THE NATURE OF VOWEL LENGTH IN EKEGUSII: A THEORETICAL ACCOUNT

BY

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Abstract
This article is aimed at presenting a report on vowel length in Ekegusii, a Narrow Bantu language spoken in south western Kenya by about 2.2 million Abagusii. Abagusii are found in Kisii and Nyamira counties, South of Kavirondo Gulf in Kenya. The objectives of the study were to: investigate the relationship between vowel length and meaning in Ekegusii; determine the phonological processes that trigger vowel length in Ekegusii and find out the orthographic presentation of vowel length in Ekegusii. Data for this study was collected from reading published books in Ekegusii. A word list was generated and presented to native Ekegusii speakers who were instructed to read it aloud. Their speech was recorded and analysed following the tenets of Autosegmental Phonology Theory. The analyses have shown that vowel length in Ekegusii is either phonemic or phonetic. Phonemic vowel length in Ekegusii makes lexical contrasts, that is, distinguishes word meaning. This kind of vowel length is reflected in the spellings of Ekegusii words as double letters. Phonetic vowel length, on the other hand, is realized after the phonetic environment is altered. This vowel length is realized as a result of the interaction between the morphological process of affixation and the phonological processes of glide formation, vowel raising and vowel deletion. Such processes have been viewed as hiatus resolution strategies in the language. Phonetic vowel length, the findings indicate, does not make lexical distinctions and is not reflected in the spellings of a word. Such observations, it is hoped, will be important to writers, readers, teachers, learners and researchers of Ekegusii.

1.1 Introduction

The focus of this paper is the presentation of vowel length in Ekegusii, a Narrow Bantu language spoken in south western Kenya by about 2.2 million people called Abagusii (The Kenya National Bureau of Statistics, 2010). Abagusii are found in Kisii and Nyamira counties, south of Kavirondo Gulf.

Ethnologues (Lewis, 2009) classify Ekegusii as a Niger-Congo, Narrow Bantu, Central, E, Kuria (E.10) language. Maho (2008) calls the language Gusii and classifies it as JE42, following Guthrie's (1967) classification system. Ekegusii has two dialects: *Rogoro* (Northern) and *Maate* (Southern) (Bosire, 1993). Most Ekegusii speakers are bilingual in one of the official languages: Kiswahili or English (Kenya National Bureau of Statistics, 1999). Ekegusii's proximity to Nilo-saharan languages (Dholuo to the West, Kipsigis to the North East and Maasai to the South East) makes some speakers multilingual.

Elwel (2005) notes that Ekegusii has contrastive vowel length. However, the author does not indicate the various manifestations of vowel length in the language neither does he give an explanation of the phonological factors that trigger phonetic vowel length. Therefore, paucity of knowledge exists in the analysis and documentation of vowel length in Ekegusii. The analyses presented in this paper will fill this descriptive gap to meet the objectives below.

1.2 Objectives of the study

The objectives of the study are to:

1. investigate the relationship between vowel length and meaning in Ekegusii;
2. determine the phonological processes that trigger vowel length in Ekegusii and
3. find out the orthographic presentation of vowel length in Ekegusii.

1.3 Methods

1.3.1 Data collection and analysis

Data used for the analyses were in the form of nominals and verbals and were purposively collected from written texts in Ekegusii. The texts selected were: the Ekegusii Bible, K.I.E (2004) "*Tusome Lugha Yetu (Ekegusii*)", K.I.E (1987) "*Amatera N'emegano (Ekegusii)"* and Monari (2000) "*Ekegusii for all Seasons"*. These texts are widely used in both education and religious domains. Because the researcher is a competent speaker of Ekegusii, native speaker intuition was used to formulate a wordlist based on an extensive core vocabulary of Ekegusii for the study. This procedure was adopted for Clark, Yallop and Fletcher (2007) argue that any attempt to produce phonological descriptions without making reference to native speaker's intuitions or insights is inconsistent. The wordlist was, consequently, presented to other native speakers who were instructed to read the words in the list as naturally as they would in spontaneous speech. Their speech was recorded in a digital audio recorder for further analysis.

