A PHONOLOGICAL ANALYSIS OF THE CONSTRAINTS ON THE SYLLABLE STRUCTURES OF OLUNYALA

By

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March 2010
DECLARATION

This thesis is my original work and has not been presented for the award of a degree or a diploma in any other university.

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We confirm that the work reported in this thesis was carried out by the candidate under our supervision. This thesis has been submitted with our approval as university supervisors.

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To the late Kayo for teaching me patience and humility.
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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title Page</td>
</tr>
<tr>
<td>Declaration</td>
</tr>
<tr>
<td>Dedication</td>
</tr>
<tr>
<td>Acknowledgements</td>
</tr>
<tr>
<td>Table of Contents</td>
</tr>
<tr>
<td>List of Figures</td>
</tr>
<tr>
<td>Operational definition of Terms</td>
</tr>
<tr>
<td>Abbreviations and Symbols</td>
</tr>
<tr>
<td>Abstract</td>
</tr>
<tr>
<td><strong>CHAPTER ONE: INTRODUCTION</strong></td>
</tr>
<tr>
<td>1.1 Background to the Study</td>
</tr>
<tr>
<td>1.2 Statement of the Problem</td>
</tr>
<tr>
<td>1.3 Objectives</td>
</tr>
<tr>
<td>1.4 Research Questions</td>
</tr>
<tr>
<td>1.5 Research Assumptions</td>
</tr>
<tr>
<td>1.6 Rationale for the Study</td>
</tr>
<tr>
<td>1.7 Scope and Limitations</td>
</tr>
<tr>
<td>1.8 Summary of the Chapter</td>
</tr>
<tr>
<td><strong>CHAPTER TWO: LITERATURE REVIEW</strong></td>
</tr>
<tr>
<td>2.0 Introduction</td>
</tr>
<tr>
<td>2.1 The Syllable</td>
</tr>
<tr>
<td>2.2 Composition of the Syllable</td>
</tr>
<tr>
<td>2.3 Literature on the Syllable in Related Languages</td>
</tr>
<tr>
<td>2.4 Summary of the Subsection</td>
</tr>
<tr>
<td>2.5 Theoretical Framework</td>
</tr>
<tr>
<td>2.5.1 Introduction</td>
</tr>
<tr>
<td>2.5.2 CV Phonology</td>
</tr>
<tr>
<td>2.5.3 Generative Phonology</td>
</tr>
<tr>
<td>2.5.4 Summary of the Chapter</td>
</tr>
<tr>
<td><strong>CHAPTER THREE: METHODOLOGY</strong></td>
</tr>
<tr>
<td>3.0 Introduction</td>
</tr>
<tr>
<td>3.1 Research Design</td>
</tr>
<tr>
<td>3.2 Sampling Procedure and Sample Size</td>
</tr>
<tr>
<td>3.3 Data Collection</td>
</tr>
<tr>
<td>3.4 Data Analysis and Presentation</td>
</tr>
<tr>
<td>3.5 Summary of the Chapter</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fig. 1</td>
<td>A Syllable Tree</td>
<td>3</td>
</tr>
<tr>
<td>Fig. 2.1</td>
<td>A Syllable Branching Tree</td>
<td>24</td>
</tr>
<tr>
<td>Fig 2.2</td>
<td>Syllable Tree Nodes</td>
<td>24</td>
</tr>
<tr>
<td>Fig 2.3</td>
<td>A Syllable Tree with an Empty Coda</td>
<td>25</td>
</tr>
<tr>
<td>Fig 2.4</td>
<td>Olunyala Syllable Tree with an Empty Coda</td>
<td>25</td>
</tr>
<tr>
<td>Fig 4.1</td>
<td>Olunyala Syllable Tree with a Branching Nucleus</td>
<td>35</td>
</tr>
<tr>
<td>Fig 4.2</td>
<td>Zero Onset Syllable Tree</td>
<td>37</td>
</tr>
<tr>
<td>Fig 4.3</td>
<td>Internally Complex Onset</td>
<td>43</td>
</tr>
<tr>
<td>Fig 4.4</td>
<td>Onset with One Grapheme</td>
<td>46</td>
</tr>
<tr>
<td>Fig 4.5</td>
<td>The Onset with a Labiolizer</td>
<td>53</td>
</tr>
<tr>
<td>Fig 4.6</td>
<td>Onset with a Prenasalised Sound and a Labiolizer</td>
<td>54</td>
</tr>
<tr>
<td>Fig 4.7</td>
<td>A Three-tier Affricate Onset with a Labiolizer</td>
<td>54</td>
</tr>
<tr>
<td>Fig 4.8</td>
<td>Onset with Two Labiolizers</td>
<td>55</td>
</tr>
<tr>
<td>Fig 4.9</td>
<td>Spreading Effect of C to V</td>
<td>55</td>
</tr>
<tr>
<td>Fig 4.10</td>
<td>Spreading Effect of /w/ to the Vowel</td>
<td>56</td>
</tr>
<tr>
<td>Fig 4.11</td>
<td>Onset with Four Graphemes</td>
<td>58</td>
</tr>
<tr>
<td>Fig 4.12</td>
<td>Fusion of Graphemes to One C</td>
<td>59</td>
</tr>
<tr>
<td>Fig 4.13</td>
<td>Nucleus with Two Vowels</td>
<td>60</td>
</tr>
<tr>
<td>Fig 4.14</td>
<td>Geminate Syllabification (Tamil).</td>
<td>62</td>
</tr>
<tr>
<td>Fig 4.15</td>
<td>Geminate Syllabification (Olunyala)</td>
<td>63</td>
</tr>
<tr>
<td>Fig 4.16</td>
<td>Shortening of a Geminate</td>
<td>64</td>
</tr>
<tr>
<td>Fig 4.17</td>
<td>Syllable Tree with a Long Vowel</td>
<td>66</td>
</tr>
<tr>
<td>Fig 4.18</td>
<td>CV Tier Showing Sound Alternation</td>
<td>71</td>
</tr>
<tr>
<td>Fig 4.19</td>
<td>Onset with Two Labiolizers</td>
<td>73</td>
</tr>
</tbody>
</table>
OPERATIONAL DEFINITION OF TERMS

Allophone  a sound that is slightly different from another but both belong to the same phoneme

Basic verb  the root verb, without inflections

Consonant cluster  individual non-vocalic phonemes that combine to form a sequence of sound segment that in turn form the onset or coda of the syllable

Grapheme  individual alphabetical unit that go into a sound segment

Internally complex onset  onset with more than two graphemes that can be phonemes on their own

Labiolizer  the semi-vowel /w/ or /j/ superscripted to another sound and realized as a separate phoneme
ABBREVIATIONS AND SYMBOLS

ADJ  Adjective
(B)  Busia group of Abanyala
C  Consonant sounds
Co  Coda
CSV  Syllable consisting of a consonant, semi vowel and a vowel
CV  Syllable consisting of a consonant and a vowel element
CVV  Syllable consisting of a consonant and two vowel elements
D  Disyllabic
GoK  Government of Kenya
GP  Generative Phonology
(K)  Kakamega group of Abanyala
M  Monosyllabic
N  Nucleus
O  Onset
OT  Optimality Theory
R  Rhyme
SPE  Sound Pattern of English
T  Trisyllabic
Po  Polysyllabic
V  Vowel sounds
V  Syllable consisting of one vowel element
P  Peak
PP  Pre-prefix
Pr  Prefix
PP  Pre- Prefix

Θ  Zero onset Syllable
σ  Syllable node
//  Phonemic transcription
[ ]  Phonetic transcription/ sound
$  Syllable boundary
ABSTRACT

This is a phonological study on the structure of the syllable. The main objective of this study is the analyses of the syllable structures of Olunyala, a dialect of the Luyia language spoken in Western Kenya. The study had the following three objectives: the first one was to investigate the natural categories of the syllable types in terms of initial, medial and final word positions. The second objective was to investigate if there were any sounds in Olunyala that could not combine to form particular syllable types. The third objective was to investigate the sequential constraints in the formation of Olunyala syllable structures. The study used CV Phonology and Generative Phonology in order to achieve the set objectives. Purposive sampling was used to get the data required for the study. Data collection procedures involved sampling only nouns and verbs because these were the word categories that the researcher needed for the investigation of the syllable. Qualitative methods were used to analyze the data. The qualitative design made it possible for the data to be categorized into nouns and verbs for analysis. Although this was not a comparative study on dialectology, the findings will enable objective generalizations of Olunyala to other Bantu dialects and generally other world languages and thus making a contribution to phonological theory. The results of the study can also be useful to scholars of dialectology and standardization of Luyia dialects because the results will provide a point of reference for Olunyala (K). From the analysis of the data, it was found out that Olunyala has only three syllable structures and that not all of them occur in all word positions. It was also found out that Olunyala has 31 consonant
sounds, only 10 of which do not have an internally complex onset. It was also observed that not all the sounds in the language carry equal status. A comparative study on the phonemic inventory of Olunyala and those of other Luyia dialects is recommended to enable an objective comparison of, not only Luyia, but other Bantu languages.
CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

This is a phonological study on the Olunyala syllable. Phonology is a branch of linguistics that deals with the function, behaviour and organization of the sounds found in a language (Lass, 1984; Massamba, 1996). The syllable is the unit in terms of which phonological systems are organized and is the heart of phonological representations (Katamba, 1989). The syllable is the highest level of phonological analysis and the basis for defining the syllable structure of any language. A syllable has a peak of sonority (usually a vowel) and the consonants that cluster around it (http://www.sil.org/linguistics/glossary of linguistic terms, 8/6/09). A syllable consisting of a consonant and a vowel represents the most basic and, historically, the oldest of all types of syllable types (Lass, 1984). A syllable is a combination of one or more units of sound in a language that must consist of a sonorous element and may or may not contain less sonorous elements, which may be consonant or semi vowels flanking it on either or both sides (Gussmann, 2002). The syllable, therefore, is not a sound but an abstract unit of prosodic organization through which a language expresses its phonology (Kenstowicz, 1994).

There are two types of syllables in linguistic literature: the phonetic syllable and the phonological syllable. The phonetic syllable has one burst of initiator power, which is the basic rhythmic unit per syllable. In a word, the phonetic syllables
exhibit an even distribution of prosodic features like tone. The phonetic syllable is, therefore, a performance unit which does not show where syllable boundaries are. According to Lass (1984:247), speech is produced in measured bursts of initiator power or feet. The initiator is the pulmonic egressive machinery by which air from the lungs is pushed out under the control of the respiratory muscles (Massamba 1996:1). For the English language, each initiator pulse corresponds to a stressed syllable and the intervals between stressed syllables are generally equal (Lass 1984: 248). Thus, English is a stress timed language. There are other languages which have one initiator burst per syllable and are, therefore, "syllable timed”. Olunyala, the object of this study, is one such language.

Olunyala, therefore, fits into the category of languages that have the “phonetic syllable” and as such fits into the definition of the phonetic syllable which is a minimal chunk of initiatory activity (Lass, 1984). However, the present study is about the phonological syllable which is not coterminus with the phonetic syllable. The phonological syllable requires a more precise definition in terms of boundaries and internal structure. The phonological syllable is a structural unit formed by combining consonant (C) and vowel (V) elements; combinations of which differ from one language to another. However, CV is the only syllable that is general in all languages and, therefore, universal. According to Hooper (1976), the CV is, therefore, the optimal syllable.

According to phonological theory, the syllable has two constituents; the ONSET, which comes at the beginning and the RHYME, which follows the onset.
Kenstowicz (1994) identifies smaller constituents of the syllable, these are; the onset, the nucleus and the coda. The nucleus is the compulsory element in this phonological organization because every syllable must have it. This fact is exemplified using the word ta (no) in Figure 1.below:

**Figure 1. A syllable tree**

![Syllable Tree](image)

Operating on the basis that the syllable is the highest level of phonological analysis, the present study examined the structure of the syllable in the context of Olunyala.

