A MORPHO-PHONOLOGICAL ANALYSIS OF LUWANGA NOUNS AND VERBS

BY

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DECLARATION

This research project is my original work and has not been submitted for examination in any other university.

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This project has been submitted for examination with our approval as the university supervisors.

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DEDICATION

I dedicate this work to my parents, Musa Olalie, Lily Aswani and siblings for being so patient with me and for their moral support, especially when I lacked time for them as I concentrated to come up with the best out of this work. I am so much humbled.

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LIST OF ABBREVIATIONS

Aff   Affix

CC   Consonant Cluster

CVC   Consonant Vowel Consonant

CV   Consonant Vowel

CCV   Consonant Consonant Vowel

KNBS   Kenya National Bureau of Statistics

LR   Lexical Representation

PR   Phonetic Representation

Syll   Syllable

VVC   Vowel Vowel Consonant

VCV   Vowel Consonant Vowel

ABSTRACT

This study explains the hierarchical nature of the Luwanga lexicon using the Lexical Phonology theory. The study also explains the relationship between morphology and phonology, in the structure of the Luwanga lexicon. The objective of the study is to show the hierarchical arrangement of the Luwanga Lexicon to form a linguistic paradigm. This study explains the processes the Lexicon goes through in the different strata of the Lexical Phonology Theory. Word building processes and the cyclic rules that govern the whole process are also described. Some morphological processes that affect phonemes in plural formation, negation, formation of augmentative and diminutive nouns are discussed in this study. The study gives a wider understanding of the Luwanga morphophonemics. It explains the phonological variations within morphemes that mark different grammatical functions.

Data collected for this study, is through interviews. A qualitative data collection procedure is used in the research. The qualitative data collected is from the native speakers of Luwanga from Matungu village in Matungu sub-county, Kakamega County. Purposive sampling technique is applied to identify the respondents for the interview process. The study established that the morphological rules of inflection and derivation are used in tandem with the phonological processes such as glide formation, vowel coalescence, and nasalization. Luwanga noun classes are also mentioned and explained.

It was found out that the Luwanga lexicon can be ordered hierarchically. The principles of the LP Theory present the Luwanga lexicon morphologically and phonologically. The study dwelled on the Luwanga lexicon. an analyzation of the lexicon using the lexical rules. There is room for further studies to be done using the post lexical rules of the LP theory.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

This study explains the role of phonological and morphological rules in the word formation process and the organization of Luwanga lexicon. According to Guthrie (1967), Luwanga is classified under Niger-Congo, Central Bantu languages belonging to class J (E32). It is a central Masaba Luhya dialect from the macro-Luhya language spoken by people of Mumias, in Kakamega County. The Abawanga are divided into 22 clans known as Tsihanga namely; Abaleka, Abashitsetse, Abakolwe, Ababere, Abamuniafu, Abambatsa, Abakhami, Abashibe, Abashieni, Abachero, Ababule, Abang'ayo, Abalibo, Abashikawa, Abamurono, Abamwima, Abakulubi, Abang'ale, Ababonwe, Abatsoye, Abamulembwa, Abamwende. All these clans are separated into Northern, Eastern, Western and Southern Luwanga.

The Abawanga migrated from Eastern Uganda through Buganda and Busoga. They mainly occupy Mumias in Kakamega County. Abawanga border other Luhya dialects like the Lumarama, Lubukusu, Lukhayo, Luidakho and Lukabras. The frequent interaction with the neighboring languages has led to acquisition of some words and sounds which are not native Luwanga words. According to the Kenya National Bureau of Statistics,2019 report, Abawanga stand at a population of 94,190 speakers.

Like most Bantu languages, Luwanga has different lexical entries for different word classes and syntactic organization of sentences Troyer (2007). These follow a particular order and rule depending on the word class. The similarity and difference of the lexical entries is determined by the morphological and phonological rules that dictate a particular lexeme. Hence, a critical analysis and explanation of these morphological and phonological rules that apply on different lexical entries and what necessitates the different levels of the lexicon has to be done.

1.2 Statement of the Problem

Luwanga nouns and verbs have a variation on phonological rules in relation to morphological environments. Unlike most Bantu languages that have the CVCV word structure, Luwanga has a lot of vowels at word initial position for most of its native nouns. Achesa, Mandillah & Barasa (2019) indicate that the vowels at the initial positions are as a result of affixation process and are used as word class markers.

According to Mohanan (1982), phonological rules apply in the lexicon after every morphological operation such as affixation or compounding. This cyclic fashion brings out phonological, syntactic and morphological components interaction of the lexicon. Through this interaction, a hierarchy is created which follows ordered lexical strata.

The study investigates the relationship between phonology and morphology and how the two interact to develop lexical strata of the Luwanga lexicon by referring to the various claims made by the LP theory. According to this theory, as discussed by Mohanan (1982), the lexicon consists of ordered lexical strata which function as the domains of application of phonological and morphological rules. These rules are assigned to particular strata or levels in both phonology and morphology whereby words are built up in stages so that some phonological rules apply early in a derivation and are then followed by morphological rules of affixation.

The present research therefore seeks to explain the role of phonological and morphological rules in the word formation process and the organization of Luwanga lexicon. Luwanga nouns and verbs have affixes, prefixes and suffixes. Affixation is a kind of morphological process whose role is to create words that have a high level of transparency, which means that words have a formal morphological structure that relates to their semantic interpretation Booij (2007, pp. 34). He argues that words are grouped into various roots and affixes called morphemes. Therefore, morphemes are morphological atoms of any given language. The morphological rules explain this morphological structure of words.

No study has been conducted to establish the nature of these prefixes and suffixes. Watulo (2018) explains the affixation processes in inflectional structure of Lubukusu verbs. His study only looks at the morphology of the Lubukusu verb. Also, given that no such study of Luwanga has been conducted using the LP theory, the present study tests the applications of the principles embedded in the LP theory with the view to establishing how effective they are in accounting for morphological and phonological processes in Luwanga. The study seeks to address this gap and give an explanation through a lexical phonological study of Luwanga.

1.3 Research Questions
This study seeks to answer the following questions:

(i)   What are the derivational and inflectional processes that occur in Luwanga nouns and verbs?

(ii)   Are Luwanga nouns and verbs hierarchically structured?

(iii)   What lexical phonological processes are involved in the formation of nouns and verbs in Luwanga?

(iv)   What is the role of morphology in the phonological structure of Luwanga nouns and verbs?

1.4 Objectives of the Study
This study was guided by the following objectives:

(i) To identify the derivational and inflectional processes that occur in Luwanga nouns and verbs.

(ii) To describe the hierarchical structure of Luwanga nouns and verbs.

(iii) To investigate the lexical phonological processes involved in the formation of nouns and verbs in Luwanga.

(iv) To establish the contribution of morphology in the phonology of Luwanga nouns and verbs.

1.5 Justification of the Study
This study is significant because it provides useful insights into the various phonological and morphological interactions that take place in the process of forming Luwanga nouns and verbs within the ordered lexical strata paradigm. The morpho-phonological strata of Luwanga lexicon is an area that has not been studied in depth.

This study will be a useful contribution to the linguistics of Luwanga in particular and by extension to the linguists of those Luhya dialects that have a similar structure as that of Luwanga. The study has given an elaborate explanation on the formation of the Luwanga lexicon. This is an integral element in the study of any aspect of a language. It will also have a pedagogical value in view of the government's stated policy on the use of mother tongue for teaching in the lower primary levels

in schools within the framework of the Competency Based Curriculum. The teachers and learners implementing this policy will be in a position to explain and understand the morphological and phonological structure of the Luwanga lexicon. This study is therefore, to the best of my knowledge justified because it will fill the gap that has not been addressed in earlier studies in as far as the lexical phonology of Luwanga is concerned. No study has looked at the paradigmatic formation of the Luwanga lexicon as presented by the principles of Lexical Phonology Theory.

1.6 Scope and Limitations of the Study

This is a descriptive study of the morpho-phonological processes that occur in the formation of Luwanga nouns and verbs. The scope of the study is limited to morphological and phonological processes of Luwanga nouns and verbs, with focus being mainly on the morphological process of affixation as well as the various consonant and vowel phonological processes that take place at the lexical level.

The study describes the different changes and alternations that occur during the process of forming nouns and verbs in Luwanga using the Lexical Phonology theory. This study is confined to the lexical level and will not address any processes that occur at the post-lexical level of phonology.

In relation to the research problem and objectives, this study is limited to examining the morphological and phonological processes affecting the Luwanga nouns and verbs. It investigates the morphological and phonological processes in word class formation, pluralization, vowel and phoneme addition and widely the hierarchy of the lexicon in Luwanga. The phonological and morphological processes are determined by affixation on different nouns and verbs. Luwanga word classes are mainly formed by the addition of prefixes or suffixes to the root and the stem of a word. Nouns are then divided into different classes according to their prefixes.

Green, Marlo & Diercks (2019) state that there are twenty noun classes in Luwanga distinguished by their prefixes. The classes are discussed in the subsequent chapters.

These noun classes are analyzed through different strata of the lexical phonology. In stratum one morphology constructs the inflection stem from the root. For example, *'sia'* 'mill' (verb) is the root, when affixation process takes place, both prefixation and suffixation *'oxusia'* (to mill) *'oxusietsaŋga'* '(to be milling) inflect the root for tense. The root undergoes morphological change while the stem undergoes phonological change.

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There are sixteen consonants and two glides in Luwanga. They undergo different processes at different strata.

These consonants are;

1.

Grapheme	IPA	Luwanga word	Gloss
B	/β/	Aβana	Children
F	/f/	Fjosi	All
K	/k/	Kaala	Slow
M	/m/	Mkhwasi	brother-in-law
NG'	/ŋ/	ŋaŋala	Shocked
Kh	/x/	Xaba	Search
Ts	/ts/	Tsixwi	Firewood
R	/r/	Ruta	Scratch
L	/l/	Langa	Call
W	/w/	Wina	Who
T	/t/	Tira	Catch
Sh	/ʃ/	Shiro	Market
Ch	/ʧ/	ʧenda	Walk
S	/s/	Sinza	Slaughter

The data above shows the graphological and phonemic representation of the Luwanga consonants. From the data presented, it is evident that Luwanga consonants, apart from the nasals, are mostly voiceless.

Some Luwanga verbs undergo an affixation process that results to formation of a noun.

2. /iruxa/ 'Run' (verb)

/oxu-iruxa/ 'To run' (infinitive verb)

/omu-iruʃi/   'a runner'   (noun)

/texa/   'cook'   (noun)

/oxu-texa/   'to cook'   (infinitive verb)

/omu-teʃi /   'a cook '   (noun)

/sirixa/   'treat'   (verb)

/omu-siriʃi/   'a doctor '   (noun)

/oxu-βaya/   'to play '   (infinitive verb)

/omu-βayi /   'a player'   (noun)

The data above shows the formation of nouns from verbs and the formation of to- infinitives from bare infinitives. The Luwanga morpheme/oxu/ is an equivalent of the English morpheme to- infinitive. The Luwanga morpheme /omu/ is an indefinite noun class marker.

1.7 Literature Review

This section reviews previous works that have a bearing on the present study and their contribution to this study. The section is divided into two sub-sections. The first sub-section reviews literature on related Bantu Languages whereas the second sub-section looks at the literature on Luwanga.

1.7.1 Literature on related Bantu languages

Bakari (1982) describes the morpho-phonology of Swahili dialects spoken in Kenya. He looks at the different structures and levels within which these distinctions occur. Luwanga being a Bantu language like Kiswahili, the observations made with regards to the morphology and phonology of Kiswahili may be applicable to Luwanga as well.

Kanyoro (1983) undertakes a syntactic analysis of seventeen related Luhya dialects and the role the missionaries played in shaping the orthography, syntax, morphology and phonology of the Luhya languages. She looks at the morphological and phonological structures of the dialects, an aspect that is relevant to this study. Luwanga being in the same language family with the dialects she looked at in her study, it is relevant that her work is referenced in this study.

Mutaka (1990) explains the lexical tonology of Kinande, a Bantu language spoken in DR Congo. He points out the division of the post lexical strata into two different strata P1 and P2. This division

he claims, is influenced by phonological changes. Having looked at the different strata within LP theory, his work is equally helpful to this study for it exhibits some lexical properties.

Mberia (1993) uses Natural Generative Phonology theory to discuss the segmental morphology with reference to the verb and the noun. The phonological changes within words he discusses are relevant to my study. In his other dissertation (1981), he discusses the various phonological processes in Kitharaka and rules that govern consonantal sound changes in words. Kitharaka being another Bantu language with a close phonological structure to Luwanga, this study will give adequate information on the morphological and phonological changes of the verb and noun.

Mutua (1999) discusses the Lexical Verb form of the Kikamba using LP theory. He discusses the interaction of word formation rules of the morphology and phonological processes in Kikamba verb formation. Having used the same theory, LP, his study therefore is related to this study with great difference on the structure of the lexicon.

Buell (2011) argues that Bantu languages use their subject markers, object markers and agreeing prefixes that appear in the verb. Bantu verb word can be composed of a number of morphemes related to different syntactic domain. This study gives an insight to the verbal morpheme composition that is one of the areas of study in this research.

Watulo (2018) uses the Inferential Realization Theory to discuss the Inflectional structure of Lubukusu Verbs. His study explains the morphological processes that the Lubukusu verb goes through. Lubukusu being a dialect of the Luhya language just like Luwanga, his study plays a role in this research.

1.7.2 Literature on Luwanga studies
Anangwe and Marlo (2008) in *Luwanga-English Dictionary* provide a lexicographical entry of Luwanga words with their English equivalents. The dictionary was prepared based on Appleby's 1943 *Luhya-English Vocabulary*. It provides the English meanings of various word categories in Luwanga such as: adverbs, adjectives, nouns, demonstratives, possessives, exclamations and verbs. This work is useful for it provides relevant data that will be used to countercheck the data provided by informants in the present study.

Lubanga (2018) explains the lexical and semantic structure of the Luwanga lexicon using the Wave Theory. His study explains the relationship between Luwanga lexicon and the other macro-Luhya dialects like Lumarama, Lushisa and Lubukusu. He states the effects of the geographical boundaries on the native words of the dialects. His study provides information on the native Luwanga lexicon that is relevant to this study.

Akidah (2000) discusses Luwanga morphophonemics using the Natural Generative Phonology approach. He generally discusses the various alternations that occur in Luwanga paying close attention to the phonological and morphological environments of the words. His study does not narrow down to the rules that govern the alternations, the different levels of the alternations and the degree to which the alternations are acceptable within Luwanga language. Nevertheless, his study provides relevant information on the phonology and morphology of Luwanga particularly with regard to the sound system of Luwanga and its noun classes.

Flickinger (1987) discusses the lexical rules in the hierarchical lexicon of Luwanga. The study focuses more on the general analysis of the hierarchy of a lexicon with no reference made to lexical strata and the morphological and phonological changes which this study discusses. The study is useful in the sense that it provides data on the lexical rules needed for different morphological and phonological processes to occur.

Green (2008) provides an explanation on Paradigm Uniformity in Luwanga Nouns. He focuses on the class 9/10 nouns. His study explains the affixation and formation of the diminutive and augmentative nature of the Luwanga noun. This is relevant to the present study in that it highlights some of the affixation processes applied on the Luwanga noun.

