

VOWEL HARMONY IN THE ROGORO
DIALECT OF EKEGUSII

AN M.A PROJECT

BY

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DECLARATION

(1) This project is my original work and has not been submitted for the award of a degree in any other University:

Signed: David Ongarora

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(2) This project has been submitted with my approval as the University supervisor:

Signed: Kimani Njoroge

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Date: 29th Nov. 1996

DEDICATION

For Bryan Atandi and Neville Maosa, who should read it;

My parents, Peter Ongarora and Bathsheba Bosibori, who impressed upon me the value of fortitude;

Ezekiel Bonuke, who shows me the way;

Veronicah Kemunto, who rekindles hope and

My brothers and sisters, who remind me to fear God.

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Notwithstanding all manner of assistance that I received, I accept as solely mine any flaws in this work.

Lastly, I would like to thank Mr and Mrs Omari for their hospitality whenever I was in Nairobi and also Mr. Kamau for typing the work.

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ABSTRACT

This study aims at investigating and establishing the nature of vowel harmony in some polysyllabic words of the Rogoro dialect of Ekegusii from the perspective of Autosegmental phonology. Autosegmental phonology is a recent phonological theory that emphasizes the idea that some prosodic features perform phonemic function and, therefore, are not integral parts of individual segments but autonomous elements in their own right, technically called autosegments.

The main objectives of the study are: to determine whether there are harmonizing features in some words and to establish whether the harmonizing feature is an autosegment.

The study finds out that vowel harmony is a rule-governed phonological process in which [\pm high], [\pm round] [\pm back] are harmonizing features because they span a sequence of units larger than the discrete segments. The process is progressive and regressive and it also causes morphemes to be realized in two phonemic forms. This is because the feature in the first syllable of the word stem controls the feature that the vowels in affixes should have.

It is also found out that the feature [\pm high] is a harmonizing feature as well as an autosegment because it is lexically contrastive in some lexis. As such, it is not an integral part of the segmental structure because it requires its own tier which shows how it is to be co-articulated with the elements on the segmental structure. In cases of the existence of multiple harmonizing features, the minimal pair test is used to identify the one that is phonemic.

Finally, it is recommended that a similar study be conducted in the other dialect of Ekegusii, Maate, and the scope widened so as to investigate whether the rest of the word classes lend themselves to the harmony patterns exhibited in the nouns and verbs of the Rogoro dialect.

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CHAPTER ONE

INTRODUCTION

1.0

1.1 ABAGUSII: THE PEOPLE AND THE LANGUAGE

The focus in this study is Ekegusii, a language spoken by a group of Bantu people known as Abagusii. The Abagusii believe that they came from the North or a place they refer to as 'Misiri' (Ochieng' 1974). At the moment, they occupy Kisii and Nyamira districts of Nyanza province, Kenya. In his study of the Ekegusii language, Bosire (1993) found out that, basically, the language consists of two dialects, namely Rogoro and Maate. This study focuses on the former.

1.2 BACKGROUND TO THE STUDY

Specifically, the research is concerned with the phonological aspect known as vowel harmony which is one of the several types of the phenomenon referred to as assimilation. Therefore, the study falls under the area of language known as phonology. Phonology is a subdiscipline in linguistics that is concerned with the study of the 'function, behaviour and organization of sounds as linguistic items' (Lass 1984). An adequate description of phonology entails the analysis of language at two levels, namely (i) the discrete consonantal and vocalic units that are known as 'segments' and (ii) the features that are referred to as the 'suprasegmentals' or 'prosodies'. At the level of the segments, which are thought of in traditional phonology as being a linear sequence of consonants and vowels, are described the contrastive sound units and their organization in a particular language. For instance, in the English phonological system, we can identify the 'speech sounds' /b/ and /p/ as distinct segments, technically known as phonemes. /b/ is a voiced bilabial stop while /p/ is a voiceless bilabial stop. The sounds contrast in the feature [\pm voice]. The contrastive function of /b/ and /p/ is evidenced by such minimal pairs as (a) bin:pin and (b) ban:pan. Since the substitution of sound [b] for [p] in each

of the pairs brings about change in meaning in the words, both sounds are said to be phonemes in English language and the relevant distinctive feature for them is [+voice]. Consequently, [+voice] and [-voice] are integral parts of the English phonemes /b/ and /p/ respectively.

In contrast to a feature like [+voice] that distinguishes /b/ from /p/ are aspects such as tone and stress which evade being ascribed to any specific segment in a word; precisely put, none of them is an integral part of the phoneme. Since in some languages such aspects carry out the contrastive function that the linearly ordered consonants and vowels perform, they are known as autosegments. For example, in a language like Mandarin Chinese, tone is an autosegment in that it is phonemic. To illustrate, in the said language, there are four lexical items distinguishable by tone as (i) mā (with high level pitch) 'mother' (ii) má (with high rising tone) 'hemp' (iii) mǎ (with low, or falling then rising pitch) 'horse' and (iv) mà (with falling pitch) 'scold'. This means that it is the variation of tone that leads to change in meaning in words. Accordingly, since tone does not fit into any one of the linearly ordered segments as an integral property and it stretches over a sequence of such segments, it is said to be a non-linear phonological phenomenon. In non-linear phonology, alternatively known as multilinear phonology, a meaning-bearing feature like tone in Mandarin Chinese is regarded as an autonomous element and therefore an autosegment in the sense that by virtue of being phonemic, it functions as a 'segment' in its own right. This explains why the neo-technical term 'autosegment' which emphasizes the linguistic independence of tone is preferred to the more traditional and inaccurate one 'suprasegmental' in nonlinear phonology. Linguists are concerned not only with the nature, behaviour and function of such phonological elements as tone, length, stress and intonation but also with their relationship with the consonantal and vocalic segments that constitute a

syllable or the entire lexical item.

Therefore, in nonlinear phonology an autosegmental feature like tone as opposed to the consonantal and vocalic segments is viewed as operating at a different and parallel but related level to that of the segmental structure. Both levels are known as tiers (a more instructive discussion of these concepts is done in section 1.8. of this work). The separation and analysis of the elements on the two tiers provides a deeper insight into the nature, behaviour and function of the phonological elements on the tiers.

It is against the foregoing phonological background and theoretical framework that this study proceeds to discuss vowel harmony in the Rogoro dialect of Ekegusii.

1.3 STATEMENT OF THE PROBLEM

This study is an investigation into vowel harmony in some polysyllabic words of the Rogoro dialect of Ekegusii. It aims at establishing whether there are features that give rise to vowel harmony in the words. It will also attempt to investigate the extent to which it may be claimed that the harmonizing feature is an autosegment, if it exists. Consequently, the study will address itself to the following three research questions:

- (i) do some polysyllabic words in the dialect have harmonizing features?
- (ii) do the harmonizing features give rise to vowel harmony?
- (iii) is the harmonizing features an autosegment?

1.4 OBJECTIVES OF THE STUDY

The study hopes to achieve the following objectives:

- (i) to determine whether some polysyllabic words in the said dialect have harmonizing features,
- (ii) to establish whether the harmonizing features give rise to vowel harmony.
- (iii) to determine whether the harmonizing features is an autosegment.

1.5 HYPOTHESES OF THE STUDY

To achieve its objectives, the study postulates the following hypotheses:

- (i) There are harmonizing features in some polysyllabic words of the Rogoro dialect of Ekegusii.
- (ii) Some features in the polysyllabic words of the Rogoro dialect of Ekegusii give rise to vowel harmony.
- (iii) The harmonizing feature is an autosegment in the dialect.

1.6 JUSTIFICATION OF THE STUDY

An adequate understanding and consequent description of the phonological system of a language is incomplete without the study of its prosodic features. By throwing some light on vowel harmony, which is a prosodic feature in the Rogoro dialect of Ekegusii about which little is known, this study will contribute towards a descriptive adequacy of the phonology of the language. In his study of the major consonantal processes in Ekegusii, Osinde (1988) uses five verbs so as to conclude that there is Advanced Tongue Root- (hereinafter referred to as ATR-) harmony in the language. This study will focus on two principal word classes, namely nouns and verbs. It is also intended to discuss some features other than [ATR] that give rise to vowel harmony. By discussing such harmonizing phonological features in the vocalic sounds of the dialect under scrutiny, the study will contribute towards a more comprehensive understanding the nature of vowel harmony not only in Ekegusii but also in African languages in general.

In autosegmental phonology, it is held that the existence of vowel harmony in a word is evidence for the fact that the harmonizing feature is a 'prosodic' property just as tone and stress are (Clark and Yallop, 1990). One further assertion of

this theoretical stand-point is that such features are autosegments in some languages. The significance of this study lies in the fact that there shall be an attempt to establish whether the harmonizing features, like the archetypical prosodic properties such as tone and stress, are also autosegments. Autosegmentality is an essential aspect of the features that are analysable within autosegmental phonology, the theoretical framework that this study will adopt. Whereas linguists like Lass (1984) and Clark and Yallop (1990) have posited that vowel harmony is a word prosody, little attempt has been made regarding the question: is the harmonizing feature an autosegment? Part of the significance of this study is based on the attempt to resolve this problem.

1.7 THE SCOPE AND LIMITATIONS OF THE STUDY

The study will be synchronic; this means that it will be concerned with the present state of the phonological process known as vowel harmony. Some light shall be thrown on such phonetic features as height, liprounding and backness of the vocalic sounds in the polysyllabic words so as to determine whether such features give rise to vowel harmony.

The data for the study will be drawn from the Rogoro dialect of Ekegusii and they shall be restricted to two word classes, namely nouns and verbs.

Since the study will adopt the autosegmental phonology framework, it will discuss whether the harmonizing feature is an autosegment in the dialect.

The major limitation of the study is that without the use of photographs, it is not easy to give precise descriptions of the shape and position of the articulators, which lead to the identification of features, in the production of the vowel sounds. Additionally, due to the brief duration within which the data has to be discussed, not all morphemes that are relevant to the discussion of vowel harmony rules are to be considered. The paucity of elaborate literature on vowel

harmony, especially on the Bantu family of languages to which Ekegusii belongs, makes it necessary for us to approach the discussion in the manner in which the concept has been dealt with in other languages, albeit with care, because some approaches may not necessarily obtain in Ekegusii.

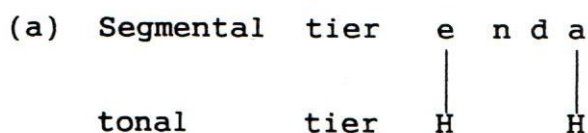
1.8 THEORETICAL FRAMEWORK

This study will adopt the autosegmental phonology theoretical framework first propounded by Goldsmith (1976) and later dealt with at length in 1990 by himself. Autosegmental phonology is a development of the classical generative phonology presented by Chomsky and Halle (1968) in The Sound Pattern of English, now commonly referred to as the SPE.

Initially, autosegmental phonology was specifically devised and intended for the analysis of African tone languages; this was as a result of the recognition that tone is phonemic and consequently an independent phonological element, technically referred to as an autosegment. Accordingly, it requires its own tier which runs parallel to the segmental structure tier to show how both tiers are related. The link between both tiers was shown by association lines. These lines indicate how the elements on the tonal tier and the successive segmental one are to be co-articulated. This means that the simultaneous articulation of the elements on both tiers leads to the production of an acceptable lexical item. In this framework, Goldsmith (1976, 1990) questions the linearity assumption in phonological structure and its representation presented in the traditional and generative phonology framework which gives the false impression that the speech continuum consists only of a linearly ordered progression of consonants and vowels.

The autosegmental phonology framework maintains that features like tone and length are sometimes autonomous phonological phenomena in some languages in the sense that they are phonemic and, therefore, not part and parcel of the

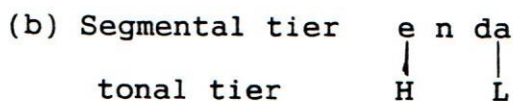
make-up of segments. The basic argument of the theorists of this framework is that since tone and length are exploited for lexical contrasts, they function like segments per se. Goldsmith (1976, 1990) proposes that the technical term for such elements is 'autosegment'. An autosegment is a meaning-bearing element that is simultaneously articulated with one or more of the segments known as consonants and vowels. Autosegmental phonology is therefore a multilinear model of phonological representation in which there are two or more tiers of phonological activity on which a specific phonetic detail is stated. For example, in a language like Ekegusii, in which tone is phonemic (Osinde 1988), a disyllabic noun such as *enda* 'louse' can be represented in a two-tiered way as:



where the high (H) tones on the tonal tier are linked with the segmental tier by association lines to show the simultaneity of the articulation of the elements on both tiers. In this representation, tone is separated from the elements on the segmental tier and placed on a separate tier, the autosegmental one. The H-H sequence on the tonal tier indicates that the high tone is successively associated with both syllables on the segmental tier in the pronunciation of the word 'enda'. As is apparent, the framework supposes that there are two tiers, namely (i) the segmental tier on which the consonantal and vocalic 'segments' are specified for all other features except tone and (ii) the tonal tier on which the segments are specified for tone only (Goldsmith 1990). In

the diagram, two tones are specified on the tonal tier as being high. Therefore, the diagram illustrates that the tones operate at a different level from that of the consonant and vowel segments.

As has been observed, the two tiers are linked by association lines. These lines are intended to show how the elements on both tiers are to be co-articulated in time. The same linguistic item 'enda' has a different meaning, that is, 'stomach' if the first syllable is pronounced with a high tone followed by a low one on the last syllable. Its autosegmental notation is:



This diagram contrasts with notation (a) not in segmental structure but in tone only. Since it is the variation of tone that distinguishes the two meanings in 'enda', tone qualifies for the status of an autosegment. It is for this reason that tone is accorded its autonomy because, being phonemic, it operates and therefore requires a tier different from the segmental one. The thesis of this reasoning is that tone is neither superimposed on nor part and parcel of the elements on the segmental tier.

From the foregoing, three principles of autosegmental phonology emerge, namely (i) an utterance is not simply a sequence of linearly ordered events (ii) the autosegmental feature, in this case 'tone', has a separate life of its own

because it is independent from the segmental structure tier and (iii) the independent feature is usually associated with and consequently co-articulated with a larger unit, typically the syllable.

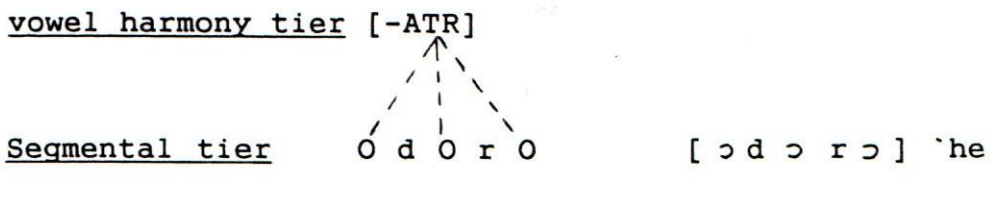
Phonologists such as Katamba (1989), Durand (1990) and Clark and Yallop (1990), working within the framework of autosegmental phonology, have argued that besides the archetypical non-linear properties like tone and stress, the framework can be extended to vowel harmony in which the spreading feature can be treated autosegmentally, that is, 'extracted' from segments and 'placed' on a separate tier (Katamba 1989). Although Katamba (*ibid.*) uses the term 'extracted', which presupposes the conviction that the harmonizing feature is an integral part of a vowel and therefore not an autosegment, I would prefer the term 'separated' to avoid theoretical confusion. The analysis of vowel harmony within the autosegmental perspective is not as fully developed as that of tone for which it was originally designed. However, from the scanty literature available, four basic principles that govern the autosegmental treatment of vowel harmony within this framework have been postulated (Katamba 1989). These are:

- (i) identify the harmonizing features that are 'suprasegmentalised' and place them on a separate tier,

- (ii) identify the set of vowels which have the harmonizing feature,
- (iii) identify the class of opaque segments that may block the rule of vowel harmony from applying. Opaque segments are vowels that are exempt from the vowel harmony rule because they are specified in the lexicon for the harmonizing feature,
- (iv) associate the harmonizing features with vowels in line with the requirements of the Well Formedness Condition (WFC) applicable in tone analysis which state:
 - (a) each vowel must be associated with at least one tone,
 - (b) each tone must be associated with at least one vowel and
 - (c) no association lines may cross.

