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Lugwere Project

Lugwere Phonology statement

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3 Document History Log

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Issue C	September 14, 2005	Update with new finds and ideas from Orthography verification report and orthography workshops.
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Lastly, while I acknowledge that it will not be that easy to list all the people I worked with in compiling this paper, I should at least mention that I obtained inestimable linguistic help, formally, from Oliver Stegen and, informally, from Ron Moe, Keith Snider, and Connie Kutch-Lojenga whose notes regarding specific areas of the write-up I often perused.

May our Lord reward you! Amen

5 Introduction

5.1 The language and the people

Lugwere is a language of a speech community, the Bagwere, who live in the Eastern Uganda, and now number over 408,800 people going by the 2002 population census figures (Mugisha 2002, 156). Lugwere is classified as Niger Congo, Atlantic-Congo, Volta-Congo, Benue-Congo, Bantoid, southern, Narrow Bantu, Central J, and Nyoro-Ganda (J-10). It is closest to Lusiki in Vocabulary, and has 68% lexical similarity with Luganda.

Although Luganda (the Language of Wider Communication) is regularly used in church alongside Lugwere, Lugwere has vigorous use in the homes, market places, radio programs, and a medium of instruction in the first two years of primary school (Grimes 2000, 246).

Traditionally, the Bagwere occupy both Uganda's Pallisa and the now Budaka Districts, a vast plain west of and adjacent to Mbale town. Some Bagwere however live in the neighbouring districts of: Mbale to the east among the Lumasaaba (Lugisu) speakers on the slopes of Mount Elgon, Butaleja (formerly part of Tororo) to the south among the Lunyole speakers, Iganga-Kaliro-Kamuli to the west among the Lusoga and Lusiki speakers, all Bantu languages. Some also live in Kumi district to the north among the Itesots, speakers of a Nilotic language.

The Bagwere are agriculturalists that depend on peasant farming. They grow cash crops like cotton, rice, and maize, besides millet, sorghum, cassava, potatoes, beans, and groundnuts as subsistence crops.

5.2 Background to the statement

This analysis is a descriptive investigation into the phonetic and phonological system of Lugwere language. It is an attempt at a thorough explanation of the evident basic Lugwere sound system and the ulterior phonological (morphophonemic, phonemic, and allophonic) processes that shape Lugwere sounds, the findings of which are meant to inform the Lugwere orthography formation process.

Lugwere has no standard orthography yet. In the past, there were sequestered attempts to write Lugwere by translating portions of scripture by some individuals based on the Luganda orthography. However, although a few booklets and gospel tracts were produced and enthusiastically accepted, this effort did not reach the intended results, largely due to orthography difficulties.

In 1992, the Summer Institute of Linguistics (SIL) conducted a sociolinguistic survey of some minority languages in Uganda among which was Lugwere. In so doing, the need for Bible translation into Lugwere was established, resulting into SIL, in 1998, attaching a missionary family to work with the Lugwere Bible Translation and Literacy Association in the Lugwere Project.

In May 2001, an SIL team, led by Ron Moe, worked with a group of mother-tongue speakers to compile a wordlist of about 10,000 Lugwere words using the semantic domain approach. In the following years, two Bagwere, Samuel Mubbala, and Richard Nzogi, then attending the NEGST in 2002 and 2003, respectively, each undertook to produce a Lugwere phonology write-up. These were as a matter of course requirement, and so, they were rather sequestered individual write-ups based on a narrow 200-phonetic wordlist each.

With such readily available preliminary phonology analyses, a foundation was laid, for in fact, this particular phonology report is an anthology of the two piecemeal analyses carefully scrutinized and proof-weighted against a standard of an over 1000 Lugwere phonetic wordlist (a copy of which is appended) and gaps filled. The verification data integrates examples found in the individual write-ups as well as those from the dictionary workshop's 10,000-dictionary wordlist, all spelled phonetically.

5.3 Fundamentals

As a matter of intimation, all Lugwere syllables are open; no consonants occur syllable-final. Besides, any consonant may fill the syllable onset but as regards which consonants can occur word-initial, there are some limitations.

Secondly, Lugwere verbs in their citation form are always in the infinitive, i.e. bearing the prefix /ku-/, and are, thus, the form **InfPfx-Rt-FV**, where InfPfx refers to Infinitive prefix /kù-;/ Rt refers to (a generally either CVC or VCVC) verb root, while FV is final vowel.

Nouns and adjectives, on the other hand, can only begin with the consonants that are within the range of the Lugwere 21 noun classes. They take the form **NcPfx-Rt** or **Ø-Rt** where NcPfx refer to class prefix; Rt refers to noun/adjective root (which is generally bisyllabic with a CVCV or VCV structure); and Ø refers to a zero-prefix (or unmarked noun class).

In all examples to come, each category will be written separated by a hyphen, and since, unlike nouns, all verbal infinitive prefixes always have a low tone, I will mark only the root tone, e.g., [ku-kàl-á] ‘to dry’. All noun/adjective tone will, however, be marked, for example [mú-táki] ‘poor (Nc1)’, [i-tákó] ‘buttock (Nc5/6)’, [kì-sítò] ‘homestead (Nc7)’, [mú-gò] ‘rim (Nc3)’, [Ø-ŋíná] ‘queen termite (Nc9/10)’, [n-sákà] ‘pot (Nc9/10)’, [m̀pásò] ‘crevice (9/10)’, [Ø-ŋóŋì] ‘bird (Nc9/10)’, [lù-gàlí] ‘winnow (Nc11)’, [βú-kàlú] ‘dryness (Nc14)’, etc

Note that there are nouns of class 9/10 whose nasal prefix doubles also as part of the root in root-initial position. This is often disclosed by pre-prefixing the diminutive singular (class 12) prefix /ka-/ whence if the class prefix nasal consonant remains, then the nasal segment is part of the root. But, if the /ka-/ prefixation causes a morphophonemic change, particularly, causing deletion or replacement of the nasal, then that initial nasal was a clear class prefix.

Thirdly, a note on transcription, we will generally adopt the representations of sounds using IPA phonetic symbols, for example, phonemic vowel length will be spelled with the IPA long vowel symbol [ː], e.g., [ku-gà:n-á] ‘to refuse’, while phonetic length, where necessary, will be transcribed with the IPA half-length symbol [ˑ], e.g., [má-gó^{mb}è] ‘grave’.

In addition, relevant to the discussion, phonemes will be enclosed in slashes /.../, phonetic realizations of the phonemes will be in square brackets [...], whereas orthographic representations will be spelled with the pointed brackets <...>.

Besides, I use symbol /j/ for the palatal glide <y> and for representing palatalization.

6 Phonemics

6.1 The phoneme Inventory

6.1.1 Consonants

6.1.1.1 Consonant phonemes overview

There are 20 distinct consonant phonemes in the inventory, as are shown in the table below, represented in the conventional format—places of articulation listed from left to right, and manners of articulation from top to bottom.

	Bilabial	Labial-dental	Alveolar	Alveo-palatal	Palatal	Velar
Plosives	p b		t d			k g
Affricates				tʃ dʒ		
Fricatives	β	f v	s z			
Nasals	m		n		ɲ	ŋ
Lateral approx.			l			
Approximants	w				j	

6.1.1.2 Ambiguous consonants and issues of interpretation

Of the 20 distinct consonant phonemes, most of them may be modified through prenasalization, palatalization, or labialization.

However, following the principle of economy, and in order to avoid doubling or even tripling the phoneme inventory by positing a plethora of consonant phonemes in the language, all modifications by these three processes are analyzed as phoneme sequences, rather than phonemes in their own right since:

- (i) nasal consonants /m, n, ɲ, ŋ/ as well as the glides /w, j/ exist as phonemes, and
- (ii) no new consonant sound is produced when the consonant bearing any of three modifications is detached from the one preceding or following it except that which is already identified and listed as a phoneme.

Further attestation is drawn from the way in which /w, j/, and all +continuant, specifically /β/ and /l/, conduct themselves when prenasalized. These phonemes particularly change to become /p, dʒ, b/, and /d/, respectively (see details in 9.1.1.1). It would be easy to analyze these prenasalized continuants as distinct phonemes if they were not already occurring as distinct phonemes.

Having noted that these sounds, as well as the glides and nasals, occur in non-labialized, non-palatalized, and non-prenasalized environments, respectively, unless more-complicated labialized, palatalized, and nasalized consonants are identified as deserving distinct phoneme identity, the phoneme inventory above covers all the sounds in the sequences available.

Consequently, in syllable the analysis, I will have to add three new syllable patterns, NCV, CSV, and NCSV where N refers to any of the nasal consonants, and the S, to any of the glides.

6.1.1.3 Consonant allophony

Of interest to us, here, are the allophonic variations in the consonant phonemes and the relationships that bear in the allophony, and the environments where they occur. These I highlight in a table. Detailed description will be in the morphophonemics section further on.

Phon	Alloph	Relationship	Environment	Example
/l/	[r]	Complementary distribution	[r] does not occur word-initial, produced inter-vocally, only following front vowels.	[kí-rólérò] ‘multi-doorway hut’ [lú-lérà] ‘umbilical cord’ [kù-lòl-á] ‘to search’
	[d]	Occlusion assimilation	Following nasal consonants	[lù-lùβí] ‘boundary’ [n-dùβí] ‘boundaries’ [ku-lòβ-á] ‘to hook’ [n-dóβ-à] ‘I hook’
/f/	[fʷ]	Complementary distribution	Anywhere, inter-vocally, and with all the vowels except vowel [u]. Phenomenon is also observed in LuGanda.	[kì-fʷò-fʷò] ‘lungs’ [Ø-fʷám-bà] ‘cotton’ [Ø-káfʷí-fʷí] ‘cotton chaff’ [ku-fùn-á] ‘to smell/stink’
/v/	[vʷ]	Complementary distribution	Anywhere, inter-vocally, and with all the vowels except vowel [u]. Phenomenon is also observed in LuGanda.	[ki-vʷí-rí] ‘feather’ [ku-vʷám-á] ‘to dent’ [ku-vʷòmók-á] ‘to cave in’ [ku-vùn-á] ‘to break’
/β/	[w]	Free variation	It is an intervocalic optional variation that occurs whenever consonant [β] precedes vowels [o, u] anywhere in a word. Elsewhere, it remains /β/, perhaps due to the light nature of phoneme. Akin is the variation between noun class 14 prefix /βu-/’s allomorph [βʷ-] and [w] word-initial preceding all vowels except [u]	[ká-βó:βò]~ [ká-wó:wò] ‘aroma’ [kù-βùlá]~ [ku-wùlá] ‘to lack’ [kù-βòná]~ [ku-wòná] ‘to see’ [ku-βàl-á] ‘to count’ [ku-βìn-á] ‘to dance’ [ku-βèg-á] ‘to spy’ [βʷ-èré]~ [wè:rè] ‘nakedness’ [βʷ-ítà]~ [wítà] ‘millet <i>ugali</i> ’ [βʷ-òᵑgó]~ [wòᵑgó] ‘brains’ [βʷ-áᵑgù]~ [wáᵑgù] ‘fluffiness’
	[b]	Neutralization	Following nasals	[m-bál-à] ‘I count’ [m-bín-à] ‘I dance’ [m-bég-à] ‘I spy’
/k/	[tʃ]	Free variation	Word-initial, inter-vocalic, only preceding vowel [i], an interspeaker variation usual among multilingual speakers with varied exposure to and influenced by LWC	[kí-díβà]~ [tʃí-díβà] ‘pond’ [kí-ᵐtù]~ [tʃí-ᵐtù] ‘thing’ [kí-sákírò]~ [tʃí-sákírò] ‘gizzard’ [kì-sìkí]~ [tʃí-sìkí] ‘tree stump’
/g/	[dʒ]	Free variation	As in the above	[gì-rí]~ [dʒí-rí] ‘bird species’ [gì-rí-sì]~ [dʒí-rí-sì] ‘grease’ [mà-gí] ‘eggs’ [mà-gìnó] ‘maggots’
/kʲ/	[tʃʲ]	Velar fronting and/or velar affrication (Details in section 9.2.1.1)	Palatalized velars plosives with a noticeable offglide, i.e. [kʲ, gʲ] are fronted into alveolo-palatal affricates [tʃʲ, dʒʲ], respectively, before vowels—seen in the class and/or verb subject concord prefix different realizations. In this case, even its concord marker [ki-], whose form is conditioned by preceding vowel versus consonant, changes to [kʲ], when before a vowel but pronounced same as /tʃʲ/	[e-kí-ᵐtù kì-nú ékì-tʃʲú:k-à tʃʲ-à:ní] ‘whose is this turning thing?’ [e-tʃʲ-òᵑzò kì-nú ékì-tónò tʃʲ-àbʷé] ‘this small bird trap is theirs’ [e:tʃʲò tʃʲ-áᵑgʷè tʃʲá mʷ-à-ná] ‘that baby’s bathing sponge’ [nĩ:tʃʲò ekì-:βó tʃʲ-émì-tʃʲúᵑgʷà] ‘It is the orange basket’
/gʲ/		As in the above	Same with noun class 4/10 concord prefix [gi-] and/or its	[mí-rímò dʒʲ-á-bà-sà-zá] ‘men’s tasks/jobs’

	[d̥ʒ]		underlying form, whose form is conditioned by whether it occurs before consonant or vowel. If followed by a vowel, the prefix changes to [gʲ], but pronounced same as /d̥ʒ/.	[é-n-sákà d̥ʒ-ónà βá-d̥ʒ-à-t-ír-è] 'even the pots are broken' [gì-nú mí-rì d̥ʒ'è-mì-sá:lè] 'these are roots of trees' [é-mí-rì d̥ʒ'è-βí-d̥ʒá ⁿ d̥ʒá:lò gì-kál-ír-e] 'the beans' roots have dried'
/m/, /n/, /l/, /t/, and /p/		Imbrication (See details on in process 12.2.2)	Across morpheme boundaries, in verbs whose final syllables have consonants [m, n, l, t, or p], the hodiernal past/perfect aspect marker /ir/ metatheses, is then deleted and root consonants are moved forward—a process called imbrication.	[kù-gà:n-á] → /à-gáin-(Ø)-è/ 'to refuse' 'he's refused' [kù-k ^w à't-á] → /à-k ^w áit-(Ø)-è/ 'to catch' 'he's caught' [kù-t ^v à'm-á] → /à-t ^v áim-(Ø)-è/ 'to sit' 'he has sat' [kù-l ^w à'l-á] → /à-l ^w áir-(Ø)-è/ 'to fall sick' 'he is sick' [kù-màp-á] → /à-máit-(Ø)-è/ to know' 'he knows'
/j/	[d̥ʒ]	Occlusion assimilation	Following a nasal consonant	[ku-jòj-á] → [j̃-d̥ʒój-á] 'I crave for' 'to crave for' [ku-jì:g-á] → [j̃-d̥ʒí:g-á] 'to hunt' 'I hunt'
/w/	[p]	Occlusion assimilation	Following a nasal consonant	[ku-w-á] 'to give' → [m̃-pá] I give [ku-wè:k-á] 'carry on the back' → [m̃-pé:k-à] 'I carry on the back'

6.1.1.4 Consonant allophonic rules summary

6.1.1.4.1 Complementary distribution

C → C /V_
[+Lateral] [+flap] [-back]
[+lateral]/ everywhere else

/f, v/ → [f^w, v^w] /_[i, e, a, o]
[f, v]/ everywhere else

6.1.1.4.2 Free variation

/k/ ~ [t̥]/#_ [i]
[k]/ everywhere else

/g/ ~ [d̥ʒ]/#_ [i]
[g]/ everywhere else

/β/ ~ [w]/_V [+back, +round]
[β]/ everywhere else

/β/ ~ [w]/_ [i, e, a, o]
[β]/everywhere else

6.1.2 Vowels

6.1.2.1 Vowel phonemes overview

There are 5 distinct oral phonemic vowels, each with a lengthened counterpart, as below

	Front		Central	Back	
	Unrounded			Unrounded	Rounded
High	i	i:			u u:
Mid	e	e:			o o:
Low					ɑ ɑ:

6.1.2.2 Ambiguous vowel phonemes

Lengthening and diphthong sequences are the only modifications known of Lugwere vowels.

