The Morphophonemics of Vowel Compensatory Lengthening in Ekegusii

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Abstract

Literature shows that not much is known about the prosodic systems in Ekegusii, a Bantu language spoken by about 2.2 million people in south western Kenya. This paper presents an analysis of vowel compensatory lengthening in Ekegusii. Synchronic evidence for hiatus resolution strategies is provided in order to describe the vowels that are lengthened compensatorily and determine the morphological processes that trigger compensatory lengthening in Ekegusii. Guided by native speaker intuition and triangulation by other native speakers, data in the form of nominals and verbals were elicited from four Ekegusii texts and qualitatively analysed for emerging patterns. Findings revealed that all the seven basic Ekegusii vowels undergo compensatory lengthening when their phonetic environments are altered. Vowel compensatory lengthening is brought out as a surface realisation of the interaction of morphemes through the morphological process of prefixation. The lengthening is further seen as a conspiracy to eliminate ill-formed sequences created by prefixation. The height of the first vowel and whether it is followed by another vowel or a consonant determines how the hiatus situation is eliminated. It is expected that the analyses done in this study will have practical pedagogical implications in the teaching of segmental and suprasegmental aspects of Ekegusii.

Key words: Compensatory lengthening, hiatus, autosegmental phonology, tier, morphophonemic processes

1 Introduction

This article presents a report on compensatory lengthening- the process of lengthening vowels as a response to a prior process which deletes or, in some way, shortens the vowel previously present- in Ekegusii. In this process, a segment 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 (see Fox, 2002 for the prosodic status of length). The article is specifically aimed at establishing the processes of establishing what a well- formed word in Ekegusii is. As Goldsmith (1999) points out, a well-formed word in a language is one that is produced by taking an input string created by the morphological component and applying the phonological rules of the language in the appropriate order (see Chomsky and Halle, 1968); consists of a sequence of well–formed syllables; has all the features (autosegments) associated with appropriate skeletal positions and simultaneously satisfies all the Well-Formed Conditions of the language.

The second concern of this study, involves the repair strategies of ill-formed vowel sequences (hiatus) created by the morphological component. The third and fourth aspects involve the positions of Autosegmental Phonology (AP) Theory proposed by Goldsmith (1976).

In the AP approach, phonological and phonetic representations consist of parallel tiers: tonal, skeletal, segmental and syllabic, associated by the Well-Formedness Condition principle (see Sagey, 1988; Hammond, 1988; Katamba, 1993; Ewen and Hulst, 2001; Anyanwu, 2008 and Durand, 1999 on the association convention). Elements of each tier called autosegmentals are not paired underlyingly but are independently ordered throughout the process of derivation. In this process, every vowel segment is associated with a V-slot and every consonant with a C-slot on the skeletal tier.

Although the rule is a one-to-one linking of vowels and the V- slots on the skeletal tier, it is possible to find one vowel segment linked into two V-slots. The phenomenon where a single vowel is doubly linked with two V-slots is called compensatory lengthening (Goldsmith, 1990; Kavitskaya, 2002; Gussman, 2002; Ingria, 1980). Figure 1 illustrates the representation of compensatory lengthening in the AP framework using the Ekegusii word ***gwekana*** 'to click'.

Figure 1: An AP Representation of CL

(a) C V V C V C V   1 (b)   C V V C V C V

k o e k a n a   ɣ w e k a n a   'to click'

In Figure 1 (a) above, each vowel and consonant is linked to a single V or C slot, but in 1 (b), the vowel /e/ is linked to two V slots thus surfacing phonetically as long.

This paper views compensatory lengthening as a part of the analysis of the synchronic grammar of Ekegusii, a Bantu language spoken in south western Kenya by about 2.2 million people. This represents about 5% of Kenya's total population of about 38,610,097 people (The Kenya National Bureau of Statistics, 2010). The Ethnologue report (Lewis, 2009) places the speakers at about 2,120,000 in Kenya, distributed over Kisii and Nyamira counties, located south of Kavirondo Gulf. About another 300 people speak Ekegusii in Tanzania bringing the total number of speakers to about 2,120,300.

Ethnologues (Lewis, 2009) classify the language as Narrow Bantu, Central, E, Kuria (E.10). Maho (2003, 2008), following Guthrie's (1967) classification system, calls the language Gusii and classifies it as JE42. The language is closely related to Lulogooli (spoken in Kenya); Igikuria (spoken in both Kenya and Tanzania); Ikizu and Ikoma (spoken in Tanzania) (Nash, 2009; Whiteley, 1974).

Ekegusii has two dialects: *Rogoro* (Northern) dialect which is regarded as the standard form and used in written works and in the teaching of '*Kikwetu*' in rural schools in lower primary and *Maate* (Southern) dialect which is spoken by majority of the occupants of Gucha South district (Bosire, 1993).