Admittedly, in our case, we are concerned not with tones but the harmonizing features. To illustrate how the framework applies to vowel harmony, we shall consider one example from Igbo, a West African language. In this language, the harmonizing feature is Advanced Tongue Root, (which is discussed in detail in the literature review in the next section). Specifically, we shall focus on the sounds [o] and [ɔ] which are thought of as being + and -[ATR] respectively. As a rule, two tiers are required in the autosegmental

representation of Igbo vowel harmony namely (i) the vowel harmony tier on which the + or - value of the [ATR] feature is specified and (ii) the segmental tier on which the vocalic segments are written in capital letters because the articulatory feature [ATR] has been 'separated' from them. The representation of the vocalic sounds on the segmental tier in capital letters is comparable to and reminiscent of the phonematic units that remain after the prosodic treatment of vowel harmony in the Firthian prosodic phonology exemplified and discussed in detail in the literature review. In the Igbo word to be analysed below, the capital letters represent the vocalic sounds that are specified for all the phonetic features except [ATR] which has been separated and placed on its own tier. Consequently, within the autosegmental phonology framework then, the Igbo word 'odoro' [ɔ d ɔ r ɔ] 'he pulled' will be analysed as:



where (i) each vowel is associated with the harmonizing feature, [-ATR], and (ii) the feature [-ATR] is viewed as a prosody that traverses all the vowels in the entire word, thereby becoming the harmonizing feature. In this diagram, the harmonizing feature,

[-ATR], has been separated from the vocalic segments symbolized as [ɔ] in the phonetic transcription form and placed on the vowel harmony tier because, as a prosody, the feature stretches over the entire word [ɔ d ɔ r ɔ]. It is because of this reason that Katamba (1989) considers [-ATR], as having been 'suprasegmentalised' since it spans all the vocalic sounds in the word although it is an inherent property of the vocalic phoneme /ɔ/. In this way, he explains, harmonizing features are unique elements because they function partly as segmental and partly as 'suprasegmental' properties. Consequently, as a 'suprasegmental' or prosodic property, the harmonizing feature claims its independence because in the diagram above, [-ATR], by spreading to the entire word, can operate on its own tier.

However, the treatment of vowel harmony as partly a segmental and partly a suprasegmental property is contradictory when viewed from the implication and perspective of 'autosegmental phonology' because the thesis of this framework is that 'autosegments' are elements that are phonemic and consequently have 'evaded' segmental classification. Accordingly, elements like [ATR] which require their own tier should not be viewed as phonetic properties of any specific segment since they are autonomous phonological phenomena. My contention is that by placing an element on the autosegmental tier, we are asserting that such an element is lexically contrastive and therefore has a life of its own.

Consequently, it ceases to be part of the segmental structure.

It is in the light of this theoretical framework that this study will discuss vowel harmony in the Rogoro dialect of Ekegusii.

1.9 METHODOLOGY

This study adopted both native speaker intuition and the use of informants as sources of data.

A written and an oral interview (see appendix II) was administered to the informants in order to elicit the linguistic items which constituted the data.

1.9.1 Selection of Sample

The researcher used ten competent and literate native speakers of the Rogoro dialect of Ekegusii and five competent but non-literate ones as informants. The non-literate ones were interviewed orally.

1.9.2 Data Collection

A written and oral interview, were used to elicit data from the informants. The literate informants were given examples of nouns and verbs and they were then instructed to write out as many such words as possible. Thereafter, they read the words aloud to the researcher who transcribed them as they were being pronounced. Similarly, the words elicited from the oral interview were also transcribed as pronunciation was

being made.

1.9.3 Data Analysis and Discussion

The cardinal vowel system is a reference point for describing the vowel features of the languages of the world. On the basis of this system, features such as height, backness and frontness in any language can be analysed. Therefore, using the system and other literature pertaining to vowel features, the phonetic features of the vowel sounds of the transcribed words were identified and analysed so as to determine whether they give rise to vowel harmony. Features concerning the shape of the lips were, however, observed and recorded by the researcher as the pronunciation was being made.

The features so analysed were discussed in accordance with the principles of the autosegmental phonology framework in order to establish whether any one or more of them are autosegments.

10.0 Definition of Key terms

- (i) Feature: a phonetic element which is co-articulated with a structure to produce an acceptable speech sound.
- (ii) Harmonizing feature: a feature that occurs in all the vowels of a word or clause.
- (iii) Autosegment: a feature that executes phonemic

function.

- (iv) Autosegmental phonology: a recent phonological theory which recognizes the fact that some phonological properties or elements are, in principle independent, and therefore ought to be viewed and represented on their own levels.
- (v) Vowel harmony: the occurrence of one or more shared phonological properties among vowels within a word or clause.

CHAPTER TWO

2.0

LITERATURE REVIEW

2.1 INTRODUCTION

Speech is a continuum of successive sounds known as segments. As such, certain phonological processes are bound to take place during the activity of speaking because of the influence the segments might exert on each other. Lass (1984) considers that one such process is the phenomenon referred to as assimilation which encompasses vowel harmony, the focus of this study.

Lass (ibid.) defines assimilation as a phonological process in which a segment becomes more like another. For example, in the anticipation to articulate the voiced velar oral stop [g] in the noun phrase 'one gate' [wʌn geit] the alveolar nasal stop, [n], becomes more like the velar stop [g] and what we perceive is [wʌŋ geit]. In this case, it is assimilation to the place of articulation of the velar stop [g] that conditions the alveolar nasal [n] to approximate to the point of articulation of [g] so as to become [ŋ] which is a velar sound. Either the preceding or the following sound can influence its neighbour and the direction of the influence is important because it helps us to identify the conditioning and the conditioned sounds. If the conditioning influence moves forward as in open [əʊpɪŋ] in which the word-final alveolar nasal [n] becomes a bilabial, [m], because of the delay of the

tongue to move fast to the alveolar ridge and the lips to open after articulating the voiceless bilabial stop /p/, this kind of influence is said to be progressive or perseverative because the bilabiality of /p/ influences the segment after it to adopt a bilabial element.

On the other hand, the influence can move backward, that is in the converse direction, as in the noun phrase 'in case' [iŋkeis] in which the initial voiceless velar stop [k] in [keis] influences the preceding alveolar nasal [n] in [in] to become [ŋ]. This kind of influence is referred to as regressive or anticipatory (Lass 1984; Clark & Yallop 1990). The two cases discussed above show that context is involved in the modification or conditioning of speech segments.

There are two categories of assimilation: (i) contiguous, also known as non-distant and (ii) non-contiguous or distant (Gleason 1961; Lass 1984). The two examples, namely [əʊpɪŋ] and [iŋkeis] above are cases of contiguous assimilation. Contiguous assimilation takes place when the conditioning and the conditioned segments occur next to each other in the speech continuum. For example, since the alveolar nasal [n] and the velar stop [k] occur next to each other in the word 'incomplete' [iŋkəmpleɪt], the alveolar nasal [n] is conditioned to become a velar nasal [ŋ], because of the influence of [k].

Conversely, in non-contiguous assimilation, the conditioning influence moves across one or a sequence of

intervening segments. This means that for the influence to take place, the conditioning segment and the conditioned one need not be next to each other in an utterance. An instructive example of non-contiguous assimilation is metaphony, otherwise known as non-contact vowel assimilation or vowel harmony which is the focus of this study. There are two types of non-contact vowel assimilation: umlaut (regressive) and vowel harmony (progressive). In the data analysis and discussion, this study will adopt vowel harmony for both types after some linguists like Hall, et al. (1974), Katamba (1989) and Durand (1990) because whether the influence travels backward or forward, we nonetheless recognize vowel consonance. The basic claim here is that the term vowel harmony is appropriate for the influence that travels in both rather than one direction (see Chapter 4).

Vowel harmony is a systematic phonological reflex which causes vocalic sounds, usually within a word, to share one or more phonological properties. This means that the property or properties spread to the entire word (Fischer-Jørgensen 1975, Atkinson et al. 1982, Katamba (1989)). To illustrate, in the Asante dialect of Akan, all the vowels of a word are produced with either an advanced tongue root or a retracted tongue root. In this dialect, the harmonizing feature is therefore + or - [ATR]. For example, in the word [ebuo] which means 'nest', all the vowels are pronounced while the root of the tongue is advanced and therefore the harmonizing feature is

[+ATR]. This can be compared to the word [ɛ b ʊɔ] which means 'stone' in the same dialect. All the vowels in this word are produced with a retracted tongue root. Accordingly, for the minimal pair [ebuo] and [ɛ b ʊɔ], the relevant harmonizing feature is [+ATR] because the + or - value of [ATR] spans the entire word, thereby creating vowel harmony. In the two words, the harmonizing feature can be said to be lexically contrastive because it brings about change in meaning. However, one notable difficulty of positing that ATR-harmony obtains in any language is that the decision that a sound is [+ATR] is impressionistic rather than scientifically proven. This is the major weakness of discussing vowel harmony with respect to [ATR]. While, for instance, an [ATR] value may be assigned to [e] and [ɛ] because we can recognize the difference between both auditorily and with regard to their relative heights in the oral cavity, it is inconceivable that we can determine whether or not [i] is + or -[ATR].

Although little is known about vowel harmony in Ekegusii, this study will be guided by the manner in which the same phenomenon has been explicated in some African languages such as Kalenjin (Hall et al. 1974), Kongo (Dell, 1980) Kiswahili (Muthiani, 1976), Kikuyu (Mbugua, 1990) and Lubukusu (Mutonyi, 1986) and the classic cases of European vowel harmony languages such as Turkish (Lyons, 1968) and Hungarian (Lass, 1984) with a view to presenting a more instructive analysis of the process.

Consequently, the literature review for this study consists of two parts: part one which is section 2.2 focuses on the nature of the classic vowel harmony cases in Turkish and Hungarian while part two which is 2.3 is focused on some African languages which are known to exhibit harmony patterns.

2.2. VOWEL HARMONY IN TURKISH AND HUNGARIAN

Classic cases of languages which exhibit vowel harmony in European languages are Turkish, Hungarian and Finnish. In Turkish phonological structure, barring borrowed words and the ones containing non-harmonic suffixes, a word contains either back or front vowels. Consequently, whenever a morpheme is suffixed to a word stem, the vocalic sounds in the morpheme are conditioned to agree with the vocalic sounds in the stem in backness or frontness accordingly so as to effect a harmony of the feature [\pm back]. As an illustration, the morpheme meaning plural can be analysed here. This morpheme assumes two conditioned allomorphic variants, namely {-ler} and {-lar} when suffixed to a stem as in:

	<u>Turkish</u>		<u>Turkish</u>	
	<u>Stem</u>	<u>Gloss</u>	<u>stem + plural</u>	<u>Gloss</u>
(i)	ev	`house'	ev-ler	`houses'
(ii)	adam	`man'	adam-lar	`men'

The hyphens in the third column indicate the end of the stem and the beginning of the morpheme.

These examples are in orthographic form and although Atkinson et al. (1982) have not expressly shown the distinction in terms of frontness and backness, between the two vocalic sounds [e] in {-ler} and [a] in {-lar}, it logically follows from their argument that [e] is a front vowel and [a] a back one. For this reason, 'ev-ler' and 'adam-lar' are front- and back-harmonic examples respectively. The existence of conditioned variants of the same morpheme is the best conclusive proof that very powerful vowel harmony rules are actually applied to the words in language. The choice of either [e] or [a] in the plural allomorph is determined by this condition: use [e] if the stem contains a front vowel as in (ii) but if the stem contains a back one as in example (ii), use [a]. Clark and Yallop have aptly said:

It is the first syllable that is distinctive and the vowels of subsequent syllables are constrained within the rules of the language. As a consequence, the suffixes have different phonemic shapes, depending on the vowels of the roots to which they are attached.

(Clark & Yallop 1990:138)

This means that such non-contiguous assimilation that restricts the selection of vowels within a phonological word is rule-governed. Admittedly then, randomness in the occurrence of vocalic sounds in a word is, according to the Turkish vocalic phonological system, not permissible. As has already been observed, the vowels of the polysyllabic word contain the same value, + or -, for a phonetic feature like

backness and therefore vowel harmony is allowed to span the whole word. The choice of the value of, for instance, 'backness' for a vowel is contingent upon the one of the vowel in the preceding syllable. On the basis of this premise, Turkish vowel harmony can be said to be 'progressive' rather than 'regressive' assimilation because the influence moves from the stem to the suffix, that is, forward.

However, in some cases, vowel harmony can be viewed as a process that results from neither 'progressive' nor 'regressive' assimilation but as a word prosody (Lyons, 1968; Clark & Yallop, 1990). In prosodic phonology, vowel harmony has become acceptable as a feature that extends over longer stretches of speech such as syllables and words (Hyman 1975; Couperkuhlen; 1986 Clark and Yallop *ibid.*). Within the prosodic phonology framework, a harmonizing feature like [Back], as in the Turkish examples that have been discussed above, is regarded as a prosodic feature because it stretches over the stem as well as the suffix. When such a feature is separated as a prosody from the word, what remains are the skeletal forms of sounds that are known as phonematic units that are unpronounceable. To illustrate, the Turkish word 'kolum' which means 'my arm' can be analysed here. If the prosodic features backness and roundness are separated as prosodies from the vocalic segments /o/ and /u/, what remain are not phonemes but phonematic units. When analysed in terms of the feature [High], that is, height, these phonematic units

yield the following units; `A' for /o/ because [o] is not high and `I' for /u/ because [u] is high. An analysis of `kolum' will therefore yield the following schema:

<u>Turkish</u>	<u>Gloss</u>	<u>Prosodies</u>	<u>Phonematic units</u>
Kolum	`arm-my' (My arm)	+Back, + Round	kAlIm

The phonematic units are represented by capital letters just as is done when the harmonizing feature is separated from the vocalic segments in the autosegmental representation of vowel harmony discussed in the theoretical framework earlier in this study. From the schema, it is instructive that in prosodic phonology, two phonological structures emerge: (i) prosodies, which constitute the 'superstructure' of the word and (ii) the phonematic units, which form its 'infrastructure' (Lyons 1968; Robins 1979). Lass (1984) explains that in prosodic phonology, the phonematic units may almost be empty of distinctive specification of features since such specification has been shifted to the prosodies. In this respect, there seems to be little difference between prosodic phonology and autosegmental phonology if we consider that the elements on the superstructure and the infrastructure are in fact elements occurring on separate tiers as in non-linear phonology. The only distinction between the two schools of thought is that autosegmental phonologists believe that for an element to occur on a separate tier, it ought to be phonemic,

that is, an autosegment.

At this stage, three questions arise: (i) what is a prosody? (ii) what precisely is a phoneme? and (iii) what is a phonematic unit? It has been noted that a prosody is a feature that extends over a stretch of an utterance. In the case of vowel harmony, prosodies are features like backness and roundness in the word 'Kolum' since they traverse the entire word. A phoneme, whose notion seems to be blurred by regarding some of its distinctive features as prosodies, may be defined as a minimal contrastive sound unit in the sound system of a language (Crystal 1985:228). In the case of 'Kolum', the phonemes are [o] and [u]. However, without recourse to traditional phonology, the concept of a phoneme in prosodic or autosegmental phonology cannot be clearly defined because the harmonizing features, which in traditional and generative phonology are part and parcel of segmental structure, have their own life. This is because what remains after the removal of the prosody or prosodies from a phoneme is a phonematic unit which, apparently, comprises less phonetic features than those of the corresponding phonemic form and as such ceases to perform the primary contrastive purpose it is intended to carry out. As has been shown in the prosodic analysis of 'Kolum', the phonematic unit 'A' not only comprises less phonetic features than those of its corresponding 'phoneme' /o/ but is also not distinctive unless and until the prosodies are supplied by the phonological

system of the language.