These studies provide a decent foundation to the present study. They discuss different aspects of Luwanga. However, none of them explains the inter relationship between morphology and phonology using the Lexical Phonology theory. This study expounds on the formation of the Luwanga lexicon, the rules that govern that formation and paradigmatic arrangement of the grammatical formation of the morphemes.

1.8 Theoretical Framework

This study is done within the framework of Lexical Phonology. Udema, (2004) postulates that Lexical phonology theory was developed in the early 1980s by K.P Mohanan, Paul Kiparsky and Steven Straus. The theory combines morphological and phonological rules within a single framework. She states thus "…lexical phonology is an approach to phonology that accounts for the interactions of morphology and phonology in the word building process and the approach is based on the insight that much of the phonology operates together with the word formation rules in a cyclic fashion to define the class of lexical items in a language." The theory also has elements from Generative Phonology propounded by among other scholars Venneman (1971), Hooper (1976), Hudson 1975) and Rudes (1976). LP expounds Generative Phonology by including the lexicon and morphology in its arguments and explanations. Kisparsky (1982) explains the relationship between morphology and phonology, and generative and lexical phonology as follows:

> It is tempting but unfair merely to dismiss lexical phonology as the generativists' rediscovery of phonemics. Lexical phonology is clearly generative in style of theoretical modelling and its commitment to rule based description including the principle of cyclic rule application Lexical phonology continues to grapple with the problem of describing English morphology and morphophonemics (Kiparsky 1982:39).

Chomsky and Halle (1968) contend that segments in language are not the ultimate units of phonological structure. Instead, they view segments as composed of smaller units called features. These are units of phonological structure that make up segment. The representation of a segment with feature can be accomplished by placing the features of each segment in a series referred to as a matrix. Each feature or group of features defines a specific group of the segment. This representation is in binary terms where [+] means that a feature is present while [-] means that a feature is absent. This work gives general phonological properties that will help in analyzing the Luwanga.

Mohanan (1982) and Kiparsky (1982) paved way into the Lexical Phonology theory which was later taken up by various scholars who proposed applications, modifications and extensions of the same. Mohanan (1982) distinguishes between Chomsky's SPE and Lexical Phonology. He argues that: It has been recognized in Linguistic theory since Chomsky (1968) that the principles

responsible for putting morphemes together to form words are to be distinguished from principles that put words together to form sentences. What Lexical phonology does is complete the set, and say that the principles governing the structure, meanings and phonology of words are to be distinguished from the principles governing the structure, meanings as well as the phonology of sentences.

Kiparsky (1982) digs deep into level ordered morphology. He states that all inflectional and derivational processes of any given language can be analyzed in a series of levels. Each level is associated with a set of phonological rules for which it defines domain of application. These rules apply in a cyclic manner yielding word formation processes.

Katamba (1989) observes that Lexical phonology gives the lexicon a unique position in the derivation and inflection of words. It is recognized as a central component of grammar which not only contains the idiosyncratic properties of words and morphemes, but also the word formation rules of the morphology which are directly paired with the phonological rules at various levels.

Following SPE's inadequacy to explain certain language functionalities, Durand (1990) looked into the interaction between word formation rules and phonological rules .He discusses lexical rules and cyclicity, zero derivation , bracket erasure convention, morphological component and level ordered morphology, strict cyclicity and abstractness .He states that "..the cycle assumes a general principle that the phonological rules first apply to the maximal strings that contain no brackets, and that after all relevant rules have applied ,the innermost brackets are erased ;and erased after each application ;and so on until the maximal domain of phonological processes is reached ."

His study has a detailed account of the Lexical Phonology frame work thus making it beneficial to this study.

Odden (1996) observes that:

> Whereas non–linear phonology concerns itself with aspects of phonological representations, lexical phonology concerns itself with the derivational problems of how rules are organized into a grammar, and how the phonological syntactic and morphological components interact. (Odden 1996)

According to Mutua (1999), Lexical phonology is a word –based theory of morphology in which "phonology interfaces with the lexicon and morphology on one hand and syntax on the other. Chomsky and Halle (1968) assert that syntax acts as a filter for the type of formatives that constitute words on which phonology operates.

Lexical phonology offers changes to the derivational aspect of the theory proposed in The Sound Pattern of English. It deals with the Lexicon as the core component of grammar which contains word formation and phonological rules. Lexicon has an internal structure which is ordered hierarchically. LP therefore allows for the sub categorization of the lexicon into different strata.

The works reviewed in both Luwanga and the related languages will provide relevant and useful information that will make it easy to conduct a comprehensive analysis to the breadth of applying the principles of LP theory to the Morpho-phonological strata of the Luwanga Lexicon.

This study was done within the Lexical Phonology (LP) theory which was previously known as lexical Morphology and Phonology as forth put by linguists such as Kiparsky (1982) and Mohanan (1982) among others and is used to explain the relationship between the morphology and phonology in the grammar of any language. Lexical phonology best explains the cyclic fashion in which morphology and phonology interchangeable apply on ordered lexical strata.

Lexical phonology concerns itself with grammar. It addresses the relationship among morphological rules, phonological changes and the lexicon. A deep explanation is given on the claims that all morphological processes and some phonological ones take place at the lexicon.

Siegel (1974) argues that affixes behave differently in word formation processes. These word formation processes are organized in a sequence linked together. Some morphological processes therefore take place at level one (stratum one). The output of the morphological changes undergoes the phonological rules at the same level. The result then moving to level two as a morphological component, which undergoes more affixation and phonological rules within level two.

This concept of the stratum is schematized as below;

Stratum 1

Stratum 2

Stratum *n*

Rule 1

Rule 2

Output of Lexicon

Post lexical stratum

Rule J
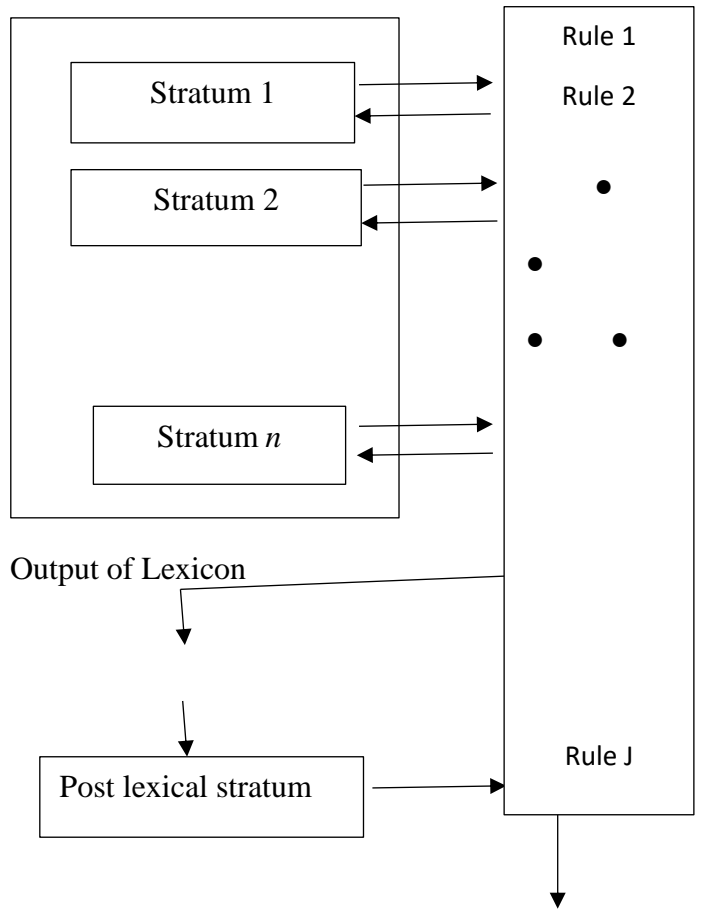
Output of Lexicon

(Phonetic representation)

Figure 1- Concept of Strata

Adapted from Mohanan (1982)

The LP theory argues that phonological rules apply from the underlying forms through the lexical forms. Akidah (2012), classifies the rules into two;

    i.   Those that require word internal morphological information to apply. These apply in the lexicon as part of the formation process.

    ii.   Those that apply after the word formation process has been completed, that is, post lexically

The lexical level has the lexical rules which interact with the morphological rules. These rules apply on the lexicon, which is a rich transformational component in inflection and derivation. They also present properties that are shared between different lexical entries. The lexicon consists of ordered lexical strata.

Affixation processes and phonological rules come packaged together. These rules apply and re-apply during word formation processes forming a cyclic pattern. There is an interlock of phonological and morphological rules at each stratum creating a successive application of word formation rules. The rule application process is schematized as follows;

Phonological rules

Lexicon

Underlying representation

.

.

.

Lexical representation

Lexical insertion ⟶

.

⟵————————————— Phonological rules

13

.
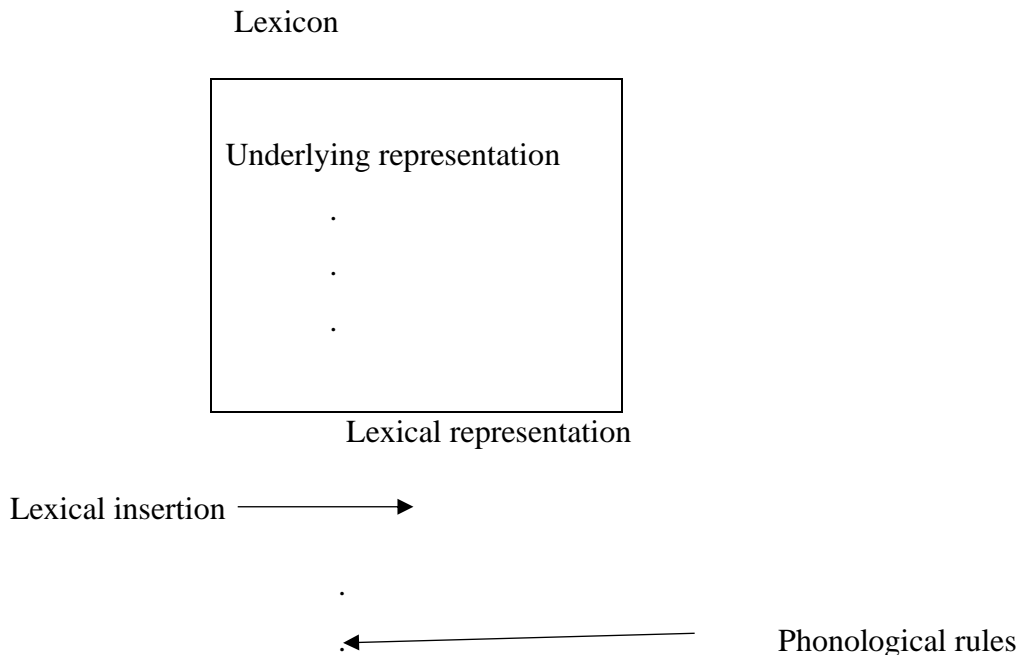
Phonetic representation

.

Phonetic representation

Figure 2 - Rule application process (Adapted from Mohanan (1982:12)

The LP's principles argue that the lexicon consists of ordered strata thus claiming that the lexicon is structured hierarchically.

Based on this postulation, phonologists have proposed different strata according to the interpretation of the lexicon.

Mohanan (1982) suggested four levels;

Level 1- Class 1 derivation

Level 2- class 2 derivation

Level 3 – Inflection

Level 4 – Compounding

Kiparsky (1982) suggested three levels;

Level 1 – Derivation and primary (irregular) inflection

Level 2 –Compounding and secondary (regular) derivation

Level 3- Secondary inflection

Katamba (1989) suggested two levels;

Level 1- Derivations

Level 2-Inflections

Words are organized into roots stems and affixes. Phonological rules apply immediately after each morphological rule at both levels of the lexicon, root and stem. Expounding on Siegel (1974) argument, Mohanan (1982) states that affixes behave differently in word formation processes.

Both processes, inflectional and derivational, operate on the given levels and are cyclic in nature. In this case, certain morphological processes take place at the first stratum of the morphological component.

The outcome of level 1 morphological process undergoes level 1 phonological process. The results derived at level 1 are then re-submitted to level 2 morphological process where other affixes are added to the lexicon and the process goes on.

This principle of strata presupposes that the lexicon is ordered hierarchically into strata. Words are hierarchically organized into roots, stems and affixes. Each level has an affix attached to it. Level 1 affixes are always closer to the root than level 2 (Mohanan, 1982). LP divides phonology into lexical components and post lexical components. At the lexical component, the word formation rules for both derivational and inflectional processes are grouped together in different strata.

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┌──────────────────────────────────────────────────────────────────┐
│  ┌─────────────────────────────┐                                    │
│  │ Underived lexical items     │                                    │
│  └─────────────────────────────┘                                    │
│                │                                                     │
│                ▼                                                     │
│  ┌─────────────────────────┐      ┌──────────────────────────────┐  │
│  │   Level 1 Morphology    │ ───► │      Level 1 phonology        │  │
│  │                         │ ◄─── │                              │  │
│  └─────────────────────────┘      └──────────────────────────────┘  │
│                                                    │                 │
│            ◄───────────────────────────────────────┘                │
│            │                                                         │
│            ▼                                                         │
└──────────────────────────────────────────────────────────────────┘
   ┌─────────────────────────┐      ┌──────────────────────────────┐
   │   Level 2 morphology    │ ───► │      Level 2 phonology        │
   │                         │ ◄─── │                              │
   └─────────────────────────┘      └──────────────────────────────┘
                                                    │
         ◄───────────────────────────────────────── ┘
         │
         ▼
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| Syntax | → | Post –lexical phonology |
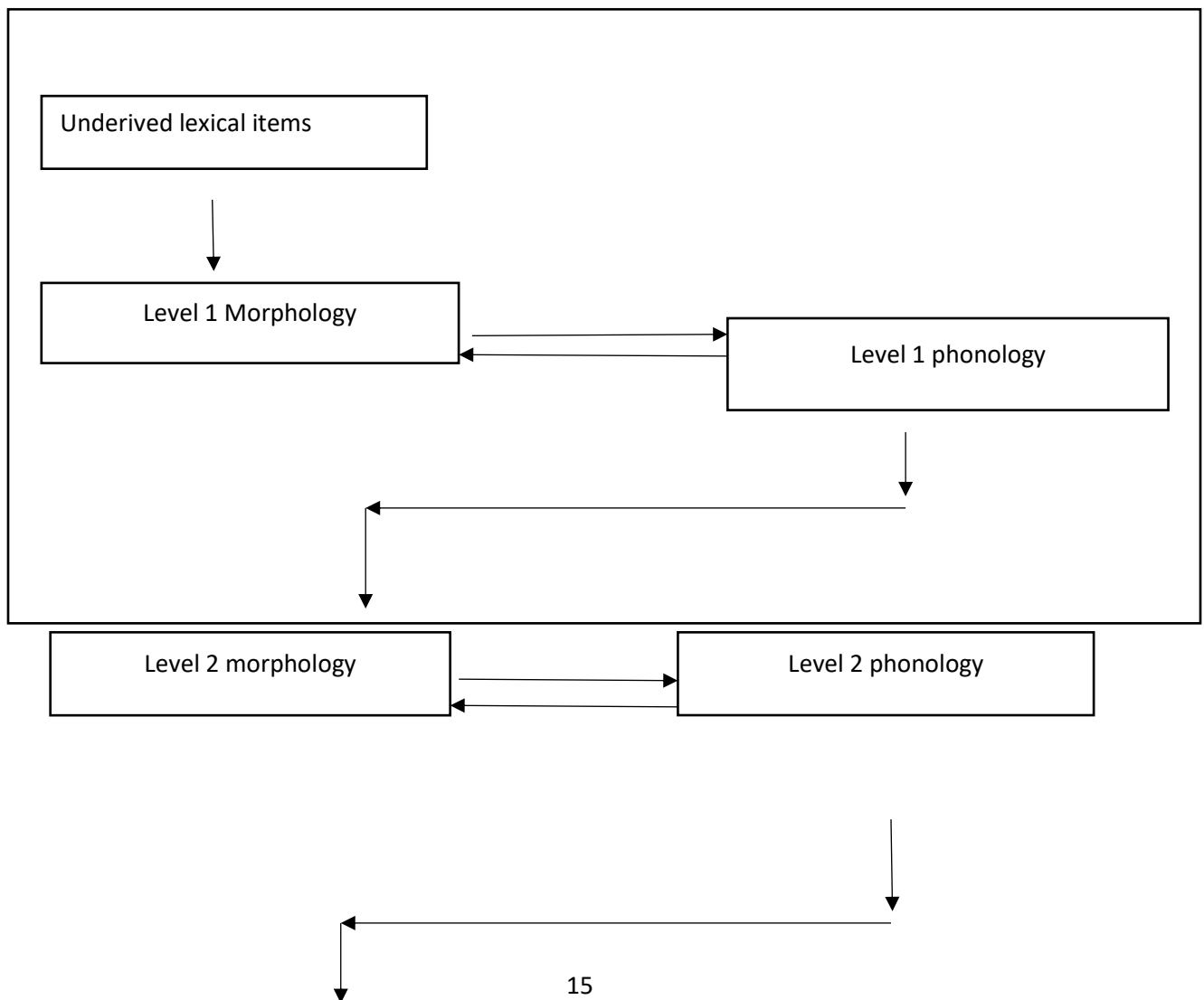
Figure 3: Structure of the Lexicon (Adapted from Kiparsky 1982a:131)

