distinctions need to be represented in a practical alphabet, especially when few of them actually provide a large number of minimal contrasts. The particular factors that are at issue have been discussed earlier on, but they are summarised here.

- 1) Establishing word boundaries (5.2).
- 2) Determining the extent to which morphophonemic variation of affixes and function words should be minimised in their orthographic representation (4.1 and 5.2).
- 3) Over-representing or under-representing vowel qualities (3.2.1 and 4.1).
- 4) Writing elided forms as the full underlying form, or closer to the spoken form (5.2).
- 5) Determining the significance of tone and the extent to which it may need to be shown (4.2).
- 6) Maintaining a similarity in the alphabets for the Kadugli-Krongo languages (1.2).

In addition, the representation of infrequently occurring phonemes (2.2.4), of unidentifiable shortened vowels (3.2.3) and of certain consonant sequences (2.2.2), are other issues that may need to be addressed.

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Dinka – Nuer Orthographies

John Duerksen

1 Introduction

This is a overview of the orthographies of the Dinka-Nuer languages of the Nilo-Saharan, Eastern Sudanic, Western Nilotic family. The family consist of Dinka, Nuer and Reel (Atuot).

The members of Dinka-Nuer languages are cattle-herding people who live in the grasslands of southern Sudan on both sides of the Nile River. They comprise the largest language group in southern Sudan with numbers ranging around 2 million (Dinka 1,350,000 and Nuer 740,000).

The Dinka, also known as the ‘Muonyjang’ (**Muonyjäŋ**), live in a horseshoe shaped area from north of Malakal, west to Nyanlal, southwest to Wau, east to Rumbek and to north of Bor.

The Nuer, also known as the ‘Naath’, live within the Dinka “horseshoe” in the area west of the Nile and extend to the east of the Nile.

Both Dinka and Nuer have had literacy materials and orthography development since early part of 1900’s. They were each Role A languages under the IRL language project and thus literacy materials have been produced in the languages.

The 3rd language in the family is Atuot which has about 25,000 speakers. ‘Thok Cieng’ is their name for the language with ‘Reel’ being the name for the people. Atuot is spoken in southern Sudan in Lakes District near Yirol. There is currently no reported orthography for Atuot. Although they are culturally similar to the Dinka, the language is linguistically more similar to Nuer and could probably use the Nuer orthography.

1.1 Phonology overview

Typical of Nilotic languages, the consonant system of this family is relatively simple. There are five points of articulation with voiced and voiceless stops and a series of nasals. A lateral, vibrant and two semivowels occur. Syllable initial consonants may be labialized and/or palatalized. The stops are devoiced syllable final.

The outstanding phonological feature of the Dinka-Nuer languages is the complexity of the vowel system. A key feature is the presence of Breathy vowels found in a system of Short-Long vowels. There are also vowel diphthongs.

Overlaying the vowel system is a Stress and Tone system which has not been fully documented.

Overall, the syllable-word shapes in this language family are short and simple with little affixation. This has led to the development of a complex internal vowel morphology that encodes both lexical and grammatical information.

2 Consonants

The consonant system of the Dinka-Nuer family is relatively simple. There are five points of articulation with voiced and voiceless stops and a series of nasals. A lateral, vibrant and two semivowels occur. All consonants occur syllable initial with voiced stops usually being devoiced syllable final.

Table 1. Consonants

	<i>labial</i>	<i>dental</i>	<i>alveolar</i>	<i>palatal</i>	<i>velar</i>
<i>stop voiced</i>	b	dh	d	j	g
<i>stop voiceless</i>	p	th	t	c	k
<i>nasal</i>	m	nh	n	ny	ŋ
<i>lateral</i>			l		
<i>vibrant</i>			r		
<i>semivowel</i>	w			y	

2.1 Final Consonants

The syllable final stops are usually voiceless (devoiced). Thus b, dh, d, j and g are not usually found syllable final (with the exception being found in proper nouns, e.g., Nuer: **Iyob** “Job”).

In Dinka, the syllable final consonants ‘w’ and ‘y’ are written as ‘u’ and ‘i’. In Nuer they remain ‘w’ and ‘y’.

Table 2. Syllable Final Semivowels

Dinka				Nuer		
-i	-i	lēi	<i>tooth</i>	-y	lēy	<i>animals</i>
		wēi	<i>soul</i>		tieey	<i>soul</i>
-u	-u	mōu	<i>beer</i>	-w	cōw	<i>bones</i>

An interesting phenomena is the interaction of final consonants with Stress. The “strength” of the final consonant is affected by the Stress with Stressed syllables having weak or “un-released” final consonants. In some dialects, particularly the Dinka Bor dialects, the final consonant may even be eliminated in Stressed syllables.

2.2 ‘y’

The ‘y’ consonant is not easy to define in the Dinka-Nuer languages. The ‘y’ character may be used to indicate a syllable break before syllables beginning with the low vowels. It is similar to an /h/ sound and is heard more strongly before Breathy vowels. An alternative view is that the ‘y’ is a neutral semivowel that occurs before non-high vowels. Word initially it may contrast with a glottal (which is not written).

Table 3. Consonant ‘y’

Dinka		Nuer	
yām	<i>thigh</i>	yāmde	<i>his thighs</i>
yer	<i>white/pure</i>	yer	<i>rejection</i>
yer	<i>outside; white</i>	yēl	<i>holy things (?)</i>
yocin	<i>our hands</i>	yomar	<i>homer (Ezk 45:14)</i>
yōi	<i>hip</i>	yōth	<i>move, leave</i>
yom	<i>to surprise</i>	yōam	<i>testing</i>
yōk	<i>cattle</i>	yōk	<i>domestic animals</i>

‘y’ is used in borrowed words for ‘h’ where it can occur before the high vowels ‘u’ and ‘i’, e.g., Nuer: **Bethleyem** ‘Bethlehem’; **Piyayiro** ‘Pi Hahiroth’; **Äbiyu** ‘Abihu’.

2.3 Consonant clusters

Consonant clusters only occur in adjacent syllables with a word. The consonants of such clusters belong to different syllables.

2.4 Labialization and Palatalization

Syllable initial consonants may be labialized and/or palatalized. Labialization and palatalization are written with ‘u’ and ‘i’ (CuVC and CiVC) respectively.

3 Vowels

The outstanding phonological feature of the Dinka-Nuer languages is the complexity of the vowel system. The vowels are characterized by the presence of Breathy vowels which may be either Short or Long.

Although Nilotic languages tend to have five-vowel systems, for the purposes of this comparison, we will use the traditional seven vowels as used in the orthography systems.

3.1 Non-Breathy and Breathy Vowels

The Dinka-Nuer vowels may be divided into two sets: **Breathy** and **Non-Breathy**. The orthographic significance between the two languages is that Dinka uses a *dieresis* to mark Breathiness while Nuer uses an *underline*.¹ [As we will see below, Nuer use the dieresis to mark Stress (shortening of the vowel).]

Table 4. *Breathy and Non-Breathy Vowels*

Non-Breathy Vowels			Breathy Vowels		
	Dinka	Nuer		Dinka	Nuer
/i/	i	i	/i̥/	ī	<u>i</u>
/e/	e	e	/e̥/	ē	<u>e</u>
/ɛ/	ɛ	ɛ	/ɛ̥/	ē	<u>ɛ</u>
/a/	a	a	/ḁ/	ā	<u>a</u>
			/ɔ̥/	ō	<u>ɔ</u>
/ɔ/	ɔ	ɔ	/o̥/	ō	<u>o</u>
/o/	o	o	/u̥/	u	<u>u</u>

3.2 Vowel length

The languages have full sets of **Short** and **Long** vowels. The Long vowels are written by doubling the vowel, e.g., [a] (Short) vs. [aa] (Long). As we will see below, additional vowel lengths can be heard in relation to Stress. These additional surface vowel lengths are not (should not be) written in the orthography.

¹ My experience has been in the Dinka language with only brief encounters with the Nuer language. It is my best guess that that in Nuer orthography the underline represents Breathy and the dieresis is used for Stress (shortening of vowel). In the few contacts I have had with Nuer readers, there is still some confusion (inconsistency) in the use of the underline and dieresis. My major source of reference text for Nuer has been the Nuer Bible.

3.3 Diphthongs

The languages also exhibit sets of diphthong vowels. The common set of diphthongs are **ie**, **iẽ**, **iē**, **iē̃**, **uo**, **uõ**, **uō**, **uō̃**. Nuer has additional vowel combinations of **ɔa**, **ɔaa**, **ɔ̃a**, **ɔ̃aa**. Due to the nature of writing labialization and palatalization of consonants (with [u] and [i] respectively), the diphthong vowels are not distinguishable from labialization and palatalization of the syllable-initial consonant.²

Table 5. Diphthong Vowels

Dinka			Nuer		
ie	diet	<i>songs</i>	ie	diet	
iẽ	kiẽth	<i>scorpion</i>	iẽ	kiẽr	<i>river</i>
iē	akiēk	<i>bats</i>	iē	riēm (1)	
	riēŋ	<i>(my) flesh</i>	iē̃	miē̃thdu	
	miē̃th	<i>food</i>	iē̃	riē̃dā	<i>my flesh</i>
				miē̃th	<i>food</i>
				yier	<i>sea</i>
iē̃	kiẽēt	<i>imitation</i>	iē̃	jiē̃n (1)	
			iē̃	ŋiē̃c	<i>teachers</i>
uo	kuōth	<i>thorns</i>	uo	kuōth	
uõ	cuō̃r	<i>vultures</i>	uõ	tuō̃k	
uō	yuōm	<i>sesame</i>	uō	thuōk	
uō̃	atuō̃c	<i>messengers</i>	uō̃	thuō̃k	
	amuō̃r	<i>sparrow</i>			
			ɔa	cɔal	<i>be named</i>
				jiɔam	<i>furious wind</i>
			ɔaa	gɔaa	<i>wisdom; knowledge</i>
			ɔ̃a	gɔ̃ar	<i>to write</i>
			ɔ̃aa	dɔ̃aar ~ dɔ̃aar	<i>fools</i>
				cɔ̃aa ~ cɔ̃aa	<i>bone</i>

Note that Dinka marks Breathiness on second member(s) of diphthong whereas Nuer may also mark it on the first member when the vowel is /i/. [The Breathy marking of the diphthongs as found in the reference text was somewhat variable.]

² A significant feature to understanding the underlying vowel system in the Dinka-Nuer languages lies in the ability to distinguish labialization and palatalization of consonants and the u / i on-glide of the diphthongs. If these are not distinguished, there is quite a large number of vowel correlations that must be postulated in order to explain the vowel changes in lexical items and in the grammar. This goes beyond the scope of this paper.

4 Stress

A significant feature that has not been fully investigated among the Nilotic languages is that of (Syllable) Stress. In the Western Nilotic languages, Stress is being shown to mark some significant grammatical features (as well as lexical items). In the past, Stress has been described in numerous ways, particularly as a shortening of the vowel length and a decrease in strength (un-release) of the final consonant.³

Stress is currently not being written in the Dinka orthography. Since one manifestation of Stress is perceived in vowel length, some Stressed – Un-Stressed differences are being written using vowel length (doubling of the vowel for Un-Stressed). This is not a consistent practice. The short/extra short vowels continue to be under-differentiated in regard to Stress.

In some current linguistic/orthography discussions for Dinka, Stress is being investigated as a feature of the root (or syllable) with the Un-Stressed form being the ‘marked’ feature. There is currently a proposal to write the Un-Stressed form with an apostrophe after the word, i.e., after the syllable since many words in Dinka are mono-syllabic. The writing of (Un-)Stress would greatly help to regularize the spelling of Dinka, particularly in regard to vowel length.

In Nuer, Stress is being marked on the vowel with the dieresis symbol (¨). [It is my understanding that since this phenomena has not been fully described and presented in a coherent manner, the marking of Stress in Nuer has been somewhat inconsistent.]

5 Tone

Although it has been reported that the western Nilotic languages have numerous tones, latest research on Dinka shows that Dinka is a two tone system: High and Low. A "Falling" tone may be found as High tone on an Un-Stressed Long vowel, and a "Rising" tone as Low tone on an Un-Stressed Long vowel.

Tone is currently not being marked in the standard orthographies of Dinka and Nuer. In some linguistic articles, the tones are marked using the acute (High: ´) and grave (Low: `) marks above the vowels. In both Nuer and Dinka, a mark for tone above the vowel is complicated by the fact that the languages already place a mark above the vowel for other vowel features. In discussions of Dinka orthography, where the dieresis above the vowel is used to mark Breathiness, there has been a suggestion to use a different symbol to combine the dieresis of Breathiness with tone, e.g., a tilde (˜) could be used to indicate a High - Breathy [while acute (´) could indicate High - Non-Breathy]. Another suggestion was to write the tone on one of the long vowels and the dieresis on the other. That does not solve the problem for short vowels.

6 Syllable & Word Structures

The Dinka-Nuer languages have basic syllable structures of CVC, CV, V. Word structures are generally short with basic structures of CVC, CV-CVC, CVC-V and CVC-CV

There are a limited number of prefixes and suffixes. There is complex internal vowel morphology which is related to grammatical features.

³ See Leoma Gilley's forthcoming article "The Feature of Stress in Nilotic" for a description of Stress in Shilluk and Dinka.

7 Nuer “/”

In the Nuer orthography, the “/” has been adopted to indicate Negation of a word or clause. It is placed at the beginning of a word, e.g., /**ca** “has not” vs. **ca** “is”. See the following example sentence from Nuer.

Kä ino /cuare dual ke naath, ke yöö thile mi ca kum mi /ca bi nyoth, kie mi ca tēē mi /ca bi ṇac.

So do not be afraid of people, for whatever is now covered up will be uncovered, and every secret will be made known. Mat 10:26

8 Phonemes and Graphemes in Dinka and Nuer

8.1 Consonants

p	p	pal	<i>knife</i>	p	pur	<i>hoe</i>
b	b	bith	<i>fishing spear</i>	b	bith	<i>fishing spear</i>
t̥	th	thök	<i>goats</i>	th	thok	<i>door, mouth</i>
d̥	dh	dhök	<i>young male person</i>	dh	dhööl	<i>boy</i>
t	t	toṇ	<i>eggs</i>	t	tet	<i>hand</i>
d	d	dom	<i>garden</i>	d	duel	<i>house</i>
tʃ	c	cök	<i>feet</i>	c	cibat	<i>fishing hook</i>
dʒ	j	jöṇ	<i>dog</i>	j	jith	<i>scorpion</i>
k	k	kur	<i>dove</i>	k	kak	<i>garden</i>
g	g	gak	<i>pied crow</i>	g	gōk	<i>baboon</i>
m	m	mac	<i>fire</i>	m	mac	<i>gun</i>
n	n	nək	<i>feather</i>	n	naath	<i>people</i>
ṇ	nh	nhom	<i>head</i>	nh	nhiaal	<i>rain</i>
ɲ	ny	nyaṇ	<i>crocodile</i>	ny	nyal	<i>girl</i>
ŋ	ṅ	ṅany	<i>chameleon</i>	ṅ	ṅar	<i>play</i>
r	r	rōu	<i>hippo</i>	r	rōw	<i>hippo</i>
l	l	lith	<i>type of hawk</i>	l	lam	<i>curse</i>
w	w	wel	<i>guinea fowl</i>	w	wic	<i>head</i>
j	y	yöl	<i>tail</i>	y	yaṇ	<i>cow</i>
h	y	yöt	<i>house</i>			

8.2 Vowels

IPA	Dinka			Nuer		
a	a	awan	<i>wolf</i>	a	gat	<i>child</i>
a:	aa	anyaar	<i>buffalo</i>	aa	gaat	<i>children</i>

ḁ	ä	kät	<i>garden platform</i>	ḁ	lak	<i>dream</i>
ḁḁ	ää	amääl	<i>sheep</i>	aa	daap	<i>money; gold</i>
a'				ä	thäk	<i>bull</i>
aḁ'				ää	thääk	<i>bulls</i>
ḁ'				ä	-	
ḁḁ'				ää	-	
e	e	rel	<i>anthill</i>	e	tet	<i>hand</i>
eḁ	ee	aweec	<i>type of bird</i>	ee	deet	<i>goats</i>
ḁ	ē	wēc	<i>hand broom</i>	ḁ	tet	<i>strong</i>
eḁ	ēē	nhiēc	<i>tortoise</i>	ee	teekä	<i>live</i>
e'				ē	tēt	<i>hands</i>
eḁ'				ēē	kēet din	<i>musicians</i>
ḁ'				ē	-	
eḁ'				ēē	-	
ε	ε	bet	<i>eight</i>	ε	dεl	<i>goat</i>
εḁ	εε	pεei	<i>moon</i>	εε	keet	<i>stick</i>
ḁ	ē	rēc	<i>fish</i>	ḁ	bεl	<i>blacksmith</i>
εḁ	ēē	kēēl	<i>garden platforms</i>	ee	keer	<i>up</i>
ε'				ē	bēl	<i>grains (pl)</i>
εḁ'				ēē	tēēṅ	<i>to check</i>
ḁ'	ž			ē	lēnye	<i>run!</i>
εḁ'	žž			ēē	ṅēēr	<i>whisper</i>
i	i	tik	<i>woman</i>	i	dit	<i>bird</i>
iḁ	ii	miir	<i>giraffe</i>	ii	diit	<i>birds</i>
ḁ	ī	nyīr	<i>young girls</i>	ḁ	dīt	<i>great</i>
iḁ	īī	ajīīth	<i>chickens</i>	ii	dīit	<i>great</i>
ḁ'				ī	-	
iḁ'				īī	-	
ḁ'				ī	-	
iḁ'				īī	-	
o	o	thom	<i>guitar</i>	o	tol	<i>smoke</i>
oḁ	oo	thook	<i>mouths</i>	oo	nyooth	<i>to show</i>
ḁ	ō	köt	<i>shield</i>	ḁ	poc	<i>be ashamed</i>
oḁ	ōō	thöoc	<i>low chair</i>	oo	booth	<i>to lead</i>
o'				ō	böth	<i>leader</i>
oḁ'				ōō	bööth	<i>leaders</i>
ḁ'				ō	-	
oḁ'				ōō	-	
ɔ	ɔ	tɔṅ	<i>spear</i>	ɔ	cɔl	<i>to name</i>

ᠠᠨ	ᠠᠨ	agᠠᠨk	<i>baboon</i>	ᠠᠨ	tᠠᠨr	<i>decay</i>
ᠠᠨ	ᠠᠨ	rᠠᠨ	<i>marabou stork</i>	ᠠᠨ	elᠠᠨ	<i>extremely</i>
ᠠᠨ	ᠠᠨ	akᠠᠨ	<i>elephant</i>	ᠠᠨ	tᠠᠨr	<i>grass</i>
ᠠᠨ	.			ᠠᠨ	-	
ᠠᠨ	.			ᠠᠨ	-	
ᠠᠨ				ᠠᠨ	-	
ᠠᠨ				ᠠᠨ	-	
ᠠᠨ	u	wut	<i>cattle camp</i>	ᠠᠨ	thuk	<i>mouths</i>
ᠠᠨ	uu	wuut	<i>type of game</i>	ᠠᠨ	guut	<i>end</i>
ᠠᠨ				ᠠᠨ	-	
ᠠᠨ				ᠠᠨ	-	

(Note that an apostrophe (') is used to indicate Un-Stressed.)

BONGO-BAGIRMI LANGUAGES IN SUDAN

Janet Persson

OVERVIEW

The Bongo-Bagirmi languages are spread across south-western Sudan, Central Africa and Chad, intermingled with languages of quite different linguistic origins. They are part of the Western group of Central Sudanic, according to the most generally accepted classification.

The Sudan languages in this family, with the exception of Sinyar, which is spoken in the border region of Dar Fur and Chad, form a group of their own known as the Bongo-Baka languages. It is this group in which language development has taken place over the last twenty or so years. Previously there had been sporadic attempts by some local people to write their languages but no concerted effort to design readable orthographies and publish books for use in the communities.

The people who speak these Bongo-Baka languages live in Western Equatoria and Bahr-el-Ghazal. The most southerly group, the Baka, occupy lands to the south and west of Maridi among the Mündü and Avokaya. Most of these peoples speak each others' languages as well as their own. Baka was first described by Kirk Parker in *OPSL* 4, 1985, under the title "Baka Phonology". A more recent article is "Update on Baka Phonology and Orthography as of 1996" by D.L. Sampson in *OPSL* 7, 1997.

From Maridi up to Rumbek stretches a chain of closely related languages and dialects. Immediately to the north of Baka is Morokodo, spoken in an area between Amadi, Mundri, Maridi and Yeri. North again from the Morokodo is a language spoken by the Mödö, the Lörü and the Wira, which for practical purposes is known as Jur Mödö because it is in the Mödö dialect that books have been published. To the west of the Mödö live the Nyamusa, whose language is close to Jur Mödö. To the north are the 'Bëli and Söpi, whose dialects are close enough to each other that they can be considered to form one language, called by linguists Jur Beli. The "Jur" part of the names "Jur Mödö" and "Jur 'Bëli" comes from a Dinka word by which all these tribes are known to other people. These "Jur" are not to be confused with the Jur of the area around Wau, whose language, Luwo, is Western Nilotic. A comparative survey of all these languages and dialects is to be found in *OPSL* 7, 1997, "Grouping of the Bongo-Baka Languages" by Andrew Persson.

Finally, the most northerly language is Bongo, spoken in Bahr-el-Ghazal in an area south of Tonj and at Bussere. Bongo was described by Fr. Stefano Santandrea in an article "Notes on Bongo" in *Sudan Notes and Records* 39, 1958. A more recent analysis by Eileen Kilpatrick, entitled "Bongo Phonology" was published in *OPSL* 4, 1985.

HISTORY OF LANGUAGE DEVELOPMENT

As mentioned before, a sustained effort at language development in this family has only taken place in the last twenty years. The peoples who speak these languages were not widely enough known for their languages to be chosen for development during the colonial and missionary era. It was only after the foundation of the Institute of Regional Languages in 1976 that local demand finally received a response from outside linguists and educators.

In 1978 a survey was carried out of the "Jur" dialects, and as a result work was started in Jur Mödö in 1980. The main impetus for language development came from the Episcopal Church of Sudan (Mundri district), which set up a local language committee to approve the orthography and oversee the distribution of books and the organising of classes and training courses. Linguists were assigned by IRL to do the necessary research and supervise the programme. The first reading primer was published in 1984 and other literature at intervals since then. There is now in 2003 a good core of fluent readers and an ongoing programme for teaching the language through both church and school. In fact, it is not too much to say that were it not for their language being written and books available, a majority of children would have had little chance of becoming literate during the current civil war. Many Morokodo and Jur 'Bëli' are also using Jur Mödö books.

In 1982 Baka began to be developed, in a similar way to Jur Mödö, through impetus from the Episcopal Church and educated Baka. Linguists from IRL did the initial research, and the first attempts at designing an orthography and writing books were made. The outbreak of civil war in the late 1980s put a temporary stop to the programme. However, a new committee was formed by the Baka community in exile and a fresh start made. During the early nineties the orthography was revised and more books written. In 2003 there is an ongoing programme but it is not as well established as the Jur Mödö, partly because the Baka have suffered more disturbance by the war.

At the beginning of the Jur Mödö work some members of their language committee were Morokodo from Yeri but after the first books were produced the Morokodo found that their language was a great deal more different from Jur Mödö than had been realised, and that their people from further south did not understand it. They therefore formed their own committee in Mundri in the late eighties and some initial work was done on developing an orthography, based on the Jur Mödö orthography. The civil war put a stop to this work until the late nineties, when the Morokodo community in Khartoum decided to form a language committee and start again, with the help of professional linguists. An orthography was accepted in 1999 and the first books written. Meanwhile, in the home area the people had also formed a new committee and were trying to get language development moving again, so they welcomed the initiative of their Khartoum community.

The most recent group to join in the movement for language development are the Bongo. Again, it was the community in Khartoum who took the initiative and formed a committee to oversee the work in 1996. To date there is a trial orthography, based partly on the linguistic analysis done by Eileen Kilpatrick. A trial edition of a reading primer was published in 1999 and is in the process of revision. Some other literacy materials have also been written.

JUR MÖDÖ PHONOLOGY

As an example of a typical Bongo-Baka language I give below a brief account of the Jur Mödö phonology based on my outline of Mödö Phonology and Grammar published in *Mödö-English Dictionary with Grammar* by Andrew M. Persson & Janet R. Persson, SIL Nairobi, 1991.

Consonants

Jur Mödö has 32 or 33 consonant phonemes, depending on the dialect. These fall into the following categories: implosives, voiceless stops, voiced stops, prenasalised stops, nasals, voiceless fricatives, voiced fricatives, trill, lateral, approximants. See the table below:

	Labial	Dental	Palatal	Velar	Labiovelar	Glottal
Implosive	ɓ	ɗ	ɟ			
VL. stops	p	t	c	k	k͡p	ʔ
Vd. stops	b	d	ɟ	g	ɡ͡b	
Prenasal.	^m b	ⁿ d, ⁿ z	^ɲ ɟ	^ŋ g	^{ɲm} ɡ͡b	
Nasals	m	n	ɲ	ŋ	ɲ͡m	
VL. frics.	f	s				
Vd. frics.	v	z				
Trill		r				
Lateral		l				
Approx.			j		w	

N.B. In the Lörī dialect /v/ occurs in many words where Mödö has /b/. The Mödö dialect does not use /v/, whereas /b/ is found in both dialects. In my outline of phonology and grammar at the front of the Mödö-English Dictionary I included /h/ as a phoneme of Mödö but this is not strictly accurate. It is only found in loan words and has not really been assimilated into the language.

Vowels

There are nine vowels in two sets, as follows:

Set 1		Set 2	
i	u	ɪ	ʊ
e	ə	ɛ	ɔ
		a	

The /ə/ in Set 1 is phonetically a centralised rounded vowel but phonologically it functions as the back counterpart of /e/ and the equivalent of /o/ in other languages.

The two sets operate in a vowel harmony system, the main feature of which is that in any single word the vowels will generally belong all to one set. There are some exceptions, the most

common being that /a/ occurs in the first syllable of a number of nouns belonging to Set 1. The only operation of vowel harmony beyond the word is in the inalienable possessive construction.

e.g. /də ɲəkɔ/ "head of a wild cat"
 /də kede/ "head of an elephant"

Tone

Mödö has two level tones, which are a feature of the syllable, that is, each syllable bears only one distinctive tone. Long vowels are best regarded as two syllables in sequence since they may carry tone glides. These tone glides are simply a fusion of high-low or low-high on adjacent syllables.

The language committee decided against marking tone in the orthography and this has greatly simplified the reading and writing of the language. The only exception is in the contrasting pair of words /ni/ "her" and /ní/ "their" which would otherwise be confused, since the only difference between them is of tone. The word for "her" is low tone and the word for "their" high tone. The committee decided to use a doubled consonant to show the high tone word, so "her" is written **nī** and "their" is written **nnī**. There is a precedent for this in the orthography of the Moru language.

Syllable and Word Structure

Syllables in Mödö are either V or CV, so words always end in a vowel. V syllables occur at the beginning of a word or, in a few cases, at the end of a word where they are homophonous with the preceding vowel. In other words, they take the form of a lengthening of the vowel but, as mentioned above, are best treated as separate syllables because there can be a tone glide, e.g. /dàá/ "spring".

It is a peculiarity of the language that all verb roots begin with a vowel whereas nouns and words of other classes normally begin with a consonant. There are, however, some nouns that begin with /a/ for one of two reasons. The first is that the word /a/, a variant of /wa/, which means "thing" is a common prefix in compound nouns. The second is that a number of loan words from Dinka and Arabic begin with /a/.

A majority of words consist of two or three syllables, with some of four or five syllables and a few monosyllables, the latter mostly pronouns and function words.

Frequency and distribution of phonemes

Some phonemes are rare. The glottal stop is extremely rare, only found in medial position in a few words. The prenasalised palatal stop is also not at all common, though it can occur both initially and medially. The dental nasal, /n/, occurs only rarely as initial consonant in a word but is much more frequent medially. The voiceless labial fricative, /f/, is found only in a few Mödö words in initial position but is much more common in the Lörī dialect. Lörī often has /f/ where Mödö has /p/. This seems to pattern with Lörī having /v/ in many words where Mödö has /b/.

As to distribution of phonemes, the most obvious restriction is the vowel harmony, which requires that all vowels in a word be from the same set, with certain exceptions. There are also some limitations on which vowels occur following each other in a word but the simple syllable structure means that all consonants except those mentioned in the previous paragraph have the same distribution.

COMPARATIVE CHART OF BONGO-BAKA ORTHOGRAPHIES

The chart below displays the orthographies of the four Bongo-Baka languages in Sudan which are written, along with the phonetic symbols which they represent. It will be seen that there is a fair amount of similarity but also some distinct differences in the way the individual languages represent the same sound. This partly reflects differences in their phonological systems and is partly a result of separate development. Whereas there was a conscious attempt for Jur Mödö and Morokodo to use the same orthographic conventions, Baka and Bongo orthographies were developed independently of the other languages in the family. Since the Baka and Bongo are not very likely to try and read Jur Mödö or Morokodo books, or vice versa, the differences in orthography will probably not matter at all.

IPA	BAKA	MOROKODO	JUR MÖDÖ	BONGO
+	'b	'b	'b	'b
d'	'd	'd	'd	'd
f	'y	'j	'j	'j
p	p	p	p	p
c	c	c	c	c
t	t	t	t	t
k	k	k	k	k
b	b	b	b	b
d	d	d	d	d
ʃ		j	j	j
g	g	g	g	g
gb̄	gb	gb	gb	gb
k̄p	kp	kp	kp	kp
m̄b	mb	mb	mb	mb
m̄v	nv	mv		
ⁿ d	nd	nd	nd	nd
ⁿ ʃ		nj	nj	nj

ⁿ z	nz	nz	nz	
ŋg	ng	ng	ŋg	ng
ŋ ^m gb̄	ngb	ŋb	ŋb	ngb
ⁿ dr	ndr	ndr		
dr	dr	dr		
tr	tr	tr		
gb̄r	gbr	br		
k̄pr	kpr	pr		
ŋ ^m gb̄r	ngbr			
m	m	m	m	m
n	n	n	n	n
ɲ	ny	ny	ny	ny
ŋ	ŋg	ŋ	ŋ	'ng
ŋm̄			ŋm	
f	f	f	f	
s	s	s	s	
h	h	h		
v	v	v	(v)	
z	z	z	z	
l	l	l	l	l
r	r	r	r	r
ɾ	ɾ	ɾ		
w	w	w	w	w
j	y	y	y	y
ʔ	'	'	'	
ʋ	ʋ			

	h^w		hw	
	t^w		tw	
IPA	BAKA	MOROKODO	JUR MÖDÖ	BONGO
i	ᵢ	ĩ	ĩ	ĩ
e	(e)	ě	ě	ě
ə	(a)	ä		ä
ø	(o)	ö	ö	ö
u	ᵤ	u	u	ü
ɪ	i	i	i	i
ɛ	e	e	e	e
ɑ	a	a	a	a
ʊ	u	o	o	u
ɔ	o	ɔ	ɔ	o
ɨ	ɨ			

Comments on the chart

The chart shows clearly how the two more southern languages, Baka and Morokodo, have a set of stops with trilled release whereas the two northern languages, Jur Mödö and Bongo, do not. Baka and Morokodo also have more prenasalised obstruents and more liquids than the other languages. The stops with trilled release and the lateral flap /r/ are also found in some neighbouring Moru-Madi languages.

In contrast Bongo is distinguished by having a much smaller inventory of consonants. In particular it has no fricatives, a feature it shares with Dinka, its Nilotic neighbour.

The vowel systems are typically Nilo-Saharan, with contrasting sets of vowels based on tongue root position [+ATR or -ATR] and vowel harmony within words. Bongo and Morokodo have a full complement of ten each, with five in each set. The Mödö dialect in which Jur Mödö is written only has nine vowels but vowel harmony operates nonetheless.

The Baka vowels seem to be in process of change from the typical Nilo-Saharan system. At a phonetic level there are 11 vowels - two sets of five each plus a neutral vowel /ɨ/ - and vowel harmony at word level. This is a similar system to the other languages in the group. However, the low vowels of the [+ATR] set, [e], [ə] and [o], only occur in words containing one of the high vowels, [i] or [u]. (A few exceptions to this rule can be explained in terms of a historical process of syllable loss.) One can therefore regard [e], [ə] and [o] as variants of [ɛ], [a] and [ɔ] occurring in the environment of a [+ATR] high vowel. In other words, at a phonemic level there are eight vowels and only eight vowel letters are required in the orthography.

When it comes to orthographic conventions it will be seen that all four languages use many digraphs and a number of trigraphs. Baka even has one quadrigraph, /ngbr/, to represent the prenasalised labio-velar with trilled release.

Diacritics have been used in many languages in Sudan to mark some vowels and the Bongo-Baka languages are no exception. Bongo, Jur Mödö and Morokodo have all chosen the umlaut or two dots over a letter to indicate at least some of their [+ATR] vowels. Baka is the only one of the four to use a dot under the letter to show this feature. However, both Baka and Morokodo have a dot under the letter to distinguish the lateral flap from /r/ and Baka also distinguishes the labio-dental flap from /v/ in this way.

The reason for Baka avoiding diacritics over letters is that it was decided to mark tone in that language. There are two contrasting tones and all high tones are indicated by an acute accent over the vowel. By placing dots underneath certain letters the Baka have avoided the problem of having two sets of diacritics over the same letter.

For the other three languages, although they all have two-tone systems similar to Baka, it was concluded that there was no need to indicate tone in the orthography and that context was adequate to decide the meaning in all but a few cases.

LITERATURE IN BONGO-BAKA LANGUAGES

Since the four languages featured in this article were first written down at different dates the amount of literature in them varies considerably. Morokodo, for example, has only some initial literacy materials, an Alphabet Book and an Alphabet Story Book. Bongo, having started earlier, has an Alphabet Book, an Alphabet Story Book and a Primer. These two languages are only at the beginning stage of a literacy programme and will obviously need to produce more titles before people can learn to read fluently.

Baka has had more time in which to develop its literature so can now boast an Alphabet Book, a Primer series, parallel reader, a transition primer for those already literate in other languages, two story books, three books on health matters, and a bulletin. There is also a variety of Christian literature: a book on Christian marriage, four Bible stories, several books of the Bible, a hymnbook and a book of youth songs. The whole New Testament is being translated and will be published eventually in one volume.

In Jur Mödö there are the following: an Alphabet Book with sentences, a Primer in two parts, a Reader to accompany the Primer, a book of stories with comprehension questions, all of which can be used in primary schools or adult classes to teach illiterate people to read and write. There are also two other books of stories, a book about wild animals with pictures, a hymnbook, a prayer book, a catechism, and a New Testament with Genesis and Exodus in a single volume. All the books are being used and there are not enough copies to meet demand.

Compared with the literature in major world languages the Bongo-Baka languages of Sudan have little, but compared with the situation twenty years ago a great advance has been made. Many Baka and Jur people of Equatoria are reading their languages and are in a position to write original stories or other compositions. It is to be hoped that they will do so and that it will not be long before the Morokodo and Bongo are able to follow suit.

Orthographies of Moru-Ma'di languages

Eileen Kilpatrick

Moru-Ma'di languages are a sub-family of the Central Sudanic language family. This paper shows the orthography used in Sudan and Uganda for the following Moru-Ma'di languages: Avokaya, Moru, Wa'di, Keliko, Ma'di, Olu'bo (Luluba) and Aringa.

Vowel systems

All Moru-Ma'di languages have both Advanced Tongue Root [+ATR] and retracted tongue root [-ATR] vowels. The number of phonemic vowels from language to language varies from seven to ten. The most common number of phonemic vowels in the language family is nine. The retracted tongue root set is the basic set of vowels. Phonetically, in regards to vowel harmony, the Advanced Tongue Root set is more dominant. A [+ATR] vowel changes the pronunciation of a neighboring [-ATR] vowel to the corresponding [+ATR] vowel. Avokaya is an example of a seven vowel system. The vowel phonemes of Avokaya are as follows:

[+ATR]		[-ATR]	
i	u	ɪ	
ə		ɛ	ɔ
		a	

Due to vowel harmony, Avokaya has sub-phonemic phones [e] and [o] which occur contiguous to a [+ATR] vowel. The [+ATR] vowel /i/ has the strongest influence on neighboring vowels, with /u/ also influencing them. The [+ATR] vowel /ə/ has the least influence on neighboring vowels. Also the influence of a [+ATR] vowel on a previous vowel is stronger than its influence on a following vowel. For instance, the Avokaya vowel /i/ will change the pronunciation of a previous /ɔ/ to the /u/ phoneme, but will change the pronunciation of a following /ɔ/ to [o].

/ ɔ - / (unspecified subject) plus / dī / "hammer" becomes [údī], but
 / dī / "hammer" plus / - zó / (purpose) becomes [dīzó].

Keliko is typical of the languages in the family which have nine phonemic vowels.

[+ ATR]		[-ATR]	
i	u	ɪ	ʊ
e	o	ɛ	ɔ
a			

All the languages in this paper except Moru write all the phonemic vowels. Moru just uses < ä > to mark any [a] in a word with [+ ATR] vowels without distinguishing the other vowels as [+ ATR].

Plosives

All languages in the language family have voiceless and voiced plosives at the following points of articulation: bilabial, alveolar, velar and labio-velar. They each have a glottal plosive as well. Olu'bo has undergone a sound shift. Words with alveolar plosives in the other languages have dental plosives in the corresponding Olu'bo words. All languages except Olu'bo have alveolar plosives followed by flap [ɾ]. Olu'bo has alveolar plosives as well as dental. The words in the other languages with the alveolar plosive followed by the flap [ɾ] are alveolar plosives in Olu'bo.

Fricatives and Affricates

The Moru-Ma'di languages have voiceless and voiced fricatives in the labio-dental and alveolar positions. They also have voiceless and voiced alveolar affricates. In most of the languages, the alveolar affricates /ts/ and /dz/ have post-alveolar allophones [tʃ] and [dʒ] which occur before front vowels. All languages use the symbols <c> and <j> for these affricates. But the prenasalized affricate /ndz/ is written <nj> in some languages but as <nz> in others, due to the fact that it too has the allophone [ndʒ].

Nasals

All of the Moru-Ma'di languages have nasals at the following points of articulation: bilabial, alveolar, palatal, and velar. Keliko and Aringa also have a labio-velar nasal.

Prenasalized plosives, fricatives and affricates

All Moru-Ma'di languages have prenasalized consonants in the following positions: bilabial, labio-dental, alveolar, post-alveolar, velar, and labiovelar. All but Olu'bo also have a prenasalized alveolar plus flap [ɾ]. Olu'bo has a prenasalized dental plosive as well as an alveolar one.

Trills and Laterals

All Moru-Ma'di languages have the trill /r/ and the lateral approximate /l/. Moru and Wa'di also have the retroflexed lateral /ɭ/.

Approximates

All Moru-Ma'di languages have the labio-velar and palatal approximates.

Implosives and preglottalized sounds

All Moru-Ma'di languages have bilabial and alveolar implosives. All Moru-Ma'di languages have preglottalized labiovelar approximates, Ma'di has a palatal implosive, all other languages have preglottalized palatal approximates.

Palatalized sounds

Avokaya, Moru and Wa'di have a palatalized allophone of the velar sounds /k/, /g/, and /ŋg/ which occurs before front vowels. Moru has written those as <ky> <gy> and <ngy>, because there are a few contrasts between those sounds and the corresponding non-palatalized sounds before the vowel /a/. Therefore these sounds are included in the orthographic inventory of Moru sounds.

Labialized consonants

The status of potential labialized consonants varies from language to language. Avokaya, Keliko and Aringa have no labialized consonants. Ma'di, Olu'bo, Moru and Wa'di have a large number of consonants that can be labialized. In each case, there are contrasts with the non-labialized version. In many cases where Avokaya has consonant C followed by /ɔ/, Wa'di has the labialized form of the consonant C^w followed by /a/. Olu'bo and Ma'di have examples of labialized implosives in the bilabial and alveolar positions.

Tones

All Moru-Ma'di languages have three level tones, High, Mid and Low. Avokaya and Olu'bo have rising tones on short vowels as well as long vowels. Wa'di, Keliko, Ma'di and Keliko have falling tone on short vowels. Olu'bo has falling tone on short and long vowels and Avokaya has falling tone only on long vowels. Tones on long vowels are analyzed as a sequence of two vowels with tones.

There are a number of tone changes in Avokaya, Wa'di and Olu'bo in the verb forms. Most of the languages have grammatical tone on nouns distinguishing an abstract quality from the person having that quality. Ma'di and Aringa also use tone to mark singular and plural distinctions.

In the charts below, sub-phonemic allophones which are marked distinctly are listed in parenthesis. When two phonemes are not distinguished orthographically the symbol used for both is listed under both phonemes.