Besides Turkish, another European language that exhibits vowel harmony is Hungarian. Lass (1984) explains the nature of the harmony in this language. An illuminating example is the dissyllabic stem 'bolond' [bɔlɔnd] which means 'crazy'. This word illustrates why vowel harmony can, in some cases, be regarded as being neither progressive nor regressive because the vocalic sounds are not conditioned by those of another morpheme or word. [bɔlɔnd] is a free morpheme in its own right. Therefore, it is not possible to speculate on the direction of the influence nor is it easy to identify the vowel that influences the other. This means that vowel harmony in the word is to be treated purely as a word prosody in which the harmonizing feature is backness. Lass (ibid.) proposes that this feature can be separated from the back-harmonic stem as:

Hungarian

Gloss

B_vv̄_ml_{v̄}m̄nd

Stem

bɔlɔnd

'crazy'

where 'w' and 'm' represent the features 'round' and 'mid' respectively for the unspecified vocalic sound shown as V from which backness 'B' has been removed as a prosody. In this analysis, two observations can be made: (i) the phonematic units are specified for height and roundness only while backness (B) is 'extracted' as a harmonic prosody that spans the two vocalic sound in the word and (ii) the segmental

underliers are not specified. In this kind of analysis, the prosody is believed to be an integral part of the sound [O]. This is why the feature is said to have been 'extracted' from the vowel sounds. This seems to be a tenable view if the prosody is not an autosegment and nowhere does Lass (ibid.) intimate that Hungarian prosodies are autosegments. On the basis of the prosodic treatment of Hungarian vowel harmony, we can grapple with harmony within the stem, for which neither progressive nor regressive assimilation accounts.

In conclusion, what the analysis of vowel harmony in Turkish and Hungarian illustrates is that the harmonizing features are backness (B) and frontness (F) because they extend over the entire polysyllabic phonological word and therefore can be treated as prosodies. Additionally, in Turkish, it has also been shown that vowel harmony rules cause a morpheme to have two phonemic shapes or conditioned allomorphic variants. However, the languages do not indicate whether the harmonizing feature, as a prosody, is an autosegment.

2.3 VOWEL HARMONY IN AFRICAN LANGUAGES

Durand (1990) argues that during the articulatory activity of vocalic sounds, the root of the tongue may assume two postures that are criterial in the characterization and consequent classification of the sounds. The two postures are: (i) Advanced Tongue Root and (ii) Unadvanced Tongue Root. The

recognition of these two postures was the basis for the inclusion of the feature Advanced Tongue Root, [ATR], into the universal inventory of the description and classification of vocalic sounds. Durand (1990) explains that a positive value for [ATR] occurs when the tongue root is drawn or pushed forward, thereby enlarging the pharyngeal cavity and nearly always simultaneously raising the body of the tongue. Any sound produced when the tongue is in this position is said to be [+ATR] because the tongue root is advanced. Conversely, [-ATR] sounds are produced when the tongue root is retracted. In this case, the tongue is in its neutral position. For instance, to illustrate, if we discuss this claim with reference to vowel system invented by Jones (1972), cardinal vowel number 7, [o], or vowels that approximate to it can be said to be produced with an advanced tongue root while cardinal vowel number 6 [ɔ], or vowels that approximate to it are produced with an unadvanced tongue root. Consequently, [o] is said to be [+ATR] while [ɔ] is [-ATR]. Therefore, [+ATR] is a tongue root feature involving the movement of the root of the tongue along the horizontal dimension in the pharyngeal cavity and, as such, the feature differs from the tongue body features such as [high] and [Back]. As a corollary, the choice of either [high] or [ATR] as the contrastive feature between [o] and [ɔ] depends on the point of focus; if the focus is on tongue body, the feature is [high] but if it is on tongue root, the feature is [ATR]. However, the choice of

[±ATR] is not fully convincing because of the unavailability of X-ray photographs of the position of the tongue root during the production of vowels.

In spite of this weakness, for some linguists, the advancement or retraction of the tongue root is of great significance because it has been posited that the feature [±ATR] is the commonest harmonizing one in the African languages in which vowel harmony has been mentioned (Benjamin 1980; Hulst 1992; Mbugua 1990). As has been shown in the theoretical framework of this study, in Igbo, the [ATR] feature is a prosodic element because it spans the entire phonological domain, usually the word, just as do tone, stress, intonation and nasalization. This fact lends credence to the fact that the harmonizing feature is a prosodic feature.

Similarly, in their discussion of Kalenjin vowel harmony, Hall et al. (1974), Martin (1985), Creider and Creider (1989) and Muthwii (1994) agree that on the basis of the value assigned to the feature [ATR], the vocalic sounds of the language can be categorized into two sets namely:

Set A: i u
 e ɔ

which is [+ATR] and

Set B: ɛ ɔ
 a

which is [-ATR]. In Kalenjin, for the + or - value of ART-harmony to obtain, a word selects its vowels from either set

A or B (Martin 1985). The form in which the sounds in both sets are represented is as varied as the linguists themselves are. For example, Martin (ibid.) uses uppercase letters to represent the [-ATR] sounds but this study adopts their phonetic transcription forms after Hall et al. (1974). For instance, we find in the language noun phrases such as:

tyʷb̃ñ -ʷbñ 'that beast'

paañ̃ - aañ 'that walk'

A morpho-phonemic analysis of both words shows that the forms {-ʷbñ} and {-aañ̃} which mean 'that' are the allomorphs that are suffixed to the stems 'tyʷb̃ñ' and 'paañ̃' which mean 'beast' and 'walk' respectively. This is borne out by the fact that in the two words, we identify the two similar forms {-ʷbñ} and {-aañ} suffixed to the two dissimilar ones 'tyʷbñ' and 'paañ'. Then it follows logically that these two dissimilar forms are the ones translated as 'beast' and 'walk' respectively. 'tyʷb̃ñ' contains the long vowel [ɔ:] which is [+ATR] while 'paañ̃' contains the long vowel [a:] which is [-ATR]. A question that provides evidence for the fact that vowel harmony takes place in the language is: if we have one morpheme, that means 'that', then what triggers its allomorphic variants, phonologically realized as {-ʷbñ}, which is [+ATR], and [-aañ], which is [-ATR]? The acceptable explanation for this phenomenon lies in the vowel harmony rule which states that in Kalenjin, a word contains either only

[+ATR] or only [-ATR] vowels. This rule ensures that the harmonizing feature, that is [+ATR] spreads to the entire phonological word so as to effect vowel consonance. For instance, in the two examples provided above, the root `tyɓɓ̃ñ' contains the [+ATR] long vowel [ɓ:]. So, for vowel harmony to take place, the vowel in the suffix {-ɓɓ n} meaning `that' must also take on the [+ATR] feature of the vowel in the root so that the word `tyɓɓ̃ñ-ɓɓn' `that beast' contains [+ATR] vowels only. For this reason, the feature [+ATR] is said to be `suprasegmentalized' (Katamba 1989) in the whole word. Similarly, since paan is [-ATR], it conditions the suffix {-aan} to be [-ATR] so that the entire word, paañ-aan, bears [-ATR] as the harmonizing feature. As a consequence of the root conditioning its suffixes to have the same phonological feature, the Kalenjin morpheme meaning `that' is made to have two phonologically conditioned allomorphic variants, namely the [+ATR] {-ɓɓ n} and the [-ATR] {aan}. As has already been observed, such a tongue root feature is not easy to visualize and conceptualize because it lacks the aid of x-ray photographs that capture the precise positions of the tongue in relation to the pharyngeal wall.

The nature of vowel harmony in this language is a function of three types of morphemes that are relevant to this study, namely dominant, recessive and opaque (Hall et al. 1974). Muthwii (1994) prefers the term `adaptive' to `recessive' in her analysis of the same morphemes because it

correctly suggests that the morpheme adapts to the feature in the dominant one. A dominant morpheme is that one which is specified as being [+ATR]. For example, the Kalenjin word `tyaañ' `beast' is always specified as being [+ATR]. As such, it conditions any other morpheme attached to it to become [+ATR], thereby effecting vowel harmony in the phonological word. This is why the neighbouring suffix {-ɔɔn} becomes [+ATR] in the word `tyɔɔñ -ɔɔ n', `that beast'. So, the dominant morpheme `tyɔɔñ' spreads the feature [+ATR] to the suffix [ɔɔn] so that it becomes the harmonizing feature in the entire word. An `adaptive' morpheme is that one which varies its + or - value of [ATR] in accordance with the specification of a neighbouring morpheme, usually the root. The suffix meaning `that' in Kalenjin has been shown to be either + or - [ATR]. This variation of the [ATR] value is determined by that of the feature in the neighbouring root. For this reason, since `paañ' `walk' is specified as [-ATR], the suffix {-aan} also becomes [-ATR] in the phonological word `paañaan.' What this shows is that the adaptive morpheme {-aan} varies the [+ATR]/[-ATR] feature according to the dominant neighbouring morpheme so as to be in harmony with it. This ensures that the entire word contains the harmonizing feature, in the Kalenjin case, + or - [ATR].

Finally, an opaque morpheme is always specified [-ATR]. This morpheme does not change in this feature even when it is contiguous with a dominant one and, therefore, it blocks the

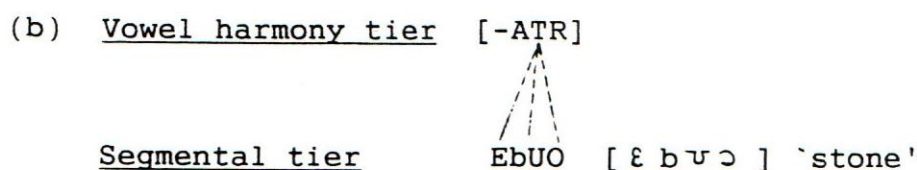
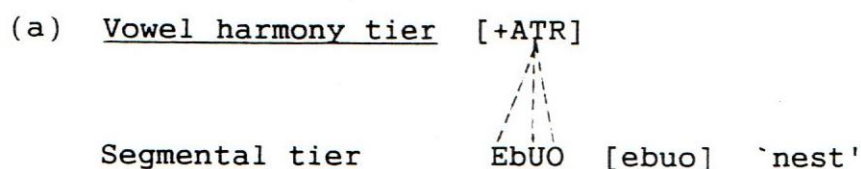
rule of vowel harmony from applying in the phonological word. While linguists like Hall et al. (1974) talk about opaque morphemes Katamba (1989) considers it more appropriate to talk of opaque segments, that is to say, vowels which prevent the harmony rule from applying. However, there is no contradiction between the terms if it is borne in mind that vowels occur in morphemes. But Katamba's (ibid.) term is more suitable for discussing vowel harmony within word stems.

Although it has become apparent that vowel harmony is regarded as a prosodic feature (Katamba 1989; Clark and Yallop 1990; Durand 1990), few linguists have explicitly shown that the harmonizing feature is an autosegment. However, some studies have intimated this. In the theoretical framework, it was shown that in Igbo, a West African language [+ATR] is the harmonizing feature. In the language, as in Kalenjin, [+ATR] is important in the discussion of vowel harmony. Actually, both languages exhibit ATR-harmony. For example, Katamba (ibid.) illustrates that [o] is [+ATR] while [ɔ] is [-ATR]. To illustrate, in the language, [ɔ d ɔ r ɔ] 'he pulled' (this was discussed in detail in the theoretical framework) can be contrasted with [ozoro] 'he did' in respect of the feature [ATR]: the vowels in [ɔ d ɔ r ɔ] are [-ATR] while those in [ozoro] are [+ATR]. Since the feature [ATR] spans the entire word, [ozoro], it is regarded as a prosodic element which can be separated from the vocalic segments and represented as:



Since all the vowels in [ozoro] are [+ATR] and this feature stretches over the entire word, the feature behaves like the archetypical autosegmental phenomena such as tone and stress, which require their own tier. However, for a feature to claim its autonomy from the segmental tier, it should be capable of functioning phonemically; being placed on a separate tier is not the essential criterion for the 'autosegmentality' of a prosody. Katamba, (ibid.) does not show how [+ATR] in Igbo, as a harmonizing feature, functions phonemically. However, two linguists who come close to demonstrating the phonemic function of the harmonizing feature are Durand (1990) and Lodge (in press). In his analysis of the Asante dialect of Akan, Durand (ibid.) identifies [+ATR] as the harmonizing feature. For example, in the word 'ebuo' [ebuo] 'nest', all the vowels are produced with an advanced tongue root and therefore the harmonizing feature is [+ATR]. In the same dialect, [ebuo] contrasts with 'ebuo' [ɛbʊɔ] 'stone', in which the harmonizing feature is [-ATR] because all the vowels in the latter (word) are produced with a retracted tongue root. Accordingly, for both words, the relevant contrastive feature is [+ATR] because the + or - value of [ATR] spans the entire words, thereby creating an ATR-based contrast. Since it is the shift from the + to the -

value of [ATR] that brings about change in meaning, it seems convincing to maintain that it is [+ATR] that is lexically contrastive in the pair `ebuo:ɛ bʊɔ' and therefore functions as an autosegment. In the autosegmental representation, the two words can be illustrated as:



These examples illustrate that the harmonizing feature requires its own level of phonological activity, the vowel harmony tier, because (i) the positive or negative value of [ATR] spreads to the entire word and in this way gives rise to vowel harmony and (ii) the change of the [ATR] value is phonemic. These two are the central principles that determine the autosegmentality of the harmonizing feature. The contrast in (a) and (b) above also raise the question of the grounds on which it can be asserted that the high back vowel in (a) is [+ATR] while its counterpart in (b) is [-ATR]. This question is significant because as for the mid vowels [e,o] as opposed to [ɛ,ɔ], there is a perceptible auditory difference which is lacking in [u] and [ʊ].

Similarly, Lodge, (forthcoming), also makes observations that are pivotal to this study. Although he discusses Kalenjin which is said to exhibit ATR-harmony, he instead identifies tense/lax as the harmonizing feature. He maintains that this feature is 'lexically contrastive' Lodge (ibid:3) and provides two minimal pairs in which the tense/lax distinction is contrastive. These are:

(a) [ɨet] 'to remain'

[ɨɛt] 'to tire'

(b) [sɔ̃ mis] 'awful' (plural)

[samɪs] 'awful' (singular)

In these pairs, the first items contain tense vowels while those in the second are lax. Accordingly, the items are tense- and lax- harmonic respectively and since the distinction in the pairs is that of tense/lax, it is worthwhile to argue that this feature is an autosegment in Kalenjin because it brings about change in meaning. It is apt to observe here that although we are dealing with vowel harmony, the process causes variation in consonant production as well. For this reason, Lodge (ibid.) and Muthwii (1994) seem to agree that in dealing with such minimal pairs as (a) and (b) above, we are in essence dealing with syllable rather than simply vowel harmony. As Clark and Yallop have held:

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Vowel harmony is of course not just a matter of vowel articulation, but of pervasive tongue or lip settings that must affect intervening consonants as well, even if less audibly.

(Clark and Yallop 1990:338).

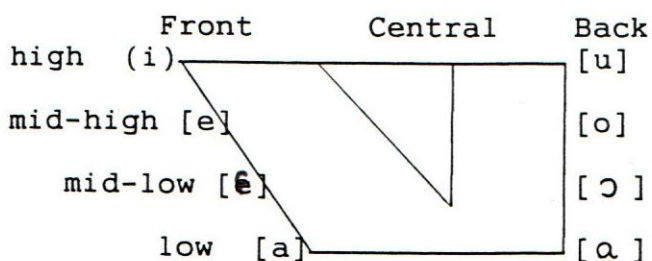
What these linguists are suggesting is that vowel harmony like other prosodic features is a syllable or word feature because it spreads to consonants. Therefore, in a pair like (a) above, it's logical to maintain that the tense-lax contrast stretches over the entire word; it does not affect vowels only. In this way, vowel harmony claims its rightful place among the prosodies because it affects not only vocalic but also consonantal sounds in an utterance.