The principle of strata is illustrated in the figure above. At stratum one, an underived lexical component goes through morphological rules. The component is then passed to phonological processes within the same stratum. The lexical component then moves to the syntax level where post lexical rules apply depending on the description of the lexical component. Using an example of the English language, Mohanan (1982) breaks down the English lexicon into the following strata;

Stratum 1: Class l affixation (in-, -ity, -ion, -ic…)

Stratum 2: Class ll affixation (un-, re-, -dom, -ship…)

Stratum 3: Compounding

Stratum 4: inflection

A lexical rule can only apply within the lexicon for it has only lexical- internal structure. The rules apply in the lexicon after each morphological process. Rules applying lexically, automatically acquire other lexical properties. The properties may be morphologically conditioned or sustain lexical exceptions and are strictly limited to word-internal domains, thus, cannot apply across word boundaries.

The cyclicity with which the morphological and phonological rules apply, first apply to the root then outside to the affixes closest to the root and then to the outermost layers of affixes.

The application of these rules divides the word into three levels; the underlying, lexical and phonetic representation. Mohanan (1982:71) ex0plains the levels in the following way; The underlying representation is the phonological representation of morphemes in the set of lexical entries, the lexical representation is the phonological representation of words in the set of lexical entries and the phonetic representation is the output of all phonological rules, given in universal notation.

Mohanan (1982) postulates that the lexical level of representation is the level at which lexical items are represented in the mental lexicon. He goes on to explain that the behavior of code languages and speech errors can be viewed as operations on the mental representations which are input to online processing.

Post lexical rules apply outside the lexicon, at the phrase level. They cannot apply to the internal structure of a word, hence are not cyclic. They fit into a word's phrasal environment and have no direct access to the lexical properties of the constituent morphemes composing a word. Durand (1990) states that lexical phonology posits the existence of a post-lexical module which can rely on syntactic information, and all rules contained within this module are called post-lexical rules.

Lexical Phonology introduces new way of morphological levels representation different from use of boundary symbols that was used in the Sound Pattern of English. This new way is restricted to bracketing. As a word goes through morphological changes within a stratum, each change is bracketed to show the history within the stratum. When the word moves to the next stratum it loses the internal brackets of the previous.

At the end of each stratum all the internal brackets are erased. LP identifies this as the principle of Bracket Erasure Convention. Durand (1990: 175) defines it as 'one which erases internal brackets at the end of each level -Mohanan (1982:29)-, uses a different term from convention – Opacity principle, which states that, the internal structure at one stratum is invisible at another stratum, there is a constant deletion of brackets from one stratum to another during the word formation processes.

Bracket Erasure Convention plays a very important role in the theory of lexical phonology. It explains the erasing of internal brackets during word formation processes. The Bracket Erasure Convention is defined as one that gets rid of each level. (Durand 1990:175)

During the word formation processes, the brackets are brought at each morphological stratum. For example, the brackets are brought at stratum one that includes derivation. Then the brackets are erased.

Mohanan (1982:30) illustrates the application of this principle as follows;

3.

Untheatricality

	[*theater*]	
	[theater] ic]	-ic affixation
	[theatric] al]	BEC
	[theatrical]	-al affixation
Stratum 1	[theatrical] ity]	BEC
	[theatricality]	- ity affixation
		BEC

	[un [theatriacality]]	un- affixation
Stratum 2	[untheatricality]	BEC

Figure 4: Application of the Bracket Erasure Principle

Luwanga lexicon can be said to be hierarchical for it fits the principles of Lexical Phonology (Kiparsky-1982). Word classes such as nouns and verbs undergo affixation at different levels to derive new words and phrases, and at times new sentence structures. To illustrate this, the following shows how affixation in the word /βaja/ 'play' is ordered hierarchically;

Prefixes **[Root/word base]**   Suffixes

[Level 1 affixes]   **[Root/word base]**   [Level 1 affixes]

[Level 2 affixes] [Level 1 affixes] **[Root/word base]** Level 1 affixes] [Level 2 affixes]

Level Ordered Morphology of the Lexicon

For example; [omu+ [βaj]] →   [omu[βaji]

The verb [βaja] 'play' becomes the noun [omuβaji] 'player' upon affixation, a phonological change is seen in the derived word because the word final vowel /a/ becomes /i/. This process could be referred to as vowel raising.

[Level 1 affixes]   **[Root/word base]**   [Level 1 affixes]

[omu +[βaj]] →   [omu [βaji] (see how the brackets are inserted and removed.

[Level 2 affixes] [Level 1 affixes] **[Verb base]** Level 1 affixes] [Level 2 affixes]

[omu   +[βaja]]   →   [omu[βaji] 'player'

[aβa   +[omuβaji]]   →   [aβaβaji] 'players'

[oxu   +[βaja]]   →   [oxuβaja] 'to play'

Level 2 is about inflection. Inflection does not change the word category, for example, plural formation. The noun remains a noun after affixation.

e.g. [oxu   +   [βaja]]   →   [oxuβaja] 'to play"

The morphological processes of deriving the verb [βaja] take place at different strata beginning with the inflection of [oxuβaja] from [βaja] at level one and an addition inflectional process at level two. The affix *'oxu'* introduces a verb or a verb phrase. The prefix 'omu' introduces a noun or a noun phrase.

It is evident that Lexical Phonology, as a framework that captures the relationship between morphology and phonology in terms of a set of strata, imposes some constraints on the nature of interaction of word formation rules in Luwanga.

1.9 Methodology
This section focuses on the methodology used in the study. The section is divided into six sub-sections. The research design, the study location and sampling techniques are discussed first. Then the Sample size, research instruments, data collection and finally data analysis procedures.

1.9.1 Data Collection Procedures

This study uses a qualitative method of data collection. The qualitative method is a way of social action that emphasizes how the people interpret their experiences to comprehend the reality of social phenomenon (Zohrabi,2013). The researcher employed this qualitative method by conducting interviews with some Luwanga native speakers.

1.9.1.1 Research Design

Bogdan and Biklen (2003) define qualitative data analysis as organizing data by grouping them into logical units and coding, synthesizing and searching for patterns and trends. This organization is done by conducting an intense interaction with the native speakers of Luwanga to understand the rules that dictate the morphological and phonological processes within the dialect. Data on the perception of the speakers is captured through a process of deep attentiveness and empathetic understanding of the topics under discussion. The study uses Lexical phonology theory which breaks down the morpho-phonological processes into different strata, lexically and post lexically.

The qualitative design was suitable for this study because it enabled the researcher to explain and gain insight and understand the morpho-phonological phenomena through intensive collection of narrative data. According to Miles and Huberman (1994), a researcher's role is to gain a 'holistic' overview of the context under study, its logic, its arrangement and its explicit and implicit rules.

1.9.1.2 Study location

The study was conducted in Matungu community area, Matungu sub-county, Kakamega County. Resource people within the Nabongo cultural center, in Matungu came in handy in data collection.

1.9.1.3 Sampling technique

A purposive sampling technique was used to pick the respondents from Matungu community area where native Luwanga is spoken. Only those people who speak and understand native Luwanga dialect were picked as informants. This was done by ensuring that the respondents speak Luwanga from childhood to date and that both their parents spoke/speak native Luwanga.

The purposive sampling technique was also used to get the required number of words which were categorized into nouns and verbs. This sampling technique ensured that the data was classified into words with a gloss consisting of nouns and verbs for purposes of having a systematic analysis

1.9.1.4 Study population

To remain objective, a total of 15 people aged between 45 and 70 years were targeted. The minimum age bracket of the respondents was forty-five years. This age was believed to have had a relatively systematic acquisition form of the language that would in turn enable the researcher to assess any linguistic deviance.

1.9.1.5 Sample size

A sample of Luwanga nouns and verbs, approximately 100, 45 nouns and 55 verbs, were used in the study. According to Milroy (1987), large samples are not necessary in linguistic studies and fewer words would still have been sufficient. Biber (1993) concurs with Milroy by asserting that in linguistics, a sample of 200 words, for instance, is likely to have the same number of nouns and large samples are not necessary. Other studies in linguistics and in particular phonological studies have also been able to adequately address the objectives of their studies by using small samples; for example, Mwangi (2001) uses 72 words, Kuria (2006) uses 64 words while Orago (2015) uses 55 words. The 100 words were, in this case, a representative sample of the sound nouns and verbs found in Luwanga.

1.9.1.6 Research instruments

The study utilized interview as a data collection method. The interview was conducted for the purpose of getting data for the study. The nouns and verbs were also picked from the conversations without the researcher being part of the conversation. Participatory conversations were also used as data collection (see Appendix 2).

1.9.2 Data collection

The interview method gave the researcher the advantage of observing natural interaction between respondents. This enabled the researcher to stimulate the respondents' insight and consequently got more information which ensured a representative sample for analysis (Best and Kahn, 1989; Crowley, 2007).

Having been bred from the same locality purposive sampling technique helps in picking out informants that have spoken Luwanga from childhood to date and have interacted with other native speakers of the language. Use of conversation as a data collection method was also be applied. The researcher participated in the daily conversations with the natives and also observed from a distance and picked out relevant data.

The data included sounds, words, phrases, sentences, derived and inflectional forms of nouns and verbs. Data was collected by administering observations and interviews to the respondents. A focus group discussion was also carried out in which respondents and the researcher had the opportunity to interact and address some of the emerging issues related to the choice of linguistic forms and language use.

1.9.3 Data analysis Procedures

Data analysis is a complex and continuous activity throughout the study ensuring constant reflection and verification of ideas (Kahn & Best, 1989). The data collected for the present study was organized, analyzed and scrutinized using the Lexical phonology theory. The nouns and verbs collected were categorized and classified according to their specific classes. The phonological and morphological steps taken towards word formation were illustrated in relation to the different strata that the words belong at a given process. The analysis included translating non-English words and phrases to English, transcribing words and sounds phonetically and assigning data to established categories. This was followed by classification based on the phonological and lexical variants. Finally, a description and analysis of the data was carried out within the framework of Lexical Phonology theory. The findings are presented using tables and maps.

CHAPTER TWO

Sound Segment and Syllable Structure of Luwanga

2.1 Introduction

This chapter discusses the sound system of Luwanga. It focuses on the consonant and vowel systems as well as the syllable structure of Luwanga. The consonants are described using the parameters of place and manner of articulation as well as voicing, while the vowels are described based on the three key parameters of vowel height, position of the tongue and the shape of the lips. The Luwanga syllables are described in terms of whether they are closed or open, and whether they are monosyllabic, disyllabic or polysyllabic. This description is relevant to the morpho-phonological processes involved in the formation of Luwanga nouns and verbs that are discussed in the subsequent chapters.

2.2 Luwanga consonants

Luwanga has 16 consonants and two semi-vowels. These are b, f, k, m, n, ɲ, ŋ, x, ts, r, l, p, t, ʃ, tʃ, s, j and w. Luwanga also has five nasal compounds; which are [mb, nd, nŋ,nʒ, nʤ]

Table 1: Orthography and IPA representation of Luwanga consonants.

S/NO	Grapheme	IPA Symbol	Example of a word in Orthography	Example of a word in IPA	Gloss
1	B	/b/	Bosi	/βosi/	All
2	F	/f/	Efilaro	/efilaro/	Shoes
3	K	/k/	Imbeko	/imbeko	A type of a tree
4	M	/m/	Amaparo	/amaparo/	Thoughts
5	N	/n/	Fuana	/fuana/	Maybe
6	Ny	/ɲ/	nyoola	/ɲo:la/	Get
7	ng'	/Ŋ/	ing'ombe	/iŋombe/	Cow
8	Kh	/x/	Khola	/xola/	Do
9	Ts	/ts/	tsia	/tsia/	Go
10	R	/r/	Rera	/rera/	Bring
11	L	/l/	Fuala	/fuala/	Put on
12	P	/p/	Olupao	/olupao/	Board
13	T	/t/	Itaiywa	/itaijwa/	Cock

14	W	/w/	Liramwa	/liramwa/	A banana
15	Sh	/ʃ/	Eshiminywi	/eʃiminwi/	Chick
16	Ch	/tʃ/	Chenda	/tʃenda/	Walk
17	S	/s/	Samula	/samula/	Travel
18	Y	/j/	yoya	/joja/	Gather

Luwanga consonants are produced through pulmonic regressive mechanism. The mechanism is employed by expelling air from the lungs up through the windpipe. Air goes through the larynx then to the glottis where the vibration or no vibration of the vocal cords causes voiced or voicelessness of the consonant. The air from the lungs passes through different organs that together form the vocal tract.

The Luwanga consonant system is based on six places of articulation. These places are presented in Table (2) below.

Table 2: The consonant inventory of Luwanga

	Bilabials	Labiodentals	Alveolar	Palatal	Velar
Oral stops	P		T		K
Nasal stop	M		N	ɲ	ŋ
Fricatives	B	F		ʃ	X
Affricates			Ts	tʃ	ʤ
Lateral			r l	J	
Approximant	W				

Adopted from Mellisa Troyer (2007) with few amendments.