Phoneme	Graphemes						
IPA 93	Avokaya	Moru	Wa'di	Keliko	Ma'di	Olu'bo	Aringa
ɪ	i	i	i	i	i	i	i
ɨ	ḭ	i	ḭ	ḭ	ḭ	ḭ	ḭ
ɛ	e	e	e	e	e	e	e
e		e	(e̞)	ẹ	ẹ	ẹ	ẹ
a	a	a	a	a	a	a	a
ə	ḁ	ä	ḁ				
ʊ		u	u	u	u	u	u
u	u	u	ṹ	ṹ	ṹ	ṹ	ṹ
ɔ	o	o	o	o	o	o	o
o		o		o	o	o	o

Phoneme	Graphemes						
IPA 93	Avokaya	Moru	Wa'di	Keliko	Ma'di	Olu'bo	Aringa
p	p	p	p	p	p	p	p
b	b	b	b	b	b	b	b
t̥						th	
d̥						dh	
t	t	t	t	t	t	t	t
d	d	d	d	d	d	d	d
tr	tr	tr	tr	tr	tr		tr
dr	dr	dr	dr	dr	dr		dr
k	k	k	k	k	k	k	k
g	g	g	g	g	g	g	g
kp	kp	kp	kp	kp	kp	kp	kp
gb	gb	gb	gb	gb	gb	gb	gb
ʔ	'	unmarked	'	'	'	'	'
f	f	f	f	f	f	f	f
v	v	v	v	v	v	v	v
s	s	s	s	s	s	s	s
z	z	z	z	z	z	z	z
ts	c	c	c	c	c	c	c
dz	j	j	j	j	j	j	j
m	m	m	m	m	m	m	m
n	n	n	n	n	n	n	n
ɲ	ny	ny	ny	ny	ny	ny	ny
ŋ	ŋ	ŋ	'ng	ŋ	ng	ŋ	ŋ
ŋm				mŋ			mŋ
ᵐb	mb	mb	mb	mb	mb	mb	mb
ᵐv	mv	mv	mv	mv	mv	mv	mv
ⁿd	nd	nd	nd	nd	nd	nd	nd
ⁿd̥						ndh	
ⁿdr	ndr	ndr	ndr	ndr	ndr		ndr
ⁿdz	nj	nj	nj	nj	nz	nj	nz
ⁿg	ng	ng	ŋg	ng	ng	ŋg	ng
ᵐᵑgb	ngb	ŋb	ngb	mgb	mgb	ŋgb	mgb

Phoneme		Graphemes					
IPA 93	Avokaya	Moru	Wa'di	Keliko	Ma'di	Olu'bo	Aringa
r	r	r	r	r	r	r	r
l	l	l	l	l	l	l	l
ɭ		ɾ	ɾ				
ɓ	'b	'b	'b	'b	'b	'b	'b
ɗ	'd	'd	'd	'd	'd	'd	'd
ʔw	'w	'w	'w	'w	'w	'w	'w
ʔdʲ					'j		
ʔj	'y	'y	'y	'y		'y	'y
kʲ		ky					
gʲ		gy					
ŋgʲ		ngy					
pʷ					pʷ		
bʷ		bw	bw		bw	bw	
tʷ		tw	tw		tw	tw	
trʷ		trw			trw		
tsʷ		cw					
dʷ			dw		dw	dw	
drʷ		drw	drw		drw		
dzʷ						jw	
ndzʷ						njw	
ndrʷ		ndrw	ndrw		ndrw		
kʷ		kw	kw		kw	kw	
gʷ		gw	gw		gw	gw	
ŋgʷ		ŋgw	ngw		ngw	ŋgw	
kpʷ					kpʷ		
gbʷ					gbw		
ŋmgbʷ					mgbw		
ɓʷ		'bw			'bw	'bw	
ɗʷ		'dw			'dw	'dw	

IPA 93	Avokaya	Moru	Wa'di	Keliko	Ma'di	Olu'bo	Aringa
m ^w					mw	mw	
n ^w						nw	
ɲ ^w					nyw		
ŋ ^w		ɲw	'ngw				
v ^w					vw	vw	
s ^w		sw	sw		sw	sw	
z ^w		zw	zw			zw	
l ^w			lw				
r ^w		rw			rw	rw	
h ^w		hw					
/ ' / é*	é	e	é	é	é	é	é
/ ˊ / ē	ê	e	e	e	e	e	e
/ ˋ / è	ẽ	à or î*	ẽ	ẽ	ẽ	ẽ	ẽ
/ ^ / ê	ée	e	ê	ê	ê	ée or éẽ	ê
/ ˇ / ǐ	ě	e	ě or ǐ			ě or ǐ	

*For demonstrating the orthographical symbolization of tone, <e> was chosen as the sample vowel. For Moru, tone is distinguished in only a few instances. Low tone is marked with a grave accent to distinguish singular and plural pronoun forms. In most instances the vowel is /a/. Therefore <à> was used in the above chart. In instances where lexical tone distinctions are marked, a caret was used to mark the word with a low tone. Therefore <î> was also included in the chart.

Phonology of the These Language
By May Yip

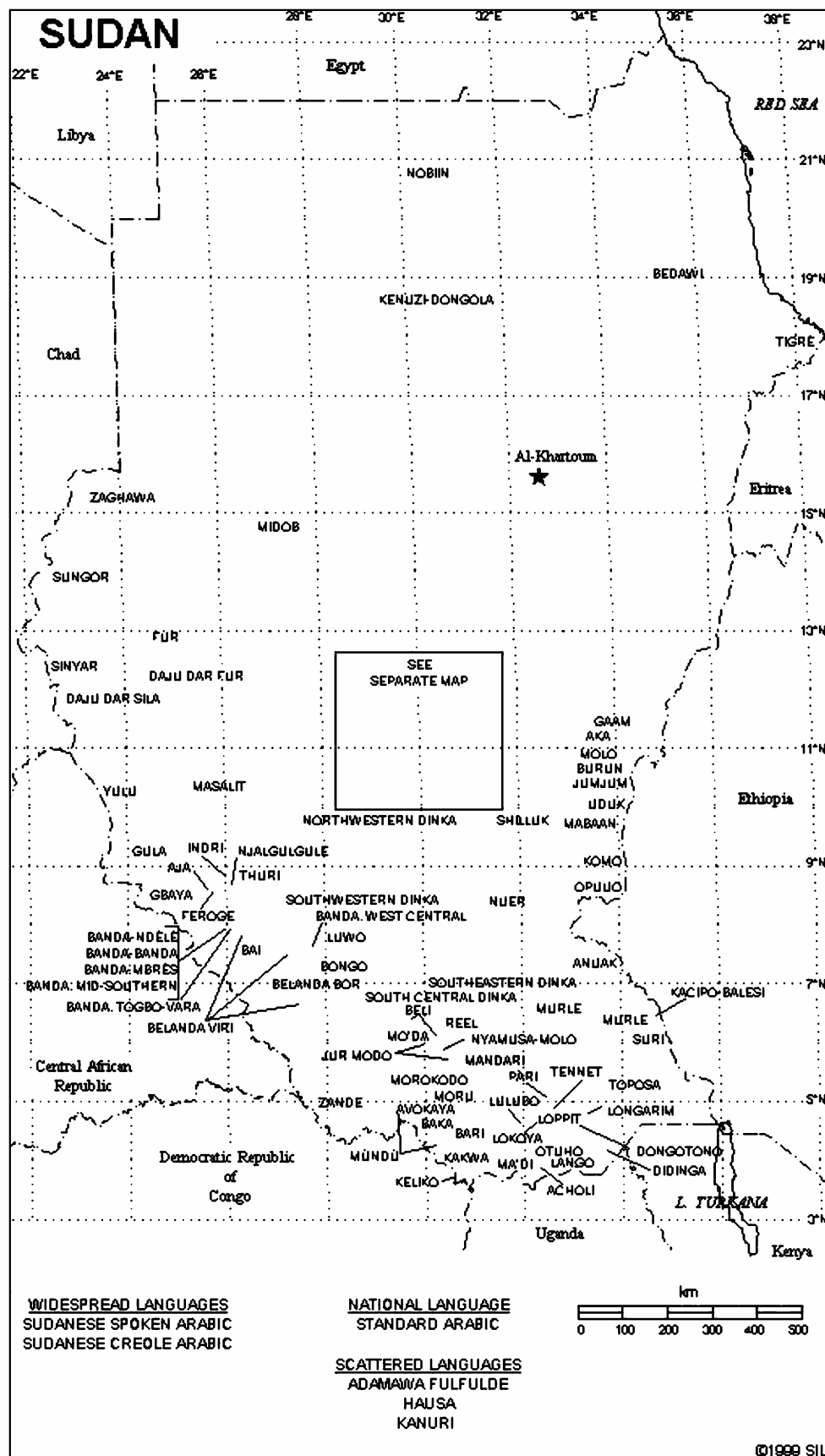
0. Introduction

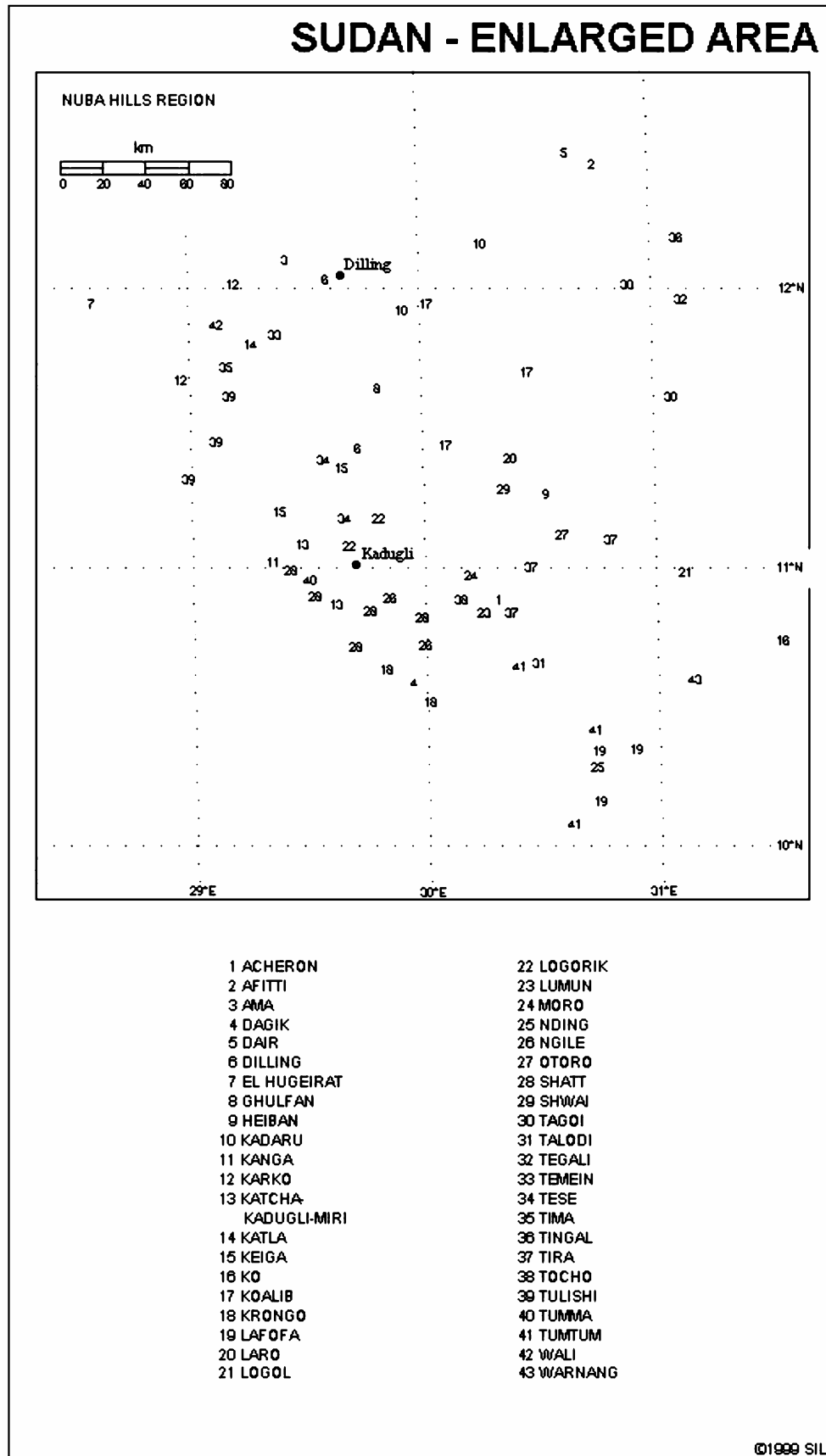
A language survey was done by Institute of African and Asian Studies of University of Khartoum in 1976.¹ The survey results claim that Tesei was called Keiga Jirru. But the Tesei or the These people believe that the These and Keiga Jirru come from the same father as the Temein and they all speak one language but different dialects. The Ethnologue (2000) records that the These language has 67% lexical similarity with the Temein. The history recorded by Stevenson (1984) about Temein agrees with what the people say about their forefathers. The name 'Tese' was used in the Ethnologue (1996), but the preferred spelling now is These. The These language is classified in the Nilo-Saharan family, an Eastern Sudanic language and belongs to the Western Group.

The These language is spoken in the area of Tesei Umm Danab (Mt. These) which lies in the south-west of the Nuba Mountains just north of Kadugli (see maps). Tesei Umm Danab is an Arabic name which means "Tesei is the mother of the tails". The These people do not like this name, they call themselves These. They got the name "These" from the Temein people which means people who are scattering. It was in the early days when they were migrating from the North to the Mountains, the Temein people saw that they were people wandering and scattering, so they called them "the scattered".

A large group of These people moved to Khartoum because of the civil war and they are now mainly staying in and around Khartoum. Ethnologue (2000) recorded that there are 1,400 speakers of this language, but the information is from Welmers (1971). The These people think there are more speakers than that. Due to the civil war there is no recent accurate estimate of the number of speakers. The These people who are still staying in the mountains are farmers, planting cotton, durra, sesame, ground nuts, etc. The ones in Khartoum work at anything that enables them to survive.

¹ The Language Survey of Sudan was launched in 1972 by the Institute of African and Asian Studies. The first phase of the survey was conducted by Bjorn Jernudd and Asyyid Hamid Hurreiz with the assistance of Ushari Ahmad Mahmud. The second phase (1973) was coordinated by Herman Bell. His survey report was written in Language Survey of The Sudan, Southern Kordofan The Nuba Mountains, Liguri, Tesei Umm Danab. Sample of Locality, Selected Tables No. 10, Institute of African and Asian Studies, University of Khartoum (1979).





1 Consonants

From a database of 700 words it has been established that there are eighteen consonants in the These language. These are listed in the chart in (1.1) with their phonetic properties, allophones and free variants are shown in parentheses (). The plosives and nasals form one set with five contrasting points of articulation.

Examples of words with each of the consonants are given below from example (1) to (6). Examples are given according to the point of articulation. In the examples the phonetic form is written in [], and the phonemic form is written in //, the ' ' shows the gloss. In the first group of each example the consonant is in the word-initial position. In the second group the consonant is in the word-middle position and in the last group the consonant is in word final-position. Gaps indicate no examples in the data.

1.1 Consonant phonemes

Chart 1

	Bilabial	Dental	Alveolar	Retroflex	Palatal	Velar	Labiovelar	glottal
Plosives [- voice]	p	(t)	t	ɖ		k	k ^w	
Plosives [+ voice]	(b)		(d)	(ɖ)	ɟ	(g)		
Implosives	ɓ		ɗ					
Nasals	m		n		ɲ	ŋ	ŋ ^w	
Trills			r	(ɽ)				
Fricative	(f)		s (z)					(h)
Lateral			l					
Approximant					j		w	

(1) Bilabial:

word-initial	/p/	[pùḁó]	/pùḁó/	'ash'
	/m/	[mùrìk]	/mùrìk/	'liver'
	/ɓ/	[ḁúrí]	/ḁúrí/	'leaf'

word-medial	/p/	[àbík]	/àpík/	'dove'
	/m/	[làmək]	/làmək/	'food'
	/b/	[sábóŋ]	/sábóŋ/	'tail'
word-final	/p/	[ák:áp]	/ák:áp/	'quickly'
	/m/	[màdám]	/màtám/	'axe'
	/b/	--		

/ák:áp/ is the only word in the data with the bilabial voiceless plosive in the word-final position.

(2) Alveolar:

word-initial	/t/	[tèré]	/tèré/	'he was'
	/d/	[dèmsé]	/dèmsé/	'he sinks'
	/n/	[nè]	/nè/	'people'
	/r/	[réné]	/réné/	'good'
	/s/	[sé]	/sé/	'teeth'
	/l/	[lèmè]	/lèmè/	'he makes'
word-medial	/t/	[tódó]	/tótó/	'he killed'
	/d/	[kúďó]	/kúďó/	'frog'
	/n/	[tónò]	/tónò/	'belly'
	/r/	[tòrá]	/tòrá/	'guard'
	/s/	[mòsók]	/mòsók/	'address to old man'
	/l/	[tòlá]	/tòlá/	'cough'
word-final	/t/	--		
	/d/	--		
	/n/	--		
	/r/	[âr]	/âr/	'way'
	/s/	--		
	/l/	[lààl]	/lààl/	'rope'

(3) Retroflex:

word-initial	/ɾ/	[tágá]	/táká/	'forehead'
	/ɖ/	--		
word-medial	/ɾ/	[ðəɾúk]	/ðəɾúk/	'stool, long bench'
	/ɖ/	[kúɖɔŋ]	/kúnɬɔŋ/	'air inside the stomach'
		[èɖók ^w é]	/èn-ɬók ^w é/	'you plant'
word-final	/ɾ/	--		
	/ɖ/	--		

Both the retroflex /ɖ/ and retroflex /ɾ/ occur only word-medially. They never occur word-initially nor word-finally. This will be discussed in sections 2 and 4.

(4) Palatal:

word-initial	/ɟ /	[ɟàgú]	/ɟákú/	'old cloth'
	/ɲ/	[ɲá]	/ɲá/	'and'
	/j/	[jà]	/jà/	'of'
word-medial	/ɟ /	[kəɟík]	/kəɟík/	'lady's fingers'
	/ɲ/	[kèɲíŋ]	/kèɲíŋ/	'eyes'
	/j/	[ìjík]	/ìjík/	'tooth'
word-final	/ɟ /	--		
	/ɲ/	--		
	/j/	--		

(5) Velar:

word-initial	/k/	[kálá]	/kálá/	'eagle'
	/ŋ/	[ŋàlò]	/ŋàlò/	'neck'
word-medial	/k/	[tágá]	/táká/	'forehead'
	/ŋ/	[èdánjá]	/ètánjá/	'big house'
word-final	/k/	[kùdúk]	/kùtúk/	'cows'
	/ŋ/	[kùdùŋ]	/kùtùŋ/	'house'

(6) Labiovelar:

word-initial	/k ^w /	[k ^w álá]	/k ^w álá/	'bull'
		[k ^w èŋ]	/k ^w èŋ/	'ears'
	/ŋ ^w /	[ŋ ^w áník]	/ŋ ^w áník/	'ear'
	/w/	[wàrà]	/wàrà/	'chief'
word-medial	/k ^w /	[tòk ^w àŋ]	/tòk ^w àŋ/	'to plant'
		[èdók ^w é]	/èn-tók ^w é/	'you (sg) plant'
	/ŋ ^w /	[tòŋ ^w àŋ]	/tòŋ ^w àŋ/	'to listen'
		[tòŋ ^w é]	/tòŋ ^w é/	'he listens'
	/w/	[nàwèk]	/nàwèk/	'bird'
word-final	/k ^w /	--		
	/ŋ ^w /	--		
	/w/	--		

The vowels following the labiovelar consonants are limited. Only the low back vowel /a/ and the front mid [ATR] vowel /ɛ/ occur after the voiceless labialised velar /k^w/ and labialised velar nasal /ŋ^w/. For the labiovelar approximant /w/, /a/, /ɛ/ and /ɪ/ may occur after it.

1.2 Description of allophones

1.2.1 [p], [f], [b] and [h]

When [p] occurs in the word-initial position, it is in free variation with a voiceless labiodental fricative [f]. However this alternative varies among the These people who speak different dialects. [p] is also in free variation with [h], a voiceless glottal fricative (7). This free variation occurs among the These people. Since [p] is more commonly used, /p/ will represent the phoneme:

(7)

- | | | |
|-----|-----------------------------|-------------|
| (a) | [pàrík] ~ [fàrík] ~ [hàrík] | 'whip' |
| (b) | [pók] ~ [fók] ~ [hók] | 'field' |
| (c) | [pàhìk] ~ [fàhìk] ~ [hàhìk] | 'coconut' |
| (d) | [pàďīŋ] ~ [fàďīŋ] ~ [hàďīŋ] | 'fire, gun' |

When /p/ occurs in the intervocalic position, it could be [h] or [b]. Sometimes it is a dialect difference (8), but sometimes it is not (9 and 10).

(8)

/pírìpírìtək/	'dragonfly'	
[hírìbírìdək]	voicing	(speaker A)
[hírìhírìdək]	spirantization	(speaker B)

The first [p] is realized by the speakers as [h], the second [p] is realized as [b] by speaker A and is realized as [h] by speaker B. We will see that the rule shown below is going through some transition. It seems to apply in some places, but as we will see in later sections there are other factors that come in to influence these sounds.

The general rule for plosive voicing is:

$$\left[\begin{array}{c} \text{C} \\ \text{-voice} \\ \text{-} \\ \text{continuant} \end{array} \right] \rightarrow [+voice] \quad / \quad \text{V_V}$$

- (9) /pèdêpèdǽŋ/ 'a musical instrument'
[hèdêbèdǽŋ] voicing

The first [p] is a free variant with [h]. These people say [p] is more commonly used in this word, but for the second /p/ it is a [b] phonetically by both speakers A and B.

(10)

- (a) [hàh̀̀k] /pàp̀̀k/ 'coconut'
(b) [kèháhá] /kèpápá/ 'coconuts'

The [h] occurs at word initial position as a free variation of /p/. The [h] occurs at intervocalic position as a [h] phonetically by both speaker A and B.

However, from the example of verb conjugation (11), [p] is /p/ when it occurs word initially or doubled (11a and 11c). /p/ becomes [h] when it is in intervocalic position (11b).

(11)

- | | | | |
|-----|---------|---------|----------------------------|
| (a) | [pè] | /pè/ | 'He sees' root of the verb |
| (b) | [à-hé] | /à-pé/ | 'I see' |
| (c) | [á-ppé] | /á-ppé/ | 'I saw' |
| (d) | [èbé] | /èn-pé/ | 'you (sg) see' |

/p/ becomes [h] when the 1st person singular prefix /a-/ is added to the root /pè/. /p/ becomes [b] when the 2nd person singular prefix /Vn-/ is added to the root, the voiceless plosive /p/ takes the voicing of the nasal and becomes a voiced plosive [b] and the alveolar nasal /n/ is deleted. More about this will be discussed in section 4.

Both [h] and [b] occur between vowels within word root (12). However, by the analog of the verb conjugation, [p], [b] and [h] can be considered as being in complementary distribution: [p] occurs in word-initial and word-final position, [h] occurs between vowels. [p] becomes [b] when it assimilates with the preceding alveolar nasal and is followed by a vowel (see the underlying form and also section 4).

(12)

	<u>Surface Form</u>	<u>Underlying Form</u>	<u>Gloss</u>
(a)	/kàtábèk/	/kàtá[np]èk/	'writing' (noun) loan word from Arabic katib
(b)	/kébēbik/	/ké[ɲp]ɛ[ɲp]ik/	'chin'
(c)	/kè[h]á[h]á/	/kèpápá/	'a kind of coconuts'
(d)	/[h]à[h]ik/	/pàpik/	'a kind of coconut'

1.2.2 [ɬ] and [t] are allophones:

[ɬ], a voiceless dental plosive is more prominent when it is doubled. The occurrence of this sound is not very frequent. The data show that the preceding vowel of [ɬ] could be in either [ATR] set. However, the vowels following it are the high and mid front vowels only. [ɬ] becomes [ɖ] when it occurs between vowels, see examples in (13).

(13)

(a)	[ɪɖɪ]	/itì/	'he comes'
(b)	[tí:nà]	/tí:nà/	'when'
(c)	[kèɖéɖéɲ]	/kètédéɲ /	'mice'
(d)	[ááɖé]	/ááté/	'I will'
(e)	[ɲòɖé]	/ɲòté/	'he washes'

For the [t], a voiceless alveolar plosive occurs with any vowel except the high and mid front vowels. [t] becomes [d] between vowels, see examples in (14).

(14)

(a)	[èdájá]	/ètájá/	'big house'
(b)	[lídák]	/líták/	'meat'
(c)	[tárò]	/tárò /	'squirrel'
(d)	[tòjòk]	/tòjòk/	'seeds'
(e)	[tòlèŋ]	/tòlèŋ /	'flower'
(f)	[tōnòŋ]	/tōnòŋ/	'shield'
(g)	[ùdùk]	/ùtùk /	'mouth'

The front vowels cause the tongue to move forward and result in a dental plosive while the back vowels allow production of an alveolar plosive. So [t̪] and [t] are complementarily distributed: [t̪] occurs before high, mid front [-ATR] vowels, [t] occurs elsewhere. Therefore [t̪] and [t] are considered to be allophones of one phoneme /t/.

1.2.3 [t̪], [ɾ] and [ɖ] are allophones:

The retroflex trill [ɾ] and the voiceless retroflex plosive [t̪] are in complementary distribution. [t̪] only occurs in word-initial position or when doubled intervocalically while [ɾ] only occurs between vowels, /t̪/ never occurs word finally, examples are listed in (15). Therefore, [t̪] and [ɾ] are considered to be allophones of one phoneme /t̪/.

(15)

(a)	[tájé]	/tájé/	'pot'
(b)	[túúník]	/túúník/	'a short big trunk of wood'
(c)	[kèájé]	/kè-tájé/	'pots'
(d)	[bètúk]	/bètúk/	'stool, long bench'

The voiced retroflex plosive [ɖ] is also considered to be an allophone of /t̪/. [ɖ] appears to occur only between vowels (see 16c and 17). However, in reality it is preceded by an alveolar nasal [n]. Like the phoneme /p/, /t̪/ exhibits the same morphological process. See section 4.

(16)

(a)	tòk ^{wé}	'He plants' (root of the verb)
(b)	à-[ɾ]ók ^{wé}	'I plant'
(c)	á-t̪ók ^{wé}	'I planted'
(d)	è(n)-[ɖ]ók ^{wé}	'you (sg) plant'

[d] occurs between vowels within the word root, see example (17a and b).

(17)

- | | | |
|-----|-------------|-------------------|
| (a) | /fi(n)d̥ir/ | 'a kind of snake' |
| (b) | /túú(n)dánè | 'rotten' |

In order to be consistent, it must be assumed that there is an underlying nasal in these words, but the morphemes have merged long ago and are no longer apparent.

1.3 Consonant distribution

All consonants occur in word initial and word middle positions. However, word final consonants are limited to p, m, r, l, j, k, and ŋ only.

There are two sounds which occur only rarely in word-final position, /p/ and /n/, see example (1). There is only one word final /p/ in the data, and one Arabic loan word which ends with /n/, /ɟèlón/ meaning 'a can which carries a gallon of fluid'.

1.4 Consonant Length

Double consonants are found in nouns, verbs and adjectives. Examples are listed in (18), (19) and (20):

(18)

Lengthened Consonants in nouns:

- | | | | |
|-----|------------|------------|-------------------------|
| (a) | /t/ - /tt/ | /mòtè/ | 'pain, difficult' |
| | | /móttó/ | 'horse' |
| (b) | /n/ - /nn/ | /kàník/ | 'thorns' |
| | | /kánnék/ | 'well, good way' |
| (c) | /m/ - /mm/ | /kómék/ | 'bone' |
| | | /kèmmúrík/ | 'a kind of big tree' |
| (d) | /l/ - /ll/ | /kíli/ | 'a kind of mouse' |
| | | /kíllík/ | 'a kind of tree' |
| (e) | /s/ - /ss/ | /mósók/ | 'address to an old man' |
| | | /mùssé/ | 'fortune teller' |

(19)

Lengthened Consonants in verbs:

- | | | | |
|-----|------------|--------|-----------|
| (a) | /p/ - /pp/ | /pè/ | 'he sees' |
| | | /áppé/ | 'I saw' |
| (b) | /k/ - /kk/ | /kì/ | 'he digs' |
| | | /ákkí/ | 'I dug' |

(c)	/t/ - /tt/	/tòk ^w è/ /áttók ^w é/	'he plants' 'I planted'
(d)	/r/ - /rr/	/ràtté/ /árrátté/	'he runs' 'I ran'
(e)	/l/ - /ll/	/àlámé/ /állámé/	'I eat' 'I ate'

(20)

Lengthened consonants in adjective for emphasis:

(a)	/l/ - /ll/	/ésákálá/ /ésákàllá/	'long' 'very long'
(b)	/r/ - /rr/	/nàrè/ /nàrrè/	'strong' 'very strong'

2 Vowels

The These language has a ten vowel system belonging to two sets which are distinguished by the feature Advanced Tongue Root [ATR] (see 2.1). Most of the words have vowels in the [-ATR] set.

2.1 Vowel phonemes

Chart 3

[-ATR]					[+ATR]				
ɪ				ʊ	i				u
ɛ			ɔ		e			o	
	a					ə			

The following chart shows the distinctive opposition between these vowel phonemes:

Chart 4

	ɪ	ɛ	a	ɔ	ʊ	i	e	ə	o	u
[high]	+	-	-	-	+	+	-	-	-	+
[low]	-	-	+	-	-	-	-	+	-	-
[back]	-	-	+	+	+	-	-	+	+	+
[ATR]	-	-	-	-	-	+	+	+	+	+

The phonemic status of the ten vowels is shown in the following examples:

(21)

/ɪ/ - /ɛ/			
/ɪlé/	'he speaks'	/kɪlɪ/	'mouse'
/ɛ̀ɛ̀/	'he knows'	/kéé/	'you (pl) know'

(22)

/a/ - /ɛ/			
/árré/	'I was'	/nà/	'goat'
/érrék/	'back'	/nè/	'people'

(23)

/a/ - /ɔ/			
/àŋ/	'come and take'	/tòrá/	'guard'
/òŋ/	'belly'	/tótó/	'he killed'

(24)

/ɔ/ - /u/			
/òtò/	'he kills'	/súró/	'river'
/ùtùmìk/	'mountain'	/sóró/	'big basket'

(25)

/ɪ/ - /i/			
/ìjàmìk/	'worm'	/kìlì/	'body'
/ìjìk/	'tooth'	/kì/	'he digs'

(26)

/ɛ/ - /e/			
/kè/	'3 rd p relative pronoun'	/sùré/	'he wrestles'
		/sùré/	'he is sad'

(27)

/a/ - /ə/			
/bà/	'if'	/kàŋ/	'being'
/bè/	'he hits'	/kèŋ/	'digging' (noun)
/nà/	'goat'		
/nènù/	'sun'		

(28)

/ɔ/ - /o/			
/bɔ̃/	'tree'	/tɔ̃nɔ̃ŋ/	'shield'
/bò/	'he gathers'	/tòjòk/	'seeds'

(29)

/ʊ/ - /u/			
/ùlɪk/	'grasshopper'	/kùú/	'you light'
/ùtùk/	'mouth'	/kùbùrí/	'leaves'

2.2 Vowel Length

The contrast of vowel length is shown in examples 30-37

(30)

(a)	/ɪ/ - /ɪɪ/	/kínɪk/	'horn'
		/kííŋ/	'horns'
(b)		/kɪlì/	'a kind of mouse'
		/kìílik/	'mice'

(31)

(a)	/ɛ/ - /ɛɛ/	/nè/	'people'
		/néé/	'you sg know'
(b)		/téɖéŋ/	'a kind of mouse'
		/tèèrèsè/	'deer'

(32)

(a)	/a/ - /aa/	/nádók/	'fear'
		/nàádók/	'lie'
(b)		/sà/	'1 st person dual'
		/sàá/	'milk'

(33)

(a)	/ɔ/ - /ɔɔ/	/lòlè/	'he excretes'
		/kàlól/	'ropes'

(34)

(a)	/ʊ/ - /ʊʊ/	/kú/	'by, at'
		/kùú/	'you light'

- | | | | | |
|------|-----|------------|-----------|------------------------------------|
| | (b) | | /kúrók/ | 'stone' |
| | | | /kùúrók/ | 'stones' |
| (35) | (a) | /i/ - /ii/ | /kə̀jik/ | 'lady's fingers' |
| | | | /kíllíík/ | 'name of a tree' |
| (36) | (a) | /u/ - /uu/ | /tújù/ | 'honey' |
| | | | /nùù/ | 'a kind of soup to eat with bread' |
| | (b) | | /ɖùɖú/ | 'big' |
| | | | /ɖúúnúŋ/ | 'grain stone' |
| (37) | (a) | /ə/ - /əə/ | /kə̀rù/ | 'he divides' |
| | | | /ə́érú/ | 'I divide' |

So far, no contrastive examples for /e/ - /ee/ and /o/ - /oo/ have been found. These sounds are relatively rare.

2.3 Vowel Changes

The These language exhibits [ATR] root controlled harmony that spreads from the root to the left. Thus, the prefixes are affected, but not the suffixes, see examples in (38) and (39).

Vowel changes in nouns:

- (38)
- | | <u>Singular</u> | <u>Plural</u> | <u>Gloss</u> |
|-----|-----------------|---------------|---------------------|
| (a) | /tɛ́lájá/ | /kɛ́-tɛ́lájá/ | 'door' |
| (b) | /téǵɛŋ/ | /kɛ́-téǵɛŋ/ | 'mouse' |
| (c) | /móttó/ | /kò-móttó/ | 'horse' |
| (d) | /jójók/ | /kò-jójók/ | 'mongoose' |
| (e) | /súró/ | /kù-súró/ | 'river' |
| (f) | /tùrùɣùk/ | /kù-tùrùɣùk/ | 'hyena' |
| (g) | /ðə́túk/ | /kìðə́túk/ | 'stool, long bench' |

(39)

	<u>Singular</u>	<u>Plural</u>	<u>Gloss</u>
(a)	/t̥ésē-tək/	/t̥ésè/	'These Person'
(b)	/kə̀jì-tək/	/kə̀jik/	'lady's fingers' (vegetable)
(c)	/kàbárē- tək/	/kábárèk/	'cloud'

3 Tone

The These language has three level tones and two contour tones. The level tones are High, Mid and Low. The contour tones are rising and falling. Low tone and High tone are the most common ones, while Mid tone is less common. The falling tone only occurs at the last syllable, and rising tone is rare in my data. More study is needed for tones.

In the following examples the tones are marked as: acute / ´ / for High tone; grave / ` / for low tone, circumflex / ^ / for Falling tone and hacek / ˇ / for Rising tone. The Mid tone is marked with a macron. In the orthography, the mid tone is left unmarked.

Tone is distinctive at the lexical level. Example (40) shows the contrast of tones.

(40)

(a)	HH	/kútúŋ/	'shoes'
	LL	/kùtùŋ/	'house'
(b)	LL	/tòlèŋ/	'flower'
	HL	/tóliŋ/	'special friend of the opposite sex'
	LH	/tòléŋ/	'male reproductive organ'
(c)	HH	/móttó/	'horse'
	ML	/mōttòk/	'sleeping'
	ML	/mōtè/	'hard, discomfort'
(d)	Rising	/ďǎl/	'child'
	Falling	/âr/	'path'
	Falling	/mâl/	'porcupine'
	Falling	/bô:/	'tree'

Tone also distinguishes the verb aspect. For instance, High tone with a doubled consonant distinguishes:

--the 1st person singular present verb form from the 1st person singular past verb form, see example (41)

--the 2nd person plural present verb form from the 2nd person plural past verb form, see example (42):

- (41)
- | | | |
|-----|----------|-------------|
| (a) | /àléme/ | 'I make' |
| | /állémé/ | 'I made' |
| (b) | /àtéká/ | 'I stop' |
| | /áttekà/ | 'I stopped' |
- (42)
- | | | |
|-----|-----------|---------------|
| (a) | /kèlémé/ | 'you pl make' |
| (b) | /kéllémé/ | 'you pl made' |
| (c) | /kètéká/ | 'you stop' |
| (d) | /kétteká/ | 'you stopped' |

4 Morphology

The second person singular imperfect verb prefix and the number markers of the nouns and adjectives are discussed in this section.

4.1 The second person singular imperfect verb prefix /ɛn-/ ~ /èn/.

The underlying forms of the first person singular imperfect and perfect, and the second person singular imperfect are as follows:

à-	1 st person sg imperfect	
áC-	1 st person sg perfect	
ÈN- ~ NN	2 nd person sg imperfect	N is a nasal which takes on the features of the consonant which follows it.

When the verb root begins with a vowel, the second person singular prefix /èn/ is added. There are some tone changes, but those changes are not within the scope of this paper, see example (43).

- (43)
- | | | | | |
|-----|-------|------------|-------------------|-----------------|
| (a) | /àlù/ | 'he ties' | /ɛnáló/ ~ /ènáló/ | 'you (sg) tie' |
| (b) | /ìtì/ | 'he comes' | /ɛnítí/ ~ /ènítí/ | 'you (sg) come' |
| (c) | /ótó/ | 'he kills' | /ɛnótó/ ~ /ènótó/ | 'you (sg) kill' |

However, when the verb root begins with a plosive, the nasal of this prefix assimilates with the initial root consonant and changes its usual behavior: its voicing and point of

articulation. The following examples will show the change of behavior of different consonants after the prefix is added.

Examples (44) and (45) show the verb root with the voiceless bilabial plosive /p/ as the initial root consonant.

- (44)
- | | | |
|-----|-----------|-------------------------------------|
| (a) | [pósè] | 'he/she anoints' (root of the verb) |
| (b) | [à-hòsè] | 'I anoint' |
| (c) | [á-ppósé] | 'I anointed' |
| (d) | [è-bósé] | 'you (sg) anoint' |
- (45)
- | | | |
|-----|---------|----------------------------------|
| (a) | [pè] | 'he/she sees' (root of the verb) |
| (b) | [à-hé] | 'I see' |
| (c) | [á-ppé] | 'I saw' |
| (d) | [è-bé] | 'you (sg) see' |

Phonologically [p] will become [h] when it occurs between vowels, (e.g. 44b and 45b) and it stays as [p] when it is doubled, (e.g. 44c and 45c). However, it becomes [b] when it is assimilated with the nasal (e.g. 44d and 45d).

Example (46) shows the verb root with the voiceless retroflex plosive /t/ as the initial root consonant.

- (46)
- | | | |
|-----|-------------------------------------|------------------|
| (a) | [tòk ^w è] | 'he/she plants' |
| (b) | [à-ɾók ^w é] | 'I plant' |
| (c) | [át ^w ók ^w é] | 'I planted' |
| (d) | [è-dók ^w è] | 'you (sg) plant' |

Phonologically [t] will become [ɾ] when it occurs between vowels see example (46b) and it stays as [t] when it is doubled, see example (46c). However, it becomes [d] when it is assimilated with the nasal, see example (46d).

There are two rules which generally apply, see example (47):

Voicing assimilation:

$$\begin{array}{c} \text{C} \\ \text{[-voice } \\ \text{ -continuant} \end{array} \rightarrow \begin{array}{c} \text{[+voice]} \\ \text{[-voice } \\ \text{ -continuant} \end{array} \quad / \quad \text{N + } \underline{\text{root}}$$

Nasal deletion:

$$\begin{array}{c} \text{C} \quad \rightarrow \quad \emptyset \quad / \quad (\text{V})___ + \text{C} \\ [+nasal] \end{array}$$

- (47)
- | | |
|----------------------|------------|
| UF (underlying form) | /ɛn+ʈókʷɛ/ |
| Voicing assimilation | ɛn ɖókʷɛ |
| Nasal deletion | ɛ ɖókʷɛ |
| Surface form or SF | [ɛɖókʷɛ] |

Examples (48), (49) and (50) show the verb root with the voiceless velar plosive /k/ as the initial root consonant.

- (48)
- | | | |
|-----|-----------------|---------------------------|
| (a) | [kì] | 'he/she digs' (verb root) |
| (b) | [à-jí] | 'I dig' |
| (c) | [ákkí] | 'I dug' |
| (d) | [ṛggí] ~ [ìggí] | 'you (sg) dig' |
- (49)
- | | | |
|-----|--------|------------------------------------|
| (a) | [kù] | 'he/she lights a fire' (verb root) |
| (b) | [à-wú] | 'I light' |
| (c) | [ákkú] | 'I lit' |
| (d) | [ùggú] | 'you (sg) light' |
- (50)
- | | | |
|-----|---------------------|------------------------------|
| (a) | [kèrù] | 'he/she divides' (verb root) |
| (b) | [è-érú] | 'I divide' |
| (c) | [ékkérú] | 'I divided' |
| (d) | [ṛggérú] ~ [ìggérú] | 'you (sg) divide' |

Phonologically the /k/ → ø / (C)V+__
 root Pfx N/A root.