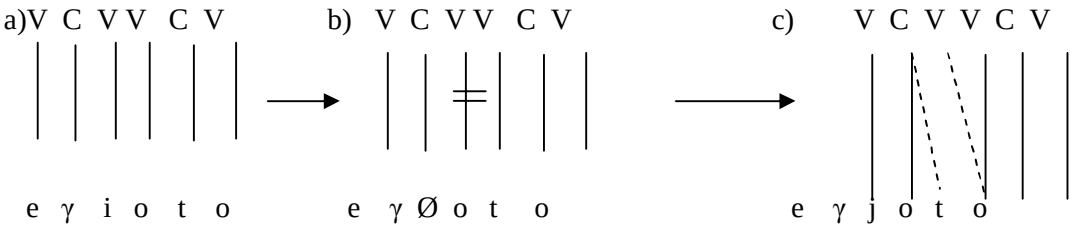
1.3.2 Theoretical Framework

The analyses in this paper are linked to the Autosegmental Phonology (AP) Theory, initiated by Leben (1971) and given formal recognition in Goldsmith (1976) and its extension of CV Phonology (Clements and Keyser, 1983). Just like other Generative Phonology approaches, AP Theory concentrates on the development of formalisms in the presentation of phonological and phonetic processes of a language. As Katamba (1989) points out, the theory was initially used in the analysis of tone in tone languages but has since been extended to handle other phonological processes such as vowel and consonant length and aspects of syllabification.

The main tenet in AP Theory is that phonological and phonetic presentations are multilinearly sequenced with segments in the form of tiers occurring parallel to each other. The segments on each tier are specified for a set of features specific and unique to that tier and are associated on other tiers by means of Association Lines, and a set of universal principles called the Well-Formedness Condition (WFC), which triggers a set of universal mechanisms termed as Association Conventions (Anyanwu, 2008; Goldsmith, 1976, 1990).

The basic tier in the phonological representation is the skeletal tier (also called the CV /timing tier). This tier plays a crucial role in the organization of the entire phonological structure, serving as the anchor point for elements on the other tiers (see van Oostendorp, 2005). In the linking of phonemes to this tier, vowel segments are associated with V-slots while consonants get associated with C - slots in a one - to - one fashion according to the association convention. However, Autosegmental Phonology also allows a multiple association of phonemic material to skeletal positions. This aspect has been useful in the analysis of phonetic vowel length, which has been looked at as a 'two-to-one' or 'one-to-two' association on the skeletal tier. A long vowel has been treated as a single vowel segment associated with two positions on a facing tier. The multiple associations represent marked cases like phonetic vowel length that are due to derivations. For example, the word [eɣioto] 'frog' is presented in Figure 1 below.

Figure 1: Representation of */eɣioto/*



In 1b, a position (V-slot) in the skeletal tier remains unassociated (and thus is phonetically unrealized) but shows its presence by interacting with phonological rules sensitive to the organizations of the skeletal tier (reassociates with the vowel next to it, as the broken line shows in 1c. This is called Spreading and has the effect of deriving a phonetic long vowel /ᵒ/.

1.3.3 CV Phonology

The theory assigns the syllable a minimum of three levels: tonal, syllabic, skeletal (CV/ timing tier) and segmental. The syllabic tier contains a string of [σ] nodes, whereas the CV –tier contains the Cs and Vs that distinguish syllable peaks (Vs) from syllable margins (Cs) and the segmental tier bears a bundle of distinctive feature matrices which represent consonant and vowel segments (Katamba, 1989).

The main application of CV Phonology in the analyses done in this study is its claim that one segment can link to multiple skeletal positions and vice versa without creating crossing association lines. A many-to-one association between tiers in Ekegusii may be found in affricates and pre-nasalised stops while, one-to-many associations occur in phonetic long vowels.

Under this framework, derived vowel length involves linking a segment to two timing positions after an adjacent segment delinks from its timing position leaving an empty slot. This happens because the deletion or gliding of a segment occurs only on the segmental tier leaving its slot empty on the timing tier (see Figure 1).

Four general principles governing CV representation were important in this study, namely: the obligatory contour principle (Leben, 1973; McCarthy, 1986; Yip 1988; Odden 1988; Anyanwu, 2008), prohibition on crossing association lines, association as spreading (Halle and Vergnaud, 1980) and the Hierarchy of Deletion Principle (Sezer, 1986). The OCP forbids sequences of identical segments and a single multiply-linked segment replaces them. Crossing association lines are ill-formed and rules are blocked when such configurations are derived. Association involves spreading the trigger segment's melody onto the target segment's CV position. The Hierarchy of Deletion Principle states that a deletion that applies at the segmental tier does not remove the associated CV unit, but a deletion applying at the CV tier automatically removes the segmental representation.