Olunyala is one of the dialects of the Luyia language spoken in Western Kenya (Appendix I). The Luyia language has a total of eighteen dialects whose speakers are spread throughout Western Kenya and some parts of Eastern Uganda (Osogo, 1966, Itebete, 1974). Speakers of Olunyala are called Abanyala and they occupy Navakholo Division, Bunyala location of Kakamega District. The Abanyala of Kakamega are 65,337 in number (GK Population Census, 1999).
There is another group of Abanyala in Busia, Kenya. In this study, the difference between the two groups is shown by using (B) for the Busia group and (K) for the Kakamega group. Historically, the two groups are related (Osogo, 1966). The Abanyala (K) are neighbours to the Abatsotso, Wanga, Bukusu and Kabras (Appendix I).

In his classification of Bantu languages, Guthrie (1967) classifies Olunyala in group 10 of zone E. According to Angogo (1980:79), the Abanyala belong to the Northern Luyia, together with the Bakhayo, Samia, Marachi and Bukusu. In his history of the Abaluyia, Osogo (1966) gives vital information on the origin of the Abaluyia showing their link to other Bantu groups and thus a pointer to any linguistic generalizations on Bantu languages.

As already stated, the present study is interested in the phonological syllable because it is a structural unit, which shows how sounds combine. Such combinations would be very useful in enabling a realistic description of the structure of the syllable in Olunyala and the sequential constraints on how sounds combine to form syllables because not all possible sound combinations in a language exist due to what Kenstowicz (1994) refers to as accidental gaps. Accidental gaps refers to sound combinations that appear to be well-formed in some languages but which do not exist, for example, in English, a sequence like *tr as in trench exists but not *tl as in *temour and yet tl is well formed. Describing the phonological syllable is what enables one to go beyond the phonetic sequencing, that sometimes leaves some sound elements unrealized, by
uncovering the individual graphemes and as such, the sounds that form the syllables.

In a phonological theory, description of the syllabic structure of any language is very important because the syllable is a natural domain for the statement of many phonotactic constraints (Kenstowicz, 1994:250). Quite a number of phonological processes, for example, stress and nasalization are determined by boundaries of units larger than the segment (Bauer, 1988:47).

Syllables are either open or closed. An open syllable ends in a vowel while a closed one ends in a consonant coda, for example, \[ tl \] in the second syllable of the English word little. Some languages have syllables with complex onsets. A complex onset consists of several consonants as opposed to one, which has only one consonant sound. If a syllable begins with a vowel or another syllabic sonorant then it is said to have no onset or null onset, also called null initial or zero initial (Charette, 1991). Olunyala, like any other Bantu language can be said to have a simple syllabic structure because it neither permits complex onsets nor closed syllables. In Bantu, syllable limits are easily determined, for every syllable is open, that is, it ends in or consists of a vowel. (Herbert1986:73). This study was motivated by the need to codify the dialect because this has so far not been done.
1.2 STATEMENT OF THE PROBLEM

As already stated, the syllable is the highest level of phonological analysis because it is significant in stating phonological generalizations and it is the basis for defining syllable structure in any language. It is, therefore, important that the syllable structure of a language is known if any meaningful generalizations in the linguistics of that language have to be made. The aim of this study, therefore, was to investigate the syllable structure in Olunyala. The syllable regulates the way in which lower level units; that is, consonants and vowels in the phonological hierarchy combine.

Every language has constraints on the syllable structure and only allows certain sound sequences in given positions. Not all combinations of graphemes and sounds, even when they exist in a language, are acceptable, for example, in English, no word begins with the consonant sequence zbf and no word ends in aeh, yet all these sounds exist in the language. Therefore, the segmental content of an onset depends on the licensing potential it inherits from the nucleus and vice versa; hence the segmental composition of a syllable.

Reference to the phoneme cannot be avoided in the investigation of the syllable because the phoneme is useful in showing the sound combinations that are allowed in the formation of syllable structures. The notion of the phoneme is also used in this study to show examples of the sound combination that cannot occur in Olunyala.
Olunyala is not a written language and generalizations on its phonology and other aspects of the language are usually made on the basis of other Luyia dialects. A gap therefore exists and more studies need to be carried out on Olunyala phonology. This study will, therefore, enable objective phonological generalizations to be made on Olunyala without using other Luyia dialects as a yard stick. The Olunyala syllable is one of the critical areas of phonology that need systematic investigation.

It is essential to investigate the natural categories of syllable structures in Olunyala to find out if there are some syllable structures that do not occur in certain word positions. The sequential constraints that prohibit the combination of some sound segments were investigated using specific examples from Olunyala in order to contribute to phonological theory.

1.3 OBJECTIVES

This study was designed with the following objectives:

1. To investigate the sound segments that combine to form syllables in Olunyala.
2. To investigate the prevalent word positions for the syllable types in Olunyala.
3. To establish the sequential constraints in syllable structures in Olunyala.
1.4 RESEARCH QUESTIONS

The following research questions guided the study:

1. What are the sound segments that combine to form syllables in Olunyala?

2. What are the prevalent word positions of the different syllable types of Olunyala?

3. What are the sequential constraints in the formation of syllable structures of Olunyala?

1.5 RESEARCH ASSUMPTIONS

The research was guided by the following assumptions:

1. Some sound segments do not combine to form syllables in Olunyala.

2. Not all syllable types occur in all word positions in Olunyala.

3. There are sequential constraints in the formation of syllable structures in Olunyala.

1.6 RATIONALE FOR THE STUDY

Universal language generalizations are claimed to be valid among various properties of language systems around the world (Catford, 1988). However, languages differ in respect to the number of phonological elements in their inventories and phonological syntags (Lyons 1981:96). In its investigation of the syllable, this study, therefore, operated from the premise that languages differ
in the kind of syllable structure they admit (Cartford 1988: 207). Each language
variety needs to be studied in order to avoid generalizations without validation.
Even when languages have the same phonemes in their phonetic inventories, these
sounds are not combined in the same way to form syllables because individual
sounds tend to pattern with certain other sounds in the overall fabric of any
language (Kenstowicz, 1994: 18). For example, English permits syllable structures
of two or even three consonant clusters at the beginning of or at the end of
syllables (Clements and Keyser, 1983). It is important to note that English has a
maximum of three consonants in the onset and a maximum of four in the coda.
Classical Arabic does not admit initial consonant clusters at all but admits final
clusters of two to three consonants (Clements and Keyser, 1983). However, such
observations have not been made about Olunyala due to lack of empirical
evidence.

This study focuses on the syllable in order to find out if there are any sound
segments that do not combine in the phonotactics of Olunyala because the syllable
is the unit in terms of which phonotactic rules are best stated (Katamba
1993:165). Constraints on the syllable structure serve as a filter because they not
only allow certain sound sequences to occur, but also certain sound sequences to
occur in certain positions (Roach 1983). This study is designed to show that there
are some syllable structures in Olunyala that do not occur in certain word
positions. The researcher investigated the consonant clusters that Olunyala admits
and also if all vowels form syllable peaks in any word position.
The realization that it is important for children to learn mother tongue as it forms a basis for them to learn other languages is well captured in the Government’s policy that the language of the catchment area is supposed to be the language of instruction from primary one to three in the rural areas (Whitely 1974, KIE, 2002). In Bunyala, however, this is not the case because there are no books, written in Olunyala and learners in Bunyala use books written in the Central Luyia dialects (Angogo, 1980). The researcher recognizes the fact that writing in Olunyala could not be effectively done without adequate linguistic study of the dialect.

As already pointed out, Olunyala is generalized with other Luyia dialects and yet they are, sometimes, different in their phonotactic realizations. Languages differ in phonological syntagms and each language has its own rules to determine its phonological well-formedness. The Olunyala syllable structure would, therefore, be useful in setting a base on which Olunyala could be objectively compared with other languages, particularly those of Bantu origin.

Findings from the study would also contribute to the documentation of the Olunyala phonology. This will be useful for pedagogy because proper knowledge of Olunyala can foster cultural and intellectual development in the formative years of Olunyala learners. In the area of applied linguistics, writers of books, magazines and the Bible in the Luyia language would find the results of the
research useful as their writing would be done using standard Luyia. (Etebete, 1974; in Whitely, 1974). The researcher, therefore, took the view by Katamba (1989) that there was need to get accurate information on dialect differentiation that was not based on subjective and impressionistic judgement.

This study operated on the premise that while the findings of past studies on Luyia dialects, for example on tone and syllable types, could be generalized to Olunyala, the role of the syllable in all the phonological aspects of Oluluyia had not been studied as shown in the literature review. In particular, the issue of sequential constraints on syllable formation had not been focused on. The syllable distribution and the role of the syllable in the phonotactic constraints of sound segments had also not been focused on. By finding out the Olunyala sound segments that do not occur together and the word positions in which some sounds do not occur, the findings of this study will make a contribution to the phonological theory.

Scholars of comparative dialectology on the Luyia language would also find the results of this research beneficial. The findings would also be helpful in ensuring that Olunyala as a dialect and the culture therein embodied does not die because a language that is not documented can easily die.
1.7 SCOPE AND LIMITATION OF THE STUDY

This is a phonological study that limited itself to the syllable structures of Olunyala. It is a theoretical study since it seeks to test the phonological notion that sound segments do not just combine haphazardly; that they are regulated by the phonotactics of a given language (Katamba, 1989). This research, therefore, studied and established the natural categories of Olunyala syllable structures, the sequential constraints in their formation and the prevalent word positions in the occurrence of the syllable structures. In particular the present research used three of the syllable structures identified by Savala (2005) shown here below:

V
CV
CVV

The V structure has only one vowel sound while the CV consists of a consonant sound and a vowel sound. The CVV syllable structure consists of a consonant sound and two vowel sounds. Savala (2005) has also identified the “CSV” syllable structure as one consisting of a consonant sound which is followed by a semi-vowel and then a vowel. However, the present study discounted the “CSV” syllable structure as non-existent and consequently discussed the “CSV” as a type of the CV syllable structure. The present study seeks to show that the CV syllable is light because it has no branching rhyme while the CVV is a heavy syllable because it has a branching rhyme.
The use of the syllable structures in the investigation of tone by Savala (2005) is outside the scope of the present study. The present study goes beyond Savala’s by showing the specific graphemes and then phonemes that form the syllable structures identified. The study also focuses on the CVV and V syllable structures to find out the difference between the diphthongs and the long vowel in terms of phoneme composition. This was necessitated by the fact that the two syllable structures have V sequences that follow each other and can easily be confused unless the words are postulated and the syllable boundaries shown as seen in Example 1.

Example 1

loomba (make)           owuulu (a bad smell)
$ l o o m a$             $ o w u u l u$
CVV                      CV V CV

The data used for the investigation of the syllable structure was limited to Olunyala nouns and verbs. The data consisted of native monosyllabic, disyllabic, trisyllabic and poly-syllabic words from the Olunyala dialect.
1.8 Summary of the Chapter

This chapter has given the introduction to the study by providing the background, the statement of the problem, objectives, research questions and assumptions. The chapter also gives the rationale of the study before the scope and limitations. The next chapter reviews literature in related languages on the syllable.
CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

In this chapter, a brief history of the syllable as a vital notion in linguistics is given and the composition of the syllable discussed in terms of graphemes and phones or sound segments. This is then followed by a discussion of the phonological studies in related languages that have a bearing on the present study. The last section of this chapter discusses the eclectic theoretical framework used in the investigation. In this chapter and the rest of the text, the terms sound and phoneme are used interchangeably to refer to the same concept. The term grapheme is used to refer to the alphabetical letters that, in some instances, fuse together to form a phoneme or sound. The fusion of such phonemes is what is referred to in this study as the internally complex onset.