This report is timely because paucity of knowledge exists on the analysis and documentation of the prosodological structures in Ekegusii (Cammenga, 2002). Again, the language heavily borrows words from Kiswahili, English and the neighbouring Dholuo (Mogaka, 2009), threatening it endangerment. Nash (2009) has also indicated that Ekegusii is an under described language with relatively few academic descriptions. Equally, previous research in Ekegusii prosody (Bickmore, 1997, 1998 and 1999; Omwansa, 2011; Nash, 2009; Elwel, 2008; Ongarora, 1996 and Gesura, 2006) addresses issues of tone, vowel harmony and reduplication with Elwel glossing over compensatory lengthening. In-depth information on the organization of the Ekegusii phonological word is, therefore, lacking.

2. Methods

2.1 Population and Sampling

We purposively sampled four adult native speakers to generate and verify the primary data used in the analyses. Purposive sampling was also used to select texts where data were drawn from. 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) "*Ekeusii for all Seasons."* It was assumed that such texts would yield data that is representative of Ekegusii words as they are widely used in both education and religious domains.

We identified in advance the required characteristics of the words to be studied. Only native words from the basic vocabulary of the language were picked. Native words for items of cultural import and verbs were preferred for this study because they constitute part of the "core" elements of vocabulary and are resistant to change or replacement (Sebba,1997). Accordingly, a corpus set of 72 nominals and verbals- with a representation of 36 words each- was obtained from the reading of the texts selected. Nouns with the singular-plural alternation of the nominal class prefixes and verbs in the infinitival and inflected forms for number, tense and aspect were selected.

The number selected was guided by Crary (1983) who points out that in qualitative research, samples of about 50 words can provide descriptive information similar to samples of 100 words. Accordingly, using 72 words gave us additional advantage to the nature of compensatory lengthening in the Ekegusii vowels.

2.2 Data elicitation

Using our own intuition as native speakers of Ekegusii and verification from four other native speakers of the language, data were drawn from the selected texts. The use of intuition as a way of conducting research is valid from a nativist perspective as propounded in Chomsky (1977; 1986). According to Chomsky, native speakers have both grammatical (syntactic, semantic and phonological) and pragmatic competencies of their language. Phonological competence, he argues, enables them to discern which structures are well or ill-formed in terms of sound sequences (phonotactics). Clark, Yallop and Fletcher (2007) have also argued that any attempt to produce phonological descriptions without making reference to the native speaker's intuitions or insights is inconsistent. The method has also been successfully used in Mwangi (2001), Kioko (1994) and Gesura (2006) and was viewed as the only way of ensuring qualitative data.

From the words identified, the researchers created a wordlist that was used to elicit primary data for the study. The wordlist adopted in this study was made by consulting lists in other studies such as Swadesh (1972), Ingonga (1991), Gesura (2006), Mogaka (2009) and Kanana (2009). This was deemed necessary in order to find out what constitutes the basic vocabulary of a language.

The wordlist (written in Ekegusii orthography with a corresponding gloss) was then presented to other Ekegusii native speakers. These were instructed to read the words while their speech was audio-recorded for further analyses (see Ladefoged, 2003 for field techniques).

2.3 Treatment of Data

The audio-recorded data was played back and phonetically transcribed. This enabled us to identify the hiatus resolution strategies employed by Ekegusii speakers. A qualitative data analysis technique in the form of descriptions was used to describe the phonological processes attested in the data. A morphological skeleton- ***Infl –ROOT – FV*** - common to Bantu morphological positions, was used in the analyses. ***Infl*** is the inflection morpheme, while **FV** is the final vowel. The roman numerals and lower case alphabetical letters, e.g., ***c15 – ROOT – FV,*** are also used to substitute *Infl* in order to show the word class markers.

Again, since Ekegusii is an agglutinating language, the infinitival verb was also segmentalised as: ***Subj - D.O - Root – FV,*** with **Subj.** marking the subject; **D.O**. showing the object and **FV** indicating the final vowel. For example, the word ***omwana*** 'child' is presented as:

/omo – an – a / ⟶ **[omuana]** ⟶ **[omwana]** 'child'
c1– Root- FV

with the formation of a glide /w/ and the lengthening of the vowel /a/ to compensate for the loss or shortening of /u/. Such a representation enabled us to identify and describe the vowels that are lengthened in the data and how this lengthening is triggered by the combination of inflectional affixes and the stems of the content words selected.

3.0 Findings

3.1 Vowel Length in Ekegusii

Previous research has indicated that Ekegusii has both phonemic and phonetic (derived) long vowels. Phonemic long vowels are orthographically written as double letters. Such vowels distinguish word meaning (see Cammenga, 2002 for examples). Our scrutiny of Cammenga's (2002) examples shows that phonemic long vowels in Ekegusii have as much freedom of distribution as the short vowels. They are not conditioned by the sounds that precede or follow them. This means that they have no phonetic environmental restrictions.