1.4 Findings

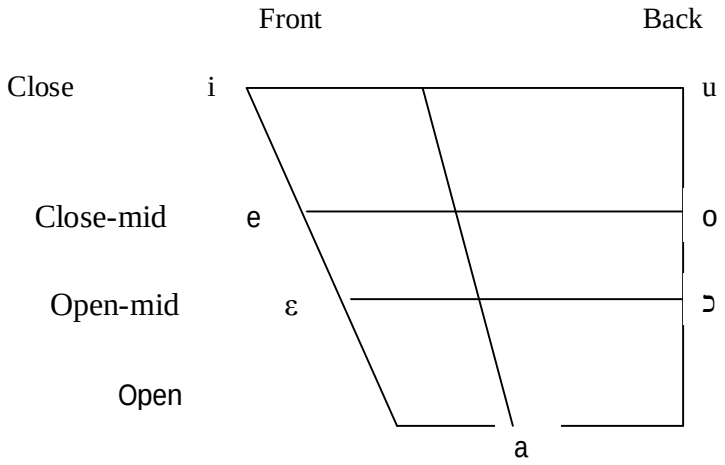
Analyses done in this study have indicated that vowel length in Ekegusii is either phonemic or phonetic. Phonemic vowel length, in the language, distinguishes word meaning. For example, the words below are distinguished by the length of the vowels alone.

a. ***gwekana*** 'to click' and ***gwekaana*** 'to deny oneself'
b. **/*koroka*/** 'vomit' versus **/*kooroka*/** 'to appear'
c. **/*ekerɔ*/** 'spike' versus **/*ekeerɔ*/** 'curved part of the palm used to feed a child'.

d. **/*amoβa*/** 'mushrooms' versus **/ *amooβa*/** 'fearful
e. **/*kwementera*/** ' to add for oneself' versus **/*kwementeera*/** 'despise oneself'
f. **/*γosiβa*/** 'to tie together' versus **/*γosiiβa*** ' to sip'
g. **/*γokɔna*/'**to bewitch' versus **[*γokɔɔna*]** 'to show irritation'.
h. **/*γotɛma*/** 'to cut /harvest mushrooms / hit' versus **/*γotɛɛma*/** 'to try'.

The data above reveal that phonemic long vowels have as much freedom of distribution as the seven short vocalic segments in Ekegusii (Ogechi, 2006; Komenda, Maroko and Ndungu, 2013). These are charted in Figure 2 below where the expected relationships between the features of vowel height, backness and rounding hold (Maddieson, 2003).

Figure 2: Ekegusii vowel inventory



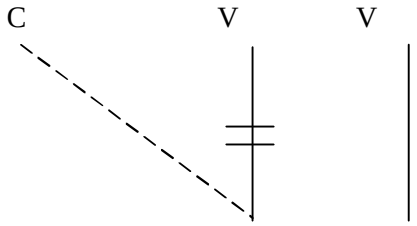
The analyses have shown that phonemic vowel length in Ekegusii is not conditioned by the sequencing of sounds in a word. The preceding or following sound has no influence on phonemic vowel length. This means that phonemic vowel length has no phonetic environmental restrictions.

Phonetic vowel length, on the other hand, does not distinguish word meaning and is a consequence of the phonological processes of glide formation, vowel raising and vowel deletion / coalescence as discussed below.

1.4.1 Glide Formation

The process of glide formation is regarded as an aspect of devocalization. Kadenge (2010) defines it as a process in which a high vowel of a class prefix or gender concord changes to become a glide when followed by a vowel commencing stem. The analyses in this study have indicated that glide formation in Ekegusii occurs whenever a high vowel is followed by a non-high vowel or a high vowel with the opposite horizontal tongue position feature value [±back].