2.1 THE SYLLABLE

The syllable is the most studied notion in linguistics owing to the fact that its role in phonological history has been controversial (Prince and Smolensky, 1993). The syllable was not officially recognized during the Sound Pattern of English (SPE) period and for a long time remained part of the conceptual baggage left from traditional grammar (Kenstowicz 1994:250). This was mainly because it is an
abstract unit. However, Generative Phonology (GP) came to recognize it as an essential concept for understanding phonological structure. The process of identifying syllables involves syllabification. Syllabification as a phonological operation consists of uncovering what constituent individual sound segments are assigned to. The issue of syllabification is not a straightforward operation since certain elements of the syllable structure may remain unexpressed phonetically. Discovery of syllable structure therefore needs to go beyond the phonetic sequencing of segments and delve into the phonological sequences of specific syllable configurations (Gussmann 2002: 107).

2.2 COMPOSITION OF THE SYLLABLE

Since the recognition that the syllable cannot be discarded in the study of linguistics, many studies in phonology and other areas in linguistics are now done with the syllable in mind. The study of the syllable structure using CV theory has been done in many languages. For instance, Dell and Elmedlaoui (1989) as quoted by Prince and Smolensky (1993:11), discovered that in Imdlawn Tashlhiyt, a dialect of Barber in North Africa, any segment, whether vowel or consonant, obstruent or sonorant can form the nucleus of a syllable. Although different languages may have different possibilities in syllable structure, every language agrees in recognizing the central element of a nucleus with margins (Kreidler 2001:1). While there are some languages in which a semi vowel can form a nucleus when it syllabifies, in Olunyala the nucleus of a syllable can only be a vowel. However, in the phonotactics of the Olunyala dialect, for a semi vowel to
be in the nucleus position, it is usually realized as a vowel. A semi vowel can also form an onset in Olunyala as seen in Appendix II.

According to the Basic Syllable Structure, as seen in Optimality Theory (OT), any grammar should be able to contend with any inputs from the sequence CVVCC set (Prince and Smolensky 1993:96).

Every language admits initial CV syllables, and some languages do not allow any other: that every language admits open syllables and that some admit only open syllables (Prince and Smolensky, 1993:93).

In syllable formation, what differs in languages is the positions that the C and V elements take in the various forms of, for example, the verb. For instance, in Arabic the verbal root is composed of consonants while in Olunyala the root is composed of both V$^s$ and C$^s$ and thus putting the root in the middle, for example in 2.1.

**Example 2.1**

| lia (eat)   | lia nga (s/he eats) |
| CVV         | V CV C V             |

In example 2.1, the common verb lia is the root and a prefix or zero onset syllable is attached to show the doer while a suffix marks the tense.
2.3 LITERATURE ON THE SYLLABLE IN RELATED LANGUAGES

Some studies on phonological aspects of Bantu languages have been carried out. Of great interest to this research is the phonology of various Luyia dialects. For example, Ingonga (1991) focuses on the lexical, phonological and morphological aspects of Logooli, Lwitakho and Egekusii. The Logooli and Lwitakho phonemes identified were of benefit to this study because these two dialects have many phonemes in common with Olunyala.

Sumba (1992) compares the major phonological processes affecting the vowel and consonantal processes in Logooli, Bukusu and Wanga dialects. The phonemes he identified were similar to those of Ingonga (1991).

Savala, (2005) and Onyango, (2006) discuss the syllable structure in relation to tone. The present study went further by looking at the sound segments that form the syllable structures in Olunyala.

In his study on Verb Tonology in Olunyala (B), Onyango, (2006) concludes that in Olunyala, the number of syllables in the verb affects its tonal pattern. Onyango (Ibid) also shows how the CV syllable structure in Olunyala is preserved in tone allocation. The issue of the preservation of the CV syllable structure was used to investigate if the preferred syllable structure in Olunyala was CV or V. As pointed
out in section 1.1, both Olunyala (K) and (B) are closely related and so Onyango's findings on tone apply to Olunyala (K).

Savala (2005) deals with tone in Lwitakho words, a study which also brings out the role of the syllable in the tonal patterns of Lwitakho. Her study identifies four syllable types, three of which will form the basis for the investigation of the syllable structure of Olunyala, since Olunyala seems to also have these syllable types.

Savala (2005) shows the relationship between syllable type and tone. She identifies the phonological segments of Lwitakho; both the vowels and consonants. In particular, she identifies twenty four consonants in Lwitakho. The identification of the Lwitakho segments is important to this study because it enables the current research to establish the phonological segments which do not occur in Olunyala. Some of these segments are /nz/, /ts/ and /ʃ/. The lack of some of these phonemes means that they do not exist in the Olunyala syllable.

In looking at the Lwitakho noun class system, Savala (Ibid) observes that Lwitakho, unlike other Luyia dialects has lost the pre-prefixes and so she uses the prefix class system. Pre-prefixes are the vowels that precede the prefixes, as in

Example 2.2

o-mu-lafu (a brown one)

PP-P-ADJ
The researcher in the present study used the pre-prefixes since Olunyala is one of the Luyia dialects which still maintains them. The idea of pre-prefixes was important to the study because it was used to investigate the zero onset or V syllable in Olunyala. Savala (Ibid) concludes that in Lwitakho, the type A, (CV) and type B or (V) syllables are found in different word positions. This study borrowed the types of syllables identified by Savala (2005) to investigate the syllable structures of Olunyala. Savala (2005) has identified the following types of syllables in Lwitakho:

A. V
B. CV
C. CV: (CVV)
D. 'CSV'

In type D, the nucleus is preceded by a consonant which is followed by a semi vowel, for example kwa, nwa or xwa. In the investigation of the syllable structures of Olunyala, focus was on the V and CVV structures to find out the boundaries of the vowel elements in the words in which they occur.

Onyango (1997) is a study of the grammatical errors made by learners from Bunyala (B) when learning Kiswahili. One of the conclusions of his findings is that the mistakes made by the learners in his study are due to phonological as well as grammatical factors. In his identification and discussion of the nominal classes, the vowel prefix before the noun manifests itself as the V syllable structure.
Although Onyango (1997) is not a study of the syllable, the data presented shows that the V syllable structure is vital in the formation of the nominal classes in Olunyala (B). The present study found this observation helpful in the investigation of the prevalent position of the V syllable structure in Olunyala (K) since the two dialects are closely related (Osogo 1966).

Mbura (1990) is a study of the syllable processes in Gikuyu. Mbura (Ibid) discusses the rules governing both consonantal and vowel processes. Relevant to this study is her observation that in Gikuyu, the optimal onset is a single consonant sound and all consonant sounds may occur in this position. One of the objectives of this research is to investigate if all Olunyala consonant and vowel segments form syllables in any word position. This is of particular interest to this study because Olunyala is one of the Luyia dialects that still uses the pre-prefix class which manifests itself as the V syllable structure (Savala, 2005). This study borrowed her methodology on the syllabification process of vowel insertion to investigate the V syllable structure. The current study set to find out if all vowels are used in the V syllable structure.

In his discussion on the discrepancies between the graphemic and phonological structure of Gikuyu, Kuria (2006) points out that there are discrepancies between the phonemic inventory and orthography of many Kenyan languages because the orthography was done by nonnative speakers. He gives an example of Bob representing any of /v/, /f/ or /b/. While the present study was not on the Olunyala
phonemic inventory and orthography, the phoneme combinations of the syllable structures will show that /B/ and /b/, just like in Gikuyu, are pronounced differently in Olunyala and therefore, need different orthographic symbols. There is also need to come up with orthographic symbols for Bantu consonant phonemes that fall in the category of what is referred to in the current study as the internally complex onset. There are also Bantu sounds that are the same but have different orthographic symbols. The elaboration of this point using Olunyala sounds gives more weight to the recommendation by Kuria (2006) that the orthography of many Kenyan languages need to be re-examined and expanded.

In her discussion on syllable weight, Oduor, (2002) cites the heavy syllable as that with the VV structure. Oduor (Ibid) points out that in Dholuo, the VV syllable structure occurs word medially, an observation that also holds true for Olunyala. However, the present study sought to show that in Olunyala, the VV syllable structure could easily be confused with the V syllable structure in which the vowel elements follow each other but belong to different syllables as shown in section 4.6. The confusion is particularly so because both have similar vowel elements that follow each other and can occur in both word medial and final positions. Further still, this study shows that words with the V syllable structure in which different vowel elements follow each other but belong to different syllables can be confused with diphthongs. The difference is shown in section 4.5.
2.4 Summary of the Subsection

In this sub section, the relevant aspects of studies related to the current one are brought out. The role of the syllable in the formation of tone and nominal classes is highlighted. This shows the need for more research on the syllable as far as its composition, types and their word positions is concerned. The next sub section deals with the theories used to investigate the Olunyala syllable.

2.5 THEORETICAL FRAMEWORK

2.5.1 Introduction

The study used an eclectic approach in its investigation. The researcher, however, mainly used CV Phonology as propounded by Clements and Keyser (1983) in analysing the syllable structures of Olunyala in order to establish the way the sounds combine to form syllables. Generative Phonology (GP) was used to investigate vowel insertion in the V syllable structure. The GP notion of natural classes was used to investigate how sounds pattern with others and which vowels do not occur in certain syllable structures and word positions (Kenstowicz, 1994). The choice of using an eclectic approach is also supported by Lass (1984) who states that there were no full alternative theories. Theories need to complement each other thus showing that that one has understood the phenomenon that one is dealing with.
2.5.2 CV Phonology

Clements and Keyser (1983) expounded a CV phonology model to describe the syllable. According to this model, a syllable (σ) consists of an onset (O) and a rhyme (R). The rhyme has a peak (P) and a coda (Co). The syllable is represented as a branching tree as shown in Figure 2.1 below:

```
σ
 / \
O   R
 /   /
P   Co
```

**Figure 2.1 A syllable branching tree**

Apart from the (P), which is also called the nucleus (N), all the other categories may be empty (Lass 1984: 252). The higher nodes shown in Figure 2.1 above dominate the lower categories of VC which in turn dominate specific segments as shown in Figure 2.2:

```
σ
 / \  R
O   P  Co
 /    /
V    C
```

**Figure 2.2 Syllable tree nodes**

Figure 2.3 below shows an example in Olunyala which has an empty coda because Olunyala does not have codas due to its simple syllable structure.
Figure 2.3 Syllable tree with an empty coda

In the present study, a syllable structure branching tree without a coda as shown in Figure 2.4 below will be adopted throughout whenever Olunyala examples are given.

Figure 2.4 Olunyala syllable tree with an empty coda

CV Phonology, particularly the CV tier model, is useful in showing the syllable structures that are not allowed in certain word positions and the sequential constraints in the formation of the syllable structures of Olunyala. The model is also useful in showing the way graphemes and phonemes or sound segments in Olunyala combine to form syllables since not all phonemes can precede or follow all other phonemes. The CV Phonology model as propounded by Clements and Keyser (1983) provided this research with a mechanism to deal with language
specific syllable structures. The model was also used to show the kind of CV tier model that was representative of Olunyala and to compare it with that given by Clements and Keyser (1983). While the model uses CV elements that follow each other, it recognizes the fact that some languages allow syllables other than the CV sequence (Hawkins, 1988:165). An example is the CC sequence in Arabic languages like Somali (Kenstowicz, 1994:254). The CV tier model was used to analyze Olunyala syllables that are formed by combining more than two graphemes and also two phnemes.

The Onset First Principle, according to Clements and Keyser (1983) requires that a string like CCV be divided as C-CV. According to this principle,

syllable initial consonant clusters are maximized to the extent consistent with the syllable structure conditions of the language in question (Katamba 1993:161).

The Onset First Principle was used to investigate the CVV and V syllable structures as appertains to the diphthongs to find out how they differ from the words with the VV syllable structure.

