

KURMUK PHONOLOGY*

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This article describes the basic aspects of the phonology of Kurmuk, a previously undescribed language belonging to the Northern Burun subbranch of the Western Nilotic family. After a morphosyntactic overview, the treatment of the phonology includes syllable structure and word shapes, vowels and vowel alternation, consonants and consonant alternation, and tones and tonal processes.

1. Introduction.

Kurmuk is a small Western Nilotic language spoken in the southern part of Blue Nile Province in Sudan. It belongs to the group of closely related languages which Evans-Pritchard (1932: 34) called Northern Burun. Their closest relatives are the Southern Burun languages Mabaan, Jumjum and Ulu (Andersen 2006: 6), together with which they constitute the Burun branch of Western Nilotic. The other branches of this family are the Lwo languages, which include among others Dholuo, Anywa, Päre and Shilluk, and the Nuer-Dinka languages. Western Nilotic is a branch of the Nilotic family, whose other branches are Eastern Nilotic and Southern Nilotic. There are no previously published studies of Kurmuk, except for two short word lists in Evans-Pritchard (1932: 37-41). According to Ecsedy (1973: 143), the Northern Burun people comprise eight tribes, but it is not clear to what extent each of these tribes speaks a separate variety of Northern Burun.

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the verb after the preposition *ɲà*, thus being demoted to adverbial status. In this construction, which I call “passive,” the verb takes a (passive) suffix *-(C)r*.² The logical subject can be left out, as in (2b).

- (2) a. *kòókók fàap -ì ɲà kámbál*
 meat boil -PASS by girl
 ‘The meat is being cooked by the girl.’
- b. *kòókók fàap -ì -r*
 meat boil -PASS -ASS
 ‘The meat is being cooked.’

When the logical subject of a transitive verb stem is pronominal, there are three alternative constructions: (i) The subject may occur in preverbal position in a short (clitic) form, as in (3a); (ii) it may be expressed by a suffix in the verb, while the object occurs before the verb, as in (3b); or (iii) the logical subject may be demoted to an adverbial in a passive construction, where it has its full citation form, as in (3c).

- (3) a. *à fàap kòókók*
 1SG boil meat
 ‘I am cooking meat.’
- b. *kòókók fàab -à -r*
 meat boil -1SG-ASS
 ‘I am cooking the meat.’
- c. *kòókók fàap -ì ɲà ʔáaníʃ*
 meat boil -PASS by 1SG
 ‘The meat is being cooked by me.’

The short preverbal personal pronouns may also be (logical) objects, as in (4).

² Here and elsewhere, “(C)” in a cited suffix symbolizes a consonant which is only present as a separate segment after certain morpheme-final consonants, which determine its articulation. When not present as a separate segment, the suffix consonant may still have some effect on the preceding consonant, cf section 5.6 below.

- (4) à nÁg-úḍ -ʼíkí -r ‘They beat me.’
1SG beat -PST -3PL -ASS

A third person singular pronominal preverbal subject or object is zero, as in (5a) and (5b), respectively.

- (5) a. ʃàap kòòkóòk ‘He/She is cooking meat.’
boil meat
- b. ʃàab-à -r ‘I am cooking it.’
boil -1SG-ASS

The inventory of subject suffixes is shown by the paradigm in (6), which also includes the passive form for comparison. Here the subject suffixes are preceded by a past tense suffix and followed by a suffix *-r*, which I gloss “assertive” (ASS), cf section 2.4 below. For first person plural there is a distinction between inclusive and exclusive. The first person plural inclusive suffix is preceded by what may be analysed as the passive suffix, while there is no passive suffix in the other forms.

- (6) 1SG ʔám-úḍ -à -r ‘I ate it.’
eat -PST -1SG-ASS
- 2SG ʔám-úḍ-ʼí-r ‘You ate it.’
- 3SG ʔám-úḍ-ʼí-r ‘He/She/It ate it.’
- 1PLIN ʔám-úṭ -ì -wéε -r ‘We ate it.’
eat -PST-PASS -1PLIN -ASS
- 1PLEX ʔám-úḍ-òṇò-r ‘We ate it.’
- 2PL ʔám-úḍ-ʼéε-r ‘You ate it.’
- 3PL ʔám-úḍ-ʼíkí-r ‘They ate it.’
- PASS ʔám-úṭ-ì-r ‘It was eaten.’

A subject may precede a preverbal object, in which case it is cross-referenced by a suffix in the verb, as in (7).

- (7) mí -k dúbán ʼʔúur-úḍ -ʼíkí -r
woman-PL polenta stir -PST-3PL -ASS
‘The women have cooked the polenta.’

Negation and a future tense particle may co-occur in that order, in which case they coalesce into one phonological word, as in (13a). They may also coalesce with a preceding short (clitic) subject or object pronoun, as in (13b).

- (13) a. áná -a ʔám -b́í ‘He/She is not going to eat.’
 not -FUT1 eat -AP
- b. à -aná -ay ʔám -b́í ‘I will not eat.’
 1SG-not -FUT2 eat -AP

2.2. Inflection for tense and aspect. Verbs are inflected for tense and aspect. There is a contrast between a non-past tense, which is morphologically unmarked, as in (14a), and a past tense, which is marked by a suffix *-(u)u(t)*, as in (14b). There are also two imperfective aspect suffixes, which express continuous and habitual meaning, respectively, as in (14c-d). Both of the aspect suffixes have the segmental form *-(a)a(t)*, but generally they are tonally distinct. They may co-occur with the past tense suffix, in that order, as in (15).

- (14) a. ʔáarák kàl d́ít
 person steal goat:PL
 ‘The man is stealing goats (successfully).’
- b. ʔáarák ʔkál-ú ʔd́ít
 person steal-PST goat:PL
 ‘The man stole goats.’
- c. ʔáarák kàl -á d́ít
 person steal-CONT goat:PL
 ‘The man is trying to steal goats.’
- d. ʔáarák ʔkál-á ʔd́ít
 person steal-HAB goat:PL
 ‘The man steals goats.’

(15) mí -n láal -áḍ -[↓]úu ʔá[↓]míṭ
 woman-SG make-CONT -PST food
 ‘The woman was preparing food.’

mí -n ʃáab -áḍ -úu kòòkóòk
 woman-SG boil -HAB -PST meat
 ‘The woman used to cook meat.’

2.3. Verbal derivation. Verb stems consist of a root and zero or more derivational morphemes. The latter are expressed by suffixes, but they may also involve one or more phonological changes in the root, namely in vowel quality, vowel length, tone and final consonant. Moreover, aspect or tense suffixes sometimes coalesce with a derivational suffix. Thus, the morphology of Kurmuk is not as agglutinative as it may look.

Transitive verbal roots may be detransitivized by means of an antipassive derivational morpheme, which is expressed partly by a suffix $-(C)I \sim -(C)i$, and partly by changes in the root, as seen in (16). The antipassive derivation removes the logical object from the valency of the root. Thus, while the underived verb stem in (16a) requires a grammatical object, the antipassive verb stem in (16b) excludes a grammatical object.

- (16) a. kámbál ʃàap kòòkóòk ‘The girl is cooking meat.’
 girl boil meat
- b. kámbál [↓]ʃáap-í -r ‘The girl is cooking.’
 girl boil -AP -ASS

Other derivational suffixes of verb stems with a transitive root include the centrifugal $-(C)I$, which expresses direction away from the deictic center, as in (17b), the centripetal $-uu \sim -uu$, which expresses direction towards the deictic center, as in (17c), the benefactive $-(C)If \sim -(C)if$, which increases the valency of the verb by introducing a beneficiary as a grammatical object, as in (18b), and the multiplicative $-I$, which indicates a repeated action, as in (19b). In each set of clauses in (17)-(19), the (a)-clause shows the corresponding underived verb stem. Similar derivational suffixes are used after intransitive roots.

the notion of assertion. However, polar interrogative sentences are identical to declarative sentences apart from a different intonation (and an optional sentence-final particle not illustrated here). Thus, they are characterized by a general rise of the pitch somewhere in the utterance, as indicated by the upstep symbol [↑] in (27) and (28a).

(27) ʒáarák ʒìní ɲéed-í -r ‘Do you know this person?’
 person D1:SG know-2SG-ASS

(28) a. ʒùlàn †nóog-ú -r
 person:PL beat -M:AP-ASS
 ‘Are the people fighting?’

b. èʒé, gà -aná nóog-ú, gàn méel -í
 no 3PL-not beat -M:AP 3PL dance-ASS
 ‘No, they are not fighting, they are dancing.’

The assertive suffix, as defined here, has three allomorphs: $-(C)_I$, $-I$ and $-r$. They are in complementary distribution in that $-(C)_I$ occurs immediately after a root, as in (20) and (26), while $-I$ and $-r$ occur after a suffix, $-I$ after a consonant, as in (21a) and (24a), and $-r$ after a vowel, as in (22a) and (23a).

In summary, to the extent that verb forms are segmentable into morphs, the linear order of their morphemes is as indicated in (29).

(29) Root + Derivation(s) + Aspect + Tense + Subject + Assertion

2.5. Noun structure. Noun forms in Kurmuk are grammatically either singular or plural, and in terms of number inflection, nouns fall into three classes, as in most other Western Nilotic languages (Storch 2005) as well as more widely in the Nilo-Saharan phylum (Dimmendaal 2000): (i) Nouns with plural marking, where the singular is morphologically unmarked and the plural morphologically marked, either by a suffix, as in (30a), or by apophony, as in (30b); (ii) nouns with singulative marking, where the singular is morphologically marked by a suffix and the plural morphologically unmarked, as in (30c), or where there is no singular counterpart of the unmarked plural, as in (30d); (iii) nouns with replacive marking, where both the singular and the plural are morphologically marked by a suffix, as in (30e-f). The method of morphemic translation for each form in (30) re-

flects the type of marking and is based on implicit principles used in morphemic translations throughout this article.

(30)	<i>Singular</i>	<i>Plural</i>	
a.	kùl wart.hog	kùl -àk wart.hog -PL	‘wart-hog’
b.	gálám kid	gólúm kid:PL	‘kid’
c.	gìm -ìṭ cheeks-SG	gím cheeks	‘cheek’
d.	—	làakim urine(PL)	‘urine’
e.	gúr -íṭ stone-SG	gúr -án stone-PL	‘stone’
f.	ḏimáaṭ bird:SG	ḏimḏim bird:PL	‘bird’

Possessive suffixes are used with inalienably possessed nouns, such as body part nouns. Thus, the paradigms in Table 1 show the possessive inflection of the singular and the plural of the word for ‘thigh’. As seen here, there is no distinction between inclusive and exclusive in first person plural possessive suffixes. Note also that the possessive suffixes express not only the person and number of the possessor, but also the number of the possessee.³ Thus, the possessive suffixes begin with a velar stop when the possessee is plural. Moreover, there is evidence that the singular possessee suffixes underlyingly begin with an alveolar stop /d/ after monosyllabic stems, cf for instance zó ‘chest’, zò-ḏii ‘my chest’; thus, the /b/ in the singular possessee suffixes shown in Table 1 is probably the manifestation

³ This feature of possessive markers is something which Kurmuk shares with some other Nilotic languages. Among the other Western Nilotic languages it is also found in Nuer (Crazzolaro 1933: 67ff) and Dinka (Andersen 2002: 16f), and it is pervasive in the Southern Nilotic family (Rotlland 1981 and 1982). Moreover, it is also found in some other Nilo-Saharan languages, for instance the Surmic languages, see Unseth’s (1991) overview.