In ekegusii, the process affects the vowels /i/ and /u/ as the first members of two consecutive vowels either in the prefix or root of nominals and infinitives. The vowel /i/ combines with vowels that are lower in quality than itself or with the opposite feature [+back] to form the palatal glide [j]. Similarly, /u/ preceding any vowel lower than it, or with the opposite horizontal tongue position feature value [-back] derives the bilabial-velar glide [w]. This process can be summarised in the CV Phonology framework below:



[+ high] [-cons]

Through this rule, a high vowel is disassociated from its V-slot and re-associated to the preceding C- slot provided a vowel follows. This leaves a floating V-slot that is not dominated by any segment. Through the linking convention (Goldsmith, 1990), the vowel left is spread to the empty V-slot to compensate for the lost segment. The formation of the palatal glide /j / and the velar glide /w/ are discussed below.

1.4.1.1 The palatal glide /j/

As pointed out, the vowel /i/ changes to [j] both at the merger between the prefix-final vowels and root-initial vowels of nominals and infinitives and at root internal intersections as seen in the words below.

	Input	**Output**	**Gloss**
1.	***/ eβi- eɣu- a /*** c8- Root-FV	***[eβjeeɣwa]***	gifts
2.	***/ tʃi- aŋg- a /*** c10-Root-FV	***[tʃjaaŋga]***	clothes
3.	***/ ɣi- atam-a /*** Infl-Root-FV	***[ɣjaatama]***	it ran away
4.	***/ βi- umeran-e /*** Infl-Root- FV	***[βjuumerane]***	they meet
5.	***/ ko- βiar- a /*** c15-Root-FV	***[koβjaara]***	to give birth
6.	***/ ko- siek– a /*** c15-Root-FV	***[ɣosjeeka]***	to close

In example 1 above, the high vowel /i/ in the prefix /βi-/ is changed to the palatal glide [j] before the vowel /e/ in the root. The root-initial vowel /e/ that conditions the glide formation is lengthened in turn. Equally, in examples 2 and 3, the high vowel in the prefix /i/ meets a non-high vowel of the root /a/. As a result, the /i/ is changed to the palatal glide [j] while the vowel /a/ becomes phonetically long. In 4, the high vowel in the prefix /i/ meets another high vowel /u/ but with the opposite tongue position feature value. The vowel /i/ is [-back] whereas /u/ is [+back]. This environment also triggers the formation of a glide.

Examples 1-4 above demonstrate glide formation processes due to prefixation. The vowels of the prefix are turned to glides while those in the root are lengthened. Examples 5 and 6, on the other hand, involve glide formation within the roots of the words.

1.4.1.2 The bilabial-velar glide [w]

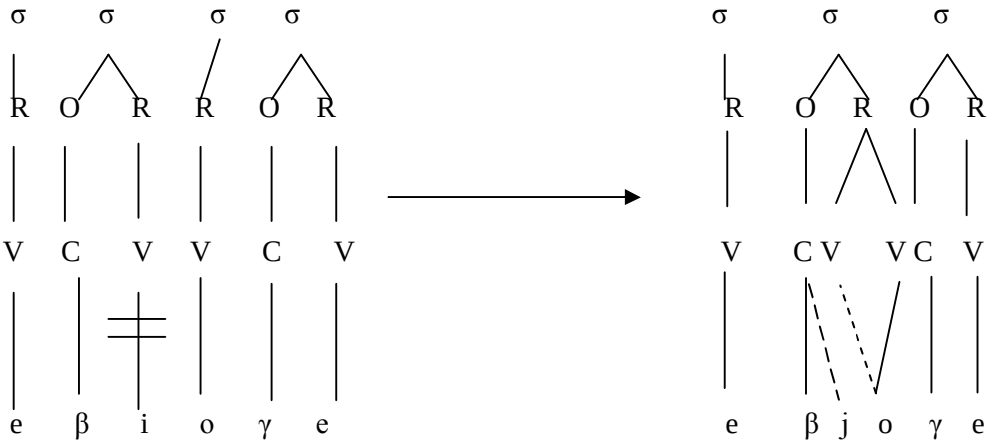
The analyses have revealed that the vowel /u/ does not occur in the prefix position. This means that glides involving /u/ as the first vowel in the series are mostly root-internal. This can be exemplified by the Ekegusii words below.