The researcher used CV Phonology to investigate which consonant combinations are allowed in Olunyala. For example, which consonant phoneme combinations are permitted in the CV syllable structure without a branching onset. The CV model was also used to investigate the incapability of some vowels to form peaks in the CV syllable structure with an internally complex onset. CV Phonology
shows that the application of phonological rules internal to a language are
constrained by the syllable structure of a given language (Katamba 1993:173).
Insight into phonological phenomena, for example nasalisation, can only be
gained by looking at the syllable. The number of syllables in a given word or part
of it have to be counted so as to determine the application of a given rule
(Katamba 1993: 173). CV Phonology was useful in showing that some sound
segments cannot combine with others in the phonotactics of Olunyala. This is
because the segmental part of the CV-tier shows the distinctive features of vowels
and consonant segments.

2.5.3 Generative Phonology

GP, as proposed by Chomsky and Halle (1968) in the Sound Pattern of English
(SPE), and also supported by Durand (1990), is a theory that advocates for an
explicit notational system in describing the sound structure of a language. While
operating from the premise that sounds have two levels, phonemic and phonetic,
GP deals with making of explicit principles to govern the association of the two
levels of sounds. GP, therefore, deals with rules or algorithm which govern the
association of phonological and phonetic levels (Massamba, 1996:88). The rules
are predictive in nature in that if a sample of rules is given, one can always predict
other forms to which the rules can apply.
The GP notion of sound alterations is used in the investigation of the V syllable structure that manifests itself as a prefix in Olunyala. The notion of sound alternations was also used to investigate the sound alternations that result when the zero onset syllable is attached to verbs in the 1\textsuperscript{st}, 2\textsuperscript{nd}, and 3\textsuperscript{rd} person categories. This is in line with the argument by Chomsky and Halle, (1968) that in language, there are clear and systematic sound alternations which must be related and therefore belong to the same basic forms (Massamba, 1996). GP is suitable in formulating phonotactic statements on sequential constraints on the formation of syllables in Olunyala words.

2.5.4 Summary of the Chapter

In this chapter, general literature on the syllable is first discussed before citing particular studies relating to the current one. The chapter closes by discussing the eclectic approach used in the study. The next chapter deals with the methodology used by the researcher in this study.
CHAPTER THREE
METHODOLOGY

3.0 Introduction
This chapter starts by discussing the design used in the study and its appropriateness. The research design is then followed by the sampling techniques and sample size before discussing the data collection procedure. The chapter then ends with a discussion of the data presentation procedure.

3.1 Research Design
To collect data that would answer the research questions of this study, a qualitative design was used. The qualitative design was suitable because it enabled the researcher to classify the data into the required categories of syllable types and word classes for analysis (Creswell, 1994). This research design was useful in validating the theory that sounds in a given language do not just combine haphazardly. The design allowed the researcher to describe the syllable types and the sequential constraints regarding the phonemes that form these structures by interpreting each category and sound (Mugenda and Mugenda, 1999). The concepts, linguistic and phonotactic statements formed on Olunyala were made of details arising from descriptions of the data analyzed.
3.2 Sampling Procedure and Sample Size

To get the required sample size, the researcher first came up with two long lists of Olunyala nouns and verbs. Olunyala phonemes were then listed before the researcher went through the two lists of nouns and verbs to ensure that each of the sounds was represented. This was followed by the generation of a list of 200 words that were required for investigation. Following Milroy (1987:21), fewer words would still have been sufficient as large samples were not necessary for linguistic surveys. Indeed other phonological related studies have used fewer words; for example, Kuria (2006) uses 64 words. Ingonga (1991) and Savala (2005) both use 200 words. In view of this, the researcher believed that 200 words were representative of Olunyala. The researcher used the purposive sampling technique to get the required number of words. The data needed for the study was drawn from native Olunyala nouns and basic verbs. Purposive sampling was used to categorize the data into monosyllabic, disyllabic, trisyllabic and polysyllabic words for systematic analysis. For each of the categories, 50 words were purposively sampled for analysis. Purposive sampling was most appropriate for grouping the 50 words into each category because the technique ensured that the researcher did not miss out any of the sound segments as this would interfere with the findings of the research.

3.3 Data Collection

To get the required data, a total of 200 Olunyala words; 100 nouns and 100 verbs, that is, single lexical items were listed as per Labov (1972 a) quoted by Milroy
The reason for using nouns and verbs was because they are major word classes and would therefore enable the researcher to get all the sound segments of Olunyala as they were all required for the investigation. The researcher used native speaker intuition to generate the data (Kenstowicz, 1994). This was necessitated by the fact that Olunyala (K) does not have any written literature from which data could be drawn. However, the researcher, using native speaker intuition ensured that the list consisted of basic Olunyala nouns and verbs. Nouns comprised parts of the body and common and proper nouns as per Milroy (1987). The notion by Kenstowicz (1994) that a native speaker can tell the sound sequences permissible in his first language and those that are not was useful in the investigation of the sequential constraints on Olunyala sound combinations in the formation of syllables.

3.4 Data Analysis and Presentation

First of all the researcher grouped the data collected into word lists consisting of 100 nouns and 100 verbs. All the words in both groups were then labeled as follows:

- M- monosyllabic
- D- disyllabic
- T- trisyllabic
Po- poly-syllabic

Ensuring that all the Olunyala sound segments were represented, the researcher used purposive sampling to pick 50 words for each of the four categories; that is; 25 verbs and 25 nouns for investigation. All the Olunyala sound segments were listed and the researcher ticked against each every time she picked a word with that particular sound. To establish the difference in phonemes with the sounds /w/ and /l/, a minimal pair test was used.

The next step was to isolate the syllable structures attested in each of the categories, basing on the CV, V, CVV and “CSV” clusters identified by Savala, (2005). Using the CV tier model postulated by Clements and Keyser, (1983), tree diagrams were presented to show the consonant and vowel elements that can combine to form syllables in Olunyala. The CV tier model was used to show the kind of tree diagrams that syllable structures form in terms of the onset and rhyme elements and without a coda element in Olunyala.

The researcher analyzed the listed words in each category to find the prevalent positions for the types of syllables in Olunyala and the sequential constraints in their formation. The GP notion of natural phonology was used to show the Olunyala vowel and consonant segments that do not occur in certain syllable structures and word positions. The sequential constraints showed the Olunyala sounds that are not permitted in certain word positions (Durand, 1990:18).
Words with V and VV syllable structures were listed to show the division of the syllables. The GP notion of vowel assimilation was used to analyze the VV and V syllable structures to show that although the vowel segments in both the VV and V structures follow each other, the vowel elements for the V structure fall in different syllables while the vowel elements for the VV structure form the long vowel and thus a branching nucleus. Vowel assimilation refers to the process in which vowels assimilate to each other such that vowels of one syllable may become more like vowels of another syllable (Massamba, 1996: 95). An example is seen in the Olunyala word *lengera* (look) in which the vowel e in the suffix – *era* assimilates to e in the first syllable the root word *leng*. This is a systematic process called vowel harmony in which given vowel sounds can only occur in the suffix if certain other sounds occur in the root.

### 3.5 Summary of the Chapter

The research design, sampling techniques and sample size used in the study have been given in this chapter. The data analysis and presentation procedure are also shown. The data presentation and analysis is discussed in the next chapter.
CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.0 Introduction

This chapter contains three main sections in which the syllable structures are discussed.

A sample of nouns and verbs from the list of the 200 words used in the study are listed (Appendix III). The words are divided into monosyllabic, disyllabic, trisyllabic and polysyllabic categories. The types of syllable structures that are attested in Olunyala nouns and verbs are first presented. The notion that not all syllable types occur in all word positions is brought out by discussing the prevalent word positions of the structures identified.

The constraints in the formation of Olunyala syllables are discussed by presenting the vowel and consonant elements that combine in the formation of Olunyala syllables and in effect those that do not occur together.

The examples of branching trees for Olunyala shown in this chapter are not as per the conventional way in which an empty coda is shown. This has been adopted to answer to the idea mentioned in the introduction that this study would give examples of the kind of branching trees and adopt a CV tier model in accordance to the sounds that occur in Olunyala. For the CV syllable structure with more than one consonant grapheme forming the onset, the individual graphemes dominated by a single slot on the tier model are shown. The syllable branching
trees in Olunyala do not branch from the R as is the case in English but branches from the N because the language does not have a coda as shown using the word lia in Figure 4.1. Some of the trees in this text are presented with the immediate constituent of the R as the C element while others trees do not have IPA symbols but graphemes to demonstrate the composition of the internally complex sounds in Olunyala.

Figure 4.1 Olunyala syllable tree with a branching nucleus

The stand taken by the researcher recognizes the fact that the graphemes that form the sound segments discussed in sections 4.4.2, 4.4.3 and 4.4.4 are single sound segments on their own or possible sound segments in Olunyala. Such are the sounds that the present study is treating as being internally complex in the formation of the onset.
4.1 The Notion of CV Tier Model in Syllable Formation

In this sub-section, the notion of the CV tier model is briefly discussed as a prelude to the discussion of the syllable structures because it is used to show their differences in terms of the specific C and V elements they take. The first proposal of the CV tier as having independent status by McCarthy (1985a) was inspired by the fact that certain morphemes in Arabic appeared to be specified in terms of strings of consonant and vowel positions or skeletal slots referred to as templates. Some of the words have no affixes but conjugations differ depending on the CV template and to derive the corresponding forms, an assumption that the consonants and vowels have separate tiers has to be made (Gussenhoven & Jacobs 2005:140). In this notion, consonants associate with C's and vowels with V's. In Olunyala, the corresponding forms of the verbs either have prefixes or suffixes which are actually syllables. This then means that the C and V elements forming these syllables are either at the word initial or word final positions. As opposed to Arabic in which the verbal root is composed of consonants, in Olunyala it is composed of both C's and V's and thus putting the root syllable in the middle as shown in Example 2.1 in Section 2.2 above.

4.2 The Syllable Structures and their Word Positions

This section discusses the syllable structures attested in Olunyala nouns and verbs by looking at the way vowel and consonant elements combine. The researcher first identifies the syllable structure and then discusses the types of words in which each structure is found and the prevalent word positions for each structure.
4.2.1 The V Syllable Structure

This is the type of syllable that is referred to in linguistic literature as the zero onset syllable (Ø). The V syllable structure is composed of one vowel segment only and, therefore, does not have a branching tree as seen the first syllable of Figure 4.2.

\[ \sigma \]
\[ N \]
\[ V \]
\[ a \]
\[ \sigma \]
\[ O \]
\[ R \]
\[ N \]
\[ V \]
\[ \sigma \]
\[ a \]
\[ n \]
\[ o \]

Figure 4.2 A zero onset syllable tree

Figure I above shows that the word ano has two syllables, that is, V and CV divided as:

\[ a\$no \]
\[ V\$CV \]

From the data analysis, the V syllable structure is very rare at the beginning of basic Olunyala verbs and only occurs in word initial positions before pre-nasalised sounds like a-ndika (write) and a-mba (come). Out of the fifty verbs sampled for investigation in this category, only two verbs (4% of the sample), one disyllabic and one trisyllabic, were seen to have the V structure at word initial position in basic verbs (see Appendix 11).
The V syllable structure was not attested in polysyllabic verbs. This may be attributed to the observation made from the data analysis that Olunyala does not have many polysyllabic verbs. Out of a sample of 100 verbs, only 3 were polysyllabic. In polysyllabic nouns, the V structure was found to occur word initially and word medially as the third syllable as in the word e$siSaSnwa (present/offering).

It was also observed that the V structure occurs as the second syllable in proper nouns that have the CV structure as the first syllable. Examples of this are shown in Example 4.1.

**Example 4.1**

<table>
<thead>
<tr>
<th>Na$u$do</th>
<th>(name of a person)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Si$a$nda</td>
<td>(name of a person)</td>
</tr>
<tr>
<td>Wa$u$do</td>
<td>(name of a person)</td>
</tr>
</tbody>
</table>

The analysis of the data revealed that V is the optimal or preferred syllable in Olunyala because it occurs in the formation of 97% of all common nouns and at the start of all names of places. From the data analysis of one hundred nouns, only three, that is, 3% were found to start with the onset syllable. However, names of places that are not originally Olunyala and those whose pronunciation has borrowed from English do not start with the V syllable structure.
Another observation from the data analyzed was that the V structure only occurs as the first syllable in disyllabic nouns and is formed using the vowel sound /e/ as in Example 4.2.