6.1.2.2.1 Long vowels

Vowel lengthening in Lugwere is widespread such that long vowels are as common as their short counterparts. This lengthening has six primary sources, all said to be typical of Proto-Bantu according to Nurse and Phillippon (The Bantu Languages 2003: 48). They are

1. Preceding prenasalized consonants or moraic nasals (systematic lengthening), such that

V → [+long]/_NC

as in /kì-tè^mpé/ → [kì-tè^mpé] 'wall' /ku-sàⁿk-á/ → [ku-sàⁿk-á] 'to bleed'
/ku-kò^mb-á/ → [ku-kò^mb-á] 'to leak' /ŋgòⁿgí/ → [ŋgòⁿgí] 'envy'
/ku-kàⁿtá/ → [ku-kàⁿt-á] 'to jeer' /ku-kùⁿg-á/ → [ku-kùⁿg-á] 'to cry'
/ku-dùⁿd-á/ → [ku-dùⁿd-á] 'to pound' /mù-sá^mvú/ → [mù-sá^mvú] 'seven'
/ku ñ ñ kòβ-á/ → [kúⁿkòβ-á] 'to say to me'
/ku ñ ñ tùm-á/ → [kúⁿtùm-á] 'to send me'

2. Following palatalized and labialized consonants except word finally, such that

V → [+long]/_NC as in

/kì-p'èdá/ → [kì-p'èⁿdá] 'abnormality'
/ku-p'át-á/ → [ku-p'át-á] 'gulp'
/mù-g^wáβí/ → [mù-g^wáⁿβí] 'smoking pipe'
/ku-k^wát-á/ → [ku-k^wát-á] 'to catch'

3. Morpheme-boundary vowel concatenation involving a sequence of vowels with similar values, as in

/βa ñ àlá/ → [βà:lá] 'girls'
/βa ñ àb-â/ → [βà:bâ] 'they are going'

If they are of dissimilar values (common with constructions involving reflexives and/or benefactives with their characteristic root-initial vowel [e], the first vowel (one of the prefix) is deleted, and the vowel in the root-initial position lengthened, as in

/βa ñ èβálì-à/ → [βè:βálì-à] 'they thank'
/βa ñ èkúb-à/ → [βè:kúb-à] 'they bit themselves'

4. Gliding, as in

/ku ñ àwúl-á/ → [kwà:wúlá] 'to separate' /mi ñ àká/ → [m'á:ká] 'years'
/mu ñ érékò/ → [mwé:rékò] 'top millstone' /li ñ òsé/ → [l'ò:sé] 'kwashiorkor'

5. Penult contour tone protraction¹, as in

¹ Occurs in all penultimate contour tone contexts except in diphthongs. E.g. [kí-kóikò] 'riddle', [kì-ráirò] 'oath', [námázi] 'vegetable type', [mbáirè] 'xylophones', etc.

/tótôli/ → [tótô·li]	‘pumpkin leaves’	/kîsêrá/ → [kîsê·rá]	‘moment’
/màsîpé/ → [màsî·pé]	‘an obstinate person’	/pâtâsí/ → [pâtâ·sí]	‘chisel’
/kîbîbí/ → [kîbî·bí]	‘sin/bad thing’	/nâbânà/ → [nâbâ·nà]	‘womb’
/nâmâd̄zî/ → [nâmâ·d̄zî]	‘banana species’	/zîzîta/ → [zîzî·tà]	‘grass sp.’
/ñkókôli/ → [ñkókô·li]	‘sisal/jute’	/ñkôtò/ → [ñkô·tò]	‘full grown’

6. Underlying representations², as in

/ku-làm-á/	‘to heal’	<i>versus</i>	/ku-là:m-á/	‘to curse’
/ku-lèr-á/	‘to baby-sit’	<i>versus</i>	/ku-lè:r-á/	‘to float’
/ku-sìg-á/	‘to sow’	<i>versus</i>	/ku-sì:g-á/	‘to smear’
/ku-kùm-á/	‘to kindle’	<i>versus</i>	/ku-kù:m-á/	‘to watch/wait for’

7. Stylistic lengthening for emphasis, e.g. in ideophones

By interpretation, only the lengthening in underlying representations is phonemic, and presents as a tautosyllabic V. This analysis is informed by the fact that, unlike all others that are short vowels merely conditioned to phonetically lengthen, this kind is the only:

(i) unpredictable

(ii) contrastive, i.e. long vowels contrast with short vowels in lexical.

For these reasons, only the long vowels attributable to underlying representations are listed in inventory beside their short counterparts.

6.1.2.2.2 *Non-identical vowel clusters*

In this category, only three vowel clusters are observed, that is, /ei/, /ai/, and /oi/, as in

[máirù]	‘edacity for meat’	[kî-kóiko]	‘riddle’
[ku-gèz-á]	‘to fatten’	[ka- ⁿ s ^w éíkè]	‘the little finger’
[ki-sàìgá]	‘bracelet/collar bone’	[βi-kàìgá]	‘boiled fresh peas’
[nàgòìgò]	‘trunk road’	[ku-sòit]-á]	‘to rebuke’

In attempting at an interpretation of these clusters, three options appear logical—each having to do with the presumed source of the clustering:

1. There is a theory that, historically, these sequences used to have an intervening glide (=g) with the form [VgV] but the glide, which used to be the onset of the next syllable, got deleted creating sequence of syllable-vowel nuclei [V₁V₂] separated by an empty onset. Basing on this, we should posit an intervening glide homorganic to one of the vowels in the sequence, thus, for example what is out-rightly [ei] would be interpreted as trans-segmental [eji]; after all, there is not necessarily an invariant cross-linguistic auditory difference between the two sequence types.

The flaw with this analysis, however, is that this assumption stops short of requiring us to believe that at the stage when deletion of the glide created a new vowel sequence, Lugwere ought to have lost every trace of distinction between its VCV or V₁CV₂ sequences (where the consonant may be a glide), which is not the case.

² Derived from the hypothesis of root reconstruction after consonant dropping, i.e. the C=consonant of a historically [VCV] sequence dropped out and was lost leading to a [V.V] sequence with the last V being an on-setless syllable.

In speaking, we always intuitively pronounce these three sequences as corresponding to the nucleus of a single syllable, so we treat them differently from the VCV or V_1CV_2 in which no intervocalic glide is ‘droppable’ yet they are as common as these three VVs. In these, speakers consistently voice the intervening homorganic glide invoking an auditory difference perceivably distinct from that heard in the three dissimilar VV-sequences. Hence, converting them into a tri-segmental sequence would make their articulation difficult and the pronunciation both unnatural and unacceptable.

Accordingly, while the assumption of intervocalic (morphological or other) glide insertion may find some attestation in some other cases, the gaps hereof fail the generalization of similar processes in these three non-high + high VV sequences. In the absence of such evidence, we may as well prefer to continue assuming that in these particular cases we are simply dealing with adjacent [VV] that belong to the same syllable, not [V-glide-V] sequences until it is proved otherwise.

2. It is also possible to think of the sequences as single-Vs in which diphthongization is a mere perceptual change in vowel-quality making it sound as though it were a V.V sequence deserving a tautosyllabic cluster analysis. This alternative analysis, which appeals to pure diphthongs, is argued as follows:

- (i). Using the clapping (at times whistling) game in which, utilizing native speaker intuition, native speakers are asked to pronounce the ‘ambiguous word’ whilst clapping their hands once per syllable, the [VV]-sequence typically receives a single clap, regardless of the tone.
- (ii). The span of vocalizing these VV-sequences is neither particularly any longer in duration than that of long vowels nor is it intervallic but uninterruptedly constant.
- (iii). There is no evidence that only these three non-identical vowel clusters may have resulted from syllable reconstruction after elision or dropping of weak and/or transparent consonants. Markedly, these three sequences appear so autochthonic, occurring robustly in all parts of speech across all word-domains. Contrary to expectation, speakers consistently reconstruct (insert a glide in) all the other anticipated un-permitted sequences, both at morpheme and word-boundary domains.
- (iv). There are examples of phonemic contrasts involving diphthongized and non-diphthongized vowels, both in identical and analogous environments, which I take to be indicative of the fact that these VV-sequences are underlying representations of segments that have psychological reality; as is the case for all those proven to be phonemes in their own right. Examples include

[kì-sàìgá] ‘collar bone/bracelet’	vs.	[kì-sàgá] ‘branch’	
[mà-ìgá] ‘fireplace’	vs.	[màká] ‘home’	and [màgí] ‘eggs’
[ṅ-kóìgò] ‘animal tail’s top part’	vs.	[ṅ-kòkó] ‘chicken’	
[nàgòìgó] ‘trunk road’	vs.	[múgógò] ‘banana stem’	

- (v). The fact that these VV sequences can ably bear any of the three attested tones, low, high, and falling without discrimination is indicative of the sequence being just a single V, with the occurrence of falling tone simply indicating the bi-moraic nature of the syllable on which falling tone is: whether it is an analogous or dissimilar VV- cluster. This remains particularly true whether falling tone is analyzed as a single unit in initial association, a derived tone sandhi, or having originated from a historical deletion of a tone-bearing unit leaving a hanging tone, which eventually re-associated onto the preceding syllable’s TBU.

3. The last alternative is a generalized V.V analysis, which would reduce the vowel phonemes to 10 but give rise to instances of word-medial V-syllables, after all

- (i). Undisputable V.V-sequences are robustly attested in Lugwere’s word-initial position--a V.V clustering apparently caused by vowel concatenation at morpheme boundaries levels.

(The process accounts for nearly all word-initial diphthongs—basically, augment, tense, pronominal prefixes and prepositions preceding word-initial vowels).

- (ii). The examples of contrasts cited may be simply examples of differences between sequences of two vowels versus a single vowel, with the sequence having resulted from root reconstruction after consonant dropping. Take, for example, the /mà-ìgá/ ‘fireplace’ which may have derived from Proto-Bantu /*-piga/, wherein the consonant /p/ was dropped resulting in adjacent vowels.
- (ii). These sequences comprise of segments already listed as individual phonemes.
- (iii). A V.V-analysis would satisfy the principle of economy of the phonemes.
- (iv). Another point stems from tone behavior. While the V.V-sequence can ably bear a similar tone, cases of HL contour clusters are equally widespread, a phenomenon only fittingly explained by a V.V-analysis. Then the hitch here would be, unless we interpret all occurrences of contour tone as bearing on a V.V sequence (in which case it becomes difficult to tell between phonemic long vowels and real V.V-sequences), this argumentation remains lacking.
- (v). This seems to be the most ‘linguistically plausible’ analysis propagated by most proto-Bantu phonology literature as being generic of the entire language family.

I must admit all the three, regardless of their deficiencies, are appealing that I find it difficult to narrow the phenomena to a single precise analysis, more so because I have to tug to mollify my Lugwere intuition that realizes the unequivocally grammatically conditioned word-initial and the inexplicable word-internal VV-clusters both phonetically diphthongized.

To give a better account of the phenomena, I adopt a two-fold analysis, i.e., first, an assumed historically systematic CV syllable structure wherefrom, by consonant dropping, dissimilar V.V sequences were derived. Then, with time, only word-initial Vs sustained their syllabicity but all word-internal V.Vs, though underlyingly syllabic and moraic, lost their other syllabic qualities, e.g. autonomy, and coalesced with the preceding syllable being realized together with that syllable’s vowel as though it were a diphthong.³

By implication, therefore, all Lugwere would-have-been word-internal syllabic V, though retaining moracity, should be counted as a member of that syllable wherein the resultant dissimilar [VV]-cluster has become a monosyllabic bi-moraic sequence.

Consequently, Lugwere has five distinct vowels, each having contrastive length, and out of which three can combine in sequence to form a monosyllabic cluster, with the language only allowing syllabic Vs word-initial.

6.1.2.3 Vowel allophony

As earlier observed, the contents below are just a highlight of each phonological phenomenon, a detailed description of which will be given in the morphophonemics section.

³ In other words, syllabic-V realisation when occurring word-initial but, though underlyingly, ideally, and technically tauto-syllabic sequence, a diphthong realization everwhere else.

Phon	Alloph	Relationship	Environment	Example
/e/	[ɛ]	Complementary distribution	Sound [ɛ] occurs inter-vocalically but consistently only following /k/ and /g/. But [e] occurs elsewhere	[kì-gèré] 'foot' [ku-gèd-á] 'be bend' [lù-sèké] 'sucking tube' [βù-kèké] 'dried cassava'
/i/	[j]		When occurring in a prefix that precedes roots with a vowel root-initial.	/mì-àkà/ → [m ⁱ -àkà] 'years' /kì-òmá/ → [k ⁱ -òmá] 'metal' /βì-éjǒ/ → [β ⁱ -éjǒ] 'brooms'
/u/	[w]		When occurring in a prefix that precedes roots with a vowel in root-initial position.	/mù-àkà/ → [m ^w -àkà] 'year' /mù-ígà/ → [m ^w -ígà] 'river' /mù-èrí/ → [m ^w -èrí] 'moon' /mù-òtá/ → [m ^w -òtá] 'breath'

6.1.2.4 Allophonic rules summary

/e/	→	[ɛ]/_ C [+velar] [e]/ everywhere else
/V/[+short]	→	[+long]/_NC [+short]/ everywhere else
/V/[+short]	→	[+long]/CS_ [+short]/ everywhere else

6.2 The phoneme Inventory

6.2.1 Consonant phoneme rarity and distributional constraints

We now look at the nature and sequential arrangement of consonant phonemes, i.e., consonant phonemes sequences that can co-occur in a word. Using a table, each distinct phoneme is corresponded with particular environment (word-initial, medial, and final) therewith two examples, first a noun/adjective, then a verb.. The gaps indicate no data or evidence to suggest possible being-ness. Unambiguous consonant phonemes occur in the following environments in syllables and words.