Phonetic vowel length, on the other hand, is not reflected in the spelling of words. Data have shown that it occurs merely on the surface representation of words. As the analyses below indicate, such vowel length is realized after the phonetic environment is altered. It is demonstrated that a vowel is phonetically realized as long due to some morphophonemic changes. Thus Table 1 summarises the possible vowel combinations across syllable boundaries attested in our data.

Table 1: Vowel Combinations in Ekegusii

First vowel (V1)	**Second vowel (V2)**						
	i	e	ɛ	a	ɔ	o	U
I	ii	jee	jɛɛ	jaa	jɔɔ	joo	juu
E	ei	ee	jɛɛ	jaa	jɔɔ	joo	juu
E	–	–	–	–	–	–	–
A	ai	ee	ɛɛ	aa	ɔɔ	oo	au
ɔ	–	–	–	–	–	–	–
O	oi	wee	wɛɛ	waa	wɔɔ	Woo	ou
U	–	–	–	–	–	–	–

Table 1 reveals that sequences of two distinct vowels can occur in Ekegusii words. In certain contexts, one of them may either be deleted or glided while the other gets lengthened. Secondly, the vowels /i, e, a, o/ occur in the V1 position. These vowels combine freely with any vowel in the

V2 position. Such combinations result in a change in both the V1 vowel and the V2 vowel as discussed below.

a) When /i/ is juxtaposed with itself, the two vowels fuse and surface as long [i] as in the word.

1. ***/tʃi-ira/*** ⟶ ***[tʃiira]*** 'covenants'

However, when /i/ is juxtaposed with /e, ɛ, a, ɔ, o, u/, the /i/ becomes [j] while those other vowels surface as [ee, ɛɛ, aa, ɔɔ, oo, uu] respectively. This change is demonstrated in the words:

2. ***/eβi-emba/*** ⟶ ***[eβjeemba]*** 'maize cobs'
3. ***/eβi-ɔγe/*** ⟶ ***[eβjɔɔγe]*** 'eye lashes'
4. ***/emi-osi/*** ⟶ ***[emjoosi]*** 'earth worms'
5. ***/eβi-uŋurieta/*** ⟶ ***[eβjuuŋurjeeta]*** 'tadpoles'

b) The vowel /e/ combines with /i/ and /u/ to surface as the diphthongs [ei] and [eu] respectively as seen in:

6. ***/eme-ino/*** ⟶ ***[emeino]*** 'sacred songs.
7. ***/eme-uto/*** ⟶ ***[emeuto]*** ' fanning pipes'

/e/ surfaces as [ee] when it combines with another /e/ as in the example below.

8. ***/eke-eγua/*** ⟶ ***[ekeeγwa]*** 'gift'

However, /e/ surfaces as [j] when it occurs before /a, ɛ, o,ɔ /. This alternation leads to the lengthening of those vowels as the examples below show.

9. ***/eke-are/*** ⟶ ***[ekjaare]*** 'age group'
10. ***/eke-ore/*** ⟶ ***[ekjoore]*** 'royal crown'
11. ***/eme-ɔrɔrɔ/*** ⟶ ***[emjɔɔrɔrɔ]*** 'soft'

c) When the low vowel /a/ combines with the vowel /i/ and /u/ , it surfaces as the diphthongs [ai] and [au], respectively, as revealed in the words:

12. ***/ama-iγa/*** ⟶ ***[amaiγa]*** 'cooking stones'
13. **/ama-uγa/** ⟶ ***[amauγa]*** 'bones'

The vowel /a/ in V1 position is deleted before /e, ɛ, o, ɔ, / and surfaces as [ee, ɛɛ, ɔɔ, oo]. This is realized in words such as:

14. ***/βa-e-aŋete/*** ⟶ ***[βeeaŋete]*** 'they hate themselves'
15. ***/βa-ɔmire/*** ⟶ ***[βɔɔmire]*** 'they have smeared'
16. ***/βa-omire/*** ⟶ ***[βoomire]*** 'they have become dry'

d) The vowel /o/ in the V1 position surface as [oi] and [ou] before /i/ and /u/ respectively. Examples 17 and 18 illustrate this phenomenon.

17. ***/ko-iyua/*** ⟶ ***[koiywa]*** 'to be uprooted'
18. ***/omo-uto/*** ⟶ ***[omouto]*** 'blowing pipe'

/o/, however, becomes [w] when it precedes /e, ɛ, a, ɔ, o/. These vowels are in turn lengthened after such a change. This is seen in:

19. ***/ko-eβoyia/*** ⟶ ***[kweeβoyja]*** 'to dress'
20. ***/ko-ɛnɛkia/*** ⟶ ***[kwɛɛnɛkja]*** 'to witness'
21. ***/ko-ama/*** ⟶ ***[kwaama]*** 'to yield'
22. ***/ omo-oγe/*** ⟶ ***[omwooγe]*** 'sharp'
23. ***/ omo-ɔrɔrɔ /*** ⟶ ***[omwɔɔrɔrɔ]*** 'soft'

e) The vowels /ɛ, ɔ, u / do not occur in the V1 position. Therefore, it was impossible to test what would happen when they precede another vowel. Although /u/ does not occur in V1 position, when it precedes /e, ɛ, o, ɔ / in a root-internal position it surfaces as [w]. The vowels that follow the derived [w] become phonetically long.