Apart from the laterals and the nasals, there are no other voiced consonants in Luwanga. In her inventory, Troyer includes voiced consonants z,g,b,d which are not articulated in Luwanga.

Stops.

Luwanga has three oral stops. These are the bilabial /p/, the alveolar /t/ and the velar /k/. All the three stops are voiceless. The phonemes are illustrated as below;

Orthography   Transcription   Gloss

Itaywa	/itajwa/	'cockerel'
Kaala	/ka:la/	' slow'
Pungulula	/puŋulula/	'distort'

Nasals

Luwanga has four nasals. These are the bilabial /m/, the alveolar /n/, the palatal /ɲ/ and the velar /ŋ/. These phonemes are illustrated below;

Orthography	**Transcription**	**Gloss**
inyanza	/iɲanʒa/	'lake'
ing'ani	/iŋani/	'grave'
amasero	/amasero/	'animal skins'
eshimuna	/eʃimuna/	'squirrel

Fricatives

Luwanga has five fricatives. These are bilabial /β/, the labiodental /f/, the alveolar /s/, the palatal /ʃ/, the velar /x/. All of these are voiceless.

Orthography	**Transcription**	**Gloss**
oβweru	/oβweru/	'floor'
ifuko	/ifuko/	'kidney'
isyo	/isjo/	'maize grinder'
eshinoko	/eʃinoko/	'water source'
olwikho	/olwixo/	'relationship'

Affricates

Luwanga has three affricates, the voiceless palatal /tʃ/, the voiced palatal /dʒ/ and the voiceless alveolar /ts/. The phonemes are illustrated below;

Orthography	Transcription	Gloss
oluchendo	/olutʃendo/	'a journey'
Amacheni	/amatʃeni/	**'news'**
injira	/indʒira/	'path'
injuku	/indʒuku/	'groundnut'
inzala	/inʒala/	'hunger'
inzu	/inʒu/	'house'
tsiswa	/tsiswa/	'termites'
tsisala	/tsisala/	'sticks'

Laterals

Luwanga has two laterals r, l. The alveolar trill /r/ and the alveolar lateral /l/.

Orthography	Transcription	Gloss
liiru	/li:ru/	'banana leaf'
Liiisa	/li:sa/	'caterpillar'
Shiro	/ʃiro/	'market'
ruuta	/ru:ta/	'scrub

Approximants

Luwanga has two approximants. These are the bilabial /w/ and the palatal /j/.

Orthography	Transcription	Gloss
eshieyo	/eʃiejo/	'broom'
Yuya	/juja/	'shake'

omwalo				/om**w**alo/						' river'								
olwana				/ol**w**ana/						'childish'								

Chomsky and Halle (1968) classify consonants using a distinctive feature matrix.

Luwanga, just like other languages, has a distinctive feature matrix that classifies the Luwanga consonants in their distinct features.

Table 3: Luwanga Distinctive Feature Matrix adapted from (Akidah 2000)

	P	β	m	F	T	ts	S	N	L	R	ʃ	ʧ	ɲ	J	k	X	ŋ	W
Cons	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ant	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Cor	-	-	-	-	+	+	+	+	+	+	+	+	+	+	-	-	-	-
High	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+
Back	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+
Voice	-	+	+	-	-	-	-	+	+	+	-	-	+	+	-	-	+	+
Cont	-	+	-	+	-	-	+	-	+	+	+	-	-	+	-	+	-	+
Lateral	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-

2.3 Nasal compounds

Nasal compounds are those that are preceded by nasals and are realized as phoneme unit -(Schane 1973:210). Speech sounds are represented using distinctive features. Some letters such as m, b, p, v, s are used as cover symbols for the features of sound they represent. Luwanga syllable structure tolerates consonant clusters but not vowel clusters. This result is the optimal Luwanga CV alternation structure. However, the tolerance on consonant structures results to nasal compounds such as mb, nd, nz, nj, ng. In Luwanga, nasal compounds can be explained in terms of consonant sequences. (Akidah, 2000) states that "Nasal compounds are homorganic co-articulators in which the first phonetic entity is a nasal consonant and the second is a non-nasal consonant." Nasal compounds are voiceless stops and fricatives, which through the process of progressive voice assimilation, become voiced because of the nasal just before them. (Aura, 2017)

N+t ⟶ /nd/

M+p ⟶ /mb/

N+s ⟶ /nz/

N+g ⟶ /ŋ/

N+ʤ ⟶ /ndʒi/

Nasal compounds in Luwanga assume any syllable position in a word; initial, medial or final. The following table illustrates this;

	Nasal compound	Orthography	Transcription	Gloss
1	Mb	Imbenya	/imbeɲa/	tooth gap
		imbalo	/imbalo/	knife
		indumbu	/indumbu/	thigh
2	Nd	Indwasi	/indwasi/	allergy
		omuanda	/omuanda/	road
		induswe	/induswe/	bile
3	Ng	Ngoba	/ngoβa/	to escort
		langa	/langa/	to call
		inganga	/iŋaŋa/	business
4	Nj	Injira	/indʒira/	Path
		Injeso	/indʒeso/	harvesting tool
5	Nz	Inzu	/inzu/	House
		inzokha	/inʤu/	snake
		inzala	/inʤala/	hunger

2.4 Luwanga vowels

Luwanga has ten vowels in total; Five are short and five are long. Most of these vowels are used at word initial and word final positions.

Table 4: Orthography and IPA representation of Luwanga

S/No.	Grapheme	IPA symbol	Example of a word in orthography	Examples of a word in IPA	Gloss
1	A	A	Aka	/aka/	Weed
2	E	E	Era	/era/	Enough
3	I	I	Imondo	/imondo/	Gizzard
4	O	O	Olwanda	/olwanda/	Rock
5	U	U	Ifuko	/ifuko/	Kidney
6	a:	a:	Olusaala	/olusa:a/	Stick
7	e:	e:	Ereera	/ere:ra/	Hang
8	i:	i:	Liika	/li:ka/	Fireplace
9	o:	o:	Moola	/mo:la/	Crawl
10	u:	u:	Uula	/u:la/	Defeat

The table below illustrates the phonetic properties of the Luwanga vowels.

Table 5: Phonetic properties of Luwanga vowels

	Front	Back
High	i, i:	u, u:
Mid	e,e:	o, o:
Low		a, a:

The short vowels go through lengthening. This results to formation of long vowels. The double vowel letters indicate vowel length.

The following examples of Luwanga vowels illustrate the length of the vowels, the position the tongue and the shape of the lips during articulation.

Table 6: Parameters for describing Luwanga vowels

Vowel	A	E	I	O	U	a:	e:	i:	o:	u:
Shape of the lips	Rounded	Unrounded	Unrounded	Rounded	High	Rounded	Unrounded	unrounded	Rounded	high
Position of the tongue	Low	Mid	High	Mid	Rounded	Low	Mid	high	Mid	Rounded

Table 7: Luwanga Vowel Matrix

High	-	+	-	-	+	-	+	-	-	+
Low	-	-	+	-	-	-	-	+	-	-
Mid	+	-	-	+	-	+	-	-	+	-

The Luwanga vowel system consists of two high vowels /i/ and /u/, two mid vowels /e/ and /o/ and one low vowel /a/. Luwanga also classifies the vowels in terms of tongue positions; two front vowels /i,e/ and three back vowels /u,o,a/. The vowels can also be classified in terms of the shape of the lips (rounding and unrounding); /o/ and /u/ are realized with rounded lips while /i/ and /e/ are realized with unrounded lips. The vowel /a/ has some degree of rounding lips as well.

Apart from the short vowels, Luwanga has long vowels too. The short vowels undergo lengthening to give rise to their corresponding long vowels. "Doubling the vowels indicates vowel length, and the vocalic length is expressed by reduplication of the vowel symbol. This lengthening is both grammatical and semantic" (Akidah 2000:34).

Basic phonetic parameters for describing Luwanga vowels

(1)   mala[a]   'finish'   low back un-rounded

(2)   maala[a:]   'flood'   low back un-rounded

(3)   era[e]   'enough'   mid front un-rounded

(4)	era[e:]	'breath'	mid front un-rounded
(5)	nyira[i:]	'cool'	high front un-rounded
(6)	nyira[i:]	'stretch'	high front un-rounded
(7)	bola[o]	'rot'	mid back rounded
(8)	boola[o:]	'say'	mid back rounded
(9)	khula[u]	'grow'	high back rounded
(10)	khuula[u:]	'uproot'	High back rounded

2.5 Luwanga Syllable Structure

The syllable is the core unit of phonological representation- (Katamba,1989). Most Luwanga phonological systems are organized at the syllable level, that is, the hierarchy of a lexicon is ordered from the syllable. A vowel is the nucleus in the Luwanga basic structure. Affixation in Luwanga is responsible for creating strata in different lexicons. It determines the different syllable structures the Luwanga nouns and verbs take. The noun classes also determine the affixes used. The Luwanga lexicon has a basic syllable structure of CVCV in most of its nouns. Some verbs, however, have the VCV structure.

Malmberg (1963: 129) states that "A syllable consisting of a consonant plus a vowel, represents the most primitive, and without the doubt historically the oldest, of all syllable types, the only which is general in all languages." Any other syllable structure that does not have the CV structure makes it difficult to divide the syllable unless the primitive way of syllable division is applied. Kahn (1976:49), Clements and Keyer (1983:37): ONSET FIRST PRINCIPLE; that

i. Syllable initial consonants are maximized to the extent consistent with the syllable structure conditions of the language in question.
ii. Subsequently, syllable final consonants are maximized to the extent consistent with the syllable structure of the language in question.

Certain consonantal and vowel processes occur at morpheme boundaries, for example glide formation and vowel assimilation. For example, omu+ana ⟶ /omwana/. The vowel /u/ and /a/ are used in complimentary distribution. They cannot coexist following each other due to their close similarity in terms of phonological characteristics. Vowel sequences that occur to be identical

can tolerate each other than those that are not. These processes are basically phonological. With that, there is an alternation in the syllable structure of a word. However, the preferred syllable structure of the language (CV) is maintained.

The Luwanga syllable structure for verbs can be classified into, consonant commencing and vowel commencing (Akidah, 2000:27) as follows;

    a) Consonant commencing

    i. Luwanga verbs are characterized as being vowel initial. However, some break this order begin in consonants. These are classified into three: CVCV

    ii. CVVCV

    iii. CVNV

CVCV STRUCTURE

1. Luwanga   **Gloss**

a. [xola]   do

b. [βeka]   shave

c. [ʃina]   dance

This syllable structure has a consonant-vowel-consonant-vowel pattern. Most Luwanga infinitive verbs end with the vowel letter 'a', as shown in the examples above.

CVVCV STRUCTURE

2. Luwanga   **Gloss**

a) [ru:ma]   jump

b) [lo:ra]   dream

c) [pu:ka]   smear

The verbs in (2) above have a CVVCV structure. There is vowel lengthening to bring out function of the verb.

CVVNV STRUCTURE

	3. **Luwanga**	**Gloss**
a)	[xo:mba]	lick
b)	[si:ɲa]	dig out
c)	[si:nza]	slaughter

The verbs in (3) above have the CVVNV syllable structure. The vowel preceding the nasal consonant is lengthened.

b) Vowel commencing verbs

VCV STRUCTURE

	4. **Luwanga**	**Gloss**
a)	[uka]	wonder
b)	[ira]	kill
c)	[era]	enough

The verbs in (4) above demonstrate the VCV syllable structure in Luwanga.

2.6 Conclusion

This chapter discussed the Luwanga sound system. Luwanga has18 consonants and 10 vowels. The vowels are classified into 5 long vowels and 5 short vowels. The Luwanga syllable structure is CVCV. Two consonant clusters do not occur at word-initial position and word final position. They only occur at syllable boundaries.

CHAPTER THREE
Morphological system of the Luwanga Noun and Verb
3.1 Introduction
In this chapter, the morphological system of the Luwanga noun and verb is described. The structure of the root and stem of the Luwanga lexeme are discussed together with all other

affixes which indicate person, number and tense. The role of affixation in strata development is analyzed. The affixes are added to a noun stem or a verb stem. A stem is the core part of a lexicon that carries the basic meaning. The Luwanga noun or verb undergoes derivational and inflection changes that are dictated by the morphological rules and phonological changes within their respective morphological levels. Each morphological rule and phonological change determine the lexical level in which the noun or verb is categorized.

This chapter analyses the two main morphological levels postulated in LP theory, namely: Level One morphology and Level Two morphology. A further division of these levels is done and results to Level One Nominal morphology, Level One Verbal morphology; Level Two Nominal Phonology and Level Two verbal morphology. The nominal and verbal morphology in both levels deals with the Luwanga nouns and verbs, respectively.

3.2 Luwanga Morphology

Booij (2007) observes that morphology gives an insight into how linguistic rules function in a language. The internal changes within different morphemes of nouns and verbs in Luwanga are discussed in this chapter. Morphology can be defined as the system of categories and rules involved in word formation and interpretation (Grady 1996:111). The focus in this chapter is on description of the morphology of Luwanga nouns and verbs. The description is meant to account for much of the phonology and morphology of the noun and verb. This gives a deep understanding to the relationship between phonological analysis and the phonetic realizations. This understanding of the morphological structure of Luwanga, provides an insight into the role of morphology in the phonology of the Luwanga lexicon.

According to Mathews (1994), "morphological conditioning occurs within the word" and so an understanding of both noun and verb morphology as well as the basic word structure is important to the analysis of the morpho-phonological processes in a language.

Morphemes are categorized into bound and free morphemes. A free morpheme is one that can be an independent word and can occur in isolation while a bound morpheme is that which must be attached to another element to form a word. Free morphemes in Luwanga

constitute root words while bound morphemes are affixes. Affixes constitute an important part of word formation and may be prefixes or suffixes. Words constitute of a root and one or more affixes. A root is part of the word that cannot be divided further, analyzed derivationally or inflectionally. It remains intact even after the removal of derivational and inflectional affixes. The root morpheme constitutes the core of the word and carries the major component of its meaning.

Level One Morphology deals with derivational changes while level two morphology deals with inflectional changes.

14. Luwanga		**Gloss**	
/khupa/	/xupa/	beat	(V)
/okhukhupa/	/oxuxupa/	to beat	(V)
/eshikhupo/	/eʃɪxupo/	a beating	(N)

In this example, /xup/ is considered the root. It is the basic unit that carries the meaning of the word. The prefix /oxu/ is used as an infinitive of the verb /xupa/ it is an equivalent of the English 'To' infinitive. The prefix /eʃɪ/ is used to mark a word class change, the word changes from a verb to a noun. This prefix is also used to identify nouns in class 7/8.

Some Luwanga roots begin in vowel sounds.