	#CV-		-CV-		-CV#	
p	Ø-pápá	dad	lú-pápúlà ku-pík-á	paper to pump	mù-pípà ku-pàp-á	metal drums be in a rush
b	Ø-búli	tea pot	kì-bírà ku-bèj-á	shrine to deceive	kì-fùbá ku-kùb-á	chest to beat
t	Ø-térèka	cassava sp.	mù-tègò ku-tèm-á	snare to cut	lú-kítà ku-sit-á	hedge to fence off
d	Ø-dàlí	toe sore	mù-dépà ku-dèj-á	kind of bag to garner	kí-dà ku-dòd-á	belly to get wet
k	kí-dà ku-kàkà	fish species to force	mù-kàlí ku-kòm-á	woman to plant	mù-kóko ku-lèk-á	tree species to leave
g	Ø-gámà	mug	mù-gàjí ku-gòn-á	stirring stick to sleep	mù-gógò ku-gàg-á	banana stem to get mouldy
tʃ	Ø-tʃúpà	bottle	kì-tʃópí ku-tʃitʃín-á	cassava type to giggle	Ø-kòtʃé ku-pùtʃ-á	proper name roiling of beer
dʒ	Ø-dʒégè	fish species	ná-mádzálà ku-dʒùg-á	white ants type to cry like cattle	kì-námédzè ku-dʒè:dʒ-á	vacated home to mimic
β	βù-mèrí	millet yeast	kí-βírà ku-βòn-á	forest to see	mù-lòβó ku-lèβ-á	hook to trick
f	Ø-fùdú kì-fùmó	tortoise fairytale	ku-fùg-á	to reign	kì-f ^w ò·fò	lung
v	Ø-vùlùmùkà	express	ká-vè:rà ku-vùn-á	polythene paper to break	mù-lévù	beard/chin

s	Ø-sítùkà	dandruff	lù-sèké ku-sàk-á	suction tube to solicit afar	kí-sùsí ku-d̄z-á	gourd flying of ants
z	Ø-zìràjá Ø-zízì'tà	demoniac grass type	mà-zìgá ku-zùm-á	horns to abuse	ì-rízì ku-ziz-á	fetish become bushy
m	Ø-mámà	mother	má-mírò ku-mùm-á	throat/voice to throw	kí-pímò ku-sàm-á	measure to bark
n	Ø-nàmùnjé	bird sp.	ì-dínìsà ku-nòkól-á	window to pluck	kí-gúnò ku-gòn-á	teeth gum to sleep
ɲ	Ø-ɲámà	meat	kì-náɲúli ku-ɲòɲól-á	to explain	Ø-ɲáɲí ku-màɲ-á	fish to know
ŋ	Ø-ŋíná	queen ant	ku-ŋòlól-á	to snore	βà-βèŋó ku-ŋè:ŋ-á	clan name flying of ants
l	lù-gàlí	winnower	lú-lérà ku-lùm-á	umbilical cord to bite	lí-mólè ku-lòl-á	reed to look at/for
w	Ø-wàlòvú	chameleon	kí-wú:gúlù ku-wòl-á	owl to get cold	βù-wòlú ku-w-á	coldness to get finished
j	jò ^m bó	quarrel	mí-jógà ku-jès-á	jingles to design	mù-jájù ku-jòj-á	wild cat to crave for

On the other hand, simple phoneme sequences may occur in the following environments in words—arranged descending: first line, word-initial, second, medial, and bottom, word-final.

	Prenasalized: NC		Labialized: CW		Palatalized: CJ	
p	ɲ-pùkú nà ^m pànú kì-tè ^m pé	cave curtly/shortly wall			kì-p'è'dá ku-kòp'í-á	abnormalcy gulp
b	ɲ-bùlí ì-fú ^m bírò ku-kò ^m b-á	goat kitchen to leak	b ^w á'gú Ø-nàb ^w ó'lò kì-b ^w é	rough grind baboon fox	ku-kèb'á'kéb'í-á ku-kùb'í-á	to excruciate probe in hole
t	ɲ-túkùlù ku-tì ⁿ tímál-á ku-kà ⁿ t-á	animal species be obstinate to jeer	Ø-t ^w ó ⁿ gò ku-t ^w à'lá mù-t ^w é	proper name to take head	Ø-t'è ^m pó kì-t'á'mò ku-t'í-á	miry soil seat to fear
d	ɲ-dèkésé ku-sì ⁿ díká ku-dù ⁿ d-á	groins to push to pound	ì-d ^w á'lìrò ku-dùd ^w -á	hospital to thunder	ku-d'è ^m m-á mù-d'í-á	to overeat fiancée
k	ɲ-kòtá kì ⁿ újú ku-sà ⁿ k-á	star severed limb to bleed	k ^w áwúl-á Ø-kàk ^w á'lí ku-k ^w -á	to separate bird species to pay dowry		
g	ɲ-gò ⁿ gí ku-lù ⁿ gám-á ku-kù ⁿ g-á	envy to take direction to cry	Ø-g ^w á'ɲí mù-g ^w á'βí ku-g ^w -á	name tobacco pipe to fall		
t̄ʃ	ɲ-t̄ʃè ⁿ gà mú-k ^w á ⁿ t̄ʃáli ku-mò ⁿ t̄ʃ-á	residue junk machine to tell a joke	ku-kàt̄ʃ ^w -á	be astringent		
d̄z	ɲ-d̄zàgí βí-d̄zà ⁿ d̄zálò ku-d̄zà ⁿ d̄z-á	egg plant beans to be hilarious	Ø-d̄z ^w á'lò Ø-d̄z ^w é ⁿ d̄z ^w é	damn poor bird species		
β			β ^w -í'tà	millet <i>ugali</i>	β ^j -à'jó ku-β'á'l-á ku-kòβ ^j -á	livestock to give birth to persuade
f	ɲ-fúkò kì ⁿ úfútè	mole fist punch	Ø-f ^w á ^m bà Ø-kàf ^w í'fí ku-f ^w -á	cotton cotton chaff to die		
v	ɲ-ví	grey hair	Ø-v ^w è ^v wè ku-v ^w á'm-á	embroidery be deformed		

	mù-sá ^m vú	seven				
s	ṅ-sèkére ku-sè ⁿ sér-á Ø-ṅáṅá ⁿ sì	lice to sprinkle pineapple	s ^w é ⁿ à ku-s ^w à ^l -á kì-s ^w à	even us be shamed ant mound	Ø-s'ó ^d ò kì-s'áβírà ku-mès ^j -á	vegetables chicken dung to scintillate
z	ṅ-zálà kù-sò ⁿ zól-á kí-zá ⁿ zà	hunger to denude skin peel-off	ku-z ^w à ^l á ku-kàz ^w -á	to wear to be vexed	ku-βiz'á ^k ù ku-wòz ^j -á	warm tepidly give a defence
m			m ^w -é ^r ékò ká-m ^w é ^s ò ku-m ^w -á	millstone razor blade to shave	m ^l -à ^k á ku-m ^l è ⁿ -á ku-lùm ^j -á	years to mash to infuriate
n			ká-n ^w á ⁿ á lú-n ^w è	tip of the lip finger/toe	Ø-n ^j à ^w é ku-n ^j ò ^l -á ku-βò ⁿ -á	tiptoe to twist to open eyes
ɲ			Ø-ɲ ^w á ⁿ tò ku-ɲ ^w -á	nipple to drink		
l			l ^w -ò ^t á ku-l ^w à ⁿ -á βù-kál ^w è	perspiration to fight sobriety	Ø-l ^j ò ^s é ku-l ^j á ^k -á ku-fù ^j -á	kwashiorkor to swindle blow the nose

Note: All glides, when prenasalized, become stops assimilating to the manner of articulation of the nasal, just as nasal consonants assimilate to the place of articulation of the glide, i.e., /w, j, and l/ are unprenasalizable, /f, v, and ɲ/ are unpalatalizable, but /ŋ/ is unmodifiable.

Complex sequences or NCS clusters (existent in a few words) may occur in the following environments and words (in the order of syllable-initial, medial, and final positions).

	NCW		NCJ	
p	ṅ-p ^w í ^t ù	obstinacy	ṅ-p ^l à ⁿ gú	name
b	ṅ-b ^w é ^w è Ø-kà ^m b ^w í ^k ó mù-tálí ^m b ^w á	chicken species mild darkness metallic rod	ku-dà ^m b ^j -á	to disturb
t	ṅ-t ^w í ^g à	giraffe	ṅ-t ^l á ^m írò má ⁿ t ^l é ^r émúkò	hind end slope
d	ṅ-d ^w àiré Ø-tú ⁿ d ^w à	diseases passion fruit	ṅ-d ^l á ⁿ gà ku-lò ⁿ d ^j -á	kind of bag to pick in bits
ḍ	Ø-ḍ ^w é ⁿ ḍ ^w é	bird species		
k	ṅ-k ^w à ^j á	armpits		
g	mù-t ^j ú ⁿ g ^v à	orange		
s	ṅ-s ^w á kà ⁿ s ^w éikè	white ants the little finger	ṅ-s'ó ⁿ ò ku-lò ⁿ s ^j -á	shrub species to chat
Z	ṅ-z ^w á ^l à	fashion		

In terms of distribution, we notice the following:

1. No consonant occurs word/syllable final. Besides, there are marked restrictions on occurrence of consonant in verbal-initial position as seen in the gaps in the table.

2. There are restriction on the possible phoneme sequences, e.g. CSVs, particularly, labialization with /p/, /β/, and /tʃ/, and palatalization with /k/, /g/, /tʃ/, /dʒ/, /f/, /v/, and /ɲ/; and the NCVs with /β/, /m/, /n/, /ɲ/, and /l/, as shown by the gaps (see 7.1.2).

In conclusion, Lugwere has 20 consonant phonemes, most of which can be prenasalized, labialized, or palatalized. In addition, phoneme/β/, when prenasalized, undergoes sound and morphophonemic change, as do phonemes /w, j, l/, as will be seen later on in section 9.1.1, the very reason they are grouped together as approximants.

6.2.2 Vowel phoneme rarity & distributional constraints

We again turn to the vowels, specifically to look at the nature and sequential arrangement of Lugwere vowel phonemes in words, i.e., the restrictions that exist on the occurrence of vowel phonemes and/or sequences. We will do this using a table structured in such a way that all vowel phonemes' occurrence is contrasted between nouns/adjectives (in first line) and verbs (in second line) in all possible environments, therewith examples.

	#V-		-V-		-V#	
i	ì-kókè	ashes	kí-mírà ku-màlír-á	mucus be determined	mú-βírì	body
i:	î-kó	body dirt	βù-dì:ɲì ku-pùlúk-á	narrowness move at dawn		
e	é-mèsé	the rats	βù-lémé ku-βònék-á	impairment to appear	mù-síbé kì-kál-ír-è	captive it is dry
e:	è:râ	even	ì-βè:ré ku-mèré:r-á	breast to bleat		
a	ámò	perhaps	βù-gàlámí	width	kí-βàlà	fruit
	á-mà-gí à-mál-à à-(j)ég-à	the eggs he's finishing he's learning	ku-bìrág-á	make sacrifice	ku-nènék-á	to blossom
a:	à:sátù	thirty	kì-gàlàβá:jò ku-sà ⁹ gá:l-á	palm of hand to be pleased		
o	ó-mú-géni	the guest	wà-lùgónò	cripling spirit	kì-námúlò	thighbone
	ò-mál-à ò-(j)áβ-à	you finish you go	ku-wòlókók-á	to melt down		
o:	ò:jó	that one	ì-dókó:lì ku-lòlò:t-á	goiter to point at		
u			lú-pápúlà ku-wùlúkúk-á	paper erupt skin rash	kì-bùbù	group/pile
u:			lú-gú:dò ku-wùdú:k-á	road be dissatisfied		

- (i). Long vowels never occur word-final, while, in verbs, only /a/ and /e/ occur word-final with /e/ occurring only in past tense and imperative mood.
- (ii). Except vowel /u/, all other vowels occur both in word-initial and root-initial positions.
- (iii). All word-initial occurrences of vowels /e/, /a/, and /o/ are either pre-prefixes or prepositions. They are augments when occurring noun-initial, and either pronominal prefixes or, if /a and e/, locatives when occurring verb-initial.
- (iv). VV-sequences are created whenever any of the prefixes precede vowel-initial roots, e.g.

	#V-		-V-		-V#	
ei	é-í-sàná	the sun	kà- ⁿ s ^w éíkè ku-tʃèisj-á	little finger go overnight		
oi	ó-írìzì ó-íz-è	an amulet (you) come	kì-bó ^m bòzì ku-sòitʃ-á	chaff dump to rebuke		
ai	à-ìná à-ìr-ìr-è	where he's returned	mà-tàitá ku-g ^w àizúk-á	mumps to run insanelly		

Note: Both the Lugwere palatal and labial approximants are individual phonemes and occur in on-sets of CV-syllables, even widely co-exist in sequence with high vowels, i.e., /j/ can precede and follow front vowels /i, e/; /w/ can precede and follow back vowels /u, o/, as in

/j/		/w/	
/kì-jímò/	'anthill'	/mù-wólò/	'curved knife'
/kí-ji ⁿ dì/	'multitude'	/mpúwù/	'dove'
/kì-jígò/	'latrine'	/ku-wà:t-á/	'to peel'
/mpí:jì/	'bad belch'	/ku-fù:w-á/	'to blow'
/mí-jé ^m bè/	'mangoes'	/ku-wùw-á/	'to freak out'
/mù-géjì/	'gossiper'	/ku-wòn-á/	'to be healed'
/kí-jéjér-è/	'lightweight'	/ku-bòw-á/	'to bind/truss'
/ku-lèjér-á/	'to be fed up'	/ku-pòwók-á/	'to be red-ripe'

6.2.3 Consonant-Vowel harmony

Lastly, I summarize the consonant-vowel phoneme collocation using a chart wherein consonants precede vowels (x= items in the extreme left column and upper row can occur).

	i	i:	e	e:	a	a:	o	o:	u	u:	ei	ai	oi	^N C	C ^w	C ^j	^N C ^w	^N C ^j	
p	x	x	x	x	x	x	x	x	x	x				x	x	x			x
b	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x			x
t	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			x
d	x	x	x	x	x	x	x	x	x	x				x	x	x			x
k	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
g	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
tʃ	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
dʒ	x	x	x	x	x	x	x	x	x	x				x	x				
β	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x			
f	x	x	x		x	x	x	x	x	x				x	x				
v			x	x	x	x	x	x	x	x				x					
s	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x			x
z	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x			x
m	x	x	x	x	x	x	x	x	x	x		x	x		x	x			
n	x	x	x	x	x	x	x	x	x	x		x			x	x			
ɲ	x	x	x	x	x	x	x	x	x	x		x			x				
ŋ			x	x	x	x	x	x											
l	x	x	x	x	x	x	x	x	x	x		x			x	x			
w	x	x	x	x	x	x	x	x	x	x		x	x						
j	x	x	x	x	x	x	x	x	x	x		x	x						

7 Syllable and word-root structure

7.1 Syllable structure

7.1.1 Syllable types

Unlike some other Bantu languages, as a typical Narrow Bantu, Lugwere's canonical syllable structure is the CV, with V potentially bearing phonemic length, unlike other Bantu languages. Other syllable types too have been widely attested in words, i.e., /V/, /CSV/, /NCV/, /NCSV/, where C = any consonant phoneme or its allophone; N = any nasal; S = any glide; and V = a phonemically short or long vowel. The /CSV/, /NCV/, and /NCSV/ patterns have been provided to cater for consonant sequences common in the language.