- (32) púrí ʼbáar ʔúl -ʼákí ‘My cloth is black.’
 cloth of:1SG be.black-PRED
- ʔim bíir ʔínzí ‘That is yours.’
 PRO:SG of:2SG ID3

3. Syllable Structure and Word Shapes.

Kurmuk has the following eight syllable types: *CV*, *CVV*, *CVC*, *CVVC*, *V*, *VV*, *VC* and *VVC*. Monosyllabic words normally begin with a consonant, as exemplified by the nouns in (33). Most monosyllabic words also end in a consonant, as in (33b) and (33d), the word shapes *CV* and *CVV* mainly being restricted to function words, as in (34).

- (33) a. *CV* zó ‘chest’
 b. *CVC* kùṭ ‘rain’
 c. *CVV* rɛɛ̃ ‘thirst’
 d. *CVVC* pʌʌm ‘mountain’
- (34) *CV* kà (preposition)
CVV ʔòò ‘what’ (interrogative)

Syllables without an initial consonant (*V*, *VV*, *VC* and *VVC*) occur only word-initially, and those with a long vowel (*VV* and *VVC*) only in phonological words consisting of two or more coalesced function words, see below. In general the syllable types *V* and *VC* occur only in phonological words with more than one syllable. They are found in many nouns that begin with a low-toned short /à/, as in (35), and many of these seem to be loanwords borrowed from the neighbouring language Berta, some in turn being borrowed from Arabic (Andersen 1993: 43).

- (35) a. àgúurú ‘cloud’, cf Berta àgúurù
 b. àṅḍòlòlò ‘ram’
 c. àʃĩṅḍúuk ‘box’, cf Berta àssàndúuk, from Arabic sʰanduug
 d. àlgálám ‘pen’, cf Berta àlgálàm, from Arabic galam

The syllable types *V* and *VC* also occur in a few monosyllabic function words, and this may be the reason for their deviant shape. The particles *á* of near future and *áy* of distant future only occur immediately before a verb, as in (36), so they

are bound morphemes, and they might therefore be considered to be prefixes; but unlike the suffixes, they are not phonologically integrated in the verb. Thus, they are tonally invariant, whereas the underlying tones of verbal suffixes may depend on the tonal class of the verbal root, see 6.7 below. Similarly, the preverbal particles, unlike suffixes, are not involved in any segmental processes that may take place in a verb, such as vowel harmonization, see 4.2 below. Since their phonological status is thus neither that of a phonological word nor that of an affix, they should probably be categorised as clitics, but I have made the arbitrary decision not to indicate this, and transcribe them as words.

- (36) á ʔám ʔdú́bá́n ‘He/She is going to eat polenta.’
 FUT1 eat polenta
- áy ʔám dú́bá́n ‘He/She will eat polenta.’
 FUT2 eat polenta

Other *V* and *VC* function words are the personal pronouns à ‘I’, ì ‘you’ (2SG), í ‘we’ (1PLIN) and ín ‘we’ (1PLEX). Like the other monosyllabic personal pronouns, wá ‘you’ (2PL) and gá ‘they’, they are also restricted to occurring in preverbal position, either immediately before the verb, as in (37a), or coalescing with a following particle, as in (37b-c). In (37b) the pronoun à coalesces with the negation particle *aná*, which creates a *VV* syllable, and in (37c) it coalesces with the distant future particle *áy*, which creates a *VVC* syllable. Like the future tense particles, the monosyllabic personal pronouns are bound morphemes in the sense that they are not citation forms, and unlike the subject suffixes they are tonally invariant underlyingly and could therefore be categorized as clitics. The corresponding citation forms of the personal pronouns are disyllabic, and they are not vowel-initial, but begin with a glottal stop: ʔáanís ‘I’, ʔiinís ‘you’ (2SG), ʔúgís ‘we’ (1PLIN), ʔónók ‘we’ (1PLEX).

- (37) a. í ʔám ʔdú́bá́n ‘We are eating polenta.’
 1PLIN eat polenta
- b. à -aná ʔám -ʔbí ‘I am not eating.’
 1SG-not eat -AP
- c. á -áy ʔám dú́bá́n ‘I will eat polenta.’
 1SG -FUT2 eat polenta

There seem to be no further restrictions on the combination of syllable types within a word. For instance, all logically possible combinations of the four syllable types *CV*, *CVC*, *CVV* and *CVVC* have been attested in disyllabic nouns, as illustrated in (38), where dots indicate syllable boundaries, while hyphens indicate morpheme boundaries. There can, for example, also be a sequence of four syllables with a long vowel, as in the verb form in (39), which constitutes a complete sentence.

- | | | | |
|------|---------------|------------------|-------------------------------|
| (38) | CV.CV | ʃɪd̥ɪ | ‘he-goat’ |
| | CV.CVC | lɛg -ɪt̥ | ‘tooth’ |
| | | teeth -SG | |
| | CV.CVV | kày -áa | ‘my sister’ |
| | | sister -1 | |
| | CV.CVVC | ʃàpúuɬ | ‘cat’ |
| | CVC.CV | bàrt̥ɪ | ‘slave’ |
| | CVC.CVC | ʃámpír | ‘mat’ |
| | CVC.CVV | wàŋ -gír | ‘my eye’ |
| | | eye -SG:1SG | |
| | CVC.CVVC | wàt̥ -kík | ‘my buttocks’ |
| | | buttocks -PL:1SG | |
| | CVV.CV | ʔúud̥ú | ‘ostrich’ |
| | CVV.CVC | ʔáarák | ‘person’ |
| | CVV.CVV | kír -í | ‘my foot’ |
| | | foot -SG:1SG | |
| | CVV.CVVC | d̥ímáaɬ | ‘bird’ |
| | | bird:SG | |
| | CVVC.CV | kúuŋkí | ‘dough’ |
| | CVVC.CVC | d̥òund̥òl | ‘chameleon’ |
| | CVVC.CVV | t̥òŋgáa | ‘locust’ |
| | CVVC.CVVC | wìnd̥òun | ‘magician’ |
| (39) | ʔáaŋ -áaɬ | -ùuɬ -éé -r | ‘You were pushing it hither.’ |
| | push -CP:CONT | -PST -2PL -ASS | |

As seen above, a word consists of a root and zero or more suffixes, while there are no true prefixes. Virtually all verbal roots are monosyllables with the shape $CV(V)C$, but verb forms may consist of up to at least five syllables, as in the sentences in (40).

- (40) ḡám -áḡ -^lúut -í -^lwéé -r ‘We used to eat it.’
 eat -HAB -PST -PASS -IPLIN -ASS
- ḡállḡ -áaḡ -^lúuḡ -íki -r ‘They were pushing it hither.’
 push -CP:CONT -PST -3PL -ASS
- púr -úz -^lúuḡ -ónò wàḡ ‘We hoed the field for him/her.’
 hoe -BEN -PST -IPLX field

Many morphologically simple nouns are monosyllables with the shape $CV(V)C$ like verbal roots; but there are also many simplex nouns with more syllables.

4. Vowels.

4.1. Inventory and distribution of vowels. Kurmuk has ten vowel qualities, and they are divided into two symmetrical sets distinguished by the feature [ATR] (Advanced Tongue Root) as indicated in Table 2. For all ten qualities there is a binary length contrast between short and long.⁶ In monosyllabic words, however, the mid [+ATR] qualities [e] and [o] are very rare. They do not occur in monosyllabic verb forms, and they have only been attested in two words that are not function words, viz. the noun *mòo* ‘beer’ and the numeral *ḡḡoḡ* ‘five’, so they have at the most a marginal phonemic status, see below. The occurrence of the other eight vowel qualities and their two lengths in monosyllables are exemplified in Table 3 with singular nouns.

Table 2: Vowel Qualities

	[-ATR]				[+ATR]			
high	i			u	i			u
mid		ɛ	ɔ		(e)		(o)	
low			a				ʌ	

⁶ When I mention vowel qualities irrespective of vowel length, I use single vowel symbols, without implying that the vowels are short.

- (43) kòḍí 'stick'
béékúm 'monkey species'
- (44) a. lèg -ìṭ 'tooth'
teeth -SG
- b. ṭèel -ìn 'lower legs'
lower.leg -PL
- c. ʔókúr 'chickens'
chicken:PL

In such words the mid [+ATR] qualities [e] and [o] are distributional variants of the mid [-ATR] qualities /ɛ/ and /ɔ/, brought about by regressive [ATR] assimilation, see section 4.2 below; or [o] is a rounded variant of /ʌ/ conditioned by a following [u], as in (44c), see section 4.3 below. However, [e] and [o] also occur in some words in which those conditions do not obtain. Thus, there are monosyllables with [e] and [o], as in (45), and there are words with more syllables in which [e] and [o] are not followed by /i/ or /u/, as illustrated in (46). In such words, which seem to be rather few, [e] and [o] must probably be analysed as having a separate phonemic status.

- (45) tèe 'why' (interrogative)
mòò 'beer'
ḍòof 'five'
ḡòò 'what' (interrogative)
kóon 'other'
- (46) àṅḍòlòolò 'ram'
múkúl'ée 'maize'
ḍórée 'hammer'

4.2. [ATR] harmony. In monomorphemic nouns with more than one syllable, all vowels normally belong to the same [ATR] set, except that the low [-ATR] quality [a] also co-occurs with the [+ATR] qualities [i], [u] and [ʌ]. In the examples given in (47), all the vowels belong to the [-ATR] set, and in (48) they all belong to the [+ATR] set. The examples in (49) show that [a] can co-occur with [+ATR] vowels.