The distinction between [+ATR] and [-ATR] sounds has been shown to be important in the discussion of vowel harmony in three languages, namely Akan (Asante dialect) Igbo, and Kalenjin. On the basis of this distinction, it has also been indicated that, for example, the high mid back vowel [o] is [+ATR] while [ɔ] is [-ATR]. The [o] - [ɔ] distinction is contentious and raises a number of issues. One of these is: in positing a +/- [ATR] distinction, are the proponents of this feature describing and hence proposing something different from the tense/lax one. This question is relevant because it is commonly held that [o] and the high mid front vowel [e] are tense, while [ɔ] and the low mid one [ɛ] are lax (Hall et al. 1974). Consequently, the articulatory label for the tense /lax distinction is [+tense]; the negative value represents the laxness. This is the position held by Chomsky and Halle (1968)

and many linguists but Durand (1990), Katamba (1989) and many others postulate that the relevant distinguishing parameter for the aforesaid sets of sounds is the movement of the root of the tongue, that is, the position of the tongue during the articulatory process as happens during the production of + or - [ATR] sounds. Consequently, for these linguists, [e,o] and [ɛ,ɔ] are + and - [ATR] respectively. Lindau (1978) also contends that since in the production of [+ATR] sounds, there is a simultaneous pharyngeal prolonged cavity widening, the relevant physiological parameter is the 'expansion' of the pharyngeal cavity size and therefore the feature is [+expanded], rather than [tense] or [ATR]. Although in traditional phonology, tenseness seems to be equated with +[ATR] and laxness with [-ATR], Clark and Yallop (1990) have stated that the articulatory label 'tenseness' and the consequent classification of sounds as either 'tense' or 'lax' is controversial and unreliable because the feature [+tense] is not easy to figure out. So, they instead recommend the term Widened Pharynx or Advanced Tongue Root [ATR] as the more appropriate label.

Since it seems that it is the label of the feature but not the sounds that is the bone of contention among these linguists, it seems logical to argue, as Halle and Clements (1983) have done, that the features [ATR] and [tense] are alternative ways of describing the apparent distinction between set [e,o] and set [ɛ,ɔ].

One other pertinent issue that arises is the fact that [o] and [e] contrast with [ɔ] and [ɛ] with respect to the notion of tongue height in the oral cavity. The tongue body can assume several positions in the oral cavity along the vertical dimension. This gives rise to the parameter of 'tongue-height' in the description of the resultant sounds (Catford 1988). Therefore, height is a tongue body feature because it entails the movement of the body of the tongue along the vertical dimension in the mouth. Gimson (1970) recognizes four cardinal degrees of tongue body raising along this dimension. These are: high, mid-high, mid-low and low. The point at which [i] and [u] are produced is the highest position to which the tongue can be raised in the production of vocalic sounds. Since this is the position closest to the palate, [i] and [u] are known as high vowels. In contrast to these are the front vowel [a] and the back one [ɑ] which are produced when the tongue occupies the lowest position in the oral cavity. For this reason, [a, ɑ] are known as low vowels. Between the [i-u] and [a, ɑ] levels occur two pairs namely, [e-o] which is mid-high and [ɛ-ɔ] which is mid-low. The four heights and the associated vowels can be diagrammed as:



(Adapted from Cartford 1988:136)

What these four positions mean is that if [o] and [ɔ] in the Igbo words ozoro [ozoro] and odoro [ɔdɔ rɔ] are distinguished on the grounds that [o] is [+ATR] and [ɔ] [-ATR], we can also contend that there is height-harmony in the sounds and that whenever the back of tongue moves, it affects the position of the body of the tongue in the oral cavity. Therefore, [ozoro] exhibits harmony in which all the vowels are mid-high while those in [ɔdɔ rɔ] are mid-low harmonic. Then, admittedly, height is another harmonizing feature in these Igbo examples. For this reason, it is tenable to argue that the examples illustrate that it is possible to have more than one harmonizing feature in the vowel harmony of a particular language. This reasoning is further borne out by the fact that the feature [+round] also spreads throughout the entire phonological words, [ozoro] and [ɔdɔ rɔ] above. However, no linguist has provided an account on how to decide which of these multiple features qualifies as an autosegment when the question of autosegmentality arises with respect to minimal pairs. Chapter 4 addresses itself to this question at length.

The idea that vowel harmony in African languages may not be discussed in the light of [ATR] only can be supported by three studies that are based on Bantu languages. Although there was no sufficient data for drawing the conclusions, they are relevant to the thesis of this study. The studies are Muthiani (1976), Dell (1980) and Mutonyi (1986). Since none of

these studies was based on autosegmental phonology, they do not attempt to discuss whether or not the harmonizing feature is an autosegment. Muthiani (1976) and Dell (1980) in their explanation of vowel harmony in Swahili and Kongo respectively allude to height as the harmonizing feature. For his conclusion, Muthiani (ibid.) relies on the formation of the applicative extension of the Swahili verb. An applicative or applied construction is one in which a preposition is incorporated into the verb so as to make a goal, a benefactive or an instrument a direct object (Spencer, 1991). Muthiani (ibid.) contends that the vowel of the applicative marker may be either [i], which is a high vowel, or /e/ [ɛ] (my transcription), which is a mid vowel, depending on the height of the vowel in the verb stem. For example, the verbs 'vuna' and 'funga' in applied constructions become 'vunia' and 'fungia' respectively. In these examples, the applicative marker, [i], is inserted before the word-final [a], but in 'ongeza' the applicative marker is [ɛ] since the word becomes 'ongezea' [ɔŋgɛzɛa].

These examples show that like the Turkish plural morpheme discussed in section 2.3., the Swahili applicative marker has two phonologically conditioned variants, namely [i] and [ɛ]. These are conditioned by the fact that the vowel [u] in the first syllables in 'vuna' and 'funga' is high while in 'ongeza' the two vowels [ɔ] and [ɛ] in the first two syllables are mid vowels.

Consequently, the applicative marker appears as [i], a high vowel, so as to agree with [u] in `vuna' and `funga', which is [+high], while in `ongeza' [ɔŋgɛzà], it becomes [ɛ] so as to agree with the mid vowels [ɔ] and [ɛ]. This phenomenon illustrates that in Swahili, vowel harmony rules are so powerful that they cause a morpheme to have two phonemic shapes. This phenomenon shall be of persuasive authority to our study in discussing the effect of applying harmony rules in Ekegusii.

The other study in which height has been alluded to with regard to vowel harmony is Mutonyi (1986). Although Mutonyi's (ibid.) dissertation is specifically about the affixation processes in Lubukusu, he observes that height and backness are harmonizing features in this dialect of Luhya. For example, in /lu+lu+i[̣]çi/ [lulu:ç[̣]i], the first syllable is a preprefix containing a vowel with the features $\begin{bmatrix} +\text{high} \\ +\text{back} \end{bmatrix}$.

These are the same features in the vowel in the second syllable which is the prefix. In this example, the feature [+high] stretches over the entire word [lulu:ç[̣]i]. This gives rise to vowel harmony in which the harmonizing feature is height.

Viewed from Muthiani's (1976) and Mutonyi's (1986) perspective, the relevant harmonizing feature in Swahili and Lubukusu is tongue height but the linguists do not discuss whether or not it can be claimed that the harmonizing feature is a prosody. What their positions simply indicate is the fact

that [ATR] may be neither the harmonizing nor the only relevant feature in the discussion of vowel harmony in some African languages.

However, in their explanation of Gikuyu vowel harmony, both Sloat (1978) and Mbugua (1990) agree that the vowel system of the language, like those of Kalenjin, Igbo and Akan which exhibit ART-harmony, is divisible into two sets, namely (i)[a,u,i, e, o] and (ii) [ɛ, ɔ]. While Sloat (ibid.) describes set (i) as being tense and the second one as lax, Mbugua (ibid.) considers that they are [+ATR] and [-ATR] respectively. The important fact from these two linguists is their agreement that there is a tendency in Gikuyu for vowels from set (i) to co-occur to the exclusion of those ones from set (ii). The descriptive label for these sets may not be as important as the conclusion as to whether, with sufficient data, one can discern co-occurrence restrictions involving the vowels from both sets. Such a view could be important because Osinde (1988) in his study of the major consonantal processes in Ekegusii remarks that [e,o] and [ɛ,ɔ] are [+ATR] and [-ATR] respectively and that [a,i,u] do not lend themselves to categorization on the basis of the feature [ATR]. He uses five verbs to arrive at this conclusion. Besides the fact that Osinde (ibid.) uses insufficient data to draw his conclusion, it is also difficult, without the use of x-ray photographs, to assert, that the vowel system of Ekegusii can be conveniently discussed in the light of the feature [ATR]. It is for this

reason that this study relied on the knowledge of Jones' (ibid.) cardinal vowel system in discussing this data.

From the scanty literature available, a number of issues remain unresolved about vowel harmony in Ekegusii. For example, it is not known whether: (i) any harmonizing feature in the language is an autosegment (ii) vowel harmony causes allomorphic variants of the same morpheme, (iii) there is vowel harmony in roots that have no affixes (iv) borrowed words exhibit vowel harmony and (v) ATR is the only harmonizing feature in the language.

Similarly, there is no account for the occurrence of one or two or more of the vowels from set [i, u, a] with members of the class [e, o] and [ɛ, ɔ].

2.4 Summary

Vowel harmony is an essential phonological aspect. Much of what is known about it is based on some European languages such as Turkish and Hungarian. In African languages, most studies have been focused on the Nilotic languages in East Africa and the Niger-Congo ones of West Africa such as Igbo and Akan. In these languages, it has been shown that vowel harmony accounts for the existence of allomorphs of certain morphemes. It has also been demonstrated that while it is clear that the harmonizing feature is a prosody, whether or not such a feature is an autosegment is uncertain. This study will employ the approaches used in the languages aforesaid in its attempt to provide a more instructive account of the phenomenon in Ekegusii from the autosegmental phonology perspective.

CHAPTER THREE

3.0. HARMONIZING FEATURES

3.1. Introduction

The featural analyses in this chapter are attempts to throw some light on the harmonizing features in the vowels of some polysyllabic words. A feature may be defined as a noticeable articulatory or auditory property of a segment or an element that is co-articulated with a segment. When such a feature stretches over a certain domain, usually the word, it is said to be harmonizing because all the vowel sounds in the domain share it. In the following sections, such features are considered severally.

3.2. TONGUE HEIGHT

Basically, there are four tongue height positions, namely high, mid-high, mid-low and low. Our task in this section is to determine whether the occurrence of, for example, a mid-high vowel in the word stem requires only mid-high vowels to occur in the morphemes attached to it. Thereafter, such co-occurrence restrictions shall be stated in the form of rules. Our first analyses will be based on data from the noun class. In the data, the hyphen indicates the point at which the word-initial morpheme can be separated from the word stem.

Data set 1

<u>Ekegusii</u>	<u>Gloss</u>
1. omo-gongo [ɔmɔ -ʏɔŋ gɔ]	'a back'
2. omo-kono [ɔmɔ -kɔ nɔ]	'an arm'
3. omo-neke [ɔmɔ -nɛ kɛ]	' a type of plant'
4. omo-tobo [ɔmɔ -tɔβɔ]	' a type of plant'
5. omo-goye [ɔmɔ -ʏɔjɛ]	'the bark of a plant that is used as a rope'
6. omo-nyoncho [ɔmɔ -ŋɔntʃɔ]	'a traditional container used for the storage of cereals'

In these data, the word stems are [-ʏɔŋgɔ], [-kɔnɔ], [-nɛkɛ] [tɔβɔ] and [ŋɔntʃɔ]. They contain either one or both vowels [ɛ] and [ɔ] which are low mid. For vowel harmony to take place, the dissyllabic singular morphemes prefixed to the stems ought to contain low mid vowels also so as to allow the same height to span the entire phonological word. Simply put, the same height stretches over the word stem and the singular morpheme. Therefore, the vowel harmony rule that is applicable to the data is: if the word stem contains low mid vowels, then the morpheme prefixed to it should also contain mid low vowels. The validity of the argument that it is height that is the harmonizing feature in the data is strengthened by the fact that the same height obtains in the whole word irrespective of whether or not the vowels are front or back. What the front vowel [ɛ] and the back one [ɔ] have in common is that both are low mid vowels; in this way, the rule effects

a harmony of the same height.

But what other empirical evidence shows that height as a harmonizing feature is a rule-governed phenomenon rather than a matter of chance? Let us consider the prefixation of another affix, the plural morpheme, to the same stems in data set 1 which appears as Set 2 below. The arrow indicates the change from the singular to the plural forms.

Data set 2

<u>Ekegusii</u> (Singular)	<u>Gloss</u>	<u>Ekegusii</u> (Plural)	<u>Gloss</u>
1. omo-gongo [ɔmɔ-ŋɔŋgɔ]	`a back' ->	eme-gongo [ɛmɛ-ŋɔŋgɔ]	blacks
2. omo-kono [ɔmɔ-kɔnɔ]	`an arm' ->	eme-kono [ɛmɛ-kɔnɔ]	`arms'
3. omo-neke [ɔmɔ-nɛkɛ]	`a type of plant'	-> eme-neke [ɛmɛ-nɛkɛ]	types of plants
4. omo-tobo [ɔmɔ-tɔbɔ]	`a type of plant'->	emetobo [ɛmɛ-tɔbɔ]	types of plants'
5. omogoye [ɔmɔ-ŋɔjɛ]	`the bark of a plant that is used like a rope for tying things'	-> eme-goye [ɛmɛŋɔjɛ]	`the barks of plants that are used like ropes for tying things'
6. omonyoncho [ɔmɔŋɔntʃɔ]	`a traditional container used for the storage of cereals'	-> eme-nyoncho [ɛmɛŋɔntʃɔ]	`traditional containers used for storage of cereals

Apparently, the morpheme that marks singularity is the disyllabic form {omo} [ɔmɔ] which contains the low mid back vowel [ɔ] in both syllables. The occurrence of this vowel in the morpheme is conditioned by the presence of the low mid vowels [ɛ] and [ɔ] in the word stems. This argument is borne out by the fact that the pluralization rule deletes the singular morpheme [ɔmɔ] and replaces it with the disyllabic prefix [ɛmɛ] which also contains the low mid vowel [ɛ] so as to allow low midness to stretch over the prefix and the stem. Therefore, the rule that is applicable to the data in set 2 is: in order to pluralize the nouns, change [ɔmɔ] to [ɛmɛ]. Although this rule changes [ɔ] to [ɛ] in each of the two syllables of the singular morpheme for pluralization to take place, both vowels have one feature in common, namely, low midness. Accordingly, the fact that the vowels in both prefixes [ɔmɔ] and [ɛmɛ] agree with those of the word stems with respect to height is indicative of the view that height, in this case, low midness, is a harmonizing feature.

The foregoing discussion has shown that the singular morpheme in data set 2 above is [ɔmɔ] and the plural one [ɛmɛ] if the vowels in the word stem are low mid ones and that this rule produces a harmony of low midness. These facts indicate that height is a stable feature in the word despite the change from singularity to plurality. But suppose we had word stems containing the high mid vowels [e] and [o], what height will be assigned to the vowels in the prefixes attached

to such stems? This question is pertinent because of two reasons; (i) [e] and [o] as opposed to [ɛ] and [ɔ] occur on distinct heights although all of them are mid vowels and (ii) it has been shown in data set 2 that [ɔmɔ] and [ɛmɛ] which contain low mid vowels are the singular and plural morphemes respectively. These are the reasons that make it necessary for us to consider whether we shall prefix [ɔmɔ] and [ɛmɛ] which obey the a harmony of low midness to the word stems exhibiting high mid consonance. In discussing this phenomenon, we shall study the following data.

Data set 3

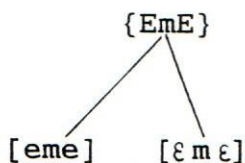
<u>Ekegusii</u> (Singular)	<u>Gloss</u>	<u>Ekegusii</u> (Plural)	<u>Gloss</u>
1. omo-sosobo [omo-sɔsɔβɔ]	`a type of ->eme-soboso[emesɔβɔ]		`types of fruit-bearing plant'
2. omo-gondo [omɔgɔndɔ]	`a farm'->eme-gondo[emegɔndɔ]		`farms'
3. omo-rondo [omɔ-ɾɔndɔ]	`part of the leg'->eme-ondo[emɛɾɔndɔ]		`parts of between the ankle and the knee the ankles and knees'
4. omo-rero [omɔɾɛɾɔ]	`a fire'->eme-rero[emɛɾɛɾɔ]		`fires'
5. omote [omɔ-te]	`a tree'-> emete [eme-te]		`trees'
6. omosocho [omɔ-stʃɔ]	`a type of->eme-socho [emesɔtʃɔ]		`types of plant plants'

Unlike in data set 2 in which the singular morpheme was [ɔmɔ] while the plural one was [ɛmɛ], in data set 3 above, the

singular and plural forms are [ɛmɔ] and [ɛmɛ] respectively. [ɔmɔ] and [ɛmɛ] contain mid high vowels because the word stems to which they are prefixed, namely [-soɔosoɔɔ], [-Yondo], [-fondo], [-fefo], [-te] and [-sotfo] contain high mid vowels only. This ensures that only high midness spans the stem and the morpheme, that is, the entire word. Bearing in mind our analysis in data set 2, the analysis in data set 3 above reveals the fact the singular morpheme has two alternative phonemic shapes. These are [ɔmɔ-] and [ɔmo-]. The choice of the form [ɔmɔ-] rather than [ɔmo] is governed by the following rule: the singular prefix is [ɔmɔ-] when the word stem contains high mid vowels but if the stem contains low mid vowels, the prefix should be [ɔmɔ-]. The existence of the allomorphs [ɔmɔ-] and [ɔmo-] as variants of the singular morpheme strengthens the view that the vowel harmony rule has a great capacity for assigning the harmonizing feature in the word stem to prefixes. The same argument holds for the plural morpheme which also appears in two phonologically conditioned morphemic alternants, namely [ɛmɛ-] and [eme-]. The occurrence of [ɛmɛ-] as the alternant expressing plurality is contingent upon the presence of low mid vowels in the word stem whereas the choice of the variant [eme-] is determined by the existence of high mid vowels in the word stem.