While all the above patterns are undeniably copious, the most prominent syllable pattern is the CV. Its prominence seen when word roots from languages having structures discrepant with Lugwere are borrowed. Such, during indigenization, are usually reconstructed into CV.

7.1.2 Ambiguous syllables and issues of interpretation

Before diving deep into the 'syllabicity in Lugwere' discussion, interpretation of the ambiguous noun-class 9/10 prefixes and verbal pre-nominal first-person prefixes is demanded. This pertains to the elusiveness with which they present in syllabification making it difficult to classify them. Possible treatments might include:

1. Generalized prenasalization realization when in nouns, and a geminate nasal realization in verbs when occurring as first-person pronominal subject prefixes because:
 - (i). The various random 'clap-out the syllables' games conducted with native speakers using sample ambiguous words, consistently yield indecisive results to specify an overriding predilection. The ratio of those who assigned a separate clap to the initial nasal segment and those who did not was virtually matching. Apparent, however, was that the inclination to assign or not assign a separate clap was contingent on: (a) whether one spoke in fast-speech or slowly, for identifiably slow-speakers often assigned a separate clap to the initial nasal, and vice-versa; and (b) whether the nasal-initial word is pronounced in isolation e.g. when it occurs singly, phrase or clause-initial. Considering the normal elocution to be the un-split syllable (single-clap)—realized prenasalized, the split-clap—syllabic realization is just but a variant.
 - (ii). The class 9/10 noun-initial nasal element is can tolerably be pronounced either short and simultaneously with the next segment or long and consecutive with the next segment without altering word meaning. Moreover, if the nasal prefix is pronounced short with manifest tone that will always be the tone on that occupies the NCV-syllable nucleus.
 - (iii). When the class-noun itself has its initial root consonant in a nasal where one would expect a nasal sequence, such imminent sequence is blocked because Lugwere does not permit nasal sequences in nouns. Instead, the nasal prefix is dropped to avoid sequence.

In the verbs, Lugwere extends this process to include the N-subject prefix following and N-initial verb root. Whenever the permitted heteromorphemic nasal sequence involving the first-person singular pronominal nasal prefix and an N-initial verb-root, whence a heteromorphemic homorganic sequence, typically a 'geminate nasal' is produced--similar to what is stated in Meinhof's Law, also known the Ganda law. The portrayal here is such that, the always homorganic N-prefix and root-initial N sequences are realized as a duratively lengthened (by over two times) and weighty nasal that passes for a 'secondary/apparent' geminate nasal made contiguous through morphological concatenation. These include [mm], [nn], [ɲɲ], and [ŋŋ], and occur in words such as

Infinitive form	Underlying form	Surface form	Gloss
/ku-màŋ-á/	/m † máŋ-à/	/mmáŋ-à/	I get to know
/ku-mò:m-á/	/m † mò:m-à/	/mmò:m-à/	I bump into
/ku-nà:β-á/	/n † ná:β-à/	/nná:β-à/	I bathe
/ku-ŋàg-á/	/n † ɲág-à/	/ɲɲág-à/	I grab
/ku-ŋà:k-á/	/n † ɲá:k-à/	/ɲɲá:k-à/	I grind roughly

A peculiar geminate is produced when the palatal glide is prefixed with the first-person subject nasal prefix, but not all cases involving the palatal glide and the nasal prefix. In other environments, the glide always realized as [dʒ], not as a geminate. Compare the two sets of examples below, where phenomenon occurs in the first, but not the others.

Infinitive form	Underlying form	Surface form	Gloss
/ku-jù ^ɲ g-á/	/n † jú ^ɲ g-à/	/ɲɲjú ^ɲ g-à/	I join
/ku-jòj-á/	/n † jój-à/	/ɲ-dʒój-à/	I crave for
/ku-jù:g-á/	/n † jú:g-à/	/ɲ-dʒú:g-à/	I sway back and forth
/ku-dʒùg-á/	/n † dʒúg-à/	/ɲ-dʒúg-à/	I am crying like a bull

2. An alternative to the above is a generalized word-initial syllabic N, reasoned as follows:

- (i). The fact that both syllabic and non-syllabic N realizations were recorded during the ‘clap out the syllable’ exercises conducted with native speakers may indicate that the non-syllabic realization is the variant. In support of this view, note that the non-syllabic realization is characteristic of isolation forms such that the nasal loses its syllabicity when pre-prefixed, say with an augment, e.g., /ɲ-tá:mà/ ‘sheep’ becomes /o:^ɲtá:mà/ ‘a/the sheep’, whereby the nasal instead compensatorily lengthens the preceding vowel.
- (ii). In Proto-Bantu, noun class 9/10 nasal prefixes, like word-initial vowels, have been widely attested to be potentially syllabic in word-initial positions. Besides, the syllabic-N element in the Lugwere NC clusters comes out as indubitably moraic, for it occurs only word-initial, and is potentially a tone-bearing unit (if pronounced long and consecutive) just like the vowels. It is that moracity that affects its word-internal environment when it loses its syllabicity whence it compensatorily lengthens preceding vowels.
- (iii). A generalized syllabic N-realization word-initial would be the comprehensive alternative analysis that accommodates both noun-related word-initial N behaviour as well as the verbal first-person singular nasal prefixes described above.

Well, while I do not propose either of above argumentations and/or analyses to be exhaustive or conclusive, each of these is certainly convincing and potential. However, notwithstanding the strong case in the first option, I opt for the rather ‘insipid’ but more stronger analysis of generalized class 9/10 noun-prefix syllabic-N realization (preceding prenasalizable/-nasals consonants) and verb-initial first-person pronominal nasal prefixes (preceding unprenasalizable/+nasals), and a prenasalized N realization everywhere else.

Consequently, another syllable type, /N/, that stemming from the assumption that the word-initial nasal element, morphologically a prefix, connects onto the following segments as a syllabic-N, is added. Conversely, the tautosyllabic analysis of word-internal NC clusters stems from the assumption that the syllable-initial nasal element thereof is incorporated phonologically into the following segment as prenasalization.

7.1.3 Syllable phonotactics

Below are some of the contexts wherein the above syllable types occur. Periods indicate syllable break, while the hyphens, as usual, identify roots from noun class, infinitive verb prefix, and final vowel categories.⁴

/V/					
[ì.-sà.ná]	'sunshine'	[ó.mú.-gé.nì]	'a guest'	màì.zí	'water'
[î.-kó]	'body dirt'	[ò.yó]	'that one'	kóí.zà	'uncle'
[é.mè.sé]	'the rats'			kì-sàì.gá	'palm of the hand'
[è.dí]	'that side'	[a.ì.ná]	'where'	kì-sòì.gí	'dry banana leaf'
[á.mò]	'perhaps'	[é.ì.-kó.kè]	'the ash'	mà.tàì.tá	'mumps'
[à.sátù]	'thirty'	[ó.ì.-rì.zí]	'an amulet'	nà.gòì.gó	'trunk road'

/CV/		/CSV/	
[kí.-sò]	'knife'	[s'ó.dò]	'vegetables'
[kí.-gó.gò]	'banana fibre'	[ku.-s'í-á]	'to grind'
[mú.-lí.rá.nò]	'neighbourhood'	[ku.-z ^w à.l-á]	'to wear'
[ku.-kù.lú.mú.t-á]	'to flow'	[m ^w -é.ré.kò]	'millstone'
[kì.-ná.ká.bú.bú.kù]	'tree crust'	[ká.-n ^w á.n ^w á]	'tip of lip'
		[mì.r'í.á.mì.r'è]	'python'

/NCV/ (in roots)		/NCSV/ (in roots)	
[ku.-kò. ^m b-á]	'to leak'	[tú. ⁿ d ^w à]	'passion fruit'
[nà. ^m pà.nú]	'curtly/shortly'	[kì.-bá. ^m b'à]	'dawn/aurora'
[ku.-sì. ⁿ dí.k-á]	'to push'	[mù.-t'fú. ^g wà]	'orange'
[mú.-k ^w á. ⁿ t'á.lì]	'junk equipment'	[má. ⁿ t'é.ré.mú.kò]	'slope'
[má. ⁿ sá. ^g gá. ⁿ zì.rà]	'junction'	[ku.-dà. ^m b'í-á]	'to disturb'

/N/(not in roots)	
[ñ.-s ^w á]	'white ants'
[ñ.s'ó.nò]	'thorny shrub'
[m̄.b ^w é.wè]	'chicken sp.'
[ñ.gò. ^g gí]	'envy'

Observations:

1. By distribution, V-syllables (whether singly standing or derived sequences consisting of two categories) occur in word-initial position, and usually as augments (in noun phrases), as subject pronominal or relative pronouns prefixes (in verb phrases), as noun-class 5 markers (if high front vowel), or as locative prepositions. They, however, occur severally root-initial. In contrast, CV syllables can occur in all the three word and root-positions; CSVs are robustly

⁴ For restriction in occurrence of some of the syllables, see the environmental charts in section 6.2.2 and 6.2.3.

attested word-initial, root-initial and root-final; NCVs and NCSVs only occur root-medial/word-final; while N is only word-initial.

2. In terms of relative frequency, NCV syllables are common and have both word-medial and word-final distribution. CSVs, on their part, are less common in nouns than in verbs and possessives but still occur in all positions; NCVs are much more common in nouns than they are verbs but widespread root-medial and root-final; while N syllables occur only word-initial in class 9/10 nouns and as first-person singular subject pronominal prefixes in verbs. NCSVs, on the other hand, are just but a handful in the entire language.

7.2 Word and root structure

7.2.1 Nouns

Lugwere nouns can, at least, be between bisyllabic and six syllables, and are mainly NcPfx-Rt or Ø-Rt where the root may be of -CV... or -VCV... structure), and vowels (whether prefix, initial root syllable, or syllable nucleus) may be short vowel, long vowel, or one of the three diphthongs identified above. From monosyllabic roots onwards, noun patterns, include:

Pattern	Example	Gloss
V-CV	[ì-gí]	egg
V-CVCV	[ì-βàlá]	spot
V-CVCVCV	[ì-sómérò]	school
CV-CV	[mù-zé]	habit
CV-CVCV	[kí-gúnò]	gum
CV-CVCVCV	[ká-mòmóló]	favouritism
CV-CVCVCVCV	[mú-sálámà]	lumberjack
CV-CVCVCVCVCV	[kì-nákábúbúkù]	dry tree crust

Note: Nouns with VCV roots preceded by a CV noun class prefix whose vowel is identical to the initial vowel of the noun-root, which ultimately results in a long vowel, also exist as in

Example	Gloss	Plural	Diminutive
[ì-ìgá]	cooking stone	[mà-ìgá]	kà-ìgá
[kì-ìβó]	basket	[βì-ìβó]	[kà-ìβó]
[mì-ìgó]	cane	[mì-ìgó]	[kà-ìgó]
[ì-ìsó]	eye	[mà-ìsó]	[kà-ìsó]

Other nouns with that bear only the root, with an unmarked (or zero) class-prefix syllable, are also common. Although some are overtly borrowed, many are indigenous Lugwere, e.g.

1. Class prefix-less nouns (having only root syllables) that may be Ø-CVCV... or Ø-CSV... as in

[Ø-pátà]	'hinge'		[Ø-tʃúpà]	'bottle'
[Ø-pápâ·li]	'pawpaw'		[Ø-tʃâ ^m pá]	'clotted blood'
[Ø-bú·li]	'teapot'		[Ø-dʒè:dʒá]	'cricket'
[Ø-bó ⁿ gò]	'sour milk'		[Ø-fùdú]	'tortoise'
[Ø-dàlí]	'toe sore'		[Ø-fèné]	'jack fruit'
[Ø-dí ⁿ gìdì]	'violin'		[Ø-s'étù]	'gossip'
[Ø-tótò·lí]	'pumpkin leaves'		[Ø-sá:nì]	'plate'
[Ø-tì ^m pá]	'yam leaves'		[Ø-sê ⁿ te]	'money'
[Ø-gásánì]	'name of a spirit'		[Ø-zèizá]	'grand parent'
[Ø-wàlòvú]	'chameleon'		[Ø-jàní]	'fish'
[Ø-wú·zi]	'thread'		[Ø-jàmà]	'meat'
[Ø-gúlú]	'stork'		[Ø-zìràjá]	'demoniac'

2. Nouns with underlying /Cu/ or /Ci/ prefix preceding a VCV root, realized as CS-V·CV...

[β ^w -ò·mí]	'life'		[β ^l -à·jò]	'livestock'
[m ^w -è·rí]	'moon'		[m ^l -à·ká]	'years'
[l ^w -ò·tá]	'sweat'		[l ^l -ò·sé]	'kwashiorkor'
[β ^l -òjò·jò]	'butterflies'			

3. Nouns with CV syllable roots and class 9/10 nasal prefixes (realized as syllabic N-CV). This kind really has its underlying root form with the initial syllabic nasal prefix split from the root. In fact, prefixing the diminutive singular class 12 prefix /ka-/ helps clear the ambiguities with pre-nasal consonant that created morphophonemic complications to condition root changes and modify the root form, as in

Citation form	Underlying root	Diminutive (sing.)
[ŋ-zí] 'fly(ies)'	[-zí]	[ká-zì]
[m̄-bàgá] 'party(ies)'	[-βàgá]	[kà-βàgá]
[ŋ-kòkó] 'chicken'	[-kòkó]	[kà-kòkó]
[ŋ-s ^w á] 'white ant(s)'	[-s ^w á]	[kà-s ^w á]
[m̄-b ^w á] 'dog(s)'	[-b ^w á]	[kà-b ^w á]
[ŋ-té] 'cow/cattle'	[-té]	[ká-tè]
[ŋ-sòlí] 'black ant(s)'	[-sòlí]	[kà-sòlí]

4. Nouns with CV syllable roots and assumed class 9/10 nasal prefixes (realized as syllabic N-CV) but whose initial nasal is actually part of the root and, thus, remains even after the diminutive marker prefixation (for those that allow this).

This kind really has its underlying root form with the syllabic nasal prefix merged onto the root. In this particular category, the disambiguation caused by prefixing the diminutive singular class 12 prefix /ka-/ supposedly to uncover the underlying root form is defied by the /ka-/ prefix suitably attaching to precede the nasal.