- | | | |
|------|-----------|------------------------|
| (47) | kòrpe | ‘boat’ |
| | ḍóŋgól | ‘cock’ |
| | kúrót | ‘play ground’ |
| | gùuzim | ‘blacksmith’ |
| | kídɨʃ | ‘pot type’ |
| | kúutár | ‘pig’ |
| | kábíl | ‘sheep’ (sg.) |
| | ʃílkát | ‘broom’ |
| | | |
| (48) | búurí | ‘twin’ |
| | kúlár | ‘porcupine’ |
| | yállɨʃ | ‘python’ |
| | múumúl | ‘diviner’ |
| | tállkál | ‘vulture’ |
| | | |
| (49) | ʃàrí | ‘ghost’ |
| | zàagúl | ‘worm’ |
| | àbùurà | ‘buffalo’ |
| | àlbàambáy | ‘sweet potato species’ |

Two exceptions have been encountered: in the nouns in (50) the [+ATR] quality [u] co-occurs with the [-ATR] quality [ɨ].

- | | | |
|------|-------|-----------|
| (50) | púrí | ‘cloth’ |
| | rúnzí | ‘rainbow’ |

In words with suffixes that contain a vowel, the situation is more complex. To some extent, there is vowel harmony based on the [ATR] feature across morpheme boundaries within a word.⁷ In this respect the suffixes fall into four classes:

⁷ [ATR] harmony is a feature of Nilotic languages in general, thus occurring in all three main branches of this language family, viz. Western Nilotic, Eastern Nilotic and Southern Nilotic. The vowel harmony in Bari, an Eastern Nilotic language, was already described by Spagnolo (1933), and further studies of vowel harmony in this language are Hall & Yokwe (1978) and Steinberger & Vago (1987). The vowel harmony in Turkana, another Eastern Nilotic language, was first described by Dimmendaal (1983) and has subsequently been discussed by Vago & Leder (1987) and Noske (1990, 1996). As for Southern Nilotic languages, see

Class 1: Suffixes which are invariably [-ATR] and which do not affect the quality of preceding vowels.

Class 2: Suffixes which are invariably [+ATR] and which spread this feature to preceding non-low [-ATR] vowels.

Class 3: Suffixes which vary between [-ATR] and [+ATR] in harmony with the preceding vowel.

Class 4: Suffixes which vary between [-ATR] and [+ATR], but where the direction of the harmonization is dependent on the height of the root vowel.

These four classes will be dealt with in turn.

Class 1 suffixes have a [-ATR] vowel which does not vary with the corresponding [+ATR] vowel and which does not affect the quality of preceding vowels. The majority of suffixes belong to this class. As exemplified below, all of the five [-ATR] qualities, except [ʊ], have been attested in such suffixes.

An invariable /ɪ/ occurs for instance in the passive suffix -(C)ɪ. Table 4 shows this suffix after stems with each of the eight root vowel qualities.

Table 4: The Passive Suffix -(C)ɪ After Stems With Each of the Eight Root Vowel Qualities

	/ɪ/	l̩m-p̩-r	‘dig’
	/ɛ/	m̩n-t̩-r	‘twist’
[-ATR]	/a/	ʔ̩m-p̩-r	‘eat’
	/ɔ/	k̩ɔ-ʃ̩-r	‘take’
	/ʊ/	p̩t-t̩-r	‘wash’
	/i/	p̩in-t̩-r	‘encircle’
[+ATR]	/ʌ/	n̩ʌk-t̩-r	‘beat, kill’
	/u/	k̩ʃ-t̩-r	‘not know’

Rottland (1982) and for instance Creider & Creider (1989). Most of the Western Nilotic languages also exhibit [ATR] harmony, see for instance Tucker (1994) on Dholuo, Lojenga (1991) on Alur, Noonan (1992) on Lango, Andersen (1989) on Pāri, Reh (1996) on Anywa, Gilley (1992) on Shilluk, Andersen (1999c) on Mayak, and Andersen (2006) on Jumjum. A few Western Nilotic languages are devoid of vowel harmony, including Dinka (Andersen 1987) and Mabaan (Andersen 1999b), but this is an innovation.

Another suffix with an invariant [-ATR] vowel is -(C)ən, which forms a singular participle from transitive verbal roots. As illustrated in (51), the vowel of the suffix is [ɔ] both after the [-ATR] stem *pél-* and after the [+ATR] stem *úr-*.

- | | | | | |
|------|---------|----|-----------------|--------------------------|
| (51) | kòkók | ʔá | ʔpél -gón | ‘The meat is roasted.’ |
| | meat | be | roast -PTCPL:SG | |
| | dúbán | ʔà | ʔúr -gón | ‘The polenta is cooked.’ |
| | polenta | be | stir -PTCPL:SG | |

An invariable /aa/ occurs in the singulative suffix *-aaʔ*, and an invariable /εε/ in the 2nd person plural subject suffix *-éε*, as seen in (52) and (53), respectively.

- | | | | |
|------|-----------------|---------------|------------|
| (52) | <i>Singular</i> | <i>Plural</i> | |
| | bèɛl-áaʔ | béɛl | ‘cane’ |
| | bùur-àaʔ | búur | ‘mushroom’ |
| (53) | bùɔ -éε | | ‘Run!’ |
| | run -2PL | | |
| | ʔùr -éε | | ‘Stir!’ |
| | stir:AP -2PL | | |

Suffixes of Class 2 have an invariably [+ATR] high vowel. They impose their [ATR] value on preceding non-low [-ATR] vowels, as exemplified by the 2nd person singular subject suffix *-i* in Table 5 and the 2nd person singular possessive suffix *-(C)u* in Table 6. In this way the non-low [-ATR] qualities /ɪ,ɛ,ɔ,u/ are realized as [i,e,o,u], while the low [-ATR] quality /a/ is left unaffected.⁸

⁸ It is not clear whether a Class 1 suffix can be followed by a Class 2 suffix and then undergo harmony.

Table 5: Vowel Harmony Imposed by the 2nd Person Singular Subject Suffix -i

		<i>Stem</i>	<i>2SG form</i>	
[-ATR]	/ɪ/	ʔíɪd-	ʔíɪd-í-r	‘cut’ (multiplicative stem)
	/ɛ/	gèp	gèb-í-r	‘cut’
	/a/	ʔàm	ʔàm-í-r	‘eat’
	/ɔ/	kóɔy	kóy-í-r	‘take’
	/ʊ/	rùuɬ	rúuɬ-í-r	‘transplant’
[+ATR]	/i/	wík-	wík-í-r	‘throw’ (centrifugal stem)
	/ʌ/	ʔʌt	ʔʌd-í-r	‘pull’
	/u/		(unattested)	

Table 6: Vowel Harmony Imposed by the 2nd Person Singular Possessive Suffix -(C)u

		<i>Stem</i>	<i>2SG form</i>	
[-ATR]	/ɪ/	kíir	kíir-ú	‘leg, foot’
	/ɛ/	ɬél	ɬél-ú	‘lower leg’
	/a/	gáaláɬ	gáaláɬ-ú	‘hand’
	/ɔ/	ɖóɔl	ɖóol-ú	‘anus’
	/ʊ/	túk	túg-ú	‘mouth’
[+ATR]	/i/	lègìɬ	lègìɬ-ú	‘tooth’
	/ʌ/	ʔʌʌm	ʔóom-bú	‘thigh’
	/u/	ʔùuŋ	ʔúuŋ-gú	‘knee’

In Class 3 suffixes the vowel varies between [-ATR] and [+ATR] in harmony with the root vowel. Some of these suffixes are productive, but only occur after roots with one of the following five vowel qualities: the high [-ATR] vowels /ɪ,ʊ/ and the [+ATR] vowels /i,ʌ,u/. Thus, these suffixes only occur after verb roots that have undergone Vowel Quality Shift, see section 4.4 below. One example is the antipassive suffix -(C)_I ~ -(C)_i, as illustrated in Table 7. While Class 1 suffixes are underlyingly [-ATR] and Class 2 suffixes underlyingly [+ATR], Class 3 suffixes may be taken to be underlyingly unspecified for [ATR].

Table 7: The Antipassive Suffix -(C)*t* ~ -(C)*i*

[-ATR]	/ɪ/	g̃ɪp-í-r	‘He/She is cutting’
	/ʊ/	l̃òt̃-í-r	‘He/She is pulling’
[+ATR]	/i/	ḥik-í-r	‘He/She is breaking (something)’
	/ʌ/	ʔʌm-bí-r	‘He/She is eating’
	/u/	pùt-í-r	‘He/She is washing (clothes)’

Other suffixes which exhibit the same kind of variation, but which are possibly not productive, are for instance the plural noun suffix *-it̃* ~ *-it̃*, as in (54), and the singulative noun suffix *-at̃* ~ *-ʌt̃*, as in (55).

(54)	<i>Singular</i>	<i>Plural</i>		
	/ɪ/	ḡɪr	ḡɪr-ít̃	‘knife’
	/a/	kàal	kál-ít̃	‘garden’
	/ɔ/	bòom	bóm-ít̃	‘throwing stick’
	/i/	bíiŋ	bíiŋ-ít̃	‘hide’
	/ʌ/	pʌʌm	pʌm-ít̃	‘mountain’
	/u/	túuŋ	túŋ-ít̃	‘horn (as musical instrument)’
(55)	<i>Singular</i>	<i>Plural</i>		
	/ɪ/	píd-át̃	pít	‘shell’
	/a/	wár-át̃	wár	‘shoe’
	/ʊ/	kúm-át̃	kúm	‘egg’
	/i/	tíd-ʌt̃	tít	‘witch-doctor’
	/ʌ/	ʔʌʌw-ʌt̃	ʔʌʌw	‘bone’

Class 4 includes the past tense suffix. This suffix has several allomorphs, but most of them contain a short or long [u] or [ʊ]. Table 8 illustrates the distribution of [u] and [ʊ] after simplex transitive stems in sentences like (56b), which is the past tense counterpart of the present tense sentence (56a).

(56)	a.	à	bóor	d̃éɛl	‘I am skinning a goat.’
		1SG	skin	goat	
	b.	à	bóor-ú	d̃éɛl	‘I skinned a goat.’
		1SG	skin -PST	goat	

- (61) ʔáarák ʔʰááŋ -ááɗ -ʔúu gúr -íʔ
 person push -CP:CONT-PST stone-SG
 ‘The man was pushing a stone hither.’

However, a short suffix vowel /i/ assimilates to a long /uu/ of a following suffix, and in that case the root-vowel quality /ʌ/ is rounded, as seen in (62)-(63). The noun forms in (62) contain a plural suffix, which is *-in* in the unpossessed form in (62a). Before a possessive suffix this plural suffix is reduced to *-i*, as seen in (62b) before the 3rd person singular suffix *-gɪk*. In (62c) the reduced plural suffix is followed by the 2nd person singular suffix *-guuk*, and it assimilates to this suffix with the result that the vowel /ʌ/ in the root ʔʌm- undergoes rounding to [o].

