# A PHONOLOGICAL ANALYSIS OF LWIDAKHO LOANWORDS FROM KISWAHILI AND ENGLISH

**BY**

**MORAND SHIKHOVA SHIDIAVAI**

**C50/69747/2013**

**A Project submitted in partial fulfillment of the requirements for the Degree of Master of Arts in the Department of Linguistics and Languages, University of Nairobi.**

**November, 2015**

## DECLARATION

This thesis is my original work and has not been submitted for the purpose of the award of a degree in any other University.

Signature _____ Date: _____

MORAND SHIKHOVA SHIDIAVAI

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

Signature _____ Date: _____

DR. JANE AKINYI ODUOR NGALA

Signature _____ Date: _____

DR. HANAH CHAGA MWALIWA AKANGA

## DEDICATION

This work is dedicated to;

My beloved late sister,

Linnet Ingado

My wonderful parents,

Michael Ambenje and Christine Mideva

My lovely sisters,

Pauline Khasungu, Lucy Aleyo and Euslyne Indeche

My dearest niece,

Maclean Malavi

and

My best friend,

Monica Wawuda

## ACKNOWLEDGEMENTS

First, I wish to proclaim my sincere gratitude to the Almighty God for the gift of life, good health, and innumerable favours. Thank you for the guidance, protection, and motivation throughout my studies.

Secondly, I will forever remain greatly indebted to my alma mater; University of Nairobi. Thank you for easing my academic journey through your award of the prestigious University of Nairobi Scholarship. This indeed confirms that you are a world-class University committed to scholarly excellence.

Thirdly, I wish to appreciate my supervisors: Dr. Jane Oduor and Dr. Hanah Mwaliwa. Your input into the present study is indispensable. Thank you so much for your patience, time and direction which added impetus to my research. I also would like to acknowledge the entire University of Nairobi Department of Linguistics and Languages lecturers; Prof. Okoth Okombo, Prof. Kithaka Wa Mberia, Prof. Lucia Omondi, Dr. Alfred Buregeya, Dr. Helga Schröder, Dr. James Nyachae, Dr. Gideon Marete and Mr. Basilio Mungania. Moreover, the departmental staff namely Peris, Steve, Simon and Naomi, be blessed!

Lastly, I extend my gratitude to Washington Ndadema, Judith Ndadema, Gabriel Ambenje and Risper Ambenje. Thank you for always making me feel at home. I am also indebted to Mercy Ambenje, Agnes Ambenje and Consolata Ambenje for the spiritual and moral support. In addition, I am grateful to my friend John Agevi (Dudi) for his insights on Luhya linguistics. To my friend Caroline Mbugi, I am thankful for the support. My classmates were a wonderful family to me in campus and I wish them well wherever they go. My academic partner, Jane Wanjiru together with longtime friend and classmate; Lawi Omwoha and the ever motivating and reassuring cohort of Bella Okoth and Mercy Nafula. Monica Onyancha, Ugas Abdirahman, Amina Hajara, Zinyuk Maringa, Hannah Macharia and Linnet Magachi were all a delightful company. I am thankful to Mr. Hillary **S**ang for kick starting my research. To all those I have not mentioned who contributed their prayers, physical, and emotional support, I will always hold you dear in my heart!

## ABSTRACT

This research discusses the phonological adaptations of Kiswahili and English loanwords into Lwidakho within the Optimality Theory framework as espoused by Allan Prince and Paul Smolensky (1993, 2002). It outlines the Lwidakho sound inventory. The study investigates the constraints responsible for the systematic adaptation of English and Kiswahili consonant segments together with the syllable structures into Lwidakho. The data was collected through natural observation and introspection. Optimality tables are used in the ranking of constraints undergirding the phonological adaptations. The findings of the study point to substitution as the process by which foreign sound segments are adapted into Lwidakho. Secondly, Kiswahili and English syllable structures are changed into CV syllables in Lwidakho. Lastly, vowel epenthesis as opposed to consonant deletion is the most preferred repair strategy for illicit codas and consonant clusters in Lwidakho. The present study contributes to the documentation of the Lwidakho language especially in loanword phonology.

## List of Tables

Table 1: /griːn/ >/ku-ri-nɪ/ ‘green’…… 6

Table 2: /kɔ-di-ʃa/>/ko-te-ʃa/ ‘to let’……..……. 7

Table 3: Lwidakho consonants……..…. 22

Table 4: Lwidakho vowels……..... 23

Table 5: Kiswahili consonants……..…… 24

Table 6: Vowels of Kiswahili…….…….. 24

Table 7: English consonants…….…… 26

Table 8: The pure vowels of English……..….. 26

Table 9: English nasal adaptations into Lwidakho ……..….. 33

Table 10: Adaptation of English plosives into Lwidakho……..….. 35

Table 11: English fricatives adaptation in Lwidakho……..….. 37

Table 12: Adaptation of English affricates in Lwidakho …… 38

Table 13: The adaptation of English glides in Lwidakho…….…... 40

Table 14: The adaptation of English liquids into Lwidakho…….. 41

Table 15: The adaptation of Kiswahili nasals into Lwidakho…….…… 43

Table 16: The adaptation of Kiswahili plosives in Lwidakho…….…… 45

Table 17: The adaptation of Kiswahili fricatives in Lwidakho…….…….. 47

Table 18: The adaptation of Kiswahili affricates in Lwidakho……..……. 49

Table 19: The adaptation of Kiswahili liquids in Lwidakho…….……..……. 50

Table 20: The adaptation of Kiswahili glides into Lwidakho……..…… 51

Table 21: The adaptation of Kiswahili prenasalized consonants in Lwidakho……...… 52