15. Luwanga	**Gloss**
/aka/	'to weed '
/ira/	'to kill'
/ambuxa/	'to cross'

The verbal root too, cannot stand on its own, it must be attached to one or more affixes for it to make sense. The root may consist of the stem or the imperative form of the verb

16. Luwanga	**Gloss**

/texa/	'cook'
/oxu-texa/	'to cook'
/a-texa-nga/	'she/he is cooking'
/ola-texa/	'you will cook'
/mula-texa/	'you (pl) will cook'
/xu-texa-nga/	'we are cooking'

Affixation is a kind of morphological process whose role is to create words that have a high level of transparency, which means that words have a formal morphological structure that relates to their semantic interpretation (Booij, 2007, p.34). Luwanga uses two types of affixes that are labelled depending on the position they hold. Prefixes are attached before the root while suffixes are attached after the root. The affixes may be derivational or inflectional. Inflectional affixes in Luwanga inflect the word form. They inflect for number, negation and tense

17. Luwanga   **Gloss**

Singular   Plural   Singular   Plural

/omu-rwe/	/emi-rwe/	'Head	Heads'
/litikho/	/ama-tikho/	'Hole	Holes'
/esh-muka/	/efi-muka/	'Gourd	Gourds'
/mu-li-tsa-nga/		'You (pl) are eating'	

Negation in Luwanga is quite straight forward. There are two negative morphemes in Luwanga; the prefix [si-] and the suffix [tawe]. The prefix morpheme [si-] negates the verbal infinitives.it precedes the subject marker in the verb. The morpheme [tawe] is

positioned after the accusative nouns in a sentence. The morpheme is often shortened to [ta-].

18. Luwanga   **Gloss**

Negated sentence

  Sijakula tsingubo ta   she did not buy clothes

  Senzire ingo ta   I have not gone home

  Siwitsa ta?   You are not coming?

  Selwala ta   I am not sick

  Sijaxuβurera ta   He did not tell you?

The tense system in Luwanga verbs provides affixal markers for tense and aspect. Tense is divided into, present continuous, simple past, future tense and perfective aspect.

19. Luwanga   **Gloss**

Conjugated sentence

Atsitsanga ingo   he is going home/he goes home

Atsire ingo   he has gone home

Jatsia ingo   he went home

Jaxatsia ingo   he has just gone home

The /tsi/ is the root verb referring to "go". It is inflected differently depending on the type of affixation accorded. The tense morpheme in Luwanga takes both the prefix position and the suffix position in different verbs. The suffixes [-nga], [-re], [-a] in the above examples are the tense markers. The morpheme /xa/ represents the perfective aspect.

Derivation is a morphological process that changes the classes of words by adding affixes to the stem of the word. Derivational affixes break a word form into different lexemes. The lexemes are different from the stem of the word. The meaning of the word also changes.

For example;

20.   **Luwanga**   **Luwanga**

Verb	Gloss	Noun	Gloss
/βaj-a/	'play'	/o-mu-βaj-i/	'player'
/ʃin-a/	'dance'	/o-mu-ʃin-i/	'a dancer'
/ira/	'kill'	/o-mwi-ri/	'a killer'

The morpheme /a/ changes to /i/ through the process of substitution, to indicate a change in the word class, from verbs to nouns. These morphemes are therefore nominalization morphemes. Derivational morphemes usually precede inflectional morphemes in a fixed order. The inflection, however, is subject to the rules that govern the class within which the word lies. This is represented as follows:

Base word	**Derivational Morpheme**	**Inflectional Morpheme**	**Verb**
/texa/	oxu	nga	oxutexanga
/iβa/	oxu	nga	oxwiβanga
/menena/	oxu	nga	oxumenenanga

Luwanga, just like other Bantu languages has a noun class categorization that depends on the prefix of the nouns. Akidah (2000:42) states that, the grammatical gender-based nouns in Luwanga are also based on nature. Quoting (Appleby (1961:8), Akidah explains that there are twelve classes of nouns in Luhya distinguished by their prefixes. Eight of the twelve have singular and plural forms also distinguished by prefixes. The rest are not based on singular and plural distinctions.

The following table illustrates this classification of nouns by Green, Marlo & Diercks (2019).

Table 8: Classification of Luwanga Nouns

Class	Prefix	Example	Gloss

	Singular		
1	omu-	omuxana	'girl'
2	aβa-	aβaxana	'girls'
3	omu-	omusala	'tree'
4	emi-	emisala	'trees'
5	Li	Liijoni	'bird'
6	ama-	amajoni	'birds'
7	eʃi-	eʃituju	'rabbit'
8	efi-	efituju	'rabbits'
9	i (n)	Imboko	'buffalo'
10	Tsi (n)	tsimboko	'buffaloes'
11	olu-	olusaala	'stick'
12	Axa	axaβwa	'dog' (dim)
13	Oru	oruβwa	'dogs'(dim)
14	Oβu	oβuɲaasi	'grass'
15	Oxu-	Oxulola	'to see'

16	a -	alwaɲi	'Outside'
17	xu-	xuundulo	'at the edge'
18	mu-	mwiiswa	'in the bush'
20	Oku-	okufuuko	'pocket'(aug)
23	e-	elwaaɲi	'outside'

These prefixes are responsible for creating agreement within a sentence. They create the distinction between singular nouns and plural nouns. When used this way, they are called concords. The table below presents the subject verb agreement markers in Luwanga.

Table 9: Subject Verb Agreement Markers

Class	Sg subject affix	Sentence	Gloss	Pl subject affix	Sentence	Gloss
1	Omu-	Omulwale akwiire	The patient has fallen	Aβa	Aβalwale βakwiire	The patients have fallen
2	Aβa	Aβalwale βakwiire	The patients have fallen			
3	Omu-	Omusaala kuatixe	The tree is split			
4	Emi-	Emisaala tʃiatixe	The trees are split			
5	li-	Litaala lixoŋo	A big homestead	Ama-		

6	Ama-	Amatala amaxoŋo	Big homesteads			
7	Eshi-	eʃisaala ʃiandʒe	My chair			
8	Efi-	Efisaala fiandʒe	Our chairs			
9	I(n)	Indukusi ixoŋo	A big insect			
10	Tsi (n)	Tsindukusi tsixoŋo	Big insects			
11	Olu-	Olukaka lwosi	The entire fence	Tsi-	tsiŋaka tsiosi	The entire fences
12	Axa-	axamosi xeruʃe	A calf has run away(diminutive)			
13	Oru-	Orumosi rwiruʃe	Calves have run away			
14	Oβu-	oβusiru βwa likondi	The stupidity of a sheep			
15	Oxu-	Oxukona aŋoloβe	To sleep in the evening			
16	a-	Aŋo wandʒe	My home			
17	xu					
18	Mu-	Mulwalo mwa imesa	Underneath a table			

12	Oku-	okujoka kufwire	A big snake is dead	Emi-	emijoka tʃifwire	Big snakes are dead

Luwanga has a definite subject-verb agreement as illustrated in the table above. Different noun classes use different prefixes.

3.2.1 Morphological Features of the Luwanga Verb

The verb comprises of different morphemes put together, each occupying a position that has a specific function. The verb comprises of a root and one or more bound affixes. The root is the base of the word while the root plus an affix forms the stem. The base defines the derivational stem, which is the domain for application of stratum 1 lexical phonology rules. This will be discussed in chapter four. Katamba (1993:41) defines the root as the irreducible core of a word which is always available. The root is the morpheme that carries meaning - it is the nucleus. All other inflections are done from the root Ryding (2005:425) observes that they are sometimes referred to as 'circumfix' because they surround the stem on both sides. The Luwanga verb is classified into two; simple and complex verb. A simple verb has one or two syllables;

21.

Luwanga Verb	**Phonemic representation**	**Gloss**
/itsa/	/itsa/	Come
/tʃenda/	/tʃenda/	Walk
/βikha/	/βixa/	Keep

The core of the Luwanga verb is the root. Other bound morphemes maybe affixed to form a complex verb. The verb has a rich system that modifies the meaning of the verb forms. The affixation process slightly alters the meaning of the verb but maintains the semantic quality. A

suffix may occur singly in a verb or with other suffixes to add to the already existing meaning. The change in meaning may result to, reciprocal, applicative, stative, causative or passive verb.

3.2.2 Reciprocal

Basic verb form   **Reciprocal**

22. Luwanga	Gloss	Luwanga	Gloss
/xuʧama/	to love	/xuʧamana/	to love each other
/ʃesia/	to greet	/ʃesiana/	to greet each other
/Xupa/	to beat	/xupana/	beat each other
/ʃeβa/	to circumcise	/ʃeβana/	circumcise each other
/ruma/	to send	/ru:mirana/	to send each other

The morpheme [-ana-] is responsible for reciprocity. It is positioned after the verb root. This gives meaning of the action being done by more than one person at the same time. The above examples illustrate this.

3.2.3 The applicative

This morpheme expresses the idea that the action of the verb is being done for, on behalf of, or with reference to something or someone. The Luwanga applicative is marked by the morpheme is [-ra-]. The verb forms in the examples below illustrate the occurrence of the applicative nature of the verb in Luwanga.

Basic form   **Applicative**

22.Luwanga	Gloss	Luwanga	Gloss
Tsekha	laugh	/tseʃera/	laugh for
Sia	grind	/siera/	grind for
Teta	cut	/tetera/	cut for
Kusia	sell	/kusiria/	sell for
Lola	see	/ lolera/	see for

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The addition of the morpheme [-ra-] demonstrates a morphological change in the infinitive verbs above. The verbs take a different function after the addition of the morpheme. They bring out the meaning of doing something on behalf of something or someone else.

3.2.4 The Stative

This expresses state without referring to the agent. It is used to describe the possibility of a subject to receive a particular action (Mulonzya, 1999). This means that the action expressed in the verb is possible to perform or the subject is in a state which will enable the action take place. The responsible morpheme for this affixation is [-kha-]. The following examples illustrate this.

Basic verb form   **Stative form**

23. Luwanga	**Gloss**	**Luwanga**	**Gloss**
kula	buy	/kulixa/	possible to buy
luma	bite	/lumixa/	possible to bite
khonya	help	/ xoɲexa	possible to help
soma	read	/somexa/	possible to read
ɲasia	damage	/ɲasix/	possible to damage

The above examples demonstrate possibility of an action. The infinitive verb semantically changes to bring out the meaning of a possibility of an action.

3.2.5 The passive

The morpheme /w/ is used to mark passive participation of a subject in a verb. The morpheme is directly added to the verb before the final vowel. This is in relation to the syllable cluster of the verb.

24. Basic form		**Passive**	
Luwanga	**Gloss**	**Luwanga**	**Gloss**
/saβa/	borrow	/saβwa/	to be borrowed
/lenga/	watch	/lengwa/	to be watched

/ru:ma/	jump	/ru:mwa/	to be jumped
/tola/	pick	/tolwa/	to be picked
/kasia/	fix	/kasiβwa/	to be fixed

Example 24 above demonstrates the change of the Luwanga verb from active form to passive form. Addition of the /w/ morpheme changes the status of the verb from the its infinitive form to the passive form.

3.2.6 The causative

The causative morpheme represents the idea causing someone to do something or making someone else to do something. The morpheme for causative in Luwanga is [-ia-]. This is illustrated below.

25. Basic verb   **Causative**

Luwanga	**Gloss**	**Luwanga**	**Gloss**
/ʃina/	dance	/ʃinia/	make someone dance
/fuka/	cook ugali	/futʃia/	make someone cook ugali
/tʃaka/	start	/tʃatʃisia/	make someone to start
/remula/	trim	/remulusia/	make someone to trim

Example 25 above demonstrates the action of making someone else perform a particular duty.

3.3 Case in Luwanga

Case refers to classification of a noun form according to the its change in grammatical function. It explains the syntactic role the noun plays in a sentence. "The term case is used to identify the underlying syntactic-semantic relationship which is universal: the case notions comprise a set of universal, presumably innate concepts which identify certain types of judgments human beings are capable of making about the events that are going on around them, judgments about such matters as who did it, who it happened to, and what got changed." (Fillmore, 1968, p.24).

The Luwanga noun takes different syntactic roles after affixation process that changes its morphological characteristics. These roles include the nominative and genitive. The nominative case plays the role of subject in a sentence while the genitive shows possession within a sentence. The noun in its entirety does not distinguish between the subject and the object, some pronouns are used for this case. These cases are marked by adding a prefix or a suffix to the noun stem.

Table: 10 Case Affixes in Luwanga

	Nominative	Genitive
First person	nda-	-anje
Second person	o-	-wo
Third person	ya-	-ae

Nominative case

26. **Luwanga Sentence (Future Aspect)   Gloss**

Graphological   Phonological

  Ndalakhola   /**nda**laxola/   **I** will do

  Olakhola   /**o**laxola/   **You** will do (sing)

  Mwalakhola   /**mwa**laxola/   **You** will do (plural)

  Yalakhola   /**ja**laxola**/**   **He/She** will do

The prefixes in the examples above are of the nominative case. The prefix /ja/ marks the neuter person. Luwanga affixes are not gender specific.

27. Genitive case

Luwanga Pronouns   Gloss

Eshianje   /eʃiadʒe/   mine

Eshiawo   /eʃiawo/   yours (singular)

Eshienyu   /eʃieɲu/   yours (plural)

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Eshiaye   /eʃiaje/   his/hers

The Luwanga genitive marker depends on the morphological gender and the number. The first-person genitive marker is the morpheme [ʤe], the second person is marked by the morpheme [wo] and the third person is marked by the morpheme[je]. The morpheme [ɲu] marks plural possession.

3.4 Formation of Augmentative and Diminutive Nouns.

These are formed through a derivation process. The stem of the word is altered, and an addition of an affix/es done. This takes place at level one morphology. In most nouns, the first syllable is dropped and an introduction of an augmentative or diminutive morpheme added.

Stem	Augmentative	Diminutive	Gloss
Om-wana	okwana	akhana	child – big child/ small child
Omu-khasi	okukhasi	akhakhasi	woman- big woman/small woman
Omu-khono	okukhono	akhakhono	hand-big hand/small hand
Itaiywa	emitaywa	orutaiywa	cockerel-big cockerel/small cockerel
Eshikapo	emikapo	orukapo	basket-small basket/big basket
Eshisala	emisala	orusala	chair-big chair/small chair

The augmentative formation is done by adding the morpheme [oku] to the stem of the noun. The diminutive formation is done by addition of the morpheme [akha] to the noun stem. These morphemes are added to the singular noun stems. The plural noun stems have the addition of the morpheme [emi] for the augmentative nouns and the morpheme [oru] for the diminutive nouns.

3.5 Conclusion

This chapter has discussed the morphological system of the Luwanga noun and verb. The inflectional and derivational morphemes have been analyzed. Morphological features such as reciprocal, applicative, stative, passive and causative have been discussed. Case has also been discussed as an aspect of morphology in Luwanga

CHAPTER FOUR

LEXICAL MORPHOLOGY OF LUWANGA NOUNS AND VERBS

4.1 Introduction

This chapter discusses the structure of the lexicon, the rule ordering and the principle of level ordering as they relate to Luwanga nouns and verbs. It also discusses the hierarchical nature of a lexicon in both derivational and inflectional processes. A stratum/level according to (Mohanan 1982) is an abstract domain at which several morphological, semantic and phonological properties converge. Different levels have different rules, phonological and morphological processes that the lexicon undergoes. These are usually linearly arranged so that both inflectional and derivational word formation processes occur in a series of levels linked together. This means that the roots, stems and affixes of words are organized in a hierarchical manner.