- (62) a. ʔʌm -in ‘thighs’
 thigh -PL
 b. ʔʌm -í -ʔgɪk ‘his thighs’
 thigh -PL-PL:3SG
 c. ʔóm -ú -ʔguúk ‘your thighs’
 thigh -PL-PL:2SG

The same phenomenon is illustrated by the verb forms in (63). In (63a) the root ʔʌp- is followed by the benefactive suffix *-iz-*. In (63b) the latter is followed by the past tense suffix *-uud-*, to which it assimilates, whereby the root surfaces as [ʃoop].

- (63) a. ʔáarák ʔʰááɗ -íz -á kòòkòòk
 person cook -BEN -1SG meat
 ‘I am cooking meat for the man.’
 b. ʔáarák ʔʰóop -úz -úuɗ -à kòòkòòk
 person cook -BEN -PST -1SG meat
 ‘I cooked meat for the man.’

4.4. Vowel Quality Shift. In addition to phonologically conditioned variation in vowel quality, there is also a recurrent, but grammatically conditioned, set of alternations in the vowel quality of roots. This set, which is shown in Table 9, will be referred to as Vowel Quality Shift, and it is exploited in verbal derivation and in number inflection of nouns. As shown in the table, it consists in an alternation between a basic vowel quality and a shifted vowel quality. Only basic vowels

which are [-ATR] are affected, and the corresponding shifted vowels are either [+ATR] with the same height or [-ATR] with a different height. Thus, the high and low vowels are shifted to [+ATR], while the mid vowels / ε, o / are shifted to the high vowels / i, u /.

Table 9: Vowel Quality Shift

	<i>Basic</i>	<i>Shifted</i>
	i	i
	ε	i
[-ATR]	a	\wedge
	o	u
	u	u
	i	i
[+ATR]	\wedge	\wedge
	u	u

This grammatically conditioned set of root vowel alternations is also found in the closely related language Mayak. As has been argued for that language (Andersen 1999c), Vowel Quality Shift can be explained historically as reflecting a former [ATR] alternation which has been obscured by mergers in the original Proto-Western Nilotic vowel system, namely a merger of original */ $\text{e}/$ and */ $\text{o}/$ with original */ $\text{i}/$ and */ $\text{u}/$. Thus, the [-ATR] mid vowels / $\varepsilon/$ and / $\text{o}/$ originally alternated with their [+ATR] counterparts */ $\text{e}/$ and */ $\text{o}/$, and later on */ $\text{e}/$ and */ $\text{o}/$ changed to / $\text{i}/$ and / $\text{u}/$.

Vowel Quality Shift is used systematically in the formation of several types of derived verb stems, for instance antipassive stems. As mentioned in section 2.3, an antipassive stem is an intransitive stem derived from a transitive root such that the logical object is removed from its valency. Thus, while the underived verb stem in (64a) takes an object, the corresponding antipassive verb stem in (64b) does not. Table 10 shows antipassive stems for all eight vowels of the corresponding roots. The forms given in the table are the ones used in present-tense sentences like those in (64).

- (64) a. $\text{t}\ddot{\text{u}}\text{ul}$ $\text{g}\ddot{\text{e}}\text{p}$ $\text{y}\acute{\text{a}}\text{a}\ddot{\text{t}}$ ‘The child is cutting the tree down.’
 child cut tree
- b. $\text{t}\ddot{\text{u}}\text{ul}$ $\text{g}\ddot{\text{i}}\text{p}\text{-}\acute{\text{i}}$ -r ‘The child is cutting.’
 child cut -AP -ASS

Table 10: Vowel Quality Shift in Antipassive Stems

	<i>Basic</i>	<i>Underived</i>	<i>Shifted</i>	<i>Antipassive</i>	
	/ɪ/	ɸim	/i/	ɸim-bí-r	‘dig’
	/ɛ/	gèp	/ɪ/	gìp-í-r	‘cut’
[-ATR]	/a/	ʔàm	/ʌ/	ʔàm-bí-r	‘eat’
	/ɔ/	lòt	/ʊ/	lùt-í-r	‘pull’
	/ʊ/	pùt	/u/	pùt-í-r	‘wash’
	/i/	pìj	/i/	pìn-zí-r	‘wash hands’
[+ATR]	/ʌ/	ʔàt	/ʌ/	ʔàt-í-r	‘pull’
	/u/	ʔúur	/u/	ʔúr-í-r	‘stir’

Vowel Quality Shift is also used as part of one among several methods of number inflection of nouns. Thus, for many disyllabic noun stems the plural is formed from the singular in the following way:

- a. Long vowels are shortened.
- b. The first vowel undergoes Vowel Quality Shift.
- c. The second vowel becomes high and rounded, and it harmonizes with the first vowel for [ATR].
- d. The surface tone pattern becomes HH (as a manifestation of the underlying tone pattern HL, see section 6.3 below).
- e. /ʌ/ becomes [o] before /u/.

The resulting plural forms, which I call apophonated, share the template $C\acute{V}C(C)\acute{U}(C)$, where U is either /ʊ/ or /u/. The first vowel of the template is either [-ATR] /ɪ/⁹ or /ʊ/, as in (65), or [+ATR] /i/, /u/ or /ʌ/, as in (66). The vowel /ʌ/ becomes [o] before /u/, as in (66b-c), in accordance with the phonological rule of Rounding dealt with in section 4.3 above.

(65) <i>Singular</i>	<i>Plural</i>	
kòrpé	kúrú	‘boat’
ḍòḥgól	ḍúḥgúl	‘cock’
kòḍṭàr	kútúr	‘hoe’

⁹ The /ɪ/ has not (yet) been attested in Kurmuk, but it is found in the closely related language Mayak, for instance in *rikot*, the plural of *reekat* ‘pot type’ (Andersen 1999c: 19).

(66)	<i>Singular</i>	<i>Plural</i>	
a.	dīwār	dīwūr	‘squirrel’
b.	gálám	gólúm	‘kid’
c.	bàrṭi	bórtú	‘slave’
d.	gúďál	gúďúl	‘bull’
e.	kúṭár	kúṭúr	‘pig’
f.	púrí	púrí	‘cloth’

Vowel Quality Shift is also found in suffixed plural nouns with monosyllabic singular counterparts, but more sporadically, as in (67).

(67)	<i>Singular</i>	<i>Plural</i>	
	wìl	wíl-ín	‘tail’
	léɛʃ	líiz-ín	‘elephant’
	káak	kʌʌg-ín	‘snake’
	ḡḡol	ḡḡl-úk	‘limping’
	tùl	tùl-ín	‘child’

5. Consonants.

5.1. Inventory and distribution of consonants. Kurmuk has 19 consonants, whose phonetic properties are indicated in Table 11.

Table 11: Consonant Inventory

	bi- labial	inter- dental	alve- olar	post- alve- olar	pala- tal	velar	labio- velar	glot- tal
voiceless stop	p	t̪	t			k		ʔ
voiced stop	b	d̪				g		
implosive stop			d̪					
voiceless fric.				ʃ				
voiced fricative			z					
nasal	m		n		ɲ	ŋ		
lateral			l					
trill			r					
glide					y		w	

There are pairs of voiceless and voiced stops in three places of articulation: bilabial [p,b], interdental [t̪,d̪] and velar [k,g]. Phonologically, the alveolar implosive stop [ɗ] functions as the voiced counterpart of the voiceless alveolar stop [t], see 4.6 below.¹⁰ The voiced alveolar fricative [z] likewise functions as the voiced counterpart of the voiceless postalveolar fricative [ʃ]. There are four nasals, and three of them, [m,n,ŋ], have the same place of articulation as stops, whereas there are no stops corresponding to the palatal nasal [ɲ]. Phonologically, however, the fricatives [ʃ] and [z] parallel the stops, see section 4.6 below, so they fill this gap.¹¹ Functionally, therefore, the consonant system is organized as shown in Table 12, and this system is a typical Western Nilotic one.

Table 12: Consonant Inventory Reorganized as a Phonological System

		bi-labial	inter-dental	alveolar	palatal	velar	glottal
obstruent	voiceless	p	t̪	t	ʃ	k	ʔ
	voiced	b	d̪	ɗ	z	g	
sonorant	nasal	m		n	ɲ	ŋ	
	lateral			l			
	trill			r			
	glide	w			y		

¹⁰The existence of an implosive consonant /ɗ/ in Kurmuk and other Northern Burun languages makes this branch of Western Nilotic different from most other Western Nilotic languages, see Storch (2005: 76-93). But /ɗ/ is also found in Alur (Ukoko et al. 1964) in the Lwo branch of Western Nilotic, where it contrasts with the plain stops /t/ and /d/, and Dimmendaal (1984, 1988) has provided evidence that the /ɗ/ of this language goes back to Proto-Nilotic */ɗ/. In Kurmuk, however, there is no voiced plain stop [d], and Kurmuk [ɗ] corresponds to [d] in other Western Nilotic languages, cf. for instance Kurmuk *d̪ɛl* 'goat', Mabaan *d̪iɛl̪*, Pāri *d̪iɛl̪*; Kurmuk *d̪im̪aaʔ* 'bird', Mabaan *d̪iin̪*, Agar Dinka *d̪iʔ*, Kurmuk *d̪ɛk* 'three', Mabaan *d̪ɛg̪*, Pāri *ɔ̪d̪og̪*, Agar Dinka *dy̪ak* (reconstructed as Proto-Nilotic **d̪ak* with */ɗ/ by Dimmendaal (1988: 60)). Hence, [ɗ] in Kurmuk (and other Northern Burun languages) is more likely to be an innovation than a retention from Proto-Nilotic.

¹¹The existence of fricatives is another feature that makes Kurmuk different from most other Western Nilotic languages, see Storch (2005: 76-93). The Kurmuk sibilants /ʃ/ and /z/ correspond to the palatal stops /c/ and /j/ in Mayak cognates, as in Kurmuk *k̪iʃ* 'bee', Mayak *kic*, and in Kurmuk *zɔ* 'chest', Mayak *jɔk*. The use of [ʃ] and [z] in Kurmuk is possibly due to influence from the neighbouring language Berta, which has both of these fricatives, but not palatal stops, as core phonemes (Andersen 1993: 57).

Table 13 shows the distribution of the consonants in terms of three positions in a word. The voiceless obstruents, apart from [ʔ], and the sonorants, apart from [ɲ], all occur word-initially, intervocally and word-finally. The voiced obstruents, on the other hand, occur word-initially and intervocally, but not word-finally. Thus, there is no voice contrast in morpheme-final obstruents, whether the morphemes are roots or $-(V)VC$ suffixes.

Two consonants have a more awkward defective distribution. The glottal stop [ʔ] occurs only in word-initial position;¹² and the palatal nasal [ɲ] does not occur word-initially, but it occurs intervocally and word-finally. Although, in this way, [ʔ] and [ɲ] are in complementary distribution, they will not be considered variants of the same phoneme. Their defective distribution is due to two historical sound changes in root-initial position: Proto-Western Nilotic (PWN) */c/ has become /ʔ/ in the Burun languages,¹³ and PWN */ɲ/ has become /y/ in the Northern Burun languages (Andersen 2006: 9-10).¹⁴

¹²The glottal stop exceptionally occurs in word-medial position in the interjection $\varepsilon\text{?}\acute{\varepsilon}$ ‘no’.