If the vowel of the root is a High vowel it controls what happens. After the /k/ is deleted, the High vowels fill in the features where the consonant used to be. The result of this is /i/ → j and the /u/ → w. There is no evidence of its place with non-High vowels. The /k/ stays as /k/ when it is doubled (47c), (48c) and (49c). However, it becomes [gg] when it is assimilated with the nasal (47d), (48d) or (49d).

Something similar happens with the verb roots: the voiced bilabial implosive /ɓ/ and voiced alveolar implosive /ɗ/ as the initial root consonant, see examples (51) and (52).

- (51)
- | | | |
|-----|---------|--------------------------|
| (a) | [ɓɛ] | 'he/she hit' (verb root) |
| (b) | [à-ɓɛ] | 'I hit' |
| (c) | [áɓɓɛ] | 'I hit' |
| (d) | [ɲɛ́mɛ] | 'you (sg) hit' |
- (52)
- | | | |
|-----|------------|----------------------------|
| (a) | [ɗɛ́msɛ] | 'he/she sinks' (verb root) |
| (b) | [à-ɗɛ́msɛ] | 'I sink' |
| (c) | [áɗɗɛ́msɛ] | 'I sank' |
| (d) | [ɲɛ́némsɛ] | 'you (sg) sink' |

The implosives [ɓ] and [ɗ] do not change when they occur between vowels or when they are doubled. However, when the second person singular prefix /ɛ̀n/~nn/ is attached to the verb root, their point of articulation is spread and then they are deleted. See the derivation below.

UF (underlying form)	/nn+ɓɛ/
Place of articulation spread	mm ɓɛ
Plosive deletion	mm ɛ
SF (surface form)	[ɲɛ́mɛ]

Examples (53), (54) and (55) show the verb root with the nasals [m], [ɲ], [ŋ] as the initial root consonant simply lengthens when the second person singular prefix is added (53d), (54d), (55d).

- (53)
- | | | |
|-----|----------------|-----------------------------|
| (a) | [máttélɛ] | 'he/she drinks' (verb root) |
| (b) | [à-máttélɛ] | 'I drink' |
| (c) | [ámmáttélɛ] | 'I drank' |
| (d) | [ɲɛ́máttélánɛ] | 'you (sg) drink' |

- (54)
- | | | |
|-----|-------------|------------------------------|
| (a) | [ɲʊɡʊmɔ̀] | 'he/she presses' (verb root) |
| (b) | [à-ɲʊɡʊmɔ̀] | 'I press' |
| (c) | [áɲʊɡʊmɔ̀] | 'I pressed' |
| (d) | [ɲʊɡʊmɔ̀] | 'you (sg) press' |

- (55)
- | | | |
|-----|----------|----------------------------|
| (a) | [ɲùrɛ̀] | 'he/she walks' (verb root) |
| (b) | [à-ɲùré] | 'I walk' |
| (c) | [áɲùré] | 'I walked' |
| (d) | [ɲùré] | 'you (sg) walk' |

Example (56) and (57) shows the verb root with the trill [r] and alveolar lateral [l] as the initial root consonant.

- (56)
- | | | |
|-----|---------|---|
| (a) | [rɛ̀] | 'being' 3 rd person sg (verb root) |
| (b) | [à-rɛ̀] | 'being' 1 st person sg imperfect |
| (c) | [árrɛ̀] | 'being' 1 st person sg perfect |
| (d) | [èrrɛ̀] | 'being' 2 nd person sg imperfect |

- (57)
- | | | |
|-----|------------|-----------------|
| (a) | [lɛ̀mɛ̀] | 'he makes' |
| (b) | [à-lɛ̀mɛ̀] | 'I make' |
| (c) | [állɛ̀mɛ̀] | 'I made' |
| (d) | [èllɛ̀mɛ̀] | 'you (sg) make' |

The nasal in the second person singular prefix /èn/~nn/ exhibits the [nasal] deletion and is changed to [d]. After the [nasal] deletion, it assimilates to the manner of articulation to the initial root consonant, see the following derivation.

UF (underlying form)	/ɛn+lɛ̀mɛ̀/
Nasal deletion	ɛd lɛ̀mɛ̀
Approximant assimilation	ɛl lɛ̀mɛ̀
SF (surface form)	[èllɛ̀mɛ̀]

Example 58 shows the verb root with the fricative [s] as the initial root consonant:

(58)

- | | | |
|-----|------------------|-----------------------------|
| (a) | [sùré] | 'he/she is sad' (verb root) |
| (b) | [à-sùré] | 'I am sad' |
| (c) | [ássùré] | 'I was sad' |
| (d) | [izùré]~[nèzùré] | 'you (sg) are sad' |

Like the voiceless plosives, the voiceless fricative [s] becomes a voiced fricative [z] after the second person singular prefix is added (58d).

4.2 Number markers with nouns and adjectives

The system of number markers is complex: prefixes and suffixes combine with vowel changes to serve as number markers. Tone analysis has not been done in this area yet.

The plural prefix /kV-/ occurs in nouns, adjectives and second person plural form of verbs. The vowel of this prefix will harmonize with the vowels in the word root. In nouns and adjectives /kV-/ serves to derive the plural form from the singular form (see example 59).

(59)

/kɛ-tɛdɛŋ/	'mouse (pl)'	/kɔ-mɔttɔ/	'horse (pl)'
/kɛ-sɛlɛmɔŋ/	'hyena (pl)'	/kʊ-tʊrʊyʊk/	'leopard (pl)'
/kɛ-matam/	'axe (pl)'	/ki-ðəʊk/	'chair (pl)'
/kɛ-sakala/	'long (pl)'		
/kɛ-tatɛ/	'pot (pl)'		
/kɛ-ɲatapɔk/	'door (pl)'		
/kɛ-naɲɔŋ/	'scorpion'		
/kɛ-ɲadɛmak/	'tongue'		

When the plural prefix /kV-/ occurs in nouns which begin with k, the initial k of the root will be deleted (see example 60).

(60)

<u>Singular</u>	<u>Underlying form of pl</u>	<u>Surface form of pl</u>	<u>Gloss</u>
/káǎ/	/kà-káǎ/	/kà-áǎ/	'tortoise'
/káǎ/	/kà-káǎ/	/kà-áǎ/	'spear'
/kúǎ/	/kù-kúǎ/	/kùúǎ/	'frog'
/kúǎk/	/kù-kúǎk/	/kùúǎk/	'stone'

The plural prefix /kV-/ combines with a plural suffix /-tVŋ/ (see example 61).

(61)

<u>Singular</u>	<u>Plural</u>	<u>Gloss</u>
/t́áká/	/kè-t́áká-t́íŋ/	'forehead'
/ɓòk/	/kù-ɓó-t́íŋ/	'room'

The plural prefix /kV-/ combines with the deletion of the final consonant and final vowel change of the singular form. This plural marker occurs in nouns ending in k (see example 62).

(62)

<u>Singular</u>	<u>Plural</u>	<u>Gloss</u>
/mùrìk/	/kù-murɔ/	'liver'
/mɛsawak/	/kɛ-mɛsawa/	'shoulder'
/ijamɪk/	/ki-jamɔ/	'generic term for worm'

5. Orthography Suggestion for the These language

IPA Symbol	Orthography		Example Word in IPA Symbol	Example Word in These Orthography	English Gloss
	short	long			
a	a	aa	ba	'ba	if
ə	ax	aax	bə	'bax	he hits
ɛ	e	ee	bɛɛ	'bele	he plays
e	ex	eex	sure	suxrex	he is sad
ɪ	i	ii	ɪjamɪk	ijamik	caterpillar
i	ix	iix	iyik	ixyixk	tooth
ɔ	o	oo	bɔ	'bo	tree
o	ox	oox	bo	'box	he gathers
ʊ	u	uu	kʊ	ku	by, at
u	ux	uux	kuu	kuux	he lights
ɓ	'b	'bb	bɛɛ	'bele	he plays
ɗ	'd	'dd	ɗɛmɛ	'demse	he sinks
ɟ	j	jj	ɟɔɔɟ	jolong	cushion put on the head to carry things
k	k	kk	kala	kala	egg
g	'k	'kk			
k ^w	kw		k ^w ala	kwala	bull
l	l	ll	lɛmɛ	leme	he makes
m	m	mm	matam	matam	axe
n	n	nn	na	na	goat
ɲ	ny	nyny	ɲa	nya	and
ŋ	ng	ngng	ŋalo	ngalo	neck
ŋ ^w	ngw		ŋ ^w anɪk	ngwanik	ear
p	p	pp	pɛ	pe	he sees
b	'p		ɛbɛ	e'pe	you sg see
r	r	rr	tora	tora	guard
s	s	ss	sɛ	se	teeth
z	's		izure	ix'suxrex	you sg are sad
t	t	tt	tɛɛ	tere	he was
ʈ	th	thth	ʈaka	thaka	forehead
ɖ	'th		ɛɖɔk ^w ɛ	e'thokwe	you sg plant
w	w		wara	wara	chief
y	y		yaya	yaya	basket

A low tone mark " à " will be use as a grammatical tone mark.

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A Brief Description of the Current Talodi Orthographies
Tanya Spronk

1.0 Introduction

Lumun, Asharon, Tocco, and Thakik are languages belonging to the Talodi subgroup of the Niger-Kordofanian family. This group of languages is spoken in the Southern Kordofan province in the Nuba Mountains in central Sudan. It is not entirely clear how many speakers there are of each language, though there are an estimated 5000 speakers of Asharon (Norton, 1994). According to the *Ethnologue*, there are 3800 speakers of Tocco, and there are reported to be more speakers of Lumun than of Tocco. The Lumun people live in the Limon Hills, north of Kadugli.

Lumun will be described primarily in this section with comments pertaining to the other subgroup languages where necessary. The comments on phonology that are made here are mainly from unpublished manuscripts written by Thomas Jacob (1996) and Russell Norton (1994), taken from data collected primarily from an older native Lumun speaker currently residing in Khartoum. These manuscripts have been used as the basis for the Lumun orthography that is currently in use by the community. Comments on Asharon, Tocco and Thakik (also known as Dagik) made here are also based on the work of Norton (1994), Thomas Jacob (1996) and Sharon Jacob. All of the data was collected in Khartoum between 1994 and 2002.

There do not seem to be any dialect differences in Lumun or Tocco; however, Asharon is divided into two dialects - 'Eastern' and 'Western'. The effect of the dialects on a unified orthography will be briefly discussed later in this paper. According to Sharon Jacob, Thakik has eleven clans: seven of which are said to speak "quietly", two "strongly", and two "slowly".

2.0 Consonant Phonemes

The Lumun inventory of consonant phonemes consists of 17 phonemes, as shown in figure 1.

	Bilabial	Dental	Alveolar	Retroflex	Palatal	Velar	Labial velar
Stops	p	t̪	t		c	k	k ^w
Nasals	m		n		ɲ	ŋ	ŋ ^w
Trills			r				
Laterals			l				
Flaps			ɾ	ɽ			
Semi-vowels	w				j		

Figure. 1 Lumun Consonant Phonemes

Each of the consonants, with the exception of the semi-vowels and retroflex flap, has a lengthened counterpart. However, these lengthened phonemes occur only word medially. This is reflected in the orthography and will be discussed in Section 5.2.

2.1 Flaps

Contrast between the alveolar flap and the retroflex alveolar flap can be seen for Lumun in (1).

- (1) [kara] <kara> ‘louse’
 [kaɾa] <ka’ra> ‘a kind of rock’ or ‘burp’

Like other Kordofanian languages, Lumun has no voiced obstruents appearing as phonemes, nor are there any implosives, voiced or voiceless.

2.2 Alveolar Stops

Lumun contrasts dental-alveolar and alveolar stops, which is also typical of Kordofanian languages (Williamson and Blench, 2000:37). (2) is an example from Lumun showing this contrast.

- (2) [tut̪ɛ] ‘naval’
 [tut̪ɛ] ‘cloud’

2.3 Labial Velars

As well, it seems that Lumun has a labial-velar phoneme. The contrast is seen in (3).

(3)	[ɔʊŋ kwapo]	‘you (sg.) fall’
	[ɔɔk kapo]	‘he falls’
	[kanɔk]	‘moon’ (from Norton, 1994)
	[kwanan]	‘spirit’
	[luka]	‘Luka (name)’
	[lukwa]	‘fish basket’

Therefore, there are seven phonemic places of articulation in Lumun, which are labial, dental, alveolar, retroflex (apical-alveolar), palatal, velar, and labial-velar.

2.4 Consonant Phonemic Inventory of Tocco, Asharon, and Thakik

Asharon has six phonemic places of articulation, which are identical to those of Lumun, except for the retroflex flap. In Asharon, the retroflex alveolar flap is an allophone of /t/ that occurs intervocalically.

The consonant phonemic inventory of Tocco is similar to that of Lumun, differing only in respect to the semi-vowels and the retroflex flap. According to Jacob (1996), Tocco has a bilabial semivowel phoneme, yet lacks a semivowel at the palatal place of articulation. In the interest of pattern symmetry, however, a /j/ phoneme may need to be investigated. As well, this analysis differs from that of Schadeberg (1981), who also posits only one semi-vowel, but it is a palatal semivowel /j/, and not the labial /w/ attested by Jacob (1996). Tocco lacks a retroflex phoneme, as well as a labial-velar.

Therefore, there are only five phonemic places of articulation in Tocco (labial, dental, alveolar, palatal and velar), contrasted with seven in Lumun.

It should be noted that Thakik has no palatal plosives, though there is a voiceless alveolar fricative /s/, as well as voiced bilabial and velar fricatives.

3.0 Vowel Phonemes

Previously, it was thought that Lumun had a ten vowel system, five from the [+Advanced Tongue Root] set and five from the [–Advanced Tongue Root] set, as in Figure. 2.

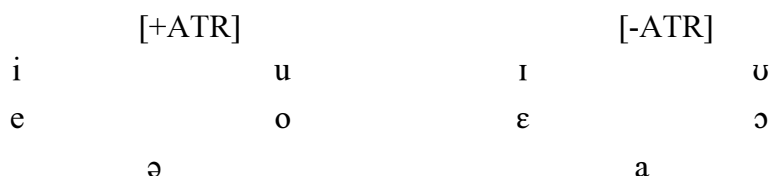


Figure. 2: Lumun Vowel Phonemes

However, recently work has suggested that the /e/ and /o/ are allophones of the phonemes /ɛ/ and /ɔ/. Thus, Lumun is now thought to have an 8 vowel system.

Schadeberg (1981) originally posited a symmetrical seven vowel system for the Talodi group languages. As well, earlier work done for the purposes of orthography development in Tocco posited only 5 vowel phonemes. However, researchers have recently become aware of more vowels than were originally posited, and all Talodi group languages are now thought to have vowel systems similar to the Lumun system as described above.

Like other Niger-Congo languages, Lumun shows vowel harmony with respect to the feature [±ATR]. The details of the harmony are still being investigated, but it is clear that noun roots exhibit vowel harmony in which all of the vowels in the root come from only one set, either [+ATR] or [–ATR], as in (4).

- | | | |
|-----|------------|-----------|
| (4) | [cakuraŋ] | ‘buffalo’ |
| | [mɔre] | ‘seeds’ |
| | [cumijən] | ‘bone’ |
| | [cək:olok] | ‘pot’ |

4.0 Tone

Tone has been recorded in Lumun, though it does not seem to carry important lexical or grammatical function. Like other Kordofanian languages, Lumun has two tones, High and Low. There have been minimal pairs found to show these contrastive tones as in (5).

- | | | | |
|-----|--------|----|-------------------|
| (5) | [kuwə] | LL | ‘a hair’ |
| | [kuwə] | LH | ‘(kind of) trees’ |

5.0 Orthography Issues

5.1 Consonant Digraphs

The orthography that was developed for Lumun has, for the most part, been consistent with the concept of each phonemic sound receiving one written symbol, and all of these symbols can easily be found on a computer for easy typing of literature. Three phonemes, /ŋ t̪ n /, which would be difficult to type on a standard typewriter or computer, have been assigned the digraphs, <ng th ny>, respectively. The labial velar is being written as a digraph <kw>. The retroflex flap /ɭ / is also written as a digraph <'r>.

5.2 Lengthened Consonants

The lengthened voiceless dental plosive is quite common intervocalically in Lumun. This is written as <thth>, as in (6).

- (6) <puththuththut> [pʊt̪:ʊt̪:ʊt̪] 'small'

Lumun has lengthened counterparts of the phonemes of [ɲ , ŋ] though no final decisions have been made as to how they will be written. It has been suggested that the lengthened phonemes be represented with the tri-graphs <nny, nng>, respectively, though this is not consistent with the <thth> currently being used for the lengthened voiceless dental plosive. Norton (1994) comments that Asharon writers, unprompted, have written the lengthened [ɲ] as <nny>.

There is a phonological rule in Lumun which voices plosives intervocalically. However, long plosives remain voiceless, as shown in (7). These long voiceless plosives are simply being written as doubled consonants.

- (7) <kucuk> [kʊjʊk] 'smoke'
 <nyuccuk> [ɲʊc:ʊk] 'blood'

The spelling rules pertaining to lengthened plosives are well understood by writers of the language.

5.3 ATR Vowels

Lumun marks all [+ATR] vowels with an umlaut and leaves the [-ATR] vowels unmarked. In this system, the Lumun words are spelled as in (8).

- (8) <cümüyän> [cumijən] 'bone'
 <caku'rang> [cakʊɾaŋ] 'buffalo'

The above system is consistent in its appearance and makes intuitive sense to writers and readers.

Some of the Talodi group orthographies have the same system as the Lumun pertaining to the [±ATR] vowels. Therefore, in the recent orthographic revisions in the Talodi group, the [+ATR] vowels are generally being marked with the umlaut. This system is still being considered by some of the language communities.

5.4 Vowel Length

As with the consonants, there seems to be a need to write lengthened vowels in Lumun, shown in (9). The long vowels are being written by doubling the vowel grapheme.

- | | | | |
|-----|---------|---------|-------------|
| (9) | [kwa:t] | <kwaat> | ‘he came’ |
| | [kwat] | <kwat> | ‘foreigner’ |

5.5 Tone

There have so far been very few words found in Lumun where tone is the only contrast. It has thus been decided that tone does not need to be shown in the orthography.

Norton (1994) reports that there is no contrastive tone in Asharon, while Jacob (1996) has reported some minimal pairs for High and Low tone in Tocco. The tone is not currently marked in the orthography of any of these languages.

6.0 Dialect Differences

As far as it is known, there are no dialect differences in Lumun or Tocco. While there are several different dialects of Thakik, the group has decided to write the “quiet” dialect.

As was mentioned before, there are Eastern and Western dialects of Asharon. According to a report written by Norton (1994), there are several differences between these two dialects which affect the orthography and spelling rules. However, they have worked to compromise between the two dialects so they will have a unified orthography. In some instances, this has required choosing a more “neutral” letter to represent cognate sounds in the dialects. An example of this is the assignment of <c> to the voiceless alveolar fricative in one dialect, and a voiceless velar stop in the other. However, to this point, there has not been agreement between the two dialects.

7.0 Phoneme and Grapheme Charts in the Talodi Language Group

Phoneme IPA	Lumun	Asharon	Tocco	Thakik
p	p	b	p	p
t̪	th	d	th	th
t	t	t, 'r	t	t
c	c	j	c	
k	k	k, g	k	k
kw	kw	gw		
(ts)		c		
Φ				b
s		z		s
x				g
m	m	m	m	m
n	n	n	n	n
ɲ	ny	ny	ny	
ŋ	ng	ng	ng	ng
ŋw	ngw	ngw	ngw	
l	l	l	l	l
r	rr	r	rr	rr
ɾ	r		r	r
ɽ	'r			'r
w	w	w	w	w
j	y	y		y
[+ATR] vowels				
i	ĩ	i	i	ĩ
e		e	e	ẽ
ə	ä	ä	ä	ä
u	ü	u	u	ü
o		o	o	ö
[-ATR] vowels				
ɪ	i	ĩ	ĩ	i
ɛ	e	ẽ	ẽ	e
a	a	a	a	a
ʊ	u	ü	ü	u
ɔ	o	ö	ö	o

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Phonology and Orthography in Gaahmg

Timothy M. Stirtz

1. Introduction

Gaahmg (also Ingessana, Gaamg, Gaam) language is an Eastern Sudanic (Eastern sub-group) language spoken in Blue Nile Province in the Sudan. There are four dialects: Buwag, Jogtaw, Kulag, and Joggoor. The first two are more closely related to each other, and the last two to each other. The teachers, politicians and other educated people tend to come mostly from the Jogtaw dialect. This language group lives in the area near the Ethiopian border in Southern Damazine state. The capital of the area is Baw and the government offices are in Soda. There are reported to be 78 mountains in the area. People live in the mountains and in the lowlands. The language is spoken by about 25,000 people. The main occupations relate to cows, cultivation and mining.

There are two published works on the language. The *Phonological Features of the Ingessana Language* by W. J. Crewe (1975) and *Preliminary Gaam-English- Gaam Dictionary* by M. L. Bender & Malik Agaar Ayre (1980). The current write-up is based on information gathered from people living in Khartoum¹. All three informants are from the town of Soda and speak the Jogtaw dialect, on which this study is based.² The three informants have spoken Gaahmg from childhood and continue to speak it in Khartoum whenever they are with other speakers of the language.

There are certain spelling issues in the current orthography that need to be worked out. The purpose of this analysis is to contribute helpful information for determining spelling rules concerning these issues. It is meant only to take the language one step further rather than to be conclusive with all the spelling issues that will eventually need to be decided upon. The study is based on the collection of about 300 words, almost all of which are nouns³.

2. Consonants (Phonemic)

	Labial	Dental	Alveolar	Palatal	Velar
Voiceless Plosives	p	t̪	t	c	k
Voiced Plosives	b	d̪	d	ɟ	g
Nasals	m		n	ɲ	ŋ
Fricatives	f		s		
Central Approximants	w	ð		j	
Flap			r		
Lateral approximant			l		

¹ Special thanks to informants Hashim Orta Adaw Madal, Safadin Hamid Ateeb, and Annaim Karaka Farajalla Yasin (Names used by permission).

² This study is also partially based on an initial write-up by Gilley (1999) unpublished ms.

³ This study is done as partial fulfilment of an agreement made with the Institute of African and Asian Studies to provide the results of all research done under its supervision as a research assistant.

A distinction is made for plosives between the dental and retroflex place of articulation. The dental plosives are made with the tongue tip touching the back of the top teeth. The retroflex plosives are made with the tongue tip or the underside of the tongue tip touching the alveolar ridge or somewhere behind the alveolar ridge. The sound of the retroflex plosives tends to vary from person to person. With some speakers of the language, common alveolar plosives are used instead of the retroflex plosives.

The phoneme /ð/ deserves special attention. It is best described as an interdental approximant. The tongue does not necessarily touch the teeth, although it can protrude out of the open mouth between the teeth. The sound is most similar to the voiced interdental fricative [ð] but there is less friction. The tongue is visually present when making the sound.

2.1 Distribution of consonants

The consonant distribution for the three positions below is nearly complete except for plosives. Although voiceless plosives contrast with voiced plosives word initially, voiceless plosives are neutralized intervocalically. Although there is strong evidence for doubled consonants (see section 2.2.2), surprisingly there have not been any doubled voiceless plosives in the words collected thus far. There is strong evidence that voiced plosives become voiceless word finally (see section 2.3). Because of this final devoicing rule, the chart below is misleading. The word final voiceless plosives in the following chart are underlyingly voiced.

Consonant distribution			
	word initially # __	intervocalic V __ V	word finally __ #
p	pāḍá 'bark'		kārāp 'troublemaker'
t	táaḍà 'grandmother'		kólót 'egg'
ṭ	tēṇḍás 'k.o. bird' ⁴		ḍōót 'k.o. bird'
c	cíifá 'tabaldi leaves'		búlíc 'worm'
k	kásán 'friend'		gāèk 'theif'
b	bèrɲâw 'tomato'	sábāl 'root/ant'	
ḍ	ḍárgà 'k.o. snake'	fòḍòr 'nose'	
ḑ	ḑāgár 'tortoise'	càḑāɲ 'k.o. illness'	
ɟ	ɟílèp 'spring'	pájō 'star'	
g	gērmūṭ 'k. o. tree'	tóogèel 'grass cutter'	
m	máəwə 'mushroom'	gəmāl 'forest'	kàḍáàm 'work'
n	nōrná 'saliva'		pāɲèn 'musician'
ɲ	ɲílēt 'intestine'	pāɲèn 'musician'	wèlɛɲ 'sour taste'
ŋ	ŋālk 'neck'	áɲé 'elephant'	fíifóəɲ 'k.o. chicken'
f	fūulmè 'k.o. insect'	tééfá 'leaves'	
s	sāmmáj 'storehouse'	wáasā 'k.o. stone'	mārōos 'spider'

⁴ Precise meaning for this and several other nouns has not yet been found.

w	wáqjá 'wild chicken'	d̥wə 'local beans'	bèrɲâw 'tomato'
ð		kàðáàm 'work'	jāað 'old clothes'
j	jāàm 'bride price'	lējà 'k.o. stone'	gàd̥áj 'basket'
r	rəəwə 'net'	wírĩ 'k.o. bird'	mōsòr 'horse'
l	lōgóot̚ 'locust'	tálò 'tax'	tóogèel 'grass cutter'

2.2 Contrasts of consonants

2.2.1 Contrasts of word initial, intervocalic, word final consonants

The consonants are considered to be phonemic based on the following contrasts. Voiced plosives surface as voiceless word finally because of the word final devoicing rule (see example (5)), and therefore they do not contrast word finally with voiceless plosives. Note that the word final voiceless plosive contrasts might better be listed as word final voiced plosive contrasts since that is what they are underlyingly. Voiceless plosives are neutralized intervocalically and therefore do not contrast with voiced plosives intervocalically. The interdental approximant /ð/ is a phoneme, but it is also an allophone of /d/ before the [-k] plural suffix (Gilley 1999).

Tone is marked as follows: acute accent for high tone, grave accent for low tone, and a macron for middle tone. For long vowels, which are written with two of the same vowel letters, tone is only marked on the first letter unless there is rising or falling tone, in which case there is a second tone marking on the second letter. For example, *t̥ōor* 'throat' has a long vowel with a level middle tone, whereas, *d̥ōór* 'k.o. fence' has a long vowel with a mid-high rising tone. The same tone marking system is used for short vowels. For example, *d̥ēm* 'Arab slave' has a short vowel with a middle tone, but *j̥ēm* 'k.o. mushroom' has a short vowel with a short mid-low falling tone.

(1)	<u>word initially</u>	<u>intervocalically</u>	<u>word finally</u>
p – b	pā́d̥á 'rope material' bá̀d̥à 'gourd holding milk'	----- -----	----- -----
t – d̥	t̥ōor 'throat' d̥ōór 'k.o. fence'	----- -----	----- -----
t – d̥	t̥éèl 'anchor' d̥èel 'shoulder bone'	----- -----	----- -----
c – ʃ	cā̀à 'k.o. tool (?)' j̥ā̀a 'son'	----- -----	----- -----
k – g	káár 'k.o. stew' gā̀àr 'pig'	----- -----	----- -----

t - ṭ	ṭēēḍ 'path' ṭēēnḍ 'story'	----- -----	gòoṭ 'excrement' ⁵ ḍōóṭ 'k.o. bird'
t - c	ṭēēr 'tool for carving' cēēr 'singer'	----- -----	māaṭ 'k.o. snake' ⁶ máac 'k.o. melon'
ḍ - ḍ̥	ḍōór 'k.o. fence' ḍōor 'hammer'	báḍà 'gourd bowl' càḍāṅ 'k.o. illness'	(see ṭ - ṭ)
ḍ - ʃ	ḍēm 'Arab slave' ʃē m 'k.o. mushroom'	báḍà 'gourd bowl' pájō 'star'	(see ṭ - c)
c - k	cáffá 'side (of body)' kāafā 'k.o. tree'	----- -----	sīic 'k.o. tree' ⁷ ḍùrsiik 'k.o. smell'
ʃ - g	ʃāa 'son' gāa 'pumkin'	pájō 'star' ḍāgár 'tortoise'	(see c - k)
n - ɲ	nāanṭ 'day' ɲāàṅ 'crocodile'	----- -----	bōn 'heart' ōɲ 'meat'
ɲ - ŋ	ɲāàw 'cat' ŋālk 'neck'	pāɲn̄ 'musician' áṅé 'elephant'	kəəɲ 'milk' f̣iifəəṅ 'k.o. chicken'
r - l	rúṅùūṭ 'k.o. bird' lúp̣ 'boomerang'	wírì 'k.o. bird' wílì 'k.o. storage'	əər 'sheep' əəl 'hyena'
s - ð	----- -----	àasà 'k.o. basket' ṭáaðà 'grandmother'	kās 'chair' bəəð 'salt'
ḍ - l	ḍēēl 'sea' léel 'grass'	fòḍòr 'nose' kólóṭ 'egg'	ḍùuṭ 'year' ⁸ ḍūûl 'k.o. instrument'
ḍ - r	ḍùuṭ 'year' rùuṭ 'stream'	báḍà 'gourd bowl' bārōol 'cistern'	ṭēēṭ 'path' ⁹ téēr 'carving tool'
ḍ - ð	----- -----	pādá 'bark' ṭáaðà 'grandmother'	ṭēēṭ 'path' ¹⁰ lēēð 'nose'

⁵ The word-final contrast is underlyingly voiced: *gòoḍ, ḍōóḍ*.

⁶ The word-final contrast is underlyingly voiced: *māaḍ, máaṭ*.

⁷ The word-final contrast is underlyingly voiced: *sīiṭ, ḍursiig*.

⁸ There is word-final underlying contrast: *ḍùuḍ, ḍūûl*.

⁹ There is word-final underlying contrast: *ṭēēḍ, téēr*.

¹⁰ There is word-final underlying contrast: *ṭēēḍ, lēēð*.

2.2.2 Contrasts for consonant length

There were no minimal pairs found contrasting consonant length. However the evidence for contrastive length is strong from the following analogous environments for many of the consonants. There were no doubled voiceless plosives found. Some examples are shown below.

(2)	b – bb	kābàr 'wing'	əbbùuṭ 'butterfly'
	ḍ – ḍḍ	rèḍà 'grass cutter'	cēḍḍáb 'mirro'
	m – mm	ṭámál 'chair'	pàmmàal 'k.o. grass'
	ŋ – ŋŋ	əŋə 'little girl'	jìŋŋēr 'lyre'
	f – ff	gāfā 'field, farm'	cáffá 'side of body'
	s – ss	kásán 'friend'	kāssá 'boy'
	j – jj	gaàjà 'k.o. tree'	ḵājjā 'k.o. ant'
	r – rr	ṫīrì 'death'	sīrrī 'carbon'
	l – ll	kālāṭ 'tongue'	bā'llēe 'k.o. tree'

Not enough words have been collected to determine whether it is possible for final consonants to be lengthened (doubled) so as to form a consonant cluster in the coda with the same consonant. It may be that the double consonant cluster simplifies word finally. There is some support for such an analysis.

(3)	pēs 'k.o. tree'	pēssāg 'k.o tree(pl)'
-----	-----------------	-----------------------

2.3 Rules for consonants

2.3.1 Word final plosives rule

Word final plosives are realized as voiceless in the surface representation, that is, the sound is voiceless in speaking. However, it is clear from the plural formation of nouns that word final plosives are voiced in the underlying representation. When the plural suffix [-k] or [-Vk] is added, where V is prescribed by an insertion rule¹¹, the final plosives of the root noun become voiced.

¹¹ In most cases the inserted vowel is a copy of the final root vowel.

(4)	<u>Word final consonant</u>	<u>Singular noun</u>	<u>Plural noun</u>
	[p becomes b]	ʃɪlèp 'water spring'	ʃɪlèbàk 'water spring(pl)'
	[t becomes d]	kāànt 'k.o. stick'	kāandàk 'k.o. stick(pl)'
	[t becomes d]	dō't 'k.o. bird'	dō'dōk 'k.o. bird(pl)'
	[c becomes ʃ]	dǒɛlc 'k.o. tree'	dǒɛlʃik 'k.o. tree(pl)'

Based on these examples the following rule is posited:

(5) Word Final Devoicing of Plosives

C → [-voice] / ____ #
 [- cont]
 [- son]

The rule states that plosives become voiceless at the end of a word. There were no examples found of word final voiced plosives to contrast with the voiceless plosives. Note that sonorants such as [m, ŋ, r, l] are not devoiced word finally as in *pāɲèn* 'musician' and *sábāl* 'root/ant'.

2.3.2 Intervocalic plosives rule

There were no words found with voiceless plosives occurring intervocalically. All plosives are voiced in the environment between vowels. So, the following rule is posited:

(6) Intervocalic Voicing of Plosives

C → [+voice] / V__V
 [- cont]
 [- son]

The rule states that plosives are voiced between vowels. Note that the voiceless fricatives [f, s] do not become voiced intervocalically as in *téefá* 'leaves'.

2.3.3 Interdental approximant rule

The interdental approximant /ð/ is a phoneme, but it also alternates with the phoneme /d/ before the plural suffix morpheme boundary.

(7) Morphophonemic Alternation of the Interdental Approximant

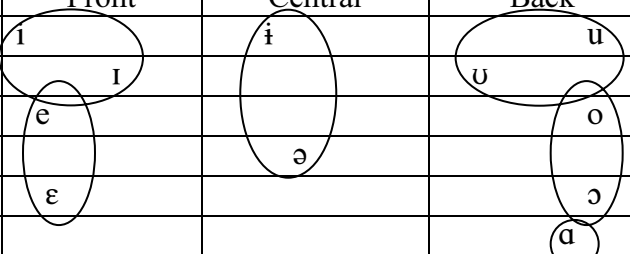
/d/ → [ð] / ____ + g (pl)

The rule states that a root final /d/[t] becomes [ð] when the –g[-k] plural marker is added. For example,

<i>luṭ</i>	'leg'	<i>wiṭ</i>	'breast'
<i>luðk</i>	'legs'	<i>wiðk</i>	'breasts'

3. Vowels (Phonemic)

The phonetic range of the sounds is larger than in many languages with [ATR]. In the case of Gaahmg, there is free variation between the vowels in each circle in the following phone chart. Each circle represents a vowel phoneme, the basic vowel phonemes being [i], [u], [ə], [e], [o], and [a].

	Front	Central	Back
Close			
Close-mid			
Open-mid			
Open			

3.1 Vowel harmony

The vowels pattern into two sets distinguished by [ATR] value. The vowels [i] and [e], [u] and [o], and [ə] and [a] are paired together, differing only by [ATR] value.

(8)	<u>[+ATR] values</u>	<u>[-ATR] values</u>
	i u	e o
	ə	a

Only vowels with the same [ATR] value can occur together in the same root word. The common [–ATR] vowel [a] occurs with [e] and [o], but not with [i] and [u]. And the common [+ATR] vowel [ə] occurs with [i] and [u], but not with [e] and [o]. The following disyllabic words only contain vowels with the same [ATR] value.

(9)	<u>[+ATR] values</u>	<u>[-ATR] values</u>
	əbbùuṭ 'butterfly'	māasēe 'k.o. root'
	kūḍúṛī 'k.o. bird'	pájō 'star'
	gəṇīiṭ 'k.o. bird'	wēeròk 'k.o. noise'

3.2 Distribution of vowels

Each of the six vowels, are found in word initial, word medial, and word final positions, as well as before codas with consonant clusters. There is nearly a full distribution for these four positions both for the short and long vowels in this six-vowel system. Only vowels, which have the same [ATR] value, can occur together in disyllabic words.

3.3 Contrasts of vowels

3.3.1 Contrasts for different vowels

The following contrasts show that each of the vowels in the six-vowel set is phonemic.

(10)	<u>Word initially</u>	<u>Word medially</u>	<u>Word finally</u>
i – e	íl 'horn' ēeṭ 'k.o. rope'	mīiṭ 'stone' mēēṭ 'rope'	mīi 'goat' jēe 'color'
u – o	úl 'stone tool' ōṭ 'wife'	gùur 'k.o. stone' ḍōór 'k.o. fence'	mūu 'forehead' mōò 'gun fire'
ə – a	ēṇə 'little girl' áṇá 'district name'	ḍēər 'snake' ḍàar 'k.o. bird'	wāə 'shade' wāa 'pond'
ə – e	əər 'sheep' ēeṭ 'k.o. rope'	gəəl 'shield' ḍēəl 'sea'	māə 'grandfather' jēe 'color'
ə – o	əndəər 'k.o. tree' ənsò 'cooking plate'	ḍēər 'snake' ḍōór 'k.o. fence'	māə 'grandfather' mōò 'gun fire'

3.3.2 Contrasts for short and long vowels word initial, word medial, and word final

The evidence for vowel length being distinctive is strong from the following contrasts.

(11)	<u>Word initially</u>	<u>Word medially</u>	<u>Word finally</u>
i – ii		cīl 'k.o. instrument' jīl 'locus'	fīrì 'death' tíríi 'k.o. tree'
u – uu	úl 'stone tool' úūṭ 'wasp'	gèrmùṭ 'k.o.insect' gērmūùṭ 'k.o. tree'	lómù 'goat dung' mūu 'forehead'

ə - əə	émī 'k.o. ant' əəmē 'liver'	jē m 'grass' jəəm 'k.o. root'	gēmə 'k.ol ant' gəməə 'k.o. pumkin'
e - ee		fēg 'water' fēeg 'pathes'	páasè 'open basket' māasēe 'k.o. root'
o - oo		kōr 'speech' tōor 'throat'	tálò 'tax' sálōo 'k.o. ant'
ɑ - aa	āràqt 'lake' áàrē 'k.o. grass'	ḍàṅ 'courtyard' jāàṅ 'crocodile'	lāldá 'grain storage' àldáa 'earth'

3.3.3 Contrasts for short and long vowels before codas with consonant clusters

Vowel length is also contrastive before codas with consonant clusters.

(12)	<u>V (Short vowel)</u>	<u>VV (Long vowel)</u>
i - ii	fīrt 'farm'	-----
u - uu	cúlṭ 'menstrual blood'	júurṭ 'k.o. smell'
ə - əə	bərt 'lion'	dəəlc 'k.o. tree'
e - ee	célṭ 'local cleaner' bènc 'hip'	jèers 'hippopotamus' tēent 'story'
o - oo	lólṭ 'dot on face'	pōork 'donkey saddle'
ɑ - aa	ṇālk 'neck' nāms 'food/eating'	nāant 'day' kāant 'k.o. stick'

3.4 Vowel sequences and diphthongs

There are numerous words with vowel sequences. Based on the vowel harmony system, it is posited that vowel sequences may only occur with vowels having the same [ATR] value.

It is also posited that words in which vowel clusters of differing [ATR] value occur are not vowel sequences, but diphthongs, having the approximants *w* and *j* instead of the high vowels *u* and *i*. For example, *cāwr* 'rabbit' and *kājt* 'ladle' both contain diphthongs with the approximants *w* and *j* respectively, rather than *au* and *ai* vowel sequences with opposite [ATR] values. The following vowel sequences are all possible although some are not attested as yet:

		Vowel sequences and diphthongs
+ ATR	iu	
	iə	
	ui	būiil 'moisture'; rúiit 'dirt'; jūik 'leopards (pl)'; mūgūik 'burning wood'
	uə	
	əi	ḍəiit 'scorpion'; ṭəiil 'k.o. tree'
	əu	gəulḍə 'fish'
-ATR	eo	bēeòk 'k.o. tree (pl)'
	ea	
	ej	
	ew	lēwdá 'animal'
	oe	gòēen 'metal worker'; lōgóoēk 'locusts (pl)'
	oa	
	oj	fōjdá 'grain storage'
	ow	
	ae	gāfāeelk 'in the farm'
	ao	ḍāòt 'fertile soil'; kārāaok 'troublemakers (pl)'
	aj	kā j̣t 'ladle'; ṭā jk 'giraffes (pl)'; ḍāàjk 'water pots (pl)'
	aw	càwr 'rabit'; ṭā w 'clan name'; māàw 'gazelle'; kâwk 'k.o. root (pl)'

Diphthongs contrast for vowel length as in the following words:

- (13) ṭā jk 'giraffes (pl)' ḍāàjk 'water pots (pl)'

It is posited that the contour falling tone on *ṭā jk* 'giraffes (pl)' is a single tone falling only on the short vowel. Alternatively, it could be supposed that the falling tone is two tones, one falling on the short vowel and one falling on the approximant. However, since it is likely that contour tone can occur on short vowels (see section 4.1.2), it is better not to posit a tone on the approximant. Diphthongs with both short and long vowels fit the mold of unambiguous syllable structures CVCC and CVVCC (see section 5).

Vowel sequences also contrast for vowel length as in the following words; either the first or the second vowel of the sequence can be long:

- (14) būiil 'moisture' rúiit 'dirt' jūik 'leopards'

Because vowel length seems to be independent of tone (see section 4.1.2), it is not likely that the observed length is merely from the higher tone. Vowel sequences also fit the mold of unambiguous syllable structures VC, VVC, CV, and CVV of monosyllabic words (see section 5). Therefore, the disyllabic syllable structures CV.VVC, CVV.VC, and CV.VC for the words *būiil* 'moisture', *rúiit* 'dirt', and *jūik* 'leopards' respectively are not difficult to accept.