From the examples above, it can be argued that when the first member of a vowel hiatus (sequence) in Ekegusii is a high or mid-high / i, e, o, u /; it is changed to either [j] or [w] given that the second vowel is low. The second vowel in the hiatus, in turn, surfaces as phonetically long. However, if the first vowel is a low /a/, it is deleted given that the second vowel is also non-high. The non-high vowel in turn surfaces as phonetically long. This shows that a change in the value of any of the seven basic vowels in Ekegusii causes the lengthening of the adjacent vowel.

Data have shown that the first vowel in a hiatus is usually the final vowel in the word's prefix. The second vowel, on the other hand, is the initial vowel of the stems of words. This means that for a vowel to be realized as phonetically long, then the morphological process of prefixation must have created a vowel sequence which has to be resolved by processes that trigger compensatory lengthening. The interaction of Ekegusii word class prefixes and stems of words is discussed below.

3.2 Prefixation and Vowel Compensatory Lengthening

The analyses outlined above have shown that vowel CL in Ekegusii is a result of prefixation. Prefixation is a morphological process (Mwangi, 2001). In Ekegusii, prefixes mark the singular-plural alternation in nominal and the subject-object agreement in finite verbs. A noun or verb in Ekegusii, as in other Bantu languages (Nurse, 2006), is principally composed of two elements: a prefix and a stem. Examples 24 and 25 below illustrate this structure.

24. ***/eke-oŋotir-a/*** 'nape of the neck'
25. ***/mba-e-rootʃ-e/*** 'they see themselves'

In example 24, there is the prefix {eke-} and the stem {-oŋotir-}. There is also the final vowel (FV) /-a /. The prefix {eke-} has the pre-prefix /e-/ which marks the augment and the prefix, /ke-/ which marks the noun class. Similarly, in 25, there is the prefix {mba-e} and the stem {-rootʃ-}. The prefix is in two parts: {mba-} which marks the third person plural subject and {-e-} which marks the reflexive object (-self).

The analysis of Ekegusii words into the prefix and stem structure is important in this discussion because the interface between the prefixes and stems of words condition the morphophonemic alternations that trigger vowel compensatory lengthening. For example, the surface realization [***ekjooŋotira***] 'nape of the neck' is due to the raising of the vowel /e / in the prefix to [i] which is then glided to [j]. This is triggered by the initial vowel /o/ of the stem. The phonetic form of the stem ***[-ooŋotir-***] has a long vowel [oo] due to the change in the prefix structure. This means that the alternations in the prefixes are determined by a phonetic environment. This environment, as revealed in this study, is the initial sound of the noun or verb stem.

The analyses in section 2.1 indicate that the vowels /e, i, o / when they are the first vowels in a sequence of V+V are changed to / j /. These vocalic segments are found in prefixes that mark the Ekegusii nominal classes 1 /mo-/, 4 /me-/, 7 /ke-/, 5/ ri-/, 8 /β1-/, 10 /ci-/, 11 /ro-/, 14 /βo-/ and 15 /ko-/. The vowel /o/ is also found in the subject prefix /to-/ 'we' /mo-/ 'you' /bo-/ 'your' (sg).

It has also been revealed that when the vowel in the prefix is a low /a/, it is deleted when followed by another non-high vowel. The data collected reveal that the vocalic segment /a/ appears mainly in prefixes in class 2 /βa-/, 6 /ma-/, 12 /ka-/ and 16 /a-/. This vowel is also found in the subject prefixes /βa-/ 'they', / (n) a-/ 'he/she' and the negative marker /ta-/ 'not'.

In what follows we discuss how stems of Ekegusii nouns are prefixed by at least one of the morphosyntactic class prefixes (Whiteley, 1960 and Cammenga, 2002) to trigger vowel CL. A discussion on how various verbal inflectional morphemes, especially the subject and object agreement markers, interact to create combinatory constraints that condition CL also follows. The morphemes considered here include: /ni-/ 'I', /o-/ 'you', /mo-/ 'you', /a-/'s/he', /to-/ 'we', /βa-/ 'they', /ki-/ 'it', /ye-/ 'it', /βi-/ 'they', /tʃi-/ 'they' and /e-/ 'them'.