**Example 4.2**

- e$mbwa      dog
- e$ggo       home
- e$si        a fly
- e$ngwe      a leopard
- e$ta        a wall

The V syllable structure is also seen to manifest itself as the vowel prefix before the Olunyala nouns. The V structure also occurs word finally in trisyllabic nouns as seen in Example 4.3 below:

**Example 4.3**

- e$fu$u      a hippo
- e$nda$a     a thicket

This study established that the V syllable structure does not occur at medial or final positions in basic verbs but does occur at word initial position in nouns. The V syllable structure was found to occur in the various forms of the verb as the verb changes appertaining to 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> person categories. This is exemplified in the Example 4.4 below:
Example 4.4

<table>
<thead>
<tr>
<th>VERB</th>
<th>1st person</th>
<th>2nd person</th>
</tr>
</thead>
<tbody>
<tr>
<td>pa$ra</td>
<td>think</td>
<td>e$mba$ra</td>
</tr>
<tr>
<td>sia</td>
<td>grind</td>
<td>e$sia</td>
</tr>
<tr>
<td>ti$ma</td>
<td>run</td>
<td>e$ndi$ma</td>
</tr>
<tr>
<td>cho$ra</td>
<td>draw</td>
<td>e$njo$ra</td>
</tr>
<tr>
<td>li$ma</td>
<td>dig</td>
<td>e$ni$ma</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3rd person</th>
</tr>
</thead>
<tbody>
<tr>
<td>a$pa$ra</td>
</tr>
<tr>
<td>a$sia</td>
</tr>
<tr>
<td>a$ti$ma</td>
</tr>
<tr>
<td>a$cho$ra</td>
</tr>
<tr>
<td>a$li$ma</td>
</tr>
</tbody>
</table>

The analysis of the data also showed that in 90% of Olunyala verbs, the underlying form of the word initial syllable of the basic verb is formed by the vowel sound /e/ in the first person, /o/ in the second person and /a/ in the third person categories. Out of the 200 words sampled, only 20 words did not display this characteristic. It was consequently observed that the 20 words have the consonant sound /j/ as the onset in the initial CV syllable structure as seen in the examples shown in 4.5.
Example 4.5.

<table>
<thead>
<tr>
<th>Verb</th>
<th>1st P</th>
</tr>
</thead>
<tbody>
<tr>
<td>/jala/ (spread)</td>
<td>/naala/ (I am spreading)</td>
</tr>
<tr>
<td>/jimba/ (sing)</td>
<td>/nemba/ (I am singing)</td>
</tr>
<tr>
<td>/jonga/ (join)</td>
<td>/nonga/ (I am joining)</td>
</tr>
<tr>
<td>/jenda/ (fetch)</td>
<td>/nenda/ (I am fetching)</td>
</tr>
<tr>
<td>/jinama/ (bend)</td>
<td>/ninama/ (I am bending)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Verb</th>
<th>2nd P</th>
</tr>
</thead>
<tbody>
<tr>
<td>/waala/ (you are spreading)</td>
<td></td>
</tr>
<tr>
<td>/wemba/ (you are singing)</td>
<td></td>
</tr>
<tr>
<td>/wonga/ (you are joining)</td>
<td></td>
</tr>
<tr>
<td>/wenda/ (you are fetching)</td>
<td></td>
</tr>
<tr>
<td>/winama/ (you are bending)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Verb</th>
<th>3rd P</th>
</tr>
</thead>
<tbody>
<tr>
<td>/kaala/ (s/he is spreading)</td>
<td></td>
</tr>
<tr>
<td>/kemba/ (s/he is singing)</td>
<td></td>
</tr>
<tr>
<td>/konga/ (s/he is joining)</td>
<td></td>
</tr>
<tr>
<td>/kenda/ (s/he is fetching)</td>
<td></td>
</tr>
<tr>
<td>/kenama/ (s/he is bending)</td>
<td></td>
</tr>
</tbody>
</table>
However, the researcher notes that some words with /j/ at the word initial position behave as shown in Example 4.5 above.

Another observation from the data analysis was that the V structure also occurs at the word medial position in Olunyala nouns. When this is the case, all the Olunyala vowel sounds can occur in this position apart from /i/, for example:

**Example 4.6**

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>o-mu- o- lo</td>
<td>/o/ traditional panga</td>
</tr>
<tr>
<td>V CV V CV</td>
<td></td>
</tr>
<tr>
<td>e- si- a- nwa-</td>
<td>/a/ present/offering</td>
</tr>
<tr>
<td>V CV V CSV</td>
<td></td>
</tr>
<tr>
<td>o- wu- u- lu-</td>
<td>/u/ a bad smell</td>
</tr>
<tr>
<td>V CV V CV</td>
<td></td>
</tr>
<tr>
<td>o- wu-e-ndi-</td>
<td>/e/ state of worry</td>
</tr>
<tr>
<td>V CV V CV</td>
<td></td>
</tr>
</tbody>
</table>

The V structure also occurs at word final position in nouns, for example:

**Example 4.7**

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>o$ lu$ pa$ u</td>
<td>a piece of timber</td>
</tr>
<tr>
<td>e$ si$ o</td>
<td>a mirror</td>
</tr>
<tr>
<td>e$ fu $o</td>
<td>termite trapping hole</td>
</tr>
<tr>
<td>e$mbe $o</td>
<td>cold</td>
</tr>
</tbody>
</table>

This V syllable structure is not found word finally in verbs unless it occurs as an affix to show position as in e$ndi$so (I am there). The V syllable structure does not also occur word medially in verbs.
In disyllabic nouns, it was observed that the V syllable structure only occurs in common nouns and at the word initial position and is formed by the vowel sound /e/.

The second syllable in most of the disyllabic words has a C with a fusion of two or more consonant graphemes as seen in Figure 4.3 below:

![Diagram](image)

(a)

![Diagram](image)

(b)

Figure 4.3 An internally complex onset

In figure 4.3(b) the dotted line means that the semi vowel /w/ assimilates to the vowel /a/ in the nucleus.
In answering one of the objectives of this study that there are sequential constraints in the formation of syllables, the data analysis showed that only the following consonant sounds were found to occur on the second syllable in words that start with the V syllable structure in disyllabic nouns in Olunyala:

**fricative**

/x/ as in – ekhwi (firewood)

/s/ as in esi (a fly)

**prenasalised**

/nd/ as in enda (stomach)

/ng/ as in engo (home)

/mb/ as in emba (a lump of ploughed soil)

**stop**

/t/ as in eta (wall)

Apart from the stop /t/ and two fricatives, the rest are prenasalised sounds. Thus, only six consonant sounds occur in the second CV syllable after the word initial V syllable in disyllabic words.

4.2.2 The CV Syllable Structure

The CV syllable structure starts with an onset which is followed by a vowel. This is the type of syllable that is referred to in linguistic literature as an onset syllable
(Katamba 1993). The CV syllable structure is an open syllable due to the fact that it ends in a vowel and has no coda. From this study, it was observed that the CV syllable structure varies in the number of phonemes that form the consonant sounds in the onset as discussed in the sub-sections below. The idea of a complex onset, as mentioned at the beginning of this chapter, is explored using examples from Olunyala. The branching onset in Olunyala is not in the strict sense as the typical English one which consists of an obstruent followed by a sonorant (Gussmann, 2002). The internally complex onset in Olunyala shows the graphemes that form the sound segments that in turn form the onset of the syllable. The CV syllable structure in Olunyala was found to have the seven types discussed in this section.

4.2.2.1 The Onset with one consonant Phoneme

The investigation revealed that there is a CV structure that does not have an onset with more than one grapheme as shown Figure 4.4.

\[
\begin{array}{c}
\text{O} \\
\text{R} \\
\text{C} \\
\text{V} \\
j \\
a \\
\end{array}
\]

(burn)

Figure 4.4 Onset with one grapheme

In this category, the following 13 Olunyala consonantal sounds occur in this structure:
In disyllabic verbs, the CV structure with one consonant segment and one vowel occurs at both word initial and word final positions. In trisyllabic and polysyllabic words it occurs in all word positions as in the verbs **suSviSra** (believe), **siSsiSmuSla** (shake) and the proper noun **E$naSmiSraSma**.
4.2.2.2 The Onset with the Prenasalised Sound

The nasal plosive in this section refers to the onset in the CV syllable structure which consists of the prenasalised sound or nasal with a plosive release.

For the CV structure with the prenasalised sound, the data analysis revealed that the prenasalised sounds /mb/, /nd/ and /ŋ/ were not found in syllables at word initial position in basic verbs. However, the sound /ŋ/ occurs in syllable at word initial position. These prenasalised sounds were, however, found in CV syllables at word final position, for example in 4.8

Example 4.8

/jemba/ (sing)
/jenda/ (bring)
/jinga/ (force)

In disyllabic verbs, all vowel sounds form the nucleus in the first syllable in a word initial position but in the word final position, only the vowel sound /a/ forms the nucleus. In disyllabic common nouns, CV syllable structure occurs as the second syllable. This means that Olunyala does not have disyllabic common nouns that begin with the CV structure.

It was observed that CV occurs as the last syllable in most Olunyala nouns and verbs. However, in polysyllabic words, CV is the only syllable structure that can occur as the last syllable in proper nouns as shown in Example 4.9 (a). Apart from this, the CV structure can occur in any word position in polysyllabic nouns and verbs. For the words that begin with the zero onset syllable, the CV always
becomes the second syllable in all nouns and verbs, whether disyllabic, trisyllabic or polysyllabic as shown in example 4.9 (b)

**Example 4.9**

(a)

O$mu$sa$mba (name of a place)
E$ma$la$va (name of a place)
E$si$ye$ŋga (name of a place)
E$wu$e$ri (name of a place)
E$wu$ŋo$ma (name of a place)

(b)

e$ŋgo (home)
e$si$sa$ku (a bunch of bananas)
a$ndi$ka (write)
e$si$sa:$la (a chair)
o$mu$si:$me (a loved one)

4.2.2.3 The Onset with the Fricative and Affricate

In Olunyala, only two affricate sounds and a fricative occur in the onset in the CV syllable structure. These are:

/ʃ/ (fricative)

/ʃʃ/ (affricate)
The affricates /tʃ/ and /ʃdʒ/ are found in words like /tʃulə/ (go out) and /nandʒala/ (name of a person, respectively while the fricative /ntʃ/ is found in words like /ŋʃia/ (I am going). However, the Olunyala data collected and analyzed showed that the CV syllable with the affricate and fricative onsets are not as common in Olunyala nouns as they are in the verbs.

4.2.2.4 The Onset with the Labiolizer

In her discussion on the tonal patterns of Lwitakho, Savala (2005) identifies the 'CSV' syllable structure which had not been mentioned in linguistic literature before. She advances the notion that the 'CSV' syllable structure is composed of a consonant, semi-vowel and a vowel. However, this study, whose main objective is the syllable structures of Olunyala is, on the contrary, advancing the theory that clusters with the semi vowel also form the CV structure. The researcher, while appreciating Savala (2005) for motivating the present study by bringing out the idea of the ‘CSV’ syllable structure, observes that the ‘CSV’ syllable structure is non-existent when one considers the following three points:

(a) The definition pertaining to an affricate

(b) The constitution of a consonant cluster in English
(c) That Bantu languages have a simple syllable structure

The argument being advanced at this point in (b) and (c) immediately above is that the CCCV complex onset in the English language; for example in the word *string*, the C elements involved can be distinctly perceived. If an Olunyala speaker is given such a word, the phonotactics of the language could force him to conform to the simple syllable structure of the language by inserting vowels after each of the C elements, effectively breaking each of them into a single C which is then followed by a vowel. This essentially means that Olunyala does not have CC or CS but only one C which, in for example, */xw/*, is a fusion of one or more consonant graphemes; the semi vowels included.