	Input	**Output**	**Gloss**
7.	/ ***ko-βuekan-a*** / c15-Root- FV	***[koßweekana]***	to resemble
8.	/ ***en-ŋuerer-e*** / c9a-Root- FV	***[eŋweerere]***	immature/young
9.	/ ***ko-tuar- a*** / c15-Root-Fv	***[ɣotwaara]***	to hunt
10.	/ ***e-nruair-e*** / c9-Root- FV	***[eendwaire]***	sick
11.	/ ***ko-ɣuey- a*** / c15-Root- FV	***[koɣweeya]***	to crow
12.	/ ***ko-ŋuans-a*** / c15-Root- Fv	***[koŋwaansa]***	sacrifice
13.	/ ***ko- suaɣa-a*** / c15-Root- FV	***[ɣoswaaɣa]***	to pound

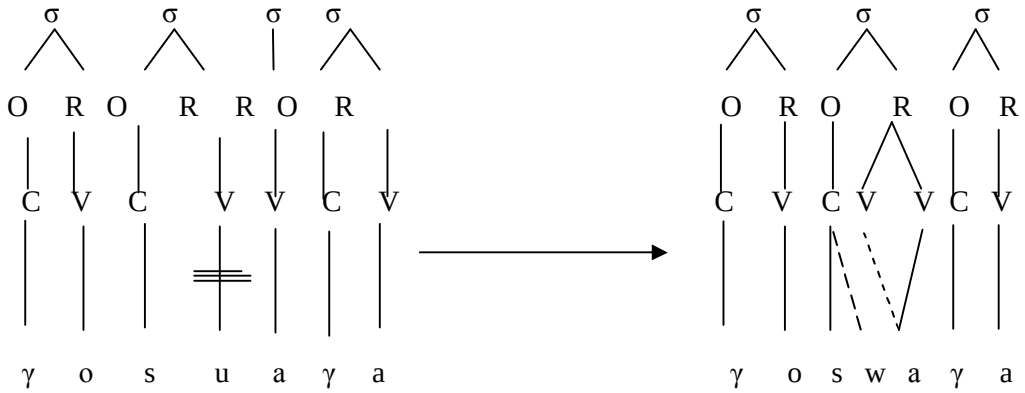
Examples 7-13 above have the vowel /u / changing to a bilabial-velar glide [w] when it precedes a non-high vowel which in turn becomes lengthened. For example, in 7, 8 and 11, the vowel /u/ in the root is followed by the vowel /e/. Since the two vowels have opposite horizontal tongue position feature values, the vowel /u/ glides to [w] while /e/ becomes phonetically long [ee]. In examples 9, 12 and 13, the high back vowel /u/ is followed by the non-high vowel /a/. The non-high vowel conditions the gliding of /u/. After gliding, there is lengthening of the vowel /a/ to [aa]. There is no lengthening of the vowel /a/, in example 10, even after glide formation. This is because the non-high vowel /a/ that conditions the gliding of /u/ is in turn followed by another vowel. Vowel lengthening is also blocked where a glide is formed at the end of the word, like in, ***[koiywa]*** 'to be uprooted' where the final vowel [a] is not lengthened. The above examples show that in Ekegusii after a vowel is glided, the triggering vowel becomes phonetically long. This occurs because glide formation leaves a trace (length) that is taken up by the next vowel to the right which then becomes legthened. Figure 3 below illustrates the above generalizations.

Figure 3: Glide Formation in CV Model

3.i. Underlying representation Surface representation



3.ii



Whiteley (1960) argues that the vowel /o/ may be turned immediately into the glide [w] but /e/ cannot be immediately turned into [j]. However, the findings of the study show that both the close-mid vowels /e/ and /o/ are first raised to /i/ and /u/ before gliding to [j] and[w] respectively. This observation is discussed below.

1.4.2 Upper-Mid Vowel Raising

Vowel raising is a phonological process in which a low vowel is realized at a higher and tenser placement following another vowel. In Ekegusii, the upper mid vowels /e/ and /o/ are regularly raised to [i] and [u] respectively. This happens when the mid vowel is followed by a non-high vowel.

The process of raising vowels in Ekegusii occurs at the merger between a vowel-initial stem and the infinitival prefix and between a vowel-initial stem and the nominal prefixes. When the upper mid-vowels /e/

and /o/ are raised to high vowels / i / and /u/ respectively, the resulting high vowels become the targets of gliding and lengthening as the data below illustrates.