4. Tone

There are three distinctive level tones as well as three distinctive falling tones in Gaahmg. This preliminary analysis is not as conclusive about rising tones. There seem to be two rising tones. A third rising tone (LH) is not yet attested. No monosyllabic or disyllabic words have been found with a LH tone pattern. The LH tone is likely realized as LM phonetically, especially in word final position.

4.1 Contrasts of tone

4.1.1 Contrasts of eight posited tones

There are eight tones posited. The following contrasts show that tone is likely distinctive for three level tones, and three falling tones. The contrasts are not as strong for the two rising tones posited.

(15) Level tones: High, Middle, Low (H, M, L)

H	éər	'bark of tree'		H,H	bássár	'dried food'		
M	ēər	'anger'		H,M	báasār	'liar'		
L	èər	'sheep'		H,L	báasàr	'liars'		
H	fúui	'k.o. tree'	H	ḍáar	'throne'	H	áy	'honey'
M	fūi	'whistling'						
L	fūuì	'male'	L	ḍàar	'k.o. bird'	L	ày	'termite'
M,L	gēmè	'ant'		M,M	bārōol	'cistern'		
L,L	gèmè	'pumkin'		L,L	bàròol	'k.o. snake'		

Falling contour tones (HL, HM, ML)

HM	káānt̚ 'fly'		
ML	kāànt̚ 'stick for carrying water'		
HL	káàr 'male goat'	HL	cīl 'k.o. instrument'
ML	gāàr 'pig'	HM	jīlt̚ 'tooth'
H	káar 'stew'	H,L	báasàr 'liars'
HL	káàr 'male goat'	L,HL	bàsàr 'lie'
H	cīl 'spine'	L	jìl 'k.o. tree'
HL	cīl 'k.o. instrument'	ML	jīl 'turkey'

Rising contour tones (MH, LM)

MH d̥ɔ́t̥ 'k.o. bird' (could be long vowel)

H,LM rúnùùt̥ 'k.o. bird' (could be H,LH)

M mīi 'goat'

MH mīí 'chicken'

Combination Contour (MHL)

MHL d̥uúl 'k.o. instrument'

4.1.2 Contrasts of long and short vowels for the same tone

There were no minimal pairs found for any contrasting short and long vowel with the same tone. However, the analogous environments for many of the tones are quite similar. Tone appears to be independent of vowel length.

(16)	<u>V (Short vowel)</u>	<u>VV (Long vowel)</u>
	<u>Level tones (H, M, L)</u>	
	H cúlt̥ 'menstrual blood'	H júurt̥ 'k.o. smell'
	M kōr 'speech'	M t̥ōor 'throat'
	M fānt̥ 'cheek'	M nāant̥ 'day'
	L bènc 'hip'	L jèers 'hippotamus'
	<u>Falling contour tones (HL, HM, ML)</u>	
	HL cīl 'k.o. instrument'	HL t̥éèl 'anchor'
	HL kâw 'k.o. root'	HL jádàw 'cat'
	HM kãjt̥ 'ladle'	HM káānt̥ 'fly'
	ML jẽ m 'k.o. mushroom'	ML jāàŋ 'crocodile'
	ML bãj 'milk pail'	ML d̥āàj 'water pot'
	<u>Rising contour tones (MH, LM)</u>	
	MH d̥ɔ́t̥ 'k.o. bird' (could be long)	MH d̥ōór 'k.o. fence'
	MH,M bā'llēe 'k.o. tree'	
		LM bùiil 'moisture'
		LM gòēen 'metal worker'

It is therefore posited that short vowels as well as long vowels can carry contour tones. The word d̥ɔ́t̥ 'k.o. bird' is the best example of an unambiguous contour tone on a short vowel.

4.2 Distribution of tone

The distribution of tone patterns identified so far are shown in the following chart. Tone is independent of the syllable structure of words.

Disyllabic tone distribution									
	Level			Falling			Rising		
	H,H	M,M	L,L	H,L	H,M	M,L	L,H	M,H	L,M
VCVC	x				x	x			
VCCVC			x						
CVCVC	x	x	x	x	x	x		x	x
CVCCVC	x	x	x	x		x		x	
CVCV	x	x	x	x	x	x		x	x
CVCCV	x	x	x	x	x			x	x
VCV	x	x	x		x	x		x	x
VCCV			x						

4.3 Tone melodies

The tone patterns, or tone melodies, for monosyllabic words are the same as for disyllabic words. Trisyllabic words have some of the same tone patterns as monosyllabic and disyllabic words, but have no contour tones like the monosyllabic and disyllabic words.

(17)	<u>Monosyllabic</u>	<u>Disyllabic</u>	<u>Trisyllabic</u>
	<u>Level</u>		
H	kúr 'k.o. clothes'	kólót 'egg'	
M	mās 'spear'	māasēe 'k.o. root'	
L	ḍàar 'eagle'	ḍàamà 'grain storage'	
	<u>Falling</u>		
HL	ṭèèl 'anchor'	ṭálò 'tax'	ṭúlífà 'k.o. grass'
HM	māāc 'k.o. melon'	wáasā 'k.o. stone'	
ML	gāàr 'pig'	gāfà 'field'	
	<u>Rising</u>		
MH	ḍōór 'k.o. fence'	kāssá 'boy'	kūsūmí 'knee'
LM	gòēen 'metal worker'	gèṇjīt 'k.o. bird'	

Combination

MHL	ḍūûl 'k.o. instrument'	mūgûi 'burning wood'	ūḡúrè 'ko.pumpkin'
MHM		bā'llēe 'k.o. tree'	kūḍúri 'k.o. bird'
HLM		áàrē 'k.o. grass'	bámàljā 'moring star'

4.4 Functional load of tone

Of the three hundred nouns collected thus far, there are only eight minimal pairs and one set of three words that are identical except for tone (see example (15)). Lexical tone will therefore need to be marked in the orthography on such similar sounding words with differing meaning. The Latin script alone should be enough for the reader to easily understand written communication of all other nouns in context, and tone should be written only on these minimal pairs. Grammatical tone will also need to be written on singular and plural nouns differing only by tone such as *báasār* 'liar', *báasàr* 'liars'.

Of 103 monosyllabic level tone words, 31 are high tone, 50 are middle tone, and 27 are low tone. The middle tone of Gaahmg appears to be the most common and the unmarked tone. Therefore in the orthography, the high tone and low tone can be marked, but the middle tone may be unmarked.

5. Syllable structure

The syllable in Gaahmg is made up of a single consonant onset, a long or short vowel nucleus, and a single consonant coda or a complex consonant coda. Both the consonant onset and consonant coda are optional.

(18) (C)V(C) or (C)V(CC)

The following syllable patterns were found in monosyllabic words. Vowel length is contrastive for most of the syllable patterns as has been shown above.

(19)	<u>V (Short vowel)</u>	<u>VV (Long vowel)</u>
V	-----	ùu 'air'
VC	úl 'stone tool'	úūṭ 'wasp'
VCC	ālṭ 'fox'	-----
CV	wā 'no'	wāa 'pond'
CVC	kōr 'speech'	tōor 'throat'
CVCC	cúlṭ 'menstrual blood'	ḡúurṭ 'k.o. smell'

The following syllable patterns were found in disyllabic words. There were not enough words collected in order to check for vowel length contrast in each syllable, however vowel length continues to occur in any syllable as in the monosyllabic words.

(20)	<u>V.V (both short)</u>	<u>VV.V (1st long)</u>	<u>V.VV (2nd long)</u>	<u>VV.VV</u>
V.CV	ūrī 'ostrich'	àasà 'k.o. basket'	-----	-----
V.CVC	áfát 'blood'	-----	ārāat 'lake'	-----
V.CVCC	-----	áawēlk 'sky'	-----	-----
VC.CV	ònsò 'cooking plate'	-----	āldāa 'dust'	-----
VC.CVC	-----	-----	əbbùut 'butterfly'	-----
VC.CVCC	-----	-----	-----	-----
CV.CV	cījī 'diarrhea'	būsà 'k.o. stone'; tīrī 'tree'; māasēe 'root'		
CV.CVC	qāgār 'tortoise'	bāasār 'liar'; bàsàar 'lie'; fīifəəŋ 'chicken'		
CV.CVCC	ḍufūt 'dust'	-----	-----	-----
CVC.CV	tīrgə 'ancestry'	fōolmà 'k.o. insect'	sāssāa 'sand'	-----
CVC.CVC	kágdār 'k.o. food'	-----	gərmūut 'k.o. tree'	-----
CVC.CVCC	-----	-----	-----	-----

The syllable pattern CVCC is less frequent in disyllabic words¹² and only occurs word finally.

6. Proposed orthography

6.1 Present orthography

The following is the current orthography¹³ originally proposed by Gilley (1999). The findings of this study agree fully with the previously proposed orthography. There are no tone markings currently in use but adding them should pose no difficulty. The letters *ʔ* and *sh* are used for writing loan words from Arabic and English.

IPA symbol	Orthography symbol	Words in IPA	Words in Orthography	English gloss
[a]	a	aam	aam	'bone'
[ə]	ah	gəməl	gahmahl	'forest'
[b]	b	baɖa	bada	'gourd'
[c]	c	ceɖa	celda	'charcoal'
[ɖ]	d	ɖogol	dogol	'leopard'

¹² Thus far, only the two words with CVCC syllable structure *áawēlk* 'sky' and *ḍufūt* 'dust' were found.

¹³ Research is ongoing and some changes may be necessary.

[d]	dh	ḍagar	dhagar	'tortoise'
[e]	e	eeṭ	eed	'k.o. rope'
[f]	f	foḍor	fodor	'nose'
[g]	g	gumur	gumur	'dove'
[h]	'h	ḥaaṣim	'Hashim	'man's name'
[i]	i	il	il	'horn'
[j]	j	jiləp	jilahb	'water spring'
[k]	k	kunṭ	kund	'chest'
[l]	l	luṭ	lud	'foot'
[m]	m	muu	muu	'forehead'
[n]	n	nərnə	nahrnah	'saliva'
[ɲ]	ny	ɲaaŋ	nyaang	'crocodile'
[ŋ]	ng	ŋalk	ngalg	'neck'
[o]	o	on	ony	'meat'
[p]	p	pəjo	pajo	'star'
[r]	r	ruuṭ	ruud	'stream'
[s]	s	sabal	sabal	'ant'
[ʃ]	sh	ḥaaṣim	'Hashim	'man's name'
[t]	t	ṭoo	too	'cow'
[t̪]	th	ṭeel	theel	'anchor'
[u]	u	uuṭ	uud	'wasp'
[w]	w	wiṭ	wind	'ear'
[j]	y	jaam	yaam	'bride price'
[ð]	z	að	az	'dog'

6.2 Spelling rules for the orthography

In addition to the present orthography, there are now a few spelling rules that can be presented as a result of this analysis.

1. Only voiced plosives and not voiceless plosives can be written at the ends of words.

correct

wind 'ear'
jilahb 'water spring'

incorrect

wint
jilahp

2. Only voiced plosives and not voiceless plosives are allowed between vowels.

correct

sabal 'ant'
fodor 'nose'

incorrect

sapal
fotor

3. The [+ATR] vowels /i/, /u/, and /ah/ are allowed in the same word and beside each other as in vowel sequences.

correct

ahbbuud 'butterfly'
 kudduri 'k.o. bird'
 gahngiid 'k.o. bird'

buiil 'moisture'
 dahid 'scorpion'
 gahuldah 'fish'

nyui [nūi] 'leopard'

incorrect

abbuud, ahbbood
 kuddure, koddori
 gahngeed, gangiid

boiil, bueel
 dahed, daid
 gaulda, gaholdah

nyuy, nyue

4. The [-ATR] vowels /e/, /o/, and /a/ are allowed in the same word and beside each other as in vowel sequences.

correct

maasee 'k.o. root'
 pajo 'star'
 weeroog 'k.o. noise'

goeen 'metal worker'
 daod 'fertile soil'
 gafaeeig 'in the farm'

beeo [bēeò] 'k.o tree'

incorrect

maahsee, maasii
 pahjo, paju
 weeruug, wiiroog

gueen, goiin
 dahod, daud
 gahfaheelg, gafaiilg

beew, beeu

5. When the sounds of the vowels /e/, /o/, and /a/ occur next to the sound of the vowel /i/, the vowel /i/ should be written /y/. The words are written in IPA symbols in between brackets [].

correct

kayd [kãjt] 'ladle'
 foyda [fõjdá] 'grain storage'
 tay [tãj] 'giraffe'

incorrect

kaid, kaed
 foida, foeda
 tai, tae

6. When the sounds of the vowels /e/, /o/, and /a/ occur next to the sound of the vowel /u/, the vowel /u/ should be written /w/.

correct

cawr [càwr] 'rabbit'
 lewda [lẽwda] 'animal'
 daw [ḍãw] 'monkey'

incorrect

caur, caor
 leuda, leoda
 dau, dao

7. Pairs of words that are identical except for the difference of tone can receive the acute accent [á] for high tone and the grave accent [à] for low tone. Middle tone should not receive any marking.

<u>IPA symbols</u>	<u>Orthography symbols</u>
ḍáar 'throne'	dáar 'throne'
ḍàar 'k.o. bird'	dàar 'k.o. bird'
bārōol 'cistern'	barool 'cistern'
bàròol 'k.o. snake'	bàròol 'k.o. snake'
mīi 'goat'	mii 'goat'
mīí 'chicken'	mií 'chicken'

7. Conclusion

Gaahmg is a language unique for its [+/-ATR] system. The common [-ATR] vowel [ɑ] occurs with [e] and [o], but not with [i] and [u]. And the common [+ATR] vowel [ə] occurs with [i] and [u], but not with [e] and [o]. The spelling system of the orthography is greatly affected by such an analysis, in that only the combinations of vowels with the same [ATR] value are allowed in the same word. Previously, all diphthongs have been written as vowel sequences for lack of a better analysis. Now, however, there is a precise spelling rule that prescribes when the vowel cluster is a diphthong written with an approximant and when it is a vowel sequence written with vowels: approximants are written in place of high vowels with disharmony in the vowel cluster; vowels are written for all other vowel clusters.

Tone carries a significant functional load in Gaahmg, being the sole distinguisher of a fair number of minimal pairs, and at least a few grammatical changes. Leaving the middle tone unmarked, high and low tone should be marked in the orthography on all tonal minimal pairs as well as any tonal grammatical distinctions.

8. References

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Didinga Orthography

Nicky de Jong

1. Introduction

Didinga language is spoken in Eastern Equatoria province of southern Sudan and belongs to the group of Southwest-Surmic languages of Eastern-Sudanic (Eastern) together with Murle, Tennet and Naarrim (Boya). It has 20 consonants, 16 of which have two phonemes, a light and a heavy variant, and 9 vowels, which may occur long or short. It is a tonal language with two level tones.

Meetings to discuss the alphabet took place in 1995 (Cuhudum, Sudan) and in 1997 (Lokichoggio, Kenya) but the orthography is still tentative. Presently, the surface form of ATR¹ and length is written. Further discussion is needed to find out if people would like to change this to a morphophonemic way of writing.

A transition primer for those who are already literate in English (revised edition 1997), an ABC book with short stories for each letter as well as an alphabet chart (both 1997) has been produced. Some more small booklets with short stories were produced during writers' workshops. In 2001, a trial edition of a Didinga Primer (book 1) was released.

2. Consonants

The inventory of consonants has been divided into syllable-initial and syllable-final consonants since 36 can occur in the former but only 14 in the latter position.

In the classification of the syllable-initial phonemes as shown in Table 1 below, the terms 'light' and 'heavy' are used, the English translation of lenis and fortis. These terms are used in the popular sense, not in the way phonetics uses them. In general, the fortis consonants are being interpreted as doubled and the lenis ones as single.

Table 1. Didinga syllable-initial consonant phonemes

	labial		dental		alveolar		palatal		velar	
	light	heavy	light	heavy	light	heavy	light	heavy	light	heavy
stop voiced	ḃ	b		ḋ	d̪	d	ʃ	dʒ	ɡ̊	g
stop voiceless		p	t̪	t̪̥		t		tʃ		k
fricative		v	ð	ð̥			ʒ		ɣ	
nasal	m	m̐			n	n̐	ɲ	ɲ̐	ŋ	ŋ̐
lateral					l	l̐				
vibrant					r	r̐				
semivowel	w	w̐					j	j̐		

The nasals are phonetically realized as short and long. However, the realization of the other pairs involves different phonetic features: slightly implosive versus egressive lung air (like /ḃ/ and /b/); apical versus laminal (as in /t̪/ and /t̪̥/)²; no friction versus some friction (like /w/ and /w̐/) or some friction versus more friction (as in /ð/ and /ð̥/); flap versus trill (as in /r/ and /r̐/)

¹ Abbreviations: ATR: advance tongue root; ex: exclusive (of hearer); gen: genitive case; in: inclusive (of hearer); nom: nominative case; obl: oblique case; RTR: retracted tongue root; sb, sth: somebody, something

² The symbol /t̪/ represents the voiceless dental laminal stop and the symbol /w̐/ the voiced rounded labio-velar fricative

and fricative versus stop (like /ʒ/ and /tʃ/). Even though these are the main differences, many of the ‘heavy’ sounds also appear slightly longer.

Since /d̪/ is realized with egressive lung air, it is classified as heavy. The palatal and velar fricatives (/ʒ/ and /ɣ/) are the light variants of the voiceless palatal and velar stops (/tʃ/ and /k/). So these two stops are also classified as heavy. But /v/ is not the light variant of /p/. Since /v/, /p/ and /t/ appear in CVC words in which the first consonant must be heavy, they are classified as heavy too.³

The fricative /ɣ/ has two phonetic realizations: [ɣ] occurs between low vowels, [x] word-initially as well as medially before the high vowels, whereas there is free variation word-medially before mid vowels. Yet, since the other fricatives are all voiced the symbol ɣ is chosen. In the orthography, the letter <h> is used.

In the process of affixation, certain suffixes like /-wa/ cause root-final consonants to geminate. Phonetically, these geminated light consonants as in (1a) and the heavy consonants occurring in roots as in (1b) are identical.

- (1) a. /ɣàḃàð:ʷá/ ‘knives’ from |ɣaḃað| |wa|⁴
 b. /ð:ḡém/ ‘soil’ /màð:ĩ/ ‘firestick’

This observation and the fact that most of them are slightly longer have played a crucial role in deciding to write most heavy consonants with double letters word-medially in the orthography. Word-initially, an apostrophe is used to indicate heaviness.

In Table 2 the syllable-final phonemes are shown together with their phones where relevant.

<i>Table 2. Didinga syllable-final consonant phonemes</i>					
	labial	dental	Alveolar	palatal	velar
stop devoiced	b [pʰ]		d [tʰ]	dʒ [tʃʰ]	g [kʰ]
stop voiceless		t̪		tʃ	k
fricative devoiced		ð [θ]			
nasal	m		n	ɲ	ŋ
lateral			l		
vibrant			r		

The devoiced stops are unreleased or slightly released, whereas the voiceless ones are fully released.

2.1 Light and Heavy Consonants: an Areal Feature

The occurrence of light and heavy consonant pairs is an areal feature. Not only do they occur in all Southwest-Surmic languages, they also appear in Lopit and Otuho (both Eastern-Nilotic languages and spoken in Eastern Equatoria). The number of pairs varies from language to language. Light and heavy consonants only contrast syllable-initially.

³ Examples: /àḃáðĩ t̪ɛtʃ/ ‘it is very bad’; /ðḃḃḃḃḃĩ v̪ɛr/ ‘it is very dry’; /àlálĩ kùtʃ/ ‘it is very cold’; /àbíĩrĩ t̪ɔl/ ‘it is very red’; /àḃíĩrĩ ɛ́ɛt̪ p̪ɪd/ ‘the man is stubborn’.

⁴ The derivation process goes as follows, using lexical phonology notation:

underlying form [ɣaḃað] [wa]
 affixation [[ɣaḃað] [wa]]
 bracket erasure [ɣaḃaðwa]

Post-lexically, a consonant sequence constraint rule causes the w to become a labialization of the preceding consonant. The empty slot takes the features of that consonant. Finally, tone is assigned.

resyllabification [ɣaḃað:ʷa]
 tone assignment [ɣàḃàð:ʷá]

2.2 Consonant Sequences

Consonant sequences only occur in the middle of a word. These consonants belong to different syllables. The second consonant appears to be always heavy. Since this is predictable, the orthographic implication is that only the symbol for the light consonant is written except that <k> is written rather than <h>. For example, /mòrdó/ ‘beans’ is written in the orthography as **mórdō** not “*mōrddō”, and /mèrkétʃ/ ‘ram’ as **merkec** not “*merhec”.⁵

In roots, the first consonant of a word-medial sequence is usually a liquid (2a, c, e) but may also be a plosive (2b). In inflected (2d, f-j) and derived (2k-l) forms, a nasal may also occur as the first consonant.

Examples (with the orthographic form following the phonemic one):

- | CC with C ₁ a liquid or a nasal | | CC with C ₁ a plosive | |
|--|------------------------------|----------------------------------|-----------------------------|
| (2) a. /ʏèélŋɪ̃tʃ/ | hěēlŋɪ̃t ‘biggest elephant’ | b. /ʏùlúktʃ/ | hũlũkɪ̃ ‘bowels’ |
| c. /mèrɪ̃tʃ/ | měrtɪ̃ ‘beer’ | d. /ʏèʒébɪ̃tʃ/ | hēcēbɪ̃t ‘we (ex) tied’ |
| e. /ʏùrlɪ̃tʃ/ | hũrlɪ̃ ‘cucumbers’ | f. /ʏùlùúgtʃ/ | huluugtʃ ‘we (ex) migrated’ |
| g. /ʏĩdĩmɪ̃tʃ/ | hidiimɪ̃t ‘we (ex) searched’ | h. /ʏàdákɪ̃tʃ/ | hadakta ‘we (ex) ate |
| i. /ʏĩʒɪ̃nɪ̃tʃ/ | hĩcɪ̃nta ‘we (ex) saw’ | | (sth hard)’ |
| j. /ʏðdɔ̃ŋtʃ/ | hōdōŋtʃ ‘we (ex) raised’ | k. /ðʏdɪ̃tʃ/ | ōhōdca ‘he invites’ |
| | | l. /òktʃàánɪ̃tʃ/ | ũkcaanɪ̃t ‘birth’ |

2.3 Word-initial Consonants

Words that begin in isolation with a light consonant vary their pronunciation within the sentence. If the preceding word ends in a vowel, the word-initial consonant is pronounced light but if the word ends in a consonant it is pronounced heavy. Since this is predictable, such words are always written in the orthography with an initial light consonant. So in the pronunciation, no difference is made between a word-medial consonant sequence and a consonant sequence across a word boundary. But a word-initial heavy consonant is not affected across a word boundary.

In **adiimi habath** [àdĩmĩ xàbáθ] ‘you want a knife’ the first consonant of **habath** is pronounced light [x] whereas in **adiim habath** [àdĩm kábáθ] ‘he wants a knife’ it is pronounced heavy [k]. So the word for ‘knife’ is written with an initial light consonant. If **habath** is replaced by **'baany** [bààn] ‘mortar’ the initial b is heavy in both cases. So this word is written with an initial heavy consonant.

3. Vowel Quality

Didinga has nine vowels that are divided into two groups according to the feature ATR (Advanced Tongue Root). The marked [+ATR] vowels are /e/, /i/, /o/ and /u/ (also called heavy) whereas the unmarked [-ATR] ones are /ɛ/, /ɪ/, /ɔ/ and /ʊ/ (also called light). The vowel /a/ is usually opaque in that it often blocks ATR spreading.

Vowel harmony is very complex in Didinga. Roots have vowels from one ATR set only. They show cross-height vowel harmony, which means that the vowels can be of different height as in

⁵ In the orthography, [-ATR] vowels are written with a tilde. For more about ATR, see section 3.

(3a-d) as well as of the same height as in (3e-f). The vowel /a/ can occur with any other vowel as in (3i-l) and have vowels of different ATR on each side as in (3m).⁶

- | | | | |
|----------------|----------------------|--------------|-----------------|
| (3) a. /ɪdɛ́t/ | ‘chameleon’ | b. /ɣĩdón/ | ‘drum’ |
| c. /ðdír/ | ‘kind of vegetable’ | d. /tùbéd/ | ‘guinea fowl’ |
| e. /ʒùúdí/ | ‘twins’ | f. /ùùzĩ/ | ‘broth’ |
| g. /dɛ́énò/ | ‘debt (money)’ | h. /fòrè/ | ‘war, conflict’ |
| i. /dílá/ | ‘spear’ | j. /bùrá/ | ‘seed, spore’ |
| k. /bàrùùtʃ/ | ‘bark’ (of tree) | l. /ʒààlùtʃ/ | ‘bunch’ |
| m. /ʒùrùkàáli/ | ‘sentry, home guard’ | | |

Adding a suffix to a root may cause a change of ATR value on the root or on the suffix. Sometimes there is no change. Whether or not a change happens, depends on the vowel height and the ATR value. Even though the vowel /a/ is neutral in general, it may cause a change of ATR value of mid vowels sometimes. This behaviour is very unusual and no explanation has been found.

Two approaches to analyze basically the same set of data have been taken. In the first one (section 3.1), the focus is on the direction of the spreading. In the second one (section 3.2), a distinction is made between derivational and inflectional suffixes.

3.1 Vowel Harmony and the Direction of Spreading

The direction of ATR-spreading depends on the vowel height of the vowels in the root and the suffix. Usually the suffix causes a change on the root. This is called right-to-left spreading (3.1.1). But sometimes the opposite occurs: the root changes the suffix. This is called left-to-right spreading (3.1.2). A few other suffixes do not cause any change (3.1.3).

The vowel height also governs whether cross-height or same-height vowel harmony occurs.

3.1.1 Right-to-left Spreading

The ATR value of the root can be changed either partially or completely by adding a suffix. The vowel harmony spreads from right to left. Since it appears that high vowels behave different from mid vowels, they will be treated separately.

- a) If a suffix with an initial [+ATR +high] vowel is added to a [-ATR] root, the root vowels will become [+ATR]. Any prefix with a [-ATR] vowel is also changed. Cross-height vowel harmony occurs as in (4b and e).

- (4) a. /dĩdĩñ/ ‘heaviness’ from underlying |dĩdĩñ| |i|
 b. /dòyòyĩ/ ‘dryness’ from underlying |dòyòk| |i|
 c. /bààkĩtú/ ‘place across’ (gen.) from underlying |baakĩt| |u|
 d. /àzĩnĩ/ ‘you (sg) see (sth)’ from underlying |a| |zĩn| |i|
 e. /ĩtùdórí/ ‘you (sg) add (sth)’ from underlying |ĩ| |tùor| |i|

The vowel /a/ blocks the spreading. Any [-ATR] vowel to its left will not be affected when a suffix with an initial [+ATR +high] vowel is added.

- (5) /bààní/ ‘you (sg) give (sth)’ from underlying |ĩ| |baan| |i|

⁶ A few exceptions exist in which a final syllable with /ɪ/ follows one with a [+ATR -high] vowel because of a phenomenon called mid-vowel raising. This causes /e/ to be realized as /ɪ/ but from the ATR point of view, it is still considered [+ATR], as in: /òlí/ ‘bull’.

- b) If a suffix with a [+ATR -high] vowel is added to a [-ATR] root, only the [-ATR -high] root vowels will become [+ATR].
- (6) a. /bòròyèètʃ/ ‘water-spirit’ from underlying |bɔrɔk| |etʃ|
 b. /ɪdɛ́ɛ̀ð/ ‘chameleon’ (gen.) from underlying |ɪdɛ́| |o|
- c) If a suffix with the vowel /a/ is added to a *stem* (7a) with a final [-ATR -high] vowel, the stem-final vowel (and any of the same kind preceding it) will become [+ATR]. But if such a suffix is attached to a *root* (7b) with a final [-ATR -high] vowel it does not cause any change.
- (7) a. /yòmòtòón:à/ ‘we(ex) meet’ from underlying |yɔ| |mɔ́t| |ɔn| |a|
 b. /yòbòdɔ́án:à/ ‘we(ex) return’ from underlying |yɔ| |bɔ́d| |an| |a|

3.1.2 Left-to-right spreading

In a number of cases, the ATR property of the root can change the ATR value of the suffix. Here the vowel harmony spreads from left to right. Again, high and mid vowels will be treated separately.

- a) If the root ends in a [+ATR +high] vowel, a suffix-initial [-ATR +high] vowel will become [+ATR].
- (8) a. /yùrùbùlìt̩à/ ‘beehives’ from underlying |yuruɓuli| |ɪt̩a|
 b. /ðìǵĩrĩ/ ‘donkey’ (nom.) from underlying |ðìǵĩr| |ɪ|

If the root ends in a [+ATR -high] vowel (9a-c), however, the same suffix-initial vowel causes that root vowel (and any of the same height preceding it) to change to a minus. So now the spreading goes into the opposite direction.⁷ Since only a marked property is allowed to spread, it is assumed that this high vowel has two properties, advanced and retracted tongue root. It depends on the environment whether it is [-ATR] or [+RTR]. But if this root-final vowel is preceded by a palatalized consonant (9d), no change occurs on the root. The spreading is blocked.

- (9) a. /lòyòlòlìt̩à/ ‘wooden spoons’ from underlying |loyolol| |ɪt̩a|
 b. /lòðɔ́ɪ/ ‘land’ (nom.) from underlying |lootʃ| |ɪ|
 c. /t̩ìǵòm̩/ ‘slope’ (nom.) from underlying |t̩ìgom| |ɪ|
 d. /ĩr̩ʲèér̩/ ‘jackal’ (nom.) from underlying |ĩr̩ʲeer| |ɪ|

- b) If the root-final vowel is /a/ it changes a suffix-initial [+ATR -high] vowel into [-ATR].

- (10) /àyààt̩ð/ ‘tongue’ (gen.) from underlying |ayaaɪ| |o|

But if /a/ in the root-final syllable is followed by a palatalized consonant there is no change, just as in (9d).

- (11) /àt̩ʲó/ ‘hand’ (gen.) from underlying |að:iiɪ| |o|

3.1.3 No spreading

In the previous section, we have already seen two examples in which there is no spreading (9d and 11). No change of ATR values also happens when the root-final vowel is [+high] and suffix initial vowel is [-high]. This means that in stems, vowels of different ATR value may co-occur.

- a) If the suffix-initial vowel is [-ATR -high], its ATR value does not change when the root-final vowel is [+ATR +high] (12a). And if the suffix-initial vowel is [+ATR -high], a [-ATR +high] vowel does not change and blocks the spreading as well (12b).

⁷ See 3.2.1.c for more about this feature.

- (12) a. /ðĩgĩrèḗtà/ ‘donkeys’ from underlying |ðĩgĩr| |ḗtà|
 b. /ðdĩrò/ ‘kind of sticky vegetable’ (gen.) from underlying |ɔdĩr| |o|
- b) If the root ends in a [+ATR -high] vowel, it will not cause a suffix-initial [-ATR -high] vowel to change its ATR value (no left-to-right spreading for mid vowels).
- (13) a. /lòʒòʒḗḗtà/ ‘small bags’ from underlying |loʒoʒo| |ḗtà|
 b. /rùbénð:ḗét/ ‘blindness’ from underlying |rubén| |ð:ḗét|

3.1.4 Conclusion

Right-to-left spreading has the widest distribution. The most dominant vowels are [+ATR +high]. The [+ATR -high] vowels affect only mid vowels. Also /ɪ/ may affect mid vowels. The vowel /a/ does that too but is restricted to stems. Vowels that are [-ATR -high] do not cause any change.

3.2 Vowel Harmony and the Type of Suffix

So far, no distinction has been made between the suffixes, whether they are derivational or inflectional. Below several suffixes will be described with examples for both kinds of suffixes taking vowel height and ATR into consideration.

3.2.1 Derivational Suffixes

a) Suffixes with a [+ATR +high] vowel show cross-height vowel harmony with right-to-left spreading unless /a/ blocks the spreading.

- (14) a. -i verb nominalizer /dōyòyi/ ‘dryness’ (from /dōyók/ ‘be dry’)
/dīdīŋi/ ‘heaviness’ (from /dīdīŋ/ ‘be heavy’)
- b. -t̪in adj. nominalizer /ðór̪t̪in/ ‘whiteness’ (from /ðərà/ ‘white’)
/mùr̪íit̪in/ ‘slimness’ (from /mùrà/ ‘slim’)
/ʒ̀láyít̪in/ ‘greenness’ (from /ʒ̀lák/ ‘green’)
- c. -eenit̪ verb nominalizer /mòdèènít̪/ ‘foreigner’ (from /mòdán/
(rare) ‘cause to be unfamiliar’)

b) Suffixes with a [+ATR -high] vowel show same-height vowel harmony with right-to-left spreading. If the root-final vowel is [-ATR +high] no spreading occurs.

- (15) a. -ek verb suffix /zèbèèk/ ‘tie (sth) to (sth)’ (from /zéb/ ‘tie’)
/ḡìṭèèk/ ‘go for (sth and bring)’ (from /ḡíṭ/ ‘go’)
- b. -oḍ verb suffix /dēèṇòḍ/ ‘see at a distance’ (from /dēèṇ-/ ‘see’)
(itive) /zìṇòḍòḍ/ ‘see at a distance’ (from /zìṇ/ ‘see’)
- c. -ooḍík verb suffix /èzèbòóḍík/ ‘(sth) is tied to (sth)’⁸
(passive of -ek) /ùṭṭùṇòḍòḍík/ ‘it has been left’ (from /ṭùṇèèk/ ‘leave’)
- d. -etʃ noun nominalizer /bòròyèètʃ/ ‘water-spirit’ (from /bòrək/ ‘pool’)
(rare)

c) Suffixes with a [-ATR +high] vowel are more complicated. The suffixes in (16a+c) below show same-height vowel harmony for [+high] vowels with left-to-right spreading.⁹

⁸ The final vowel of the suffix -ooðik is raised from an underlying /e/.

The [+high] vowel in the other three suffixes (16b+d-e) is assumed to be [+RTR] with right-to-left spreading to account for the change of the mid vowels. A [+ATR +high] vowel does not change. Also if a palatalized consonant, whose semivowel is [+ATR], precedes the mid vowel in the root-final syllable it prevents a change. So ATR is more dominant than RTR.

- (16)a. -I verb suffix /ḍùḡĩ/ ‘drop’ (from /ḍúk/ ‘drop (sth)’)
(middle, passive) /ṭùḡŭ/ ‘be changed’ (from /ṭùḡú/ ‘change’)
- b. -I verb suffix /ɛ̃zɛ̀bɛ̀ɛ̀kì/ ‘(place where) he is tying (sth) to (sth)’
(applicative) /ɛ̃zɛ̀bɔ́ɔ́zìkì/ ‘(place where sth) is tied to (sth)’
/àḍùḡɔ́ɔ́zìkì/ ‘(place) into (which) he fell’
but: /ĩr’óónì/ ‘(place where) they debate (sth)’ (from
r’òòn ‘debate’)
- c. -Ið verb nominalizer /bĩr’ĩð/ ‘ripening’ (from /bĩr/ ‘ripen’)
/bĩr’ĩð/ ‘fullness’ (from /bĩr/ ‘be full’)
- d. -ðĩṭ verb nominalizer /ḡùzɛ̀ɛ̀ð:ĩṭ/ ‘pity’ (from /ḡùzɛ̀k/ ‘cause to have pity on’)
/ṭùḡɔ́ɔ́ð:ĩṭ/ ‘purpose’ (from /ṭùḡòðð/ ‘go with a purpose’)
but: /ĩṭ’óónð:ĩṭ/ ‘family connection’ (from /ṭ’òòn/ ‘accompany’)
- e. -ɛɛð:ĩṭ adj. nominalizer /ḡùṭúrɛ̀ɛ̀ð:ĩṭ/ ‘shortness’ (from /ḡùṭùrà/ ‘short’)
noun nominalizer /lòbɔ́lɔ́bɛ̀ɛ̀ð:ĩṭ/ ‘greediness (for food)’ (from
/lòbòlòb/ ‘greed’)
/ṭòḡólóḡ’ɛ̀ɛ̀ð:ĩṭ/ ‘prostitution’ (from /ṭòḡòlólóḡ/ ‘prostitute’)
- d) A suffix with a [-ATR -high] vowel or the vowel /a/ does not show vowel harmony.
- (17)a. -ðɛɛṭ adj. nominalizer /rùbénð:ɛ̀ɛ̀ṭ/ ‘blindness’ (from /rùbén/ ‘blind’)
/ḡùṭúrð:ɛ̀ɛ̀ṭ/ ‘shortness’ (from /ḡùṭùrà/ ‘short’)
- b. -an verb sfx. /ḡòbòðḍáán:à/ ‘we (ex) return (come back)’ (from
(ventive) /bòd-/ ‘return’)

Normally, ATR and tone are independent. Occasionally a suffix with an underlying [-ATR -high] vowel may change to [+ATR] when the tone on it changes to low and the root-final vowel is [+ATR]. But when the root-final vowel is [-ATR] the suffix does not change even if the tone changes.

- (18)a. -ɔ verb suffix /ḡùḍúkṭɔ́/ ‘we (in) have been the same’
(perf. reciprocal) /ùḍúkṭò/ ‘they have been the same’
/ḡìzínṭɔ́/ ‘we (in) have seen each other’
/ìzínṭò/ ‘they have seen each other’
/ḡìl:’ɛ̀ɛ̀kṭɔ́/ ‘we (in) have avoided each other’
/ìl:’ɛ̀ɛ̀kṭò/ ‘they have avoided each other’
- b. -ɔ verb suffix /ḡùḍúkṭɔ́/ ‘we (in) have eaten’
(perf. antipassive) /ùḍúkṭò/ ‘they have eaten’

⁹ Two verbs with a root-final mid vowel exist that take -I: /ĩṭ’óónì/ ‘fear; respect’ and /ĩlólól/ ‘dangle’ (from /ĩlól/ ‘carry (sth on a handle)’). The paradigms are the same but why one has right-to-left spreading and the other not, is not clear.

3.2.2 Inflectional Suffixes

a) Suffixes with a [+ATR +high] vowel show cross-height vowel harmony with right-to-left spreading unless /a/ blocks the spreading as in (19d2nd).

- (19)a. -i verb suffix /ĩt̥dórí/ ‘you (sg) add (sth)’ (from /t̥dòr/ ‘add’)
(1s/2s imperf.) /ǎ́zínĩ/ ‘you (sg) see (sth)’ (from /zín/ ‘see’)
- b. -i noun plural suffix /bùŷèèzĩ/ ‘girls’ (from /bùŷèt̥/ ‘girl’)
(rare)
- c. -t̥i noun plural suffix /èlèèt̥i/ ‘bodies’ (from /èlè/ ‘body’)
/ŷùðùŋt̥i/ ‘knees’ (from /ŷùðùŋ/ ‘knee’)
- d. -niṭ noun sing. suffix /ŷèróniṭ/ ‘kidney’ (from /ŷèr/ ‘kidneys’)
/lòð:ààt̥iṇiṭ/ ‘pumpkin’ (from /lòð:ààt̥i/ ‘pumpkins’)
- e. -u verb suffix /ĩt̥dóru/ ‘you (pl) add (sth)’
(2 plural) /ǎ́zín:ù/ ‘you (pl) see (sth)’
- f. -u noun case suffix /t̥aḡííðù/ ‘dry season’ (gen.) (from /t̥aḡííð/)
(gen. singular) /bààk̥iṭú/ ‘place across’ (gen.) (from /bààk̥iṭ/)
- g. -u noun case suffix /lòŷòlòl̥iṭù/ ‘wooden spoons’ (gen.) (from /lòŷòlòl̥iṭà/)
(gen. plural)

b) Suffixes with a [+ATR -high] vowel show same-height vowel harmony with right-to-left spreading. If the root-final vowel is [-ATR +high] no spreading occurs.

The vowel /a/ in the final syllable causes the suffix -o to become [-ATR] (left-to-right spreading) unless a semivowel immediately preceding the suffix keeps it [+ATR]. There is no difference whether /a/ occurs in a root like /ŷèélàn/ ‘leopard’ or a stem like /àŷát/ ‘food’ (nominalization of the verb /ák/ ‘cook’).