Mohanan (1982) stratifies the English lexicon in four different strata or levels, namely Stratum one which involves primary (irregular) derivation. Stratum two involves secondary (regular) derivation, Stratum three involves compounding, where a compound word is derived through combining two-word categories and Stratum four involves (regular) inflection, for example inflection of nouns for plurals.

4.2 Structure of Luwanga Lexicon

Level 1 affixes are added close to word stems while those of Level 2 are further from the stem of the word.

Level 1 – Derivation

Level 2- Inflection

4.2.1 Level One Morphological Processes in Luwanga

Level 1 morphological processes are manifested in the process of derivation. Derivation is a process that results in the formation of a word category that is different from the base. This process is mainly done through the addition of affixes to the word base. This section describes the derivation of nouns from verbs in Luwanga. An understanding of this process will help explain the various lexical phonological processes that will be discussed in Chapter 5.

4.2.1.1 Derivation of the subject in Luwanga

In Luwanga, the subject is derived by adding the nominalization prefix *omu-* to the verb base as shown in the examples below:

28.		Level 1 aff	Verb base	LR	PR	Gloss
	(i)	[omu	+[texa]]	[omutexa]	[omuteʃi]	'a cook'
	(ii)	[omu	+[rema]]	[omurema]	[omuremi]	'one who cuts'
	(iii)	[omu	+[iβa]]	[omuiβa]	[omwifi]	'a thief'

The addition of the prefix omu- causes changes in the phonological structure of the derived word which is manifested at the phonetic level. For instance, in (i), the phoneme /x/ becomes /ʃ/ and the word final vowel changes from /a/ to /i/, while in (ii), there is a change in the word final vowel, whereas in (iii), the phoneme /β/ becomes /f/ and the word final vowel also substituted from /a/ and becomes /i/ to ease the process of articulation. These are the phonological processes that result from the morphological process of affixation and which will be discussed in detail in Chapter 5.

Infinitive verbal nouns are derived from verbs. Verbal nouns are achieved by making changes outside the verb base through the addition of the morpheme –okhu

29. Level 1 aff	Verb base	LR	PR	Gloss
(i) [oxu	+[xupa]	[oxuxupa]	[oxuxupa]	'to beat'
(ii) [oxu	+[ira]	[oxuira]	[oxwira]	'to kill'
(iii) [oxu	+[lanŋa]	[oxulanŋa]	[oxulanŋa]	'to call'

This process is illustrated below.

29. Prefixes	Verb base		Verbal noun	Gloss
[Level 1]				
oxu	[texa]	→	[oxutexa]	to cook
oxu	[lola]	→	[oxulola]	to see
oxu	[ambuxa]	→	[oxwambuxa]	to cross
oxu	[βaja]	→	[oxuβaja]	to play

oxu	[ʧenda]	→	[oxuʧenda]	to walk
oxu	[xola]	→	[oxuxola]	to do
oxu	[xwesa]	→	[oxuxwesa]	to pull

The data above shows the underived lexical items going through a derivational process. A derivation affix is added to the stem of the verb resulting to a verbal noun. Most Luwanga bare infinitives end in the vowel sound /a/ making it easy to adopt the suffix marking the verbal noun.

4.2.1.2 Derivation of nouns from verbs

The input to this stratum is the root verb of Luwanga. Each root undergoes affixation. It also involves introducing a change to the verb stem in some cases. This is illustrated as in (34).

34.

Prefix	Level	Verb base	Noun
Omu	+	[texa]	[omuteʃi]
		'cook'	' a cook'
		[βeja]	[omuβeji]
		'lie'	'liar'
		[kamba]	[omukambi]
		'preach'	'preacher'
eʃi	+	[lia]	[eʃiaxulia]
		'eat'	'food'
		[aja]	[eʃiajo]
		'graze'	'grazeland'
		[ʧera]	[eʃiʧero]
		'measure'	'measurement'
Oβu	+	[sirixa]	[oβusiriʃi]
		Treat	Treatment
		[lama]	[oβulaamo]
		Pray	Prayerful

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			[indʒira]	[oβwindʒiriro]
			Enter	Entrance

The processes are captured in the data (35).

35.

Prefix	Level2 aff]	level 1 aff]	Verb base	Noun
[omu	-	+	[iruxa]	[[omwiruʃi]
			'Run'	'runner'
[omu	-	+	[βaja]	[[omuβaji]
			'Play'	'player
[olu	-	+	[tʃenda]	[[olutʃendo]
			'Walk'	'journey'
[olu	-	+	[xaja]	[[oluxairo]
			'Harvest grass'	'sickle'
[oβu	-	+	[ʃina]	[[oβuʃino]
			'Dance' (v)	'Dance' (n)
[oβu	-	+	[kona]	[[oβukono]
			'Sleep'	'beddings'
[eʃi	-	+	[ana]	[[eʃianwa]
			'Give'	'gift'
[eʃi	-	+	[jeja]	[[eʃiejo]
			'Sweep'	'broom'

This data illustrates the derivation process and change in word class. A prefix is added to the verb base to create a noun. The prefixes are determined by the class the noun belongs to. Noun classes are always marked by prefixes. Most verbs end in /a/ and their derived nouns end in /o/.

4.2.2 Level two morphological process
4.2.2.1 Inflection
Inflectional morphology is the study of processes, including affixation and vowel change that distinguish word forms in certain grammatical categories. In Luwanga, the inflectional processes

take place further from the stem. The input of this verb is the mono-morphemic verb stem of Luwanga. These stems go through the affixation processes at level two. Inflection takes place before the noun stem. This process results to formation of plurals and diminutives.

4.2.2.2 Formation of plurals

Plurals are formed by addition of prefixes to the noun stem. These take different forms depending on the noun classes. The following examples demonstrate this formation;

30. Noun class   Prefix   Noun base   Noun base+ PL   Noun   Gloss

Noun class	Prefix	Noun base	Noun base+ PL	Noun	Gloss
1/2	[aβa	[lalu]	[aβa+lalu]]]	[aβalalu]	'mad people'
	[aβa	[ndu]	[aβa+ndu]]]	[aβandu]	'people'
	[aβa	[xana]	[aβa+xana]]]	[aβaxana]	'girls'

Class 1 words in Luwanga take the form [omu-] which is a singular form. Class 2 words take the form [aβa] which is the plural. These prefixes are added to the stem. They are all words for different types of people and groups of people.

4	[emi	[sala]	[emi+sala]]]	[emisala]	'trees'
	[emi	[kunda]	[emi+kunda]]]	[emikunda]	'pieces of land
	[emi	[alo]	[emi+alo]]]	[emialo]	'rivers'

Class 3 words begin with the prefix [omu-] which is in the singular and class 4 begin with the prefix [emi-] which is in the plural. They include: body parts and things found in nature. In addition, [emi-] can also be used as an augmentative to indicate largeness. Used this way, class 3 and 4 words can be derogative for some nouns, including humans.

5 /6	[ama	[ʧina]	[ama+ʧina]]]	[amaʧina]	'stones'
	[ama	[βaa]	[ama+βaa]]]	[amaβaa]	'feathers'
	[ama	[ramwa]	[ama+ramwa]]]	[amaramwa]	bananas

Most of the words with in class 5 begin with the alternate form [li-] to mark their singularity. Class 6 marks the plurality by beginning in the prefix [ama]. Words in this class refer to both animates and inanimate.

7/8	[efi	[laro]	[efi+laro]]]	[efilaro]	'shoes'
	[efi	[iro]	[efi+iro]]]	[efi:ro]	'markets'
	[efi	[mosi]	[efi+mosi]]]	[efimosi]	'calves'

Class 7 words are in the singular form marked by the prefix [eʃi] while the plural ismarked by class 8 words with the prefix [efi]. Words in these classes refer to animals, non-living things and some body parts.

9/10	[tsi	[uβo]	[tsi+ŋuβo]]]	[tsiŋuβo]	'clothes'
	[tsi	[mbusi]	[tsi+mbusi]]]	[tsimbusi]	'goats'
	[tsi	[ɲaŋa]	[tsi+ɲaŋa]]]	[tsiɲaŋa]	'days'
	[tsi	[inda]	[tsi+inda]]]	[tsi:nda]	'stomachs'

Class 9 and 10 words begin with the prefix [i(N)-] in the singular and the prefix [tsi(N)-] in the plural where 'N' is a nasal which is underspecified for place and appears in some words.

11	[tsi	[xairo]	[tsi+xairo]]]	[tsixairo]	'sickles'
	[tsi	[ʤendo]	[tsi+ʤendo]]]	[tsiʤendo]	'walks'
	[tsi	[mondo]	[tsi+mondo]]]	[tsimondo]	'gizzards'

Class 11 words begin with the prefix [olu-] in the singular and [tsi-] in the plural. Words include parts of the body, living things, and things found in nature (or made from things found in nature), among others.

According to the Principle of strata in the Lexical Phonology Theory, words are organized into roots, stems, and affixes. A root is an inflectional morpheme that carries the major component of the word's meaning and which belongs to a lexical category. A stem is a base to which inflectional affix is added. The underived lexical item, the Noun Base, goes through Level 1 morphological process of affixation. A prefix is added to the base of the word to form the plural. The derived word then goes through the application of a phonological rule at the same level (Level 1). The processes are captured hierarchically in the in the data below

31.

	Prefixes	[Level2 aff]	[Level 1aff]	Root	Noun	Gloss
1.	[omu	-	+	[xana]	[[omuxana]	'girl'
	[aβa	-	+	[xana]	[[aβaxana]	'girls'
	[omu	-	+	[ʃini]	[[omuʃini]	'dancer'
	[aβa	-	+	[ʃini]	[[aβaʃini]	'dancers'
	[omu	-	+	[xasi]	[[omuxasi]	'woman'
	[aβa	-	+	[xasi]	[[aβaxasi]	'women'
	[omu	-	+	[kofu]	[[omukofu]	'old man'
	[aβa	-	+	[kofu]	[[aβakofu]	'old men'
2.	[omu	-	+	[koje]	[[omukoje]	'rope'
	[emi	-	+	[koje]	[[emikoje]	'ropes'
	[omu	-	+	[kunda]	[[omukunda]	'piece of land'
	[emi	-	+	[kunda]	[[emikunda]	'pieces of land'
	[omu	-	+	[βajo]	[[omuβajo]	' a game'
	[emi	-	+	[βajo]	[[emiβajo]	'games'
	[omu	-	+	[ixo]	[[omwixo]	'cooking stick'
	[emi	-	+	[ixo]	[[emi:xo]	'cooking stick'
3.	[li	-	+	[tixo]	[[litixo]	'holes
	[ama	-	+	[tixo]	[[amatixo]	'holes'
	[li	-	+	[ru]	[[liru]	'banana leaves'
	[ama	-	+	[ru]	[[amaru]	'banana leaves'
	[li	-	+	[isa]	[[liisa]	'caterpillar'
	[ama	-	+	[isa]	[[amasa]	'caterpillars'
	[li	-	+	[ʧina]	[[liʧina]	'stone'
	[ama	-	+	[ʧina]	[amaʧina]	'stones'
4.	[eʃi	-	+	[muna]	[[eʃimuna]	'squirrel'

[efi	-	+	[muna]	[[efimuna]	'squirrels'
[eʃi	-	+	[rendʒe]	[[eʃirendʒe]	'leg'
[efi	-	+	[rendʒe]	[[efirendʒe]	'legs'
[eʃi	-	+	[mosi]	[[eʃimosi]	'calf'
[efi	-	+	[mosi]	[[efimosi]	'calves'
[eʃi	-	+	[laro]	[[eʃilaro]	'shoe'
[efi	-	+	[laro]	[[efilaro]	'shoes'

5.
[I	-	+	[ŋani]	[[iŋani]	'grave'
[tsi	-	+	[ŋani]	[[tsiŋani]	'graves'
[I	-	+	[ŋuβo]	[[iŋuβo]	'cloth'
[tsi	-	+	[ŋuβo]	[[tsiŋuβo]	'clothes'
[I	-	+	[ŋujesi]	[[iŋujesi]	'blackjack'
[tsi	-	+	[tsiŋujesi]	[[tsiŋujesi]	'blackjacks'
[I	-	+	[mburusi]	[[imburusi]	'sling'
[tsi	-	+	[[mburusi]	[[tsimburusi]	'slings'

6.
[I	-	+	[si]	[[isi]	'fly'
[tsi	-	+	[isi]	[[tsiisi]	'flies'
[I	-	+	[susrusi]	[[isurusi]	'bull'
[tsi	-	+	[tsisurusi]	[[tsisurusi]	'bulls'
[I	-	+	[ŋoxo]	[[iŋoxo]	'hen'
[tsi	-	+	[ŋoxo]	[[tsiŋoxo]	'hens'

The data above shows the pluralization of the Luwanga nouns. Plurals are marked by different prefixes depending on the noun classes. Different classes have different plural markers. Some plural markers have one syllable, for example 'tsi'. While others have two syllables, for example 'e-fi'. Both of these are level 2 prefixes because they are attached at the beginning of the base form of the word.

4.2.2.3 Formation of diminutives

The diminutive form is achieved through the addition of affixation morphemes to the noun stem. This is illustrated below.

32.

Prefix sing.	Prefix Pl.	Noun base	Noun	Gloss
[axa]	[oru]	[xono]	[axaxono]	tiny hand
			[oruxono]	tiny hands
[axa]	[oru]	[mosi]	[axamosi]	small calf
			[orumosi]	small calves
[axa]	[oru]	[miɲwi]	[axamiɲwi]	tiny chick
			[orumiɲwi]	tiny chickens

These are formed through the derivative process that involves making changes to the noun base. This morphological process takes place at level one of Luwanga morphology. The first syllable in the base word is dropped and an introduction of the diminutive morpheme /axa/ is witnessed. The process is captured in the data below.

33.

Noun class	Prefix	Noun base	Noun	Gloss
1	[omu	[ndu]	[[omundu]	'person'
	[axa	[ndu]	[[axandu]	'tiny person'
	[oru	[ndu]	[[orundu]	'tiny people
3	[omu	[xoli]	[[omuxoli]	servant
	[axa	[xoli]	[[axaxoli]	tiny servant
	[oru	[xoli]	[[oruxoli]	tiny servants
5	[li	[puoni]	[[lipuoni]	sweet potato

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	[axa	[puoni]	[[axapuoni]	tiny sweet
				potato
	[oru	[puoni]	[[orupuoni]	'tiny sweet
				potatoes'
7	[eʃi	[renje]	[[eʃirenje]	'leg'
	[axa	[renje]	[[axarenje]	'tiny leg'
	[oru	[renje]	[[orurenje]	'tiny legs'
9	[I	[seβere]	[[iseβere]	'stream'
	[axa	[seβere]	[[axaseβere]	'tiny stream
	[oru	[seβere]	[[oruseβere]	tiny streams

The data above shows that Luwanga has one affix morpheme, the prefix [axa-oru] that indicates the diminutive nature. The form /axa/ is a prefix used on singular diminutives while /oru/ is a prefix used on plural diminutives. The prefixes are attached on the noun stem.