(i) Raising of /e/ to [i]

	Underlying form	Vowel raising	Surface form	Gloss
14.	***/eke-aɣas- o /*** c7- ROOT-FV	***[ekiaɣaso]***	***[ekjaaɣaso]***	itch
15.	***/eke-oβir- i /*** c7- ROOT-FV	***[ekioβiri]***	***[ekjooβiri]***	rhino
16.	***/a- je- antʃet- e /*** SM-OM-ROOT-FV	***[ajiantʃete]***	***[ajjaantʃete]***	s/he loves it
17.	***/eme- eŋ- e /*** c4- ROOT-FV	***[emieŋe]***	***[emjeeŋe]***	short (e.g. trees)

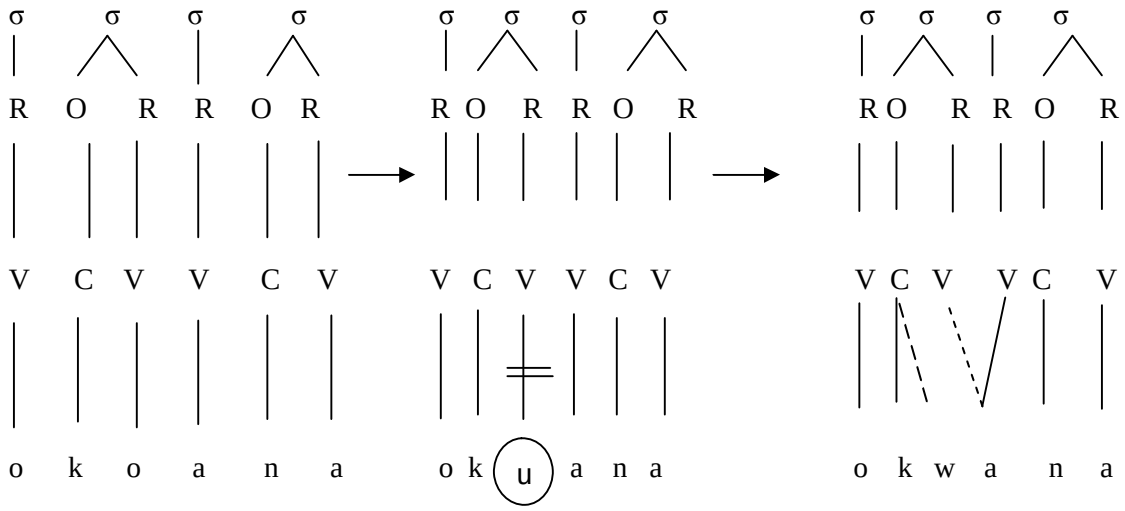
Examples 14-17 indicate that the vowel /e/ in the prefix is raised to [i] when it appears before the vowels /a, o, e, כ/. In 14, the vowel /e/ of the prefix /*ke*-/ combines with /a/ of the root */-aɣas*-/ surfacing as [ea]. The sequence /ea/ calls for the operation of a phonological rule to give the phonetic form ***[-kjaaɣas-].*** In 17, both the vowel in the prefix and that in the root are the same. The first vowel is raised to [i] before it glides to [j]. The second vowel is consequently lengthened.

ii) Raising of /o/ to [u]

	Underlying Form	Vowel Raising	Surface Form	Gloss
18.	***/ko- eɣen- a /*** c15-ROOT-FV	***[kueɣena]***	***[kweeɣena]***	trust
19.	***/ko- aɣur- a /*** c15-ROOT-FV	***[kuaɣura]***	***[kwaaɣura]***	to crawl
20.	***/ko- an- a /*** c15-ROOT-FV	***[kuana]***	***[kwaana]***	moo
21.	***/omo-anr- o /*** c3- Root-FV	***[omuando]***	***[omwaando]***	inheritance
22.	***/ko-antʃeran-a /*** c15- ROOT-FV	***[ɣuantʃerana]***	***[ɣwaantʃerana]***	to accept
23.	***/omo-oɣ- e /*** c1 - Root-FV	***[omuoɣe]***	***[omwooɣe]***	clever person/sharp object
24.	***/ (n) to– e - rootʃ-e /*** Subj- D.O-see-FV	***[ntueerootʃe]***	***[ntweerootʃe]***	we see ourselves