The assumption here is such that although the noun root starts with the nasal, that same nasal functions as a class marker as well, as in

Citation (sing. & plural)	Alternative form (plural only)	Diminutive (sing.)
[m̄-pàṅá] 'male goat'	[βù- ^m pàṅá]	[kà- ^m pàṅá]
[ŋ-tù·zì] 'jigger(s)'	[tù- ⁿ tù·zì]	[ká- ⁿ tù·zì]
[m̄-pìrí] 'snake(s)'	[tù- ^m pìrí]	[kà- ^m pìrí]
[ŋ-zálà] 'hunger'		[ká- ⁿ zálà]
[m̄-b ^w é·wè] 'chicken species'	[βú- ^m b ^w é·wè]	[ká- ^m b ^w é·wè]
[ŋ-t ^w í·gà] 'giraffe(s)'	[tú- ⁿ t ^w í·gà]	[ká- ⁿ t ^w í·gà]
[ŋ-d ^l á·gà] 'type of bag'		[ká- ⁿ d ^l á·gà]
[ŋ-sálò] 'boundary(ies)'	[má- ⁿ sálo]	[ká- ⁿ sálò]
[ŋ-s ^l àìkà] 'species of bush'	[βú- ⁿ s ^l àìkà]	
[m̄-p ^w í·tù] 'obstinacy'		
[ŋ-s ^l ó·nò] 'thorny shrub'	[tú- ⁿ s ^l ó·nò]	
[ŋ-sákà] 'pot(s)'	[má- ⁿ sákà] 'pots'	
[m̄-pálè] 'trouser(s)'	[má- ^m pálè] 'trousers'	
[ŋ-k ^w à·já] 'armpit(s)'	[mà- ⁿ k ^w à·já] 'armpits'	
[ŋ-t ^l á·mírò] 'hind end'	[má- ⁿ t ^l á·mírò] 'hind ends'	

7.2.2 Verbs

Lugwere verbs in their citation form always bear the infinitive (class 15) prefix /ku-/ (InfPfx), a root (Rt), which is generally -CVC- or -VC- though longer roots are also available,

and a final vowel /-a/ (FV), hence, the form InfPfx-Rt-FV. They usually consist of a range of root syllables between one and six syllables. Monosyllabic roots are particularly of two kinds:

1. Those that consist of the infinitive /ku-/ prefix followed a mono-segmental root onwards, then followed by the default final vowel /-a/, as in

[ku-j-á]	to be cooked	[ku-w-á]	to give
[ku-b-á]	to be	[ku-tʃ-á]	to dawn
[ku-sàl-á]	to cut'	[ku-βèg-á]	to spy
[ku-tàl-á]	to despise	[ku-kòβ-á]	to say
[ku-sùmúl-á]	to abort	[ku-ŋòlól-á]	to snore
[ku-sùmít-á]	to stab/pierce	[ku-pàpúk-á]	to pop apace
[ku-tàgálál-á]	to pose broadly	[ku-βàizágál-á]	to belch
[ku-wòlókók-á]	to melt down	[ku-sìsímúk-á]	to awake a bit
[ku-gàlágátan-á]	to writhe	[ku-lùgálúgán-á]	to rove about
[ku-lìgálígán-á]	to cry fowl	[ku-sàmálírír-á]	to be stunned

2. Those whose infinitive prefix undergoes gliding before V-initial roots, a phenomenon that ultimately results a modified syllable structure and a phonetically long intervening vowel hence the shape CS-VC... then followed by the default final vowel /-a/as in

Underlying	Citation	Gloss	Underlying	Citation	Gloss
[kù-ìj-á]	[k ^w -ìj-á]	to uproot	[kù-è-ì-gám-á]	[k ^w -èìgám-á]	to shelter from
[kù-èt-á]	[k ^w -èt-á]	to call	[kù-èmérér-á]	[k ^w -èmérér-á]	to stand up
[kù-àβ-á]	[k ^w -àβ-á]	to go	[kù-èkálíkítʃ-á]	[k ^w -èkálíkítʃ-á]	to scrutinize
[kù-òtʃ-á]	[k ^w -òtʃ-á]	to burn	[kù-èkédé ^ɔ kérér-á]	[k ^w -èkédé ^ɔ kérér-á]	to be slumped
[kù-ìrúk-á]	[k ^w -ìrúk-á]	to run	[kù-àwúkán-á]	[k ^w -àwúkán-á]	to get separate

Notes:

1. Another kind of monosyllabic root consists of the infinitive prefix /ku-/ followed by a potentially bi-syllabic root which is, however, modified by gliding⁵. Juxtaposition of the root vowel and the default final vowel /-a/ results in the structure CV-CS, as follows

Underlying form	Citation form	Gloss
[ku-gù-á]	[ku-g ^w -á]	to fall
[ku-fù-á]	[ku-f ^w -á]	to die
[ku-lì-á]	[ku-lʰ-á]	to eat
[ku-tì-á]	[ku-tʰ-á]	to fear

2. Vowel /u/ or its long counterpart do not occur root-initial.

⁵ Same process hinted on in 6.2.3 whence approximants are inserted to break incongruent vowel sequences.

8 Tone

Lugwere seems to have a register type of tone, and there are several pointers to the mora as the tone-bearing unit (TBU), including

- (i) existence of syllabic nasals in word-initial contexts which bear tone—just like all word-initial V-syllables,
- (ii) word-internal nasals on prenasalized segments compensatorily lengthening the vowels they follow (as is the case following palatalized and labialized segments),
- (iii) widespread litigious falling tone, both as a derived tone (in verbs and some adjectives) and as a melodic unit in single association (in nouns, adverbs, and some adjectives) both on phonemic short vowels (but conditioning phonetic length except word-final) and on monosyllabic bi-moraic vowel clusters (Heine & Nurse 2000, 60).

Three distinct tones are apparent in Lugwere, out of which eight melodies: HL, LH, L, H, FH, FL, LF, and HF, are attested in the words and whose distribution in words upon the individual morae is highly word-specific.

8.1 Ambiguous tonic structures and issues of interpretation

The only ambiguous tonic structure is the falling/contour tone, which most of the literature contest as not being tonemic but a mere cluster of two tonemes in sequence. While I seem not to have any problem with such a verdict (for, it it satisfactorily accounts for falling tone occurrence in the verbs and in some of the adjective phrases), I am tempted to consider the falling tone seen in the nouns, adverbs, and some adjectives as a single melodic unit in initial association because:

1. Firstly, it is articulated as a single melodic unit on the TBU that bears it minus decomposing into level tones over a polysyllabic domain. It remains associated as a unit with the tone-bearing unit that bears it; unlike if it were a derived/sandhi tone.
2. Secondly, the environment of occurrence of some instances of falling tone, at least in nouns, adverbs, and some adjectives, is not predictable as has been supposed in literature.
3. Thirdly, in terms of distribution, Lugwere noun and adverb falling tone typically appears on the tone-bearing unit as both a citation and underlying tone, as a unit at both edges of syllable, word, and phrasal domains just as freely as the high and low tones do. Besides, it associates to both syllable non-final and final domains as a single melodic unit with no such restrictions as had been predicted if it were to a tone cluster.
4. Fourthly, this falling tone in nouns and adverbs is contrastive; it contrasts meanings of lexemes in identical environments (see examples in 8.2.1). In view of this, we uphold the conviction that Lugwere falling tone is like to be tonemic.

The falling tone scenario observed in Lugwere, apparently, appears to somewhat differ from that of Luganda, a related language, whose tone phenomena has received a lot of treatment in the literature, such that not all generalizations for Luganda matchingly suit or even satisfactorily account for the Lugwere falling tone contour.

Relatedly, generalizations that insist that all contour tones are derived melodies serve to subdue us to the majority analysis just for the sake of it. As such, although in a remote analyst's view this is the easiest and facile account of the widespread falling contour in the language, for as long as a generalized HL-cluster analysis falls short of

- (i) accounting for occurrences of falling tone on unequivocally short word-final vowels;
- (ii) avoiding unintended extended interpretations, i.e., diphthongs (in 6.1.2.2.2) singly resulted from deletion of a tone-bearing unit and subsequent re-association of a stranded tone, rebutting attested occurrence on word-medial analogous V-sequences; and/or

(iii) dissemblingly assuming that all falling tone occurrences contour in Lugwere can simply yet exhaustively be explained by a single generalization;

I would rather uphold the occurrences of falling tone that cannot be explained by the derived contour analysis to be tonemic, at least, until it is refuted with cogent arguments.

8.2 Tone in Lugwere parts of speech

Lugwere tone is a considerable feature that merits mention, at least for the orthography development, thus, I identify some of its pertinent features and values by parts of speech.

8.2.1 Noun tone

Several things can be observed on tone in Lugwere noun:

1. There exist lexical minimal pairs that are only distinguishable by their tone, e.g.

- a. [mú-wólò] 'type of knife'
[mù-wólò] 'tree sp.'
[βú-kúlù] 'tadpoles'
[βù-kùlú] 'old age'
- b. [ṁ-pà:tá] 'bald'
[ṁ-pâ:tà] 'proper name'

2. In monosyllabic roots, a strict pattern of LH and HL presents, i.e. if the prefix mora (or first syllable of the noun word) has a high tone, the tone of the root mora will be low, and vice versa. In terms of relative frequency, the spread is nearly comparable, as in

[ṁ-té]	cow/cattle	[kí-dà]	belly
[ṁ-ví]	grey hair	[kí-gà]	chips on the heel
[ṁ-gó]	leopard	[kí-β'à]	vessel
[ì-ká]	home	[βú-t ^w à]	poison
[ì-gí]	an egg	[kì-gó]	circle
[ì-kó]	body dirt	[kì-dʒó]	potato
[ì-b ^w á]	wound	[kì-s'á]	scalp fungus
		[lù-k ^w í]	firewood

Note: No case of falling tone has been identified in monosyllabic noun roots in the data.

3. In polysyllabic nouns-roots

(i) Long vowel and diphthong sequences only have the following tones within a syllable:

	Long vowels	Gloss	Diphthongs	Gloss
HH	[má-fú:dʒà]	boiled nut pods	[βú-káířè]	old age
	[mà-lá:là]	sour milk	[kà. ⁿ s ^w éífkè]	little finger
	[m ^w -álá:là]	stripe	[táífkùlà]	type of bird
	[mù-sí:sì]	millet chaff	[kóízà]	uncle
	[mú-ké:kà]	palm mat	[téítè]	father (informal)
	[má-tó:kè]	banana	[ṁbéízà]	princess
LL	[lù-kò:kóí ^w à]	elbow	[kì-bó ^m bòizì]	chaff dump
	[mà:ńé]	urine	[kì-sàìgá]	palm of the hand
	[mà:ńí]	strength	[kì-sòìgí]	dry banana leaf
	[ì-bà:lé]	Stone/rock	[màtàítá]	mumps
	[kì-dè:ró]	granary	[nàgòìgó]	trunk road
	[mù-dè:pá]	type of trap	[mòizá]	one

	[kì-zì:má]	crown	[màizí]	water
	[lù-kì:kó]	meeting	[mù-sàizá]	man
FF	[màsì:pè]	obstinate person	[βù-gáigà]	riches
	[kì-nàjù ^m bà]	bird's nest	[kì-kóikò]	riddle
	[kì-bì·bì]	bad/sin	[kì-ráirò]	oath
	[kì-pâ ⁿ gà]	machete	[nàmáizi]	vegetable type
	[mâ-bû·sù]	prison	[m̀báirè]	xylophones
	[ɲ-tètê·tè]	trepidation	[mù-gáitò]	a fine/mulct
	[nàmâ·d̀zì]	banana sp.	[ɲ-gáitò]	shoe(s)
	[ɲ-kúdú·lí]	beetle sp.		
	[tótô·lí]	pumpkin leaf		
	[ɲ-tʃê ⁿ gà]	residue		

(ii) Over all, the following pitch patterns (and tone melodies) are possible:

	2-S roots	Gloss	3-S roots	Gloss	4-5 Syllable roots	Gloss
HH	ì-βírí	two	∅-wólód̀z̀ó	bird species	∅-námád̀z̀áli	ants species
	kì-bó:tó	hovel	∅-wédéd̀é	bird species	∅-kádá ⁿ tá:mà	lizard species
	∅-gúlú	stork bird	kì-sá ⁿ gálá	dry crop stem	kì-nákábúbúkù	dry tree shell
	∅-wá:lú	crane bird	kí-rólérò	rest house	∅-má ⁿ sá ⁿ gá ⁿ zírà	junction
		∅-gásáni	a spirit name			
HL	βú-lézì	medicine	∅-námùnjé	bird species	βù-d̀z̀úl̀z̀ì	testimony
	lú-báni	wood deck	∅-námòlí	wild goat	∅-kádúkùl̀ù	cell
	kí-mírà	mucus	∅-kó:fùló	padlock	m̀-pùlúkùt ^w í	inner ear
			kì-nánpùlí	tree species	∅-mìr ^l á·mìr ^l è	python
		∅-kálàlí	pepper			
HF			∅-tótô·lí	pumpkin leaf	∅-ká ^m púmù ^m pú	beer type
			∅-jápá ⁿ sì	pineapple		
			∅-pápá·lí	paw-paws		
LL	í-rizì	amulet	∅-kálà:là	grass species	∅-bòtòkòlò	elephantiasis
	kí-βàlà	fruit	ì-tàkàlí	soil		
LH	ì-rálú	madness	∅-d̀d̀úm̀ù	plough wheel	kì-gàlàβá:jò	palm
	βù-nòlí	sweetness	ɲ-d̀ikí:r ^l á	darkness	∅-kàmòmólò	discrimination
	mù-sàbí	spear type			∅-wàlùgónò	spirit's name
	kì-d̀èkù	calabash			kì-sálámà ^m bá	grass species
LF	∅-fènê	jack fruit	∅-nàmâ·d̀z̀ì	plantain sp.		
	∅-ɲà:ɲâ	bird sp.	∅-nàmáizi	veggie type		
	kì-fò:f ^w ô	lung	ɲ-tètê·tè	trepidation		
	kì-ɲò:ɲò	black ant	∅-kàlâ·mù	pencil		
FH	∅-sù·d̀ó	blood clot	∅-kàk ^w â·lí	bird species		
	ɲ-tù·zì	jigger	∅-màsì·pé	obstinacy		
	m ^w â ⁿ gò	jamb	∅-m̀t̀ê·ré	rice		
	kì-râ·ló	herd	ɲ-sérê·rá	bird species		
	m̀-ghâ·bé	long drum	ɲ-kúdú·lí	beetle species		
	kì-bì·bí	sin	m̀pérê ^m pé	type of game		
	m̀-gháitò	fine/mulct	kì-nàjù ^m bá	bird nest		
FL	∅-jâ·jà	tomato(es)	ɲ-kókò·lí	sisal		
	∅-lâ·mà	scathe	kí-tá ^m bá:là	veil		
	kà-n ^l â·là	a midget				

In the above charting, we observe that other than the FF pitch, Lugwere noun-roots, by syllable divisions, can host any of the following pitch sequences on a single word:

Bisyllabic	Trisyllabic	Quadri-syllabic	Pente-syllabic
-HH	-HHH -HFL	-HHFH	-HHHHL
-HL	-HHL -LFH	-LHLH	
-LL	-HLH -LFL	-LLHH	
-LH	-HLL -HFH	-LLHL	
-LF	-LHH	-LHLL	
-FH	-LHL	-LLLH	
-FL			

(iii). Only the following tone patterns and/or melodies are permissible:

HL LH LL HH FH FL LF HF

I confirmed these by investigating the interaction between syllable pattern, vowel length, and tone in a circumscribed sample of bisyllabic noun-roots, categorized by all possible syllable patterns. Across these, I compared the tonal pattern possible. I also highlighted some of the far-flung tone pattern across syllable patterns with a similar colour for quick view. Despite some gaps, it is noticeable how majority tone patterns duly overlap across the various syllable patterns, as seen below.