From the foregoing discussion, it is apparent that, for example, the plural morpheme is an abstract notion for which there exist two realizations, namely [ɛmɛ-] and [eme-]. The

abstract form can be represented by using capital letters as 'EmE' in which there is no specification of height because the form normally copies the + or - value of the feature [high] from the word stem. This means that such a form has no phonological reality unless and until the rule of vowel harmony applies to it, thereby assigning it the desired harmonizing feature. Therefore, the plural morpheme can be represented as:



where the capital letters stand for the front mid vowels whose precise heights are unknown and [eme-] and [m -] are its phonological realizations because they have been assigned the specific harmonizing heights by the vowel(s) in the word stems.

The rule that it is the height of the vowels in the stem that controls the height of the one(s) in the prefixes is further exemplified by the type of vowel(s) in the prefixes attached to borrowed words or loanwords. For example, in the following data,

Data set 4

<u>Ekegusii</u>	<u>Gloss</u>
1. e-retio [e-ʃetio]	'a radio'
2. e-tochi [ε-totʃi]	'a torch'
3. e-gori [e-ɣofɪ]	'a goal'

<u>Kiswahili</u>	<u>Ekegusii</u>	<u>Gloss</u>
4. meza [meza]	e-meza [ɛmeza]	'a table'
5. teke [teke]	e-tege [ɛ-teke]	'a kick'
6. choo [tʃo:]	e-choo [e-tʃo:]	'a toilet'

the height of the vowels in the first syllables of the word stems [-fɛtio], [-totʃi], [-ʏofi], [-mɛza] and [-tɔtʃi], which are approximations to those in the first syllables of the English and Kiswahili words, determine the height of the Ekegusii word-initial vowel that expresses singularity. On the basis of the first three words in data set 4, it is logical to posit that the singular morpheme that is prefixed to borrowed words is either [e] or [ɛ]. These two variants are phonologically conditioned by the vowel harmony rules of Ekegusii. Although there is a diphthong in the first syllable of the English word radio [reidiəʋ], once borrowed into Ekegusii, it is reduced to the monophthong [e] which is a high mid vowel. It has to be noted that the reduction of the diphthong to a monophthong is as a result of the tendency in Ekegusii to produce vowels of the same height, in line with harmony rules. The high midness of this vowel, which occurs in the first syllable of the noun, dictates the variant of the singular morpheme that has to be prefixed to the word stem. Consequently, for a harmony of height to take place, the desired prefix becomes [e], a high mid vowel. Similarly, for torch [tɔ tʃ], the variant that is prefixed to it once the word is borrowed into Ekegusii is the low mid vowel [ɛ]

because the vowel [ɔ] in 'torch' is a low mid one. These harmony rules account for the occurrence of the singular morpheme in two realizations.

The same argument obtains in the words borrowed from Kiswahili. Since the sound [ɛ] in the first syllables of the Kiswahili words [mɛza] and [tɛkɛ] is a low mid vowel, it conditions the prefixes attached to both words in Ekegusii to become [ɛ] so as to agree with the height of [ɛ] in the stems, specifically low midness. On the other hand, the prefix becomes [e] in 'choo' [tʃo:] so as to be in harmony with the height of [o], high midness. In a nutshell, the rule for the prefixation of the singular morpheme to borrowed words is: prefix [e] if the vowel in the first syllable contains a high mid vowel but if the syllable contains a low mid one, prefix [ɛ]. This rule illustrates the fact that randomness in the occurrence of vowel sounds in the Ekegusii polysyllabic word does not obtain; consequently, even borrowed words are made to obey the rules of the system.

Having discussed how vowel harmony is exhibited in some examples from the noun class, we now examine the same process in verbs. Verbs present the most convincing evidence for vowel harmony rules because they are affected by more affixation processes than nouns are. Despite the occurrence of many such processes, the vowel harmony rules that are applicable to nouns still obtain. Let us consider the data from the verb class below:

Data set 5

<u>Ekegusii</u>	<u>Gloss</u>
1. o-to-kor-e-re [ɔ-tɔ-kɔɫ-ɛ-ɛɛ]	'You do for us'
2. o-to-gor-e-re [o-to-ɣoɫ-e-ɛɛ]	'You buy for us'
3. o-to-rend-e-re [o-to-ɫend-e-ɛɛ]	'You guard for us'

These data show a harmony of two heights, namely, low midness for datum 1 and high midness for data 2 and 3. Incidentally, vowel harmony can be seen, from set 5 above, as a prosody that spans not only words as in nouns but also clauses as happens in Somali vowel harmony (Hall et al. 1994). What evidence proves that it is the vowel harmony rule that is in operation in the conditioning of the heights that occur in the vowels of the morphemes? Beginning with datum 1, [ɔ-tɔ-kɔɫ-ɛ-ɛɛ], it is apparent that the word stem [kɔɫ-] is the residual form of the verb [kɔɫa] which means 'do'. This stem contains the low mid vowel [ɔ]. Consequently, all the vowels of the morphemes that have to be either prefixed or suffixed to it ought to be in harmony with the feature [high], that is, low midness, in the morpheme [ɔ]. It is for this reason that (i) [ɔ-] the singular subject marker meaning 'you', (ii) [-tɔ-], the plural object marker meaning 'us', (iii) [-ɛ-], the applicative extension marker and (iv) [-ɛɛ] the affix that marks the plural first person, all of which are bound morphemes because Ekegusii is agglutinative, contain vowels, whether front or back, that are in agreement

with regard to height with the [ɔ] in the stem [kɔf-]. This phenomenon shows that the influence of the vowel in the stem travels backwards so as to spread the harmonizing feature to prefixes and also forward so that the same feature can be copied to suffixes.

Evidence that vowel harmony is actually taking place is provided by data 2 and 3 in set 5 where the height of the vowels in the word stems differs from the one in datum 1. For example, unlike the stem [kɔf-] in datum (1) in which we have seen that the vowel contains a low mid vowel, in datum 2, the vowel in the stem [ʏof-] contains a high mid one. What consequence does the presence of the high mid [o] in the stem [o-] have on the morphemes attached to it? This question is relevant because in the data, the four morphemes in datum 2 remain the same as those in datum 1 but they appear in different phonemic shapes. In datum 2, all the morphemes have high mid vowels only, thereby becoming [o-], [-to-], [-e-] and [-fe] in contrast with the low mid ones, namely [ɔ-], [tɔ-], [-ɛ-] and [-fɛ] in datum 1. The explanation for the assignment of different phonemic shapes to the same morpheme lies in the following vowel harmony rule: if the vowel in the stem is a high mid one, then the morphemes attached to it should contain high mid vowels but if the vowel in the stem is low mid, then the morphemes attached to it ought to contain low mid vowels. This rule accounts for the existence of allomorphic variants of the same morphemes in data set 5 and also strengthens the

reasoning that the rule of vowel harmony operates on the polysyllabic words so as to spread the harmonizing feature to the entire words. The rule also dictates the choice of one rather than the other of the two variants of a particular morpheme. For this reason, we can posit that for example, the allomorphs [ɔ] and [o] are the phonologically conditioned variants of the morpheme that means 'you'.

The last piece of evidence from the verb class that this study puts forward in discussing vowel harmony is the nominalization process. Nominalization is the process of forming a noun from some other word class (Crystal 1985). Of particular interest to us is the formation of nouns from verbs. We shall consider the morpheme that is prefixed to verbs so as to change them into nouns. The arrow indicates that the verb on its left changes into the noun on its right once the nominalization morpheme is attached to the verb.

Data set 6

<u>Ekegusii</u>	<u>Gloss</u>		<u>Ekegusii</u>	<u>Gloss</u>
1. gesa [ʏɛsɑ]	`harvest` ->		oko-gesa [ʏɛsɑ]	`harvesting`
2. kora [kɔɫɑ]	`do` ->		ogo-kora [ɔʏɔ-kɔɫɑ]	`doing`
3. rera [ɾɛɾɑ]	`cry` ->		oko-rera [oko-ɾɛɾɑ]	`crying`
4. gora [ʏɔɾɑ]	`buy` ->		oko-gora [oko-ʏɔɾɑ]	`buying`
5. kama [kɑmɑ]	`milk` ->		ogo-kama [oʏo-kɑmɑ]	`milking`
6. manya [mɑɲɑ]	`know` ->		oko-manya [oko-mɑɲɑ]	`knowing`
7. aka [ɑkɑ]	`paint` ->		ogo-aka [oʏo-ɑkɑ]	`painting`
8. buna [βuna]	`break` ->		oko-buna [oko-βuna]	`breaking`

Incidentally, the data reveals three things, (i) all the verbs end with the low vowel [a], (ii) the prefix containing the voiced velar fricative [ɣ] is used when the verb stem contains the voiced velar stop [k] and (iii) the forms {oko-} and {oɣo-} occur with stems that contain any type of vowel except [ɔ] and [ɛ].

It is also apparent from these data that in order to nominalize a verb, the affix [oko-] and its variants [ɔkɔ-], [okɔ-] and [oɣo-] are prefixed to the verb. The linguistic explanation for the appearance of, for example, the form [oko-] as opposed to [ɔkɔ-] lies in the vowel harmony rule posited earlier in this section, namely that the height of the vowel in the first syllable of the verb spreads to the two vowels in the disyllabic prefix. This means that if the first syllable of the verb contains any of the two high mid vowels [e] and [o], then the nominalization prefix becomes [oko-], a form that also uses the high mid vowel [o]. However, if the initial syllable contains either [ɛ] or [ɔ] which are low mid vowels, then the nominalization prefix appears in the form [oɣo-] for vowel harmony to take place. This phenomenon points to the fact that the vowels in the nominal prefix remains unspecified for height until they are attached to verbs. Only then can they be assigned the harmonizing heights, either high midness or low midness. Since the influence of the first vowel in the verb travels backwards, it can be maintained that with regard to data set 6, the vowel harmony process is regressive.

The data also reveals that the nominalization prefix occurs in two forms because it contains two alternants of the intervocalic velar consonants, namely the stop [k] and the fricative [ɣ]. The conditions in which either [k] or [ɣ] can be used are not only outside the scope of the present study but also not clear from the data.

Besides the two heights of the mid vowels, there are two others, namely high and low. Two vowels, [i] and [u], occur on the high level while [a] occurs on the low one. In some words, only high vowels occur as the nouns below show:

Data set 7

<u>Ekegusii</u>	<u>Gloss</u>
1. sugusu [suɣusu]	`north'
2. ritutu [ɾititu]	`a kind of bird'
3. rirubi [ɾiɾuβi]	`a python'
4. ribururu [ɾiβuɾuɾu]	`a grasshopper'
5. ribu [ɾiβu]	`ash'
6. riru [ɾiɾu]	`a knee'

From these data, it may seem logical to argue that any of the two high vowels [i] or [u] or both may be used in all the syllables of the word. Whether one or both occur in a word, it gives the impression that there is a harmony of height where only high vowels occur. Similarly, it may also appear logical to explain that where the low vowel [a] is used in all the syllables of the word as in the verbs in set 8 below:

Data set 8

<u>Ekegusii</u>	<u>Gloss</u>
1. aka [aka]	'paint'
2. ara [aɾa]	'spread for example a bed'
3. ana [ana]	'moo or bleat'
4. gana [ɣana]	'narrate'
5. bana [βana]	'prophecy'
6. kana [kana]	'deny'

the words agree with respect to one feature, that is, the lowness in the vowel [a]. But upon examination of such data as those in set 9:

Data set 9

<u>Ekegusii</u>	<u>Gloss</u>
1. egioto [eɣioto]	'a frog'
2. enyangeni [eɲaneni]	'a cooking pot'
3. ogotera [ɔɔtɛɾa]	'a song'
4. ekemanyererio [ekɛmanɛɾɛɾio]	'a sign'
5. ekebaki [ɛkɛβaki]	'an eagle'
6. rigereria [riɣɛɾɛɾia]	'look (at)'
7. orosao [ofoɾao]	'dysentry'

it is more appropriate to argue that [i], [u] and [a] belong to a class of vowels, technically called opaque segments, that blocks the spread of the same feature, in our case, 'height' to all the vowels in the polysyllabic word. This means that our vowel harmony rules posited earlier ought to be modified by adding these two conditions: (i) complete height harmony

occurs only and only if the word contains the mid vowels [e, o, ε, ɔ] and (ii) whenever one or two or all the vowels namely [i], [u] and [a] occur in combination with one or more from the class [e, o, ε, ɔ] in a word, the height harmony ceases to exist. These are the pieces of evidence that vitiate the argument that there is a harmony of lowness and highness in the Ekegusii polysyllabic words.

In conclusion, in this section, it has been posited and demonstrated that height is a harmonizing feature. The discussion was based on the parameter of vertical tongue-position in the oral cavity. In the next section, we shall discuss whether lip-shape, which is also an important variable in the characterization of vowel sounds, is a harmonizing feature.

3.2 SHAPE OF LIPS

During the process of articulation, the shape of the lips assumes basically two shapes. These are rounded and unrounded. These shapes usually result in change of voice quality because lip shape is associated with vowel height. This explains why although, for example, [o] and [ɔ] are produced with rounded lips, their auditory impression is not the same. Lip rounding involves some elongation of the lips while they are in circular shape, thereby narrowing the lip orifice. On the other hand, unrounded lips do not involve the formation of a circular shape because they are either spread or neutral. Lip

rounding or the absence of it are the bases for the inclusion of the feature [±round] in the description of vowel sounds. The following discussion is intended to establish whether Ekegusii language exhibits the feature [±round] as a word prosody, thereby making it span a sequence of syllables. We shall begin our discussion by focusing on the following data (See also appendix I).

Data set 10

<u>Ekegusii</u>	<u>Gloss</u>
1. obokorogoto [oβokoroŋoto]	`the dirt that collects especially in the human ear'
2. omokobokobo [omokobokobo]	`a type of tree'
3. omong'ong'o [omɔŋɔŋo]	`a dull person'
4. okogoro [okofolo]	`a leg'
5. omwongo [omwɔŋgo]	`a pumpkin'
6. obwororo [oβwɔɔɔɔ]	`kindness'
7. omogooko [ɔmɔŋɔko]	`happiness'
8. omoondoko [ɔmɔ:ndɔko]	`fright'
9. okoboko [ɔkoβɔko]	`a hand'
10. omokono [ɔmɔkɔno]	`an arm'

The longest polysyllabic words are data 1 and 2 which have six syllables. The rest but datum 6, which has five, have four syllables. All the syllables in data 1,2,3,4 and 5 contain the high mid back vowel [o] which is a rounded one while data 7,8,9 and 10 contain the low mid back vowel [ɔ]

which is also rounded. Datum 6 is different in the sense that it contains the high mid back vowel [o] in the first syllable and the low mid back one [ɔ] in the subsequent ones. In spite of the occurrence of [o] and [ɔ] which have a difference in height, it is true to maintain that in some words lip rounding is the harmonizing feature because it stretches over all the vowels, whether high mid or low mid, in the whole set of data. Therefore, the feature [+round] is a prosody.