4.2.2.4 Inflection for tense

This is a morphological process of modifying word forms through the addition of prefixes, suffixes as well as internal change within a base word to indicate the grammatical sub class to which a lexical item belongs. The regular inflection process involves inflection for tense.

Luwanga marks its tenses by different prefixes added to the verb stem. These prefixes mark the infinitive verb, the past tense, the perfect tense, the continuous tense and the future aspect. Person markers are used to mark singularity and plurality. Luwanga has six-person markers as shown in the table below

Table 11: Forms of pronouns in Luwanga

Singular pronouns			Plural pronouns		
1st person	2nd person	3rd person	1st person	2nd person	3rd person
nda	O	ya/I	xwa	Mu	βa/fi

4.2.2.4.1 Past tense

Luwanga marks its past tense inflectional morpheme by adding both prefix and suffix morphemes to the verb stem. The prefix morpheme goes through level 2 morphological rules while the suffix morpheme goes through Level 2 phonological rules. The data below demonstrates this.

	Prefix	Verb base	Suffix	Verb	Gloss
1	[nda	[tsia]	re]	[[ndatsire]]	'I went'
	[nda	[kula]	re]	[[ndakulire]]	'I bought'
	[nda	[xupa]	re]	[[ndaxupire]]	'I beat'
2	[wa	[kona]	re]	[[wakonere]]	'You slept'
	[wa	[funa]	re]	[[wafunire]]	'You harvested'
	[wa	[xwesa]	re]	[[waxwesire]]	'You pulled'
3	[βa	[kwa]	re]	[[βakwire]]	'they fell'
	[βa	[βola]	re]	[[βaβolire]]	'They said'
	[βa	[ʃina]	re]	[[βaʃinire]]	'They danced'
4	[xwa	[luma]	re]	[[xwalumire]]	'We bit'
	[xwa	[raka]	re]	[[xwaraʧire]]	'We planted'
	[xwa	[βaja]	re]	[[xwaβajire]]	'We played'

The underived lexical item goes through an inflection process which takes place at Level 2. The prefixes are attached to the word stem and are the subject markers of the word. This is a level 2 morphological process. The past tense morpheme attached to the verb stem goes through a phonological rule. Most Luwanga verbs end in /a/ which is a low back vowel. The past tense morpheme is an alveolar trill /r/ and a mid- high vowel /e/. For ease of articulation, the vowel /a/ is dropped and the front high vowel /i/ is introduced. The hierarchical processes are captured in the data below.

36.

Prefix	Level2 aff]	Level1aff]	Verb base	Suffix	Verb	Gloss
[nda	-	+	[kwa]	re]	[[ndakwire]]	'I fell
[wa	-	+	[ʧenda]	re]	[[waʧendere]]	'you walked'
[ja	-	+	[ambuxa]	re]	[[jaambuʃire]]	'he/she crossed'
[xwa	-	+	[teenda]	re]	[[xwateendere]]	'we served
[I			[kwa]	re]	[[ikwire]]	'it fell'

The data above shows that the past tense is arrived at by adding both a prefix and a suffix. The verb base goes through internal phonological changes for ease of articulation. Most verbs end in the vowel sound /a/ which is dropped when forming the past tense. The sound /a/ being a back vowel is replaced by a morpheme marker that is responsible for marking the past tense. The marker has an alveolar trill and a front vowel. A front vowel /i/ is introduced to reduce the effort of articulation.

4.2.2.4.2 Perfect tense
The perfect tense in Luwanga is marked by adding a prefix to the verb stem. The prefix added is the same to all verbs regardless of the verb formation. The following data shows this;

37.

PrePrefix	Prefix	Verb base	Verb	Gloss
[Nda	xa	[tsia]	[[ndaxatsia]	I have gone
[ja	xa	[kwa]	[[jaxakwa]	It has fallen
[Wa	xa	[kona]	[[waxakona]	You have slept

The bracketing illustrates that the verb base is the underived lexical item and so it is placed in the initial brackets. Upon addition of the subject prefix to the verb base, the prefixation takes place at

stratum 2 of the lexicon which is inflectional. A second bracket is placed on the verb base. The bracket erasure convention is applied thereby leaving only one set of square brackets. The inflection processes are captured in the data below.

38. Prefix

Level 1 aff]	Level 2 aff]	Verb base	Verb	Gloss
[[xa	[nda	[koɲa]	[[[[ndaxakoɲa]	I have searched
[[xa	[xwa	[lia]	[[[xwaxalia]	We have eaten
[[xa	[ja	[βaja]	[[[jaxaβaja]	He has played
[[xa	[mwa	[ʃira]	[[[mwaxaʃira]	You have won (pl)
[[xa	[βa	[lomaloma]	[[[βaxalomaloma]	They have talked
[[xa	[wa	[xupa]	[[[waxaxupa]	I have beaten
[[xa	[nda	[ʧenda]	[[[ndaxaʧenda]	I have walked

The data above shows inflection of the Luwanga verb to the perfect tense. The affixation morpheme [xa] is used. The morpheme is added between the person marker and the verb base in level 2 affixation process. Level 1 affixes are always closer to the stem than level 2 affixes. The prefix /xa/ is added to the stem of the verb to mark the perfect tense. The subject marker then is attached to the inflected word.

4.2.2.4.3   Inflection for continuous tense

The continuous tense in Luwanga is marked by the addition of both the prefix and the suffix to the verb stem. The prefix and the suffix together give the full meaning of the verb. Ryding (2005:425) observes that they are sometimes referred to as 'circumfix' because they surround the stem on both sides. Quoting Anderson (1992:53), Ryding (2005) states that these affixes involve simultaneous prefixation and suffixation that correspond to a single unit of morphological form. However, the discontinuous inflection affixes on Luwanga continuous tense, verbs may be considered circumfixes, but the concept of circumfix as separate morphological category is disputed (Ryding 2005:441). The person markers in Luwanga are used as the prefixes while the continuous morpheme marker is used as the suffix.

The data below illustrates this;

39.

Prefix	Verb base	Suffix	Verb	Gloss
[enzi	[tsia]	ŋa]	[[enzitsaŋa]]	I am going
[βa	[kona]	ŋa]	[[βakonaŋa]]	they are sleeping
[a	[ʃina]	ŋa]	[[aʃinaŋa]]	he is dancing
[ʃi	[itsa]	ŋa]	[[ʃiitsaŋa]]	it is coming
[e	[xupa]	ŋa]	[[exupaŋa]]	I am beating
[o	[lola]	ŋa]	[[ololaŋa]]	you are seeing
[xu	[tsexa]	ŋa]	[[xutsexaŋa]]	we are laughing

4.2.2.4.4   Inflection for the future tense

The future tense is marked by the addition of the prefix 'la-' between the person marker and the verb base. The data in 40 below illustrates this;

40.

Preprefix	Prefix	Verb base	Verb	Gloss
[nda	[la	[kula]	[ndalakula]]]	I will buy
[ja	[la	[texa]	[jalatexa]]]	she will cook
[βa	[la	[rera]	[βalarera]]]	they will bring
[ʃi	[la	[xola]	[ʃilaxola]]]	it will do
[wa	[la	[βija]	[walaβija]]]	you will get spoilt
[o	[la	[tsia]	[olatsia]]]	you will go

The data provided above suggests that the Luwanga lexicon comprises underived lexical items to which affixes are added to derive other words of the same category or other word categories. In word formation process, both morphological and phonological rules (discussed in Chapter 5) apply at various levels. Lexical items go through primary and secondary derivational processes at level Lexical phonological rules are applied at this level. The resultant words then undergo level 2 inflectional process after which level 2 phonological rules are applied.

Based on the data provided, it has been found that the Luwanga lexicon is stratified into two hierarchical strata, stratum 1 and 2.

4.3   Conclusion

Luwanga verb goes through derivation and inflection processes. The derivation process involves addition of a prefix to the verb stem while inflection involves addition of a suffix to the verb stem. This process of affixation is determined by the stratum in which the verb stem belongs at a time. This chapter analyses the morphology of Luwanga and brings out the functions of inflections and derivations of the verb.

CHAPTER FIVE

LEXICAL PHONOLOGY OF LUWANGA NOUNS AND VERBS

5.1 Introduction

This chapter discusses the application of phonological rules at the lexical level. It looks at the articulation of words and formation of a new words. Lexical rules apply to words only and not across word boundaries. Watson (2002:200) states that, lexical phonological processes are sensitive to lexical information and morphological structure. Quoting MacMahon (1994:66), Watson (2002:201) describes lexical rules as having some link with the morphology, may have lexical exceptions, are structure preserving in so far as they do not introduce or refer to contrastive segments and they only apply within words. Lexical rules in Luwanga are word bound.

5.2 Rules affecting sounds

There are different rules that apply on different consonants. This is determined by the manner of articulation of the consonants. Voiceless stops and affricates never occur after nasals. Obstruent are voiced after nasals. However, the fricative /β/ is the only voiced obstruent which occurs in positions other than after nasals. The fricative can only occur word initially or intervocalically.

Voiced and voiceless oral stops are in complementary distribution with voiced stops following nasals and voiceless stops elsewhere -(Troyer 2007:5)

5.3 Consonant Processes
5.3.1 Glide formation

Glide formation is a process in which the first part of the two adjacent vowels surfaces as a semi-vowel (Casali 1996; Hamman 2003; Barasa, 2018). In Luwanga, glide formation results from the two glides /w/ and /j/ across the morphophonemic word boundaries. This process of glide formation is an attempt to eliminate vowel clusters within words. A less complex structure is reached once the vowel coalescence is broken. It is simpler to articulate a glide than two vowels following each other successively. Luwanga has a rule that inserts a glide between a consonant in the first syllable and the adjacent vowel.

Glide formation in Luwanga resulting from the bilabial approximant /w/ occurs in three instances;

i.   When a high vowel is followed by another high vowel. The first vowel changes into a glide while the second is retained.

49. Vowels   **Underlying form**   **Phonetic form**   **Gloss**

Vowels	Underlying form	Phonetic form	Gloss
/u+i/	omu+ifi	omwifi	a thief
/o+i/	oβu+iri	oβwiri	killings

ii.   When a high vowel is followed by a low vowel.

50. Vowels   **Underlying form**   **Phonetic form**   **Gloss**

Vowels	Underlying form	Phonetic form	Gloss
/u+a/	oβu+ami	oβwami	Leadership
/u+a/	olu+asa	olwasa	Gap

iii.   When a high vowel is followed by a mid-vowel.

51. Vowels   **Underlying forms**   **Phonetic forms**   **Gloss**

Vowels	Underlying forms	Phonetic forms	Gloss
/u+o/	omu+ojo	omwojo	heart
/u+e/	oxu+eɲa	oxweɲa	to want

Luwanga has both compensatory and non-compensatory vowel length in its glide formation process because vowel length is used to distinguish meaning in some environments. This is what brings about either compensatory or non-compensatory glide formation. Compensatory vowel length is whereby a vowel is lost in the first syllable and compensated in the second syllable through a long vowel that comes after a glide. On the other hand, non-compensatory vowel length is where the vowel lost is not compensated in the preceding syllable(s).

52. Prefix   **Root**   **Noun**   **Gloss**

Prefix		Root	Noun	Gloss
[olu	+	[asia	[[olwa:sia]	take care of a patient
[olu	+	[ania	[[olwa:nia]	keep struggling

In the examples above, the vowel in the first syllable /e/ is lost and the glide /w/ introduced.

Luwanga also has the occurrence in which the high vowel /i/ becomes a glide. Glide formation that involves the palatal glide /j/ takes place when the high vowel /i/ comes before any high or mid vowel.

53. Vowels   **Prefix**   **Noun stem**   **Noun**   **Gloss**

Vowels	Prefix		Noun stem	Noun	Gloss
/a+i/	[eʃi	+	[alo]	[[eʃjalo]	World
/a+i/	[eʃi	+	[ombo]	[[eʃjombo]	Pretty girl
/a+i/	[eʃi	+	[uma]	[[eʃjuma]	Chain
/a+i/	[eʃi	+	[ejo	[[eʃjejo]	Broom

When the high vowel /i/ is preceded by the sibilant /ʃ/, the vowel changes to the glide /j/. The morpheme /n/ is affixed to the lexicon to bring out a negative connotation of the verb. However, this negative connotation can also be achieved by the addition of the suffix [-ula] on the stem of the verbs. The suffix brings out the negative form of the verb.

For example;

Hierarchical representation.

/oxwanula/

[Level 2	[level 1	[Verb base]	Level 2]		Gloss
[n	[oxu	[ala]	ula]	/oxwanula/	'unspread'

54. Luwanga   **Gloss**

Luwanga	Gloss
/fwala/	'put on'
/fwalula/	'take off'
/xwesa/	'pull'
/xwesulula/	'unpull'

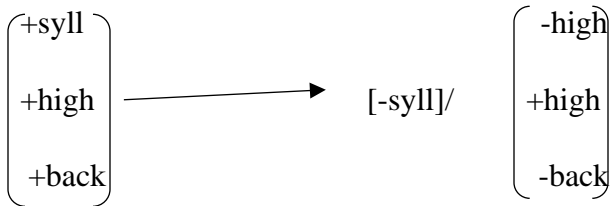/texa/   marry

/texulula/   'unmarry'

Clark and Yallop (1995:62) view phonological processes as complex articulations which capture both secondary articulation (a super imposed articulation) and complex articulation (involving more than one place of articulatory activity in the vocal tract). In Luwanga, a high back vowel changes into a glide when immediately followed by a non-high vowel or a high vowel with opposite value for the feature [BACK]. The rule is formulated as follows;

$$
\begin{bmatrix} +syll \\ +high \\ +back \end{bmatrix} \longrightarrow [-syll]/ \begin{bmatrix} -high \\ +high \\ -back \end{bmatrix}
$$

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Verb base	Level 1 aff+Verb base	LR	PR	Gloss
[imba]	[omu+[imba]]	[omuimba]	[omwimbi]	'singer'
[ira]	[omu+[ira]]	[omuira]	[omwiri]	'killer'
[itsa]	[omu+[itsa]]	[omuitsa]	[omwitsa]	'singer'

This process applies the following rule;

U $\longrightarrow$ W/C- C. The high vowel /u/ changes to the glide /w/ in the environment of two consonants. The vowel /i/ however, is retained in its original form.

5.3.2 Homorganic Nasal Assimilation
Akidah (2012) defines assimilation as a phonological process in which a segment (consonant or vowel) acquires the phonetic features of another segment contiguous to it. The motivation for this process is normally to reduce the effort spent in the articulation of the two contiguous segments. He goes on to explain that voicing may spill over into adjacent segments. Hence, the rule of suffix voice agreement in an instance of regressive assimilation. This brings about the aspect of

directionality. According to Katamba (1989:84), a sound may become like the sound that precedes it or the sound that follows it.