¹³The change */c/ > /ʔ/ in Kurmuk (and in the Burun family as a whole) is attested by cognate series like the following: Kurmuk $\text{ʔ}\acute{\alpha}ak$ ‘milk’, Mabaan $\text{ʔ}\acute{\alpha}ak\acute{\lambda}$, Pāri $c\acute{\alpha}ak$, Agar Dinka $c\acute{a}$; Kurmuk $\text{ʔ}\acute{o}r\acute{\alpha}k$ ‘blind’, Pāri $c\acute{\upsilon}r$, Agar Dinka $c\acute{\upsilon}r$. But /ʔ/ in Kurmuk also has another source, as attested by cognate series in which it corresponds to /ʔ/ in Pāri and to either [w], [w] or [y] in the Agar dialect of Dinka according to the quality of the following vowel. Thus, Agar Dinka has a velar approximant [w] before non-high vowels, a palatal approximant [y] before high front vowels, and a labio-velar approximant [w] before high back vowels, cf. Kurmuk $\text{ʔ}\acute{\lambda}\acute{\alpha}m$ ‘thigh’, Mabaan $\text{ʔ}\acute{\lambda}\acute{\alpha}m$, Pāri $\text{ʔ}\acute{\lambda}\acute{\alpha}m$, Agar Dinka $u\acute{q}am$; Kurmuk $\text{ʔ}\acute{\alpha}\acute{\alpha}n\acute{\imath}f$ ‘I’, Pāri $\text{ʔ}\acute{\alpha}\acute{\alpha}n\acute{\imath}$, Agar Dinka $u\acute{e}\acute{e}\acute{e}n$; Kurmuk $\text{ʔ}\acute{\lambda}\acute{\imath}$ ‘house’, Mabaan $\text{ʔ}\acute{\lambda}\acute{\alpha}n\acute{\lambda}$, Pāri $\text{ʔ}\acute{\imath}\acute{\imath}\acute{\omega}$, Agar Dinka $u\acute{q}\acute{\imath}$; Kurmuk $\text{ʔ}\acute{\imath}\acute{\imath}n\acute{\imath}f$ ‘you’ (2SG), Mabaan $\text{ʔ}\acute{\imath}$, Pāri $\text{ʔ}\acute{\imath}\acute{\imath}n\acute{\imath}$, Agar Dinka $y\acute{\imath}\acute{\imath}n$; Kurmuk $\text{ʔ}\acute{\imath}\acute{\imath}$ ‘climb’, Pāri $\text{ʔ}\acute{\imath}\acute{\imath}$ -, Agar Dinka $y\acute{\imath}\acute{\imath}$; Kurmuk $\text{ʔ}\acute{\imath}\acute{\imath}\acute{\upsilon}\acute{\upsilon}$ ‘ostrich’, Pāri $\text{ʔ}\acute{\imath}\acute{\imath}\acute{\upsilon}\acute{\upsilon}$, Agar Dinka $w\acute{\imath}\acute{\imath}$; Kurmuk $\text{ʔ}\acute{\omega}mb\acute{\omega}n$ ‘nose’, Pāri $\text{ʔ}\acute{\imath}\acute{\imath}m$, Agar Dinka $w\acute{\imath}\acute{\imath}m$. Dimmendaal (1988:9f) suggested that this consonant goes back to a Proto-Nilotic */q/.

¹⁴The change */ɲ/ > /y/ in Kurmuk is attested by cognate series like the following: Kurmuk $y\acute{\alpha}\acute{\alpha}n$ ‘crocodile’, Mabaan $\text{ɲ}\acute{\alpha}\acute{\alpha}n\acute{\lambda}$, Pāri $\text{ɲ}\acute{\alpha}\acute{\alpha}n$, Agar Dinka $\text{ɲ}\acute{\alpha}\acute{\alpha}n$; Kurmuk $y\acute{\lambda}\acute{\lambda}\acute{\imath}f$ ‘python’, Pāri $\text{ɲ}\acute{\lambda}\acute{\lambda}\acute{\omega}$, Agar Dinka $\text{ɲ}\acute{e}\acute{e}l$. But again, Kurmuk /y/ also has another source, as attested by cognate series in which it corresponds to /j/ in Mabaan and to /y/ in Pāri: Kurmuk $y\acute{\alpha}\acute{\alpha}t$ ‘tree’, Mabaan $\text{ɲ}\acute{\alpha}\acute{\alpha}n\acute{\lambda}$, Pāri $y\acute{\alpha}\acute{\alpha}t$; Kurmuk $y\acute{\omega}m$ ‘monkey species’, Mabaan $\text{ɲ}\acute{\imath}\acute{\imath}u\acute{\alpha}m\acute{\lambda}$, Pāri $\acute{\alpha}^1y\acute{\omega}m$.

Table 13: Distribution of Consonants

	<i>Word- initial</i>	<i>Inter- vocalic</i>	<i>Word- final</i>
p	+	+	+
ṭ	+	+	+
t	+	+	+
ʃ	+	+	+
k	+	+	+
b	+	+	-
ḍ	+	+	-
d̥	+	+	-
z	+	+	-
g	+	+	-
m	+	+	+
n	+	+	+
ɲ	-	+	+
ŋ	+	+	+
l	+	+	+
r	+	+	+
y	+	+	+
w	+	+	+
ʔ	+	-	-

5.2. The pair /ʃ,z/. Although /z/ is the voiced counterpart of /ʃ/, its point of articulation is different: /z/ is alveolar, while /ʃ/ is postalveolar. This difference has a consequence after the palatal nasal /ɲ/, as seen in the verb forms in (68)-(69). The root-final consonant of the verbs in question is underlyingly a palatal /ɲ/, as evidenced by the (a)-clauses, where the consonant is palatal in intervocalic position and in word-final position, respectively. /z/ changes the preceding palatal /ɲ/ to an alveolar [n], as in the (c)-clauses, while /ʃ/ does not, as in the (b)-clauses.

(68) a. mí -n góɲɲ -á †ʃákál
 woman -SG scratch -CONT pot
 ‘The woman is scratching the pot.’

b. ʃákál †góɲɲ -ʃɪ ɲ̀ mí -n
 pot scratch -PASS by woman -SG
 ‘The pot is being scratched by the woman.’

c. *ʃákál* ^l*góon* -z -*át* -*ì* *ɲà* *mí* -n
 pot scratch -CF -CONT -PASS by woman -SG
 ‘The pot is being scratched by the woman.’

(69) a. *tùul* *kàɲ* *dùlg* -*ìn* ‘The child is picking money up.’
 child pick.up money -PL

b. *ɲòo* *kàɲ* -*ʃì* *ɲà* *tùul* ‘What is being picked up by the child?’
 what pick.up -PASS by child

c. *tùul* *kàn* -*zí* -r ‘The child is picking up.’
 child pick.up -AP -ASS

5.3. The glottal stop /ʔ/ and vowel coalescence. Since the glottal stop [ʔ] only occurs word-initially, it might be suggested that it is just a possible manifestation of the absence of a consonant, i.e., that words with alleged /ʔ/ actually begin with a vowel. However, the glottal stop differs from the absence of a consonant, as evidenced by the possibilities of vowel coalescence. A word-initial vowel may coalesce with a preceding vowel, see (70). In (70a) the initial /a/ of the borrowed noun *àlgálám* ‘pen’ coalesces with the /a/ of the preceding preposition *bà* ‘of’ into one long vowel [aa]. In (70b), similarly, the pronoun *à* ‘I’ coalesces with the preceding conjunction *ɲà* ‘while’. If, by contrast, the word begins with a glottal stop, no coalescence takes place. In (71), for instance, there is a phonetically prominent [ʔ] between the pronoun *à* and the /a/ of the following verb stem.

(70) a. *ʔáarák* *ʔòt*-*í* *ʔí* *bà-àlgálám*
 person put -CF PRO:PL of -pen
 ‘The man is paying for the pen.’

Lit. ‘The person is putting those (i.e. the money) of the pen.’

b. *à* *ʔóok* -*úḍ* -*ʔíkí* *ɲà* -a *ʔàm* *kòokóok*
 1SG see:CF -PST -3PL while-1SG eat meat
 ‘They saw me eating meat.’

(71) *à* *ʔàm* *dúbán*
 1SG eat polenta ‘I am eating polenta.’

The copulative verb *ʔa(g-)* ‘be’ begins with a glottal stop, as seen in its past tense form in (72). But in its non-past tense form *ʔà*, the glottal stop is often elided after another word. This elision may occur whether the preceding word ends in a consonant, as in (73a), or in a vowel, as in (73b-c). In the latter case the elision is accompanied by vowel coalescence, /àʔà/ and /iʔà/ being realized as [àa] and [ìi].

(72) ʔáarák ʔáná ʔág-ú ʔúúr -ók ‘The man was not blind.’
 person not be -PST blind -SG

(73) a. à wàaŋ kízúk ʔík -à ʔíw -ím
 1SG burn leaves PRO:PL -be dry -PTCPL:PL
 ‘I am burning the dry leaves.’

b. à -a bòr -òk
 1SG-be afraid -SG
 ‘I am afraid.’

c. ì -i bòr -òk
 2SG-be afraid -SG
 ‘You are afraid.’

5.4. Glide insertion. If a vowel-initial suffix is added to a vowel-final stem, a glide may be inserted between the two vowels: [w] after a rounded vowel, [y] after an unrounded vowel. Glide insertion, which prevents hiatus, has been attested between noun stems and the plural suffix *-aak*, as in (74), and between the centripetal suffix *-u* and the 2nd person plural subject suffix *-éé*, as in (75).

(74) *Singular* *Plural*
 àndòlòolò àndòlòolò -w -áak ‘ram’
 kòdí kòdí -y -áak ‘stick’
 àbùurà àbùurà -y -áak ‘buffalo’

(75) ʔòd-ú -w -éé ‘Come!’
 go -CP -2PL

5.5. Heterosyllabic clusters. Two consonants may be adjacent across a syllable boundary within a word. On such heterosyllabic clusters the following observations can be made:

- a. The first consonant is a sonorant, whether a nasal, a liquid or a glide.
- b. The second consonant is normally an obstruent. Words in which the second consonant is a sonorant are probably all loanwords, such as nouns of Arabic origin which begin with /ʔl/, in Arabic the definite article.
- c. Nasal plus obstruent are mostly homorganic, and always so in verbs.
- d. The two consonants are often heteromorphemic, and always so in verbs.