In contrast with words that contain the feature [+round] are some which give the untenable impression that [-round] is a prosody. The vowels that are [-round] are [i], [e], [ɛ] and [a]. Incidentally, all of these are front vowels as opposed to [u], [o] and [ɔ] which are [+back] and [+round]. Let us consider the following data.

Data set 11

<u>Ekegusii</u>	<u>Gloss</u>
1. ekeng'ese [ekɛŋɛsɛ]	`a piece of, for example, wood'
2. egechembene [ɛɛɛtʃɛmbɛnɛ]	`a child of one's grand-child'
3. eng'ende [ɛŋɛndɛ]	`a bean'
4. enkenge [ɛŋkɛŋgɛ]	`an outgrowth of flesh on the cornea'
5. enkenene [ɛŋkɛnɛnɛ]	`a berry'
6. ekenyene [ɛkɛŋɛnɛ]	`the core of a boil'

- | | |
|-------------------------|--------------------|
| 7. ekegenga [ɛkɛɣɛŋgã] | 'a glowing splint' |
| 8. ririndi [ʃiʃindi] | 'a log of wood' |
| 9. kana [kã nã] | 'deny' |
| 10. gana [ɣã nã] | 'narrate' |

Despite the existence of such words in the dialect, it seems incorrect to postulate that there is a harmony of [-round]. This is even if the vocalic sounds are produced when the lips are either spread or in neutral position, since [a] [i] and [u] may co-occur with any other vowel sound, items 1-6 exhibit ± height rather than -round harmony.

CHAPTER FOUR

4.0 THE AUTOSEGMENTALITY OF THE HARMONIZING FEATURE

4.1 INTRODUCTION

Although Goldsmith's 1990 autosegmental phonology was originally intended to offer an account of the nature of tone in African languages, some linguists have proposed that the theory can be elaborated and extended so as to encapsulate prosodies like stress, intonation, nasality, aspiration, voicing and vowel harmony. The following section addresses itself to the question: to what extent is it tenable to posit that the harmonizing feature is an autosegment?

4.2 IS THE HARMONIZING FEATURE AN AUTOSEGMENT?

In chapter three, it was noted that in some words, it is possible to identify multiple harmonizing features, namely height, lip rounding and backness. In such cases, the task of deciding which of the three features is an autosegment, if any, can give rise to controversy. For example, in the minimal pair:

Pair 1

(i) omoko [omoko] 'a sycamore tree'

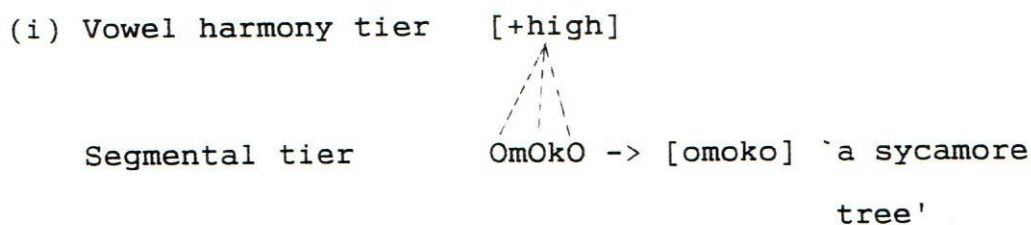
(ii) omoko [ɔmɔkɔ] 'a relation of one's wife'

there is harmony in respect of the three features aforesaid . Admittedly, principled criteria are needed in identifying the feature which is an autosegment. The cardinal criterion is that the feature should be able to carry out either lexical or

grammatical function. If we consider the minimal pair above, it is apparent that there is harmony with respect to three features. These are height, lip rounding and backness. The selection of any one of these prosodies as the autosegment depends on whether the feature is responsible for the contrast in the words. In other words, the feature must be distinctive.

Then considering that lip rounding occurs in both words, this fact militates against the possibility that this feature, [+round], is the distinctive one. It is on the same grounds that [+back] is also not acceptable; it of course, stretches over the entire words and therefore cannot be distinctive. Accordingly, both features, namely [+round] and [+back] are prosodies but not autosegments because neither of them brings about the contrast in meaning in the minimal pair. This reasoning leaves only one feature, [+high], as the distinctive element and, consequently, an autosegment. This means that [+high] is the feature in which the vocalic sounds in the pair contrast. In [omoko], there is a harmony of high midness while in [ɔmɔkɔ] the harmony is in low midness. This shows that [+high] is not only the harmonizing feature but also the element which performs the contrastive function. The basic claim here is that height is the autosegmental element in which the contrastive function lies. The representation of the feature [+high] as an autosegment that is co-articulated with other speech segments has not been attempted by any linguist

because, for most of them, the feature [ATR], which has a binary contrast, that is, + or -, seems to be the commonest harmonizing feature in some of the African languages in which vowel harmony has been alluded to. However, the feature [\pm high] exhibits four degrees, namely high, high mid, low mid and low. Therefore, in order to capture the four-way distinction in the feature matrix, this study proposes that two more notations can be devised, ++ and --, for purposes of prosodic analysis and representation. We shall let [++high] stand for the high vowels [i] and [u], [+high] for the high mid vowels [e] and [o], [-high] for the low mid vowels [ɛ] and [ɔ] and [--high] for the low vowels [a] and [ɑ]. This notations are convenient because they help us to eliminate the redundancy of stating that, for example, [i] is [+high] and also [-low], yet 'highness' and 'lowness', so to say, are degrees of the same feature [\pm high]. Using the proposed notation enables us to isolate each of the specific four heights usually identified as high, high mid, low mid and low. Equipped with these notations, we can now proceed to postulate that the autosegmental representation of the contrastive minimal pair [omoko] and [ɔmɔkɔ] can be diagrammed as:



(ii) Vowel harmony tier [-high]

Segmental tier

OmOkO -> [ɔmɔkɔ] 'an inlaw'

where, as has already been explained in the literature review and theoretical framework, the capital letters on the segmental tier stand for the vocalic segments that are unspecified for their respective heights because height as an autosegment is a prosody that occurs on a separate tier, the vowel harmony one. The specific heights that occur on the harmony tier are supplied by the speaker who selects either [+high] or [-high] depending on the meaning he wants the hearer to identify. As Goldsmith (ibid.) himself would put, a child who is learning the language-specific phonological rules is expected to know "which sets of feature-specifications on separate tiers may be merged together to form an acceptable segment in that language' (1976:164). This means that the child ought to know that in the language he is learning, there are alternative contrastive heights which are to be selected and co-articulated with other segments and that if, for example, [+high] is substituted for [-high] as in minimal pair 1 above, change in meaning will occur. So, the language learner has to identify, prior to speaking, which height is to be co-articulated with other phonological structures while the other is withheld. The argument that is being put forward here is that the variation of tongue height in the oral cavity, with respect to some minimal pairs is distinctive and, as a

corollary, an autosegment.

Perhaps it might be argued that the fact that height is distinctive in Pair 1 above is a matter of chance and therefore it is not the result of a rule-governed phonological phenomenon. Such a view cannot be tenable if we consider the following more minimal pairs:

Pair 2. (a) engoro [eŋɡoɾo] 'a hole'

(b) engoro [ɛŋɡɔɾɔ] 'God'

Pair 3. (a) emondo [emondo] 'a gizzard'

(b) emondo [ɛmɔndɔ] 'an outgrowth of flesh on one's
body'

Pair 4. (a) esese [esese] 'a dog'

(b) esese [ɛsɛsɛ] 'whooping cough'

Pair 5. (a) ekeene [eke:ne] 'the part that remains for example
when an animal's tail has been
cut'

(b) ekeene [ɛkɛ:nɛ] 'truth'

Pair 6. (a) emerongo [emɛɾɔŋɡo] 'hair roots'

(b) emerongo [ɛmɛɾɔŋɡɔ] 'tens'

Pair 2, 3 and 6 contain front and back vocalic sounds. The front sounds [e] and [ɛ] occur in the first syllables and the back ones [o] and [ɔ] in the penultimate and last syllables. The feature that effects harmony for both front and back vowels is height. Specifically, all the vocalic sounds in

pair 2 (a) exhibit high midness harmony because [e] and [o] are high mid sounds. On the other hand, the sounds in 2 (b) have a harmony of low midness. Consequently, in each word in the pair, height as the harmonizing feature stretches over the front and back vowels. Since: (i) [ɛŋgɔlɔ] means 'a hole' and [ɛŋgɔlɔ] refers to 'God' (ii) the consonantal segments are the same in both words and (iii) only height is varied in the vocalic segments to cause change in meaning, it logically follows that it is height that is an autosegment because it executes the function which is a segmental preserve in traditional phonology. It is in this respect, being lexically contrastive, that height qualifies for 'phonemic status'. The argument for the pair 2 discussed above obtains in the pair 3 as well. In pair 4, as in pair 5, there is further evidence for considering height as a harmonizing feature because structurally, the two words are identical except for height. 4 (a) is high mid harmonic while 4 (b) is low mid harmonic. These examples also prove that what is varied for change of meaning to be brought out is height and it has to be borne in mind that whenever a prosody causes change in meaning, it is, in essence, an autosegment. That height should be regarded as such is the thesis in this chapter. As an autosegment, the feature [+high] for example in pair 2 and 4 can be represented as:

2. (a) Vowel harmony tier [+high]
 Segmental tier EngOrO -> [eŋgɔɹɔ] 'a hole'

(b) Vowel harmony tier [+High]
 Segmental tier EngOrO -> [eŋgɔɹɔ] 'God'

4. (a) Vowel harmony tier [+High]
 segmental tier EsEsE -> [esese] 'a dog'

(b) Vowel harmony tier [-High]
 segmental tier EsEsE -> [ɛsɛsɛ] 'whooping
 cough'

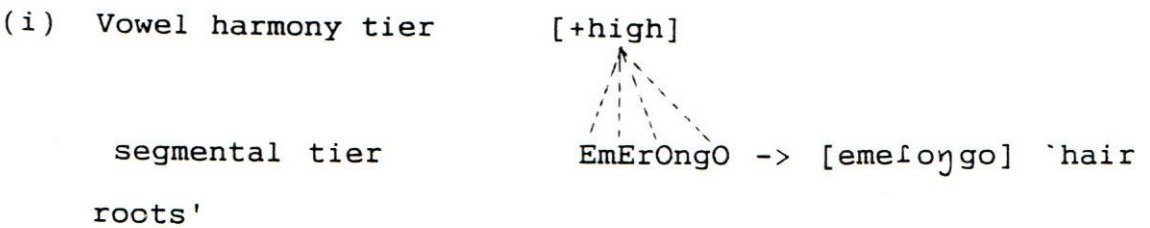
These representations show that change in the harmonizing feature, [\pm High], results in change in meaning. So, given the elements on the segmental tier, the speaker decides which height is to be co-articulated with them so as to form an acceptable segment that communicates the intended meaning. This is why the height on the vowel harmony tier is linked to the phonematic units by association lines.

In this section, it has been posited that the harmonizing feature is an autosegment. Such a view means that the understanding of a 'segment' has to be re-considered because a feature like [+high] that was traditionally thought of as part of a segment is an independent phonological element. The next section is an attempt to account for the issues that

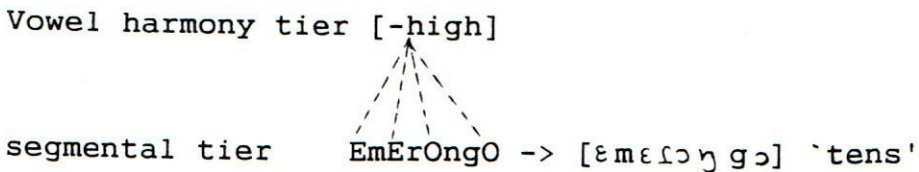
arise as a result of according the harmonizing feature autosegmental status.

4.3 The autosegmental representation of the harmonizing feature.

It has been argued in 4.2 that the harmonizing feature [high] is an autosegmental element in the Ekegusii phonological structure. Such a view appears to be logical because of the fact that given an orthographic form like 'emerongo', it is not easy to state the meaning of the item because the precise height of the vocalic segments is unknown. The height is supplied during the process of articulation. If we choose to articulate the word, we have to decide on whether the segments are to be co-articulated with high midness harmony or a harmony of low midness. A harmony of high midness will produce [emeɔŋgo] which means 'hair roots' while low midness harmony will produce [ɛmɛɔŋgɔ] which means 'tens'. In this case, [emeɔŋgo] ought to be represented as:



so as to be in contrast to:



In this minimal pair, the contrastive function is carried out by the heights of the vocalic segments where the choices are either high midness or low midness. Apparently, it is the shift from high midness to low midness that brings about change in meaning. For this reason, the feature [\pm high] is said to be an autosegment because it executes the function that segments perform in traditional phonemics.

As such, the feature [\pm high], as an autosegment, is not part of any individual vowel. This means that in the two sets of mid vowels, namely (a) [e, o] and (b) [ɛ, ɔ], set (a) is simply a variant of set (b) because high midness or low midness are autosegmental elements, and therefore, not integral parts of any individual segments. Accordingly, we have one mid front vowel that is phonologically realized as either [e] or [ɛ] and another mid back vowel which is also phonologically realized as either [o] or [ɔ] when the height on the vowel harmony tier is specified. Let us present one piece of evidence in illustration of the argument that [o] and [e] could be phonologically conditioned variants of [ɔ] and [ɛ] respectively:

Ekegusii

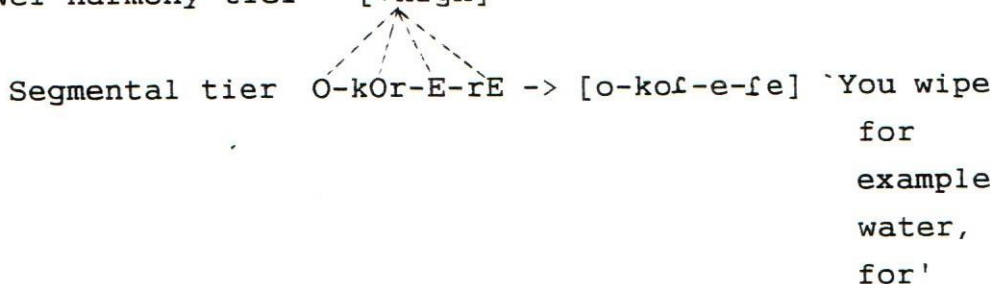
Gloss

(i) o-kor-e-re [o-kɔɾ-e-fe] 'You wipe, for example, water, for'

(ii) o-kor-e-re [ɔ-kɔɾ-ɛ-fɛ] 'You do for'

whose autosegmental representation can be done as:

(i) Vowel harmony tier [+high]



(ii) Vowel harmony tier [-High]

Segmental tier O-kOr-E-rE -> [ɔ-kɔɾ-ɛ -ɾɛ] 'You do
for'

The foci in these examples are the phonemic shapes of (i) the initial singular subject morpheme which has two forms, namely [o] and [ɔ] and (ii) the penultimate applicative extension morpheme which also appears in two forms, namely, [e] and [ɛ]. As has already been noted in section 3.2, it is true to argue that the singular subject morpheme has a form which we can represent by capital 'O' which has no specific height until the height is specified on the vowel harmony tier; this height is either high midness or low midness. This means that whether we have [o] or [ɔ] as the subject marker in an utterance, we shall still be talking about the same morpheme. Similarly, the change from [e] to [ɛ] in the applicative extension does not alter the meaning of the morpheme. Therefore, the two forms [e] and [ɛ] can be said to be in complementary distribution, since both mean the same thing but are restricted in occurrence by the vowel harmony rules of the language. This view strengthens the reasoning that + or - [high] may not be an integral part of, for example, the individual sounds [e] and [ɛ] but a prosody that operates at a different phonological tier. From the foregoing discussion, it may be further postulated that the distinction between, for example, [e] and [ɛ], on the one hand, and [o] and [ɔ] on the other, which is maintained in traditional

phonology, ceases to obtain in the dialect in question. In such a case, the one logical account for the relationship between [e] and [ɛ] is that both may be viewed as phonologically conditioned variants of the same vowel. Otherwise, it is not easy to provide an explanation for the lack of distinction between the two vowels. The same explanation can be posited for the lack of contrast between [o] and [ɔ]. This view means that in Ekegusii, there is a two-way distinction along the parameter of height. These are [++ high] as for [i] and [u] and [-- high] for [a]. Between these heights occur one front vowel that is phonologically realized as either [e] or [ɛ] and one back vowel which is also realized as either [o] or [ɔ]. In both realizations, the specific heights, that is to say, high midness and low midness are co-articulated with the unspecified elements on the segmental tier. In line with the autosegmental phonology framework, we shall represent the forms which have no specific heights in capital letters. This means that 'E' will stand for [e] and [ɛ] while 'O' represents [o] and [ɔ]. The implication of this view point is that the distinction between set (a) [e,o] and (b) [ɛ,ɔ] is that set (a) differs from set (b) only in relative highness and lowness from a zero mid point between [++high] and [--high]. This view is congruous with the reasoning that 'E' and 'O', which we assign the + or - value with respect to the feature [high] are, respectively, the unconditioned applicative and subject markers in the examples [o-kɔɪ-e-fe]

and [ɔ-κɔf-ɛ-fɛ] presented earlier in this section.