Table 22: /æn-ə-lɒg/ >/ana-lo-ko/ ‘analog’……..….54

Table 23: /ki-ɲɔ-zi/ >/ʃɪ-ɲo-sɪ/ ‘barber shop’……... 54

Table 24: /wɒtʃ-mən/ >/wo-tʃɪ-ma-nɪ/ ‘watchman’……... 55

Table 25: /sɛ-ŋɛ-ŋgɛ/>/lu-se-ɲɛ-ɲdʒɛ/ ‘barbed wire’…….... 55

Table 26: /fɑː-ðə/ >/fa-tsɑ/ ‘father’……..……..…. 56

Table 27: /fræŋk/ >/fu-ra-ŋga/ ‘Frank’……... 57

Table 28: /pa-zi-a/ >/ɪ-pa-sɪ-a/ ‘curtain’…….…… 57

Table 29: /m-lɛ-vi/ >/mu-ɾe-fɪ/ ‘drunkard’……..…….. 58

Table 30: /ʃu-kra-ni/ > /ʃu-ku-ra-nɪ/ ‘gratitude’……..... 58

Table 31: /ɣa-ra-ma/ >/ɪ-kɑ-rɑ-mɑ/ ‘cost’…….....59

Table 32: /wɒtʃ-mən/ >/wo-tʃɪ-ma-nɪ/ ‘watchman’……..…… 60

Table 33: /dʒɜː-mə-ni/ > /tʃa-ma-nɪ/ ‘Germany’……... 60

Table 34: /m-tʃɛ-lɛ/ > /mu-tʃe-ɾɛ/ ‘rice’……..…..… 61

Table 35: /plɒt/ >/ɪ-pu-lo-tɪ/ ‘plot’…….…… 61

Table 36: /bəʊlt/>/ɪ-po-ɾo-tɪ/ ‘bolt’……...……..... 62

Table 37: /suːt/>/ɪ-su-tɪ/ ‘suit’…….... 62

Table 38: /du-ka/ >/ɾɪ-tu-ka/ ‘shop’……... 62

Table 39: /si-ga-ra/>/ɪ-sɪ-ka-la/ ‘cigarette’……..……. 63

Table 40: /pɛ-rɛ-mɛ-ndɛ/>/ʃɪ-mɛ-rɛ-me-ndɛ/ ‘sweet’…… 63

Table 41: /pi-ki-pi-ki/>/pɪ-tʃɑ-pɪ-tʃɪ/ ‘motorbike’…….…….. 64

Table 42: /kwɒg-maɪə/>/kwo-ku-ma-jɑ/ ‘quagmire’…….……..…….. 64

Table 43: /u-la-ja/ >/bu-la-ja/ ‘abroad’…….…….. 65

Table 44: /friː-wiːl/ >/ɪ-fu-re-ja/ ‘freewheel’……..…… 65

Table 45: /æn-ə-lɒg/ >/ana-lo-ko/ ‘analog’…….…….. 66

Table 46: /ɣa-li/ >/ka-ɾi/ ‘expensive’……..…….…… 66

Table 47: /griːs/ >/ɪ-kɪ-ri-sɪ/ ‘grease’……..……. 67

Table 48: /sa-mba-za/>/sɑ-mbɑ-sɑ/ ‘to distribute’…….……... 67

Table 49: /bu-ndu-ki/>/ɪ-pu-ndu-tʃɪ/ ‘gun’……..... 68

Table 50: /sɛ-ŋɛ-ŋgɛ/ >/lu-se-ɲɛ-ɲdʒɛ/ ‘barbed wire’……..……... 68

Table 51: Consonant Structure of words in the data.……..…….. 74

Table 52: /wɔːd/>/ɪ-wo-tɪ/ ‘ward’…….. 76

Table 53: /stɔː-ri/ >/ɪ-sɪ-to-rɪ/ ‘story’……..….. 77

Table 54: /fræŋk/>/fu-ra-ŋga/ ‘Frank’……... 77

Table 55: /dak-ta-ri />/ta-tʃɪ-ta-ɾɪ / ‘doctor’……..... 78

Table 56: /mwis-la-mu/>/mwi-sa-la-mu/ ‘Muslim’…….……...…… 78

Table 57: /frendz/>/βɑ-fu-re-nzɪ/ ‘Quakers’…….……..…… 79

Table 58: /kaʊn-ti kaʊnsl/>/kɑ-u-ndɪ-ka-nzo/ ‘County council’……...…..…….. 79

Table 59: /hɒs-pɪ-tl/ >/ɪ-sɪ-βɪ-ta-ɾɪ/ ‘hospital’……....… 80

## List of Figures

Figure 1: The application of OT to language grammar……12

# TABLE OF CONTENTS

**Contents**

**DECLARATION** ii

**DEDICATION** iii

**ACKNOWLEDGEMENTS** iv

**ABSTRACT** v

List of Tables vi

List of Figures ix

Symbols xiii

Abbreviations xiv

**CHAPTER 1** 1

**INTRODUCTION** 1

1.1 General Introduction 1

1.1.1 Background to Lwidakho Language 1

1.1.2 Background to the Study 2

1.2 Statement of the Problem 3

1.3 Objectives of the Study 3

1.4 Research Hypotheses 3

1.5 Justification of the Study 4

1.6. Scope and Limitations of Study 4

1.7 Theoretical Framework 5

1.7.1. Principles of Optimality Theory 6

1.7.2. GEN 7

1.7.3. CON 8

1.7.4. EVAL 10

1.7.5. Strict domination 10

1.7.6. Economy 10

1.7.7. The Diagrammatic Representation of Optimality Theory 11

1.8. Literature Review 13

1.8.1. Review of Literature on Lexical Borrowing 13

1.8.2. Review of Literature on Loanword Adaptation ..... 14
1.9. Methodology ..... 17
1.9.1. Data Collection ..... 17
1.9.2. Data Analysis ..... 18
1.10. Conclusion ..... 18
**CHAPTER 2** ..... 20
**PHONEMIC INVENTORIES OF LWIDAKHO, ENGLISH AND KISWAHILI SOUNDS** ..... 20
2.1. Introduction ..... 20
2.2. Lwidakho Sound Inventory ..... 20
2.2.1. Consonants ..... 20
2.2.2. Vowels ..... 22
2.3. Kiswahili Sound Inventory ..... 23
2.3.1. Kiswahili Consonants ..... 23
2.3.2. Kiswahili Vowels ..... 24
2.4. English Sound Inventory ..... 25
2.4.1. English Consonants ..... 26
2.4.2. English Vowels ..... 26
2.5. Conclusion ..... 29
**CHAPTER 3** ..... 31
**THE ADAPTATION OF ENGLISH AND KISWAHILI CONSONANTS IN LWIDAKHO** ..... 31
3.1. Introduction ..... 31
3.2. The Adaptation of English Consonants in Lwidakho ..... 32
3.2.1. Nasals ..... 32
3.2.2. Plosives ..... 33
3.2.4. Affricates ..... 38
3.2.5. Glides ..... 39
3.2.6. Liquids ..... 40
3.3. The Adaptation of Kiswahili Consonants in Lwidakho ..... 42
3.3.1. Nasals ..... 42
3.3.2. Plosives ..... 44
3.3.3. Fricatives ..... 47
3.3.4. Affricates ..... 48

3.3.5. Liquids ..... 49
3.3.6. Glides ..... 51
3.3.7. Prenasalized consonants ..... 52
3.4.1. Nasal Adaptation ..... 53
3.4.2. Fricative Adaptation ..... 55
3.4.3. Affricate Adaptation ..... 59
3.4.4. Plosive Adaptation ..... 61
3.4.5. Glide Adaptation ..... 64
3.4.6. Liquid Adaptation ..... 66
3.4.7. Prenasalized Consonant Adaptation ..... 67
3.5. Conclusion ..... 69
**CHAPTER 4** ..... 71
**THE SYLLABLE STRUCTURE ADAPTATION OF LOANWORDS IN LWIDAKHO** ..... 71
4.1. Introduction ..... 71
4.2. The Kiswahili Syllable Structure ..... 71
4.3. The Lwidakho Syllable Structure ..... 72
4.4. The English Syllable Structure ..... 72
4.5. Syllable Structure Adaptation in Optimality Theory ..... 74
4.6. Conclusion ..... 80
**CHAPTER 5** ..... 82
**CONCLUSION** ..... 82
5.1. Findings ..... 82
5.2. Recommendations for further Study ..... 84
**REFERENCES** ..... 85
**APPENDIX 1** ..... 89
**APPENDIX 2** ..... 92

**Symbols**

(Blank cell) …… satisfaction of a constraint

(Grey shaded cell)…… irrelevant constraint (non-optimal candidate)

***** ……..…….constraint violation

**!** ..... fatal constraint violation

……..optimal/winning candidate

…….....deviant candidate but preferred as winner

>> .....constraint dominance

– …….syllable boundary

## Abbreviations

appr……...Approximant

Artirclt..……Articulation

C…….……Consonant

CON……..…..Constraint

cons……....Consonant

cont…….Continuant

EVAL……....Evaluator

GEN……..Generator

LG……Language Grammar

nas……Nasal

OT……Optimality Theory

son……Sonorant

UG……..Universal Grammar

# CHAPTER 1

# INTRODUCTION

## 1.1 General Introduction

This study on Lwidakho loanword phonology attempts to analyse the phonological adaptations of words borrowed from English and Kiswahili within the Optimality Theory framework. The segmental and phonotactic changes in phonemes and syllable structures are discussed. The background to the Lwidakho language is covered in section 1.1.1. It is followed by a background to the study under section 1.1.2. Section 1.1covers the problem statement. Research questions, objectives of the study, research hypotheses, justification of the study together with the scope and limitations are tackled in sections 1.3, 1.4, 1.5, 1.6, and 1.7 respectively. Section 1.8 states and explains the theoretical framework with 1.9 covering the literature review. Lastly, the methodology is covered in 1.10 with 1.11 concluding the chapter.