- (20)a. -o noun case suffix /ĩdét̥ò/ ‘chameleon’ (gen.) (from /ĩdét̥/)
(gen. singular) /òdíró/ ‘kind of sticky vegetable’ (gen.) (from /òdí/)
/zèèzèró/ ‘honey guide’ (gen.) (from /zèèzèr/)¹⁰
/àŷátò/ ‘food’ (gen.) (from /àŷát/)
/ŷèélànó/ ‘leopard’ (gen.) (from /ŷèélàn/)
/ŷàŷátò/ ‘bitterness’ (gen.) (from /ŷàŷát/)
/át̥ó/ ‘hand’ (gen.) (from /àð:ĩt̥/)
- b. -ot̥f noun sing. suffix /t̥òbóloòt̥f/ ‘blister, callus’ (from /t̥òból/ ‘blisters’)
/b̥ìl̥íloòt̥f/ ‘straw for drinking’ (from /b̥ìl̥íl/ ‘straws’)

¹⁰ This example shows that the underlying form of the genitive suffix is -o regardless of the tone. Yet the [-ATR] form of the suffix appears after a root-final [+high] vowel when the word-final syllable has a high tone: /ŷèèðĩt̥ó/, gen. of /ŷèèðĩt̥/ ‘woman's breast’; /t̥ùŷùl̥òz̥ó/, gen. of /t̥ùŷùl̥òt̥/ ‘chicken’. Even though some nominalized stative verbs with a root-final [+high] vowel do not have a high tone, their genitive does follow the same pattern, like /b̥ĩr̥ĩðó/, gen. of /b̥ĩr̥ĩð/ ‘ripening’. No explanation has been found why the ATR value changes. The genitive case of the gerund (nominalized verb) is irregular too as it is usually [-ATR]. Examples: /d̥ĩmèn̥t̥ó/ ‘searching’ (gen.); /d̥ũŷèènt̥ó/ ‘eating’ (gen.); /m̥òt̥òðnt̥ó/ ‘meeting’ (gen.); /z̥òðŷĩnt̥ó/ ‘smelling’ (gen.) but /z̥èb̥ĩnt̥ó/ ‘tying’ (gen.).

- c. -etʃ noun sing. suffix /ʏĩbòlòŋɛ̀tʃ/ ‘anthill with a high turret’
(plural /ʏĩbòlòŋɛ̀tʃà/)
/ʏimìnínɛ̀tʃ/ ‘natural hive’ (of a tiny kind of
honey producing flies) (from /ʏimìnín/ ‘hives’)
- c) Suffixes with a [-ATR +high] vowel are more complicated.
- (21) a. -ɪ noun case suffix /ðĩǵĩrɪ/ ‘donkey’ (nom.) (from /ðĩǵĩr/)
(nom. singular) /lòðʒɪ/ ‘land’ (nom.) (from /lòðtʃ/)
/tòóɪtɪ/ ‘sausage tree’ (nom.) (from /tòóɪt/)
but: /ĩrʲɛ́ɛrɪ/ ‘jackal’ (nom.) (from /ĩrʲɛ́ɛr/)
/tòŋólóʃʲɛ́ɛð:tɪ/ ‘prostitution’ (nom.) (from
/tòŋólóʃʲɛ́ɛð:t/)
- b. -ɪ noun case suffix /ʏùrùbùlɪtɪ/ ‘beehives’ (obl.) (from /ʏùrùbùlɪtʃà/)
(oblique plural) /òtòðn:t/ ‘horns’ (obl.) (from /òtò/)
/lèèyɪtɪ/ ‘private fields’ (obl.) (from /lèèyɪtʃà/)
/tòròjòyɪtɪ/ ‘hunts’ (obl.) (from /tòròjòyɪtʃà/)
/lòʒòʒɛ́ɛtɪ/ ‘small bags’ (obl.) (from /lòʒòʒɛ́ɛtʃà/)
but: /l:ʲòónɪ/ ‘mosquitoes’ (obl.) (from /l:ʲòón/)
- c. -ɪtʃà noun plural suffix /ʏùrùbùlɪtʃà/ ‘beehives’ (from /ʏùrùbùlɪ/)
/lòyòlòlɪtʃà/ ‘wooden spoons’ (from /lòyòlòl/)
/ʒùrùkààlɪtʃà/ ‘home guard’ (from /ʒùrùkàáli/)
but: /mòòmɪtʃà/ ‘wombs’ (from /mòòmù/)
/lèèyɪtʃà/ ‘private fields’ (from /lèèyɛ̀/)
/lòyòlòòŋɪtʃà/ ‘kind of beetle’ (pl.) (from /lòyòlòòŋò/)
/tòròjòyɪtʃà/ ‘hunts’ (from /tòròjòyò/)
/tɪŋɪrʲòmɪtʃà/ ‘escarpments’ (from /tɪŋɪrʲòm/)

These suffixes show same-height vowel harmony for [+high] vowels with left-to-right spreading.

The suffix [+high] vowel is also assumed to be [+RTR] with right-to-left spreading to account for the change of the mid vowels. If a palatalized consonant precedes the mid vowel in the root-final syllable it prevents a change (like in /l:ʲòónɪ/). If the palatalization has occurred in the middle of the stem it still prevents preceding mid vowels from changing. Note that in the mixed stems (like /lèèyɪtʃà/) the mid vowels change to [+RTR] (like in /lèèyɪtɪ/). This is in accordance with bracket erasure in lexical phonology. The stem is treated as a unit, not as a sequence of morphemes. (Otherwise, the oblique form would have unchanged mid vowels like *lèèyɪtɪ.)

As for (21c), when the root ends in a [+ATR +high] vowel this vowel is deleted but its ATR property remains and causes the suffix-initial vowel to become [+ATR] except when the penultimate syllable is long with a rising tone and its vowel not [+high] (like 3rd under c). The pattern for roots with a final [-high] vowel is similar but the spreading is only blocked. It does not make a difference whether the penultimate vowel is long or short. If a palatalized consonant precedes the mid vowel in the root-final syllable it prevents a change.

- (22) -ɪ adj. attr. suffix /ʏùtùrɪ/ ‘short’ (from /ʏùtùra/)
/rùbénɪ/ ‘blind’ (from /rùbén/)

The adjective attributive suffix shows also same-height vowel harmony with left-to-right spreading. But the root-final mid vowel does not change. To explain this, it is assumed that the underlying form of the suffix is -ɛ. This is supported by the nominative form before a pause: /ʏùtùréénɪ/ and /rùbénéénɪ/. Word-finally the mid vowel of the suffix is raised. If the raised vowel appears after a [+ATR +high] vowel same-height vowel harmony occurs.

- (23) -I noun plural suffix /ĩvèyèʒì/ ‘big vessels (used for storage)’ (from /ĩvèyètʃ/)

In spite of the fact that the underlying form is -ε as well, as is supported by the genitive and oblique forms (/ĩvèyèʒèèn:ù, ìvèyèʒèèn:ì/), the raised final vowel is nevertheless [+RTR] with the mid vowels changing (right-to-left spreading).

d) Suffixes with a [-ATR -high] show no vowel harmony. The root-final vowel of the verb in (24b) is deleted but the property [+back] is retained and attached to the suffix vowel. The same does not happen to the nouns. The tone remains instead.

- (24)a. -ε̣ta noun plural suffix /ðĩǵĩrèètà/ ‘donkeys’ (from /ðĩǵĩr/)
/lòʒòʒéètà/ ‘small bags’ (from /lòʒòʒó/)

- b. -εεtʃ verb suffix /ĩðòðòtʃ/ ‘enter!’ (pl) (from /ĩðó/)
(perfective plural)

e) A few suffixes with the vowel /a/ cause a change of ATR value even though this vowel is considered opaque blocking the spreading.

If such a suffix is attached to a verb *stem* (mɔt-ɔɔn-, ðɔɔð-ɔɔn-)¹¹ with a final [-ATR -high], this vowel (and any of the same kind preceding it) will become [+ATR]. So of the stem ʒuʊr-ɛn- only the mid vowel changes. But if such a suffix is attached to a *root* with a final [-ATR -high] vowel (long or short) it does not cause a change.

- (25) -a verb suffix /yòmòtòón:à/ ‘we (ex) meet’
(1 pl. exclusive) /yòðòðòðòn:á/ ‘we (ex) talk together’ (from /ðòðòð/ ‘speak’)
/yàʒùùren:á/ ‘we (ex) are washing off’ (from /ʒùùr/ ‘wash off’)
but: /yðbððáán:à/ ‘we (ex) return (come back)’
/yðʒóktà/ ‘we (ex) have soaked (sth)’ (from /ʒók/ ‘soak’)
/yðʒòóktà/ ‘we (ex) have smelled (sth)’ (from /ʒòók/ ‘smell’)

The noun singular oblique suffix (26a) does not cause a change to a [-ATR -high] vowel if attached to any root or a stem with only short vowels. If a *stem* with a final [-ATR -high] vowel contains a long vowel, this final vowel (and any of the same kind preceding it) will become [+ATR] (right-to-left spreading) but again [+high] vowels do not change.

The noun nominative plural case suffix (26b) does not cause any change whether attached to a root or a stem.

- (26)a. -a noun case suffix /tèǵélà/ ‘song’ (obl.)
(obl. singular) /ðòóðà/ ‘matter’ (obl.)
/yðʃòkóðtà/ ‘stranger’ (obl.) (from /yðʃòkóð/ ‘strangers’)
/ð:íktà/ ‘piece of iron’ (obl.) (from /ð:ík/ ‘iron’)
but: /bòlòóktà/ ‘leaf’ (obl.) (from /bòlòók/ ‘leaves’)
/ðĩǵĩrèèntà/ ‘cowrie’ (obl.) (from /ðĩǵĩrèènà/ ‘cowries’)
- b. -a noun case suffix /yìròḡà/ ‘flies’ (nom.)
(nom. plural) /ðĩǵĩrèètà/ ‘donkeys’ (nom.)

¹¹ The suffix -ɔɔn- expresses reciprocity, the suffix -ɛn- antipassive (patient obligatory absent) and the suffix -an- ventive. All of them are used with the imperfective aspect. Perfective has no /n/.

3.2.3 Conclusion

From the list of suffixes given in 3.2.1 and 3.2.2 one can see that the vowel harmony patterns for derivational and inflectional suffixes are very similar. So vowel harmony appears to be largely independent of the type of suffix.

The hierarchy is that high vowels are more dominant than mid vowels, and ATR is more dominant than RTR. The behaviour of /a/ described in (20a) and 3.2.2.e is unusual. No explanation can be given.

3.3 Writing and ATR spreading

At present, the surface form with ATR spreading is written. Further discussion is needed whether to write the underlying form of the root and the suffixes or to write the ATR spreading.

4. Gemination

Certain suffixes exist that cause a stem-final consonant to geminate. Some of the suffixes in question begin with a semivowel or two suffixes are added simultaneously, the first one being /i/ or /-i/.

1. /-jok/, /-jak/ attached to a verb, an adjective or a noun to express people who do something or who have a certain quality (a-d in example below);
2. /-jok/ attached to a noun to express plural (e);
3. /-wa/ attached to a noun to express plural (f);
4. /-i/, /-i/ followed by another suffix beginning with a vowel, attached to a verb or a noun (g-i).¹²

Examples (phonemic form, underlying form, present orthography):

(27) a.	/kàtʃòòk/	kaɬ jok	kattiook	‘farmers’
b.	/dĩim:ʃák/	dĩim jak	diimmiak	‘searchers’
c.	/màkàjòòk/	maka jok	makayyiook	‘politicians; generals’
d.	/wèètʃák/	weɛɬ jak	weettiak	‘people who move a lot’
e.	/bòròkʃòòk/	bɔrɔk jok	borrokiook	‘ponds; swamps’
f.	/zàrĩĩtʃwà/	zarĩĩtʃ wa	carriittwa	‘porcupines’
g.	/yèŋérʃà/	yɛ ŋɛr i a	hengerria	‘we (ex) have divided’
h.	/gòón:ʃà/	gɔɔn ɪ a	'goonnia	‘his friend’ (nom.)
i.	/àmùdʃàá/	a mud ɪ an	amuddiaa	‘it is found’

Note that the semivowels are [+ATR] as they change the preceding vowels just like [+ATR +high] vowels. Moreover when [-ATR +high] vowels become a semivowel, the ATR property becomes [+ATR] causing the preceding vowels to change (g+h).

- At present, the surface form with gemination is written. Further discussion is needed whether to write the underlying form of the root and the suffixes or to write the surface gemination.

¹² Glosses for the morphemes in the underlying forms are as follows: c) màká ‘big’; d) wèètʃ ‘walk’ (n); g) |yɛ| = first person, perfective; |ŋɛr| = divide; |i| = perfective plural; |a| = first person plural exclusive; h) |gɔɔn| = friend; |ɪ| = 3rd person singular possessive; |a| = nominative case; i) |a| = 3rd person, imperfective; |mud| = find; |ɪ| = impersonal, passive; |an| = ventive.

5. Vowel Length

Didinga has contrastive length in roots but in cases of suffixation, the length of the root-final vowel usually governs the length pattern. If the root-final vowel is short, the vowels of the odd suffix syllables are long and those of the even syllables are short. The reverse is true when the root-final vowel is long. This pattern is called iambic. So the length alternation is always left to right. The final syllable of the resulting word does not always follow the pattern.

Below are some examples from the verb class.¹³

Root-final vowel short			Root-final vowel long				
(28) a.	/ʒɪnòðð/	ʒɪn oð	‘foresee’	b.	/dɛɛɲòð/	dɛɛɲ oð	‘foresee’
c.	/bòdɔ̀àk/	bòd ak	‘come back to get (sth)’	d.	/ʒìdɔ̀àk/	ʒɪd ak	‘pour into’
e.	/bòdɛ̀èk/	bòd ek	‘go back to get (sth)’	f.	/ʒìdɛ̀ik/	ʒɪd ek	‘pour out into’
g.	/ʒìnà/	ʒɪn an	‘look towards’	h.	/dɛɛɲà/	dɛɛɲ an	‘look towards’

In final position, the suffix /-an/ is reduced to /-a/. Even though you would expect */ʒìnàà/, it is nevertheless realized as /ʒìnà/. A long vowel with low tone in an open final syllable is reduced to a short vowel. The long vowel and the /n/ reappear in non-final position as in /ʔàʒìnàán:à/ ‘we (ex) are looking towards (sth)’.

If the length pattern of a suffix is fixed, it has two allomorphs as in /-ooðɪk/ ~ /-oðooðɪk/. The latter is used after a root with a final long vowel to fit the iambic pattern of alternating long and short vowels.

(29) /bòdòðòðɪk/ ‘go nearer’ /p^waanoðooðɪk/ ‘appear to sth/sb’

The iambic pattern is not always followed in other word classes. In a number of nouns, two long vowels are allowed in consecutive syllables as long as the tone patterns are different like low on the first one and rising on the second one.

(30) /tùl:ùùkèén/ ‘squirrels’ (plural of /tùl:úúyù/)

- At present, surface length is written. It needs further discussion whether to write these suffixes according to the underlying vowel length or to follow the surface pattern.

6. Vowel Height Dissimilation

Vowel height not only influences ATR spreading as discussed in section 3, but sometimes even controls which allomorph of a suffix is chosen.

The choice between /-ɛɪɪt/ and /-ɪɪt/ (which is affixed to a number of verbs to make a noun) is governed by the height of the root-final vowel. The allomorph /-ɛɪɪt/ occurs after the high vowels (i, ɪ, u and ʊ) as in (a-b) below whereas the allomorph /-ɪɪt/ come after the non-high vowels (a, e, ɛ, o and ɔ) as in (c-f) below. This phenomenon is called vowel height dissimilation. The length of the root-final vowel governs the length of the suffix-initial vowel.

(31) a. /dùʔɛ̀énɪt/ ‘eating (sth soft)’ b. /dʔiménɪt/ ‘searching’
 c. /ʒèbɪ́ɪnɪt/ ‘tying’ d. /ʒòðdɪ́nɪt/ ‘carrying’
 e. /dàʔɪ́ɪnɪt/ ‘eating (sth hard)’ f. /ʒààmɪ́nɪt/ ‘booking’

- At present, the surface forms are written. Further discussion is needed to decide whether to use one form since the distribution is complementary and see how people react, or to follow the surface pattern.

¹³ The roots /ʒɪn/ and /dɛɛɲ-/ are synonymous.

7. More on Consonant Sequences

In section 2.2 it was mentioned that the second consonant of a consonant sequence appears to be always heavy. This phonotactic feature is independent of the morphology of the word and functions on the post-lexical level. It applies equally to forms that come out of the lexical level unchanged (roots) as well as to derived forms.

In the derivation process, consonant sequences may appear. Some have co-occurrence constraints and a rule has to apply on the lexical level that causes the features of both consonants to become the same resulting in a heavy consonant. Others do not have any constraints but on the post-lexical level sometimes two pronunciations exist or a preferred one.

7.1 Lexical Level

In the process of verb derivation (as in a-b below) or inflection (as in c), certain consonant sequences are prevented from appearing because of co-occurrence constraints. A sequence of a stop and a nasal is not permitted. Instead a heavy nasal appears. This happens on the lexical level in (32a-b) and needs to be written but on the post-lexical level in (32c) and doesn't need to be written. This is not recommended from a didactic point of view, however.¹⁴ For derivations of (32a+c), see appendix.

- (32) a. /àð:úún:ì/ ‘he is taking care of (sb/sth)’ (from |a| |ð:úú| |ní|)¹⁵
 b. /àðáán:ì/ ‘(place where) he is dying’ (applicative) (from |a| |ðaa| |ní|)
 c. /γàðáakn:à/ ‘we (ex) are dying’ (from |γa| |ðaa| |na|)

A number of two-syllable verb roots have the second vowel deleted in the derivation process but only in the imperfective aspect. A sequence of a stop and a nasal, a fricative or a liquid is not permitted (as in a-c below), whereas a sequence of two stops or of a liquid and a nasal is allowed (as in d-e). For derivations of (33a-b), see appendix.

- (33) a. /àdún:â/ ‘he emerges’ (from |a| |duyun| |an|; /dũyún/ ‘enter’)
 b. /àtúrĩ/ ‘she is cooking’ (from |a| |tuɣur| |ɛn|)
 c. /ĩðàð:èék/ ‘he assumes (sth)’ (from |ĩ| |ðayĩð| |ek|; /ðayĩð/ ‘imitate’)
 d. /ðɣódtfâ/ ‘he invites (sb)’ (from |ɔ| |ɣɔdtf| |an|; /ɣɔdtf/ ‘pinch’)
 e. /èɜ́erm:â/ ‘she is carrying away on the back (infant) to (speaker)’
 (from |ɛ| |ɜ́ɛɛm| |an|)

¹⁴ It is recommended to write (32c) like (32b): *yàdãán:a*.

¹⁵ The third person imperfective aspect prefix is /a-/ when the root-initial vowel is [+high] or [+low] and a copy vowel if it is [-high]. Some verbs belong to a different class and have /I-/ irrespective of the root-initial vowel.

Derivations of some so-called t-verbs have a pattern that is just the opposite of what has been described above. Heavy consonants appear too but they take the features of the left element of the consonant sequence, not the right. It only happens to dental and alveolar consonants (34a-c), not to nasals and the voiceless velar stop (34d-e).¹⁶ Although sequences of alveolar consonants followed by /t/ are allowed in nouns, such as in /mèélɬin/ ‘state of being many’ and /òórɬin/ ‘whiteness’, there is a co-occurrence constraint in this type of verbs that forces the appearance of a heavy consonant instead of a sequence.¹⁷

- (34)a. /ðǵól:â/ ‘he is creeping away from (sth)’ (from |ɔ| |ǵɔl| |ɬ| |an|)
 b. /àǵúrâ/ ‘he is pulling at (sth)’ (from |a| |ǵur| |ɬ| |an|)
 c. /àǵúð:ĩ/ ‘he is hiding himself’ (from |a| |ǵuð| |t| |ɪ|)
 d. /èyénɬâ/ ‘he is creating (sth)’ (from |ɛ| |yɛɲ| |ɬ| |an|)
 e. /írókɬâ/ ‘he is bringing up (child)’ (from |i| |rok| |ɬ| |an|)

7.2 Post-lexical Level

The homorganic /n-t/ sequence is realized either as /nɬ/ or as /t/. Even though there is no constraint, preferences occur that are phonologically conditioned. Since the output of the lexical level is the sequence, these variations happen at the post-lexical level.

The genitive and the oblique case of the gerund prefer /t/ except when the root-final vowel is /ɔ/.

- (35)a. /zèðĩĩɬà/ [zèðĩĩɬà] ‘tying (obl.)’ (from |zɛb| |in| |ɬ| |a|)
 b. /mùyèèɬà/ [mùyèèɬà] ‘thinking’ (obl) (from |muk| |ɛn| |ɬ| |a|)
 c. /mòtððɬà/ [mòtððɬà] ‘meeting’ (obl.) (from |mɔt| |ɔn| |ɬ| |a|)¹⁸

For the perfective first person exclusive and second person plural both pronunciations are acceptable except that only the sequence is used when the root-final vowel is /ɔ/.

- (36)a. /yìzĩɬà/ [yìzĩɬà ~ yìzĩɬà] ‘we (ex) saw (sth.)’ (from |yɪ| |zɪn| |ɬ| |a|)
 b. /yèbèɬà/ [yèbèɬà ~ yèbèɬà] ‘we (ex) sang (song)’ (from |yɛ| |bɛn| |ɬ| |a|)
 c. /yòmónɬà/ ‘we (ex) rested’ (from |yɔ| |mɔn| |ɬ| |a|)

For the plural of some adjectives and the nouns derived from them the same is true.

- (37)a. /rèèɬɪg/ [rèèɬɪg ~ rèèɬɪg] ‘far’ (plural of /rèén/)
 b. /rèénɬin/ [rèénɬin ~ rèéɬin] ‘distance’
 c. /ðfððɬɪg/ ‘near’ (plural of /ðfððn/)

¹⁶ The alveolar nasal is apparently ambivalent with /àwánɬi/ (from /tawánɬi/ ‘take around’) and /ùw:áɬi/ (from /tùwánɬi/ ‘go ahead’). Evidently a VCV root (/uwan/) behaves differently from a CVC root (/wan/).

¹⁷ To build the stem of a t-verb with a CVC root is by prefixing in the perfective aspect but by suffixing in the imperfective aspect. When a derivational suffix like -a is added, the /t/ assimilates to the root-final dental/alveolar consonant in the imperfective: /ðǵól:â/ (from |ɔ| |ǵɔl| |ɬ| |an|). In the perfective, since a consonant cluster is not allowed a copy vowel is inserted: /ðtðǵólá/ (from |ɔ| |ɬ| |ǵɔl| |a|).

¹⁸ Contrary to what is stated in 3.2.2e, no change of ATR value occurs in the oblique case of the gerund.

The homorganic /r-n/ sequence is realized either as /rn:/ or as heavy /r/. The latter pattern is different as the direction of the process is opposite. Yet again it is the /n/ that is dropped out.

(38)a. /pìrn:ánìt̪/ [pìrn:ánìt̪ ~ pìránìt̪] ‘suffering’

b. /mààrn:ì/ [mààrn:ì ~ mààrì] ‘his uncle (mother's brother)’

A few nouns have two allomorphs. In one a consonant sequence occurs, in the other only a heavy consonant (like /-k̪-/ or /-t̪-/ or /-lb-/ or /-b-/ or /-rl:/ or /-l:/). The same speaker can use both alternatives. However, the general pattern is that consonant sequences are stable since there are no constraints that force them to have allomorphs.¹⁹

(39)a. /γùlók̪í/ ~ /γùlúí/ ‘bowels’

b. /γùrl:í/ ~ /γùl:í/ ‘cucumbers’

c. /γèlbéèná/ ~ /γèbéèná/ ‘beads’

- The present way of writing is somewhat inconsistent. Some write the sequence, others just the heavy consonants even when there is a co-occurrence constraint. It needs to be considered to write the form that is the output of the lexical level, which in some cases has the consonant sequence but in others just the heavy consonant.

8 Tone

Didinga has two level tones, high and low. Falling and rising tones normally occur on long vowels and are interpreted as sequences of high-low and low-high.

The functional load of lexical tone is low. Only a few words exist whose meaning depends on tone like:

(40) /ìdʒó/ ‘pot’ /ìdʒò/ ‘goods, possessions’

More important is grammatical tone. Quite a number of nouns have a different tone for subject and object as in (41a). In the verb, differences between two forms are sometimes marked only by tone. For example, the tone on the second syllable is low in the first and second person singular but high in first person plural inclusive and third person singular (all in the imperfective aspect) as in (41b), and for certain two-syllable verb roots, the tone on the second syllable is high in the third person singular in the imperfective aspect but in the perfective aspect it is the tone on the third syllable that is high as in (41c).

(41)a. /èlè/ ‘body’ /èlé/ ‘body’ (nom.)
/dòγóléét̪/ ‘child’ /dòγòlèét̪/ ‘child’ (nom.)²⁰

b. /γòkò/ ‘I am going’ /γòkó/ ‘we (in) are going’
/òkò/ ‘you are going’ /òkó/ ‘he is going’

c. /òdólàn/ ‘he reaches’ /òdólán/ ‘he reached’

In spite of that, people prefer not to write tone but rather depend on the context for the right pronunciation. Certainly, the discourse and grammar will often help to disambiguate but not always.

In the following example, a new reader may stumble over /bòγɔl/ because it can have high or low tone depending on whether it is object (as in a) or subject (as in b). An experienced reader looks a few words ahead and can decide how to pronounce it.

¹⁹ Even though allomorphy of noun roots is rather rare, here are some different examples:

/nàǵáǵà/ ~ /nàǵáǵà/ ‘beer to be distilled’; /làǵí/ ~ /nàǵí/ ‘sorghum’; /nèbúrèét̪/ ~ /nàbúrèét̪/ ‘sheath’

²⁰ Before a pause a longer form occurs: /dòγòlèézà/ as in /àdǵák dòγòlèézà/ ‘the child died’.

- (42)a. /i-kíà òṣòl-ì né í-ṣín báyól/ ‘Elephant came and saw Tortoise.’
PF-come elephant-NOM and PF-see tortoise
- b. /ikíà òṣòlì né íṣín báyòl ìnóón:ò/ ‘Elephant came and Tortoise saw him.’
PF-come elephant-NOM and PF-see tortoise.NOM him

But in the next example (taken from **Thǎǎth ċ Dǎdinga** (Didinga primer 1) page 45) the word /yǎtǎ/, which marks future (F) with low tone and hodiernal past (HP)²¹ with high tone, cannot be disambiguated by the context at all. So there are four options.

- (43) /àpǎá ẓèèní. àǎíím yǎtǎ nèé ókó úúyà òòìná. àbál àpǎá òòìn ẓíg mèèlìg.
Apaa this want F/HP he go tend cows owns Apaa cows that many
- òúòèní yǎtǎ nèé òààṅ ùm^wà tǎúúyà ẓúyúǎmà/
sell F/HP he cow some at.market in.Cuhudum
- ‘This is Apaa. He wants to take his cows for grazing. Apaa owns many cows. He is going to sell a cow at the market in Cuhudum.’ (both future: first /yǎtǎ/, second /yǎtǎ/)²²
 - ‘This is Apaa. He wants to take his cows for grazing. Apaa owns many cows. He just sold a cow at the market in Cuhudum.’ (first future: /yǎtǎ/, second past /yǎtǎ/)
 - ‘This is Apaa. Just before he wanted to take his cows for grazing. Apaa owns many cows. He is going to sell a cow at the market in Cuhudum.’ (first past /yǎtǎ/, second future: /yǎtǎ/)
 - ‘This is Apaa. Just before he wanted to take his cows for grazing. Apaa owns many cows. He just sold a cow at the market in Cuhudum.’ (both past: first /yǎtǎ/, second /yǎtǎ/)
- It needs to be tested with various readers of different reading abilities how well they can read without any tone marks.

9. Phonemes and Graphemes in Didinga, Murle and Tennen

Below is a list of phonemes and graphemes of Didinga with examples. Corresponding graphemes are given for Murle and Tennen.

		<i>Didinga</i>		<i>Murle</i>	<i>Tennen</i>
a	a	a'theet	sheep	a	a; <u>a</u>
a:	aa	ahaat	tongue	aa	aa; <u>aa</u>
6	b	bōhōl	tortoise	b	b
b	bb, 'b	hēbbēēna	beads	b *	bb
b	b	hilib	shield	p	b
3	c	carriit	porcupine	c	c
tʃ	cc, 'c	muccuhudi	boil	c	c
tʃ	c	merkec	ram	c	c
d	d	dōhōm	chisel	d	d

²¹ Hodiernal past refers to anything that happened between last night and the present.

²² The tone on the first syllable varies according to the preceding word. The tone on the second syllable is fixed: low for the future and high for the hodiernal past. There is more to be said about this tone phenomenon but that is beyond the scope of this article.

d	dd, 'd	addungu	one-stringed harp	d *	dd
d	d	lohod	big leather bag	t	d
ɖ	dh	dhulum	hornbill	<u>d</u>	dh
t	dt	dtaaba	stool	<u>t</u>	t
e	e	etelu	bedbugs	e	<u>e</u>
e:	ee	eet	person	ee	<u>ee</u>
ɛ	ẽ	ẽlẽ	body	ɛ	e
ɛ:	ẽẽ	ẽẽth	goat	ɛɛ	ee
ɡ	g	gaarrieenit	amulet	g	g
ɡ	gg, 'g	iggooli	log	g	gg
ɡ	g	ūtūg	mouth	k	g
ʏ	h	hẽẽta	tree		h
i	i	ittiheenit	zebra	i	<u>i</u>
i:	ii	diith	cloud, sky	ii	<u>ii</u>
ɪ	ĩ	ĩraga	granary	i	i
ɪ:	ĩĩ	ĩĩna	ears	ii	ii
f	j	jaanĩ	broom	j	j
dʒ	jj, 'j	ijjo	pot	j	jj
dʒ	j	hẽrẽẽjĩj	kind of tiny ant (pl)	c	j
k	k	kõr; torkõk	sun; greater kudu	k	k, kk
l	l	lĩl	river	l	l
l: *	ll, 'l	halli	whip	l *	ll
m	m	mĩnyõõn; lottiim	little goat; baboon	m	m
m:	mm, 'm	ẽmmẽ	bones	m *	mm
n	n	nakẽẽdũ; maan	hare, rabbit; yellow	n	n
n:	nn, 'n	hõnna	liana	n *	nn
ŋ	ng	ngaadõkĩ; iding	rat, mouse; meat	ŋ	ng
ŋ:	'ng	ngaangẽ'ngẽẽth	gizzard		
ɲ	ny	nyalladõ	ornament (worn around the arm)	ny	ny
	ny	hõõny	he-goat	ny	ny
ɲ:	'ny	mũ'nyaac	star		
o	o	olomĩ	ostrich	o	<u>o</u>

o:	oo	hodoolu	green monkey	oo	oo
ɔ	õ	õngõl	elephant	ɔ	o
ɔ:	õõ	'gõõl	path	ɔɔ	oo
p	p	pelo	whistle	p	p, pp
r	r	hūrara; mēdēr	sheath; grudge	r	r
r	rr, 'r	hōrrōõñ	halved gourd	r	rr
t̥	t	taggõõn; eet	giraffe; man	t	t
t̥ *	tt, 't	otto	horns	t	tt
ð	th	thigir; ēēth	donkey; goat	z	z
ð: *	'th	a'thiit	hand	z	zz
u	u	ulugooc	fish	u	u
u:	uu	buuru	eggs	uu	uu
ʊ	ũ	ũthūr	dog	o	u
ʊ:	ũũ	hattũũg	door	oo	u
v	v	vadduhu	gun	v	v
w	w	wēēka	okra	w	w
w *	ww, 'w	nyelelewwa	trap, net	w	w
j̥	y, i	īyaaĩ; irrieer	mother; jackal, fox	y	y
j̥ *	yy, 'y	iyyo	three	y	yy

Didinga: The letters marked in the first column with an asterisk (*) have features that could not be expressed in IPA:

- /t̥/ a voiceless laminal dental stop;
- /l:/, /ð:/, /w/ and /j̥/ are pronounced with more friction than the light counterpart.

In word-initial position, the first letter of any digraph consisting of two identical letters is replaced by an apostrophe. The heavy consonants that involve digraphs are always written with an apostrophe as 3- or 4-letter combinations were not acceptable: 'ng, 'ny and 'th.

Murle: Word-final devoiced stops are written with the symbol for the voiceless stop. Apparently, no light and heavy consonant pairs occur. The same letter is used for both. Occasionally sequences of the same letter are found in the middle of words; these graphemes are marked with an asterisk. Even though Murle has at least nine vowels like Didinga, only seven are written.

Tennet: Contrary to Didinga, the low vowel is also marked for ATR. The letter h only occurs word-medially. Word-initially it has sometimes k where Didinga has h.

Appendix

Derivational suffixes function on lexical stratum 1, inflectional suffixes on stratum 2. The imperfective vowel deletion rule deletes the vowel of the second syllable of the output of stratum 1 if both first and second syllables are short and if that vowel is not /a/. The vowel-height dissimilation rule applies to the under-specified front vowel /E/. Mid-vowel raising happens to final front mid vowels causing them to become /ɪ/. To explain all the other rules is beyond the scope of this paper.

Derivations of (32a+c)

Underlying form	[V] [ð:ʊʊt̪] [nɪ]	[ɣV] [ɖaak] [na]
Lexical stratum 1		
Affixation	[[ð:ʊʊt̪] [nɪ]]	-
Length alternation	-	-
Vowel-height dissimilation	-	-
ATR right-to-left spreading	-	-
Bracket erasure	[ð:ʊʊt̪nɪ]	-
Lexical stratum 2		
Affixation	[[V] [ð:ʊʊt̪nɪ]]	[[ɣV] [ɖaak] [na]]
Imperfective V assignment	[[a][ð:ʊʊt̪nɪ]]	[[ɣa] [ɖaak] [na]]
Imperfective V deletion	-	-
Assimilation	[[a] [ð:ʊʊnnɪ]]	-
Final -n deletion	-	-
Mid-vowel raising	-	-
ATR left-to-right spreading	-	-
Bracket erasure	[að:ʊʊnnɪ]	[ɣaɖaakna]
Post-lexical level		
Assimilation	-	[ɣaɖaanna]
Tone assignment	[àð:úʊnnì]	[ɣàɖāánnà]
Final vowel to short	-	-
Surface form	[àð:úʊn:ì]	[ɣàɖāán:à]

Derivations of (33a-b)

Underlying form	[V] [ɖuɣun] [an]	[V] [tuɣur] [En]
Lexical stratum 1		
Affixation	[[ɖuɣun] [an]]	[[tuɣur] [En]]
Length alternation	[[ɖuɣun] [aan]]	[[tuɣur] [EEn]]
Vowel height dissimilation	-	[[tuɣur] [εen]]
ATR right-to-left spreading	-	-
Bracket erasure	[ɖuɣunaan]	[tuɣurεen]

Lexical stratum 2

Affixation	[[V] [dʊyunaan]]	[[V] [tʊyurɛɛn]]
Imperfective V assignment	[[a] [dʊyunaan]]	[[a][tʊyurɛɛn]]
Imperfective V deletion	[[a] [dʊynaan]]	[[a][tʊyurɛɛn]]
Assimilation	[[a] [dʊnnaan]]	[[a][tʊrɛɛn]]
Final -n deletion	[[a] [dʊnnaa]]	[[a][tʊrɛɛ]]
Mid-vowel raising	-	[[a][tʊrrɪ]]
ATR left-to-right spreading	-	[[a][tʊrrɪi]]
Bracket erasure	[adunnaa]	[atʊrrɪi]
Post-lexical level		
Assimilation	-	-
Tone assignment	[àdúnnáá]	[àtʊrrɪi]
Final vowel to short	[àdúnná]	[àtʊrrɪ]
Surface form	[àdún:â] ²³	[àtʊrí]

²³ The falling tone is a phonetic feature before a pause.

The Lwoian Family

Leoma G. Gilley

1. Introduction

The Lwoian languages are in the Western Nilotic subgroup of Nilo-Saharan. Languages in this group that are spoken in Sudan are: Anywa, Luwo, Thuri, Belanda Boor, Pärī, Shilluk, Acoli, Burun, Jumjum, and Mabaan. The Anywa live in the eastern part of the country and cross into Ethiopia. The Burun (Mayak), Mabaan and Jumjum live in Blue Nile State in the east. The Shilluk live along the Nile and Sobat rivers south of Malakal, north to Renk and west to Tonga. The political center of the Shilluk is the residence of the Rādh (king) in Pacoda. The Luwo, Thuri and Belanda Boor live in Bahr el Ghazal State around the towns of Mbili and Wau. The Pärī live in Eastern Equatoria around Lafon. Finally, the Acoli are found in the southernmost state of Eastern Equatoria. Their area extends from west of Torit south to the border of Uganda. Mangui is the provincial capital. Acoli people also live in Uganda. Due to the insecurity in the south of Sudan, many people have moved to cities in the north, especially to the capital, Khartoum.

Among these languages, Shilluk had one of the earliest orthographies. Westermann worked on the language and proposed a writing system as early as 1912. There have been periodic alterations to the writing system as more distinctions were needed for people to read the language accurately. The system described here reflects the current version as developed over about 20 years. Acoli has been written for almost as long as Shilluk, but has had fewer modifications made to it. Anywa has used two scripts, an Amharic script in Ethiopia and a Roman script in Sudan. In the early 1990's, the Ethiopian government changed its policy of writing all vernacular languages in Amharic script and a conference was held in 1992 to decide what conventions would be used. These decisions are described here. However, recently further meetings have been held as various interest groups have departed in different ways from the agreed system. Therefore, further changes may result that are not reflected in this document. Mabaan has been written for many years with a New Testament being published in the 1980's. Burun and Jumjum have more recently begun the process of orthography development. Luwo began seriously developing their orthography in the early 1980's with some modifications being made in the 1990's. Thuri is very similar to Luwo, and for the most part, they are able to use the Luwo materials. They have not developed a separate writing system at this point. Work on

Belanda Boor began in the 1980's but has been stopped for some time. Recently they have picked up the task again. Finally, Pärī is just beginning the process of deciding how to write their language. Some work has been done in Uganda, but the community has not yet reached a consensus.

The purpose of this paper is to describe the phonological features that need to be represented in the orthographies of the languages in this group. In addition, the spelling rules adopted for Shilluk will be used to demonstrate how word shape is maintained. Finally, the symbols currently being employed by these languages are listed.

2. Consonant issues

There are three major areas of interest with regard to Lwoian consonants: five points of articulation, consonant modifications, and geminate consonants. Each of these topics will be discussed briefly.

2.1 Points of articulation

There are five points of articulation in most if not all of the members of the Lwoian family discussed here. Four of these places are quite normal; namely, the bilabial, alveolar, palatal and velar. Shilluk seems to be the only language in this group that evidences dental harmony. If a word has a dental plosive or nasal, then it cannot contain an alveolar plosive or nasal. Likewise, a word with an alveolar plosive or nasal cannot contain a dental. The approximants are excluded from this harmony system. A pair of Shilluk words demonstrating this feature is shown below.

ṭṛṇ	‘small’	ṭṛṇ	‘today’ (Shilluk)
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Belanda Boor has the most unusual consonant system of the group as it has had significant contact with the Belanda Viri, a Niger Congo language (Storch, forthcoming). Thus, the Boor have included prenasalized plosives and double plosives into their phonology. In addition, there is evidence of labialization functioning extensively through the language. While the 1986 Alphabet book lists all of the sounds that are shown, not all of them have been used in materials written during the 1990's. There was a long gap in their orthography-development efforts, and it seems that some distinctions in the language have been neglected by the present writers, and need to be worked through again to gain more consistency in adequately using the orthographic system that was developed earlier.

Acoli has the fewest consonants, having no distinction shown between the dental and alveolar sounds.

2.2 Consonant Modifications

There are two types of modification that can occur in the consonants of most, if not all, of the Lwoian languages spoken in Sudan. Labialization is the most common modification and has the fewest restrictions. Any consonant in Shilluk, except "r" can be labialised. Furthermore, any vowel can come after a labialized consonant except for the close, back, rounded vowel <u, o> /u, ʊ/.

Palatalization, on the other hand, is more limited in scope. Any consonant except "w" can be palatalized, including "y". However, no rounded vowels may occur after a palatalized consonant.

/pjɛw/ ‘heart’ /pjarɔ/ ‘ten’

Shilluks generally write all consonant modifications using the semivowel alternative, thus pyew, pyarɔ or gwɔg 'dog'.

In Anywak, the labialization is written with a vowel <u> and the palatalization is written with a semivowel <y>. They acknowledge some inconsistencies, but they are not alone in this. Luwo have a spelling rule that says:

Write <w> before a, e, and i. Write <u> before o.

Write <y> before a and <i> before e and o.

The result of these rules are words such as: dwaahy ‘moon’, apuoyo ‘rabbit’, rywaw ‘to wither’ and tielo ‘foot’.

Mabaan has an interesting distinction in the root of a word in that there is a contrast between diphthongs and palatalization and labialization. There are two main patterns:

- (a) a diphthong beginning with the front vowel [i], normal length, while [y] is used to indicate one half the length of [i]; (CiVC, CyVC), and
- (b) another diphthong beginning with the back vowel [u] is normal length, while [w] is used to indicate one-half the length of vowel [u] (CuVC, CwVC).