The examples in 18-24 show that the vowel /o/ in the prefix position closes to [u]. This occurs before /e/ and /a/. The derived [u] then is glided to [w]. The vowels /e/ and /a/ are thereafter lengthened. The derivation of the word ***okwana*** 'to bellow' in Figure 4 below exemplifies the above observations

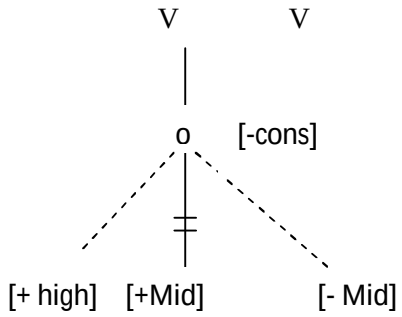
Figure 4: Upper-Mid Vowel Raising in CV Model



In this formulation, after the vowel /o/ has been raised to /u/, it delinks from the V- unit in the skeletal tier, leaving the 'floating' V to reassociate to the following vowel producing the surface [VV] representation. This results in the phonetically long vowel [a]. The delinking vowel /u/ also relinks to the C-slot on the left deriving a non-syllabic glide [w] in the complex segment [kw].

The data have revealed that when /e/ precedes /i/ and /o/ precedes /u/, gliding is blocked and no vowel lengthening follows. This means that when the trigger is higher than the target and both agree in their specification for roundness, the two processes are blocked. This explains the non occurrence of surface forms like *[wuu] and *[jii] in Ekegusii.

In an Autosegmental framework the rule that raises upper-mid vowels is given below:



1.4.3 Vowel Deletion

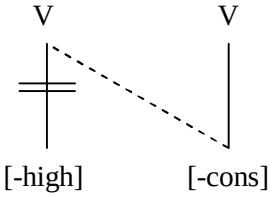
The deletion of a vowel in hiatus is also another morphophonemic process that triggers phonetic vowel length in Ekegusii. Vowel deletion occurs when one of the two adjacent vowels is omitted in a particular

phonological environment. In Ekegusii, pre-root non-high vowels before other non-high vowel are deleted resulting in a surface long monophthong. The examples below have the low vowel /a/ getting deleted when it appears before the vowels /e, o, a /.

	Input		Output	Gloss
25.	/***aβa-orok- i- a /***		***[aβoorokja]***	teachers
	c2- Root- A- FV			
26.	***/βa -on- i -a /***		***[βoonja]***	they sell
	Infl- ROOT-A- FV			
27.	***/ βa- en -i -a/***		***[βeenja]***	they keep
	Infl- ROOT-A-FV			
28.	***/βa– e- siβ- i- a /***		***[βeesiβja]***	they wash themselves
	Subj-D.O-Root-A-FV			
29.	***/mba- e- root͡ʃ-e /***		***[mbeeroot͡ʃe]***	they see themselves
	Subj-Obj-Root-FV			
30.	***/βa- ar- i- a /***		***[βaarja]***	they eat
	Subj-Root-A-FV			
31.	***/ko- ta- a-eβ- a /***	***[γotaeeβa]***	***[γoteeβa]***	not to forget
	c15-NEG-T-ROOT-FV			
32.	***/βa- et- i- a /***		***[βeetja]***	they passed (e.g a law)
	Subj-ROOT-A-FV			

In example 25, the second vowel /a/ in the prefixes is deleted when the noun class prefix is attached to the vowel-initial stem /-or-/. Following this, the vowel in the stem becomes phonetically long. In 27, the vowel /a/ in the subject prefix is attached to the vowel /e/ of the object prefix. As a result of this, the vowel /a/ is deleted and /e/ gets lengthened. In the derivation of **[*γoteeβa*]** 'not to forget,' (31), a combination of rules: vowel deletion, lengthening and x-trimming are brought into play. In this case, the tense marker, /a/, delinks and the root vowel /e/ spreads leftwards resulting in [eeβ]. Again the non-high vowel /a/ of the negative marker is deleted and the derived [e] in the root spreads to occupy the position left vacant as per the linking convention (Goldsmith, 1976) producing [- eeeβ-]. The extra-long [eee] is then trimmed down to produce [-ee-).