### 1.1.1 Background to Lwidakho Language

Lwidakho is a dialect of the Luhya language group. Luhya languages form the Western Bantu speakers. They are spread across the Western region of Kenya and Eastern Uganda. The 2009 Kenya Population and Housing census lists 5,338,666 Luhya speakers in Kenya. There are about 170,720 speakers of Lwidakho (Kenya National Bureau of Statistics, 2010: 397). The remaining dialects of the Luhya are Lukhayo, Lunyala, Lunyore, Lutsotso, Lubukusu, Lwisukha, Lukabarasi, Lukisa, Lumarachi, Lulogoli, Lumarama, Lusamia, Lutachoni, Lutiriki, Lutura and Luwanga.

Lewis, Gary and Charles (2015) assert that Lwidakho is closely related to other immediate bordering dialects of the Luhya language namely Lwisukha and Lutirichi. The Idakho mythology according to Were (1967) as quoted by Lidonde (1978: ii) identifies Mwitakho as their ancestor. This follows from the fact that the six major clans comprising the speakers of Lwidakho developed from his six sons namely Shikulu, Ngalori, Shiangala, Musali, Kasam and Masaba. Geographically, speakers of Lwidakho are spread across twelve sub counties of Kakamega. These sub counties comprise of Lugari, Likuyani, Navakholo, Malava, Lurambi,

Khwisero, Ikolomani, Shinyalu, Mumias, Mumias East, Matungu, and Butere. However, as Lidonde (1978: i) notes, many speakers come from Itakho location. According to Lewis, Gary and Charles (2015) Lwidakho is classified within the Niger-Congo, Atlantic –Congo, Volta-Congo, Benue-Congo, Bantoid, Southern, Narrow Bantu, Central, J language family.

### 1.1.2 Background to the Study

Language contact inevitably leads to linguistic change. It is usually occasioned by the interaction of speakers of the different languages which leads to lexical borrowing where words from one language are adapted by another (O'Grady, Dobrovolsky and Katamba 1997: 316-17). This is necessitated by the need to fill lexical gaps in the loan language especially in denoting new concepts from the source language. Moreover, some instances of borrowing may result from the desire to identify with the prestige associated with the source language among others.

When words are borrowed, they undergo phonological, morphological and in some cases semantic changes where differences exist in the two language systems. This is because languages of the world exhibit a number of features unique to themselves ranging from sound systems to permissible grammatical structures.

English and Kiswahili are the official languages of Kenya. The former's history dates back to the coming of European Christian missionaries which was followed by the acquisition of Kenya as a British colony. English words subsequently found their way into the Lwidakho vocabulary through church missionary activities, settler farmers and government posts. Kiswahili and English are both taught as compulsory subjects and are examinable in the Kenya Certificate of Primary Education and the Kenya Certificate of Secondary Education. As a result, there has been a considerable period of contact between speakers of Lwidakho, Kiswahili and English languages.

Therefore, a study is necessary to explain how the loanwords are adapted into Lwidakho given the differences in their phonemic inventories. English for instance, is a Germanic language while Kiswahili is a Bantu language. In spite of the fact that both Kiswahili and

Lwidakho are Bantu, many loanwords undergo different phonological and morphological changes from the source language to the borrowing language during nativization. It is also notable that English and Kiswahili loanword adaptation in Lwidakho conforms to a systematic pattern. The illicit syllable structures need repairs to conform to the borrowing language. In addition, consonants and vowels absent in the Lwidakho inventory call for a systematic adaptation strategy.

## 1.2 Statement of the Problem

This study seeks to phonologically analyse loanwords in Lwidakho from English and Kiswahili within Optimality Theory. In spite of the growing literature on loanword phonology, most of the researchers have adopted rule based theories like the CV-phonology and Natural Generative Phonology to account for the segmental, syllable structure and morphological adaptation of loanwords. There is also no known study on Lwidakho loanword phonology. This study fills the gap using the theory of Optimality. What we do not know is how consonants and syllable structures from English and Kiswahili are adapted in Lwidakho. Moreover, we do not know which repair strategy is the most preferred in the adaptation of consonant clusters in Lwidakho. This statement of the problem could be summarized in the following research questions: What changes do English and Kiswahili consonants and syllables undergo in their adaptation into Lwidakho? What repair strategy is preferred in the adaptation of consonant clusters in Lwidakho?

## 1.3 Objectives of the Study

The objectives of this study are as follows:

i. To investigate how English and Kiswahili consonants are adapted into Lwidakho.
ii. To find out how English and Kiswahili syllable structures are adapted into Lwidakho.
iii. To investigate the most preferred repair strategy in the adaptation of consonant clusters in Lwidakho.

## 1.4 Research Hypotheses

i. English and Kiswahili consonants are adapted into Lwidakho by substitution.

ii. English and Kiswahili syllables are adapted into Lwidakho by being changed into CV syllables.
iii. Epenthesis is the most preferred repair strategy in the adaptation of illicit consonant clusters in Lwidakho.

### 1.5 Justification of the Study

The present study of Lwidakho loanword phonology within the Optimality Theory framework is a first one of its kind in the language and makes significant scholarly contributions in phonology. Firstly, it helps in the documentation of the Lwidakho dialect of the Luhya language especially in loanword phonology. The study as previously asserted, provides a different framework of loanword analysis away from the rule based approaches used in studying loanword phonologies. This comes in the backdrop of efforts by the government to promote literacy in first language in the lower classes of primary education in Kenya.

Secondly, the findings of this study are also of importance to dialectologists with research interests in Lwidakho. In addition, the information therein can be applied in understanding other related Luhya dialects.

Moreover, lexicographers working on the dictionary of Lwidakho will find the results of the study relevant given that they focus on meanings of words and borrowing is a key source of new vocabulary adopted by languages to fill existing lexical gaps. The study provides an exposition of new sound segments that are introduced in Lwidakho as a result of borrowing.

Lastly, students of Linguistics and languages together with the broader discipline of African studies should also find this research useful in their subject areas. The study does not only provide an insight into Lwidakho language but also the way of life of the Idakho community expressed in their use of words.

### 1.6. Scope and Limitations of Study

There are many aspects of language borrowing ranging from morphological, phonological, semantic and sociolinguistic. For the purpose of the present study, I limit my research to the phonological aspects, that is, segmental and phonotactic adaptations of English and Kiswahili loanwords in Lwidakho. At the segmental level, special focus is on consonants and not vowels.

This is done to avoid a sketchy analysis which denies vowels the deserved attention since there is a lot to be discussed on the adaptation of vowels in the nativization process. Secondly, the syllable structure adaptation is analysed at the phonotactic level. Suprasegmental changes also occur in loanword adaptation but they fall beyond the scope of this study. Though Lwidakho has borrowed words from many languages, the choice of words will be limited to English and Kiswahili. The analysis is done within the framework of Optimality theory by Prince and Smolensky as proposed in 1993 and they subsequently updated in 2002.