The length difference is shown in the orthography by using the <y> or <w> for palatalization or labialization respectively and two vowels as diphthongs for the longer versions (Miller, *et al*, unpub. ms). Examples of the differences are shown below.

jieyin ‘praise’	jiyeyin	‘chat’
wiɛldɛ ‘will sell’	wyɛldɛ	‘will buy’
puokca ‘will pour’	pwokca	‘habitually pour’
ʔuayi ‘heat’	ʔwayi	‘scatter’

2.3 Single vs. Geminate Consonants

Geminate consonants were not written in the Shilluk or Anywa orthographies until the late 1980's or 1990's, which is probably one of the major reasons they had had difficulty reading the language prior to that. They are still not written in Luwo or Acoli, though they are likely to occur in the phonology. Geminate consonants in Shilluk mark plurality in nouns and intensification of action in verbs. The geminate consonants also control the syllable structure which in turn controls the phonetic length of the vowels. Vowels in open syllables are phonetically longer than vowels in closed syllables. Not all geminate consonants are being written in the orthography, but they are regularly being used to mark the grammatical categories mentioned above. One odd convention should be mentioned for Shilluk. In many plural forms of nouns, the underlying form is CVCC but the phonetic realisation of that word when it occurs in an unmodified form is CVVC. It is assumed that the plural vowel suffix along with its tone is metathasized into the root of the noun¹. The vowel of the plural marker (usually –i) assimilates to the quality of the vowel in the root, but keeps its tone. In these cases, the spelling, shown in angle brackets < >, also reflects the underlying form as shown in the examples below.

Singular	Sing+1ps	Plural	Pl+1ps	Gloss
a) lɛb	lɛɛbā	léɛb	lébbá	‘tongue/tongues’
<lɛb	leba>	<lebb	lebba>	
b) dāādə	dāādā	dāād	dāddá	‘hoof/hooves’
<dadə	dada>	<dadd	dadda>	

All Lwoian languages except Shilluk and Luwo write the voiceless plosive word-finally and the voiced plosive word-medially when it occurs as a single consonant. Usually the geminated plosives occurring intervocalically are written as single voiceless plosives in these other languages.

3. Vowel phonemes

All of the Lwoian languages have a basic five-vowel system. Each of the five vowels may have the feature [±ATR] resulting in a ten (10) vowel system with five [-ATR] vowels and five [+ATR] vowels. Shilluk, Anywa, Belanda Boor and Luwo write all ten vowels while Acoli only writes the basic five. The [-ATR] vowels are referred to as "light" while the [+ATR] vowels are "heavy". In accordance with the system of writing [ATR] in Nilotic languages, the IPA symbols for the minus set are: ɪ, ɛ, ɑ, ɔ, ʊ while the plus set are: i, e, ə, o, u. In some of the languages under discussion, these symbols reflect the sounds, but in others they do not. For example in Shilluk, the [i] and [ɪ] sound like [i] except that the first is breathy and the second is not. Likewise, the [e] and [ɛ] sound like [ɛ], but the first is breathy and the second is not. More difference in both the breathy quality and the vowel sound can be heard in the back vowels. In Luwo, the [e] and [o] are only long vowels. They are never short.

Acoli underdifferentiates all vowel qualities writing only five of the nine or ten vowels in their phonology. Mabaan and Burun have fewer phonemic vowels, seven in Mabaan and eight in Burun. Belanda Boor seems to have nine vowels, but these are not distinguished in the books they have recently written.

Length is another feature of vowels. There are underlyingly long and short vowels. Determining real vowel length is not as easy as it may appear. There is phonetic length and phonemic length and these must be distinguished if the real system is to be correctly understood. The problem with vowel length seems more prominent in Shilluk than in the other languages. For further discussion see Gilley (1992) or Gilley (unpub ms.)

4. Tone

All the Lwoian languages included here have three level tones and at least some have contour tones on short vowels. However, very little is understood about the tonal systems for the most part. Anywa is writing tone "where it distinguishes grammatical features". Luwo writes tone on specific words where meaning would otherwise be unclear. Shilluks have long claimed that they can read their language without the tone being written, but in recent days it has become clear that tone must be written on certain verbal forms or it is impossible to tell who is acting as Agent or Benefactive. Tone also distinguishes singular and plural forms as well as verbal nouns from concrete nouns. Thus, we can assume that tone is not so significant at the lexical level, but plays a much more active role at the grammatical level.

5. Segmental: CV and word shapes

Most root words have a CVC structure. There may also be a prefix or a suffix or both. The singular/plurals are marked by the suffix. The only exception to this is Belanda Boor. According to Storch (forthcoming) they have been influenced by the Niger-Congo languages near them and use prefixes for number marking. Historically the prefix in Nilo-Saharan designates gender, but that system is no longer productive. Possessive pronouns are attached as a suffix. Since most of the suffixes are vowels and two different vowels cannot come together, the affix generally replaces the final root vowel. For example, in Shilluk, the singulative suffix <-ø> /-ɔ/ or /-o/ is deleted before the possessive suffix as in this example: *tībò* ‘shadow’ *tībā* ‘my shadow’.

6. Major spelling features or challenges

Shilluk has developed a complex set of spelling rules in addition to the regularised spelling of the singular / plural nouns. There are many *a* affixes which have different meanings, and thus need distinctive representation in the orthography. In an effort to avoid writing tone, several methods have been employed to clarify the meaning. The symbols used in these examples are orthographic.

In the nouns, there is an *-a* meaning 1ps possessive. This *-a* is attached directly to the noun root. There is another *-a* meaning ‘a particular one’. Phonologically, the addition of this suffix has the effect of lengthening the root vowel of the noun. This suffix is conjoined to the root with a hyphen, but the root vowel lengthening is not written.

gyena ‘my chicken’ *gyen-a* ‘this particular chicken’

The verbs have a slightly different problem with *a* affixes. There are two *a*’s that come before the verb and several that come after the verb root. There is one prefix *a-* with a High tone that means past, evidential (Miller and Gilley, forthcoming). This *a-* is attached to the verb root in the orthography. There is another *a* that acts as a focus marker for whatever comes before the verb. This *a* has a Low tone and is written as a separate word. The two *a*’s can come together.

Rējø arob yi Acol. ‘Acol strung the fish’

Yīn a rob rējø. ‘You (not another) string the fish.’

Yīn a arob rējø. ‘You (not another) strung the fish.’

There are several *-a* suffixes on the verb. The subject pronoun may be incorporated into the verb as an *-a* suffix meaning 1ps. This suffix is attached directly to the root. The addition of

this suffix creates an open syllable in the root, and thus it lengthens phonetically. This length is written in the orthography. However, there is another *–a* suffix that means 1pp (inclusive). When this *–a* is added to the root, the suffix is stressed. This *–a* is added to the root following a stress mark, currently a grave accent.

Rīj acaama. ‘I ate the fish.’

Rīj acam`a. ‘We (inclusive) ate the fish.’

If the *–a* suffix is added to the short vowel root, it takes the meaning of focus on the following word. This construction is found more often in SVO word order. If the verb has the sense of intensive or repeated action, the final consonant is doubled.

Col acama rīj. ‘Col ate the fish (not something else).’

Col acamma rīj. ‘Col repeatedly ate the fish (not something else).’

There can also be a reduced form of *e ba* which functions as a relative clause marker. The *a* that results from this reduced form has a high tone and is written as a separate word.

Gīncam acam a akelø. ‘The food eaten, it was *akelø*.’

Both motion and location can be marked in the verb. In both cases, the direction of the motion or the location word follow the verb. Motion is shown by a long vowel on the root and an *–a* suffix that is attached directly to the stem. No Agent can be included in this clause. The meaning is that the object is taken to a location and the action is performed on it there. In the case of location, the object is already in that location when the action is performed. Location is marked by a doubling of the root-final consonant and the *–a* suffix attached to the stem.

Rīj acaama ød. ‘The fish was taken to the house and eaten there.’

Rīj acamma ød. ‘The fish was in the house and was eaten there.’

Finally, the presence of an instrument can also be marked in the verb. The underlying structure has a *ki* which often disappears. The loss of this morpheme is indicated by an apostrophe at the end of the word.

Rīj acaama' pal. ‘I ate fish with a spoon.’

Pal acaama' rīj. ‘It was with a spoon that I ate the fish.’

Rīj acamma' pal. ‘I repeatedly ate fish with a spoon.’

Pal acamma' rīj. ‘It was with a spoon that I repeatedly ate the fish.’

Rīj acaama ka pal. ‘I went and ate fish with a spoon.’ (ki a -> ka)

There are some Shilluk homophones that have been distinguished by special spellings. Some of these are shown below.

døøj	‘good’	døjj	‘proper’
bënn	‘all’	bëën	‘come’
nuddĩ	‘still’	nutĩ	‘not yet’
buddĩ	‘lay down’	butĩ	‘near’

It is becoming clear that non-evidential verbs are very confusing unless they are marked for stress and tone. So far there has not been agreement on the way in which these differences will be indicated. These examples show the way these distinctions are being written while they are under discussion. These issues have been outlined in Gilley (unpublished ms).

1. Aney òcwöddø ki dhanhø.
ānéy ùcwòttò kī dhánhò 'Someone is calling a person for Aney.'
Aney NE:IMPF:BEN-call IND person
2. Aney ó`cwöddø ki dhanhø.
ānéy úcwòttò kī dhánhò 'Someone called a person for Aney.'
NE:PF:BEN-call
3. Aney ócwöddø ki dhanhø.
ānéy úcwòttò kī dhánhò 'Aney is calling a person.'
NE:IMPF-call

Some fairly innovative solutions have been used to represent the complex morphology for Shilluk. Those solutions that have been tested have significantly improved reading ability. It is hoped that the final testing on the remaining issues of writing stress and tone will be conducted soon.

In conclusion, there is a listing of the orthographic symbols currently used in the Lwoian languages of the Sudan.

List of phonemes and their orthographic symbols

IPA	Shilluk	Anywa	Luwo	Acoli	Belanda	Mabaan	Jumjum	Burun
					Boor			
ɑ	a	a	a	a	a	a	a	a
ə	ä	ä	ah		ä	o	ä	ä
b	b	b	b	b	b	b	b	b
c	c	c	c	c	c	c	c	c
ɖ	dh	dh	dh	dh	dh	ɖ	d	d
ɗ					'd			'd
d	d	d	d	d	d	d	dh	dh
ɛ	e	e	e	ɛ	ɛ	ɛ	e	e
e	ë	ë	eh	e	e	e	ë	
f					f			
g	g	g	g	g	g	g	g	g
gb					gb			
h						h		
ɪ	i	i	i	i	i	i	i	i
ĩ	ĩ	ĩ	ih		ĩ		ĩ	ĩ
ɟ	j	j	j	j	j	j	j	j
k	k	k	k	k	k	k	k	k
kp					kp			
l	l	l	l	l	l	l	l	l
m	m	m	m	m	m	m	m	m
mb					mb			
n	n	n	n	n	n	n	n	n
nd					nd			
ɲ	nh	nh	nh		nh			
ɲɟ					ɲɟ			
ɲ	ny	ny	ny	ny	ny	ɲ	ny	ny
ɳ	ng	ng	ng	ɳ, ng ²	ɳ	ɳ	ng	ng
ɳ ^m gb					ngb			
ɔ	ø	ø	o		ɔ	ɔ	o	o
o	ö	ö	oh	o	o		ö	

p	p	p	p	p		p	p	p
r	r	r	r	r	r	r	r	r
t̥	th	th	th			t̥	t	t
t	t	t	t	t	t	t	th	th
u	o	o	u		u		u	u
u	u	u	uh	u	ü		ü	ü
w	w	w	w	w	w	w	w	w
j	y	y	y	y	y	y	y	y

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¹ For further information on this see Gilley (1992).

² Orthographically, the Acholi have recently started to eliminate the <ŋ> and use the digraph <ng>. However, both are still currently in use, the <ŋ> being used word initially before a vowel with <ng> in other cases. As they become aware that these symbols represent one sound, they may change to using the digraph throughout.

The Adamawa - Ubangi Languages in Sudan

Clement Murba Wau Bilal.

O. Introduction.

The Eastern Ubangi languages of the Niger - Congo family which are spoken in the south-west of Southern Sudan can be divided into two main groups namely group (A) and group (B). Group (A) consists of languages that are spoken in the Sudan only, and they are as follows: Viri , Ndogo, Bai, Feroqe, Mangaya, Indiri and Togoyo. However, Group (B), consists of languages which are spoken in the Sudan and also in the neighbouring countries, such as the Democratic Republic of Congo, Congo (Brazzaville) and Central African Republic and these languages are as follows: Mundu, Zande, Banda and Sere (Boyd 1989).

The main purpose of this paper is to provide a phonological overview of the Viri language. This overview covers the following areas. Phonetic description of consonants, and vowels, Phonemic systems of consonants and vowels, consonant and vowel contrasts, Advanced Tongue Root distinctiveness, vowel harmony, tone, syllable structures, and orthographic equivalents for both consonants and vowels. At the end of the paper, there are some inclusive comments on the comparative chart of the Viri, Mundu and Ndogo orthographies.

The consonant inventory.

Bilabial	Labio-dental	Alveolar	Alveo-palatal	Palatal	Velar	Labio-velar
		t		c	k	kp
		d		ʃ	g	gb
ɸ		ɗ				
	f	s				
	v	z				
			dʒ			
m		n			ŋ	
	nv	nd nz		ɲʃ	ŋg	ɲmgb
		l				
		r				
		ɾ				
				j		w

Table 1. The phonetic inventory of consonants.

There are seven points in which the twenty-nine phonetic consonant sounds are articulated. These places are known as bilabial, labio-dental, alveolar, alveo-palatal, palatal, velar, labio-velar. In addition to places of articulation, there are manners of articulation which are termed

plosives, implosives, fricatives, affricates, nasals, prenasals, lateral, vibrant trill or flap and glides. The consonants according to these places and manners of articulation are shown in Table 1.

The trill vibrant can be found in initial and final positions in word structures. The flap on the other hand, occurs only when it appears between the vowels. Thus, we can give a general statement that the phoneme / r/ changes to a flap [ɾ] when this phoneme /r/ occurs between the vowels.

1.1 Consonants Contrast.

In this section, phonetically similar sounds are compared. If a sound can be substituted for another and the meaning changes, then they are different phonemes. If for example, in the word [gòrò] 'to smell' versus [kòrò] 'grandchild'. This shows that the sounds [k, g] are different sounds in the two words because they are phonetically similar segments occurring in the same environment that change meaning. Table 2 below shows the minimal pairs of consonants in Viri.

Contrast	Viri	English	Viri	English
t d	tírí	a load	dírí	a stone
k g	kàrà	to turn	gàrà	a bell
kp gb	kpáà	a leaf	gbáà	a boat
d ɗ	dɔ	a lie	ɗɔ	to stay/to be
ɓ gb	ɓà	to see	gbà	a buffalo
d r	dù	to dig	rù	to bite
ɗ r	ɗɪ	who	rɪ	to ambush
f v	fala	to roll	vala	to push forward
s z	sɛrɛ	beside	zɛrɛ	a type of plant
n z	nzɔrò	a wild cat	zɔrò	to hang on
w j	wɪ	fire	jɪ	a thing
ŋ ɲg	ɲɔ	you	ɲgɔ	water
w ɾ	kèwɛ	to scratch	kèrɛ	a basket
r l	rò	to stop	lò	to cook
ŋg g	ŋgùrù	a chicken	gùrù	a hole
gb ɲmgb	gbàngà	to drive/to wave	ɲmgbàngà	a case
nd d	ndɛ	a work	dɛ	a kind of monkey

n nd	nò	a flesh	ndò	short
n nv	nó	a walk	nvó	a mark
n nz	nò	to walk	nzò	an orphan
nv v	nvèlè	special gift	vèlè	a sling
m n	mè	tongue	nè	a trap

Table 2 Consonant Minimal Pairs.

In Table 2. all the consonants show contrasts in identical environments. That is to say, different phonetic consonants in the same contexts result in differences in words meanings. Therefore, the phonetic consonants in the list are distributed in initial and medial positions which manifest the contrast in the words or meanings.

There are some alternative pronunciations in Viri, for instance [z-dʒ] in words [za] 'to pull' and [dʒa] 'to pull' or [nzá] 'food' and [ndʒá] 'food'. The alternation of these sounds [z,dʒ] and [nz,ndʒ] do not create meaning differences at all. So, they are in free variation since there is no contrast. This alternation of the same word may be said by one speaker. Therefore, these sounds in Viri are free variants of one phoneme.

1.2 Consonant Phonemic Inventory

In Table 3 below, all the phonemes according to their places and manners of articulation are listed.

Bilabial	Labio-dental	Alveolar	Palatal	Velar	Labio-Velar
		t		k	kp
		d		g	gb
ɸ		ɗ			
	f	s			
	v	z			
m		n		ŋ	
	nv	nd , nz		ŋg	ŋmgb
		l			
		r			
			j		w

Table 3 Consonant Phonemes in Viri.

2. Vowels.

2.1 Phonetic vowels inventory

In Table 4 below, the Viri phonetic vowel inventory is shown.

	Front	Central	Back
High	i ɪ		u ʊ
High mid	e ɛ	ə ɐ	o ɔ

Table 4: Phonetic Vowels in Viri.

Viri has a five vowel system with the addition of the feature Advanced Tongue Root [ATR]. The vowels are divided into two sets 'A' and 'B'. Set 'A' contains [+Advanced Tongue Root] symbolized as [+ATR] vowels. While, set 'B' contains the [-Advanced Tongue Root], [-ATR] vowels.

Set 'A' [+ATR]

i u
e o
ə

Set 'B' [-ATR]

ɪ ʊ
ɛ ɔ
ɑ

Table 5 below shows the Contrast between two Sets 'A' and 'B' Vowels.

Viri	English	Viri	English
vi	a kind of tree	vi	to make red
nzi	salt	nzi	to kill
fùlù	dust	fùlù	to praise
tú	earth	tú	a message
jeè	up	jɛè	medicine
gərə	a gourd with a handle	gara	to burn slightly
sogo	the last born	sɔgɔ	to hate

There is full contrast between set 'A' vowels and set 'B' vowels which occur in identical environments.

2.2 Vowel Harmony.

In Viri the vowel harmony occurs as a result of the agreement among the vowels of one set. For example, the vowels in a word must either come from the [+ATR] set from the [-ATR] set.

Consider the examples below.

1. a. kóngè 'a kind of bird'
- b. dùmè 'beer made from honey'
- c. nulé 'small fishes made to rot for food'
- d. limo 'a kind of plant with acidic taste'
- e. kùlè 'a kind of wild dove'

In examples (2), all the vowels are from the [-ATR] set.

2. a. kùsé 'a navel'
- b. dùngà 'a kind of small animal'
- c. kəsì 'three stones that food is cooked on'
- d. lèmi 'sweet'
- e. tàjɔ 'dawn'

The examples in (3) show the assimilation process among the vowel sets of the feature [+ATR] and the vowel set of [-ATR]. When [-ATR] vowels are added as suffixes to the [+ATR] vowels, the [-ATR] vowels will be assimilated to [+ATR] vowel values so that all the vowels in a particular word become [+ATR] vowels.

	[+ATR]		[-ATR]	All [+ATR] vowel
3. a.	gbere	+	ɪ	gbereí
	paralyse		obj.	paralyse it.
b.	fù	+	ɪ	fúi
	kneed		obj	kneed it

In examples (4) the suffix with [-ATR] does not change when it is combined with a [-ATR] root.

4. a.	zà	+	ɪ	zàɪ
	eat		obj.	eat it
b.	fɛɛ	+	ɪ	fɛɛí
	wring		obj.	wring it

In examples (5) below, there is evidence that only left to right spreading is allowed. Therefore, prefixes are unaffected by vowel harmony since they appear on the left side of the root.

5. a. nve+wili nvēwili 'guest'
- b. nve + kpó nvēkpó 'a lazy person'
- c. nve + kumu nvēkumu 'a wealthy person'

As can be seen in (5.a.) and (5.c.), the [ATR] vowel of the root does not change the [-ATR] vowel of the prefix to [+ATR]. In (5.b.), the compound words (the prefix and the root) are from the same set [-ATR] vowel value, so, there is no problem of vowel harmony.

3. Tone System in Viri

In Viri there are three level tones. These tones are represented by the acute (´) for high tone, and a grave sign (`) for low tone. The mid tone is unmarked. The change of tones in Viri contrast lexically and grammatically. Some contrasts are presented in [6] below

6. a. gbí 'in' or 'a cry'
 b. gbì 'to beat'
 c. gbɪ 'pumpkin'

The tonal contrasts shown in (6) demonstrate the lexical importance of tone. The grammatical importance of tones is shown in (7) below.

7. a. jélè 'cold'
 b. jèlè 'to cool'

Also, there is another contrastive use of tone in verbs. Verbs with mid tones on low vowels have a simple meaning or an intensified meaning. An intensified meaning (i.e. repeated action) can be derived by changing the vowels from an open central to a front vowel (a → ε). Moreover, there is a change of tone from Mid to Low. Consider the examples (8) below.

Verb	English	Intensified verb	English
8. a. kpala	'to pluck'	8. b. kpèlè	'to pluck many times'
kala	'to pick'	kèlè	'to break many times'
kara	'to carry'	kèrè	'to carry many times'

Note that all the verbs in example (8 a) under the word verb carry Mid tones and indicate that the action is done once but in the second example (8 b) under the Intensified verb, the verbs have all front vowels carrying low tones on each syllable indicating that the action is repeated. There is also another example in which all the vowels are the same but the tones on the verbs (with simple meaning) are mid tones while the low tones change the meaning to 'many times.' See (9) below.

9. a. wɛlɛ 'take all' 9. b. wèlè 'take all, many times'

Another type of grammatical function of tones is shown between two aspects. The high tone occurs on the incomplete aspect while low tone marks the completive aspect in the verb. The example is shown in (10.a) and (10.b) below.

10. a. ká be (incomplete) 10. b. kà be (completive)

4. Syllable Structures in Viri.

The most common syllable structure in Viri is an open syllable. Few words end in consonant. The only sounds that may occur in syllable final position are either liquid consonants [l,r] or nasal consonants [m,n,ŋ]. Therefore; there is very limited distribution of sounds that occur word finally in this language. Probably the final vowels were lost a long time ago. Below are some samples of the syllable structures in question.

11. a.	v.	ɑ or à	it is
b.	v . cv	úfɔ̃	a name of a person
c.	cv . v	gbúaà	a boat
d.	cv . cv	kèrè	a basket
e.	cv.cv.cv	vɔ̃gìlì	arrow

In example (11), the varieties of syllable structures are shown. In (11a) and (11c) it is thought that the consonants were lost before the final vowels. In addition to these type of the structures there is another type in which either the construction ends in nasal consonants[m,n,ŋ] or it may end in liquids[l,r]. It is thought that the final vowels were lost here. Consider the examples in (12) below.

12. a.	cvN	sàn (i)	poverty
b.	cvl	sɔl (ɔ)	a sack
c.	cvr	gbar(ɑ)	to spread so as to dry

This paper focusses on the Viri phonological overview, however, it includes the comparative chart for orthographies of three related languages. These languages are: Viri, Ndogo and Mundu. Mundu is actually spoken in Western Equatoria State while Viri and Ndogo are spoken in Western Bahr El Ghazal State. Below is the chart for the comparison of the orthographies of these languages.

Phonemes	Graphemes		
	Viri	Mundu	Ndogo
p		p	p
t	t	t	t
c		c	c
k	k	k	k
kp	kp	kp	kp
b		b	b
d	d	d	d
ʃ		j	j
g	g	g	g
gb	gb	gb	gb
ɓ	'b	'b	'b
ɗ	'd	'd	'd
m	m	m	m
n	n	n	n
ɲ		ny	
mb		mb	mb
nv	nv		
nd	nd	nd	nd
nj		nj	nj
nz	nz	nz	
ng	ng	ng	ng
ɲmgb	mgb	ngb	ngb
f	f	f	f
s	s	s	s
z	z	z	z
v	v	v	v
'v			'v
l	l	l	l
r	r	r	r
ɾ			ɾ

w	w	w	w
j	y	y	y
ɪ	i	i	i
ɛ	e	e	e
a	a	a	a
ɔ	o	o	o
ʊ	u	u	u
ɪ̃	ĩ	ĩ	
e	ě	e	
ə	ä	ä	
o	ö	ö	
u	ü	ü	

The orthographic tones that are used in the languages are shown below.

Viri	Ndogo
(/) H	(/) H
(~) L	(\) L
() M	() M
	(^) Falling tone

Of all these languages, Viri has the smallest number of consonants. As mentioned earlier, Viri has twenty four consonants while Mundu has thirty consonants. Ndogo also has thirty consonants plus the tilde used for a grammatical purpose- to mark the notion of complement in the final position of the clause.

Among the three languages, Viri has three level tones but Ndogo has three level and a falling tone on short vowels. Mundu does not write the tones.

There is a problem over the issue of the orthography of Viri. There are two schools. One school advocates the writing of homorganic symbol [mgb] rather than the symbol [ngb] but the other school advocates [ngb]. The former school also prefers to write tones whereas the second prefers not to use tones although the language is a tonal language with a heavy functional load in both grammatical and lexical functions. Actually, the vowels are not as important as the tones in Viri.

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Suggestions for Writing Modern Nubian Languages ⁽¹⁾

Asmaa Mohd. Ibrahim Ahmed

1. Introduction:

This paper is concerned with the writing of modern Nubian languages. It is restricted to Darfur and Nile Nubian languages, not covering the Nubian languages in the Nuba Mountains.

All these languages are used in their home areas as well as in other parts of the Sudan and in the capital city in particular (except Birgid which is almost extinct) .

The Nubian languages descend from the Eastern Sudanic language group, which in turn comes from the Chari-Nile group belonging to the Nilo-Saharan family group, one of the four language families in Africa.

According to the classifications, the Nubian languages are grouped into two:

1. The Nile Nubian languages have two major divisions.

The first division contains Mahas and Nobiin which are spoken from the first cataract in Egypt in the north to Karima, Sudan in the south.

The second division includes is Kenze- Dongolese which extends over the area from Aswan, south of Egypt, to the fourth cataract in northern Sudan (AlDabba district), except for the area of Mahas-Nobiin.

(1) Thanks to Osman Balla for translating this paper into English. It was originally written in Arabic. It is based on my M.A. dissertation in the Institute of African and Asian Studies, University of Khartoum. I would also like to thank Dr. Leoma Gilley for her guidance and invaluable correction.

2. The Darfur-Nubian languages:

Likewise, there are two language groups. Midob is spoken by the Nubians of the Midob mountains north- east of Darfur.

Birgid is an almost extinct language spoken in Darfur between Nyala and Al Fashir. Ushari (1974) argues that the speakers of this language, for reasons not yet studied gave it up and adopted Arabic as their mother tongue.

Many of Nubians have asked for their modern Nubian languages to be written, and some have been written using the following scripts:

1. Latin script by Badr (1955, 1978) and Mohamed El-Hadi (1997).
2. Old Nubian script by Kabbara (1997) .
3. Arabic script by Badr (1955, 1978) and Asamaa (2001).

Herman Bell suggested that the Nobiin language should be written using Arabic script with some modifications. Mohamed Jallal (1995) thinks that it is necessary for modern Nubian languages to be written using Old Nubian script. He adds that using the three scripts: Old Nubian, Latin and Arabic is of great benefit in some situations like: maps, names of peoples and places. It is important to note that all these suggestions are restricted to Nile Nubian languages.

There have been several attempts to write Nile Nubian in particular. However there are several choices of scripts to write them: the Old Nubian, the Latin or Roman one, and the Arabic. All three have been used for the Nile Nubian languages but only Latin for the Darfur Nubian language. This paper describes the sounds needing representation in writing the modern Nubian languages. We will discuss several approaches by which to examine this problem. We begin with a description of the vowels and consonants in the modern Nubian languages, and the description of the vowels and consonants of the Old Nubian language, English (the symbols of which represent the Latin alphabet), and Arabic (standard Arabic). Symbols from all of these languages have been used to write the modern Nubian

languages. This comparison will serve two purposes: Firstly; to acquaint the reader with the similarities and differences between the modern Nubian languages, which helps to identify a phonological system representing the basic system of vowels and consonants in the modern Nubian languages. And secondly to recognise the similarities and differences between the modern Nubian languages and the Old Nubian language, English and Arabic. This comparison is based on the following guidelines:

- a. If a vowel or a consonant occurs in all but one modern Nubian language, this consonant or vowel is taken to be a basic one in the vowel or consonant system in modern Nubian languages.
- b. Likewise, if a vowel or a consonant does not occur in two Nubian languages (or does not occur in two different branches: one Nile Nubian language and one Darfur language), that vowel or consonant is assumed not to be basic in the vowel or consonant system of Nubian languages.

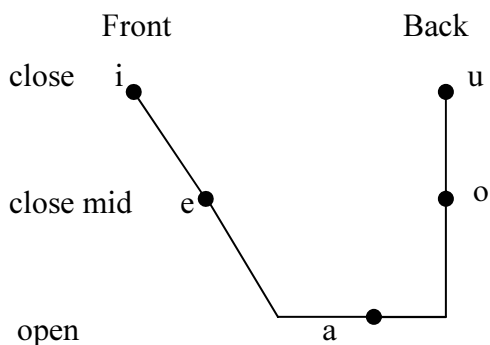
2. Phonological comparisons:

Table (1) shows the consonants in modern Nubian languages in terms of voice, manner and place of articulation. It is to be noted that the Table contains the consonants in all the modern Nubian languages, even though some consonants may not occur in the consonant systems of some of them.

Table (1): Consonants of Modern Nubian Languages

	Bilabial	Labio-dental	Alveolar	Post-Alveolar	Palatal	velar	Glottal
Plosive	p b		t d		c ɟ	k ɡ	
Fricative		f	s	ʃ			h
Nasal	m		n		ɲ	ŋ	
Trill			r				
Lateral			l				
Approximant	w				j		

Notice, in the Table above that modern Nubian languages consist of 18 consonants and two semi-vowels. In Figure (1) the vowels in all modern Nubian languages are shown.

Figure (1): Vowels of Modern Nubian Languages

From Figure (1) above, notice that modern Nubian languages as a whole consist of five vowels. These vowels may all be short or long.

In order to compare the vowel and consonant sounds in modern Nubian languages, Table (2) shows vowels and consonants written according to the International Phonetic Alphabet (I.P.A).

Table (2): Consonants and vowels of Modern Nubian Languages

I.P.A	Mahas-Nobiin	Dongolese-Kenze	Midob	Birgid
p	-	+	+	+
b	+	+	+	+
t	+	+	+	+
d	+	+	+	+
c	+	+	+	+
ʃ	+	+	+	+
k	+	+	+	+
g	+	+	+	+
f	+	+	+	-
s	+	+	+	+
z	-	+	-	+
ɰ	+	+	+	-
h	+	+	+	-
m	+	+	+	+
n	+	+	+	+
ɲ	+	+	+	+
ŋ	+	+	+	+
r	+	+	+	+
l	+	+	+	+
w	+	+	+	+
j	+	+	+	+
i	+	+	+	+
a	+	+	+	+
e	+	+	+	+
o	+	+	+	+
u	+	+	+	+

Table (2) above can be summed up as follows:

All modern Nubian languages share the fourteen (14) consonants: /b/, /t /, /d/, /c/, /ʃ/, /k/, /g/, /s/, /m/, /n/, /p/, / ɲ /, /r/, /l/ and the two semi-vowels /j/ and /w/.

The consonant /c/ which is exists in the Modern Nubian language like: accem (bites), is different from the consonant /ʃ / like aʃri (beautiful) which is exists in this language too.

All the languages share the consonant /p/ except Mahas (Bell, 1970). They also share the consonant /z/ except Mahas (ibid, 1970) and Midob (Werner, 1993). Likewise, they share the consonant /h/ except for the Birgid language (Ushari, 1974). According to the principles described earlier, the consonants /h/ and /p/ are considered as basic consonants in the consonant system of modern Nubian languages because they occur in the others, even though each sound fails to occur in one of them. However, by the same standard, the consonant /z/ is not a basic consonant in the consonant system of modern Nubian languages because it does not occur in two Nubian languages belonging to two different branches: the Mahas-Nobiin language which is Nile Nubian, and the Birgid language which is Darfur Nubian.

The consonant /f/ exists in the Birgid language as an allophone for /p/, while /ʃ/ is an allophone for /c/ (see Ushari, 1974). However, these two consonants /f/ and /ʃ/ also exist as two phonemes in the consonant system of other modern Nubian languages.

The semi-vowels /w/ and /j/ are two phonemes in the consonant system of modern Nubian languages because they exist in all modern Nubian languages as phonemes except for the Birgid language.⁽¹⁾ They are still considered as two

(1) Ushari pointed out that the semi vowels /w/ and /j/ are allophones for the phonemes /u/ and /i/ respectively in the Birgid language, but they change into semi-vowels in certain conditions.

phonemes because they represent two vowels in some contexts, and semi-vowels in others.

It can be said, therefore, that the phonological system in modern Nubian languages, according to the approach adopted, consists of eighteen (18) consonants: /p /, / b /, / t /, / d /, / c /, /ʃ/, /k/, /g /, / f /, / s/, /ʃ/, / h/, /m /, /n/, /ɲ/, /ŋ/, /r/, /l/ and the semi-vowels /w/, and /j/ .

As to vowels, refer again to Table (2). Modern Nubian languages share 5 vowels. These vowels are: /i/, /e/ , /a/ , /o/, /u/. Each vowel can be short or long. Werner (1993) mentions a sixth vowel in Midob, the central vowel /ə/. Ushari considers this vowel in Birgid language to be an allophone for /a/. Thus [ə] is not included in the basic vowels of Nubian languages, because it was found to be a phoneme in only one Nubian language.

In order to compare the vowels and consonants of modern Nubian languages with those of Old Nubian languages, English, and Arabic, it is necessary to describe the vowels and consonants of Old Nubian languages, as well as English and Arabic. Tables (3), (4) and (5) show the consonants in these respective languages.

Table (3): Consonants in the Old Nubian Language

	Bilabial	Labio-dental	Alveolar	Post-Alveolar	Palatal	Velar	Glottal
Plosive	p b		t d		ʃ k	g	
Fricative		f	s z	ʃ			h
Nasal	m		n		ɲ	ŋ	
Trill			r				
Lateral			l				
Approximant	w				j		

Table (4): Consonants in English

	Bilabial	Labio-dental	Dental	Alveolar	Post-Alveolar	Palatal	velar	Glottal
Plosive	p b			t d		c ʃ ⁽¹⁾	k g	
Fricative		f v	θ ð	s z	ʃ			h
Nasal	m			n			ŋ	
Trill				r				
Lateral				l				
Approximant	w					j		

Table (5): Consonants in standard Arabic:

		Bilabial	Labio-dental	Dental	Alveolar	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	Light	b		t d		ʃ k	q			ʔ
	Dark ⁽²⁾			tʰ dʰ						
Fricative	Light		f	θ ð	s z	ʃ	x ɣ		ħ ʕ	h
	Dark			ðʰ sʰ						
Nasal		m			n					
Trill					r					
Lateral					l					
Approximant		w				j				

(1) For the purposes of this paper, tʃ and dʒ are being treated as palatal plosives though that is not the standard designation in English phonology.

(2) Pharyngealised

Figures (2), (3) and (4) show the vowels of Old Nubian languages, English, and Arabic respectively:

Figure (2): Vowels in the Old Nubian Language

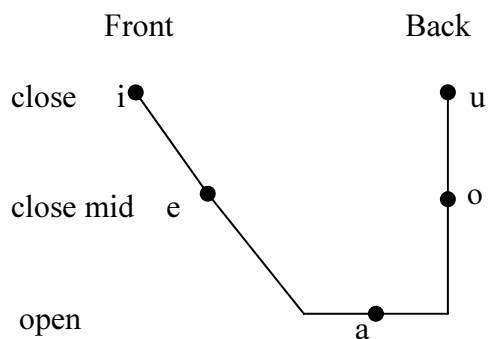


Figure (3): Vowels in English:

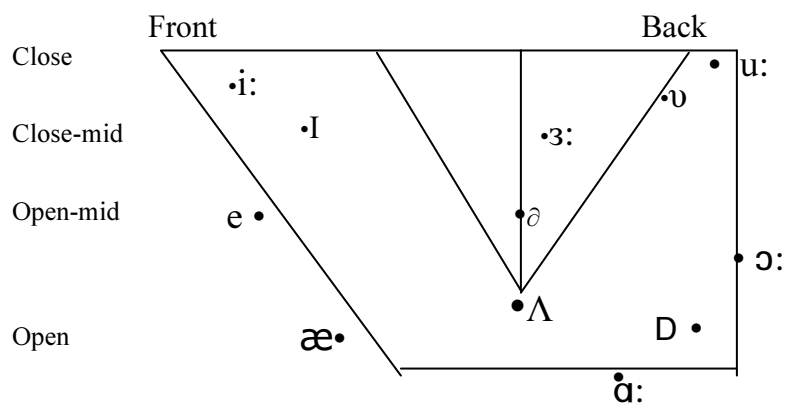
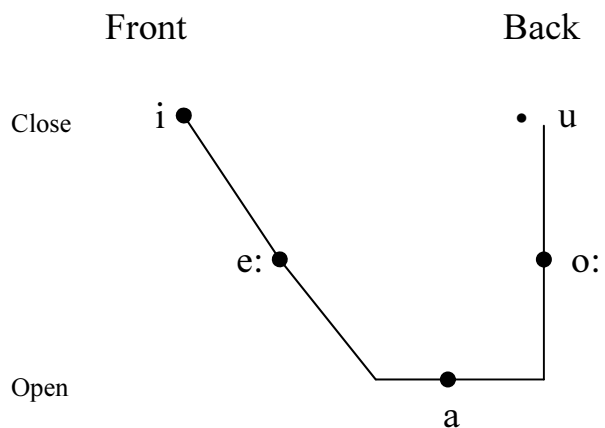


Figure (4): Vowels in Arabic:



It is also important to make a comparison of the vowels and consonants in modern Nubian languages with those of the Old Nubian languages, English, and Arabic. Table (6) shows the vowels and consonants of modern Nubian languages, Old Nubian languages, English and Arabic, written in IPA.

Table (6): Vowels and Consonants in modern Nubian Languages, Old Nubian languages, English, and Arabic

I.P.A	Modern Nubian	Old Nubian	English	Arabic
p	+	+	+	—
b	+	+	+	+
t	+	+	+	+
t ^ʃ	—	—	—	+
d	+	+	+	+
d ^ʃ	—	—	—	+
c	+	—	+	—
ʃ	+	+	+	+
k	+	+	+	+
g	+	+	+	—
q	—	—	—	+
ʔ	—	—	—	+
f	+	+	+	+
θ	—	—	+	+
ð	—	—	+	+
ð ^ʃ	—	—	—	+
s	+	+	+	+
z	—	+	+	+
s ^ʃ	—	—	—	+
ʃ	+	+	+	+

ʒ	—	—	+	—
X	—	—	—	+
ʏ	—	—	—	+
ħ	—	—	—	+
ʃ	—	—	—	+
h	+	+	+	+
m	+	+	+	+
n	+	+	+	+
ɲ	+	+	—	—
ŋ	+	+	+	—
r	+	+	+	+
l	+	+	+	+
w	+	+	+	+
j	+	+	+	+
i	+	+	+	+
i:	+	+	+	+
e	+	+	+	—
e:	+	+	+	+
a	+	+	+	+
a:	+	+	+	+
u	+	+	+	+
u:	+	+	+	+
o	+	+	—	—
o:	+	+	+	+

Referring to Table (6), it is shown that the Old Nubian language shares with the modern Nubian languages the following consonants:

/p /, /b/, /t/, /d /, /ʃ/, /k/, /g/, /f/, /s/, /ʃ/, /h/, /m/, /n/, /ɲ/, /ŋ/, /r/, /l/ and the semi-vowels /w/, and /j/. The only difference is the absence of the consonant /c/ in

the Old Nubian consonant system. Also the Old Nubian consonant /z/ is no longer part of the basic consonant system of modern Nubian languages.

Old Nubian shares five vowels with the modern Nubian languages: /i/, /e/, /a/, /o/ and /u/. All vowels may be short or long.

By referring to Table (6) one finds that English language shares seventeen (17) consonants with the modern Nubian languages: /p /, /b/, /t/, /d /, /c/⁽¹⁾, /ʃ/, /k/, /g/, /f/, /s/, /ʒ/, /h/, /m/, /n/, /ŋ/, /r/, /l/ and the semi-vowels /w/, and /j/.

The main difference between the consonant of Nubian languages and English is the absence of /p/ in English. Of course there are several English consonants that do not occur in modern Nubian namely: /z, ð, θ, ʒ /.

Since vowels in English are inconsistently represented in the orthography, we will not spend time discussing variations in the two systems. It will be sufficient to say that English orthography has five (5) vowel symbols and Nubian needs to represent five vowels. In Table 6, only Nubian vowels are represented along with the equivalent English and Arabic vowels. We are not concerned with English vowels that do not have equivalents in Nubian.