The consonant clusters attested thus far in words that are not of Arabic origin are exemplified in Table 14. Additional clusters occurring in nouns of Arabic origin are for instance /lm/, /lb/ and /lp/, as in *àlmáafik* ‘tongs type’, *àlbáal* ‘attention’ and *àlpúul* ‘bean’.

Table 14: Heterosyllabic (Homomorphemic or Heteromorphemic) Consonant Clusters

/mb/	kám b ál		‘girl’
/mp/	ʔám-pì	-r	‘It is being eaten.’
	eat	-PASS -ASS	
/mɖ/	yóm	-ɖán	‘monkeys’
	monkey.species	-PL	
/mg/	kòm	-gúrk	‘my kidneys’
	kidneys-PL:1SG		
/nd/	rún	-ɖán	‘years’
	year	-PL	
/nt/	ʔón t ál		‘cotton’
/nd/	ʔín	-ɖínáaɖ	‘intestine’
	intestines	-SG	
/nt/	mèn	-tì -r	‘It is being twisted.’
	twist	-PASS -ASS	
/nz/	rún z í		‘rainbow’
/ng/	mèn	-gòn	‘twisted’
	twist	-PTCPL:SG	
/nʃ/	kà n	-ʃì -r	‘It is picked up.’
	pick.up	-PASS -ASS	
/ŋg/	mò ŋ gòn		‘name’
/ŋk/	bí l íŋkìʃ		‘bat’

/ld/	g̀il -đim lion -PL	‘lions’
/lt/	kàl -t̃ -r steal-PASS -ASS	‘It is stolen.’
/lg	kòlgón	‘fat’
/lk/	ʃilkát	‘broom’
/rb/	àbùrbùtù	‘butterfly’
/rp/	kòrpé	‘boat’
/rd/	wìr -đim river -PL	‘rivers’
/rt/	bàrt̃i	‘slave’
/rf/	?èr -f̃i -r break-PASS -ASS	‘It is broken.’
/rg/	?èr -gòn break-PTCPL:SG	‘broken’
/rk/	kùrk-ón nail -SG	‘nail’
/yd/	bùy -đim ant.hill -PL	‘ant-hills’
/yd/	b̀l̀y -đii beard-SG:1SG	‘my beard’
/yg/	kóygót	‘hunger for meat’
/wg/	?̀ΛΛw-g̀ik bones -PL:3SG	‘his bones’

Basically, there are no geminate consonants in Kurmuk; but interdental [t̃] and [d̃] may arise as a result of optional deletion of the vowel in the past tense suffix *-uđ-* ~ *-uť-* after roots ending in an interdental stop. Thus we get minimal pairs like those in (76)-(77), where the present tense form has a single [t̃] or [d̃], while the past tense form has a geminate [t̃t̃] or [d̃d̃]. See further in section 6.5 below.

- (76) múur m̃éť-ì ìii ‘The gazelle is being killed.’
gazelle.species beat -PASS dead
- múur m̃éť-ť -ì ìii ‘The gazelle was killed.’
gazelle.species beat -PST -PASS dead

Table 15: Intervocalic Voicing Before the Past Tense Suffix -u

	<i>Non-past tense</i>	<i>Past tense</i>	
/p/	gèp	géb-ú	‘cut’
/t/	yèṭ	yéd-ú	‘cut’
/t/	pùt	púḏ-ú	‘wash’
/ʃ/	ʔùʃ	ʔúz-ú	‘suck’
/k/	dɛ̀k	dé̄g-ú	‘tie’
/m/	ʔàm	ʔám-ú	‘eat’
/n/	mèn	mén-ú	‘twist’
/ɲ/	kàɲ	káɲ-ú	‘pick up’
/ŋ/	wáaŋ	wáaŋ-ú	‘light’
/l/	kàl	kál-ú	‘steal’
/r/	ʔèr	ʔér-ú	‘break’
/y/	kóoy	kóy-ú	‘take’
/w/	wìiw	wíiw-ú	‘lose’

Table 16: Intervocalic Voicing Before the Plural Suffixes -ak and -aak

	<i>Singular</i>	<i>Plural</i>	
/p/	dʎíyíṭ	dʎíyíb- ^l áak	‘termite’
/t/	góṭ	góḏ-ák	‘adze’
/t/	kút	kúḏ-ák	‘nest’
/ʃ/	kíʃ	kíz-ák	‘bee’
/k/	ʔáak	ʔáag-ák	‘net’
/m/	ʔáam	ʔám-ák	‘magician type’
/n/	gáaɲim	gáaɲim- ^l áak	‘sword’
/ɲ/	kúubáɲ	kúubáɲ- ^l áak	‘bark’
/ŋ/	ʃàŋ	ʃàŋ-ák	‘donkey’
/l/	ʃáal	ʃáal-ák	‘garden’
/r/	kúr	kúr-ák	‘chair’
/y/	máay	máay-ák	‘dry season’
/w/	dáw	dáw-ák	‘monkey species’

However, some instances of root-final intervocalic voiced obstruents are not a result of intervocalic voicing. Thus, there is evidence that such consonants sometimes manifest an underlying cluster of two consonants. This is the case, for instance, in verb forms that consist of an underived intransitive stem and the assertive suffix, as in (79).

- (79) t̀òul ẁèεg-ì ‘The child is crying.’
 child cry -ASS
- kámbál †méel-í ‘The girl is dancing.’
 girl dance -ASS
- ḡáarák ḡim-bì ‘The man starts spitting.’
 person spit -ASS

Table 17: Combination of Underived Intransitive Verb Stems with the Assertive Suffix

	<i>Root</i>	<i>Root-ASS</i>	
/p/	léεp	léεb-í	‘rain’
/t/	b̀ùṭ	b̀ùḡ-ì	‘run’
/t/	k̀òut	k̀òuḡ-ì	‘laugh’
/ʃ/	ỳèʃ	ỳèz-ì	‘get torn’
/k/	ẁèεk	ẁèεg-ì	‘cry’
/m/	ḡim	ḡim-bì	‘spit’
/n/	nim	nim-dí	‘lie, sleep’
/ɲ/		(unattested)	
/ŋ/	wáaŋ	wáaŋ-ǵí	‘burn’
/l/	méel	méel-í	‘dance’
/r/	páar	páar-í	‘jump’
/y/	záay	záay-í	‘speak’
/w/	t̀ùw	t̀ùw-ì	‘die’

As illustrated in (79) and as shown in Table 17, the assertive suffix has the form *-ɪ* after root-final obstruents, liquids and glides, but a consonant-initial form *-Cɪ* after root-final nasals. In the latter case the initial consonant of the suffix is a voiced obstruent which is homorganic with the preceding nasal. While the surface forms thus suggest that the underlying consonant is an obstruent, they do not provide any clue as to any particular place of articulation for this consonant, so we may assume that it is underlyingly unspecified in this respect, but that it receives its place of articulation from the preceding nasal.¹⁵ The consonant-initial allo-

¹⁵Alternatively, given that the assertive suffix has the allomorph *-r* after vowels, cf section 2.4 above, one might speculate that the underlying initial consonant of the suffix is /r/.

morph of the suffix may be assumed also to underlie the *-ɪ* allomorph that occurs after non-nasal consonants; and since root-final obstruents here surface voiced rather than voiceless, it may further be assumed that the suffixal consonant is underlyingly specified as [+voiced], symbolized Ç. When *-Çɪ* is suffixed to roots ending in a non-nasal consonant, the place and manner features of the latter are presumably spread to the underlying consonant Ç, which in turn spreads its [+voiced] feature to a preceding obstruent. The result of these processes are geminate consonants across the morpheme boundary, and all of them are then degeminated. Given these rules of Assimilation and Degemination, the verb forms in (79) are derived in the way shown in (80).

(80)	wèɛk-Çì	méɛl-Çí	ḍum-Çì	<i>Underlying representation</i>
	wèɛg-gì	méɛl-lí	ḍum-bì	<i>Assimilation</i>
	wèɛg-ì	méɛl-í	–	<i>Degemination</i>

The assumption of a general phonological rule of Degemination is compatible with the fact that there are no surface geminate consonants in Kurmuk, except for the interdental [ḍḍ] and [tt] mentioned in section 5.5 above. Alternatively, one could assume that the assertive suffix has no initial consonant underlyingly after non-nasal consonants. In that case, the realization of root-final obstruents as voiced in Table 17 could be the same voicing process as that of Tables 15 and 16. However, there is external evidence for a degemination process, at least historically. Thus, in Surkum, another Northern Burun language, the suffixation of the assertive morpheme to an intransitive root results in geminate voiced consonants when the root-final consonant is not a nasal, as in *ʔəɔb-bì* ‘He/She is squatting’, *ləaj-jì* ‘He/She is urinating’, *méɛl-lí* ‘He/She is dancing,’ and *ʔáar-rí* ‘He/She is breathing’.

There is a further complication: The existence of the rule of Intervocalic Voicing does not preclude root-final voiceless obstruents from occurring in intervocalic position in the surface representation. For instance, they surface in such a position in the passive form of underived transitive verbs, as in (81c), which is a passive counterpart of the active sentence (81a). In the passive verb form *pùt-ì-r* in (81c), the root-final voiceless stop [t] occurs before the vocalic passive suffix *-ì*, while the root-final stop is a voiced [d] before the past tense suffix *-u* in (81b).

- (81) a. kámbál pùt púró ‘The girl is washing clothes.’
 girl wash cloth:PL
- b. kámbál ʔpúɗ -ú ʔpúró ‘The girl washed clothes.’
 girl wash -PST cloth:PL
- c. púró pùt -ì -r ‘The clothes are being washed.’
 cloth:PL wash -PASS -ASS

However, there is evidence that root-final voiceless obstruents in the passive form are, again, a manifestation of an underlying sequence of two consonants. Table 18 gives an example of the passive form for almost each of the 13 possible root-final consonants, illustrated with the same roots as in Table 15 above, where the root-final obstruents undergo voicing. As seen in Table 18, the passive suffix has an initial consonant after roots that end in a sonorant. The initial consonant of the suffix is everywhere a voiceless obstruent, but its place of articulation varies: it is homorganic with a preceding nasal or lateral, but it is postalveolar /ʃ/ after alveolar /r/, so that /ʃ/ may be taken to be the underlying value of the consonant.