### 1.7 Theoretical Framework

Optimality Theory is employed in the present study because according to Downing (2009:2), it presupposes of universal constraints that are violable which yield factorial typologies. This means that, whereas for instance, Lwidakho and English are evaluated based on similar constraints, differences exist in their ranking of the constraints. Secondly, OT limits the abstractness which characterizes rule-based theories as it only has the input and output levels. In the analysis of Lwidakho loanwords the input is the un-adapted English and Kiswahili word while the output includes all the possible candidates generated by the language grammar. For instance, the English word 'green' /gri:n/ is the input into Lwidakho. The outputs generated by the grammar of Lwidakho as possible candidates for ranking are numerous. Some of the prospective candidates are /gri:n/, /ku-ri-n/ and /ku-ri-nɪ/.

According to McCarthy (2002:1), this theory was introduced to the academic circles as a course taught in 1991 at the University of California. The pioneer proponents of Optimality Theory are Allan Prince and Paul Smolensky. It was not until 1993 that scholars worldwide received detailed expositions of the theory. Hitherto, it has grown to find wide application in psycholinguistics, sociolinguistics, morphology, semantics and syntax domains away from its initial application to phonology.

Archangeli (1999:533) asserts that the essential premise of OT is enshrined in the presence of universal constraints which imply they operate across all languages and that these constraints are also violable. It is this violability of constraints that accounts for the different typologies found in various languages. The examples of these universal constraints and constraint violability are elaborated using Lwidakho loanwords in section 1.7.1.

### 1.7.1. Principles of Optimality Theory

OT is guided by the principles of GEN, EVAL and CON. These three work hand in hand with the principles of strict domination and economy. The previous example in section 1.7 is represented in the table below within Optimality Theory.

**Table 1: /gri:n/>/ku-ri-nɪ/** 'green'

| /gri:n/ | COMPLEX* | NO CODA | MAX-10 | DEP-10 |
|---|---|---|---|---|
| /gri:n/ | *! | * | | |
| /ku-ri-n/ | | *! | | * |
| /ku-ri-nɪ/ ☞ | | | | * |

The constraint definitions of the above table are as follows (Partly taken from Prince and Smolensky (1993) cited in Sang (2009:64) :

a) COMPLEX*

Complex onset clusters are generally prohibited with the exception of few permissible in line with Lwidakho syllable structure.

b) NO CODA

No codas are allowed within the syllable boundary.

c) MAX-10

Every input segment has an output correspondent (no deletion)

d) DEP-10

Every output segment has an input correspondent (no epenthesis)

The second example is from Kiswahili which illustrates substitution constraints in consonantal adaptation.

**Table 2:** /kɔ-**d**i-ʃa/> /ko-**t**e-ʃa/ 'to let'

| /kɔ-**d**i-ʃa/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /ko-**t**e-ʃa/ | | | * |
| /ko-**ts**e-ʃa/ | *! [-cont] | | * |

The constraint definitions under consideration in table 2 are listed below (Miao, 2005:81).

IDENT abbreviates Identical.

a) IDENT (Manner)

Manner of articulation constraints namely [$_{-}^{+}$nas], [$_{-}^{+}$cons], [$_{-}^{+}$cont], [$_{-}^{+}$approx], and [$_{-}^{+}$son].

b) IDENT (Place)

Place of articulation namely bilabial, labiodental, dental, alveolar, palatoalveolar, palatal, velar, and glottal sounds.

c) IDENT (Voice)

The state of the glottis is described as either voiced or voiceless

The previous section on symbols provides description of the symbols used in the interpretation of Optimality tables.

### 1.7.2. GEN

First, it should be noted that the relationship between potential outputs and the actual input is generated by GEN (Archangeli, 1999:534). GEN is responsible for generating a universal set of candidates. The functions of GEN in a grammar according to McCarthy (2002:8) are constructing the output forms of candidates like words or sentences and specifying the relation between the input and the candidate output forms.

Generally, GEN is universal since for every input it produces similar candidate forms across language boundaries, and is also input dependent because its emitted candidates "bear a

determinate relation to some sort of input form, which might be a phonological underlying representation, a syntactic D-structure, or a morphosyntactic feature specification…" (McCarthy, 2002: 8-9). Consider Table 1 where from the English input 'green' /gri:n/ GEN generates three possible candidates in Lwidakho namely /gri:n/, /ku-ri-n/ and /ku-ri-nɪ/ for evaluation. In Table 2 the Kiswahili input 'kodisha' /kɔ-di-ʃa/ generates /ko-te-ʃa/ and /ko-tse-ʃa/.

**1.7.3. CON**

As Archangeli (1999:534) notes, constraints on phonological representations, CON form the other set of universal principles of Optimality Theory. CON is characterised by universal constraints just like the GEN. These constraints are violable depending on features specific to a given language through constraint ranking where lower ranked constraints can be tolerably violated to satisfy constraints ranked higher in the language (Archangeli, 1999: 533). This means that constraints apply cross-linguistically. However, since the grammar of languages differ, individual languages exhibit language specific hierarchies for these universal constraints. For instance, Table 1 has four constraints against which the generated candidates are ranked namely COMPLEX$^{*}$, NO CODA, MAX-10, and DEP-10. Typological differences between English and Lwidakho are demonstrated whereby the former allows many onset consonant clusters whereas Lwidakho only permits few. This is the reason why /gri:n/ is knocked out of the competition for violating the highest ranked constraint COMPLEX$^{*}$. The optimal candidate /ku-ri-nɪ/ ends up winning in spite of violating the lowly ranked constraint DEP-10. Similarly, /ko-tse-ʃa/ is knocked out for the fatal violation of IDENT (Manner) feature [-cont].The optimal candidate, /ko-te-ʃa/, on the other hand violates no constraint at all.

Constraints are further divided into faithfulness and markedness. The faithfulness constraint calls for identity between the input and the output candidates under evaluation. This is done using the GEN supplied record of the disparity between the input and output. Markedness constraints on the other hand, evaluate the output candidate form preferring certain structural configurations to other structural configurations (McCarthy, 2002:13).

Archangeli (1999:535) explains that faithfulness constraints derive from the tendency of inputs or mental representations being to a great extent essentially identical to the outputs or surface representations of phonological systems. It therefore follows that correspondence or faithfulness

constraints require both the input and the output to correspond as exhibited in their similarities. However, it should be noted that such correspondence can either be symmetric or asymmetric. Unlike asymmetric correspondence, each input sound has an output correspondent in symmetric correspondence (Archangeli, 1999: 535). In symmetric correspondence as the word suggests, phonetic segments in the input match with similar or closely related segments in the output. On the other hand, asymmetric correspondence arises in the absence of a one to one relationship between segments in the input and the output. For example 'kodisha' /kɔ-di-ʃa/ and /ko-te-ʃa/ meaning 'to let' illustrate symmetric correspondence. Finally, /fri:-wi:l/ and /ɪ-fu-re-ja/ meaning 'freewheel' exhibit an asymmetric correspondence. This is because the liquid 'l' lacks a matching sound in the nativised word.