-CVCV		-CV:CV		-CSVCV	
H	[ì-βírí] 'two'	H	[kì-bó:tó] 'hovel'	H	[mù-g ^w á'βí] 'tobacco pipe'
HL	[ì-rógò] 'magic'	HL	[mù-sí:sì] 'millet chaff'	HL	[mù-g ^w á'li] 'rags'
LH	[ì-ràlú] 'madness'	LH	[βì-rà:tó] 'sandals'	LH	[kì-p'è'dá] 'abnormalcy'
FH	[kì-bî'bí] 'sin'	FH		FH	[mù-t'ê'ré] 'rice'
FL	[kà-nâ'là] 'urinal'	FL		FL	[kà-n'â'là] 'midget'
LF	[fènê] 'jackfruit'	LF	[kì-nò:nò] 'ant species'	LF	
L	[kí-βàlà] 'fruit'	L		L	

-CVVCV		-CVNCV	
H	[βú-káírè] 'old age'	H	
HL	[kí-kóikò] 'riddle'	HL	[kí-tí ^m bò] 'rag'
LH	[mù-gáitò] 'mulct/fine'	LH	[kì-tè ^m pé] 'wall'
FH		FH	[kì-pâ ⁿ gá] 'machete'
FL		FL	[kí-tâ ⁿ dà] 'bed'
LF		LF	
L	[mà-tàitá] 'mumps'	L	
	[nàirâ ⁿ gé] 'disdained person'		

N-CVCV		N-CSVCV	
H		H	
HL	[m̄-pásò] 'crevice'	HL	[ḥ-s'ó'nò] 'shrub'
LH	[m̄-pìrí] 'snake'	LH	[ḥ-k ^w à'já] 'armpit'
FH	[ḥ-tú'zí] 'jigger'	FH	[ḥ-d'â ⁿ gá] 'bag'
FL	[m̄-pâ'tà] 'name'	FL	[ḥ-k ^w â'lé] 'bird sp.'
LF		LF	

L		L	
---	--	---	--

4. Tone on noun prefixes varies. They may have either a high or low tone with no apparent clue as to which one should occur where. Augments, however, usually have a high tone.

8.2.2 Adjective tone

I particularly undertook to consider tone behaviour in this part-of-speech (not usual for tone studies) because Lugwere adjectives: are of the same structure as nouns, behave like nouns, and in essence share nearly all the properties of nouns save for a few distinctions. Prominent among these is class marking, which, like in the nouns, obligatorily precedes the adjective root and depends on the class of the subject of the construction. While monosyllabic adjectives do not bear falling tone, polysyllabic roots present two differing facets of tone, i.e.

- (i). Autonomous falling tone occurs on Lugwere adjectives as a melodic unit in single association and is widespread, e.g., [i:râ] ‘long ago’, etc.
- (ii). A derived tone contour apparently resulting from sequencing of HL tones on the same syllable also presents in the adjectives when prefixed with a noun-class 9/10 prefix. For example, take the adjective ‘good’ whose underlying form [Pfx -sà] ‘... good’, when marked with noun-class 7/8, we obtain [kí-sà] ‘it is good’ and [βí-sà] ‘they are good’ respectively; while class 1/2 prefixing yields [mú-sà] ‘s/he is good’ and [βá-sà] ‘they are good’, respectively. However, when class 9/10 prefix is introduced, a falling tone is realized on the adjective, as in [n-sâ] ‘it/they are good’, and apparently results from the transferring of the H of the nasal prefix onto the vowel ahead.

Such realizations, if conceived as pragmatic, would ultimately support the argument that word-initial Ns in NC clusters, anywhere, are actually prenasalized realisations.

As such, here, the class 9/10 nasal prefix is sessile onto the following segment an prenasalization, thus a single syllable, with the tone previously borne by the deleted TBU (seen in other class prefixations) shifted ahead onto the remaining TBU, the final vowel.

8.2.3 Verb tone

Just like in nouns, several things can be observed on tone in Lugwere verbs:

1. Monosyllabic verb roots are by default pronounced with a high tone, which is also the default tone for the verbal final vowel (FV)⁶, while the prefix is always low ‘toned’, as in

[kù-b-á]	‘to be’
[kù-l-á]	‘to eat’
[kù-t-á]	‘to fear’
[kù-g ^w -á]	‘to fall’
[kù-f ^v -á]	‘to die’

In cases where the forms are inflected for tenses and aspects, surface-tone realization changes to a default low tone on the final vowel. As such, in monosyllabic roots, with the would-be word initial (prefix) low tone compensatorily marked on the tense prefix coming just before

⁶ Apparently, this default FV high tone changes to a low tone when the verb is inflected for other tenses/moods

the root, both the default root-syllable high tone and the obligatory low tone verb-final conflate, and are realized on the verb's final vowel as a contour, as in

- a. [kì-b-á] 'it is' (literally 'it be')
 b. [βà-l̩-á] 'they eat'
 [à-t̩-á] 's/he fears'
 [mù-g^w-á] 'you (pl.) fall'
 [tù-f^w-á] 'we die'

The contour derivation in the group (b) bisyllabic examples can be explained by modification of the mono-segmental root by gliding the root vowel (also the tone-bearing mora) due to contact with the final vowel, whence the stranded tone of the modified (*read* deleted) mora is pushed onto the next mora, which is in this case the final vowel.

2. In polysyllabic verb roots:

(i) Long vowel and diphthong sequences can have the following tones within a syllable:

	Long vowels		Diphthongs	
H	ku-kòtá:kót-á	to walk bent over	k ^w -ègáírír-á	to plead
	ku-lògótán-á	to talk uncoordinated	k ^w -ìkákán-á	to calm down
			ku-kè ^ɲ géz-á	to filter
L			ku-gàgátúk-á	to stagger
	ku-ṅà:k-á	to grind roughly		
	ku-kò:ɲ-á	to assist	ku-gèz-á	to grow fat
	ku-sà:m-á	to castrate	ku-gàit-á	to add
	ku-sà:ɲ-á	to swim	ku-kòìg-á	to plant potatoes
	ku-lò:b-á	to tether	ku-g ^w àizúk-á	to walk numbly
	ku-lò:t-á	to dream	ku-βàizágál-á	to belch
	ku-símú:l-á	to wipe		

(ii) In citation form, only the following pitch pattern exists

	Disyllabic roots		Trisyllabic roots		4 or 5-syllable roots	
LH	ku-kùɲ-á	to squeeze	ku-tùkút-á	to shiver	ku-kàlámát-á	to scrape
	ku-sàm-á	to bark	ku-sòdók-á	to escape	ku-dùkú:lík-á	to stink
	ku-tàl-á	to despise	ku-tìβúl-á	to untie	ku-gàlágátán-á	act strenuously
	ku-dìβ-á	be unmarketable	ku-sòdók-á	to escape	ku-lìgálígán-á	to deplore
	ku-βàl-á	to count			ku-tèré ^m bérér-á	to go straight

From the chart, a given verb-root can only host the following pitch sequences:

Bisyllabic **Trisyllabic** **Quadri-syllabic** **Pente-syllabic**
 LH LHH LHHH LHHHH

This indicates that, unlike nouns, verbs belong to one tone-class and the roots have [-LH] as the only tone pattern and melody regardless of the number of syllables.

As surface realizations, in monosyllabic roots only the high tone root-final is realized, with the preceding low tone supposedly catered for by the infinitive prefix's default low tone. Relatedly, in polysyllabic roots, the first root-syllable that precedes the prefix's low tone will always be low 'toned', followed by an all-high tone, for final high on the second root-syllable spreads over any all the syllables that follow it.

(iii) In inflected forms, though upholding the phenomena of displacing the default high tone verbal-final for a low tone when inflected, ONLY when occurring with singular-person prefixes in the present, the Immediate and Remote past, and the Remote future tenses is the LH melodic sequence maintained, as in

ku-kùŋ-á	to squeeze →	à-kùŋ-à	he squeezes
ku-sàm-á	to bark →	à-sàm-á ^{ng} -à	it usually barks
ku-dìβ-á	to be unsold →	kì-dìβ-à	it gets unsold
ku-βàl-á	to count →	yà-lí-βàl-à	he will (RmFut) count

ku-tùkút-á	to shiver →	à-tùkút-à	he shivers
ku-sòdók-á	to escape →	à-sòdókér-è	he's escaped
ku-tìβùl-á	to untie →	à-tìβùl-à	he unties
ku-tàl-á	to despise →	à-tàl-ír-è	he's despised

kù-kàlámát-á	to scrape →	ò-kàlámátír-è	you (sg.) have scraped
kù-dùkú:lík-á	to stink →	ò-dùkú:lík-à	you (sg.) are stinking
kù-gàlágátán-á	to act strenuously →	à-gàlágátán-à	He's acting strenuously
kù-ligálígán-á	to deplore →	à-ligálígáin-è	he has deplored
kù-tèré ^m bérér-á	to go straight →	ò-tèré ^m bérér-à	you (sg.) go straight

Note: Interestingly however, in tri-syllabic and more syllable words, preceding the rather preserved low tone prefix, the would-have-been low tone root-initial syllable assumes a high tone (which eventually spreads till the penultimate mora), then the default derived verb low tone word-final, as in

ku-tìβùl-á	to untie →	tù-tìβùl-à	we untie
ku-tùkút-á	to shiver →	mù-tùkút-à	you shiver
kù-dùkú:lík-á	to stink →	âù-dùkú:lík-à	they stink

kù-kàlámát-á	to scrape →	mù-kàlámát-à	you (pl.) are scraping
ku-sòdók-á	to escape →	mù-sòdókér-è	you (pl.) have escaped
kù-gàlágátán-á	to act strenuously →	tù-gàlágátán-à	we're acting strenuously

Above is an illustration of how tone behaves in non-infinitive multi-syllabic words where the would-have-been low tone on the root-initial syllable instead becomes a high tone just because the (subject) prefix introduced before it has assumed a low tone resulting into a LH...L pattern, conformity to the verbal default LH melody.

In the Near-future (NFut) and Hesternal past (HestPst) tenses, and all plural person prefixes, contrary behaviour presents such that surface tone realizations are interchanged. In disyllabic words, the prefix assumes high tone (instead of the low tone widely known of the other cases) with the rest of the syllables assuming a low tone—kind of spreading backwards.

ku-kùŋ-á	to squeeze →	y-á-kùŋ-à	he will (NFut) squeeze
ku-dìâ-á	to be unsold →	k ^l -á-dìβ-à	it will (NFut) be unsold
ku-βàl-á	to count →	n-á-âàl-à	I will (NFut) count
ku-tàl-á	to despise →	t ^w -á-tàl-à	we will (NFut) despise
kù-tèré ^m bérér-á	to go straight →	n-á-tèré ^m bèrèr-à	I will (NFut) go straight
ku-sàm-á	to bark →	β-á-sàm-ír-è	they barked (HestPst)
Kù-ligálígán-á	to deplore →	ná-ligálígáin-è	I deplored (HestPst)

3. As regards these verbal derivational affixes, unlike the citation form always-low tone infinitive prefix and its always-high tone final vowel, whenever the verb is inflected, e.g. for tense, aspect, mood, etc, the final vowel obtains a low tone.

8.3 Lugwere tone functional load

First, assuming a one tone per syllable mora ordering, whether short, long, or clustered sequences whence the tone may be high, low, or falling, all Lugwere tones are contrastive. In other words, adjusting a single tone value on an individual syllable may change the meaning of the entire word, both in lexical items and grammatical categories. Below is a brief description of the three functions of Lugwere tone:

1. Lexical function:

Tone in Lugwere contrasts lexical items as can be demonstrated in the examples below

a.	[mú-wólò]	‘type of knife’	b.	[ì-sùβí]	‘grass’
	[mù-wólò]	‘tree sp.’		[ì-sù·βì]	‘hope’
	[βú-kúlù]	‘tadpoles’		[m̄-pà:tá]	‘bald’
	[βù-kùlú]	‘old age’		[m̄-pâ·tà]	‘proper name’
c.	[kàdí]	‘the other (small) one’	d.	[bá-ká:lí]	‘they are vehement’
	[kádí]	‘not at all’		[bà-kâ:lì]	‘they’ve not yet...’
	[m ^w álí]	‘girl-child’		[m ^w álà]	‘stream of water’

2. Grammatical functions:

(i). Tone distinguishes tenses and other morphological categories in verbs. It may be the only way to tell between some tenses in verbal phrases, e.g. minus tone, it is not easy to tell between Hesternal and Remote past tenses unless otherwise explicitly indicated say using time words, as seen in the verb [ku-tèm-á] ‘to cut’ below

	/y- á- kì- tèm- ér- à/	
	3S-HestPst-Obj-cut- Perf-Fv	‘he cut it yesterday’
<i>versus</i>	/y- à- kì- tèm- èr- á/	
	3S-RmPst- Obj- cut- Perf- Fv	‘he cut it (prior to yesterday)’

(ii). Tone distinguishes declaratives from polar interrogatives (yes/no questions), as in

/óíké ⁿ dì àtó;ɲà/	<i>versus</i>	/óíké ⁿ dì àtó;ɲǎ/
‘it is raining’		‘is it raining?’

3. Discourse functions:

(i). Tone indicates contrastive focus, as in

/ómwàná ágónà/	<i>versus</i>	/ómwàná àgónà/
‘the child who is sleeping’		‘the child is sleeping’

(ii). Tone indicates significant relationship, as in

/kàità kà ⁿ gé/	<i>versus</i>	/káità kà ⁿ gé/
‘my cherished little millet bread’		‘my little millet bread’
/mùntù wà ⁿ gé/	<i>versus</i>	/múntù wà ⁿ gé/
‘my relative by blood’		‘my buddy/crony’

9 Morphophonemics

9.1 Word-internal changes at morpheme boundaries

The following word-internal morphophonemic changes are observed:

9.1.1 Assimilatory or strengthening processes

In Lugwere, nouns bear obligatory noun class markers, whereas verbs in derived forms are of such a structure that there must be a subject prefix. By default, the first-person singular obligatory subject prefix and at times first-person singular object prefix, which is a nasal, also doubles as the noun-class 9/10 marker, influences the amount of closure that the adjacent segment will take on articulation thereby changing the form of the resultant segment. This phenomenon manifests through the processes:

9.1.1.1 Occlusion assimilation

This process affects all labial consonant phonemes which are +continuant, i.e. /β, w, j/ and /l/. These, when prenasalized take on the same amount of oral closure as the preceding labial nasal, thus, presenting evidence of assimilation, also called neutralization. They, specifically, become [b, p, d̪] and [d], respectively, yet they contrast with each other in identical or analogous environments, as in the examples below.