While advancing the argument about the non existence of the CSV syllable structure, the researcher wishes to note that some languages, for example, Abkhazia, a Caucasian language in Russia, treats */w/* and */j/* as labiolizers and this is what this study is adopting (Brakel 1983:70). Thus what Savala (2005) refers to as CSV structures are treated in this study as affricates or variants of C with the labiolizers */w/* and */j/*. In Abkhaazian, */w/* and */j/* are treated as features of the prime phonemes whenever they occur with them and are, therefore, distinguished as */hʷ/* or */xhʲ/*. A feature is an attribute that helps to define a phoneme; it may or may not show an independent phoneme (Travel 1981). The following examples drawn from Twi and Olunyala respectively, show that labialization of */w/* is contrastive. In Twi, a Ghanaian language, the superscripting of */w/* to the sound */k/* in the word [aka], ‘(somebody) has eaten’, to have the word [akʷa], ‘a round
about way’ gives it a different meaning (Laver, 1994: 322). In Olunyala, [esa] ‘a caterpillar’ and [eswə] ‘termites’, are contrastive because of the sound /w/. In this case, the researcher wishes to use the definition by Travel (1981) to show a different phoneme. By adopting this notion, the present researcher is arguing that the addition of /w/ to a phoneme in Olunyala makes it a totally different phoneme which in turn produces a different sound that forms the onset of a syllable. The list in Section 4.2.2.1 also shows that /w/ is an independent sound on its own. This then gives Olunyala the seventeen labialized phonemes in the examples below and in Table 1 which in essence, still gives the C element of the CV syllable structure:

<table>
<thead>
<tr>
<th>Phoneme</th>
<th>Example</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>pw</td>
<td>/epwoni/</td>
<td>(a potato)</td>
</tr>
<tr>
<td>tw</td>
<td>/etwası/</td>
<td>(a bull)</td>
</tr>
<tr>
<td>mw</td>
<td>/omwana/</td>
<td>(a child)</td>
</tr>
<tr>
<td>nw</td>
<td>/esinanwa/</td>
<td>(chin)</td>
</tr>
<tr>
<td>ngw</td>
<td>/engwe/</td>
<td>(leopard)</td>
</tr>
<tr>
<td>sw</td>
<td>/swaka/</td>
<td>(grind)</td>
</tr>
<tr>
<td>lw</td>
<td>/lwana/</td>
<td>(struggle)</td>
</tr>
<tr>
<td>fw</td>
<td>/fwala/</td>
<td>(dress up)</td>
</tr>
<tr>
<td>rw</td>
<td>/erwanji/</td>
<td>(outside)</td>
</tr>
<tr>
<td>kw</td>
<td>/ekwena/</td>
<td>(crocodile)</td>
</tr>
<tr>
<td>jw</td>
<td>/ejajwa/</td>
<td>(an axe)</td>
</tr>
<tr>
<td>ndw</td>
<td>/endwasi/</td>
<td>(allergy)</td>
</tr>
</tbody>
</table>
In this study, the consonant with a labiolizer is treated as a different phoneme because it is not realized as an allophone of the 17 phonemes shown in Appendix IV. It is not realized as an allophone in the same way as the English [t] and [th], which are non-aspirated and aspirated, respectively. Just like in English, Olunyala also has aspirated and non-aspirated phonemes for the same consonants with labiolizers, for example; [p] as in [opicha] (type of bird) and [ph] as in [epicha] (a photo). Another example of allophonic occurrence in Olunyala, as opposed to a different phoneme is shown using the phoneme /r/ and /l/. It was, however observed that both /r/ and /l/ do not always interchange in Olunyala. Both of them can be used interchangeably without affecting the meaning. Apart from Abkhaazian, Chinese, Korean and also Spanish exhibit phones that form different phonemes; for example, in Korean /tol/ means stone while /tʰol/ means a grain of rice and the two are treated as different phonemes and not allophones (http://wikipedia.org/wiki/phoneme) 10/6/2009. It is for this reason that the type of branching trees used below in this section has been borrowed from Abkhaazian and adopted in this study (Brakel 1983:77).

The onset with one consonant sound and a labiolizer can be represented as shown in Figure 4.5 below.
Unlike Abkhaazian, in Olunyala only one labiolizer occurs; that is /w/. The labiolizer /w/ gives Olunyala 17 sounds with the labiolizer /w/ shown in Appendix IV. From the study, it was noted that all the 17 sounds occur in all word positions. However, /rw/ does not occur in word initial position in Olunyala.

From this standpoint, the researcher notes that apart from the type of onsets in the CV syllable structure shown in Section 4.2.2.1 above, the CV structure also has six other variants as shown in 1-6 immediately below:

1. One C onset (as shown in 4.4.1) and a labiolizer

2. A pre-nasalised sound (as in 4.4.2 above) forming the onset. In Olunyala the prenasalised sounds /ndw/, /ŋgw/ and /mbw/ can also take on a labiolizer to form a different sound as explained 4.2.2.4.

The CV structure with a pre-nasalised sound and a labiolizer forms the kind of branching tree shown in Figure 4.6 below:

![Figure 4.5 Onset with a labiolizer](image-url)
Figure 4.6 The onset with a prenasalised sound and a labiolizer

The tree in Figure 4.6 shows that the two consonant elements /n/ and /d/ and the labiolizer fuse into one to form one sound, that is, C.

3. Three tier affricate plus a labiolizer seen in figure 4.7 below.

Figure 4.7 Three tier affricate onset with a labiolizer

4. One C and a nucleus with two vowel sounds (section 4.6)

5. The onset with a geminate (see Section 4.2.2.7)

6. One consonant element and two semi vowels as seen in Figure 4.8 immediately below:
Figure 4.8 Onset with two labiolizers

Figure 4.8 shows that Olunyala, unlike English, has affricate sounds with as many as three consonant graphemes forming the C in the onset of the CV syllable structure. These also occur in Egekusii in words like *nchwo* (come) and Kimeru in for example, *ncheke* (something thin).

In the CV structure with a consonant that is immediately followed by the semi-vowel /w/, the semi-vowel spreads to the vowel in the nucleus as shown by the broken lines from C to the vowel sound /a/ in Figure 4.9 below. The broken lines are used to show that the nucleus is affected by the C element when the semi vowel /w/ assimilates to the vowel sound /a/.

Figure 4.9 Spreading effect of the C to the V
In Figure 4.9 above, the semi vowel is first linked to the C element of the CV syllabic structure. This association is then broken and the semi vowel is in turn associated to the V element. The spreading of the semi vowel to the vowel is exemplified by the word /omwana/ (child) in the skeletal tier in Figure 4.10.

Figure 4.10 Spreading of /w/ to the vowel

The semi vowel /w/ in the CV syllable structure with a labiolizer is linked to the C element and is considered as a non-syllabic glide. In this type of CV structure, the /w/ is first assigned as the V element or nucleus of the syllable because it is higher in the sonority hierarchy than the C element. However, the fact that it is followed by a vowel which is higher than it on the sonority hierarchy, the /u/ is then linked to the C element and phonotactically realized as a nonsyllabic glide (Katamba 1993:171). The glide formation rule immediately below can, therefore apply to Olunyala.

\[ [+\text{syl}] \rightarrow [-\text{syl}] / [+\text{syl}] \]

\[ + \text{high} \]

(Adapted from Katamba 1993:171)

The rules of glide formation have the same format, regardless of the language they occur in.
4.2.2.5 Word Position of the CV Syllable with the Labiolizer

From the study, it was observed that syllables with semi vowels in the onset occur in monosyllabic verbs and apart from the semi-vowels, the only other Olunyala consonant sounds that are used in the formation of the syllable in this category are /k/ and /h/. Only the vowel sound /a/ is used in the nucleus position. The data analysis also revealed that Olunyala does not have monosyllabic nouns with semi vowels in the onset.

In disyllabic verbs, the semi vowel onset was found to occur at both the word initial and final positions. As far as the formation of the nucleus is concerned, the study found out that the vowel sounds /e/ and /o/ do not occur in the first syllable. The study also revealed that the vowel sound /a/ does not occur in the nucleus position in the final syllable in the semi vowel onset structure in disyllabic verbs.

In trisyllabic words, the semi vowel onset structure was only attested in the middle and last syllables in nouns. It was noted that the consonants that occur in the onset in the formation of the syllables in this position were limited to /k/, /m/, /n/ and /w/. In nouns, all vowel sounds, apart from /u/ can form the nucleus in the middle syllable while only /a/ and /i/ may occur in the word final syllable. The semi vowel onset structure was not found at word final position in trisyllabic words. This structure was not found in polysyllabic verbs. Olunyala does not have
many polysyllabic words as seen from the data analysis. In polysyllabic nouns the semi vowel onset structure was found as the second, third or fourth syllable in common nouns. This structure can only occur as the first syllable in people’s names. It was observed that while the nucleus in the labiolized consonant CV structure has one vowel grapheme, the C in the onset has graphemes varying from one to four as seen in Figure 4.11(a) and the CV tier in Figure 4.11(b) This means that the syllable (σ) has one consonant sound (C), which is in turn composed of 4 consonant graphemes fused together and, therefore, making C an internally complex element.

![Figure 4.11 Onset with four graphemes](image)

The fusion of consonant graphemes in the labiolized CV structure in Olunyala forms the kind of syllable branching tree shown in Figure 4.12.
The above tree and the explanation offered is in line with CV Phonology which offers the possibility of capturing the nature of complex segments like diphthongs and geminates (Carr 1993). Using the CV notion of Onset and Rhyme, the trees in Figure 4.12 (a) and (b) show non branching R and the postulation of an internally complex onset on the CV tier model respectively. From the data analyzed, it was observed that the highest number of consonant and vowel graphemes that can occur in one syllable in the labiolized CV structure in Olunyala is five and the lowest is two.

4.2.2.6 The Nucleus with two Vowel Elements

The CV syllable structure in Olunyala also has one consonant segment and a nucleus with two vowel segments fused into each other as seen immediately below:
The dotted lines in figure 4.13(b) show that unlike the VV in the CVV structure in section 4.3, the N in (b) does not branch but two vowel graphemes assimilate into each other to form one V segment. In this case there is a fusion of the two vowels which forms a short vowel as opposed to the long vowel discussed in Section 4.3. In the example in Figure 4.13, the vowel /i/ is assimilated by the vowel /a/ after it. In this type of CV syllable structure, the general rule that any vowel is deleted when followed by another vowel can be applied (Carr 1993:44).

The study found out that all the basic vowels in Olunyala can occur in this structure with the vowel sound /i/ preceding them although no words with /u/ were attested. In monosyllabic verbs, this structure occurs with only the vowel sounds /i/ and /a/ forming the nucleus. From the data analyzed, syllables with this kind of nucleus were only found as the first or second syllable in the word. The observation shows
that the structure formed by the fused vowels occurs in monosyllabic and disyllabic words.

4.2.2.7 The Onset with the Geminate

The data used in the study shows that Olunyala has geminates. A geminate refers to the occurrence of the same consonant in the same syllable without the intervention of a vowel. This essentially means that in Olunyala there is allophonic possibility of length in the C element unlike English where length is only realized in the V element. Allophonic length was found in words like those in 4.10.

Example 4.10

mmwalo  (in the river)
mmoni  (in the eye/face)
essanda  (guard)
ollunda  (type of shrub)

The degemination in Olunyala is a case of the two phonological processes of deletion and assimilation taking place. For example in the first word in Example 4.10 above, the shortening of the two consonants happens as shown in the following four steps:

1. mu + Omwalo
2. mu + Ømwalo
3. mu + Ømwalo
4. mmwalo
The four steps above show that the vowels /u/ and /o/ initially intervened between the two consonants mm in the word mmwalo. In the word mmwalo, the “m” comes from the locative prefix [mu], meaning “inside”. The vowel /u/ is then deleted and the first /m/ is assimilated to the following /m/, making it appear like a lengthened /mː/.