The MAX and DEP classes fall under the faithfulness constraint. Every type of phonological structure like features, segments and prosody are relativised to the constraint of MAX and DEP. According to McCarthy (2002:14), in MAX the output should express the input maximally. Conversely, DEP is to the effect that the output is dependent on the input. MAX constraints insist that the input should be maximized consequently demanding the properties of the input to correspond those of the output. The DEP constraints, on the other hand, entail that output depends on input implying that the output should correspond to the input (Archangeli, 1999: 535-536). From the example in Table 1, Lwidakho does not permit certain onset clusters. Syllable final clusters are totally illicit. Therefore, the input /gri:n/ which is well-formed in English is adapted to the Lwidakho phonological structure via vowel epenthesis to /ku-ri-nɪ/. This violates the lowly ranked constraint DEP which advocates for deletion instead of vowel epenthesis. The MAX constraint which demands epenthesis as opposed to deletion is thus satisfied.

According to McCarthy (2002: 14), Markedness constraints evaluate the structures of the output. These constraints exclusively base on the output structure in assigning violation-marks to a candidate disregarding similarity to the input. Archangeli (1999: 536) describes markedness constraints as a set of constraints with an inclination for the unmarked configuration. Unmarked configurations like ONSET and PEAK or bar marked configurations like NOCODA and COMPLEX are demanded by these markedness constraints.

### 1.7.4. EVAL

EVAL is responsible for selecting the optimal or harmonic output by evaluating potential outputs against a set of ranked constraints simultaneously (Archangeli, 1999: 534). The general working of OT is guided by specifically encoded information for a language to which GEN creates a candidate set. The optimal candidate is then selected by EVAL using the constraint hierarchy of the language (Archangeli, 1999: 534). For instance, based on the Lwidakho constraint hierarchy, /ku-ri-nɪ/ is the harmonic candidate as it does not violates higher-ranked constraints COMPLEX$^{*}$, NO CODA and MAX-10. Consequently, it is selected by EVAL at the expense of /gri:n/ and /ku-ri-n/ which fatally violate the highest and the second highest constraints respectively.

### 1.7.5. Strict domination

The strict domination principle according to Benus (2009: 15) asserts that satisfying lower ranked constraints cannot compensate for the violations of higher ranked constraints. This is because violation of higher-ranked constraints knocks a candidate out of the race for the optimal candidate. Consider /gri:n/ which satisfies lower ranked faithfulness constraints: MAX-10 and DEP-10 and /ku-ri-n/ which satisfies MAX-10. The violation of the higher ranked markedness constraint COMPLEX$^{*}$ and NO CODA eliminate them from the race. The two candidates are knocked out by the optimal candidate and /ku-ri-nɪ/ which only has one violation but of the least ranked faithfulness constraint DEP-10. Therefore, given that the Lwidakho strict domination hierarchy is represented as COMPLEX$^{*}$>>NO CODA>>MAX-10>>DEP-10, the satisfaction of lower ranked constraints does not make up for the violation of higher ranked constraints. Dominance decreases from the left towards the right.

### 1.7.6. Economy

Lastly, the economy principle of Optimality Theory proposes that ranked constraints should be minimally violated. The principle of economy further elaborates that the justification for such violations should be triggered by the need to avoid violations of higher-ranked constraints. This means that the optimal candidate ought to have the least number of violations possible compared to other competitors. This principle accommodates the distinguishing feature of OT to the effect that constraints are violable. For instance, /ko-te-ʃa/ satisfies two ranked constraints whereas its competitor, /ko-tse-ʃa/ violates two constraint satisfying only one constraint. This therefore

means that with two satisfied constraints, it has the most constraint violations thereby infracting the economy principle.

### 1.7.7. The Diagrammatic Representation of Optimality Theory

Using the example in Table 2, the Kiswahili input /kɔ-di-ʃa/ generates two candidates namely /ko-te-ʃa/ and /ko-tse-ʃa/ from the universal GEN. The universal grammar and the language grammar are actively engaged at this point. These candidates are further subjected to evaluation at EVAL. This is done through constraint ranking in which the optimal candidate is selected. The winning candidate is the one incurring the least violations of higher ranked constraints in comparison to other competitors. It is the constraint hierarchy of Lwidakho that selects /ko-te-ʃa/ as the optimal candidate in the Lwidakho nativised output.

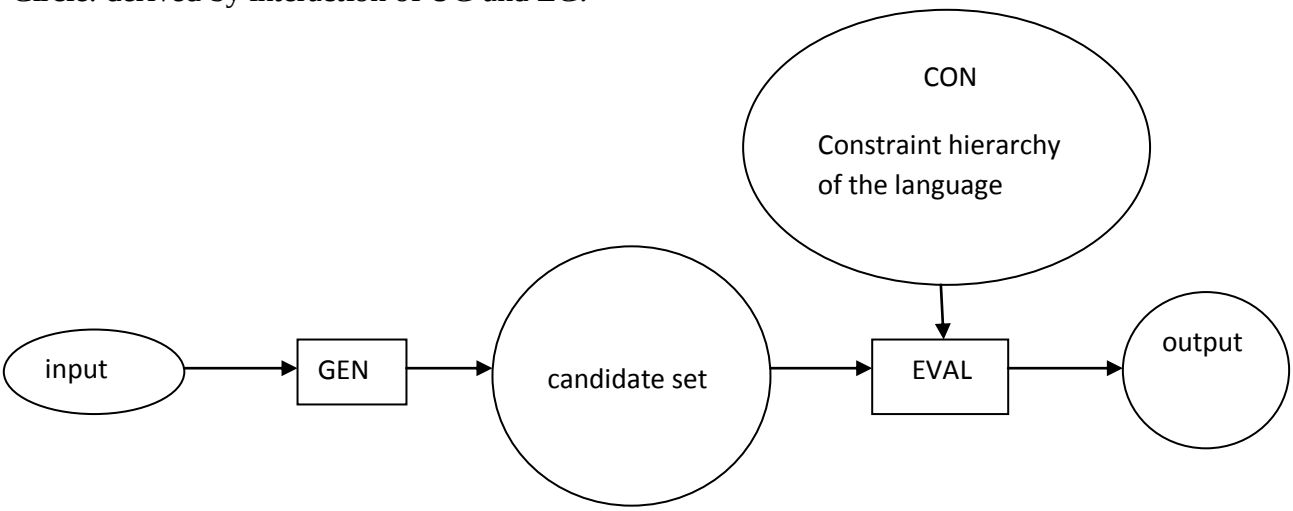
**Figure 1: The Application of OT to Language Grammar**

KEY

Oval: grammar of language (LG)

Box: Universal Grammar (UG)

Circle: derived by interaction of UG and LG.




Taken from Archangeli (1999: 534)

## 1.8. Literature Review

This section provides a review of literature on scholarly contributions to the two main areas of the present study. The first subsection presents information on lexical borrowing with the second part reviewing literature on loanword adaptation in English, Kiswahili and other Bantu languages together with other world languages like Mandarin Chinese.

### 1.8.1. Review of Literature on Lexical Borrowing

In this section, the definition of a loanword is given first. A loanword is a borrowed lexical item from a different language. It is basically the adoption of another language's vocabulary which originally did not form part of the loan language's vocabulary (Campbell, 1998: 58). For the present study, I define a loanword as a foreign word that is introduced into Lwidakho.

Campbell (1998: 59) further identifies two main factors that motivate languages to borrow from one another namely need and prestige. The acquisition of new concepts or items from a different culture normally comes with new terms that describe them. In the present world, technology is by far the most rapidly advancing sector. The invention and widespread use of computers for instance introduced into Lwidakho words like /ko-mbju-ta/, /ɪ-ndɑ-ne-tɪ/ and /fe-si-pu-ku/ for computer, internet and Facebook respectively. Secondly, where a foreign language is highly esteemed, there is usually a tendency of borrowing new terms for the prestige associated with their use. A case in point is the English word 'dotcom' which draws meaning from an association with the internet. Speakers of Lwidakho have expanded the semantic scope of 'dotcom' nativised as /to-ti-ko-mu/ to refer to people who are deemed chic.