(i). Phonemes /β/ and /b/ contrast in identical environments, as in

/k^w-àbá/ 'to fetch a needed item from a place of abundance'
/k^w-àβá/ 'to go away/depart'

but this contrast is annulled following a nasal with whose POA it assimilates, such that

/β/	→	[b]/C _	
[+nasal]		[β]/everywhere else, as in	
/ku-βèg-á/ 'to spy'	→	/à- βég- à/ 3S-spy- Fv	'he spies'
but /m ≠ βèg-á]	→	/m̩-bég- à/ 1S-spy- Fv	'I spy'
and	→	/à- m- bég- à/ 3S-1S.Obj- spy- Fv	'he spies on me'
/ku-βòn-á/ 'to see'	→	/à- βón- à/ 3S-see- Fv	'he sees'
but /m ≠ βòn-á]	→	/m̩-bón- à/ 3S-see- Fv	'I see'
and	→	/à- m- bón- à/ 3S-1S.Obj- see- Fv	'he sees me'

(ii). Phonemes /w/ and /p/ contrast both in identical and analogous environments, as in

/ku-wà:lá/ 'to scour/abrade a surface'
/ku-pà:lá/ 'to run off without precise knowledge of direction'

but this contrast is annulled following a nasal with whose POA it assimilates, such that

/w/	→	[p]/C _	
[+nasal]		[w]/everywhere else, as in	
/ku-w-á/ 'to give'	→	/à-w- á/ 3S-give-Fv	'he gives'
but /m ≠ w-á]	→	/m̩-p- á/ 1S-give-Fv	'I give'

and	→ /à- m- p- â/	3S-1S.Obj- give- Fv	'he gives me'
/ku-wòn-á/ 'to be healed'	→ /à-wón- à/	3S-heal-Fv	'he gets healed'
but /m ≠ wòn-á]	→ /m̄-pón- à/	1S-heal-Fv	'I am healing'
and	→ /à- m- pón- j- à/	3S-1S.Obj-heal-Caus-Fv	'he heals me'

- (iii). Phonemes /l/ and /d/ contrast in identical and analogous environments, as in
/ku-lòlá/ 'to look for/to gaze'
/ku-dòdá/ 'to get wet'

but /l/ and/or its allophones assume coronal articulation characteristics following a nasal such that the contrast is annulled, hence the rule

/l/ → [d]/C _
[+nasal] [l]/everywhere else, for example

In verbs: /ku-lòl-á/ 'to look'	→ /à- lól- à/	3S-look- Fv	'he looks for'
but /n ≠ lòl-á]	→ /n- dól- à/	1S- look- Fv	'I look for'
and	/à- n- dól- à/	3S-1S.Obj- look- Fv	'he looks for me'
/ku-lìm-á/ 'to dig'	→ /à- lím- à/	3S- dig- Fv	'he digs'
but /n ≠ lìm-á]	→ /n- dím- à/	1S-dig- Fv	'I dig'
and	→ /à- n- ðim-ír- à/	3S-1S.Obj-dig- Appl-Fv	'he digs for me'

In nouns: /lu-lérà/ 'umbilical cord' → /n ≠ lérà/ → /n̄- dérà/ 'umbilical cords'
/lu-lùβí/ 'boundary' → /n ≠ lùβí/ → /n̄- dùβí/ 'boundaries'

- (iv). Phonemes /j/ and /d̄ʒ/ contrast in identical and analogous environments, as in
/ku-j-á/ 'to be cooked/burnt'
/ku-d̄ʒ-á/ 'to fly out like ants'

but following a nasal that contrast is annulled, such that

/j/ → [d̄ʒ]/C _			
[+nasal] [j]/everywhere else, as in			
/ku-j-á/ 'to get burnt'	→ /à- j- â/	3S-burn- Fv	'he gets burnt'
but /n ≠ j-á]	→ /n̄- d̄ʒ- â/	1S-burn- Fv	'I get burned'
/ku-jì:g-á/ 'to hunt'	→ /à- jí:g- à/	3S-hunt- Fv	'he hunts'
but /n ≠ jì:g-á]	→ /n̄- d̄ʒí:g- à/	1S-hunt- Fv	'I hunt'
and	→ /à- n- d̄ʒí:g- à/	3S-1S.Obj- hunt- Fv	'he hunts for me'
/ku-jòj-á/ 'to crave for'	→ /n ≠ jój-à] → /n̄- d̄ʒój- à/		'I crave for'

vowel is [+mid], that is, [e or o], while the suffix form /-ik/ is realized if the last root vowel is [-mid], that is, [a, i, or u], as in

/ku- βàl- ík- á/
Inf- count- AB/Alc- Fv 'to be countable'

but /ku- βòn- ék- á/
Inf- appear- Caus- Fv 'to be visible/ to seem'

9.1.2 Dissimilatory or cognitive process-velar affrication

Lugwere has affricate segments /tʃ/ and /dʒ/, as well as the velar segments /k/ and /g/ as distinct phonemes. While the velars can bear palatalization, affricate phonemes cannot.

Now, this velar palatalization normally occurs at morpheme boundaries phonologically conditioned by the attempt to break un-permitted segment sequences, specifically involving the obligatory noun-class and/or noun class associative pre-verbal prefixes. The scenario is such that velars are fronted before high front vowels towards affrication whenever noun class 7 /ki-/ and noun class 4/10 augment pre-verbal /gi-/ marker prefixes are affixed onto vowel-initial syllable roots. Technically, because the co-occurrence causes the prefix-final and root initial vowels to occur in sequence, the prefix vowel changes to [j] and is realized as palatalized onto the velar segment, hence becoming allomorphs /k^j/ and /g^j/, respectively

However, during articulation, palatalized velars lose their velar qualities changing to an affricate POA being realized same as plain affricates—similar to the phenomenon observed by Hyman in *The Bantu Languages* (ed. by Nurse & Phillipson 2003, 55). At elocution, speakers do think they are pronouncing [k^j] or [g^j], for that is what is at the back of their minds, but what is actually realized is a /tʃ/ or a /dʒ/ sound, respectively, just because

C → C / everywhere else
[+velar] [+affricate]
[+palatal]

Phonetically, /k^j] and [g^j] are imperceptible and need not be posited in the phonetic inventory, yet phonemically, both sounds, though widely understood as word-boundary phonological features (conditioned by subject concord prefixing), are indistinctive with other palatalized segments robustly attested. Thus, a single generic transcription rule for all palatalization in which we treat all morpheme modification similarly as the other palatalized segments would be a significant aid to literacy, as motivated by the following considerations:

- (i). All the other plosive consonants can be palatalized, thus, it remains phonologically plausible that even the velar plosives are palatalizable.
- (ii). It is well-known that this [k^j] is an allomorph of noun-class 7 marker /ki-/ obligatorily marked on all class 7 nouns. Therefore in such words if prefix /ki-/ follows a vowel-initial root the prefix becomes [k^j-], and accordingly, /ki-/ has its plural in prefix /βi-/, whence if the /βi-/ prefix is followed by a vowel-initial root it becomes [âi-], which are not the cases with the voiceless affricate-initial words. Likewise, all class 4/10 nouns whose associative marker is prefix /gi-/, which also, whenever it is followed by a vowel-initial root becomes [g^j-] but not so for the voiced affricate-initial words, but have their associative markers in /wa-/ or /ja-/ for singular, and /ga-/ in plural. Examples include

Underlying form	Surface form	Realization	Gloss
/kí-ámá kî-à ⁿ gé/	[k ^j -ámá k ^j -à ⁿ gé]	[tʃ-ámá tʃ-à ⁿ gé]	my secret
/βí-ámá βî-à ⁿ gé/	[âi-ámá βî-à ⁿ gé]	-same-	my secrets
/(é-kî-dèku) kî-àtík-ír-è/	[... k ^j -àtík-ír-è]	[... tʃ-àtík-ír-è]	(the calabash) is broken
/(é-βî-dèkù) βî-àtík-ír-è/	[... βî-àtík-ír-è]	-same-	(the calabashes) are broken
/ginù ^m bùlì gî-àni/	/ginù ^m bùlì g ^j -àni/	/ginù ^m bùlì dʒ-àni/	whose goats are these?
/é-misá:lè ègí-ó n'-é-mírì gí-á-gì-ò/	/é-misá:lè è:g ^j -ó n'-é-mírì g ^j -á-gì-ò/	/é-misá:lè è:dʒ-ó n'-é-mírì dʒ-á-dʒ-ò/	those trees and their roots

9.1.3 De-syllabification

This is a syllable structure process by which preset impermissible morpheme ordering at word formation level is broken. A case in point is the incongruent vowel sequences whence one of the vowels in sequence either becomes a consonant or a consonant is infixed to suit CV-syllable structure, and prohibit internal vowel sequencing.

9.1.3.1 Vowel gliding

By default, [+ high] vowels [i] and [u] are the only ones occurring in all word class prefixes. When these prefixes are attached to roots of, or if locatives are put preceding, vowel-initial words the prefixes are de-syllabified (processes follow, first, prefixes then locatives) such that

$$\begin{array}{l} /V/ \rightarrow [C] _ V \\ [+high] \quad [+sonorant] \\ \quad \quad \quad [+continuant] \end{array}$$

9.1.3.1.1 Prefix-vowel [i] alteration

Some Lugwere noun class and augment prefixes with their respective associative markers bearing vowel [i], when prefixed onto a vowel-initial noun root, its vowel changes to [j] hence causing the prefix to obtain an allomorph form [kj-], a process that follows the rule

$$/i/ \rightarrow [j] _ V$$

	Underlying form	Citation form	Gloss
In nouns	/lì-òsé/	/l ^j -òsé/	kwashiorkor
	/kì-éjò/	/k ^j -éjò/	broom
	/mí-ólò/	/m ^j -ólò/	age groups
In phrases	/kí-ámà kì-à ⁿ gé/	/k ^j -ámà k ^j -à ⁿ gé/	my secret
	/mí-ójò gí-á mà-bà:lé/	/m ^j -ójò g ^j -á mà-bà:lé/	hearts of stone
	/mú-kàlí ó-mù-kùlú/	/m ^j -kàl ^j -ó-mù-kùlú/	the elder woman/wife

Note: when prefix vowel [i] precedes a vowel [i] initial root, it lengthens by concatenation.

9.1.3.1.2 Prefix vowel [u] alteration

Similarly, some Lugwere noun class prefixes, in their singular forms together with their respective associative markers end in vowel /u/. Now, whenever such a class prefix is prefixed onto a vowel-initial noun root, the prefix vowel changes to [w]. Similarly, the Lugwere verb default marking for infinitives is the prefix /ku-/. However, whenever this infinitive marker is prefixed onto a verb whose root-initial syllable is a vowel, the infinitive marker's vowel becomes [w] causing the infinitive marker to obtain an allomorph [kw-]. This particularly occurs in such a way that,

$$/u/ \rightarrow [w] _ V, \text{ for example}$$

	Underlying form	Citation form	Gloss
In nouns:	/lù-òtá/	/l ^w -òtá/	sweat
	/mù-àkà/	/m ^w -àkà/	year
	/mú-èrì/	/m ^w -èrì/	moon
	/βu-ítà βú-á βùlò/	/β ^w -ítà β ^w -á βùlò/	ugali of millet
In verbs:	/ku-òt ^f -á/	/k ^w -òt ^f -á/	to burn
	/ku-è ⁿ g-á/	/k ^w -è ⁿ g-á/	to ripen
	/ku-ìzùl-á/	/k ^w -ì zùl-á/	to be filled up
In phrase:	/ku-àwùl-á kú-á é-βí ⁿ tù/	/k ^w -àwùl-á k ^w -é-βí ⁿ tù/	separation of things
	/lì-nù ì-sìmó lì-à ⁿ gé/	/lì-n ^w -ì-sìmó l ^j -à ⁿ gé/	this is my spear

Note: there are no words having vowel /u/ root-initial.

9.1.3.1.3 Locative [u] alteration

Lugwere has four locatives, that is, /ku/, /mu/, /a/, and /e/. However, when a vowel [i] initial noun-root is preceded by either locative /mu/ or /ku/, which end with vowel [u], the locative marker's vowel is labialized to break the prohibited vowel sequences of [ui], as in

Locative	Underlying form	Citation form	Gloss
/ku/	/ku ì-zúli/	/k ^w -ì-zúli/	on the veranda
	/ku ìbà:lé/	/k ^w -ìbà:lé/	on the rock
	/ku mbàgá/	-same-	at the party
/mu/	/mu ì-tàkàlí/	/m ^w -ì-tàkàlí/	in the soil
	/mu ì-sàná/	/m ^w i-sàná/	in sun
	/mu kìsà:lé/	-same-	under the tree

9.1.3.2 Glide insertion

Besides the long vowels, Lugwere permits three non-identical vowels to cluster in a sequence, that is, [ei], [ai], and [oi]. Though assumed, no obvious clues to signal that these resulted from syllable reconstruction after elision or dropping of weak and/or transparent consonants have been adduced. Contrarily, unacceptable clusters, whenever anticipated, are consistently broken by insertion of an intervening homorganic glides such that the sequence yields a tri-segmental realization. This phenomenon follows the rule

$$\emptyset \rightarrow C \quad / \# _ V$$

[+ sonorant]
[+ continuant]

and can be illustrated, first, in the singular-plural comparisons of verbs, whereby the 'lexical' rule applies in the singular case but not in the plural case, then in locative vowels as follows.