Table 18: Non-Past Tense Passive Forms of Underived Verbs

	<i>Root</i>	<i>Passive</i>	
/p/	gèp	gèp-ì-r	‘cut’
/t/	yèɬ	yèɬ-ì-r	‘cut’
/t/	pùt	pùt-ì-r	‘wash’
/ʃ/	ʔùʃ	ʔùʃ-ì-r	‘suck’
/k/	dɛk	dɛk-ì-r	‘tie’
/m/	ʔàm	ʔàm-pì-r	‘eat’
/n/	mèn	mèn-tì-r	‘twist’
/ɲ/	kàɲ	kàɲ-ʃì-r	‘pick up’
/ŋ/	wàaŋ	wàaŋ-kì-r	‘light’
/l/	kàl	kàl-tì-r	‘steal’
/r/	ʔèr	ʔèr-ʃì-r	‘break’
/y/	kóoy	kóoy-ʃì-r	‘take’
/w/	wìrw	(unattested)	‘lose’

This analysis is supported by the form of the passive suffix after derived stems. Here the passive suffix is -*ʃì*, with the voiceless obstruent /ʃ/, as in (82b) and (83b). In (82) the derived verb stem is multiplicative, in (83) centrifugal. The

The one-to-many relation between surface obstruents and their underlying representation poses a problem for the analysis of intervocalic obstruents in simplex noun stems, as in (85).

- (85) a. *ʃákál* ‘pot’
 b. *kúuʃár* ‘pig’
 c. *gúďál* ‘ox’
 d. *tàbúr* ‘dust’

If Intervocalic Voicing is a completely general phonological rule, then the voiceless obstruents [k] in *ʃákál* and [t] in *kúuʃár* cannot have intervocalic position in the underlying representation of those words; but there is no evidence as to what a different underlying representation would be. Similarly, there is no way of choosing between different underlying alternatives for the intervocalic voiced obstruents [d] in *gúďál* and [b] in *tàbúr*. A viable solution would seem to be to restrict Intervocalic Voicing to obstruents that occur in root-final position, or, more generally, morpheme-final position. By analysing such obstruents as unspecified for the feature [voice] underlyingly, and by restricting the rule of Intervocalic Voicing to obstruents with this specification, that rule would still be completely general. Hence, I shall assume that the underlying representation of the nouns in (85) is identical to their surface representation.

6. Tones.

6.1. Tone inventory. Kurmuk is a tone language with three underlying tones: high (H) /ˈ/, low (L) /ˌ/, and a compound falling tone (\overline{HL}) /ˈˌ/. There are five different surface tones. Three of them are level tones: high (H), downstepped high (^ˈH), and low (L). Two are contour tones, but they are rare, and both of them must be analysed as composed of two level tones: a rise from low to high (\overline{LH}) and a fall from high to downstepped high ($H^{\overline{ˈ}H}$). At the surface there is no contour tone falling from high to low.

6.2. Surface tones and pitch levels: downdrift and downstep. The pitch of a high tone following a low tone is lower than the pitch of a preceding high tone; that is, Kurmuk has downdrift. In (86), for instance, the high tone of the syllable [kóok] at the end of the sentence has a lower pitch than the high tones of the initial word [kámbál]; the numbers are explained below.

- (86) kám**á**l ʃà**a**p kò**ò**kó**ò**k
 1 1 3 3 1

 1 1 3 3 2
 girl boil meat
 ‘The girl is cooking meat.’

The distance between the pitch of a low tone and that of a following high tone is half the distance between the pitch of a high tone and that of a following low tone. Thus, in a sequence like LHLH, the second H has the same pitch as the first L, as is clear when the utterance is whistled. In (87), for instance, the high tones of [kám**á**l] at the end of the sentence have the same pitch as the low tone of the sentence-initial syllable [kò**ò**].

- (87) kò**ò**kó**ò**k ʃá**a**p -ì ñà kám**á**l
 3 1 1 3 3 1 1
 1 1 1 1 1 1

 3 2 2 4 4 3 3
 meat boil -PASS by girl
 ‘The meat is being cooked by the girl.’

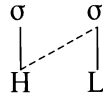
Hence, the relative pitch level of each tone of an utterance can be expressed in terms of integers such that the higher the number the lower the pitch, and it can be calculated as done in (86)-(87). First, all high tones are assigned the value 1 and all low tones, the value 3. Then each time that a high tone follows a low tone, 1 is added to that high tone and to all following tones, and the sums indicate the pitch levels. In (86) the downdrift effect occurs once, in (87) twice. In (88), where only the sums are shown, the downdrift effect occurs three times.

- (88) wà**l**á ì nÉ**É**t ʔÁ**Á**w-à**à**t ʔí**í**án
 3 2 4 3 3 5 4 4
 PROH 2SG suck bones -SG D2:SG
 ‘Don’t suck on that bone!’

In addition to downdrift, Kurmuk also has downstep, which is indicated by the symbol [[↓]]. Thus, a high tone may be lower than an immediately preceding high tone, and the pitch distance between these two high tones is identical to the

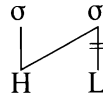
After the low-toned noun *wìnìt* in (92a) the demonstrative has the same tones, LL, as it has in isolation. But after nouns ending in a high tone in (92b-c), it has the tones HL. What happens can be described as follows: the high tone at the end of the noun spreads to the immediately following low-toned syllable (σ), which thereby gets a compound tone \overline{HL} , as indicated in (93), using notational devices of Autosegmental Phonology (Goldsmith 1990).

(93) High Spread:



If \overline{HL} were manifested as such, it would be a contour tone falling from high to low, but Kurmuk has no surface \overline{HL} tone, so it is manifested as a high tone. That is, \overline{HL} is simplified to H by delinking the L component from its syllable, thus setting L afloat, as indicated in (94).

(94) Fall Simplification:



The noun in (92d) has a high tone in both of its syllables, exactly like the noun in (92c). However, it does not have the same effect on the following word as the latter; i.e., High Spread does not apply to *ʔmì* here. In order to explain this, it must be assumed that the noun in (92d) does not end in a high tone underlyingly, but that its second syllable has a low tone which is replaced by the high tone of its first syllable via the rules of High Spread and Fall Simplification already established. Independent evidence for this analysis is given in (95). Here the same four nouns are followed by the demonstrative identifier *ʔmí*, which means ‘this is’, and which forms a non-verbal clause together with the noun.¹⁶

- (95) a. *wìnìt* *ʔmí* ‘This is a rope’
 b. *bùumú* *ʔmí* ‘This is a hyena’
 c. *tʔʔakʔl* *ʔmí* ‘This is a vulture’
 d. *kábíl* *ʔmí* ‘This is a sheep’

¹⁶I have borrowed the term “demonstrative identifier” from Diessel (1999).

Unlike the demonstrative pronoun, the demonstrative identifier carries a high tone in its initial syllable after all of the four nouns, so its initial tone must be underlyingly high. However, after the noun in (95d), this high tone is downstepped, and that is exactly what should be expected if it is preceded by a floating low tone, as hypothesized above.

High Spread is a completely general phonological rule, i.e., it applies whenever the phonological condition is met.¹⁷ The rule is independent of morphological and syntactic boundaries. Thus, the two syllables involved may constitute a word which is either monomorphemic, as in (96a), or contains a suffix, as in (96b), or they may be part of a word with more than two syllables, as in (97). The forms enclosed in slashes show the underlying tones, while the forms without slashes show the surface tones.

- (96) a. ʔáarák /ʔáaràk/ ‘person’
 b. tɔŋ -ín /tɔŋ-ìn/ ‘spears’
 spear -PL
- (97) ʔúudú -wáak /ʔúudù-wáak/ ‘ostriches’
 ostrich -PL
- ʔám -ùṭ -ì -r /ʔám-ùṭ-ì-r/ ‘It has been eaten.’
 eat -PST -PASS-ASS
- ʔám-úḍ -í -r /ʔám-ùḍ-í-r/ ‘He/She has eaten it.’
 eat -PST-3SG-ASS
- ʔám -áḍ -ùḍ -íkí -r /ʔám-àḍ -ùḍ -íkí -r/ ‘They used to eat it’
 eat -HAB -PST -3PL -ASS
- ḥim -búz -úḍ -á -r /ḥim-búz -úḍ -à -r/ ‘I dug for him/her.’
 dig -BEN -PST -1SG-ASS

¹⁷But there are a few monosyllabic low-toned function words that seem to be immune to High Spread, among others the pronoun *ì* ‘you’, as seen in (88) above, and sometimes the preposition *bà* ‘of’, as in (31) above. I have no immediate explanation for these exceptions.

- (105) a. bǒǒkí 'It is white.'
 /bǒ -ákí/
 be.white -PRED
- b. ʔim b̀ kày -áa bó ʔókí 'My sister's is white.'
 /ʔim b̀ kày -áa b̀ -ákí/
 PRO:SG of sister-1 be.white -PRED

6.5. Floating low tones not triggered by High Spread. Given the rules of High Spread and Fall Simplification, we can make three predictions about possible sequences of surface tones in an utterance:

- The tone sequence HL is preceded by H, since the L-toned syllable would otherwise be subjected to High Spread.
- A downstepped H is preceded by HH, since the downstep represents an L that has been set afloat by Fall Simplification of \overline{HL} , whose H component comes from a preceding H-toned syllable by High Spread.
- A downstepped H is not followed by L, since a downstepped H is an underlying H, which would spread to a following L-toned syllable.

These predictions actually hold most of the time, but not always. Most of the exceptions can be explained as being due to vowel deletion or as reflecting lexically inherent underlying falling tones.

Some of the exceptions involve the deletion of a syllable which would otherwise have undergone High Spread. This situation is illustrated in (106) and (107). The (a)-sentences do not conform to the predictions stated above: In (106a) the sequence HL is not preceded by H, but by L, and in (107a) the downstepped H is not preceded by HH, but by LH. However, the sentences in question have the variants (106b) and (107b), which do conform to the predictions. Here the relevant word, a past tense form of the verb 'drink', has the past tense suffix [úǰ], whose vowel has been deleted in (106a) and (107a). The underlying tone of this suffix is low, as indicated in the next lines, and its surface high tone is the result of High Spread and Fall Simplification. The underlying low tone set afloat by the vowel deletion is what prevents the high tone of the root vowel from being spread to the vowel of the subject suffix -̀ in (106a), and it is also what causes the downstep in (107a).

(106) a. ʔàak máaḍ-ḍ -à -r

b. ʔàak máaḍ-úḍ -à -r

/ʔàak máaḍ-ùḍ -à -r/

milk(PL) drink -PST -1SG-ASS

‘I drank the milk.’

(107) a. ʔàak máaḍ-ḍ-í-r

b. ʔàak máaḍ-úḍ -í -r

/ʔàak máaḍ-ùḍ -í -r/

milk(PL) drink -PST -3SG-ASS

‘He/She drank the milk.’

Another example of the same type is given in (108). Here the noun stem *gáalát* ‘hand’ exhibits variation before the third person singular possessive suffix *-í*. Thus, the second vowel of the stem is optionally elided. But its underlying low tone is retained as a floating tone, and that is why the high tone of the suffix is downstepped not only in (108a), but also in (108b).