In a nutshell, it has been demonstrated in this chapter that the harmonizing feature, [\pm high], is an autosegment in the Rogoro dialect of Ekegusii.

CHAPTER FIVE

5.0. SUMMARY AND CONCLUSION

This chapter is a concise restatement of the gist of the thesis in this study. In it, is presented not only a summary of the discussions in chapters 1,3, and 4 but also the conclusion and recommendations for further research.

5.1. Summary

The aim of this study was to investigate into the nature of vowel harmony in the Rogoro dialect of Ekegusii. To accomplish this task, the study adopted step-by-step procedural objectives, namely (i) establishing whether there are harmonizing features in the dialect, (ii) determining whether the harmonizing features result from the process called vowel harmony and (iii) discussing whether the harmonizing feature is an autosegment.

In chapter 3, it was noted that the features [\pm high], [\pm round] and [\pm back] stretch over a sequence of vocalic segments, usually in words and even clauses. For this reason, these features are known as prosodies. It was also found out that vowel harmony rules are responsible for the appearance of allomorphic variants of some morphemes in Ekegusii. The feature in the vowel of the first syllable of the word stem spreads to the vowels in the prefixes and suffixes for harmony to take place in the entire phonological word. In such a case, the harmonizing feature ceases to function as an integral part

of the individual segment and becomes a prosody. Since the conditioning influence affects both prefixes and suffixes, vowel harmony in Ekegusii could be said to be progressive and regressive.

In chapter 4, the study addressed itself to the question of the extent to which the harmonizing feature can be considered as an autosegmental element in the language under study. The autosegmental phonology framework that this study adopted holds that, as an autosegment, the phonological element ought to carry out either lexical or grammatical function. In this study, there are indicators to the fact that one of the harmonizing features, [\pm high], performs the contrastive function that discrete segments execute. On the basis of the minimal pairs discussed in chapter 4, it appears logical to postulate that the harmonizing feature that functions as an autosegment in the language is [\pm high]. Feature such as [\pm round] and [\pm back] are simply prosodies but not autosegments. Accordingly, [\pm high] requires its own tier that runs parallel to the segmental structure one to show how the elements on both tiers are to be co-articulated so as to produce an acceptable word.

5.2. Conclusion and Recommendations

The occurrences of vocalic sounds in the polysyllabic words of the Rogoro dialect of Ekegusii are rule-governed. The occurrences form predictable patterns with regard to

especially the feature [+high]. Additionally, since the traditional distinctions between, on the one hand, [o] and [ɔ] and, on the other, [e] and [ɛ] are lost in the autosegmental treatment of the harmonizing feature, it is logical to consider that the set [o,ɔ] contains conditioned phonemic shapes of the same rounded mid back vowel. This reasoning affects [e] and [ɛ] which also ought to be viewed as conditioned variants of the same unrounded mid front sound. On the basis of this conclusion, it seems correct to postulate that the Rogoro dialect of Ekegusii may be set to have five short vowels, namely [a], [e], [i], [o] and [u] as opposed to but not the seven that are traditionally maintained, namely [a], [e], [ɛ], [i], [o], [ɔ] and [u] as in Osinde (1988).

This study was confined to the dialect aforesaid. One recommendation for further research is that the same study should be done on the Maate dialect of the language so as to find out whether the conclusions herein could obtain therein. Similarly, it would also be worth studying whether the harmony patterns exhibited in nouns and verbs, which are the major word classes, are manifest in the rest of the word classes in the language. It might also be necessary to look into the feature [+ATR] in order to determine the nature of the harmony patterns in Ekegusii based on the feature. Of particular interest should also be the study of other affixation processes that attest to the fact that harmony rules are in operation in the language. Lastly, it might also be important to carry out not only a more comprehensive study of the entire Ekegusii vowel system but also its phonological processes.

APPENDIX I: WORDS EXHIBITING VOWEL HARMONY

PART ONE: NOUNS

(a) Low midness harmony

	<u>Ekegusii</u>	<u>Gloss</u>
1.	enkenene [ɛŋ kɛnɛnɛ]	'type of berry'
2.	etente [ɛtɛntɛ]	'a swamp'
3.	egechege [ɛʏɛtʃɛʏɛ]	'a small outgrowth of flesh on the skin'
4.	entetere [ɛn tɛtɛɛɛ]	'a seed'
5.	ekenyeke [ɛkɛɲɛke]	'an aphid'
6.	enkeene [ɛnkɛ:nɛ]	'a tape-worm'
7.	ekeene [ɛkɛ:nɛ]	'truth'
8.	esese [ɛsɛsɛ]	'whooping cough'
9.	enyenche [ɛɲɛntʃɛ]	'a bead'
10.	ekerenge [ɛkɛɛŋ gɛ]	'a leg, especially of hen/cock'
11.	ekenylene [ɛkɛɲɛnɛ]	'the core of boil'
12.	ekengere [ɛkɛŋgɛɛɛ]	'a bell'
13.	emeseke [ɛmɛsɛkɛ]	'the remains, usually fermented flour, after liquor has been extracted'
14.	endege [ɛndɛʏɛ]	'an aeroplane'
15.	enche [ɛntʃɛ]	'a sand particle'
16.	etege [ɛtɛ:ʏɛ]	'a kick'
17.	ekengerengere [ɛkɛŋɛɛŋɛɛɛ]	'the condition of bitterness or annoyance that causes inability to talk well'
18.	ekee [ɛkɛ:]	'a type of traditional bowl'
19.	ekebee [ɛkɛβɛ:]	'the left hand'
20.	ekenye [ɛkɛɲɛ]	'a verge'
21.	echeche [ɛtʃɛtʃɛ]	'a joke'
22.	emeterere [ɛmɛtɛɛɛ:lɛ]	'types of plants'
23.	embegete [ɛmbɛʏɛtɛ]	'a traditional musical instrument'
24.	enseeke [ɛnsɛ:kɛ]	'a kind of bee'

25.	enkenge [ɛŋkɛŋgɛ]	'a spot that develops on the cornea'
26.	omokono [ɔmɔkɔnɔ]	'an arm'
27.	omooko [ɔmɔ:kɔ]	'a type of plant'
28.	orogongo [ɔɔɔŋgɔ]	'a region'
30.	obooro [ɔβɔ:lɔ]	'the cooked food of a previous day'
31.	obongo [ɔβɔŋgɔ]	'the brain'
32.	omooro [ɔmɔ:lɔ]	'a matchet'
33.	omoko [ɔmɔkɔ]	'a relation of one's wife'
34.	omotobo [ɔmɔtɔβɔ]	'a type of thorny shrub'
35.	omonyoncho [ɔmɔŋɔntʃɔ]	'a tradition container used for the storage of cereals'
36.	omonyororo [ɔmɔŋɔɔɔɔ]	'a chain'
37.	obongondo [ɔβɔŋgɔndɔ]	'the fat on the nape'
38.	omogooko [ɔmɔŋgɔ:kɔ]	'happiness'
39.	obomo [ɔβɔmɔ]	'unity'
40.	omobono [ɔmɔβɔnɔ]	'a type of shrub'
41.	omoondoko [ɔmɔ:ndɔkɔ]	'fear'
42.	omogongo [ɔmɔŋgɔ]	'a back'
43.	omogo [ɔmɔŋgɔ]	'the rim of a sufuria'
44.	okoboko [ɔkɔβɔkɔ]	'a hand'
45.	omogomo [ɔmɔŋgɔmɔ]	'a strike'
46.	omoyo [ɔmɔjɔ]	'the will to do something'
47.	omootoro [ɔmɔ:tɔɔɔ]	'a bangle'
48.	engoko [ɛŋgɔkɔ]	'a hen'
49.	engo [ɛŋgɔ]	'a leopard'
50.	egetong'o [ɛɛɛtɔŋgɔ]	'a one-eyed person'
51.	egetoongo [ɛɛɛtɔ:ŋgɔ]	'a pot hole'
52.	egetoono [ɛɛɛtɔ:nɔ]	'a small pot'
53.	embeo [ɛmbɛɔ]	'air'
54.	engobo [ɛŋgɔβɔ]	'a skin used as cloth'
55.	emonyo [ɛmɔŋɔ]	'an ant'
56.	enyonyo [ɛŋɔŋɔ]	'a type of weed'
57.	ensemo [ɛnsɛmɔ]	'a side'

58.	engeero [ɛŋgɛ:ɾɔ]	`a song'
59.	egoree [ɛʏɔɾɛ:]	`a billy goat'
60.	egetoero [ɛʏɛtɔɛɾɔ]	`soup prepared from pounded potatoes'
61.	engoro [ɛŋgɔɾɔ]	`God'
62.	ekeronche [ɛkɛɾɔntʃɛ]	`a wicked person'
63.	ekerore [ɛkɛɾɔɾɛ]	`a mirror'
64.	orogendo [ɔɾɔʏɛndɔ]	`distance/a walk'
65.	etoro [ɛtɔɾɔ]	`a moment of sleep'
66.	entobo [ɛntɔβɔ]	`the part containing the seeds of a type of plant'
67.	ensoko [ɛnsɔkɔ]	`a river source'
68.	engote [ɛŋgɔtɛ]	`a bunch of bananas'
69.	omoseso [ɔmɔsɛsɔ]	`the particles that come off a tree when it is sawed'
70.	emerongo [ɛmɛɾɔŋgɔ]	`tens'
71.	enkoro [ɛŋkɔɾɔ]	`a heart'
72.	omokenene [ɔmɔkɛnɛnɛ]	`the plant of a berry'
73.	endorero [ɛndɔɾɛɾɔ]	`the pupil of an eye'
74.	egekongo [ɛʏɛkɔŋgɔ]	`the remaining part of a tree which a branch has been cut'
75.	omoseto [ɔmɔsɛtɔ]	`marrow'
76.	endobo [ɛndɔβɔ]	`a rude response'
77.	obonene [ɔβɔ nɛnɛ]	`greatness'
78.	ekegokoro [ɛkɛʏɔkɔɾɔ]	`an elbow'
79.	egekone [ɛʏɛkɔnɛ]	`a miracle'
80.	rero [ɾɛɾɔ]	`today'
81.	omochere [ɔmɔtʃɛɾɛ]	`a container for milk that looks like a gourd'
82.	ekeromo [ɛkɛɾɔmɔ]	`dirt on one's body'
83.	omoge [ɔmɔʏɛ]	`the young one of, for example, a louse'
84.	engombe [ɛŋɔmbɛ]	`a cow'
85.	egesero [ɛʏɛsɛɾɔ]	`the skin of, for example a goat'

86. omogoye [ɔmɔʏɔjɛ]	'a bark of tree that may be used like a rope for tying things'
87. ekero [ɛkɛɛɔ]	'a period of time'
88. embochero [ɛmbɔtʃɛɛɔ]	'the stomach of a hen'
89. ekerero [ɛkɛɛɛɛɔ]	'modernity'
90. omotere [ɔmɔtɛɛɛ]	'a type of plant'
91. egekombe [ɛɣɛkɔmbɛ]	'a cup'
92. obochege [ɔɓɔtʃɛɣɛ]	'provocation'
93. egekondo [ɛɣɛkɔndɔ]	'a monkey'
94. ekerengo [ɛkɛɛɛŋgɔ]	'a measure'
95. eyemo [ɛjɛmɔ]	'one'
96. entomo [ɛntɔmɔ]	'excessive jealousy'
97. ekenoko [ɛkɛnɔkɔ]	'fermented dough that is used for preparing liquor'
98. oboche [ɔɓɔtʃɛ]	'any kind of game, for example chess'
99. ekegonko [ɛkɛɣɔnkɔ]	'a kind of disease'
100. emeko [ɛmɛkɔ]	'jealousy'
101. oboterere [ɔɓɔtɛɛɛɛɛ]	'the state of being slippery'
102. emboto [ɛmbɔtɔ]	'a cheek'
103. embore [ɛmbɔɛ]	'a kind of animal'
104. emekoono [ɛmɛkɔ:ɔɔ]	'whatever (things) that cause disgust'
105. omonyene [ɔmɔɲɛnɛ]	'the owner'
106. omotengecho [ɔmɔtɛŋgɛtʃɔ]	'an earth quake'
107. endoto [ɛndɔtɔ]	'a dream'
108. eboocho [ɛɓɔ:tʃɔ]	'food'
109. omokonge [ɔmɔkɔŋgɛ]	'a kind of shrub'
110. ekengoro [ɛkɛŋgɔɔ]	'a siren'
111. etobe [ɛtɔɓɛ]	'mud'
112. oboke [ɔɓɔkɛ]	'the state of being small or insufficient'
113. erombo [ɛɛɔmbɔ]	'a kind of bird'
114. ekebondo [ɛkɛɓɔndɔ]	'a nodule on a person's body'
115. ekebono [ɛkɛɓɔnɔ]	'the waist'

116. ekoko [ɛkɔkɔ] 'a child's word for a bad thing'
 117. emondo [ɛmɔndo] 'a big outgrowth of flesh on one's body'

(b) High midness harmony

118. omogondo [omɔndo] 'a farm'
 119. okogoro [okɔɔɔ] 'a leg'
 120. omorondo [omɔfondo] 'the part of a leg between the knee and the ankle'
 121. obororo [oβɔɔɔ] 'bitterness'
 122. omosocho [omɔsɔtʃɔ] 'a kind of tree'
 123. omonto [omɔntɔ] 'a person'
 124. omsobosobo [omɔsɔβɔsɔβɔ] 'a kind of fruit-bearing plant'
 125. ototo [otɔtɔ] 'a type of vegetable'
 126. omonyonko [omɔɲɔnko] 'a smell especially of an animal'
 127. omorongɔ [omɔɔɔŋɔ] 'a hair root'
 128. orogoro [oɔɔɔɔ] 'sunrise'
 129. oronɔŋɔ [oɔɔŋɔ] 'the beard of a billy goat'
 130. obokorogoto [oβɔkɔɔɔɔ to] 'the dirt that collects in the human ear'
 131. omokorogoto [omɔkɔɔɔɔ to] 'the log that is used for closing a cattle-shed door'
 132. omoko [omɔkɔ] 'a kind of tree'
 133. oroko [oɔkɔ] 'a dry piece of wood'
 134. omonyɔ [omɔɲɔ] 'salt'
 135. obosongo [oβɔsɔŋɔ] 'poison'
 136. rogoro [ɔɔɔɔɔ] 'north'
 137. omogoko [omɔɔkɔ] 'a person who is not generous'
 138. omong'ong'o [omɔŋɔŋɔ] 'dull person'
 139. omwongo [omwɔŋɔ] 'a pumpkin'
 140. oroso [oɔsɔ] 'a fould stench'
 141. sokoro [sɔkɔɔ] 'one's grandfather'
 142. bosongo [βɔsɔŋɔ] 'west'
 143. oberoso [oβɔɔsɔ] 'a foundation'
 144. omosono [omɔsɔnɔ] 'style of sewing'