The borrowed words are thereafter remodeled in line with the phonological and morphological structure of the borrowing language. Campbell (1998) adds that foreign sounds are usually changed due to phonetic interference through a process known as adaptation. It replaces sounds absent in the receiving language with the nearest phonetic equivalents in the borrowing language (p. 60-61). For example, /kəm-pjuː-tə/ changes to /ko-mbju-ta/ because the pre-nasalized consonants in Lwidakho are composed of a nasal and a voiced obstruent. This explains the voicing of the voiceless bilabial plosive /p/.

Moreover, phonological patterns which are alien to the native language also undergo accommodation. This is done through addition, deletion, and recombination of some sounds in

line with the permitted phonological combinations in the borrowing language. Take the example of the English word dotcom /dɒt-kɒm/ which is realized as /to-ti-ko-mu/ in Lwidakho. Whereas English entertains both open and closed syllables, Lwidakho only allows open syllables. Consequently, the epenthetic vowels /i/ and /u/ are inserted after the codas /t/ and /m/ respectively.

Kiparsky (1973) as quoted by Sang (2009:27) outlines two categories of borrowing situations namely extensive bilingualism and casual contact. In the former situation, due to knowledge of the donor language by a majority of the speakers, there is the tendency of using the phonetic inventory of the borrowing language to preserve the donor language's lexical distinctness. For instance, Lwidakho speakers with exposure to the English language adapt 'Facebook' /feɪs-bʊk/ as /fe-si-pu-ku/. On the other hand, due to lack of knowledge on the donor language in the casual contact situation, phonetic approximation is used in the assimilation of loanwords. /feɪs-bʊk/ is produced as /we-si-pu-ku/. This is attributed to the limitations of casual contact borrowing. Hence, speakers render incoming words with their language's phonetic material.

### 1.8.2. Review of Literature on Loanword Adaptation

Guo (2001) analyses Mandarin Loanword phonology within the Optimality Theory framework. The paper successfully demonstrates that a constraint based approach is sufficient in accounting for the modification of consonant clusters and illicit codas in Mandarin. It also identifies deletion, epenthesis and feature change as the repair strategies that are adopted in the adaptation of Mandarin words borrowed from English. In spite of the differences between Mandarin Chinese and Lwidakho, there are a few notable similarities. The corpus data which comprised of transliterated American state names and typhoons used in the analysis of Mandarin Chinese loanword phonology pointed to the fact unlike Lwidakho, Mandarin does allow nasals at the syllable end position. It was also demonstrated that epenthesis was the most common repair strategy for illicit consonant clusters in preserving the borrowing language's syllable structure. Lwidakho also to a greater extent employs epenthesis as a repair strategy in the nativization of illicit consonant clusters in borrowed words. The constraints employed in determining the preferred repair strategy should be useful in my study particularly in explaining the syllabic structure adaptation of Lwidakho loanwords.

Mbonankira (2004) analyses the accommodation of Kiswahili and English loanwords into Kinyarwanda within an eclectic theoretical framework. The model was informed by the sociolinguistic, historical, descriptive and comparative linguistic dimensions of the study. Notable similarities exist between Lwidakho and Kinyarwanda loanword phonology especially the segmental, syllable structure and morphological adaptations. Epenthesis was found to be useful in repairing illicit consonant structures from Kiswahili and English loanwords. This finding on epenthesis as a nativization strategy further strengthens its cross-linguistic prevalence in ensuring well-formedness of loan languages. Kinyarwanda is a Bantu language together with Luhya. Pursuant to the fact that Lwidakho is a dialect of the latter, Mbonankira's findings should add valuable insights to the present study.

Miao (2005) provides an account of Mandarin Chinese loanword phonology within the Optimality Theory framework. The study analyses substitution of consonant phonemes alien to Mandarin together with the adaptations of foreign consonant clusters that are impermissible in Mandarin from German, Italian and English languages. The theory of Optimality is applied in line with perception model where only perceivable sound segments tend to be preserved. The study further discusses the role sociolinguistic factors play in the phonological adaptation of loanwords in Mandarin. The present study benefited a lot from the work by Miao. This is because both researches employ the theory of Optimality in the analysis of data on syllable structure adaption and consonantal changes of loan words. The study on Standard Mandarin Chinese was conducted using a large corpus data of English, German and Italian loanwords. The findings greatly affirmed the earlier study by Guo (2001) with epenthesis overriding deletion in syllable structure adaptation. It was also established that the patterns of segmental adaptation in consonants were systematic with manner features ranking higher in the constraint hierarchy followed by place features and voice ranking least. These same constraints were successfully employed in the present study. This corroborates the previously asserted universality of Optimality theory. It follows from the fact that similar constraints apply for different languages with language specific constraint ranking differentiating language phonologies.

Iribemwangi (2008) studied sound changes in Standard Kiswahili in Kenya and Tanzania phonemes using a synchronic approach. Several theories were employed in the research namely the Natural Generative Phonological theory, the Autosegmental Phonological theory and

Generative Phonology. This study provides an extensive survey of Kiswahili phonemes from vowels, semivowels and consonants. Moreover, various syllable types of Kiswahili are outlined. The impact of language contact between speakers of Kiswahili and English together with Arabic is exhibited in the Kiswahili sound system. Loanwords from English and Arabic have contributed new syllable types in Kiswahili. The present study finds the information on the segmental and syllabic systems useful in discussing the phonological adaptations of Kiswahili loanwords in Lwidakho.

Akwala (2008) studied the phonological and morphological nativization of Dholuo loanwords in Lumarachi. The study was conducted within the theory of Natural Generative Phonology (NGP). It was established that phonological and morphological processes account for the nativization of Lumarachi loanwords from Dholuo. Lumarachi being a dialect of the Luhya language sheds some light on the understanding of Lwidakho loanword adaptation. The study, like many others, underscores the role of the borrowing language in understanding the systematic nativization patterns. This is because the borrowing language dictates, to a great extent, the adaptation strategy for all incoming sound segments.

Sang (2009) studied the phonological adaptation of English Loanwords in Naandi using Feature Specification theory together with Optimality Theory. The Feature Specification theory was used to account for the adaptation of vowel and consonant phonemes from English into Naandi. The theory of Optimality was used in explaining the syllable structure adaptation constraints undergirding the nativization of English loanwords in Naandi. This research also elaborated that indeed epenthesis is preferred to deletion in the adaptation of illicit consonant clusters. This strengthens the cross-linguistic ramifications of Optimality theory. In addition, the quality of the epenthetic vowel in Naandi was also found to be predictable using Optimality Theory. The epenthetic vowel copied features of preceding consonants or vowels within the same syllable depending on the position of the loanword consonant cluster, that is, at the onset, medially or coda position. Therefore, given that the present study is also interested in the syllable structure adaptations of Lwidakho loanwords, generalizations from the Naandi research should be insightful.

Boen (2014) analysed the phonological and morphological adaptations of English and Kiswahili loanwords in Naandi. The phonological and morphological processes were accounted for within

the Natural Generative Phonology framework. The Generative –CV Phonology on the other hand was used to discuss the syllable structure adaptations. The study demonstrated the great role played by the borrowing language's grammar and sound system in the process of nativization of loan words. Therefore, the incoming words have to be adopted within the rules of the borrowing language which are also subject to the interaction with the source language constraints.