(108) a. gáalát -í píl -[↓]ákí
/gáalàt -í píl -ákí/
hand -SG:3SG be.painful-PRED

‘His hand is paining.’

b. ɲìr gáalɲ -í
/ɲìr gáal`ɲ -í/
knife hand -SG:3SG

‘the handle of a knife’

For another class of exceptions to the predictions stated above, there is no evidence of synchronically operative syllable deletion. This class involves function words and nouns borrowed from Arabic. Thus, some monosyllabic function words that always surface with a high tone never spread this tone, and a following syllable with an underlying high tone is always downstepped. Examples of such words are the distant-future particle [áy] in (109), the first person plural exclusive pronoun [ín] in (110), and the focus particle [dáa] in (111). The (a)-sentences show the lack of High Spread, and the (b)-sentences show the downstepping of a following high tone. Because of these properties, such words must be analysed as having a floating low tone after their high tone, and this low tone will be taken to be linked to the vowel underlyingly. Thus, such words lexically have a falling

tone, which is subjected to Fall Simplification. The low tone component of such function words might reflect a historical loss of a second, low-toned syllable.

(109) a. áy ʔám dúbáɲ
/ây ʔám dúbàɲ/
FUT2 eat polenta ‘He/She will eat polenta.’

b. áy †láal -á -r pà -díɪ
/ây láal -à -r pà -díɪ/
FUT2 do -1SG-ASS alone -SG:1SG ‘I shall do it myself.’

(110) a. ím ʔám dúbáɲ
/ím ʔám dúbàɲ/
1PLEX eat polenta ‘We are eating polenta.’

b. ím †ʔám -ú †dúbáɲ
/ím ʔám -ù dúbàɲ/
1PLEX eat -PST polenta ‘We ate polenta.’

(111) a. ró -dí †ḍáa pɔ̀ɪ
/rɔ̀ -dí ḍáa pɔ̀ɪ/
body -SG:3SG FOC be.blunt ‘He/She is only lazy.’

b. ʔáaníʃ ḍáa †áy †ʔáḍ -í
/ʔáaníʃ ḍáa ây ʔáḍ -ì/
1SG FOC FUT2 go -CF ‘I will go.’

Some nouns include a syllable that exhibits the same behaviour as the function words dealt with above. They all appear to be loanwords, and at least some of them have been borrowed from Arabic, some of them apparently via Berta. For instance, the nouns in (112) contain the surface sequence LHL, and those in (113) end in the surface sequence LH whose H does not spread to a following word. Therefore, the high-toned syllable of such words must also be analysed as having an underlyingly falling tone, whose low component is set afloat by Fall Simplification. In such words, the floating low tone cannot reflect the loss of a low-toned vowel. The syllable in question is the one that bears the stress in the Arabic source words.

noring underlyingly falling tones, which seem not to occur in native nouns). Examples are given in (115).

(115) /HH/	táakál	‘vulture’
	réeṅóon	‘flower’
	búurí	‘twin’
/HL/	táarak	‘person’
	ríṅít	‘meat’
	gúḍál	‘ox’
/LL/	lègìt	‘tooth’
	mùṅgòn	‘name’
	kòṭàr	‘hoe’
/LH/	ḍimáat	‘bird’
	kòlgón	‘fat’
	bùumú	‘hyena’

However, there seem to be relatively few nouns distinguished solely by tone. Two examples of minimal pairs are given in (116)-(117).

(116)	ʔám	‘thigh’
	ʔám	‘kind of magician’

(117)	ʔámít	‘food’
	ʔámít	‘left hands’ (underlying /HL/), pl. of ʔám ‘left hand’

Verbal roots, virtually all of which are monosyllabic, are also lexically either high-toned, as in (118a), or low-toned, as in (118b-c); but all roots with a short vowel are lexically low-toned, as in (118c). The roots given in (118) are transitive.

(118) a.	máat	‘drink’
	táaŋ	‘push’
	púur	‘hoe’
	wéεf	‘sweep’

b.	p̄it̄	‘sow’
	b̄ε̄er	‘twist’
	k̄λλ̄l	‘push’
	d̄āak	‘finish’
c.	ʔ̄am	‘eat’
	k̄al	‘steal’
	l̄ε̄k	‘break’
	n̄an	‘bite’

Again, verbal roots distinguished exclusively by tone seem to be rare. One example is given in (119).

(119)	p̄aat	‘twist’ (tr. verb)
	p̄aat	‘be wide’ (adjectival verb)

More minimal pairs of lexical items can be found if taken from different word classes, as in (120)-(122).

(120)	r̄ε̄ε	‘two’ (numeral)
	r̄ε̄ε	‘thirst’ (noun)
(121)	m̄in	‘woman’ (noun)
	m̄in	‘from’ (preposition)
(122)	w̄l̄l̄	‘or’ (conjunction)
	w̄l̄l̄	‘do not’ (particle expressing prohibition)

The functional load of tone is considerably heavier in the grammar than in the lexicon. Thus, in many parts of the morphology, tone is what systematically distinguishes one category from another in some morphological contexts. This is illustrated by the minimal pairs in (123)-(129). In each case both the surface tones and the underlying tones (in slashes) are shown.

Examples (123)-(124) illustrate the tonal difference between demonstrative modifiers and demonstrative identifiers.

- (123) ʔáarák ʔìní 'this person'
 /ʔáarák ʔìní/
 person D1:SG
- ʔáarák ʔíní 'This is a human being.'
 /ʔáarák ʔìní/
 person ID1:SG
- (124) léʃ ʔíkì 'these teeth'
 /léʃ ʔíkì/
 teeth D1:PL
- léʃ ʔíkí 'These are teeth.'
 /léʃ ʔíkì/
 teeth ID1:PL

Example (125) shows the tonal difference between the first person singular pronoun à and the near future particle á.

- (125) à ʔàm dúbán 'I am eating polenta.'
 /à ʔàm dúbàn/
 1SG eat polenta
- á ʔám ʔdúbán 'He/She is going to eat polenta.'
 /á ʔàm dúbàn/
 FUT1 eat polenta

Examples (126)-(127) illustrate the tonal differences between different possessive suffixes: first person singular versus third person singular in (126), and second person singular versus second person plural in (127).

- (126) kír -á -gíík píl -ákí 'My legs are painful.'
 /kír -á -gíík píl -ákí/
 leg -PL -PL:1SG be.painful-PRED
- kír -á -ʔgíík píl -ʔákí 'His legs are painful.'
 /kír -à -gíík píl -ákí/
 leg -PL -PL:3SG be.painful-PRED

- (127) kír -á -^lgúuk píl -^lákí ‘Your (sg.) legs are painful.’
 /kír -à -gúuk pìl -ákí/
 leg -PL -PL:2SG be.painful-PRED
- kír -á -gùuk píl -ákí ‘Your (pl.) legs are painful.’
 /kír -à -gùuk pìl -ákí/
 leg -PL-PL:2PL be.painful-PRED

Example (128) shows the tonal difference between the continuous and the habitual aspect suffixes in verb forms with a short root vowel.

- (128) táarák kàl -á dít ‘The man is trying to steal goats.’
 /táaràk kàl -á dít/
 person steal-CONT goat:PL
- táarák ^lkál -á ^ldít ‘The man steals goats.’
 /táaràk kál -à dít/
 person steal-HAB goat:PL

Finally, example (129) illustrates the tonal difference between the assertive suffix after a non-derived intransitive verb stem and the second person singular subject suffix in the imperative form with the same stem.

- (129) b̀̀d̀ -ì ‘He/She starts running’
 /b̀̀d̀ -ì/
 run -ASS
- b̀̀d̀ -í ‘Run!’
 /b̀̀d̀ -í/
 run -2SG

6.7. Grammatically determined tone alternation. When a root combines with a suffix, its underlying tone often deviates from its lexical underlying tone. Moreover, the underlying tone of many suffixes is dependent on the tonal class of the root. Thus, Kurmuk is replete with grammatically determined tone alternation, which is distinct from the tonal variation that results from phonologically determined tonal processes such as High Spread. A few examples from the morphol-

ogy of verbs can illustrate this fact. As seen in (130a), the lexical tone of the verbal root *táan* ‘push’ is underlyingly high; but before the high-toned third person singular subject suffix *-í*, its underlying tone is low, as seen in (130b). Conversely, the tone of the verbal root *rùuṭ* ‘transplant’ is lexically low, as shown by the form in (131a); but before the same underlyingly high-toned third person singular subject suffix its underlying tone is high, as seen in (131b).

- (130) a. *tùul* *táan* *gúr* *-íṭ* ‘The child starts pushing the stone.’
 /*tùul* *táan* *gúr* *-ìṭ*/
 child push stone-SG
- b. *ŋòò* *táan* *-í* *?ánì* ‘What does he/she start pushing here?’
 /*ŋòò* *táan* *-í* *?ànì*/
 what push -3SG here
- (131) a. *tùul* *rùuṭ* *pÁʃ* ‘The child is transplanting sorghum.’
 /*tùul* *rùuṭ* *pÁʃ*/
 child transplant sorghum(PL)
- b. *ŋòò* *rúuḍ* *-í* *?ánì* ‘What is he/she transplanting here?’
 /*ŋòò* *rúuḍ* *-í* *?ànì*/
 what transplant -3SG here

Other examples of underlying tone alternation in roots can be seen, for instance, in (126) and (128) above.

One of the suffixes that exhibit tone alternation is the second person singular subject suffix *-i*. As illustrated in (132) with the same verbal roots as in (130)-(131), it has an underlying low tone in (132a) after a lexically high-toned root, but an underlying high tone in (132b) after a lexically low-toned root, which here carries an underlying high tone.

- (132) a. *ŋòò* *táan* *-í* *?ánì* ‘What do you start pushing here?’
 /*ŋòò* *táan* *-ì* *?ànì*/
 what push -2SG here
- b. *ŋòò* *rúuḍ* *-í* *?ánì* ‘What are you transplanting here?’
 /*ŋòò* *rúuḍ* *-í* *?ànì*/
 what transplant -2SG here

7. A Nilotic Outlook.

Kurmuk and other Northern Burun languages exhibit a more extensive use of suffixes than most other Western Nilotic languages. Thus, although roots are typically monosyllabic in Kurmuk as elsewhere in Western Nilotic, words tend to be longer in Kurmuk than in languages of the Lwo branch of Western Nilotic and certainly much longer than in Dinka and Nuer, which tend towards monosyllabicity. In this respect, then, the Northern Burun languages are reminiscent of the Southern and Eastern Nilotic languages. Nevertheless, the types of grammatically determined root-internal alternations which are found in the other branches of Western Nilotic, and which are assumed to reflect former suffixes, are also found in the Northern Burun languages, namely alternations in vowel length, vowel quality, final consonant, and tone. Thus, although the Northern Burun languages are certainly morphologically conservative in many respects, they seem not to have retained all of the specific suffix features that could explain the alternations in the other Western Nilotic languages.

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