The above derivation points to the fact that Ekegusii phonotactic constraints do not allow extra-long vowels. However, when they are produced during a derivation they get trimmed down to long ones (Rule 3). As examples 25-32 above show, the deleted vowel is often the marginal one (that is, the first vowel in the sequence). This hints to the fact that Ekegusii is a first vowel deleting grammar. The lengthening that occurs after vowel deletion should be viewed as compensation for the loss of the full vowel value of the deleted segment. In an AP framework, non-high vowel deletion can be formulated as:

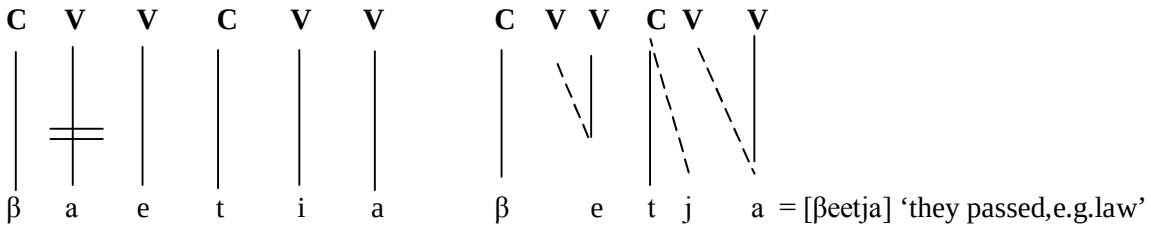


The rule disassociates the first vowel dominated by a V-slot, provided it is non-high. The resulting unassociated V-slot is then reassociated with the following vowel. This yields a monophthong with the feature [+long] represented as [V V] in the CV skeleton.

The deletion of non- high vowels can also be explained in terms of McCarthy's (1986, 1988, 2004) Obligatory Contour Principle, a phonological hypothesis that constrains consecutive identical features in underlying representations. The hypothesis states that at the melodic level, adjacent identical elements are prohibited. The hypothesis was meant to account for the fact that in tone languages, identical high (H) or low (L) tones cannot be adjacent to one another (see Leben, 1973; Goldsmith 1999 for a discussion on OCP). Equally, Frisch (2004) observes that repeated place of articulation features are not allowed within a root. The deletion of non-high vowels witnessed in the data is, thus, a similarity avoidance constraint that deletes the first of the two adjacent non-high vowels to avoid feature redundancies.

In McCarthy's (1986) Prosodic Morphology Framework, any additional slot (empty V, in this case) in the CV template must be filled by spreading, thus the long vowel (VV) in the surface representation. The CV derivation of the Ekegusii word [***βeetja***] 'they passed, e.g. law' exemplifies this position.

Figure 5: Derivation of [*βeetja*] 'they passed'



The above schema shows that when the vowel /a/ in the prefix is deleted, it leaves an empty V-slot which is reassociated with the following V-unit resulting in a long vowel sound [e]. The vowel /a/ at the end of the word is not lengthened though associated with two V-slots. A possible explanation is that the lengthening is later undone due to the general constraint on marginal long vowels in Ekegusii.

1.5 Vowel length and orthography in Ekegusii

Phonemically long vowels are orthographically written as double letters. These, however, should not be regarded as separate phonemes for Whiteley (1960) indicates that prosodic factors such as tone interact freely with the short and long vowels. Also as noted in Ladefoged (2006), a pair of a long and a short sound is identical except for length. Phonetically long vowels, on the other hand, are not reflected in the spelling of words. A phonological argument postulated by Cammenga (2002) is that since the length of these vowels is not distinctive but is derived automatically; their length need not be reflected in the orthography. For example, since there is no semantic contrast in Ekegusii between <***omwana*** > and < ***omwaana*** > 'child', then the derived long vowel [aa] need not be written as long.

1.6 Conclusion

The study has established that the process of lengthening vowels in Ekegusii is seen as a response to a prior process which deleted or in some way shortened the vowel previously present. A segment, thus, makes up in length for what is deleted to the utterance as a whole when another segment loses all or part of its own length. Phonetic (derived) vowel length, unlike the phonemic vowel length, occurs merely on the surface. This means that it is realized after the phonetic environment is altered. The derived long vowels, the study has established, are environmentally conditioned by among others, the syllable boundaries and the morphological characteristics of the word. It is usually the interplay between morphology and phonology that makes a vowel to be phonetically realized as long (Komenda, Maroko and Ndungu, 2013).

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