(a) Class 1/2 Prefixes

Class 1 prefix with the structure {omo-} marks a noun to be singular. The vowel /o/ in the prefix /mo-/ is not changed when it is appended to a stem that begins with a consonant. However, when the vowel /o/ is attached to a stem that begins with a nasal-consonant cluster, it is lengthened. The nasal-consonant combination here acts as a conditioning environment for the lengthening of the prefix vowel. This is realized in the word:

26. ***/omo-nt-o/*** ⟶ ***[omoonto]*** 'person'

In this example, the vowel /o/ of the prefix /mo-/ changes to [oo] before the prenasalised stop [-nt]. The same vowel /o/ surfaces as [w] when it is attached to a stem that begins with a non-high vowel. This is illustrated in 27 below.

27. ***/omo-an-a/*** ⟶ ***[omuana]*** ⟶ ***[omwaana]*** 'child'

In 27 above, the vowel /o/ of the prefix /mo-/ is first changed to [u] before becoming the bilabial-velar glide [w]. The vowel /a/ that conditions the observed changes is lengthened to [aa]. In examples 26 and 27, the preprefix vowel /o/ is not affected by the root initial sound.

The class 2 prefix {*aβa-*} mark the plural form of the noun derived from the class 1 prefix. The vowel /a/ in the prefix */βa-/* remains unchanged if the stem it is attached to begins with a consonant. It, however, surfaces as [*βaa-*] if the stem begins with a nasal-consonant cluster, or another non-high vowel. Examples 28 and 29 below capture this generalization.

28. ***/a-βa-nt-o /*** ⟶ ***[aβaanto]*** 'persons'
29. ***/a-βa-an-a/*** ⟶ ***[aβaana]*** 'children'

In 28, the vowel /a/ in the prefix */βa-/* meets a root that begins with a prenasalised stop. This environment conditions the length of the prefix vowel. The long vowel in 29 can be attributed to either vowel deletion or vowel fusion. Here, either the first vowel in the prefix */ βa /* is deleted to trigger the lengthening of the root vowel or the vowel /a/ of the prefix merges with the vowel of the root.

(b) Class 3/4 Prefixes

Class 3 prefix {omo-} signal a singular noun, while class 4 prefix {eme-} signal a plural noun. The vowel /o/ in /mo-/ and /e/ in /me-/ prefixes become the bilabial-velar glide [w] and the palatal glide [j] respectively when they are attached to a non-high vowel initial stem. The derivations in 30 and 31 support this position.

30. ***/omo-os-i/*** ⟶ ***[omuosi]*** ⟶ ***[omwoosi]*** 'earthworm'
31. ***/eme-os-i/*** ⟶ ***[emiosi]*** ⟶ ***[emjoosi]*** 'earthworms'

In 30, the vowel /o/ of the prefix /mo-/ is changed to [u] before it is glided to the bilabial glide [w]. This is conditioned by the initial vowel /o/ of the root /-os-/. The consequence of the alternation observed in the prefix vowel is the lengthening of /o/ of the root. This is represented by the double vowel [oo] in the word ***[omwoosi]*** 'earthworm'. Similarly, in 31, the vowel /e/ in the prefix /-me-/ becomes [i] before it is changed to the palatal glide [j]. This is conditioned by the initial vowel of the stem /o/. The long vowel [oo] in [***emjoosi***] 'earthworms' is also due to the vowel alternations observed here. Such changes are, however, blocked when the initial vowel in the stem is a high /i/ or /u/. This explains the surface forms of examples 7 and 18.

7. /*eme-ut-o*/ ⟶ ***[emeuto]*** 'fanning pipes'
18**. /*omo-ut-o*/** ⟶ ***[omouto]*** 'fanning pipe'

The forms *[omwuuto] and *[emjuuto], are, therefore, ill-formed in Ekegusii grammar**.**

(C) Class 5/6 Prefixes

The class 5 prefix is {ri-} while class 6 prefixes are {ama-}. When the vowel /i/ in class 5 prefix {ri-} is attached to a stem beginning with another vowel, it changes to the palatal glide [j]. This derives forms such as:

32. ***/ri-uko/*** ⟶ ***[rjuuko]*** 'letter'
33. ***/ri-ɔmɔ/*** ⟶ ***[rjɔɔmɔ]*** 'mud-wall'
34. ***/ ri –ot-e/*** ⟶ ***[rjoote]*** 'wound'.

In Example 32, the initial vowel in the stem /-uko/ provides the phonetic environment for changing of /i/ in the prefix to the palatal glide [j]. This in effect triggers the lengthening of the conditioning vowel to [uu]. Likewise, in 33, the vowel /ɔ / is lengthened to [ɔɔ] after the formation of the palatal glide [j].

The prefix vowel /a/ in the class 6 prefix /ama-/, however, does not glide as the /i/ in class 5. Instead, it is deleted when it is attached to a stem that begins with a non-high vowel. This explains the surface forms below:

35. ***/ama-ɔm-ɔ /*** ⟶ ***[amɔɔmɔ]*** 'mud-walls'
36. ***/ama-ot-e /*** ⟶ ***[amoote]*** 'wounds'

In the above examples, the prefix vowel /a/ is deleted from the sequence. The initial-vowels /ɔ/ and /o/ in the stems /-ɔm -/ and /-ot-/ are consequently lengthened to [ɔɔ] and [oo] respectively. The prefix vowel /a/ is not deleted if the stem begins with a high vowel. This is seen in 37.