Voice assimilation

Lexical representation	Phonetic representation	Gloss
[ekula]	[eŋgula]	I buy
[etexa]	[endexa]	I cook
[epaŋga]	[embanga]	I plan

This process shows that the nasal always anticipates the place of articulation of the consonant that follows it. As a result of the anticipation the speaker adjusts the place of articulation of the nasal to the preceding consonant. This is termed as progressive assimilation and the rule can be formulated as follows;

i.   N ⟶ n/t_____   Nasal is realized as [n] before alveolar consonant [-t]
   The following data illustrates this;

42. Underlying form	**Prefix**	**Rule application**	**Phonetic form**
[te:ma	[e	[Nasalisation]	[[[endola]
Try	I		I try
[to:la	[e	[Nasalisation]	[[[endola]
Pick	I		I pick
[Tira	[e	[Nasalisation]	[[[endira]
Catch	I		I catch

The voiceless alveolar plosive /t/ changes to a voiced alveolar plosive intervocalically. The consonant is then nasalized through the introduction of the alveolar nasal /n/ before the consonant to reduce the effort used in articulation.

ii.   The nasal is realized as [m] before bilabial consonants like [p, β]

The following data illustrates this rule;

43. Underlying form	**Prefix**	**Rule application**	**Phonetic form**
[βola	[e	+ [Nasalisation]	[[[emβola]

Speak	i		I speak
[para	[e	+[Nasalisation]	[[[embara]
Think	i		I think
[βeka	[e	+ [Nasalisation]	[[[embeka]
Shave	I		I shave

The examples above illustrate the phonological process of nasalization. The alveolar nasal consonant /m/ is inserted between the subject marker /e/ and the verb stem that begins with the voiceless bilabial plosive /p/ and the voiceless bilabial fricative /β/. The bilabial nasal eases the effort of articulation.

iii. The nasal is realized as [ŋ] before velar consonants like [k].

44. Underlying form	prefix		Rule application	Phonetic form
[Koβa	[e	+	[Nasalisation]	engoβa
Escort				I escort
[Kona	[e	+	[Nasalisation]	engona
Sleep				I sleep
[Ka:ma	[e	+	[Nasalisation]	engama
Bring				I bring

The alveolar nasal /n/ is inserted between the subject marker /e/ and the verb stem. The voiceless velar stop /k/ changes to the voiced velar stop /g/ due to the insertion of the nasal.

iv. The nasal is realized as [ʤ] before alveolar consonant /ʧ/

45.

Underlying form	Prefix	Rule application	Phonetic form
[ʧenda	[e	+ [Nasalisation]	[[[enʤenda]
Walk	I		I walk
[ʧinga	[e	+ [Nasalisation]	[[[enʤinga]
Carry	I		I carry

[ʧama		[e	+ [Nasalisation]	[[[endʒama]
Love		I		I love

The principle of rule ordering has been applied. The phonological rule of nasalization inflects the lexical item. This is done after the morphological process of level 1 affixation taking place. The phonological process at the same level results to the nasalization of the lexical item.

The alveolar nasal /n/ is inserted between the subject marker and the verb stem. The voiceless affricate /ʧ/ changes to a voiced affricate /dʒ/ due to the insertion of the nasal.

5.3.3 Voice Assimilation

Assimilation is broken down into three categories. Progressive, regressive and coalescent assimilation. Progressive assimilation is where features of a phoneme are modified by the features of the phoneme immediately before it. In Luwanga, this type of assimilation is exhibited through the first-person pronoun /e/ on verbs that begin in alveolar, bilabial and velar consonants.

The following data illustrates this;

46.

Level 1 aff	Level 2 aff	Verb Stem	Verb	Gloss
[e	[dʒ	[enda]	[[[endʒenda]	I walk
[e	[dʒ	[ienula]	[[[endʒienula]	I redo
[e	[dʒ	[inga]	[[[endʒinga]	I carry

The first-person pronoun /e/ has a high level of sonority compared to the voiceless affricate /ʧ/. This, therefore, changes the affricate to the voiced one /dʒ/.

Regressive assimilation can be defined as "the change in phoneme characteristics due to influence of a sound occurring later in the word" (Garn-Nunn& Lynn, 2004; 111). This type of assimilation in Luwanga is exhibited through strengthening of the fricative /β/ to be realized as a bilabial stop because of being preceded by a nasal.

The following data illustrates this;

47.

Level 1 affix	Level 2 affix	Verb stem	Verb	Gloss
[e	[m	[βola]	[[[embola]	I say
[e	[m	[βixa]	[[[embixa]	I keep
[e	[m	[βeka]	[[[embeka]	I shave

The bilabial nasal /m/ is inserted between the subject marker and the verb stem. Its nasal quality strengthens the voiceless bilabial fricative /β/ to a voiced bilabial stop.

Coalescence assimilation is a process whereby two vowels are replaced by a single vowel which shares the features of the replaced vowels. Coalescence occurs in vowels that are adjacent to each other because the morphemes they belong to occur at the end and the beginning of adjacent words. Vowel height is a case that triggers coalescence in Luwanga.

5.3.2.1 Vowel height coalescence
Schane (1973:54) states that the first kind of coalescence usually involves consonants only, while the other kind involves vowels. One vowel may influence another exactly so that it sheds off its own features and takes the features of influencing vowel thus leading to what is called complete vowel assimilation. Similarly, vowels may influence each other resulting in a different vowel, thus leading to what is called reciprocal vowel assimilation. Vowel height coalescence takes place when the first vowel is a low vowel and the second vowel is a high vowel, and both of them coalesce into a mid-vowel. The data below illustrates vowel height coalescence:**48. Vowels   Prefix**

Verb Stem			**Noun**	**Gloss**	
/a+i/	[aβa	+	[ira]	[[aβeri]	Killers
/a+i/	[aβa	+	[ifi]	[[aβefi]	thieves
/a+i/	[aβa	+	[itsa]	[[aβesta]	friends

The data above shows that the two vowels /a/ and /i/ merge into the mid vowel /e/ in forming the plurals of the nouns.

Vowel harmony appears to take place every time the verb stem has an affix whose vowel belongs to a different quality from the vowel of the root.

5.5 Conclusion

Luwanga has two types of voice assimilation. Progressive assimilation and Vowel coalescence. In the two assimilation processes, vowels fuse to one intermediate vowel; in this case, a high vowel and a low vowel merge to a mid-vowel. Vowel coalescence in Luwanga can be said to be at the morpho-phonemic word boundary. It also results to vowel lengthening.

The Bracket Erasure Convention is applied in the above examples. Brackets are introduced at the Underlying level. Derivation process takes place hence erasing of the brackets.

CHAPTER SIX
CONCLUSIONS AND RECOMMENDATIONS.

6.1 Conclusions

The first objective is to identify the derivational and inflectional processes in Luwanga. These processes include, formation of diminutives, pluralization and tense formation. It was established that the Luwanga lexicon is derived and inflected through strata one and strata two of the LP theory

The second objective was to describe the hierarchical structure of Luwanga nouns and verbs. The morphological and phonological processes take place cyclically. It has been found that the Luwanga noun and verb is hierarchically ordered. The lexicon consists of two levels; Level 1 and Level 2.

The third objective was to investigate the lexical phonological processes involved in the formation of nouns and verbs in Luwanga. Luwanga noun and verb go through the processes of glide formation, homorganic nasal assimilation, voice assimilation, vowel height coalescence. Level 1 affixation processes lead to change in the phonological structure of a derived lexical item.

The last objective was to establish the contribution of morphology in the phonology of Luwanga nouns and verbs. It was concluded that most of the affixes, upon addition to word stems, lead to phonological processes thereby changing the phonological structure of the derived words. This phenomenon is more prevalent in level one affixes.

The research describes the morpho-phonological structure of the lexicon. It has explained the extent to which the Luwanga lexicon can be termed as hierarchical. This explanation has been done within the parameters of Lexical Phonology theory. The data has been presented and analyzed morphologically and phonologically. The research problem has been intensively discussed. The study has demonstrated that indeed Luwanga lexicon is hierarchically ordered.

The principles of LP theory can apply to Luwanga lexicon without difficulty. This theory has also managed to analyze the Luwanga lexicon morphologically and phonologically.

6.2 Recommendations

The analysis done in this study can provide significant information to linguists who may wish to conduct further research in Luwanga. Phrasal, clausal, semantic among other grammatical areas

have not been looked at in this study. The study can therefore be beneficial through its in-depth analysis of the Luwanga noun and verb, the paradigmatic arrangement of the morphemes and the grammatical functions the different morphemes have. As earlier mentioned, this study can also be useful to the government policy (Competency Based Curriculum) for teaching mother tongue in schools. It explains the relationship between morphology and phonology. It also elaborates the morphophonological processes that take place within the Luwanga morphemes and phonemes. This lays a very good foundation for teaching the dialect to students.

Having looked at the morphology and phonology of Luwanga, this study leaves room for broadening of Luwanga in terms of syntax and semantics. The phrasal and clausal structures of Luwanga can also be studied using the LP theory. The analysis of these two can be done using the post lexical rules of the LP theory.

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APPENDICES

Appendix 1 –Study Area; Previous Wanga Kingdom map.
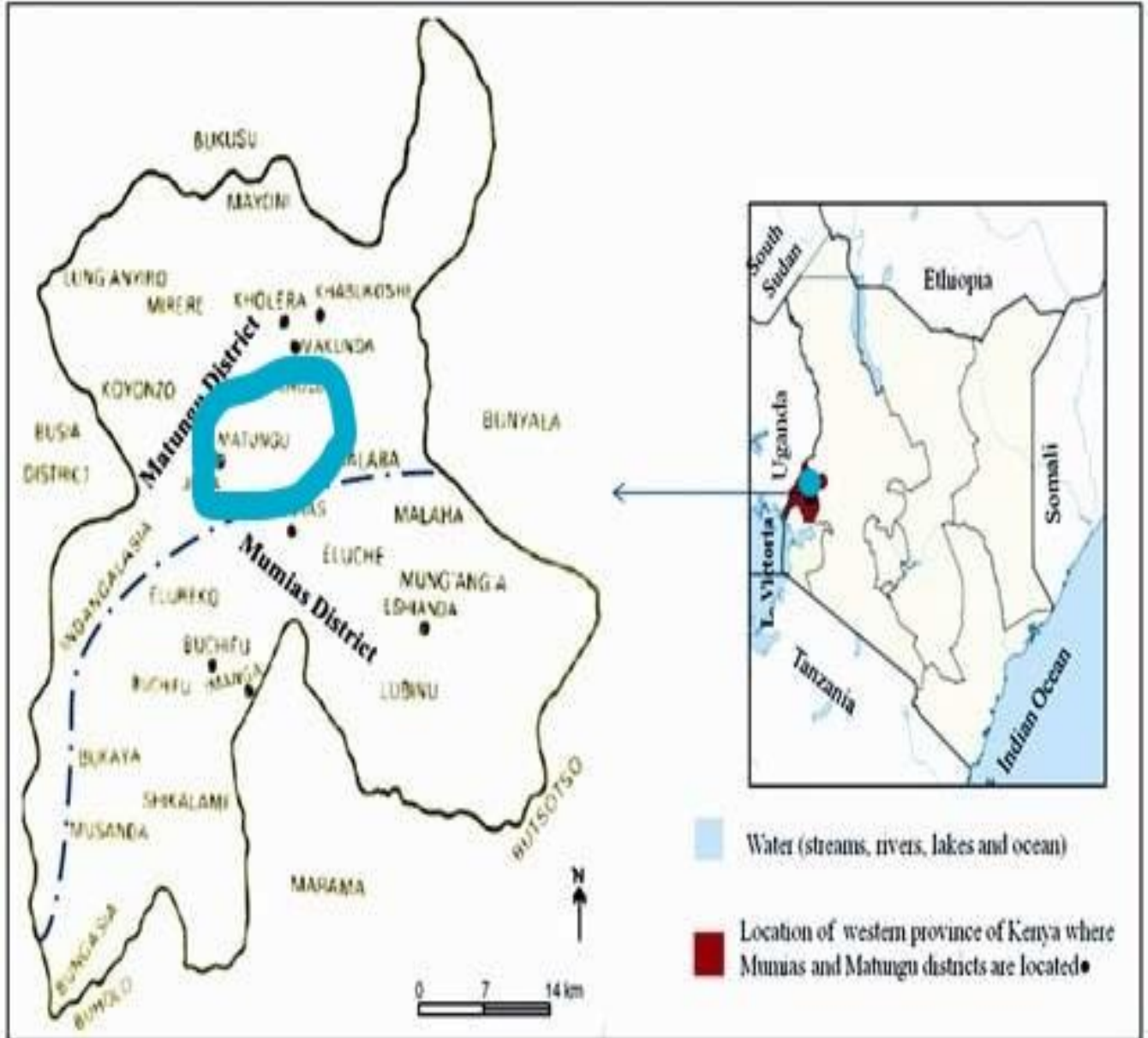
Research gate: Uploaded by Matin Muthee Gakuubi

Appendix 2-Interview Schedule for respondents

I appreciate the support you have given me during this research. All the data and discussion done here

will be used purposely for my study research only.

Section A. Data on Tense

1. What do I say when I want to build a house?

2. When the house is in the process of being built, what do I say?

3. How about when I already built the house, what do I say?

4. What do I say when I don't want to build a house?

5. How do I say I've just finished building a house?

Section B. Data on Plurals

1. How do I say my calf is lost?

2. What about many calves are lost?

3. How do I say people stole my calves?

4. How about my calves ran into the woodlands?

Section C: Demographic information about research assistants.

1. Gender. Male ( )   Female ( )

2. Age

      41-45 years   ( )

      46-50 years   ( )

      50 years and above   ( )

Appendix 3- Some sample data collected from interview.

Fjosi	All
Kala	Slow
Mkhwasi	brother-in-law
Kololoxa	Straighten
ŋaŋala	Shocked
Mxwasi	Brother in law
Tsixwi	Firewood
Ruta	Scratch

Langa	Call
Wina	Who
Tira	Catch
Shiro	Market
ʧenda	Walk
Sinza	Slaughter

/iruxa /   'Run'

/oxwiruxa /   'to run '

/Omwiruʃi /   runner

/Texa /   'cook '

/Oxutexa/   'to cook'

/Omuteshi /   'a cook '

/sirixa/   'treat'

/Omusirishi/   'a doctor '

/oxubaya/   'to play'

/omubayi /   'a player'

a) [xola]   do
b) [βeka]   shave
c) [ʃina]   dance

d) [ru:ma]   jump
e) [lo:ra]   dream
f) [βuxa]   wake up

g) [xo:mba]   lick

h) [ʧenda]   walk

i) [si:nza]   slaughter

Appendix 4 – Data on Negation

TENSE/ASPECT	PERSON	NEGATION	SINGULAR NEGATION FORM	GLOSS
PRESENT	1st	Se	Se xola ta	I am not doing
	2nd	So	So xola ta	You are not doing
	3rd	Sa	Sa xola ta	He/she is not doing
PAST	1st	Si	Si ndaxola ta	I didn't do
	2nd	Si	Si waxola ta	You didn't do
	3rd	Si	Si jaxola ta	He/she didn't do
FUTURE	1st	Si	Si ndala xola ta	I will not do
	2nd	Si	Si wala xola ta	You will not do
	3rd	Si	Si jala xola ta	He/she will not do
PROGRESSIVE	1st	Se	Se xolanŋa ta	I'm not doing
	2nd	So	So xolanŋa ta	You are not doing
	3rd	Sa	So xolanŋa ta	He/she is not doing