Mwaliwa (2014) analyses the syllable structure of Standard Kiswahili loanwords from Modern Standard Arabic using the Generative CV-Phonology theory. The theory effectively demonstrates that Standard Kiswahili's phonotactic constraints dictate the syllable structure of loanwords from Modern Standard Arabic. In addition, there were foreign syllable structures that were copied and adopted in Kiswahili. For instance, Kiswahili had open syllables but contact with the Modern Standard Arabic introduced closed syllable structures. Moreover, changes in consonants and vowels are also discussed at the segmental level. The present study benefits on information concerning phonetic inventory, phonological processes and the syllable structure constraints of Standard Kiswahili tackled in Mwaliwa's dissertation. The research provides insight into the impact of loanwords on the borrowing language. Loanwords not only introduce new sound segments from the source language but also bring about changes in the syllable structure. The findings identified the influence of Modern Standard Arabic closed syllable structure to Kiswahili. Some of the words hitherto have retained their syllable structures and by extension introduced into the Kiswahili sound system new structures. These findings are helpful in understanding some remarkable differences characteristic of Kiswahili despite its being a closely related Bantu language to Lwidakho

### 1.9. Methodology

This subsection provides information on how the data used in the study of Lwidakho loanword phonology was collected and analysed.

#### 1.9.1. Data Collection

The present study relied on primary data of one hundred and four words elicited from naturalistic observation and introspection. In the naturalistic observation, the author armed with a notebook noted down loanwords from conversations within the natural environment from native speakers of Lwidakho. The conversations in the church, matatus, bus termini and the vernacular radio station were used. Mulembe Fm's interactive listener and presenter correspondences together

with Luhya songs constitute the bulk of the data. The study was conducted in the county of Kakamega specifically within Kakamega town and Lugari sub-county in the period of March and April 2015. The county of Kakamega was the preferred destination for data collection as it is home to a majority of Lwidakho speakers. The second data elicitation technique was introspection using native speaker competence to supplement the observation data. This is pursuant to the fact that I am a native speaker of Lwidakho.

### 1.9.2. Data Analysis

The word list compiled for the study was first transcribed orthographically then using IPA symbols together with a gloss of their meaning for analysis. The orthographic transcription was necessary for researchers and other enthusiasts interested in the language. The orthographic transcription is presented in the appendix section of this study. The data was represented in tables to analyse preferred repair strategies. Using the statistics on repair strategies, faithfulness and markedness constraints were ranked to explain the resultant adaptations. The constraint ranking was done using Optimality tables. The data is composed of fifty four Lwidakho loanwords from Kiswahili and fifty words from English. The number of words was deemed sufficient for the present study which only focuses consonantal segments. Considering that both segmental and the phonotactic adaptations in words occur at the syllable level, all consonant clusters at the onset and coda positions within the syllable boundary were subjected to analysis. Moreover, it is vital to note that there are numerous cases of multiple adaptations of a single loanword. For instance, the Kiswahili bunduki meaning 'gun' is realized as /ɪ-pu-ndu-tʃɪ/ and /ɪ-pu-ndu-kɪ/ in Lwidakho. However, it is the former that is used most of the time. In such cases, I used both adaptations that for analysis. The data for English and Kiswahili loanwords was further grouped according to the complexity of the consonants.

## 1.10. Conclusion

This chapter has introduced the topic under study, that is, a phonological analysis of Lwidakho loanwords from English and Kiswahili. A background to the speakers of Lwidakho has been given, categorizing Lwidakho as a dialect of the Luhya language which further falls in the Bantu language group. There has also been a background on the greater subject of loanword phonology and the aim and significance of the study have also been tackled with research questions and

possible hypotheses to be tested. The theoretical framework of Optimality theory as proposed by Prince and Smolensky (1993) has been introduced demonstrating how the constraint based approach adequately explains the segmental and phonotactic adaptations of loanwords in Lwidakho. Lastly, the methodology used in the collection and analysis of data was also presented.

# CHAPTER 2

## PHONEMIC INVENTORIES OF LWIDAKHO, ENGLISH AND KISWAHILI SOUNDS

### 2.1. Introduction

This chapter discusses the consonants and vowels of Lwidakho, Kiswahili and English. This is because an understanding of their phonemic repertoire is resourceful in exploring possible areas of limitation in as far as adapting foreign consonants and consonant clusters is concerned. Haugen (1950) as cited in Mwaliwa (2014: 82) reiterates that the predictability of substitution patterns for sound segments and the syllable structure adaptation is anchored in the knowledge of a language's sound system. Section 2.2 analyses the Lwidakho sound system, section 2.3 presents the Kiswahili sound segments while the English sound system is discussed in section 2.4. The concluding remarks are given in the last section.

### 2.2. Lwidakho Sound Inventory

In this section, Lwidakho vowels and consonant sounds are discussed.

#### 2.2.1. Consonants

Lwidakho consonants are categorized according to manner of articulation: plosives, fricatives, affricates, approximants, nasals, liquids and pre-nasalized consonants. The next section will briefly list Lwidakho consonants using manner of articulation parameter.

The production of stops is usually the result of two articulators momentarily coming together completely cutting off air flow. This is immediately followed by the abrupt release of the articulators (Katamba, 1989:6). Stops are further divided into plosives and nasals. The point of departure in nasals is that their production is accompanied by the lowering of the soft palate allowing air out through the nose. The examples of stops (plosives) in Lwidakho include: /p/, /t/, and /k/. It should be noted that all the plosives in Lwidakho are voiceless.

Nasals are also stops. According to Katamba (1989:7), the production of nasals is characterised by the lowering of the velum thereby allowing air to escape through the nasal cavity with the simultaneous closure of the oral cavity. Therefore, they are produced by the obstruction of the airstream at some place in the mouth cavity while allowing the escaping air out through the nose. The nasal sounds in Lwidakho are /m/, /n/, /ɲ/ and /ŋ/.

Thirdly, fricatives account for the majority of sounds in Lwidakho. According to Katamba (1989:7) fricatives are characterised by the turbulence of air squeezing out of narrow articulatory channels resulting from articulators being brought close together. This means that fricatives are produced by the friction of air against extremely close articulators but there is no complete closure that is exhibited in stops. Lwidakho fricatives are /β/, /f/, /s/, /ʃ/, /x/ and /h/. It is observed that all Lwidakho fricatives except the voiced bilabial fricative /β/ are voiceless.

Fourthly, affricates are the result of a transition from one sound to another. They start with plosives but end with fricatives. Affricates are essentially composed of a plosive and a fricative. Katamba (1989: 6) describes affricates as sounds produced by the coming together of articulators completely cutting off airflow followed by a gradual separation. Lwidakho has two voiceless affricates /ts/ and /tʃ/.

Glides are also referred to as semivowels or approximants. Yule (2006:37) asserts that their production is characterised by tongue movement to a vowel or from a vowel position. Lwidakho has two glides namely /w/ and /j/.

Liquids are made up of laterals and trills. Lwidakho laterals are /l/ and /ɾ/. According to Katamba (1989:7) laterals are produced by the obstruction of air centrally in the mouth by the tongue while allowing the escape of air over the side of the tongue which is low. The trill /r/ on the other hand (Yule, 2006:37) is produced by a raised tongue tip that is curled back close to the alveolar ridge where it vibrates resulting in rapid taps.