37**. */ama-uko/*** ⟶ ***[amauko]*** 'letters'

Here, the vowel /a/ in the prefix /ma-/ is not deleted when it appears before /u /. In examples 35, 36 and 37 the pre-prefix vowel /a/ is neither affected nor does it affect the initial vowel of the roots.

(d) Class 7/8 prefixes

Class 7/8 prefix pairing is characterized by the prefixes {*eke*-} in the singular and {*eβi*-} in the plural. When the prefix form / eke-/ combines with a non-high vowel-initial stem, the vowel /e/ in the prefix /ke-/ changes to [i] before becoming [j]. The vowel /i/ in the prefix /βi-/ immediately becomes the palatal glide [j] when it is attached to a root beginning with another vowel. This is followed by the compensatory lengthening of the stem - initial vowels. The data below further exemplifies this situation.

38. / ***e-ke-oŋorek-a /*** ⟶ ***[ekioŋoreka]*** ⟶ ***[ekjooŋoreka]*** 'hiccup'
a-c7-ROOT-FV
39. ***/e-βi- or- e /*** ⟶ ***[eβjoore]*** 'skulls'
a-c8- ROOT-FV
40. ***/e-βi- omβ- e /*** ⟶ ***[eβjoombe]*** 'groups'
a-c8- ROOT- FV

In the above words, the vowels /e/ and /i/ in the prefix become the palatal glide [j]. This is triggered by the vowel /o/ in the stems /-oŋorek-/, /-or-/ and /-omβ-/. After the derived glide [j], the stem-initial vowel /o/ becomes phonetically long.

(e) Class 9a/10a Prefixes

This is also called the N/N class and distinguishes nouns with their prefix forms {en-} for singular and {tʃin-} for the plural (Whiteley, 1960). The nasal prefix in these classes creates a nasal-consonant cluster whenever it is attached to a consonant-initial stem. Consequently, the vowel preceding the derived nasal-consonant cluster lengthens in a compensatory manner as the data below shows.

41. ***/en- βarater-o /*** ***[eembaratero]*** 'sole of a foot'
c9a-ROOT- FV
42. /t***ʃin- βarater-o /*** **[t*ʃiimbaratero*]** 'soles of feet'
c10a-ROOT- FV
43. ***/en- tiɣatiɣ- i /*** ***[eentiɣatiɣi]*** 'arm pit'
c9a-ROOT- FV
44. /t***ʃin-tiɣatiɣ-i*** / ***[tʃiintiɣatiɣi]*** 'arm pits'
c10a-ROOT-FV

In example 41, the prefix {*en*-} is attached to the root-initial consonat /*β* / to derive the prenasal [*mb*]. The prenasal derived triggers the lengthening of the prefix vowel /e/. Similarly, the prenasal [*mb*] derived from the combination of the prefix /t*ʃin*-/ and the consonant /β/ of the root ***/-βarater-/*** in example 42 conditions the lengthening of the prefix vowel /i/. Likewise in examples 43 and 44 the prenasal [*nt]* derived conditions the lengthening of the vowels /e/ and /i/.

(f) Class 11 Prefix

The class 11 prefixes are {oro-}. The plural form of nouns in this class takes the prefix in 10a and not 12 as would have been expected. When the second vowel in the prefix /oro-/ is attached to a stem beginning with a non-high vowel, it is changed to a high /u/ before it is glided to [w]. This alternation is realized in 45 below.

45. ***/oro-amb-o/*** → ***[oruambo]*** → ***[orwaambo]*** 'mat'

Here, the vowel /o-/ in the prefix /ro-/ is raised to /u/ before it is glided to [w]. This is followed by the lengthening of the vowel /a/ in the stem.

(g) Class 12 prefixes

The class 12 prefix is {aka-}. It is used to mark diminutive nouns. When the final vowel of this prefix is attached to a root beginning with a nasal consonant it is lengthened as in example 46 below.

46. ***/aka-ŋin-a/*** → ***[akaaŋina]*** 'small woman'.

The vowel is, however deleted when it is attached to a root that begins with a low vowel as pointed out in Table 1. This deletion conditions the lengthening of the root vowel. Example 47 below illustrates this observation.

47. ***/aka-eŋu-e/*** → ***[akeeŋwe]*** 'small stick missile'

(h) Class 14 prefix

The class 14 prefix is {oβo-}. The vowel /o/ in the prefix /βo-/ changes to the bilabial-velar glide [w] when it is attached to a root that begins with another vowel. This is exemplified in 48.