In languages that have geminates, the geminates do not appear in the onset; for example in Tamil (Gussenhoven & Jacobs 2005:156). The case is, however, different for Olunyala because geminates occur in the first syllable of the word. In languages like Tamil, syllabification is such that the geminate is divided over the coda of one and the onset of the next syllable as shown in Figure 4.14 below:

![Figure 4.14 Geminate syllabification (Tamil)](image)

The kind of syllabification shown in figure 4.14 cannot occur in Olunyala because its simple syllable structure does not have codas. Instead, geminates in Olunyala, like in Lithuanian, can be syllabified as shown in the skeletal tier and branching tree shown in Figures 4.15 (a) and (b) respectively.
Figure 4.15 Geminate syllabification (Olunyala)

The mapping of individual vowel and consonant elements on the skeletal tier showed that degemination takes place in Olunyala. Degemination is based on a rule that affects segment length. The degemination, therefore, reduces consonants clusters (long consonants) to single consonants and thus, a single long consonant segment is shortened (Carr 1993:130,210). Degemination is not a matter of deleting one of the two identical consonant segments but it is a matter of shortening a single long segment. This shortening of a long segment is represented as deletion of a timing slot on the CV tier. The shortening of the long consonant effectively conforms to the phonotactics of Olunyala by having a single C and thus the CV structure.

The degemination rule which shortens a long consonant giving it a single slot on the skeletal tier is as follows.
The occurrence of inserting a vowel after the consonant element would easily take place as discussed in 4.2.2.4 above but in this case, it does not happen; hence the occurrence of a geminate consonant. Degemination makes the word *essanda* to have three syllables as opposed to the common occurrence in which a vowel would be inserted after the initial /s/ to make the syllables conform to the phonotactics of the language. The insertion of the vowels would make the noun *essanda* to have four syllables instead of three. From the data collected, only the consonant sounds /m/ and /s/ occur as geminates in Olunyala.

4.3. The CVV (CV:) Syllable Structure

In this sub section, the difference between the long and short vowels in the formation of Olunyala syllables is shown. Of vital importance is the analysis of the difference between the long vowel and the sequences in which vowels follow each other but belong to different syllables or do not form a long vowel. The analysis of these
sequences is as per Aronoff and Oehrle (1984:88). They state that it is in order to analyze the difference between phonologically long and short vowels because it is only then that syllable boundaries can be seen.

The CVV syllable structure is composed of a consonant sound and two vowel elements; the VV in this case is what is always referred to in syllabification as either the long vowel or the diphthong. However, from this research, it emerged that there needs to be a difference when referring to the vowel elements involved in this structure. This is necessitated by the fact that in linguistic literature only the diphthong and long vowel are referred to as both having the VV sequence and the difference being noted in the former changing the quality while the latter remaining the same for the whole duration (Durand 1990). The researcher in this study wishes to note that what would be a diphthong in English actually forms two distinct vowel sounds in the phonotactics of Olunyala as seen in example 4.11(ii) below:

**Example 4.11**

i) n a a b a ( to fish)

| | | | |

C VVCV
amae nga (mixture of cooked beans and maize)

\[ \text{V CVVC V CV} \]

The representation of the long vowel on the syllable branching tree and CV tier show a branching nucleus in Olunyala shown in the figures in 4.17 (i) and (ii).

\[ \text{Figure 4.17 Syllable tree with along vowel} \]

In example 4.12 (i) the nucleus of the syllable is constituted by a long vowel. In Example 4.12(ii), the vowels sounds /a/ and /e/ fall in different syllables as seen from the syllable boundaries in example 4.12.
Example 4.12

(i) naa$ba  (ii) a$ m a$ e$ n g e$ r a

From the data analysis it was observed that confusion of the long vowel and vowels that fall in different syllables is bound to be more if the vowels if the vowels in the latter are similar; for example in the word es$nda$sa.

The type of CVV structure shown in example 12 (i), which is the long vowel, occurs at the word initial position in both disyllabic verbs and nouns (names of people). The long vowel can also occur in word final position in disyllabic nouns, for example, embwii (type of bad smell) and monosyllabic verbs, for example, vaa (be).

4.4 Constraints on Syllable Formation

From the study, it was observed that not all consonant sounds combine with all vowel sounds even when they appear well-formed. This is what Kenstowicz (1994) refers to as accidental gaps.

From appendix IV discussed in section 4.2.2.4, it was observed that Olunyala has 17 phonemes resulting from labiolization. The analysis of the data showed that the labiolizer /w/ does not however combine with all the phonemes found in Olunyala. Conspicuously missing from appendix IV discussed in section 4.2.2.4 is the sound /β/ which is a very common phoneme in the language yet does not combine with /w/.

From the data analysis in this study, the researcher observed that while it was expected that Olunyala, like any other Bantu language should, for instance accept
NC sequences like [nd] as in [ndugu] brother at word initial position in common nouns, this is not the case. Instead, the phonotactics of Olunyala constrain syllables at word initial position in common nouns to have a vowel prefix; referred to in this study as the V syllable structure or fuse single phonemes to form one C. The issue of constraints on syllable formation can also be explained using the point advanced in section 4.2.2.4 that speakers of Olunyala are forced by the phonotactics of the language to insert vowels between complex CCCV onsets in English words.

In the present study, it was noted that in Olunyala verbs, only the vowel sounds /a/, /e/ and /o/ are used in the formation of the V syllable structure. It was observed that not all vowel sounds in Olunyala occur in the V syllabic structure in the word final position. Those that do not occur in this position are /a/, /e/ and /i/. The vowels /i/ and /u/ do not occur at the word initial position in Olunyala words consisting of the V syllabic structure. In nouns, the data analyzed showed that the vowel sounds /u/ and /o/ occur in the V syllable structure in the word final position; for example;

\[
\begin{align*}
o$su$p\alpha$su & \quad \text{a piece of wood} \\
e$sfu$su & \quad \text{hippopotomus} \\
em$b$s$o$s & \quad \text{cold}
\end{align*}
\]

The sound /r/ does not occur in the first syllable in Olunyala words while /l/, does not occur in the last syllable. In syllables that have geminates in Olunyala, the onset is only formed by the consonant sounds /m/ and /s/ while the nucleus is only formed by the vowel sounds /a/, /o/ and /u/.
In the CV syllable structure only the vowel sound /a/ forms the nucleus in monosyllabic words in Olunyala. In cases where the vowel sound /i/ occurs, it is assimilated by /a/ as discussed in section 4.4.6 above. Another observation made from the data analysis is that a syllable with the consonant sound /p/ does not occur together with a syllable with the sounds /β/ and /j/ in the same word. While some languages allow VVCC sequences, the VV sequence in the CVV syllable structure cannot occur in the same word with the geminate in Olunyala. This non occurrence in Olunyala is also the same in Swedish which does not allow VVCC sequences (Carr, 1993:210).

### 4.5 The GP Notion of Sound Alternations in Syllable Formation

It was observed that some consonant sounds change to completely different ones when the verb changes to the first person category. Examples of these changes are shown in Example 4.13 below.

**Example 4.13**

/k/ → /ŋg/

/ʃ/ → /n/

/t/ → /nd/

/β/ → /mb/
Morphological alternation of some sounds seems to take place.

If the first syllable of a word starts with the velar fricative /k/, this changes to /ng/ on the second syllable in the 1st person singular as seen in Example 4.14.

Example 4.14

koola (come back) /ŋgoolə/ (I am coming back)
kania (refuse) /ŋgania/ (I am refusing)

In accordance with the GP notion that advocates for the use of rules and features as elements of phonological description (Clark and Yallop, 1990), a rule governing this in Olunyala can be formulated as:

/k/ → [ŋg] 1st person singular→ on the 2nd and CV syllable
/t/ → [ŋd] 1st person singular on 2nd CV syllable

In this study it is observed that in the case of the voiceless sounds like /k/, /t/, /p/, the change occurs when the sounds change in voicing. The stops are then prenasalised.

The general rule would thus be:

Voiceless voiced on 2nd syllable verb in 1st person category
Stops → prenasals
When these sound alternations result in an increase of the consonant graphemes of the resultant sound, this sometimes changes the shape of the onset. It also changes the CV tier of the syllable concerned as seen in the figures in 4.18.

The addition of an extra grapheme to the resultant syllable in Olunyala brings out a different occurrence from what happens in some languages. For example, in Russian, /d/ is substituted for /t/ in cases where a word final /t/ is voiced preceding a voiced obstruent (Clark & Yallop 1990: 153). Keyser and Kiparsky (1984) present an example in Finnish in a process called Consonant Gradation in which the single stops /p/ and /k/ weaken and assimilate to preceding nasals.

Figure 4.18 CV tier showing sound alternation

One of the aims of GP is to characterize the unconscious knowledge which constitutes our knowing a language (Carr 1993:98). These sound alternations occur unconsciously to speakers of Olunyala, but according to Chomsky and Halle (1968), such alterations tend to be systematic.
It was also observed that in the CV syllable structure, all verbs apart from a majority of those that have the sound /j/ in the onset at the word initial position, acquire an extra V syllable when they change to the first, second and third person singular. This is shown immediately below:

<table>
<thead>
<tr>
<th>Verb</th>
<th>1st person singular</th>
<th>2nd person singular</th>
</tr>
</thead>
<tbody>
<tr>
<td>funga (close)</td>
<td>efunga (I am closing)</td>
<td>ofunga (you are closing)</td>
</tr>
<tr>
<td>3rd person singular</td>
<td></td>
<td></td>
</tr>
<tr>
<td>afunga (he is closing)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The verbs that have the phoneme /l/ as the onset at the word initial position will not only acquire the extra V syllable at the word initial position in first, second and third person categories but will also change the phoneme of the onset of the second syllable, but only in the first person singular. This occurrence is exemplified in the example immediately below:

<table>
<thead>
<tr>
<th>verb</th>
<th>1st person singular</th>
</tr>
</thead>
<tbody>
<tr>
<td>/iima/ (dig)</td>
<td>enima</td>
</tr>
</tbody>
</table>

The analysis of the data however showed that the consonant sound /l/ does not change in the second and third person categories as is the case in example immediately above.

Another observation from the data presented was that words that have /j/ and also some words with /l/ at the word initial position change it to /n/ in the first person, /w/ in the second person singular and /k/ in the third person singular; for example:
Verb 1st person category 2nd person category
/jikula/ (open) /nikula/ I am opening) wikula (you are opening)

3rd person category
kekula (he is opening)

The occurrence shown using the sound /j/ is more or less similar to the Finnish case in which there is an example of assimilation where /t/ changes to /s/ before the vowel sound /i/. This is represented as:

\[
\text{This rule can be applied to Olunyala for the change of /j/ to /n/ in the first person singular, a rule which can be formulated as follows:}
\]

\[
\text{j} \rightarrow \text{n/} \quad 1^{\text{st}} \text{person singular}
\]

4.6 The Onset with Two Semi Vowels and Semi Vowel Syllabification

The analysis of the data revealed that in Olunyala, two semi vowels can form the onset of a syllable as shown by the common noun eyaywa in Figure 4.19.

\[
\text{Figure 4.19 Onset with two labiolizers}
\]
In the above example the semi vowel /w/ may be superscripted to the semi vowel /j/ to appear /jw/ as per the discussion on labiolizers in Section 4.2.2.4. This means that /jw/ is a phoneme on its own. The observation of the data showed that in Olunyala, when the onset of a syllable is formed by a semi vowel, the nucleus is always formed by the vowel sound /a/.