We turn now to a comparison of modern Nubian languages with Arabic. They share thirteen(13) consonants: /b/, /t/, /d /, /ʃ/, /k /, /f/, /s/, /ʒ/, /h/, /m/, /n/, /r/, /l/ and the semi-vowels /j/, and /w/. However Arabic differs from Nubian languages in that it has the additional following consonants: /tʃ/, /dʃ/, /q/, /ʔ/, /θ/, /ð/ , /ðʃ/, /sʃ/, /z/, /x/, /ɣ/, /ħ/, and /ʕ/. Note that the consonants / p /, / c/, / g/, /p/, /ŋ/, in modern Nubian do not exist in standard Arabic, but the consonant / g / is present in colloquial Arabic in place of the /q/.

(1) In Nubian /c/ and /ʃ/ are functioning as palatal plosives whereas they are affricates /tʃ/ and /dʒ/ in English.

The vowels of Arabic are similar to those of Nubian in that there are five vowels. However in Arabic /e:/ and /o:/ are only long while the other three vowels, /i, u, a /, may be short or long. In Nubian all vowels occur as short and long. It should be noted that there is no distinctive orthographic representation in Arabic to distinguish /i:/ from /e:/ or /u:/ from /o:/.

3. Orthographic choices:

We will now turn to issues in the orthography. Three scripts are available for writing Nubian, these are: Old Nubian, Latin and Arabic.

The equivalent symbols that could be used for writing each of the languages are found in Table (7).

Table (7): Vowels and Consonants in Modern Nubian Languages and the Symbols of the Old Nubian Language, Latin, and Arabic

IPA	Symbols of Old Nubian Language	Symbols of Latin Language	Symbols of Arabic Language(ESCO)
p	Π	p	پ
b	B	b	ب
t	Τ	t	ت
d	Δ	d	د
c	Ϟ	c	ڤ
ʃ	ϙ	j	ج
k	Κ	k	ك
g	Γ	g	گ
f	ϕ	f	ف
s	C	s	س
z	Z	z	ز
ʃ	ϣ	x	ش
h	ϡ	h	ه

m	М	m	م
n	N	n	ن
ɲ	ϕ	v	ڤ
ŋ	Ლ – Მ	q	ق
r	Р	r	ر
l	λ	l	ل
w	ω	w	و
j	ï	y	ي
i	ı	i	ی
a	Ɑ	a	ا
e	ε	e	ي
o	ο	o	ؤ
u	οϣ	u	و
ɔ ⁽¹⁾	Ω	å	أ

The following points can be observed in table (7):

The phoneme /c/ did not exist in the consonant system of Old Nubian language but is present in Modern Nubian. The symbol <Ლ>, which is in the consonant system of Old Nubian language, has been modified to the symbol <Მ> to represent the consonant /c/ when writing Modern Nubian.

There are twenty six (26) letters available in the English alphabet five are vowels leaving twenty one (21) consonant symbols. Most of these symbols represent a corresponding sound relatively consistently.

(1) /ɔ/ only occurs in Midob.

If <c> is used for /tʃ/ or /c/ and <j> for /dʒ/ or /J/, then the only problematic sounds in Nubian are: /n, ŋ, ʃ/. In English, digraphs could be used: ny, ng, sh. Alternatively <ñ> could be used for /ɲ/ as in Spanish. Likewise <š> could be used for /ʃ/. However, if one prefers to use one symbol to represent sounds, then it is possible to use <x> for /ʃ/, <v> for /n/ and <q> for /ŋ/.

If /ə/ is to be written, then there are several possible ways to include this in a Latin based orthography. One could use a digraph, <ah> or <ae>, a diacritic, <ä> <å> or a different unused symbol. For this paper the diacritic <â> has been chosen.

The consonants /p/, /c/, /g/, /ɲ/, and /ŋ/ do not exist in the consonant system of standard Arabic. However it is possible to use the symbol system adopted by SESCO⁽¹⁾ to represent those consonants from left to right: <پ>, <چ>, <گ>, <ڤ> and <ڭ> respectively.

Jallal (this volume) states that in Nobiin, the name of the place *mugrakka* was not written properly and has come to be mispronounced. In fact, it can be written in the following way: مُگَرَكَ. This was one of the few examples of problems mentioned in his paper.

The vowel /ə/⁽²⁾ does not exist in the vowel system of the Old Nubian language, nor in that of Arabic, so the vowel symbol <O>, that exists in the Old Nubian language may be modified to <Ō>. The SESCO symbol <◌◌> has been taken to stand for this vowel in Arabic script.

The vowels /e/ and /o/ do not exist in the orthographic vowel system of Arabic, so the SESCO system has borrowed the symbols (◌◌ and ◌◌) to represent them.

(1) The SESCO Education, Sciences and Culture Organization adopts symbols taken from the writing system peculiar to Arabic for writing African language.

(2) Werner (1993) mentions /ə/ as the sixth vowel of Midob.

The short vowels: / — /, / — / and / — / in Arabic become: / ʾ /, / ې / and / و / when they are long vowels. And the short vowels (َ and ُ) can become / ۆ /, / ۆ / to represents the long vowels⁽¹⁾.

Although the consonant /z/ and the vowel /ə/ are not basic to the consonant and vowel systems of modern Nubian languages, corresponding symbols for each have been presented in order to facilitate writing them in modern Nubian languages These symbols can be used instead of looking for new symbols.

Arabic symbols have been modified for the purpose of writing other (non-Arabic-based) languages but further modifications may be needed (Jallal, this volume). However, this should not present a problem since it is also possible for symbols to be changed even in the case of Arabic itself. Early on, Arabic was free of form even after the advent of Islam and the revelation of the Quran. The "form" and the "dots" were added in the Ommayad age and are still being used for Arabic today. The Arabic script has also witnessed many changes so as to write languages other than Arabic such as Persian, Hausa and Swahili (before being replaced by the Roman script).

Samples of Nubian texts from the four modern Nubian languages will now be written. The texts are written phonologically first, and then translated into English. The texts are written using the Old Nubian script, then the Latin, then the Arabic.

4. Writing of Nubian Languages

We will now discuss how each script can be used to write Modern Nubian. Then example from a variety of modern Nubian languages will be written using the variety systems presented.

(1) The tow symbols / ۆ / and / ۆ / are used represent long vowels /o/ and /e / in Urdu languages respectively.

1. Writing of the Mahas-Nobiin language:

(I) hison maʃa fa ?

hison maʃa fa ?
when sun rise
when does the sun rise ?

N ʒɪCON Mɔʎɔɔ ɸɔ?

L hison maxa fa?

A ھِسْن مَشَفَ

(B) ter nookka kunin⁽¹⁾

ter nook ka kunin
s/he house Acc⁽²⁾ to have for s/he

He/She has a house.

N TEP NOOΓ Kɔ KOYNIN.

L ter noog ka kunin.

A تَر نُوگ كَ كُنِن

(C) in buru masa.

In buru masa
this girl kind
This girl is kind.

N IN BOYPOY MɔCɔ.

L in buru masa.

A اِنْ بُرُ مَسَ

2. Writing of Dongolese - Kenze language:

(A) in bitaan artigi bisandi.

in bitaan arti gi bi sandi.
This boy (Allah) Accu PRES fear

(1) A regressive assimilation occurs between the consonans /g/ and /k/ changing the /g/ into /k/.

(2) Abbreviations: Acc: Accusative, PRES: Present, PST: Past tense.

The boy fears God (Allah) .

N IN BITAAN ARTI GI BISANDI.

L in bitaan arti gi bisandi.

A إِنَّ بَتَانِ أَرَتِ الْبِسْندِ

(B) tir kalsa.

tir	kal	sa
they	eating	PST
They ate.		

N TIR KALSA.

L tir kalsa.

A تِرْكَلسَ

Writing of Darfur - Nubian Languages:

1. Writing the Midob language:

(A) nen Pôôl aaner accem.

nen	Pôôl	aaner	accem.
This	the dog	the people	bites
This dog bites people.			

N NEN PÔÔL AANER ACCEM.

L nen Pôôl aaver accem.

A نَن پَالِ أَوْرِ أَدِّم

(B) ôi nen aabede aarhem.

ôi	nen	aabede	aarhem.
I	this	the bird	caught
I caught the bird			

N ÔI NEN AABEDE AARHEM.

L ôi nen aabede aarhem.

A أَيْ نَن أَبَدِ أَرْهَم

2. Writing of the Birgid language:

(A) idina naaJija.

id	ina	naaJija
the man	this	understanding

This man is understanding.

N ID INΔ NΔΔSIIΔ.

L id ina naajiya.

A إِدْ إِنْ نَاجِي .

(B) nai notta ?

nai	notta
who	son

Whose son?

N NΔI NOTTΔ?

L nai notta.

A نَي نُوْتْ

5. Advantages and Disadvantages

Having demonstrated that it is possible to write Nubian languages using Old Nubian, Latin, and Arabic scripts, we move to a discussion of the advantages and disadvantages for each of these scripts so as to choose one of them for writing Nubian languages. First to be discussed is the Old Nubian script, then the Latin, the Arabic being the last.

5.1 The Old Nubian Script

Many Nubians and those who are studying Nubian prefer to use the Old Nubian script such as Khalil Kabbara (1997). However, others suggest the use of the Old Nubian script, but in their own writings use Latin script. Mohammed Jallal and Mohammed AlHadi (1995) conducted a survey of speakers of Nubian and

concluded that 78% of them preferred Old Nubian script. Mohammed AlHadi and A. Cartwright then wrote a book on How to Learn Nubiin (1997) but used Latin script in this book.

The choice of using the Old Nubian script comes from the belief that it would help link the contemporary Nubians to their origins, to say nothing of the man's sentiments and affection tying him to his roots. However, there are some reservations in choosing the Old Nubian script for writing modern Nubian languages. These reservations can be summed up as follows:

- The Old Nubian script was not originally Nubian, but was taken from the Greek and Coptic languages with modifications to suit some of the sounds existing in the Old Nubian language. Even though Old Nubian script is part of their history, it has been borrowed and modified just as Latin and Arabic. Thus, any of these scripts could be used to represent the languages.
- Secondly, these symbols are not known now to the speakers of modern Nubian languages, but only to specialists. So whoever wants to use the modern Nubian languages written with the Old Nubian script has to learn the symbols of the Old Nubian language. Since these symbols are unfamiliar and unknown, it will take more effort and determination to learn it.
- Finally, if the revival and preservation of the Nubian language is the ultimate goal, there are more practical methods to achieve this end. Although the Old Nubian symbols symbolise the Nubian identity, the use of more familiar symbols is more practical, and saves time, energy and resources.

5.2 The Latin Script

Latin script for writing modern Nubian languages has been used by Badr (1955 and 1978); Herman Bell (1970); Ali Osman (1973 and 1987) and Mohammed AlHadi (1997). By going back to the Nubian texts written with the

Latin script, one can pinpoint the positive and negative points of using this system for writing the Nubian languages:

- First, one can say that the Latin script can adequately represent the Nubian sounds very well. There is significant similarity between the sounds of these languages and the sounds of English represented by the Latin script. The issue of the vowels and consonants needed for the modern Nubian languages can be written with the available symbols with some modifications. For example, the sounds / ʃ ,tʃ, ŋ / are represented in Latin orthography by the digraphs < sh >, <ch> and <ng> . In response to Jallal's criticism in this volume of the use of digraphs and diacritics, alternative symbols such as <x>, <c> and <q> could be used for these sounds.

The symbol < ɲ > does not exist as a sound or a symbol in the consonant system of English, but it does exist in the Nubian sound system. However, other Romance languages do have this sound as in Spanish represented by the symbol <ñ>. However, to accommodate Jallal's preference for single symbols, the symbol <v> is proposed to represent the palatal nasal.

- Secondly, Nubian people have some exposure to the Latin script because of their study of English language.
- Thirdly, the writing of modern Nubian languages using the Latin script presents no problem whatsoever in the computer since these symbols are present in the computer.

With all these positive points, there are some restrictions limiting the choice of the Latin symbols for writing the Nubian languages:

- First, if Latin script is used to write Nubian , then the students must learn a second alphabet or writing system to move into Arabic.

- Secondly, the use of the Latin script for writing modern Nubian languages may pose a psychological barrier that would stop some from reading what is written, especially if they associate these symbols with having to have a knowledge of English. Insufficient knowledge of English may put off any who want to read what is written about the Nuba and the Nubian languages using the Latin script, since the person may think that s/he will not be able to read or understand.

5.3 The Arabic Script

Arabic script has been used for writing modern Nubian languages by Badr (1955 and 1978), and Asmaa (2001).

In his book "The Nubian language" - 1955 Badr talked about the Nubian alphabet and its grammar rules (Mahas - Nobiin). The book was concluded with a glossary for Nubian words translated into Arabic. He used the Arabic and Latin script in writing.

In 1978 he wrote a group of Nobiin sayings and proverbs using the Arabic and Latin script, the meanings and words of which were explained in Arabic together with the situations they were applicable in and with the Arabic proverb equivalents.

In 1995 Bell had a seminar on the use of the Arabic script in writing a Nubian language (Mahas - Nobiin), with some modifications on it especially in vowels. However written documents about this seminar were not available.

In a 2001 paper by Asmaa on the use of the Arabic script in writing the Nubian language (Mahas - Nobiin), the advantages and disadvantages of using the Arabic script in writing these language was discussed. The problems in the use the Arabic script were also pointed out.

The pros and cons of using Arabic script are discussed below.

- First, let us consider this topic from a linguistic point of view. Like English, the Arabic language has many similar sounds to the Nubian languages. Therefore, most sounds have a letter correspondence. However, there are some problems, but these have already been addressed by SESCO with the suggestions noted in Section 3. The outstanding issue to be discussed here is the problem of the vowels.

In standard Arabic, short vowels are not written in most texts. However in Nubian, it is important to include the vowels, both long and short, to ensure clarity. There are two alternatives to sorting out this problem which are discussed below.

First, to be accurate in writing the Nubian languages, one must pay attention to the form in writing so the reader does not have to guess which word is intended. Words must be written accurately and fully so as to be clear, not ambiguous, such as:

Nubian	Arabic	English	Nubian	Arabic	English
tar	تَر	h/she	ter	تِر	they
fokki	فَكَّ	high	dukki	دُكَّ	hill
batto	بَتَّ	he hitt	butti	بُتَّ	equal in age
dawwi	دَوَّ	road	dawwu	دَوَّ	big
nalü	نَلُّ	sleep	nulu	نُلُّ	white
kutti	كُتَّ	flies	kitti	كِتَّ	clothes
arkki	أَرَكِّ	mud	orkki	أُرَكِّ	cool

One method for representing the vowels is to use the *kasra*, *damma* and *fatha* as well as the *kasra mumaala* and *damma mumaala* in the text for short vowels. The long vowels would be written with ا و ي يّ وّ as shown in these examples.

Vowel	Nubian	Arabic	English	Nubian	Arabic	English
i	kid	كيد	stone	niid	نييد	teeth
e	fent	فينتِي	date	weera	وييرا	one
a	kaba	كابا	food	faab	فاب	father
o	nog	نوگ	go	noog	نووگ	house
u	murti	مورتي	horse	suu	سوو	milk

The second alternative would be to replace the *damma*, *fatha*, *kasra*, with the *alif*, *waw* and *ya* to represent short vowels. Doubling them would mean long vowels. The *kasra mumaala* and *damma mumaala* are doubled when they are long. This alternative differs significantly from the traditional way of writing Arabic. For those familiar with Arabic, the words may be perceived as being too long, such as "daffimiinikka" (دافيمييىنككا) (to be lost), or a vowel may recur such as "waajoos" (وايووس) (flew). However, for those unfamiliar with writing standard Arabic, the second alternative may prove to be more straightforward for the learners and more intuitive to the speakers of the language. However, the transition to writing standard Arabic from this alternative might prove more difficult. Ultimately, the final decision must be made by the members of the speech community.

From a practical viewpoint, choosing Arabic symbols are advantageous for several reasons.

1. Arabic is the national language, so once the alphabet is known, transition is easier.

2. Arabic, at present, is the mother tongue for more than half of the population in Sudan, and the second language, or language of wider communicative for the rest of the population (1993). Jallal (this volume) points out that educated Nubians are knowledgeable in Arabic, a fact that led them to use the Arabic script to write Nobiin.
3. Arabic is the official language of the Sudan. It is the language used as the medium for education, literacy, religion, health and entertainment.
4. Most of the speakers of the modern Nubian languages are Moslems, which means that they have been exposed to Arabic.
5. The influence of Arabic and modern Nubian languages on each other is due to the continual contact since ancient times. There are some Nubian words and sounds in local Arabic. Likewise there are some Arabic sounds in modern Nubian languages. These influences make Arabic more familiar to the speakers of modern Nubian languages.

In view of the fact that Arabic is the official language of the country and the language of wider communication among all groups of speakers of languages other than Arabic, using Arabic script for writing Nubian languages should be more acceptable than using the Old Nubian script or Latin script. The Old Nubian script could continue to be used by the specialists and educated people. The Latin script may also discourage people from reading what is written about modern Nubian languages, for it may be unfamiliar to some speakers of these languages. Latin script has little relevance to their daily lives. The Arabic script unlike these others, is familiar to all, for it is already being used in academic work, newspapers and other publications, on television and in the markets. It is familiar to both the specialist and to the layman. In addition, the use of Arabic script for writing modern Nubian languages may work toward the spread of these languages and the culture. It is possible that the government might support such projects since

development of local languages is guaranteed in the constitution. However, Jallal (this volume) also points out that support has been given by the successive governments to encourage the use Arabic language over vernacular languages.

All of these factors strongly recommend the use of Arabic script for writing modern Nubian languages. Ultimately, people will come to prefer it to the old Nubian script.

In summary, the following points have been made about writing modern Nubian languages:

- First: Both the Latin and Arabic scripts provide good alternatives for writing modern Nubian languages, whilst the Old Nubian script is a less satisfactory option because of its unfamiliar symbols.
- Second: The Latin script provides an easier solution to the problem of vowels than does the Arabic script. However, the lack of familiarity with Latin letters may hinder some Nubians from reading their language. It is important that not only the specialists read about and publish materials on Nubian heritage.
- Third: the use of Arabic script for writing these languages requires the additional indication of the *damma*, *fatha*, *kasra*, *damma mumaala* and *kasra mumaala* in the conjugation of verbs and writing of nouns to clarify the nominative, accusative, dative cases. That it no easy matter for many, and if care is not taken, this point will be ignored. This obstacle can be overcome by emphasizing the necessity of conforming to the form when writing. Care must be taken to ensure that the writing of Nubian texts is correct without the reader's having to guess the meaning.

It maybe difficult for those writing to follow this principle at the present since the extra vowel symbols are not available in the computer. However, if these are

accepted throughout the Arabic-speaking world, they should be included in programmes in the years to come.

I agree with Jallal (this volume) about the use of the three symbols for writing the names of places on signs or maps.

6. Conclusion

This study discusses problems related to how the modern Nubian languages are to be written. First, there was a discussion of the phonological aspects of the Nile and Dafur Nubian languages spoken in the Sudan. Then, several options were considered about the suitability of the scripts of Old Nubian, Latin and Arabic to write these languages. Each of these was discussed, considering the advantages and disadvantages.

The discussion concludes that Latin script would be the easiest to use because of the available number of vowels. However, Latin script is not so familiar to Sudanese as Arabic is the language of wider communication and the medium of instruction in schools.

In considering the problems of writing Nubian languages in Arabic script, solutions were discussed for overcoming the problem of symbols for sounds not found or not written in standard Arabic. Two different solutions were discussed for writing the five vowels of Nubian. Given the possibility of writing all the necessary sounds in Arabic script and the government policy that encourages languages to use Arabic script wherever possible, it is concluded that using Arabic script would be the most practical and efficient.

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Competing Orthographies for Writing Nobiin Nubian

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1. Introduction:

The aim of this paper is to describe, discuss and analyze the trials made to write Nobiin Nubian language in general (mainly Arabic and Latin based scripts), and using the Old Nubian script in particular. It is not only about how to correctly transcribe the sounds of the language into alphabetical characters, but it is, furthermore, about grammatology, i.e. writing systems. Grammatology is defined as the “system of more or less permanent marks used to represent an utterance in such a way that it can be recovered more or less exactly without the intervention of the utterer” [Daniels & Bright, 1996: 3]. ‘Script’ will be used to denote the writing characters of the above mentioned languages when utilized to write Nobiin, whereas ‘orthography’ will be used to denote the writing system/s developed from them to write Nobiin. Rendering Nobiin sounds and glosses in any script of the three languages may not be considered as orthography if it does not entail a system of writing in its own right. ‘Nobiin’ is used to denote the language that comprises the three dialects of Mahas, Sikkood (in the Sudan) and Fadijcha (divided between Sudan and Egypt) [Bell, 1974]. The major trials for writing this language in the three scripts will be reviewed, and then those of Arabic and Latin-based scripts will briefly be analyzed.

The experience of using Old Nubian script to write Nobiin will be reviewed a little more in detail and then analyzed. What makes us give a special attention to this experience is the fact that there is a growing interest among the Nubian intellectuals (in both Sudan and Egypt) to revive and modify this ancient script to write their own language. This part would end up by recommending a certain way, hereby called ‘katharevousa’, for dealing with the contracted forms of suffixes so as to help approach a proper writing system. At the end of the paper a concluding assessment will be made. ‘Technicality’ versus ‘ideology’ and their respective roles in designing and modifying suitable orthographies for Sudanese languages will also be discussed.

There are certain questions which this essay aims to answer in its course of discussion and analysis. They are summed in the following:

a/ does the knowledge of the orthography of a certain language (for instance of Arabic or Latin) which is targeted to be modified for writing a non-written language entail help or obstacle in promoting literacy of the target language (for instance Nobiin)?

b/ can diacritics, or other characters- such as macrons, dots etc. which are not part of the trunk of the main character- as tools primarily employed for clarifications entail confusion and obscurity?

c/ are there advantages or disadvantages to digraphs (two characters for one sound) as orthographic modifications?

The methodology we adopt for doing this is descriptive-analytical. Like linguistics in general, grammatology “must be descriptive, historical, and theoretical” [Daniels & Bright, 1996]. But being a relatively new discipline in linguistics, it sometimes invokes certain methodological doubts. It may be disputed whether grammatology entails a process of ‘prescriptive’ method as it usually recommends certain ways of orthographic renderings, a matter we are also going to do here. As writing is fundamentally different from language, so “the theory of writing must be very different from the theory of language. It is not to be expected that patterns or principles that describe language should apply to writing, but little attention has been paid to that” [*ibid.*]. What may seem to be ‘prescriptive’ are merely improvements of orthographic rendering, that is to say the “descriptive grammar of spoken language *written down*” [*ibid.*]. Nevertheless, generally in linguistics in certain circumstances prescriptivism is entailed for purely ideological reasons. For example, in English, with “the rise of capitalism, a new middle class emerged who wanted their children to speak the dialect of the ‘upper’ classes. This desire led to the publication of many prescriptive grammars [Fromkin & Rodman, 1998: 16]. The influential 18th century grammarian Lowth prescribed that ‘*I don’t have none*’ to be replaced by ‘*I don’t have any*’, in responding to the ideological needs of this rising class. This may be in many ways similar to what the Nubians generally and the Nobiin speaking groups particularly expect to find in their language when developed into written form [Hāshim & Hāshim, 1995]. The method applied to deal with this situation, so as neither to fully comply with it nor to alienate it is addressing to the ‘full-fledged’ forms of the suffixes which are also attested to be in daily use along with the ‘contracted’ forms. We tackle this within the realm of grammatology so as to help formulate a formal register of Nobiin which is supposed by its turn to help in correctly writing the spoken language rather than to relegate or devalue it. “No linguist would deny that a more formal register of speech is appropriate in a more formal situation” [Daniels & Bright, 1996: 10].

Another methodological questioning about grammatology is whether it entails a process of diachronical analysis of the language in question. Writing, as a material record of language, can

go back to very ancient times, unless we are inventing new characters. Even when we are modifying for the first time a script for a spoken language, it is necessary to consider the historical development of the target script language. However our recommended ‘full-fledged’ suffixes are synchronically attested in daily spoken Nobiin, nevertheless, a diachronical consideration will be made of the Old Nubian script when its modification for writing Nobiin is discussed. In this regard we adopt the stance of Harris [1986] in not separating the present state of the language from its past, or its spoken form from its written form.

2. The Legacy of Writing Nobiin Nubian:

So far three orthographies have been used to write the Nobiin language, namely Old Nubian, Latin and Arabic. In the Christian era of the Nubian kingdoms a script was derived from Greek, Coptic, and Meroitic orthographies. The Old Nubian language was written with this script. Taking into consideration the notion that Old Nubian is a direct ancestor of Nobiin, [Griffith, 1909: 545], then perhaps that was the inception of writing Nobiin. Stricker deals with both of them as the “... medieval phase of the language now spoken between Korosko and Hannak ...” [Stricker, 1940: 439]. All the literary works of the Christian period, mostly ecclesiastical, are written with this script.

Nobiin in Latin script appeared centuries later. Here we are going to make a panoramic review where only the works of a literary nature will be mentioned. A tentative vocabulary list was made by Burckhardt [1819]. De Cadalvene and de Breuvery [1836] also included an alphabetical list of vocabulary of Nobiin and Dongolese with their French translations. A real Nobiin literary work written in Latin script did not appear for a few decades. The Gospel of Mark, translated into Nobiin and written in Latin script, was published in Berlin in 1860 [Lauche, 1996]. It was translated in Cairo under the supervision of Lepsius by a Sudanese Nubian named Hasan who was from the village of Seree (i.e. Serre; it was not identified as to Serre East or West) [*ibid.*]. From that time until the first decade of the 20th century many editions of this Nobiin Gospel appeared. Years later Reinisch [1879] published his Nubian-German, and German-Nubian dictionary, where Nobiin was represented by what seemed to Reinisch as two distinct dialects, ‘*Fadisch*’ and ‘*Mahassi*’. In fact he treats Dongolawi, Kinuzi, Fadijcha, and Mahas as dialects of one Nile Nubian language.

A year later the impressively wide covering work of Lepsius [1880] on Nubian grammar appeared containing a dictionary of Nubian-German and German-Nubian, and the translation of the Gospel of Mark in Nobiin. Latin script was used for writing Nobiin. Rochemonteix [1888] produced his book, which contained nine tales in Nobiin written in Latin script, with their French translations. For some reason, one of these Nobiin tales was produced in Arabic script.

The Nobiin Gospel of Mark appeared in Cairo in 1899 in Arabic script [Irsich, 1899]. About this time the Old Nubian manuscripts were being identified as Nubian by Schafer and Schmidt [1906], to be properly deciphered and largely studied by Griffith [1913], and later more analyzed and criticized by Zyhlarz [1928]. Also in 1913 Abels' book appeared containing 35 small pieces of Nobiin folktales with their German translations and explanations and a glossary at the end using the Latin script. A few decades later Mutwalli Badr published his first book on Nobiin [1955] with some excerpts of Dungulawi-Kenzi language, and a vocabulary of Nobiin. He used both Latin and Arabic scripts for writing Nobiin. Thus, he initiated a new era for writing Nobiin with Arabic script which was purely secular in comparison to the missionary's translation of the Gospel of Mark.

The Latin script was also used by Bell in his work on Nubian place-names [1970], which was undertaken in the Belly of Stone, in the middle of the Nobiin speaking region. Some years later Mutwalli Badr produced his book on Nobiin Proverbs [1978], using Arabic script for writing. In the same year, although it appeared as undated, his unprecedented Nobiin primer appeared with Latin script as a means for reading and writing the text and Arabic as a means for explaining it. This Arabic-Latin dualism of scripts characterizes all his works.

Old Nubian again appeared on the scene, gaining momentum, so that by the turn of the century it became the script of choice for a considerable number of Nubian intellectuals in Sudan and Egypt. This surge was initiated by an article by Browne [1979]. Within two decades his research and publications of and on Old Nubian language amounted to more than sixty titles [Jacobi & Kummerle, 1993: 41-47]. The legacy of Latin script continued with Simon [1980] publishing Dongolese and Nobiin songs and Werner [1980] with his book of Nobiin grammar which included the primer of Mutwalli Badr.

The decade of the 1990's witnessed a new surge of reviving the Old Nubian script for writing Nobiin but the fruit did not ripen until late in the nineties. Meanwhile Mohy Eldin Sherif (Muhyi

al-Dīn Sharīf) [1995] finished his manuscript of the Fadijcha primer. A year later the publication of the Nobiin-German Dictionary of Mukhtār Khalīl (Kabbāra) [1996] came out using the Old Nubian script and that was the launch of the new era. Later Al-Hādi Hāshim & Wheeler (a.k.a. A. Cartwright) finished publishing their Nobiin primer [1997]. Hāshim & Wheeler expressed their wish to use the Old Nubian script, if software was provided. A year later, Mukhtār Khalīl produced the first Nobiin alphabetical teaching book [1997] using Old Nubian script. The book is not a primer *per se*, but it is rather a book that introduces the Old Nubian characters so they can be used in writing Nobiin. Although the book is almost completely about Nobiin, nevertheless, some of the exercises are in Kenzi and Dongolese. Adel Hafiz (ʿAbdu al-Ḥāfiz) published his book on how to write both Nobiin and Kenzi-Dongolese using Arabic-based script [1998]; two glossaries of Kenzi-Dongolese and Nobiin were appended. Again, that same year also witnessed the publication of the English/Arabic Dongolese- Kenzi and Nobiin dictionary of Sunbāj where a Latin-based script was used for writing. The same year a workshop on both Nile Nubian languages was organized in Cairo by the Nubian Studies & Documentation Centre, the result of which appeared in what was meant to be a primer for teaching both Nobiin and Kenzi-Dongolese simultaneously in one book [1999]. Due to the overwhelming number of mistakes another impression of it appeared in 2002 which was meant to be a revision. Old Nubian script was used for writing the two Nubian languages while Arabic script was used for the explanation.

This brief review shows that the writing of Nobiin language has a long history. In fact Meroitic and Nobiin (i.e. Old Nubian) are the first purely African languages to be written. The three orthographies (Latin, Arabic, and Old Nubian) have been used in the process. One would assume that this history would have led to some sort of standardization for each script. In fact, each script, at different time periods and places has been exercised differently. This situation will be discussed in more detail below.

3. Arabic-based scripts:

It has been considered advantageous that all literate Nubians know Arabic language in varying degrees, from fully mastering it to barely reading and writing. This familiarity is assumed to pave the way for developing and modifying a script based on Arabic characters for writing Nobiin. This notion has been advocated by academicians who are engaged in tackling the problem of writing Muslims' African languages using Arabic-based script [Abu Naẓīfa, 1994:36-

38]. This movement is backed by many Arabic and Islamic institutions at the head of which comes the Islamic Educational, Scientific and Cultural Organization (ISESCO) [Abu Manga, 1999], which has shouldered the responsibility of providing computer software for an Arabic-based script [Chtatou,1992]. Being motivated by the objective and technical viability of using Arabic script for writing African languages, this movement was overlapped by clear Islamic-Arabic ideological assumptions, namely to bring the Muslim Africans nearer to Arabic language and hence to Islam, and to protect and defend them against penetration by the church and Christian institutions (manifested in using Latin script for writing African languages like in Chad) [Abu Naẓīfa, 1994:37-38].

In Sudan, since independence, the successive national governments have advocated a policy of Arabicisation. Education, from then up until now, has been the vehicle for Arabicisation [Al-Sīd, 1990]. Aside from the south, the national governments have not bothered to consider the language situation in Sudan or to recognize the other African ethnic identities of the Sudan. It has been taken for granted that the periphery (west, east, and north) have been completely assimilated into the Islamo-Arabic culture. “The year1955 marked the beginning of a new era in the history of education in the southern Sudan. The government had taken over full responsibility of running educational affairs which was shouldered by the missionary organizations. The system of education was adapted with the intention of integrating it gradually into the national system. Arabic was introduced, first as a subject, and later on as a medium of instruction” [Abu Bakr, 1978:200]. This resulted in delegating the Egyptian linguist ‘Asākīr from Cairo University “to head the Arabic team for the south”, a mission that resulted in formulating an Arabic-based script [*ibid*].

Coincidentally that was the same year Mutwalli Badr published his book *Al-lughatu al-nūbiyya* [1955], using both Arabic and Latin scripts. This voluntary intellectual work was not in any way affected by the official language policies of Sudan government. Notwithstanding the political instability in newly independent Sudan, the official language policies were always aimed at Arabicisation, favouring Arabic language on one hand, and excluding English language from cultural hegemony on the other hand [Abu Bakr, 1991:3]. One may wonder whether it was a coincidence that the civil war flared up that same year.

Coming back to Nobiin language, we find that of the three competing scripts (namely Old Nubian, Latin, and Arabic) the last one is the least influential. If it were not for the Gospel of Mark [Irrsich, 1899] and the two books of Mutwalli Badr (1955, 1978), we would have nothing to account for Nobiin literature written in Arabic-based script until the end of the 20th century when Abdel Hafiz [1998] published his book. In other ways, Arabic language is very influential; the Nile Nubians are completely Islamized with their personal names arabicized although a few exceptions of Nubian personal-names linger in the memory. The familiarity of the Nile Nubians with the Arabic script is beyond dispute; their mastery of Arabic, especially among the intellectuals, may reach the level of considering Arabic as a mother tongue. Furthermore Arabic is the *lingua franca* of the Sudan, without mentioning the unshakable support of the successive national governments to it which consequently resulted in making it the sole medium of educational instruction.

We may summarize the two points so far as: *a)* Arabic language has not been influential in so far as the writing legacy of Nobiin is concerned; *b)* , Arabic language is very influential regarding language ideology in the Sudan. Thus we see conflicting ideological discourses.

3.1. The Technical Problems of Arabic Script:

Although some scholars advocate that Arabic script can adequately represent the unique sounds of African languages without adding additional characters [Chtatou, 1992], it is experimentally proved that there are significant inadequacies [Bell, 1999]. A Nubian linguist scholar specialized on Dongolese-Kenzi who also advocates the use of Arabic script for writing Nubian languages admits that, if not modified, Arabic script would not be a practical solution [Abdel Hafiz, 1998: 9]. Modification deficiencies may have grave consequences; such severe deficiencies are believed to have “.. led to the demise of the Arabic script for Languages” in Central Asia [Kaye, 1996: 743]. Consider an example from Sikkood, the middle region of Sudan Nile Nubia. There is a village just north of the municipality of Abri. Until after the middle of the 20th century there was only one primary school which was at Abri. The children of that village used to go to that school where the students were occasionally asked by their teachers to write the name of their respective home villages. The name of that particular village is: *Mugrakke*. Writing this place-name in standard Arabic involved two of the major problems of using Arabic for African languages: *a)* the consonant sounds alien to Arabic, for instance ɾ/g is usually solved by

proposing one of the following three options: ج ك اق \ b) and the parasitic vowel markers, *i.e.* the diacritics. Accordingly, the place-name considered here was rendered in Arabic as follows: مُجْرَكَة, مُقْرَكَة, مُكْرَكَة. As the primary pupils were also being introduced into standard Arabic, they tended to pronounce this particular place-name with its Arabic sounds, and even with the added feminine suffix, *i.e.* (*tā' marbūṭa*) which was introduced to account for the ending vowel of the place-name. Otherwise the word should have been written ended with the character ك and the vowel marked by a diacritic *fathā*: <مُجْرَكٌ>, <مُكْرَكٌ> and <مُقْرَكٌ>. Unable to solve this problem while preserving the correct Nubian phonology, the teachers of that school at that time decided to deal pragmatically with this troublesome “letter”; they decided to change it into a (*fā'*) sound, *i.e.* /f/ /φ/ instead of /g/ /Γ/. This sequence of events explains how, in the course of time, this village has come to be known by the name: ΜΟΥΦΡΑΚΚΕ, *Mufrakke*, instead of ΜΟΥΓΡΑΚΚΕ, *Mugrakke*. By preserving the *tā' marbūṭa*, *i.e.* the Arabic feminine suffix, the name was Arabicized. Originally the place-name is as follows: *Mugrakke*, but when it is Arabicized, the ending (*e*) transforms into (*a*). This example shows how Arabic script, if not modified, can drastically distort Nubian language phonology.

Another problem of using Arabic script involves parasitic characters. This term ‘parasitic’ has been used by Abu Bakr [1978: 205] to denote any sub-character which is not physically part of the main trunk of the principal character, also called the “carrier”, *e.g.* the dot on the Latin characters (i) and (j). In this context this term is used to refer to Arabic diacritics or *tashkīl*. The suitability of this term is that it deals with both Arabic consonants and vowels.

For reasons of space we will not deal with the technique of doubling and tripling of characters in order to capture the morpho-phonemic clusters of African languages. These examples [taken from Abu Bakr, 1978] will demonstrate the principle:

Latin	IPA	Arabic
Nj	nj	نج
ngw	ŋg ^w	نقو

The parasite consonant in Arabic is shown in the following example. The character: /ب/ gives us the sound of /b/ with one parasitic dot added below and the sound /n/ if it is added above. If the same technique is applied with doubled dot, below we get the sound of /y/, and above we get

the sound of /t/; with the dot tripled, below we get the sound of /p/, and above we get the sound of /th/ as in ‘thin’. Following this rule of dot positioning and numbering has so far been the rule in the method applied by those who try to modify Arabic script in order to write African languages. Thus the Nubian place-name *Mugrakke* would be written by ‘Asākir as follows: مُجْرَكَّة; or would be written by Chtatou, following his Fulfulde modification [1992:33] as follows: مُعْرَكَّة. Non-parasitic Arabic characters such as /م/ / /m/ and /ك/ / /k/ may also be loaded with dots in order to correlate them to certain sounds [Abu Nazīfa, 1994:69].

The vowels present an even more complicated problem, because Arabic has only three vowels: /a/ *fatha*, /u/ *damma* and /i/ *kasra*. On the other hand the African languages usually have more than six vowels, with some of them multiplying to greater numbers. For instance, the language of the Bor Dinka contains “..... 7 basic vowels based on place of articulation, multiplied by 5 tones and multiplied by 4 degrees of length. This means 7 times 2 times 5 times 4 times or a total of 280 potential vowels and associated prosodies” [Bell, 1999: 11]. In Arabic orthography the three vowels are regressively assimilated onto the preceding character (the carrier) and only marked with diacritics. In order to modify an Arabic-based script for writing African languages, more dots, macrons, curved, rounded and semi rounded characters will probably be needed along with the original standard Arabic diacritics. This may possibly result into modifying an orthography which is too much complicated. The “... dot indicating the vowel might well get confused with a dot characterizing a particular consonant [while].. consonants which are normally dotted occurring with a dotted vowel may look overcrowded ...” [Abu Bakr, 1978: 206].

In this way any writing or printing mistake in one or more of the diacritics may cause severe disruption in the phonological structure of the words and sentences alike. If we bear in mind the usual tendency in Arabic to omit diacritics, there is a great possibility this will also happen in the modified orthography. The available Arabic-based scripts themselves suffer from methodological divergences. For instance, Abu Manga [1998: 8] writes the following Hausa gloss as follows:

Kumbo = كُمْبُ

Here the vowels /u/ ُ and /o/, which does not have an equivalent in Arabic, are represented as though they are identical. Chtatou [1992:31] in his modification for Songhey shows that “.... the

length [is made] by a *kasra* /ـ/ and a /yā'/ـي/ in the case of both /ii/ and /ee/". Then he gives the following example:

Jiiri	جير
Beene	بين
Feeji	فيج

Concerning Nobiin there have only been four trials using a modified Arabic script, counting the one made by Asma Ibrāhīm (this volume). The first as mentioned before was the one made by Irrsich [1899], the second was made by Mutwalli Badr [1955, 1978] and the third is the one presently being advocated by Abdel Hafiz [1998], the fourth is the one presented by Asma Ibrāhīm and which is included in this volume. The pioneering work of Irrsich in reproducing the Nobiin Gospel of Mark into Arabic script is daring and worthy of admiration. Strikingly his representations of vowels are similar to those adopted years later by 'Asākir. In representing consonants the dots are utilized to account for the peculiar sounds of Nobiin such as (ny) and (ng). In the second edition which was produced at the turn of the century, the system got a bit confused, probably because Irrsich was no longer in charge [Hāshim, 2001].

The vowels were represented in the following way:

a	ـَ	aa	ـَا
e	ـِـَـ	ee	ـِـِـَـ
i	ـِـِـ	ii	ـِـِـِـ
o	ـُـَـ	oo	ـُـُـَـ
u	ـُـِـ	uu	ـُـِـِـ

Mutwalli Badr was much less consistent than Irrsich in his Arabic modifications. This becomes very clear when his Latin and Arabic applications are comparatively analysed. Below are some examples:

1-[1955:96]: wierra ngo / نِقْ / ويرّ

2-[1955:190]: wierra ngo / ويرنق /

[He/ she/ it has become far away.]

Although wrong, his Latin rendering looks to be systematic; it should be as follows:

Wiir +ang +o[n]

Stem+inchoative suffix+past suffix

By disrupting the inchoative suffix the verbal gloss is split up into two halves for no good reason at all. His Arabic rendering is clearly inconsistent, although one of the two examples is at least correctly written.

Abdel Hafiz is far less consistent than Badr, probably for technical reasons pertaining to the lack of adaptability of printing system which failed to keep up to the standard of his modifications. Thus the book was more of a grammar than a book about orthography.