48. ***/oβo-aŋg-a /*** → ***[oβuaŋga]*** → ***[oβwaaŋga]*** 'fermented mixture for making porridge'

In 48 above, there is the lengthening of the root-initial vowel /a/ due to the formation of the bilabial-velar glide [w].

(i) Class 15 Prefix

This is the class also associated with infinitives. Infinitives in Ekegusii are derived by prefixing the class 15 prefix {ko-} (hence called the infinitive marker) and suffixing /-a / to the root. Such infinitives can be used with or without the pre-prefix /o/. Elwel (2005) points out that any choice is as good as the other. He further argues that, for example, the word ***/ko-ritɔ-a/*** would mean 'heavy', while ***/oko-ritɔ-a/*** is more similar to 'to be heavy'. However, our position is that without the pre-prefix /o/, the word derived is a verbal. This is similar to the English infinitive with 'to'. When the pre-prefix is attached before the prefix /-ko-/, a deverbal nominal is derived.

A common feature observed between verbals and deverbal nominals is that they derive from the same root as example 49 shows.

49 a. Verbal derivation

Stem	*/ -eβ-/*	
Affixation	***/ ko-eβ-a/***	'to forget'
Phonological rules		
Output	***[kweeβa]***	'to forget'

b. Deverbal nominal derivation

Input	***/ko-eβ-a/***	verb
Augmentation	***/o-koeβa/***	verbal noun
Phonological rules		
Output	***[okweeβa]***	'forgeting'

The alteration between / ko-/ and /γo-/, sometimes observed in this class, is accounted for by Dahl's law, the cross linguistic voicing dissimilation rule in Bantu languages. The rule states that a voiceless stop, such as /p, t, k /, becomes voiced /b, d, g / when immediately followed by another syllable with a voiceless stop (Katamba, 1989).

Dahl's law is formulated as:

Rule 1: Dahl's Law

[-son] → [-α voice]/- [+syl] + [-syl]

[+high] [α voice]

This explains the alternation between /k/ and [γ] in 50 below.

50. ***/ko-ɔk-a/*** → ***[γuɔka]*** → ***[γwɔɔka]*** 'produce light'

Here, the consonant in the prefix /k/ gets voiced and surfaces as /γ/. This makes it disagree in voicing with the consonant /k/ of the root /- ɔk- / to which it is attached.

When the prefix {ko-} in class 15 is attached to vowel-initial stems, it triggers the phonological processes of vowel raising, gliding and compensatory lengthening. The examples given below illustrate this change.

	Input	Vowel Raising	Output	Gloss
51.	/ ***ko- aγam- a*** / c15-ROOT-FV	***[kuaγama]***	***[kwaaγama]***	lean on
52.	***/ko- ɔman- a /*** c15-ROOT-FV	***[kuɔmana]***	***[kwɔɔmana]***	quarrel
53.	***/ko- εγer- a /*** c15-ROOT-FV	***[kuεγera]***	***[kwεεγera]***	learn

In examples 51-53 above, the prefix vowel /o/ is first raised to [u] before the stem-initial vowels /a, ɔ, ε /. After vowel raising, the vowel /u/ is glided to [w]. The vowels in the initial position in the stems are then lengthened in a compensatorily manner. They surface as [aa, ɔɔ, εε], respectively.

(j) Subject and Object Prefixes

The prefixes discussed above mark the grammatical class of nominals. In Ekegusii, there are also prefixes that mark concord and number. This is usually done by verbal morphemes. Just as in the word class prefixes, such morphemes interact with one another creating combinatory constraints. This paper focuses on the subject and object prefixes. The subject prefix in Ekegusii encodes the subject category on the verb. It provides information about the person, number and class. It has various realisations for the different mophosyntactic classes. For example:

a. **Person**

Singular	1	/ ***ni***-/	‘I’
	2	/ ***βo***- /	‘you'
	3	/ ***na***- /	‘s/he'
Plural	1	/ ***to-***/	'we'
	2	/***mo-***/	'you'
	3	/***βa***-/	'the

b. **Non- person**

Singular	/***ki***-/ /***ji***-/	‘It’
Plural	/***βi*** -/ /***tʃi***-/	‘they'

The conjugation of the verb root ***/-antʃ-/*** ‘love/like’ in 54 below exemplifies the above subject prefixes.