145. bongoro [βoŋgoɾo]	`a place far from home'
146. etoto [etoto]	`a wall'
147. egento [eYento]	`a thing'
148. egetonto [eYetonto]	`a plant, usually growing in swamps, that resembles a reed'
149. etongoro [etɔŋgoɾo]	`a ten cent coin'
150. oborere [oβoɾeɾe]	`a bed'
151. ekerengo [ekeɾeŋgo]	`a porcupine'
152. omotwe [omotwe]	`a head'
153. egetooro [eYeto:ɾo]	`one's contribution, for example, towards a particular fund'
154. engoncho [eŋ gontʃ o]	`a parrot'
155. otete [otete]	`a traditional musical instrument'
156. ekeombe [ekeombe]	`a group/association/organization'
157. ebokombe [oβokombe]	`a jembe'
158. ekeono [ekeono]	`a rude animal, said of esp. cows'
159. egetondo [eYetondo]	`a corpse'
160. enyongo [eŋoŋgo]	`a pot'
161. engoto [eŋgotɔ]	`a type of plant'
162. omerero [omɔɾeɾo]	`a fire'
163. eroro [eɾoɾo]	`a desert'
164. entobe [entɔβe]	`a small lump containing uncooked flour in ugali'
165. endemero [endemɛɾo]	`a place for digging/farming'
166. emondo [emondo]	`a gizzard'
167. ekeondoko [ekeondoko]	`fright'
168. endoche [endotʃe]	`a type of bird that lives near rivers'
169. oromeme [oɾomeme]	`a tongue'
170. ekerogo [ekeɾoɾo]	`a seat'
171. ekeore [ekeoɾe]	`a skull'

172. obobe [oβoβe]	`badness or a weakness'
173. enkororo [eŋkoɾoɾo]	`a Gusii warrior'
174. ekemero [ekemeɾo]	`the velum'
175. endobe [endoβe]	`a heap of usually plant litter'
176. engencho [eŋgentʃo]	`a reason/meaning'
177. ekeboko [ekeβoko]	`a cane'
178. ekworo [ekwoɾo]	`a type of animal'
179. enengo [eneŋgo]	`a node'
180. enkonde [eŋkonde]	`a type of pest'
181. embogo [emboŋo]	`a tse tse fly'
182. ensobosobo [ensoβosoβo]	`the fruit of a type of plant called `omosobosobo''
183. eogoto [eoŋoto]	`rubbish'
184. oroche [ofoɾʃe]	`a river'
185. egetoto [eŋetoto]	`a bud'
186. esoko [esoko]	`some herbs given to dogs to make them fierce'
187. emeremo [emeɾemo]	`work'
188. engoge [eŋgoŋe]	`an animal that belongs to the family of apes'
189. egekoroto [eŋekoɾoto]	`a shoe'
190. obooke [oβo:ke]	`honey'
191. ekenyoro [ekenoɾo]	`a clan-based region'
192. obwoge [oβwoŋe]	`sharpness'
193. enchome [entʃome]	`a clever child'
194. omobere [omoβeɾe]	`the body'
195. enogo [enoŋo]	`a stupid person'
196. oboroonge [oβorembɔ]	`sincerity or `fairness'
197. oborembo [oβorembo]	`some kind of wax'
198. omobeno [omoβeno]	`a type of plant'
199. eero [e:ɾo]	`the sitting room'

C. Nouns formed from verbs; the prefix is the nominalization affix; the remainder is the verb

- | | |
|---------------------------------|---|
| 200. ogo-kora [ɔʔɔ -kɔɭa] | `doing' |
| 201. ogo-kiina [oʔo-kiina] | `growing' |
| 202. oko-gera [ɔkɔ-ʔɛɭa] | `measuring, for example, of water in terms of litres' |
| 203. oko-manya [oko-manya] | `knowing' |
| 204. oko-gona [ɔkɔ-ʔona] | `snoring' |
| 205. oko-gooka [ɔkɔʔo:ka] | `being happy' |
| 206. oko-rara [oko-ɭaɭa] | `sleeping' |
| 207. oko-gora [oko-ʔoɭ a] | `buying' |
| 208. oko-rora [ɔkɔ-ɭɔɭa] | `seeing' |
| 209. oko-rigia [oko-ɭiʔia] | `looking for' |
| 210. ogo-toma [oʔo-toma] | `sending' |
| 211. ogo-teema [ɔʔɔ-tɛ-ma] | `trying' |
| 212. ogo-sibia [oʔo-siβia] | `washing' |
| 213. ogo-kama [oʔo-kama] | `milking' |
| 214. ogo-swaga [oʔo-swaʔa] | `pounding, for example, of grains in a mortar' |
| 215. ogo-kira [oʔo-kiɭa] | `keeping quiet' |
| 216. ogo-tiga [oʔo-tiʔa] | `stopping, for example doing something' |
| 217. ogo-koonya [ɔʔɔ -kɔ:na] | `helping' |
| 218. ogo-saba [oʔo-saβa] | `asking for/praying' |
| 219. ogo-kwana [oʔo-kwana] | `speaking' |
| 220. okw-ana [okwana] | `mooing/bleating' |
| 221. oko-mita [oko-mita] | `squeezing, for example, pus out of a wound' |
| 222. ogo-sunyunta [oʔo-sununta] | `beating, for example, of cereals in a sack' |
| 223. ogosiba [oʔo-siβa] | `tying' |
| 224. ogo-soma [ɔʔɔ-soma] | `reading' |
| 225. oko-gita [oko-ʔita] | `fencing' |
| 226. ogorita [oʔo-ita] | `killing/beating' |
| 227. ogo-tora [ɔʔɔ-tɔɭa] | `picking of parts of plants' |

228. ogo-simeka [oYo-simeka]	`planting'
229. ogo-komera [oYo-komε[a]	`putting of seeds in the soil'
230. ogo-tuberera [oYo-tuβe[ε[a]	`covering for example of seeds with soil'
231. ogo-susura [oYo-susu[a]	`pounding'
232. ogo-tenya [oYo-tεna]	`looking for, and gathering, for example, firewood'
233. ogo-tama [oYo-tama]	`running away'
234. ogo-tuga [oYo-tuYa]	`taming/rearing'
235. ogo-somba [oYo-somba]	`taking away from a place, for example, of the same items, several times'
236. ogo-sicha [oYo-sit a]	`flowing'
237. ogo-karanga [o o-kara ga]	`frying'
238. oko-rosa [o k o -fosa]	`becoming tired'
239. ogo-samba [oYo -samba]	`burning'
240. ogo-toba [oYo -toβ a]	`ripening'
241. oko-genda [o k o -Y[enda]	`going'
242. okorenda [oko-[enda]	`guarding'
243. ogo-kobia [oYo-koβ ia]	`copying'
244. oko-ruga [oko-fuYa]	`looking'
245. oko-rema [oko-rema]	`digging'
246. ogo-sooka [oYo-s o :ka]	`getting out'
247. oko-beeka [oko-β e:ka]	`putting'
248. ogo-tenena [oYo-tenena]	`standing'
249. okwoma [okwoma]	`drying'
250. ogo-kana [oYo-kana]	`denying'
251. oko-boria [oko-βo[ia]	`asking'
252. oko-bereka [o k o -ββ[εka]	`carrying, for example, a baby on the back'
253. ogo-kenda [oYo-kenda]	`cooling'
254. oko-ragera [oko-[aYe[εa]	`eating'
255. ogo-sia [oYo-sia]	`grinding'
256. oko-rama [oko-[ama]	`insulting'

Part 2

(a) Applicative extensions; the applicative extension variants [e] and [ɛ] occur between the verb stem and the word-final 'ra'

257. kor-era [koɫ-ɛ-ɫ a]	'do for'
258. gach-e-ra [ɣ atʃ -e -ɫ a]	'keep for'
259. rem-e-ra [rem -ɛ-ɫ a]	'dig for'
260. ror-e-ra [ɫoɫ-e -ɫ a]	'be bitter for'
261. ror-e-ra [ɫɔɫ-ɛ -ɫ a]	'see for'
262. rend-e-ra [ɫend-e-ɫ a]	'guard for'
263. bungera [β unɣ-e-ɫ a]	'close for/in'
264. kur-e-ra [kuɾ-e-ɫ a]	'warn/make known to'
265. teb-e-ra [tɛβ-e-ɫ a]	'say/answer for'
266. riik-e-ra [ɫi:k-e-ɫ a]	'write for'
267. bek-e-ra [βek-e-ɫ a]	'put for'
268. teng-e-ra [tɛŋ g-e-ɫ a]	'dance for'
269. ten-e-nera [tenen-e-ɫ a]	'build for'
270. ak-e-ra [ak-e-ɫ a]	'paint for'
271. sung-e-ra [suŋ g-e-ɫ a]	'hang for'
272. ar-e-ra [aɫ -e-ɫ a]	'spread, for example, the bed for'
273. ment-e-ra [mɛnt-e-ɫ a]	'add for'
274. gor-e-ra [ɣoɫ -e-ɫ a]	'buy for'
275. chang-e-ra [tʃaŋ g-e-ɫ a]	'contribute for'
276. sab-e-ra [saβ-e-ɫ a]	'pray for'
277. gok-e-ra [ɣok-e-ɫ a]	'be pleased with'
278. ges-e-ra [ɣes-e-ɫ a]	'harvest for'
279. eng-e-ra [eŋ g-e-ɫ a]	'concoct, for example a meal space for'
280. suk-e-ra [suk-e-ɫ a]	'create space for'
281. bang-e-ra [βaŋ g-e-ɫ a]	'arrange for'
282. akan-era [akan-e-ɫ a]	'pay for'
283. samb-e-ra [samb-e-ɫ a]	'roast for'

284. umor-e-ra [umoɫ -e-ɫ a]	'pour, for example, water on'
285. karang-e-ra [karang-e-ɫ a]	'fry for'
286. gan-e-ra [ɣan-e-ɫ a]	'narrate to'
287. togonye-ra [toɣɔŋ-e-ɫ a]	'shout at'
288. bug-e-ra [βuɣ-e-ɫ a]	'make noise to'
289. seret-e-ra [sɛɫɛ t-e-ɫ a]	'thatch for'
290. kwan-e-ra [kwan-e-ɫ a]	'say on behalf of'
300. abus-e-ra [aβus-e-ɫ a]	'sweep, for a house for'
301. rem-e-ra [ɫem-e-ɫ a]	'be brave for example, in facing somebody'
302. ter-e-ra [teɫ -e-ɫ a]	'sing for'
303. morek-e-ra [morek-e-ɫ a]	'light, for example, the way for'
304. igor-e-ra [iɣoɫ-e-ɫ a]	'open for'
(b) Other bound affixes that obey harmonizing rules in verbs.	
305. o-to-mo-rent-e-re [o-to-mo-ɫ ɛnt-r-rɛ]	'you bring him for/to us'
306. o-to-mo-tom-e-re [o-to-mo-tom-e-re]	'you send him to us'
307. o-mo-goroke [o-mo-ɣɔɫɫ-e]	'you make him straight'
308. o-mo-gor-e [o-mo-ɣoɫ -e]	'you buy him'
309. o-mo-rog-e [o-mo-ɫ oɣ -e]	'you bewitch him'
310. o-mo-e [o-mo-ɛ]	'you give him'
311. o-to-tom-e-re [o-to-tom-e-ɫ e]	'you send to us'
312. o-to-mo-teg-e-re [o-to-mo-teɣ-e-ɫ e]	'you trap him for us'
313. o-to-mo-nyeny-e-re [o-to-mo-ŋɛŋɛ-e-ɫ e]	'you kill him for us'
314. o-mo-rok-e-re [o-mo-ɣɔ k-e-ɫ e]	'you be pleased with him'

315. o-mo-ter-e-re [ɔ-mɔ -tɛ ɾ -e- ɾɛ] 'you sing for him'
316. o-mo-monyer-e-re [ɔ-mɔ -mɔɲɛɾ-ɛ-ɾɛ] 'you whisper to him'
317. o-mo-bek-e-re [o-mo-β ek-e- ɾ e] 'you put (something) for him'
318. o-to-bek-e-re [o-to-β ek-e- ɾ e] 'you put (something) for us'
319. o-mo-nyoke [ɔ-mɔ -ɲɔk-e] 'you get him'
320. o-monyor-e [o-mo-ɲ oɾ -e] 'you defeat him, for example, in a race'
321. o-n-kor-e-re [ɔ- ɲkoɾ -e- ɾ e] 'you do for me'
322. o-n-koor-e-re [o- ɲko:ɾ -e- ɾ e] 'you finish for me'
323. o-to-teneen-e-re [o-to-tenen-e-re] 'you stand for us'
324. o-mo-ges-e-re [ɔ-mɔɣɛ s-ɛ-ɾɛ] 'you harvest for him'
325. o-gend-e [ɔ -ɣ end-e] 'you go'
326. o-rok-e [o-ɾ ok-e] 'you vomit'
327. o-teeb-e [ɔ -tɛ :β-e] 'you say'
328. o-nye-ret-e [ɔ -ɲɛ -ɾ ɛt-ɛ] 'you bring it'
329. o-mo-meny-e-re [ɔ-mɔ-mɛɲ -ɛ- ɾ ɛ] 'you stay at (his place)'
330. o-mo-keb-e [ɔ-mɔ -kɛβ -e] 'you cut him'
331. o-et-e [o-et-e] 'you pass'
332. o-nye-to-rent-e-re [ɔ -ɲɛ -tɔ -ɾ ɛnt-ɛ-ɾ ɛ] 'you bring it for/to us'
333. o-mo-mogor-e-re [ɔ-mɔ-mɔɣɔɾ -ɛ-ɾ ɛ] 'you jealously stare at'
334. o-nyore [ɔɲɔɾɛ] 'you'

335. omenye [ɔmɛŋɛ]	find/get/meet'
336. otegerere [ɔtɛɣɛɛɛɛɛ]	'you stay'
337. omogookere [ɔmɔɣɔ:kɛɛɛ]	'listen'
	'you be pleased with someone'

APPENDIX II
DATA ELICITATION INSTRUMENT

Below is the written and oral interview which was administered to the informants. Part One was administered to the literate informants and Part Two to the illiterate and semi-literate ones.

Part One: Literate Informants

Write out as many Ekegusii polysyllabic nouns and verbs as possible for the next two days. Here are some examples:

- | | |
|-------------------------------|---------------------------------|
| (i) omosobosobo [omosobosobɔ] | 'a type of fruit-bearing plant' |
| (ii) emonyo [ɛmɔŋɔ] | 'an ant' |
| (iii) risungi [ɾi s uŋgi] | 'a cluster of bees' |
| (iv) egesicha [eɣesitʃa] | 'a flower' |
| (v) ogokora [ɔɣɔkɔɾa] | 'doing' |
| (vi) ogokorera [ɔɣɔkɔɾɛɾa] | 'doing for' |
| (vii) tenena [tenena] | 'stand' |
| (viii) kogora [koɣoɾa] | 'to buy' |
| (ix) gora [ɣoɾa] | 'buy' |

On the third day, I shall request you to read aloud all of them for me as I will be transcribing them.

Part Two: Illiterate and Semi-Literate Informants

This category of informants were visited and during the conversation between them and the researcher, the latter asked them some questions in order to elicit some data from them. The following is a sample of some of the questions that were asked during the conversations:

1. What are the types/names of the crops you grow here?
2. Are there specific seasons when you grow them? Which Ones?
3. I hear occasionally you have poor harvests because pests attack the crops; what are some of these pests?
4. Apart from the crops, what other plants do you or do you not prefer on or near your farm?
5. When you intend to prepare the farm for planting, what kind of activities do you do on it?
6. What about after planting, what do you do to care for the crops?
7. Do you require some specific implements to carry out these activities? Which ones?
8. How do you prepare the harvests before storage?
9. Do you require some specific containers for storage or do you simply put all the harvests in your granary?
10. Good, what about animals? Do you raise any here? Which ones?
11. Are they also attacked by some types of diseases? Which ones?
12. Other than those ones, which other diseases are common in this area? Do some of these attack human beings? Which ones attack them?
13. Are some of the animals raised for food? I believe you do not eat every part of the animal; which ones do you eat and which ones do you not?
14. Apart from the ones that you raise, which other animals do you know or are common in this region?

15. Do you like modern or traditional music? What instruments would you like the music to be accompanied with?
16. What are the household items that you always find indispensable?
17. In case a war breaks, what are the weapons that you find useful?
18. What are the things that you consider as virtues and vices in society?
19. Do you like liquor? How is it prepared?
20. What parts of the body do you find vital for survival? Which ones might be dispensable?
21. What types of foods are common among the Abagusii?
22. What do you normally do during your leisure?

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