The modifications of Asma Ibrāhīm [in this volume] for the vowels missing in Arabic, i.e. the sounds <e> and <o>, are achieved by introducing parasitic diacritics. Their long sounds are achieved by extending both of them into a consonant <y>. Her assigning of the Persian character <گ> for the sound <g> may be challenged by what the Nobiin speakers prefer. In the Toponymic Survey of the Maḥas Project (Dep. of Archaeology, Faculty of Arts, University of Khartoum 1999-2003), the present writer adopted the same character for the same sound. Later in the questionnaire, the majority of the Maḥas respondents preferred to assign the character <ق> for the sound <g> which is traditionally the case in most dialects of colloquial Arabic all over the Arabophone countries. This has made the present writer comply with the choice of the language speakers. A major problem faced Asma's modifications – just like her predecessors – was that the morphology of the language might not be well discernible from the orthography, as will be shown later. As a result of personal communication with her, she adapted her system later so as to standardize it with the system adopted by the present writer.

3.2. Concluding remarks on Arabic-based Scripts:

Many scripts are being modified and designed by relying more or less on introducing new characters and / or replacing characters' phonological functions. Standard Arabic diacritics play a major role in these modifications, which means that more parasitic characters will be introduced. As these modifications have not yet been standardized, and as there are abundant contradictions, they are a long way from being consistently applied.

The result of these problems may mean that if there is an applicable Arabic-based orthography, the most effective way of applying it would be through a didactic curriculum, i.e. a context of classroom teaching where the modifications would be explained and taught. The knowledge of Arabic language and consequently of Arabic characters seems to be insufficient to enable self-teaching. This makes the factor of familiarity of the common population with Arabic language relatively weak. The experience of the present writer in teaching Nobiin has shown that in the classroom any knowledge of the script from which the orthography is modified may negatively mediate in the process of skill-building and may be a factor of confusion. Finally, the direct involvement of ideology, represented for instance in the open support of the State or any other Islamic-Arabic oriented organizations, in the designing of an Arabic-based orthography, may give a negative reaction. In such cases the people of the targeted language may not only back off from the proposed orthography, but further they might build up a strong aversive attitude toward the whole project.

4. Latin-based Scripts:

There are three advantages of Latin script. First, the educated Nubians are familiar with it. Presently English language is being taught in Sudanese primary schools. In this regard Latin and Arabic scripts are neutralized. Secondly, the vowels are not parasitic like Arabic and in number the orthographic representations equal the Nubian vowels, i.e. 5 times 2= 10. Thirdly, the experience of using this script for writing African languages is both ancient and fruitfully rich. The western missionary and scholars' involvement in African languages has been wide and deep as they are the ones who pioneered studying these languages. As a result of all this, a kind of standardization is achieved represented in the International Phonetic Alphabet (IPA). IPA is not solely designed for African languages; it also deals with many other languages worldwide. The rules of IPA are usually liberally followed; consequently many modifications are introduced on the basis of either institutional or personal convenience. Although the IPA is presently used primarily for specialized linguistic purposes, nevertheless, it was the scientific launch for Latin-based orthographic modifications to be worked out. It is worth mentioning that it was Lepsius who presented to the London 1853 'Alphabetical Conference' the notational system he had been working on which "was quickly accepted and adopted as the Church Missionary Society's

standard and was published [in German and English] ... under the name of ‘Standard Alphabet’” [MacMahon, 1996: 835] to develop later into the IPA.

The disadvantages of the Latin based-scripts can also be generally concluded in three points. First, the process of modification involves introducing parasitic characters in the form of macron, bar, dots....etc. Although the diacritic characters here are not like those of Arabic, nonetheless the problem of Arabic diacritics also applies here. Secondly, digraph and trigraph characters are used to represent the phonemic clusters in African language which may well create confusion. Ironically confusion occurs right in the same process of pursuing adequate representation of complex sounds. Thirdly, whatever the modified script that may come out from Latin, it ought to be taught in a classroom context for skill-building. Thus the advantage of familiarity is also neutralized.

Notwithstanding all these disadvantages, Latin-based scripts are very consistent regarding the rules applied by each modified script.

4.1. Latin Script and Nobiin:

Latin script has widely been used in writing Nobiin. In fact apart from the bulk of Old Nubian texts, Nobiin was most commonly or frequently written with the Latin script. Three examples will be shown below as to how vowels and consonants are represented: (a) Lepsius’ Nobiin Gospel of Mark, (b) Mutwalli Badr, and (c) Mohy Eldin Sherif. These are chosen because they cover the last 150 years.

The five vowels with their long extensions:

Lepsius	Mutwalli Badr		Sherif
1860	1955	(n.d.)	1996
a/ā	a/â	a/â	a/aa
e/ē	e/ê	e/ê	e/ee
i/ī	i/ie	i/î	i/ii
o/ō	o/oo	o/ô	o/oo
u/ū	u/ou	u/û	u/uu

The consistency of both Lepsius and Sherif is very clear contrasted with the inconsistency of Mutwalli Badr. Modifications of both Mutwalli Badr and Lepsius involve the using of parasitic

characters, while Sherif- just like Old Nubian- doubles the short vowels in order to represent the long ones.

The Consonant:

Latin	Lepsius	Mutwalli Badr	Sherif
	1860	1955 (n.d.)	1996
ng	ñ	q ġ	ng
ny	ñ	gn gn	ny
ch	KK'	ch ch	ch
sh	š	sh sh	sh
g	g	g g	g
j	ġ	j j	j

As can be seen from the consonant chart above, Lepsius avoids using digraphs to represent the unique sounds, but he does use parasitic characters to represent them. He doubles the < K K' > to stand for the sound <ch>. Mutwaalli Badr is also consistent, except for the sound <ng> for which he assigned the character <q> in 1955, but the character <ġ> in a later publication (n.d.), thus involving parasitic characters as with the vowels. The modification of Sherif is very consistent, but it suffers from the disadvantage of using digraphs in order to represent the unique sounds in Nobiin. Its main advantage is that it does not introduce new characters; neither does it involve any parasitic ones. Furthermore it is the most popular, having been used by scholars, such as Bell, Werner, and others.

To sum up, there is a divergence of methods in modifying a Latin-based script for writing Nobiin. So far, there has been no standardized system agreed upon, although many efforts have been exerted in order to achieve that. The literacy knowledge of English language, consequently of Latin script, is not by virtue a guarantee for a good skill-building; the modified scripts would need to be taught in a classroom context.

5. The Old Nubian Script:

5.1. The Advantages:

The advantages of the Old Nubian orthography can be concluded in five points. The first advantage is that it reflects the continuum of writing tradition in an ancient area. This tradition started with Egyptian hieroglyphic to Meroitic hieroglyphic, then from Hieratic and Demotic to Meroitic cursive orthography [‘Abdu Al-Gādir Maḥmūd ‘Abdu Allah, 1985], then to Greek and Coptic, from which we come down directly to Old Nubian orthography which was based on both of Greek and Coptic as well as Meroitic [Griffith, 1913]. The historical depth of this heritage of writing is an advantage, because the Nubian people value this heritage. Secondly, the Old Nubian orthography is rightly presumed to have a great deal of adequacy in representing the language sounds; for instance, the chart of Old Nubian consonants presented by Browne [1989a: 4] can be given for Nobiin; the symbols between slashes are the author’s additions.

	Labial			Alveolar		Palatal		Velar		Glottal		
	Bilabial		Labiodental									
	vs	vd	vs	vd	vs	vd	vs	vd	vs	vd	vs	vd
Explosive	p/b/ π	b Β			t Τ	d Δ			k Κ	g Γ		
Affricate								j δ				
Fricative			ph/f/ φ		s C		sh ϣ				h Ζ	
Lateral						l λ						
Roll						r Ρ						
Nasal		m Μ				n Ν		ñ ϣ		ṅ Γ		
Approximant				w ϣ, OY				y I, E/İ/				

After all it is an orthography which was developed and practically used in writing and reading the parent language of Nobiin. Comparing the following Nobiin lexemes using both Mutwalli Badr's modification and the Old Nubian orthography may better explain this point.

E. Gloss	M. Badr	O.N
Eye	mâgn	ṢḌḌṖ
Standing (he/she/it is)	menjin	ṢḌṖḌIN

Here the sound <ny/ Ṗ> is present in the pronunciation of both glosses, with the verbal gloss for “standing” having the sound <j> immediately after <ny>. In the Old Nubian example the sound <ny> is represented by the character assigned for it, i.e. <Ṗ> in both glosses, with the sound <j> also represented in the gloss for “standing”. But Mutwalli Badr seems to have been confused by the presence of the sound <j> after <ny>; he deals with them as if they constitute an assimilation. The two phonemes are distinctly different sounds in Nobiin and when they come in the above way, they are distinctly articulated without assimilation. To have them distinctly rendered in Old Nubian orthography can be taken as a proof that that was also the case. For instance the word for ‘life’ in Nobiin is ‘aanyj’ and in Old Nubian [Browne, 1995: 23] ḌḌṖḌ, but ‘living’ is ‘aanye’ which is the same in Old Nubian i.e. ḌḌṖḌ [ibid]. The confusion of Badr is not in anyway on behalf of his knowledge of the language, but rather on behalf of his orthographic rendering and script modification which is caused, as the present writer believes, by his pursuit to write the language by transcription. Thus a peculiar aspect of Nobiin phonology is not addressed by orthography.

Another example will show how morphemes are inappropriately separated from the stem of the word, whereas this does not happen in the Old Nubian orthography:

E. Gloss	M. Badr	O.N.
She/it has become pregnant	junta gnon	ḌOYNTḌḌON

We do not know the reason behind separating the following two morphemes from the stem: -agn- {-ang-}/-ḌḌ-(Inchoative) + -on/-ON(Past suffix), which are more correctly written as a single word in the Old Nubian orthography since it is a stem + the suffix. Such flaws are

common in modern modified orthographies whether they are using Latin, Arabic or Old Nubian scripts.

Thirdly, the Old Nubian Orthography represents a real writing system in its own right and with its own tradition of tackling the peculiarities of the language. This does not in any way mean that the writing system of Old Nubian is fault proof; many mistakes on behalf of the scribes can easily be pointed out. However, a ‘uniform dialect’ is clearly discernible from the orthography of the texts [Browne, 2002: 2]. The discrepancies cited above in modern trials are due to the attempts to write the language by transcription; in this way the language is treated as a collection of separate glosses, each of which is also treated separately. While transcription is very useful to specialists, it can be very confusing to the average users of the language.

Fourthly, the Old Nubian characters are quite familiar to the literate Nubians. In 1993-4, Hāshim & Hāshim undertook a survey among the Nobiin speakers at Kalākla Ṣanga‘at, Khartoum. Their goal was to assess the speakers’ orientations toward the writing of their language. The first impression of the Old Nubian script was that it looked like English. In fact of the original 23 sound-characters of the Old Nubian orthography, 14 are also part of the English alphabet, i.e. Latin script. Thus, Old Nubian also has a high familiarity rating with educated Nubians, putting it on a more equal footing with its rivals, i.e. Arabic and Latin.

Fifthly, the Old Nubian orthography is backed by a growing ethno-national ideology. Since the Nobiin language, like its other sister languages, is on the verge of becoming extinct, a strong surge of Nubian nationalist consciousness has come into being to safeguard the Nubian identity represented primarily in the language. The core of this ideology aims at bringing together the Nubian past with the present and the future in one continuum that can take them into the long future just as it goes back for thousands of years. It is very central in the Nubian consciousness that they are an ancient people with an ancient civilization. If this historical prestige does not show in the language they are taught, a language that they believe to be very ancient, they may well react with a negative attitude. In the survey made by Hāshim & Hāshim [1995] many Nubians were about to dismiss the Old Nubian script because it was similar to the English alphabet. They were very indignant at having their ancient language written with a modification from a modern orthography. Their negative attitude changed, however, when they were informed that that was the same script used by their ancestors. Still some of the Nubians stick to using only the Meroitic script. The responses of that survey were based on structured interviews and

consisted of two male groups: 50 adult and 50 young. The former were fluent in Nobiin as it was their mother tongue, while the latter could barely speak it but could understand it very well. They answered the questions about which script to use for writing Nobiin as follows:

a		b		c		d		e	
Latin script		ON script		Meroitic script		To invent new script		Arabic script	
Adult	Young	Ad.	Yng.	Ad.	Yng.	Ad.	Yng	Ad.	Yng.
%20	%6	%76	%80	%4	%10	-	%4	-	-

Table x: Results of the survey about preference for script (Hāshim and Hāshim, 1995)

These results show that 78% of both groups combined were positive about using the Old Nubian orthography, while 100% were opposed to using the Arabic script. Recent surveys among the Nubians of the middle Mahas region held by the present writer in 2002 [unpublished fieldwork inventory of the Maḥas Project, Dept. of Archaeology, Faculty of Arts, University of Khartoum] proved to be consistent with the earlier one. Instead of standing in the face of such strong ideological attitudes, it may be better to comply with them.

5.2. The Disadvantages:

Five points can also be raised as to the disadvantages of Old Nubian. First, the Old Nubian orthography involves the use of parasitic characters in the form of both macron and dot. The macron is used either over a short vowel or a consonant to function what Stricker [1940: 440-1] believes to be a syllable-forming vowel. Browne adopts this view [2002: 12-14]. As their argument is believed by the present writer to be supported by evidences from Nobiin tonal system, the hypothesis is extended further to include a tonal function for the supraliteration in Old Nubian. It is worthy of mentioning that Kabbāra [1997] uses the macron differently so as to achieve the long vowels in a way similar to modern transliteration. Occasionally it is used in the same way as Arabic diacritics where the vowel itself is not represented by an independent grapheme, but only marked by a macron above the preceding character, the ‘carrier’. For instance, the word (TILLI /tilli/, God) is occasionally written (T̄LLI).

Secondly, the Old Nubian orthography suffers from the problem of doubling the characters which takes place in two ways: *a)* by assigning two different characters for one sound, *e.g.* <O> and <Ϟ> for <o> sound; and *b)* by assigning digraphs for single sounds, *e.g.* OY for (u).

Thirdly, the orthography of Old Nubian language abounds with Greek characters which do not have their equivalent sounds in the Nubian language. Here are some examples:

- x/kh/ ΧΡΙCΤOC (Christ)
- Θ/th/ ΘΡONOC (throne)
- ψ/ps/ ΨΑΛM (Psalm)

Although these characters are only used in Greek loan words, nevertheless they are usually mentioned along with the Old Nubian characters because these loan words are written with their Greek characters. They are Nubianized loan glosses retaining their Greek orthographic forms. As there are so many of them, it is deemed necessary that they should be considered.

Fourthly, the Old Nubian orthography, if not modified, comes short of adequacy in representing modern Nubian personal and place- names of Arabic origin such as: ‘Akāsha, Khalīl, etc.

Fifthly; experience has shown that however the orthography is modified from the Old Nubian script, it should be taught in the context of a classroom. Thus the Old Nubian script shares the same disadvantage with the Arabic and Latin scripts. Hereby the seemingly positive factor of familiarity is also neutralized.

5.3. The experience of using Old Nubian orthography for writing Nobiin reviewed:

There were three centres from which the new surge for Old Nubian script simultaneously sprang: Khartoum, Cairo and Abu Dhabi. In each location there were also three societies involved in Nubian cultural activities, namely the Society of Nobatia (Khartoum), Nubian Heritage Society (Cairo) and ϣααḏ Society (*Faay, i.e. Write!*) (Abu Dhabi).

In Khartoum the movement began in 1989 pioneered by Al Hādi H. Hāshim who was taught the Old Nubian language by Prof. Herman Bell in the early 1970s. By 1990 three other persons joined him, namely M. Jalāl Hāshim, ‘Abdu Al-Ḥalīm Ṣabbār and Manāl M. O. Ḥasanayn. By

1991 they formed a group to start studying the Old Nubian language under the supervision of Al-Hādi.

In Cairo interest started in late 1989 and early 1990. It was initiated by Dr. Mukhtār Khalīl Kabbāra who was an academic specialist in the language. Later he was joined by Mohy Eldin Sherif, Muḥammad Sulaymān Jeddūcāb, Muḥammad ‘Abdu al-Gādir and others.

In Abu Dhabi it was initiated by ‘Abdu al-Gādir Shalabi, ‘Abdu Allah Ṣabbār, Ibrāhīm ‘Abdu and others. In the beginning there was no connection between the three groups. Then Kabbāra was approached by Shalabi who urged him to write down the essentials of Old Nubian orthography. The former immediately took up to the mission and soon finished the draft of a book on this topic. Then Shalabi shouldered the responsibility of preparing software for the Old Nubian script which is currently available [Shalabi-Narrow (true type), File Size: 20KB, Version: Macromedia Fontographer 4.1, 5/19/98] (www.napata.org). By 1992 the manuscript was already set on computer and distributed for more discussion. Thus the groups of Cairo and Abu Dhabi came closer together but the Khartoum group was not yet involved. It was ‘Abdu Allah Ṣabbār who made the contact when he brought the manuscript of the book to the group in Khartoum for more discussion. It was entitled in both Nobiin and Arabic:

NOBĪN-ΓΔ CIK-KIP φΔī-ωΔ? (اللغة النوبية: كيف نكتبها؟) [The Nubian Language: How Can We Write It?].

A year later history took a sharp turn when the Nubian Studies & Documentation Centre was established, registered in London as a charity and temporarily based in Cairo. The establishing of the Centre was a joint effort of a group of veteran Sudanese and Egyptian Nubians at home and in exile. The camera-ready proof of the book was handed over to the Centre which successfully took the responsibility for publishing it.

In August 1996 the first class for teaching the Old Nubian script took place in Khartoum. Organized by the Society of Nobatia, the class was aimed at qualifying Nubian vocalists and dramatists in writing and reading using Old Nubian script. Those who attended the class were all members of the Society. They were also the composers of song poems and plays. The course was taught by M. Jalāl Hāshim; among the learners were some of the famous Nubian vocalists such as: Makki ‘Ali Idrīs, ‘Imād Abāḏa, ‘Āṣim Khitām, Ḥasan ‘Ajāj and Wahaba Walwalē.

The same year witnessed the publication of Kabbāra's Nubian-German dictionary [1996] using the Old Nubian script. Its influence was not far reaching however. His big breakthrough took place the next year when the course of history also took another sharp turn. In 1997 the Nubian Studies & Documentation Centre (Cairo branch) completed the publishing of Kabbāra's book on how to use the Old Nubian script in writing both Dongolese-Kenzi and Nobiin. From that time forward classes were organized regularly, especially among the Nile Nubian students in the universities of Sudan.

5.4. *NOBĪNEḌ CIKKIP φḏīʾwa*: An Assessment of the Orthographic Modifications:

This book [Khalīl, 1997] is not a primer, and the author is aware of this fact. He states that the aim of the book is: "...to enable those who are speaking the Nubian language in order to write and record. I hope it will be followed by another work about the Nubian grammar especially for those who are eager to learn the language" [P.8]. So the book is only about the alphabet and fluent Nubian speakers are its target learners.

The author does not follow the orthographic system of Old Nubian in any strict manner, and he does not explain the methodology of his orthographic modifications. He seems to make his choice, selecting this and discarding that character, without explaining 'How' or 'Why'. His methodology must be discovered by examining what he writes in the epilogue of the book as well as analyzing the modifications he has made. He says: "Since the objective of this treatment is to achieve the easiest way to write and record the Nubian language in its present form, we will select the following group of letters [i.e. Characters] from the Old Nubian alphabet" [P.27]. This statement reveals that the author was aware of the need of modification "selectivity" in what he was doing. He began the epilogue of his book with a paragraph which is purely ideological. He says: "From the foregoing we come to the conclusion that our ancestors knew writing and recording the language. Thus we are in no need of innovating a new form or method of writing". [P.73]. He reinforces that to use the Old Nubian orthography entails a process of modifications where specialists – and consequently methodology – are required. Again, he said "we need to resume using the ancient alphabet, with the insertion of amendments or additions, as seemed necessary by specialists... for re-use in writing" [*ibid*]. Three out of the four reasons he mentions in the epilogue for using the ancient script, are purely technical; the first for suitability, the second for conformity. The third reason is quite revealing about his inherent methodology. He

says: “the use of Nubian alphabet in writing would bring about conformity and harmony between the number of letters [i.e. characters] in the alphabet and the sounds of the spoken language. This would make both reading and writing easier” [*ibid.*]. So, the focal point of the methodology seems to be to write the language (i.e. Nobiin) as it is uttered. Thus we may think that that is the reason why he does not follow the writing traditions of Old Nubian orthography, for instance, in writing the gloss ‘ΟΥΕΙΕΡΔ’- pronounced *weera* /she, he, it is one/ which he renders as follows: ‘ωῆρΔ’ *wēra*. However the macron used here to achieve the long vowel is itself a writing tradition of Old Nubian adopted by him for a different function. Thus he follows the ways of Old Nubian orthography in one case but discards them in another case without explaining why. In a footnote [P.74] he excuses himself for adopting the writing tradition of Old Nubian in assigning a digraph for the vowel sound (u), i.e. (ΟΥ). This raises questions about the consistency of his modifications.

Practically he deals with the Old Nubian orthography as merely a reservoir of orthographic characters. In this way he is not actually using the writing system of Old Nubian, but simply using the Greek, Coptic and Meroitic characters from which Old Nubian orthography was designed. In fact, this methodological pragmatism defeats the ideological reasoning he makes in the first paragraph of the epilogue quoted above. There seems to be a contradiction between what Kabbāra says in the epilogue and what he practically does in the text regarding the writing system of Old Nubian. For instance, in the epilogue he brings a purely ideological reasoning for using the Old Nubian orthography when he says that the function of the ‘letters’, i.e. characters, is not only to represent the sound of the language, “because they become symbols and tools of distinguishing, i.e. an identity, and this is how each language can be differentiated from the other, German from French etc.” [P.74]. Following this reasoning we can also say that this is how Old Nubian can be differentiated from Coptic and Greek, i.e. by the writing system and not by the written characters, i.e. by the orthography and not by the script. In fact what makes Old Nubian have its own orthography is its tradition of a writing system rather than the borrowed characters. Observing this tradition caused Schmidt to recognize that the language of the manuscript handed over to him in 1906 was different from Coptic, as Kabbāra himself mentions [P.15].

Furthermore, Kabbāra does not seem to recognize the Meroitic language as a third contributor to the Old Nubian orthography. Such characters as <ϣ> and <ϣ> are mentioned without their Meroitic origin being acknowledged. Consequently, the Meroitic character <ϣ/w> is sacrificed by the author for the Greek character <ω>, although the latter along with <ο> were both used in the Old Nubian to represent the sound <ο> but not <w>. Most important, one of the peculiar Nubian language characteristics is passed by without being addressed orthographically. This is the sound interchangeability in the Nubian language- ancient and modern; in the Old Nubian the character <π> is interchangeably articulated by the sounds <f> and <p> or according to context and tradition. For example the word for ‘date’ in Old Nubian orthography is ‘πENTI’ which is pronounced in Nobiin as ‘fenti’ and in Dongolese-Kenzi as ‘penti’. The author takes the Nobiin pronunciation as the original. Another example from the book of Kabbāra is the word for ‘[we] write’ which is included in the title of the book itself. Following the Old Nubian tradition it would have been rendered using the Meroitic character for /w/, (πΔΔİϣΔ), with the initial character pronounced in Nobiin as /f/, and in Dongolese- Kenzi as /b/ [Browne, 2002: 9]. In the Maḥas region, Sudan, there is a place-name pronounced interchangeably Parja/Farja. This phonological characteristic can easily be addressed if we follow the Old Nubian tradition by writing it πΔΡΔΔ. Another place-name called *Iraafayki* {Iraafa> *Rābiḥa* (an Arabic feminine personal name)+ iki> irki, *i.e.* clan residential compound)} shows how the sound /b/ is interchangeably pronounced as /f/. A third example, in Nobiin as well as Dongolese-Kenzi speaking groups, is the Turkish title for a provincial ruler, *kāshif*, which is usually pronounced as *kāshúb*. The people are very aware of this sound interchangeability; both the above place-name and the ruling title can rightly be rendered as: ΕΙΡΔΔΠΔİΚΙ, ΚΔΔϣΟΥΠ, simply because the /π/ can be pronounced as /f/) and vice-versa. No one claims that this should be applied to all words that begin with /p/ or /f/ sounds; it can only be applied whenever deemed significant as shown above, or when they are convenient for Nobiin-Dongolese bilingualism and ideological attachment.

Kabbāra has neither followed this tradition, nor has he explained why he did not. Instead he selected the Greek character (ϕ), which was only used in Greek loan words, to write, *e.g.* ϕENTI,

ϕḏīwḏ etc. In doing this not only is the writing tradition ignored but also the language history becomes distorted [Hāshim, 2001: 47].

In his pursuit to write the language according to its pronunciation, he follows in the steps of Mutwalli Badr in acknowledging the existence of the sound /tch/, where he assigns a Coptic character and later the character /ḥ/ is modified for it. In the writing tradition of Old Nubian this was treated according to the rule that governs sound interchangeability, such as /k/ interchanging with /g/ and /d/ with /t/ and vice-versa. When the sound /j/ i.e. /ḥ/ is geminated /ḥḥ/, it becomes the sound /tch/.

Kabbāra was a pioneer like his predecessor Mutwalli Badr. Both their works are original and unprecedented. Their works shall always be among the important milestones on the long path that the Nubians have traveled and will travel to develop their language. Studying and criticizing their works will help the Nubians go forward and eventually arrive at the goal of a society, literate in the language.

6. The Nubian Katharevousa:

‘Katharevousa’ is a Greek word that literally means the ‘pure language’. It was an artificial variety of the Greek language created by Adamantio Koraïs and it prevailed for about two centuries until the 1970s. Its creation was aimed at filling up the gap between ancient and spoken Greek as the former was completely unintelligible to modern-day Greek-speaking people. It also served as an intellectual level of the Greek language.

By the early 1990s some Nubian researchers found a significant gap between the Old Nubian and Nobiin to the extent that the former was unintelligible to Nobiin speakers. Unaware of the Greek katharevousa, they reasoned that if this gap was to be filled, then the two versions (levels) - modern and ancient- of this one language should be brought together. In the survey which was undertaken at Kalākla, a Khartoum suburb known to be densely populated by Nobiin speakers [Hāshim and Hāshim, 1995], the respondents were presented with three forms of a passage originally taken from the Old Nubian miracle of Saint Menas [Browne, 1989b]. The three forms consisted of: a) the original Old Nubian passage, which was unintelligible, b) the same passage recomposed in modern spoken Nobiin, inevitably containing Arabic loan words; c) the same passage recomposed in modern spoken Nobiin, but having the Arabic loan words replaced with

the Old Nubian ones. The majority of the respondents opted for the last form. The aim of that project was to create a standard high Nubian, or, using the words of Herman Bell, “a Nubian *fusha*” [Bell, 1998], where the spoken Nobiin would serve as a low variety and thus linking up the three versions (ancient, high and low) into one historical continuum so that it becomes possible for the Nobiin Nubians to go easily from one variety to the other in the same way achieved regarding the three varieties of the Greek language [Hāshim, 1999].

In this essay the term ‘katharevousa’ is used differently to denote the whole process of particularly writing Nobiin as a language with a considerable tradition of writing in a certain context of socio-cultural consciousness. The Nubians in general and the Nobiin Nubians in particular have a strong folk belief that they are the true inheritors of the ancient civilizations of the Nile valley and that all the ancient writings –hieroglyphic or alphabetic- were forms of their own language writing. There is also a belief that the true language was in the past, hence they have developed a game of lexical identification where contestants challenge each other on old or unusual or rare words. The one who knows the most is believed to be well versed in the language; the elders are usually sought by the contestants for old and unusual or rare words. Any project for writing the Nubian languages that does not take into consideration this ideological factor may not be accepted by the Nubians, because it fails to satisfy one of their basic needs in language writing, *i.e.* reviving the past. In fact this pursuit motivated the Nubian intellectuals to search out the past to revive the Old Nubian script so they could write their language and this is also why the ancient script is so attractive to the Nubians. This is the socio-cultural context of writing Nubian languages in general and Nobiin in particular. A precaution should be made here so that the satisfying of this need for history does not lead the linguist into treating the language only diachronically rather than synchronically.

‘Katharevousa’ is also used here to mean the standardization of the spoken Nobiin language with a certain writing system; a writing system is much more than Sound/Symbol relationship, especially when it is the first time to write the language. “It is ...nowadays a truism that the spoken language is different from the written language; but one of the things that has emerged from linguistic research is that the *extent* of the difference between the two media is very much greater than was previously imagined” [Crystal, 1987: 19]. The Sound-Symbol equation is more or less like transcription which does not necessarily show the structure of the language, whereas one of the major functions of the writing system is to clearly and understandably show the

logical structure of the language. In the spoken language, the morphemes are usually uttered in one breath unit, whereas in written languages they are either clearly and logically separated from each other, or otherwise linked together accordingly. In the spoken languages the *contracted forms* are usually in use, such as *isn't* [*ibid.* p. 26], whereas in the written language, especially if it is the first time to write the language, no one can say that *isn't* is the *full-fledged form*, simply because he/she has not observed the underlying or full version (variety) *is not*, even if it is attested to be in use by the people who speak the language. So far the experiments of writing Nobiin language have contained countless mistakes that fall into two categories:

a) The morpheme structuring is incompatible with the innate logical structuring of the language; two examples will be given:

1) The title of Kabbāra's book [1997] contains the following: NOBĪN-ḞḞ, where the ḞḞ, is meant to be the objective suffix which was originally either ḞḞ or KḞ. In his parsing of some Nubian proverbs [pp. 43-51], he describes -ḞḞ or -KḞ as objective suffixes. The use of -ḞḞ as an objective suffix, as shown above, is a result of his tendency to represent the sound without paying any heed to the rule. It is worth mentioning that in the manuscript of the book the above-mentioned word was written as follows: NOBĪN-ḞḞ, which is correct.

2/ In the title of the book issued by the Nubian Studies & Documentation Centre [2002] the same word is written as follows: NOBĪNḞḞḞ, where -ḞḞḞ is meant to represent the objective suffix -ḞḞ. The group authors of the book neither followed the incorrect modification of Kabbāra included in his book title, nor did they follow the correct rule mentioned by Kabbāra himself in the content of the book. Neither Kabbāra nor the group authors bother to explain why they have made the choices they made.

In the above examples the spelling does not correctly represent the grammatical rules of the language; hence we cannot call it a system because, in fact, it fails to adequately represent the system of the language.

b) There is a failure to consider the *full-fledged forms* of the language. Rather, they take the *contracted forms* of the spoken language as being the proper ones. The *full-fledged forms* are still used occasionally in certain grammatical contexts. In fact the people are aware of the *full-fledged forms* and can use them any time, particularly when the meaning of a phrase is

confused by using the *contracted forms*. Kabbaara [1997: 43-53] gives six examples of Nobiin *full-fledged* form, and two examples [pp.54-57] of Kenzi-Dongolese.

In consideration of the above-mentioned mistakes, ‘katharevousa’ is used here to mean the use of *full-fledged* forms as a kind of High Nobiin, or formal language style with a clear and understandable writing system. This seems the reason why computation softwares of languages may offhand reject the contracted forms that entail confusion, because they are programmed to interlinearize speech in accordance with the innate logic of languages in general. For instance, if we are using the software of THE LINGUIST’S SHOEBOX, VERSION 5.0 it would be impractical and confusing to assign the following: /ḡḁ/ /kḁ/ /ḥḁ/ /ḥḥḁ/ to one *field marker* that represents the objective suffix in Nobiin. SHOEBOX software can deal with the information that /ḡḁ/ and /kḁ/ are interchangeably the objective suffix in Nobiin, something on which all parties agree. This can hardly be done for /ḥḁ/ and /ḥḥḁ/ as they can easily be confused with /-ḁḥḁ/ which is the inchoative /-ḁḥ/+ the predicative suffix /-ḁ/. To make it do that we need to go into painstaking computing explanation and reasoning, a matter we are, in the first place, supposed to offer before going into computation.

‘Katharevousa’ is also meant to deal with reviving the Old Nubian lexicon into Nobiin. Whenever there is a lexical gap it can be smoothly filled up with a revived ancient gloss. Any Old Nubian gloss revived in this way is supposed to be modified in terms of phonology, *i.e.*, to be Nobiinized. In this way the Nubians will probably maintain the sense of history and the depth of time, which they always have, while reading and writing their language; the Nubians seem to be really interested in *reviving* their language much more than in merely having their language written.

Writing Nobiin as a spoken language in the present with writing tradition from the past imposes a paradox; it is the first time to write the language on the one hand, and it is not the first time to write it on the other hand. Although the mother-tongue speakers do not maintain any memory of the literacy tradition, nevertheless, they do maintain a strong ideological consciousness of it and the desire to revive it. ‘Katharevousa’ realizes this revivalism as represented in the proposed *full-fledged forms*. Where the *contracted forms* can be used in the daily life affairs, the *full-fledged forms* can be used in more formal situations. Thus ‘katharevousa’ is a writing system that

manifests in a clear way both the structure of the language and the identity of the mother-tongue speakers of the language.

6.1. The Writing System and the Structure of Language:

Nobiin is an inflecting language where suffixes frequently occur in noun and verb grammatical formations. As we have mentioned earlier, in the daily spoken languages suffixes have variant pronunciations that represent their most basic forms. Building up a ‘writing system’ for Nobiin necessitates that the structure of Nobiin be clearly manifested in writing. Generative phonology [Chomsky & Halle, 1968], accounting for such cases, maintains that there are ‘underlying forms’ in the minds of the language speakers that closely go into line with the orthographic form we should speak. An example for what is meant can be taken from Kabbāra [p.47] where he (a) brings a proverb and then (b) starts parsing it with the suffixes in their reduced forms, and (c) finally reconstructs it in its full-fledged form (we preserve his use of the macron):

(a) TEMEN NĒPKAMMI NĒPINNA. (One can only sleep soundly, if also his neighbour is soundly asleep).

(b) TEMEN NĒP-KAM-MĪ NĒP-I-NA(N).

(c) TEMEP-λ-I NĒP- KAN-MĪ NĒP-I-NA.N.

Thus we come out with the following proper sentence:

–TEMEPλI NĒPKANMI NĒPINAN.

Although Kabbaara brings forward the *full-fledged* forms as the grammatically correct forms of the language, however he does not adhere to them.

Buy doing this ‘Katharevousa’ also builds up an ‘orthography’, i.e. a ‘writing system’ where the structure of the language is discernible regardless of the script we use. For instance, in Asma’s modification [in this volume], the objective marker /-ka/ in <noog+ka> (house+ka) is pronounced <nook+ka> as a result of assimilation. Accordingly, Asma has rendered it as follows: نوكٌ. Here showing the assimilation in the written form is at the cost of showing the

structure of the language by simply adopting the Arabic diacritic for gemination, *tashdīd*. Thus Asma in fact is not only writing Nobiin with Arabic characters, but also with Arabic orthography as well. Consequently, her modifications do not merit the status of ‘orthography’ for Nobiin.

Following the morphophonemic rule adhered by the present writer it could be rendered as follows: نُوقَكْ, and following the present writer's adoption of <ق> for <g>, it could also be rendered as follows: نُوقَكْ, where the objective marker morpheme <ك> would have always remained orthographically independent regardless of the assimilation it may seem to undergo by articulation.

6.2. Writing System and the History of Language

The history of languages can easily be observed in the writing system. Such words as 'knife' and 'knight' tell us about the ancient phonological system of the English language. From this perspective, it is very significant to maintain in the writing system the (*k*) when it comes in such positions, although it has become irrelevant to the present phonology of the language. As Nobiin is considered to be an African tonal language, it can also be assumed that Old Nubian- being the parent of the former- was also a tonal language. Certain vowels are rendered in a very peculiar way in the Old Nubian orthography which can probably be attributed to the representation of tone in the writing system. For instance, 'one' in Old Nubian is $\text{OY}\epsilon\text{I}\epsilon\rho$ which consists of OY (o + u = u) - ϵI (e + i = i) - ϵ (e) ρ = U-I-E-R to be pronounced as W-E-E-R, which is the same pronunciation in Nobiin. A close observation of the Nobiin speakers' articulation of such lexemes has lead the present writer to the following analysis: in both Nobiin and Dongolawi-Kenzi the initial sound /w/ seems to be a shift from the initial sound /u/ in the Old Nubian. The following glosses, from the Old Nubian dictionary [Browne, 1996: 130-1] support this:

$\text{OY}\lambda\lambda-$: spring, hurl, throw (*wal* in Nobiin and Kenzi)

$\text{OY}\lambda\lambda-$: tomorrow (*wallo* in Nobiin)

$\text{OY}\lambda\text{OY}-$: to sail (*wau* in Dongolawi-Kenzi)

$\text{OY}\lambda\epsilon\text{I}-$: to sail (*wai* in Nobiin)

Interestingly, loan words in the Old Nubian initialized with the sound /w/ were usually written initialized with the /u/; the Arabic word وادي, /wādi/ i.e. valley, was rendered in the Old Nubian in the following way: $\text{OY}\lambda\lambda\text{T}\text{I}$ and $\text{Ṭ}\lambda\text{T}\text{I}$. So, the hypothetical syllable structure of the gloss 'one' might be something like this: uWiEr, with the sounds of the small letters assumed to have

been overshadowed and eventually assimilated. Kabbaara has rendered it as follows: $\omega\bar{\epsilon}\rho$, which is not in any way wrong, if it were not for the macron as in Old Nubian it is either rendered $\mathfrak{J}\epsilon\epsilon\rho/\omega\epsilon\epsilon\rho$, or with one vowel. However, the close observation of the vowel articulation in Nobiin positively supports the hypothesis that the peculiar writing system of such lexemes may well be a survival of a complex ancient phonological system of the Nubian languages in general and Nobiin in particular. Besides showing the history of the language, preserving such characteristics in the Nobiin writing system may help in deeply understanding it. There are many such cases which need to be considered one by one and in details, a matter the present essay has no intention of doing for reasons of space.

It may be said that including or using these irregularities makes learning the language very difficult, but this is not true because learning languages is a matter of skills. For instance, in English the digraphs (*ph*, *ch*, *gh*) are pronounced differently in each of the following words:

ele <u>ph</u> ant /f/	shep <u>h</u> erd /p/	dolph <u>in</u> /f/
<u>ch</u> aracter /k/	<u>ch</u> urch /tch/	mach <u>in</u> e /sh/
enough <u>gh</u> /f/	thorough <u>gh</u> /silent/	rough <u>gh</u> /f/

What makes us distinguish between the three different sounds of the same digraphs is the skill we have developed in learning the English language. In fact writing the language in transcription may prove to be far more difficult for learning than a writing system that reflects what people intuitively know about their language. The worry of some of the Nubian revivalists in this regard may be a kind of projection; they project on the Nubian people the same difficulties they have encountered in trying to follow such tentatively outlined rules. But Nubian people should not be asked to learn writing and reading in the same painstaking way that those pioneering revivalists have had to so far. The subject matter of the language should be defined and clearly explained in simple, usable terms. Then it will be easy to develop these skills.

The Nubian Katharevousa is an infant venture with only its main guidelines clear. Experimental exercises should be made, then discussed and assessed. Scholarly forums, seminars and workshops are necessary in order to achieve fruitful results.

7. Conclusion:

Nobiin is among the first living languages of purely African origin to have been written. Its writing system represents a historical continuum that goes back to ancient times. So, it deserves to be given special attention that considers its historicity and traditions of writing.

The three scripts (Arabic, Latin and Old Nubian), from a purely technical point of view, are equally qualified to serve a basis for developing an appropriate orthography. In this regard they are about equal in what might be considered to be either advantages or disadvantages. The three of them would inevitably involve parasitic characters and digraphs when modified into orthographies. The three of them also have their advantages. Old Nubian-based orthography would adequately tackle the peculiar aspects of Nobiin, such as sound interchangeability etc. Latin-based orthography would fit in with the emerging concept of standardization, plus gaining consistency from its well-established systems. Arabic-based orthography would put the Nubians in harmony with the State-supported orientation of Arabicization, plus gaining efficiency in representing the Arabic loan words, Arabic personal and place names common in Nobiin. On the other hand, from an ideological point of view, the Old Nubian orthography outweighs both Arabic and Latin orthographies because it represents the glorious past of the Nubians in general, and the Nobiin speaking groups in particular. However, it is inevitable that at least transliteration and transcription systems should be designed from the three of them for certain technical writings, such as maps, road signs of personal and place names, etc. So, the discussion of how to derive adequate modifications for each of them is not in any way a waste of time.

Whichever of the three scripts is used for writing Nobiin, it is better not to use a purely phonetic sound-symbol correlation. The Nubian intellectuals are advised not to take their people for granted in the matter of using the ancient orthography for writing their language. As it is the Nubian people who are going to read and write the language, they have the right to decide which script they prefer, even if it is the ancient one.

It is a human right for any group of people to speak, read, write and study in their own language, in the way they believe to be best to promote their own welfare and well-being. The dream of the “New Sudan” can not be realized if the question of language policy and planning is not justly and fairly answered.

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