	Underlying Form	Surface Form	Gloss
54.	(a) / ***ni-*** ɲ ***e-antʃ-et-e/***	***[ni*** ɲ ***eantʃete]***	'I love myself'
	(b) **/ *bo-e-antʃ-et-e/***	***[βweeantʃete]***	'You (sg) love yourself'
	(c) / ***na-e-antʃ-et-e/***	***[neeantʃete]***	'S/he loves her/himself'
	(d) ***/to-e-antʃ-et-e/***	***[tweeantʃete]***	'We love ourselves'
	(e) **/*mo-e-antʃ-et-e/***	***[mweeantʃete]***	'You (pl) love yourselves'
	(f) ***/βa-e-antʃ-et-e/***	***[βeeantʃete]***	'They love themselves'
	(g) ***/ki-e-antʃ-et-e/***	***[kjeeantʃete]***	'It loves itself'
	(h) ***/ji-e-antʃ-et-e/***	***[jjieeantʃete]***	'It loves itself'
	(i) /***bi-e-antʃ-et-e/***	***[βjeentʃete]***	'They love themselves'
	(j) ***/tʃi-e-antʃ-et-e/***	***[tʃjeeantʃete]***	'They love themselves'

In each of the examples above, the subject prefix is the first element in the sentences. Immediately following this is the prefix /-e-/ which marks the reflexive object '-self'. As Cammenga (2002) notes, the position taken by the object marker in Ekegusii is the one immediately before the verbal root. This can mark a direct object, an indirect object or even a reflexive object. Whiteley (1960) calls it a 'verbal infix'. In non-tensed forms (infinitives and imperatives), the object prefix is preceded by the infinitive prefix /ko-/. In tensed forms, it is preceded by a tense prefix (an unspecified vowel); by the negative prefix/ ta-/ in negative forms, and by the subject prefix in positive forms. A morphological skeleton of the Ekegusii verb can be schematised as:

Tensed-form: (IN)-SM-TM-OM-ROOT-(EXT)-FV

Infinitive: (PPFX)/(IN) - PFX –NEG- OM-ROOT-EXT-FV (Elwel, 2005). This structure can be illustrated by the words below:

	Underlying Form	Surface Form	Gloss
55.	***/ki- a- ye- ror- ir- e /*** SM-TM-OM-ROOT-EXT-FV	***[kjaajerorire]***	'it has seen it'
56.	**/*o- ko- e - buk- er- a /*** PPFX-PFX-OM-ROOT-EXT-FV	***[okweeβukera]***	'smear oneself with dirt'
57.	***/a- βa- e- ŋer- et- e /*** SM-OM-OM-ROOT-EXT-FV	***[aβeeŋerete]***	's/he brewed for them'

The interaction between the subject and object prefixes in examples 55-57 results in the morphophonemic processes of glide formation and vowel deletion. For example, in examples 54 (c) and (f) and 57, the third person subject/object prefix vowel /a/ is deleted yielding the long vowels [ee] in the surface forms of the words [***neeantʃete***] 's/he loves her/himself', [***βeeantʃete***] 'they love themselves' and [***aβeeŋerete***] 's/he brewed for them'. In examples 54 (b, d, e) and 56, the bilabial-velar glide [w] formed is followed by long vowels in the surface realization of the words involved.

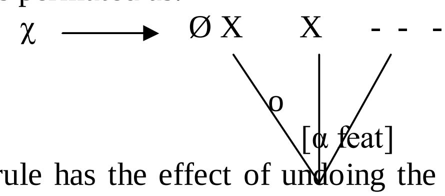
The formation of the palatal glide [j] in 54 (g, h, i and j) and 55 is followed by long vowels in those words. Note that in example 55, it is the interaction between the subject vowel /i/ and the tense vowel /a/ that trigger glide formation and compensatory lengthening. Example 54 (a) shows that the combinations of the object prefix vowel and the root-initial vowel does not lead to glide formation although the structural configuration is conducive for the process. This is due to lexicalization constraints. Changing the /e-/ to [j] in that word would yield **[*ni*ɲ *jaantʃete*]** which means 'I love it, e.g. donkey (class 9a words)'.

The analyses in this study have also revealed that vowels are long after prenasalised consonants. This means that the initial vowel /a/ in the root */-antʃ-/* 'love / like' should also be lengthened in the data in 54. For example, in 54 (f) the surface form would have been [***beeaantʃete***] 'they love themselves'. However, because of the X-Trimming Rule, the sequence [-eeaa-] is shortened to [-eea-]. The rule that deletes extra-long vowels is stated in 2 below:

Rule 2: X-Trimming:

Whenever a single vowel is linked to more than two V-slots on the timing tier, the extra-long vowel derived is trimmed down to two.

This is permuted as:



This rule has the effect of undoing the lengthening of vowels after the application of appropriate morphophonemic processes. Cases of vowel shortening can be argued for in such instances.

4. Conclusion

It can be concluded that Ekegusii does not allow hiatus situations in the underlying forms of words. However, hiatus situations can arise in the language as a result of the morphological process of prefixation, leading to false germination. Ekegusii consequently relies on the phonological processes of glide formation, vowel raising and vowel deletion as hiatus resolution strategies. These strategies lead to changes in both the vowels in the prefixes and roots bringing about the desired CV syllable structure. The occurrence of phonetic (derived) long vowels is, therefore, conditioned by the syllable boundaries and the morphological characteristics of the word. Further work in this area could focus on the effects of vowel compensatory lengthening on other suprasegmental features in Ekegusii such as intonation.

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