9.1.3.2.1 Verbal subject pronominal prefix alteration

In this case, the usual third-person subject prefix /a-/ becomes [aj-] as in

/ku-àβ-á/ 'to go'	→	/à- áβ- à/	→	/àj-áβ-à/
		3S- go- Fv		'he is going'
but not in	→	/βà- áβ- à/	→	/βà-àβ-à/
		3P- go- Fv		'they are going'
/ku-èj-á/ 'to sweep'	→	/à- éj- à/	→	/àj-éj-à/
		3S- sweep- Fv		'he is sweeping'
but not in	→	/βà- óz- à/	→	/βò-òz-à/
		3P- wash- Fv		'they are washing'
/ku-òz-á/ 'to wash'	→	/à- óz- à/	→	/àj-óz-à/
		3S- wash- Fv		'he is washing'
but not in	→	/βà- óz- à/	→	/βò-òz-à/
		3P- wash- Fv		'they are washing'

/ku-ìz-á/ ‘to come’ → /à-ìz-â/ ‘he is coming’ and /βà-ìz-à/ ‘they are coming’

9.1.3.2.2 Locative vowels form alteration

Whenever a vowel initial place-word is preceded by any of the locative vowels /a/ and /e/, since the locatives themselves are vowels, the locative is realized attached to the place-word, with the would-have-been vowel sequence broken by insertion of a glide [j]⁹, as in

/é † álà/	→	/éjálà/	‘at the far end’
/á † èdí/	→	/áwèdí/	‘where I am at’

yet elsewhere, it remains (or may just be lengthened), as in

/é † ʔkótò/	→	/é ʔkótò/	‘at the back of the neck’
/é † náʔkódò/	→	/é Náʔkódò/	‘at Nankodo’
/á † mú-ójò/	→	/á:mʷójò/	‘at the heart’
/á † mé:zà/	→	/á:mé:za/	‘beside the table’

Moreover, if the locatives /a/ and /e/ precede a deictic adverbial, since the locatives themselves are vowels, the locative vowel is attached to the deictic adverbial, as in

/já † là/	→	/jálà/	‘(it is) far away’
/já † ànù/	→	/jáànù/	‘(precisely) here’
/já † ìná/	→	/jáìná/	‘(precisely) where?’
/jé † èdí/	→	/jèdí/	‘(precisely) there’

9.2 Word-internal changes conditioned by syllable structure

These include deletion and imbrication and arise in a context of normal syllables in contact. They appear not to be entirely accounted for by the motivation to preserve or restore a syllable or word pattern that is acceptable within the phonotactics of the language alone as Burquest (2001, 169,175) suggests. They are as follows.

9.2.1 Deletion

Apart from the vowel height described in section 9.1.1.3, the tense/aspect suffix /ir/ has also been discovered to, in addition, condition the process of deletion in verbs. This happens when it occurs with the analogous applicative marker in the same verb (in which case they follow each other). The coming into contact of the Past tense/Perfect aspect morpheme /ir/ suffix and the applicative morpheme /ir/, which by default precedes it, causes the applicative to lose its [r]. This occurs according to the following rule, and as seen below.

r	→	∅/_/ir/, as in	
/ku-lìm-á/ ‘to dig’	→	/à- lìm- ír- è/	
		3S- dig-Perf- Fv	‘he dug’
compared with	→	/à- mù- lìm- í(∅)- ír- è/	
		3S-3S.IOBJ- dig Appl- Perf- Fv	‘he has dug for him’

Other endings show no other processes other than deletion, as seen in the comparisons below

⁹ Or [w]; the environment in which one should occur, where, and when is not certain.

- /ku-l^wàn-á/ ‘to fight’ and /ku-βòn-á/ ‘to see’
- /à- mù- l^wàn- í(∅)- ír- è/
3S-3S.IObj- fight-Appl- Perf- Fv ‘he has fought for him’
- /à- mù- βòn- é(∅)- ír- è/
3S-3S.IObj- see- Appl- Perf- Fv ‘he has seen for him’
- /ku-βál-á/ ‘to count’; /ku-kòl-á/ ‘to work’; and /ku-gùl-á/ ‘to buy’
- /à- mù- βál- í(∅)- ír- è/
3S-3S.IObj- count- Appl- Perf- Fv ‘he’s counted for him’
- /à- mù- kòl- é(∅)- ír- è/
3S-3S.IObj- work-Appl- Perf- Fv ‘he’s worked for him’
- /à- mù- gùl- í(∅)- ír- è/
3S-3S.IObj- buy- Appl- Perf- Fv ‘he’s bought for him’
- /ku-làìr-á/ ‘to swear’ and /ku-lèr-á/ ‘to baby-sit’
- /à- mù- làìr- í(∅)- ír- è/
3S-3S.IObj- swear-Appl- Perf- Fv ‘he has sworn for him’
- /à- mù- lèr- é(∅)- ír- è/
3S-3S.IObj- baby-sit-Appl- Perf- Fv ‘he’s baby-sat for him’

9.2.2 Imbrication

This process occurs in the Hodiernal past-Perfect aspect verb forms with some verbs often involving deletion as well. The process begins with the deletion of the [r] of the Hodiernal past-Perfect aspect marker /ír/, and then the [i] is moved backwards and in-fixed into the root of the verb to glide with the root vowel. In case the root vowel was long, it is shortened to accommodate the diphthongization. The root-final syllable consonant then receives the past tense/perfect aspect final vowel [-e]. This process is observed in verbs whose final syllables have consonants /m/, /n/, /ɲ/, /l/, and /t/. It occurs as per the following rules:

- (i). [r] → ∅/ m_‾
- /ku-t^hám-á/ → /à- t^hám- à/
3S-sit- Fv ‘he sits’
- but → /à- t^hám-ír- è/ → /à- t^hám-í(∅)- ír- è/ → /à- t^hám- è/
3S-sit- Perf- Fv ‘he has sat’
- (ii). [r] → ∅/ n_‾
- /ku-gà:n-á/ → /à- gá:n- à/
3S-refuse- Fv ‘he refuses’
- but → /à- gá:n- í(r)- è/ → /à- gá:(∅)- n- (∅)∅- è/ → /à- gáín- è/
3S- refuse-Perf- Fv ‘he has refused’
- (iii). [r] → ∅/ l_‾
- /ku-t^há:l-á/ → /à- t^há:l- à/
3S-visit- Fv ‘he visits’
- but → /à- t^há:l- í(r)- è/ → /à- t^há:(∅)- r- (∅)∅- è/ → /à- t^háír- è/
3S- visit- Perf- Fv ‘he has visited’
- (iv). [r] → ∅/ t_‾
- /ku-k^wát-á/ → /à- k^wát- à/
3S- hold- Fv ‘he holds’
- but → /à- k^wát- í(r)- è/ → /à- k^wát- (∅)∅- è/ → /à- k^wáít- è/

	3S- hold- Perf- Fv	'he has held'
(v). [r] → ∅/ɲ_		
/ku- màɲ-á/ →	/à- máɲ- à/ 3S- know- Fv	'he gets to know'
but →	/à- màɲ- í(r)- è/ → /à- mà(ɹ)ɲ-(ɹ)∅- è/ → /à- máít ¹⁰ - è/ 3S- know-Perf- Fv	'he has known'

9.3 Changes across word boundaries-vowel elision

Usually, Lugwere words that make up a phrase are spoken together without an intervening pause. However, in this particular case, whenever the next word follows a clitic, preposition, demonstrative, possessive pronoun, or any other determiner like an associative marker—all that end with a vowel, quite often, a word boundary morphophonemic change is observed.

This change occurs in such a way that whenever a vowel-initial word follows a clitic or associative marker, one of the vowels bound to cause forming a sequence (unless what will result is a permitted one) is completely lost through elision, then the two words joined. While in most cases what is elided is the clitics' vowel, sometimes it is the vowel of the following word, in which case it is the augment prefix (as seen in the last example), e.g.

Underlying form	Citation form	Gloss
/mù-kò ⁿ dá gú-á é-kì-kópò/	/mùkò ⁿ dá g ^w (∅)ékìkópò/	handle of a/the cup
/kì-kópò kí-á á-mà-tá/	/kìkópò k ^l (∅)ámàtá/	a cup of milk
/βà-àná βá é í-kà/	/βààná β(∅)-é íkà/	children of/from home
/lù-kàlá ⁿ gúkí ⁿ gá é-í-bá:lé/	/lùkàlá ⁿ gúkí ⁿ g(∅)-éíbá:lé/	it is as hard as a stone
/tú-áí-ír-è βìdžó ná é-ɲámà/	/t ^w áíírè βìdžó n(∅)-éɲámà/	we ate potatoes with meat stew
/ì-kìrá lí-á ó-n-tá:mà/	/ì-kìrá l ^á (∅)ntá:mà/	tail of a/the sheep
/∅-s'ódò wá ó-mú-génì/	/∅-s'ódò wá (∅)múgénì/	the guest's sauce

¹⁰ While this phenomenon is consistent and common, the motivation for this change from [ɲ] to [t] is still unknown.

10 Orthography

10.1 The alphabet

All the phonemes of Lugwere would be sufficiently represented using the following graphemes or letters (also called 'The Alphabet'):

	Phoneme	Grapheme	Description
1.	/p/	P, p	
2.	/b/	Bb, bb	To make it distinct from the fricative sound written single
3.	/t/	T, t	
4.	/d/	D, d	
5.	/k/	K, k	
6.	/g/	G, g	
7.	/tʃ/	C, c	
8.	/dʒ/	J, j	
9.	/β/	B, b	
10.	/f/	F, f	
11.	/v/	V, v	
12.	/s/	S, s	
13.	/z/	Z, z	
14.	/m/	M, m	
15.	/n/	N, n	
16.	/ɲ/	Ny, ny	It is easier to write and use on typewriters, secerns the nasal from palatalized n [nʲ], also the same spelling as in the LWC
17.	/ŋ/	Ŋ, ŋ	
18.	/l/	L, l & R, r	Both should be written since speakers are already used to writing both, and all neighboring languages write both
19.	/w/	W, w	
20.	/j/	Y, y	
21.	/i/	I, i	
22.	/e/	E, e	Also represents the [ɛ] sound realized only following velars.
23.	/ɑ/	A, a	
24.	/o/	O, o	
25.	/u/	U, u	
26.	/i:/	Ii, ii	
27.	/e:/	Ee, ee	
28.	/ɑ:/	Aa, aa	
29.	/o:/	Oo, oo	
30.	/u:/	Uu, uu	

10.2 Other representations

10.2.1 Palatalization

This is characteristic of noun-class or concord prefixes that end in vowel <i>, which whenever preceding an incongruous vowel in sequence; inserting a <j>, which in this case is actually being used to evince the palatalization, breaks the sequence.

Except: Palatalization with <n>, i.e. [ny] shall be written <ni> to distinguish it from the <ny> symbol combination, which is being used for the palatal nasal [ɲ], as in

<kuniola>	'to twist'	<kuwonia>	'to heal'
<kukaniamba>	'to persist'	<kunoonia>	'to search'

10.2.2 Labialization

This is characteristic of verbal prefix and noun-class or concord prefixes that end in vowel <u> which whenever preceding a dissimilar vowel in sequence, the sequence is broken by inserting a <w>, which in this case is actually being used to evince the labialization.

10.2.3 Dissimilar vowel sequences

These are characteristic of both word-initial pre-prefixes and word-internal derived diphthongs. They include <ai>, <oi>, and <ei> and for these, each of the two vowel sounds should be written as pronounced corresponding to the sequence of elocution, as in

<mataita> ‘mumps’	<kikoiko>	riddle
<buceire> ‘(it is) dawn’	<oibba>	‘you are stealing’
<aina> ‘where?’	<eira>	‘long ago’

10.2.4 Tone

Although, in this write up and the wordlist, tone is (phonetically) transcribed, tentative consensus arrived at by the Lugwere language committee is: in lexemes, given that usually there are contextual, textual, and lexical clues for the reader to utilize in directing him/herself to meanings of analogous lexemes, tone shall not be marked in any special way.

For grammatical tone in verbal phrases and longer texts, tone may be written but only using additional clarifying/disambiguating words, e.g. time words (for tense), relative pronouns (for contrastive focus), and punctuation marks (for interrogation), etc, not special marks, and only if and where there is a grammatical distinctiveness worth highlighting. The premise here is that writers should always endeavor to help their readers by adding clarifying words.

10.3 A short sample text

Kaisi kituufu ekyalo kyaiswe kicuukire. Eira, abantu baabanga okulima bwire kibambya, eino eino okw’omweri. Kyali kigosi okwaja omuntu omwomi ng’agonere okutuuca eisana overyazwerayo. Naye okuti, omu Bugwere omwaiswe munu, abantu aBagwere abalimaku abakira obungi baaba omu ndimiro okulima nga buceire ce.

Era, omu biro eby’eira kyabbanga kiswaza iino abainawo okukulamuca okwaba okulima naye okuti oyaja n’omusaiza omufumbo yena, omukali niiye asiiba amulamuca. Aate, abantu balimanga ebintu byonabyona ni biira, ting’okuti. Mazima ng’oyaja omuntu aali n’ebideero: eky’obulo, eky’amaido, era n’empindi gyona nga babisa mu kideero kyagyo.

Kaisi n’olutumu lwona lwaba lucuuka. Ebibono ebimo bibbuuca n’okugota, aate nga n’ebindi byaiziremu makulu gandi.

[Certainly, our world has on change. In the past, people used to go digging way before dawn, especially if there is moonlight. It was strange for someone to sleep till sunrise; unlike today where even the few who do dig get to the gardens long after sunrise! While, in the far past, it was so shameful to wait to be awakened to go digging, these days it is no longer awful to see even a married man being reminded daily by the wife to get up go dig. Besides, in the past, whatever was planted would produce. Unlike today, you could find a single person owning a range of granaries, one for millet, another for groundnuts, with the peas in their own.

Besides, our language is in a similar way gradually changing. For example, you will realize some of the words are getting lost, whilst others are adopting different senses.]

11 Residue

For further interest, auxiliary examination could be carried out to establish some more facts about the subjects below

11.1 Tone

Tone in the noun system is not fully analyzed, e.g. the phonemicity of falling tone, whether there are any real patterns that are predictable, and if so, in what environment, etc. Besides, although it is clear that tonal changes within verbal context occur, it is not well established as to what extent are these tonal changes.

11.2 Diphthongs or vowel sequences?

Much stronger arguments for either analysis are welcome to this debate, and since these vowel clusters occur widely in the language, a thorough investigation of the same is called for, for as long as such efforts are geared towards finely defining the phonological structures of the language.

11.3 Prenasalization, syllabic, or geminate nasals?

Similarly, strong argumentations were presented for the widely occurring NC sequences in the language, the N of which, in word-initial position, has somehow drawn conflicting analyses. It remains open for whoever might be interested to definitively pin down this issue.

Any re-analysis or literary criticism of these debatable, and many more other potential topics herein handled, would not be considered in prejudice to the decisions in this write-up, whatsoever, but rather in the interest of the language. Albeit, these open questions do not affect the orthography whatsoever.

12 Glossary

AB	Abilitative marker affix
Alc	Alethic mode marker affix
Appl	Applicative marker affix
C	Consonant
Caus	Causative marker affix
F	Falling tone
Fv	Final vowel
H	High tone
HestPst	Hesternal past tense
Hod	Hodiernal past tense
Inf	Infinitive marker affix
IObj	Indirect object
L	Low tone
N	Nasal
Nc	Noun class
NC	Nasal-Consonant sequence
NFut	Near-future tense
Obj	Object
P	Plural
Perf	Perfective aspect
POA	Point of articulation
PSS	Phonetically similar segments
RmFut	Remote future tense
RmPst	Remote past tense
S	Singular/Subject/Semi-vowel
Son	sonorant
TBU	Tone-bearing unit
V/Vs	Vowel(s)
∅	zero (unmarked) morpheme

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14 Appendix- wordlist

See separate file attached