In Bantu languages, the nucleus of a syllable can only be a vowel or a semi-vowel. However, for a semi-vowel to be in the nucleus position in has to be realized as a vowel. From the present study, it was observed that this realization is not exactly the same for Olunyala in which each semi vowel behaves differently in syllable formation. The semi vowel /w/ does not always syllabify to occupy the nucleus of the syllable. Two things take place with the semi vowel /w/. In the first occurrence, it was observed that it is the vowel sound /u/ that tends to acquire the characteristics of the semi vowel /w/ when it is assimilated to any of the basic vowels in the language to form the semi vowel /w/ which then becomes part of the onset. This occurrence is shown in the words in column II of Example 4.15. In the second occurrence, is when assimilation of two vowels, usually in the second syllable and the third zero onset syllable, does not take place. The failure to assimilate then results in a word with an extra syllable as shown in the words in column I of Example 4.15.

Example 4.15

<table>
<thead>
<tr>
<th>I</th>
<th>II</th>
</tr>
</thead>
<tbody>
<tr>
<td>O$m$mu$d$e$yi (adulterer)</td>
<td>o$m$we$d$yi (a sweeper)</td>
</tr>
</tbody>
</table>
O$mu$sa$ni (a generous person)  o$mw$wa$yi  (a shepherd)
O$mu$o$nia (a savior)  o$rm$wo$ni (a sinner)

From the words in Example 4.15, it was observed that the manner of syllabifying the semi vowel /w/ is determined by the meaning. For instance, the word omueyi would still be articulated as omweyi by fussing together the nucleus of the 2nd syllable to the zero onset syllable in the manner shown in Section 4.2.2.4 but this would change the meaning.

From the present study, it was noted that the same cannot be said of the semi-vowel /j/. In Olunyala, /j/ syllabifies to form the vowel sound /i/, which is assimilated by the vowel immediately after it and thus resulting in the CV syllable structure discussed in section 4.2.2.6 above. In cases where /j/ does not syllabify, the resultant word has a different meaning. For example, lia (eat) would be liya (‘getting cooked’). Therefore, just like in the case of /w/, syllabification of the semi vowel /j/ is used to show difference in meaning.

4.7 Summary of the Chapter

The analysis of the data in this section indicates that onsets in Olunyala can be internally complex and as such, the language uses more consonant compound sounds in the onset than the single graphemes in syllable formation. The findings also showed that the V is the optimal or preferred syllable structure in Olunyala.
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

The summary, conclusions and recommendations of the research findings are contained in this chapter. Guided by the research questions, objectives and assumptions, the researcher first presents a brief summary of the research findings. The implications of the research findings are then discussed before the conclusions and recommendations.

5.1 Summary and Findings

The objectives of this study were to identify the syllable structures of Olunyala and their prevalent word positions and to establish the sequential constraints in the formation of these structures.

From the analysis of the data, there were quite a number of findings. First of all, from the postulation of the Olunyala sounds (Appendix 11) the language was found to have only 13 basic consonant sounds. These are /b/, /v/, /k/, /l/, /l/, /n/, /m/, /p/, /l/, /s/, /w/ and /j/. Olunyala also has 22 sounds that consist of more than one grapheme; 17 of which are as a result of the labiolizer discussed in section 4.2.2.4. This gives Olunyala a total of 35 consonant sounds and 5 basic vowels. The data
analysis showed that Olunyala has three (3) syllable structures and not all of them occur in all word positions. The CVV syllable structure occurs in the word initial position in Olunyala while syllables with the geminate do not occur in the word final position. The geminate and the CVV syllable structure do not occur in the same word. Although the V and CVV syllable structures can occur at any word position, each of them has a preferred word position. The CV syllable structure has 7 types. The V syllable structure is the optimal syllable in Olunyala.

Secondly, some Olunyala sounds do not occur in certain word positions in some syllable structures. Not all basic vowels form the nucleus in any position in the formation of Olunyala syllable structures. In particular the vowel sounds /i/ and /u/ do not occur in the initial word position in the V syllable structure in Olunyala. The consonant sound /r/ does not occur in the word initial position in Olunyala syllables.

Thirdly, the data analysis also shows that only 4% of common nouns in Olunyala do not begin with the zero onset syllable. The analysis of the data revealed that the sounds /g/, /h/, /d/ and /b/ do not occur independently in Olunyala while /ʃ/ /z/ /dʒ/ and /ts/ do not occur at all. The sound /d/ seems to occur accidentally when it is interchanged with /t/.

Fourthly, the postulation of the syllable structures shows that there is allophonic occurrence in Olunyala which is seen in the /I/ and /r/ as in /eʃianI/ and /eɾianI/. It was also observed that /I/ is not an allophone of /I/ because the minimal pair test did
not show any Olunyala words in which the two could replace each other without altering the meaning.

5.2 Implications of the Findings of the Study

The findings of this study identify the basic phonological structure of Olunyala. Another important implication of the research findings is the contribution to the phonological theory that not all segments in a language can occur in any syllable structure and word position and that it is the syllable that constrains the combination of vowels and consonant segments of a language. The results add to information on the phonological structures of world languages for comparison purposes. This adds to the documentation of phonological elements of other languages as the existing ones seem to favour the Indo-European languages. The findings of this study pertaining to the V syllable structure show that Olunyala is one of the languages that can be assumed to have a rule for the phonological component which deletes the syllable initial C element and thus allowing canonical syllables with V only. The findings will not only contribute towards the documentation of Olunyala but also the writing of material in the language which can, inter alia, be used in the catchment area in tandem with the Government of Kenya policy.

The findings of this study will also help to remove the confusion that speakers of Olunyala have between the voiced and voiceless sounds like/p/ and /b/, /t/ and /d/ and /k/ and /g/ and /tʃ/ and /dʒ/.
5.3 Conclusions

From the findings of this study, it can be concluded that Olunyala conforms to the linguistic generalizations like most Bantu and world languages in some of its phonological processes like deletion and gemination and therefore the algorithm that govern phonological occurrence. Like any other language, Olunyala too has constraints on syllable formation and does not allow the phonemes in the language to combine haphazardly. The language has sounds that do not occur independently and some that are used minimally. For example, the Olunyala consonant sound /r/ does not appear much in the formation of syllable structures, and is therefore used minimally in the language. This is as per Odden (2005: 226) that not all segments or sets of segments have equal status in phonological systems. The findings also show that V is the preferred syllable structure in Olunyala.

5.4 Suggestions for Further Research

The syllable structures of Olunyala was the focus of this study. The study, however, revealed the following areas which need further research. One is the cause of the sound alternation in morphological paradigms in which voiceless sounds like /l/, /k/ and /j/ change to voiced prenasalised sounds. There is also need for the phonemic inventory of Olunyala and those of other Luyia dialects to be carried out. Such a study would enable an objective comparison of Olunyala and other Luyia dialects as it would show the sounds that do not occur in all of them. Such a study would also
inform comparative studies to other Bantu and world languages. Another area
connected to the present study that needs to be studied is the issue of a branching
onset to capture the composition of the internally complex onset and nucleus in
Bantu languages. A study on the orthographic symbols of Bantu languages also
needs to be carried out to differentiate some sounds like /b/and /B/ and also get phonetic
symbols for sounds that are not represented in the IPA chart; for example those with
nchw sequences. A study can also be carried out on the geminate and vowel
assimilation to find out the sound combinations in both cases.
REFERENCES


www.kenya-advisor.com/kenyamap.html 29/2/08
APPENDIX I

MAP OF WESTERN PROVINCE SHOWING STUDY SITE

KEY
1. BUKUSU
2. WANGA
3. BUKHAYO
4. MARACH
5. SAMIA
6. BUNYALA (K)
7. BUSONGA
8. MARAMA
9. KISA
10. BUNYORE
11. MARAGOLI
12. TIRIKI
13. IDAKHO
14. ISUKHA
15. BUTSOTSO
16. BUNYALA (K)
17. KABRAS
18. TACHON

MAP OF KENYA SHOWING WESTERN PROVINCE

www.kenya-advisor.com/kenyamap.html
APPENDIX II

Olunyala Nucleus and Onset forming Sounds

<table>
<thead>
<tr>
<th>Orthographic Symbol</th>
<th>Phonetic Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nucleus</strong></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>a</td>
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<tr>
<td>e</td>
<td>e</td>
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<td>i</td>
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<td>u</td>
<td>u</td>
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<tr>
<td><strong>Onsets</strong></td>
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</tr>
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<td>Nouns</td>
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</tr>
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</tr>
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<td>nchw</td>
<td>87</td>
</tr>
</tbody>
</table>
# APPENDIX III

## SAMPLE LIST OF NOUNS AND VERBS

### MONOSYLLABIC

<table>
<thead>
<tr>
<th>Nouns</th>
<th>Verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>lia</td>
<td>eat</td>
</tr>
<tr>
<td>nywa</td>
<td>drink</td>
</tr>
<tr>
<td>chia</td>
<td>go</td>
</tr>
<tr>
<td>khwa</td>
<td>pay dowry</td>
</tr>
<tr>
<td>wa</td>
<td>give</td>
</tr>
</tbody>
</table>

### DISYLLABIC

<table>
<thead>
<tr>
<th>Nouns</th>
<th>Verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>eta</td>
<td>wall</td>
</tr>
<tr>
<td>esio</td>
<td>a mirror</td>
</tr>
<tr>
<td>engwe</td>
<td>a leopard</td>
</tr>
<tr>
<td>esi</td>
<td>a fly</td>
</tr>
<tr>
<td>embwa</td>
<td>a dog</td>
</tr>
</tbody>
</table>

### TRISYLLABIC

<table>
<thead>
<tr>
<th>Nouns</th>
<th>Verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nanjala</td>
<td>name of a person</td>
</tr>
<tr>
<td>omwayi</td>
<td>a shepherd</td>
</tr>
<tr>
<td>funula</td>
<td>uncover</td>
</tr>
<tr>
<td>komosa</td>
<td>turn round</td>
</tr>
<tr>
<td>Nouns</td>
<td>Verbs</td>
</tr>
<tr>
<td>--------------</td>
<td>--------------</td>
</tr>
<tr>
<td>omusamba</td>
<td>kalusania</td>
</tr>
<tr>
<td>esiwiri</td>
<td>kololosa</td>
</tr>
<tr>
<td>wamburuku</td>
<td>kangulula</td>
</tr>
<tr>
<td>Enamirama</td>
<td>yingirira</td>
</tr>
<tr>
<td>esianwa</td>
<td>angalala</td>
</tr>
<tr>
<td>ekonge</td>
<td>yingana</td>
</tr>
<tr>
<td>esio</td>
<td>chanuula</td>
</tr>
<tr>
<td>efwiri</td>
<td>somesia</td>
</tr>
<tr>
<td></td>
<td>teach</td>
</tr>
</tbody>
</table>

POLYSYLLABIC

Nouns
- omusamba: name of a river
- esiwiri: mortar
- wamburuku: dove
- Enamirama: name of place
- esianwa: offering

Verbs
- kalusania: turn
- kololosa: straighten
- kangulula: untie a rope
- yingirira: poke one’s nose
- angalala: left wondering
APPENDIX IV

A Table Showing the Labialized Consonants

<table>
<thead>
<tr>
<th>k</th>
<th>f</th>
<th>l</th>
<th>m</th>
<th>n</th>
<th>p</th>
<th>r</th>
<th>s</th>
<th>t</th>
<th>j</th>
<th>ndʒ</th>
<th>nd</th>
<th>tʃ</th>
<th>n</th>
<th>tʃ</th>
<th>x</th>
<th>n</th>
<th>ɲ</th>
<th>ŋ</th>
</tr>
</thead>
<tbody>
<tr>
<td>kʰ</td>
<td>fʰ</td>
<td>lʰ</td>
<td>mʰ</td>
<td>nʰ</td>
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<td>tʰ</td>
<td>jʰ</td>
<td>ndʒʰ</td>
<td>ndʰ</td>
<td>tʃʰ</td>
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<td>tʃʰ</td>
<td>x</td>
<td>nʰ</td>
<td>ɲʰ</td>
<td>ŋʰ</td>
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</table>