Lastly, pre-nasalized consonants constitute a complex group of sound segments that exhibit sequential feature organization on the subsegmental level (Katamba, 1989:171). This is basically a sound segment composed of a nasal and a non-nasal. A nasal stop precedes the non-nasal. Lwidakho pre-nasalized consonants are made up of a nasal which combines with a voiced plosive, fricative or affricate. The examples of pre-nasalized consonants in Lwidakho are /mb/, /nd/, /nz/, /ɲdʒ/ and /ŋg/.

We can see that Lwidakho has twenty five consonants in its phonemic inventory. It has no voiced plosives. As already stated, Lwidakho fricatives are predominantly voiceless with the exception of the voiced bilabial fricative /β/. Moreover, the Lwidakho language has pre-

nasalized consonants. These pre-nasalized consonants are composed of a nasal and a voiced non-nasal sound segment. The consonants of Lwidakho are summarized below in table 3.

**Table 3: Lwidakho Consonants**

| | Bilabial | Labiodental | Alveolar | Palatoalveolar | Palatal | Velar | Glottal |
|---|---|---|---|---|---|---|---|
| Plosives | p | | t | | | k | |
| Nasals | m | | n | | ɲ | ŋ | |
| Fricatives | β | f | s | ʃ | | x | h |
| Affricates | | | ts | tʃ | | | |
| Trills | | | r | | | | |
| Tap | | | ɾ | | | | |
| Glides | w | | | | j | | |
| Laterals | | | l | | | | |
| Pre-nasalized consonants | mb | | nd<br>nz | ɲdʒ | | ŋg | |

### 2.2.2. Vowels

These are sounds whose production is characterised by little obstruction to airflow through the mouth and/or the nose from the lungs. It is the shape of the vocal tract during airflow that dictates the vowel quality (Fromkin, Rodman and Hyams, 2011: 206). As Katamba (1989:9) notes, there is no place of articulation and manner of articulation distinction for vowels. Hence, their description takes a different turn from the one previously seen in consonants. The position of the tongue determines whether the vowel is high, mid or low. There is also a further differentiation of front, central and back vowels.

The distinctive feature of tongue root position can also describe vowels. The tongue root moves forward in the production of advanced tongue root segments. The expansion of the pharynx resonating chamber ensues resulting in an upward push of the tongue body. Conversely, the neutral tongue position is said not to be advanced (Katamba, 1989: 47). This parameter is useful in the distinction of four front vowels in Lwidakho.

**Table 4: Lwidakho Vowels (**Partly taken from Ebarb (2014:6))

| | Front | Central | Back |
|---|---|---|---|
| High | i<br>ɪ | | u |
| Mid | e<br>ɛ | | o |
| Low | | a | |

The vowel inventory provided above groups Lwidakho among other seven vowel languages of the Bantu. There is also one central low vowel /a/ in the language. The front vowels /ɪ/ and /ɛ/ are produced with the tongue in neutral position hence are not advanced, whereas /i/ and /e/ are produced with the tongue in the advanced tongue root position.

### 2.3. Kiswahili Sound Inventory

Kiswahili, being a Bantu language like Lwidakho, shares certain sounds with it. The consonant and vowel sounds of Kiswahili are discussed below.

#### 2.3.1. Kiswahili Consonants

Kiswahili has thirty one consonant phonemes represented in table 5.

**Table 5: Kiswahili Consonants (**Partly taken from Mwaliwa (2014: 98))

| | Bilabial | Labiodental | Dental | Alveolar | Palatoalveolar | Palatal | Velar | Glottal |
|---|---|---|---|---|---|---|---|---|
| Plosives | p b | | | t d | | ɟ | k g | |
| Nasals | m | | | n | | ɲ | ŋ | |
| Affricate | | | | | tʃ | | | |
| Trill | | | | r | | | | |
| Fricative | | f v | θ ð | s z | ʃ | | x ɣ | h |
| Approximant | w | | | | | j | | |
| Lateral approximant | | | | l | | | | |
| Pre-nasalized consonants | mb | | | nd<br>nz | | ɲɟ | ŋg | |

### 2.3.2. Kiswahili Vowels

Kiswahili is a five vowel language. According to Iribemwangi (2008: 50), Kiswahili has the front high unrounded vowel /i/, the back high unrounded vowel /u/, the front mid low unrounded vowel /ɛ/, the back mid-low rounded vowel /ɔ/ and the central ( near back) low rounded vowel /a/.

**Table 6: Vowels of Kiswahili** (Partly taken from Mwaliwa (2014: 86))

| | Front | Central | Back |
|---|---|---|---|
| High | i | | u |
| Mid | ɛ | | ɔ |
| Low | | a | |

The vowels of Kiswahili as summarized in Table 6 total up to five unlike the previous seven vowels of Lwidakho. It can also be noted that there are only two front vowels in Kiswahili, that

is, /i/ and /ɛ/ as opposed to four front vowels in Lwidakho namely /i/, /ɪ/, /e/ and /ɛ/. Both Lwidakho and Kiswahili have one central vowel /a/. Lastly, Kiswahili and Lwidakho each have only two back vowels namely /ɔ/ and /u/.

The Kiswahili sound system has more consonants than Lwidakho at thirty one whereas the latter only has twenty five consonant phonemes. There are voice distinctions among all the Kiswahili plosives with the exception of the voiced palatal stop /ɟ/. On the contrary, all the Lwidakho stops are voiceless. The Kiswahili fricatives also have a voicing distinction except the palatoalveolar fricative /ʃ/ and the glottal fricative /h/. Conversely, all fricatives in Lwidakho are voiceless with the exception of the voiced bilabial fricative /β/. Nonetheless, both Kiswahili and Lwidakho have complex compounds known as prenasalized consonants. Kiswahili five prenalised consonants like Lwidakho. The Kiswahili prenasalized consonants are /mb, nd, nz, ɲɟ and ŋg/. On the other hand, Lwidakho prenasalized consonants are /mb, nd, nz, ɲdʒ, and ŋg/. In addition, Lwidakho has the palatoalveolar /ɲdʒ/ which is alien to Kiswahili. Lastly, Kiswahili has the palatal /ɲɟ/ which Lwidakho lacks.

Kiswahili and Lwidakho have the alveolar trill /r/ together with the alveolar lateral /l/.Whereas both languages have the approximants /w/ and /j/, Lwidakho has an extra alveolar tap /ɾ/.

It is therefore largely expected that during adaptation of these sound segments, close substitutes are sought to replace the alien sound segments as licit segments are preserved. This should be expounded in chapter 3 on the segmental adaptation of consonant phonemes from Kiswahili and English languages into Lwidakho.

### 2.4. English Sound Inventory

This subsection presents the sounds of English namely consonants and vowels. A comparative study of English and the sounds of Lwidakho will be presented at the end of the vowels and consonants listing.

### 2.4.1. English Consonants

English is a Germanic language as opposed to Lwidakho which is Bantu. Whereas Lwidakho has twenty five consonants, English has twenty four. The Table 7 below presents English consonants.

**Table 7: English Consonants** (Taken from Roach (2002:65))

| | Labial | Labiodental | Dental | Alveolar | Palatoalveolar | Palatal | Velar | Glottal |
|---|---|---|---|---|---|---|---|---|
| Plosive | p b | | | t d | | | k g | |
| Nasal | m | | | n | | | ŋ | |
| Fricative | | f v | θ ð | s z | ʃ ʒ | | | h |
| Affricate | | | | | tʃ dʒ | | | |
| Lateral | | | | l | | | | |
| Approximant | w | | | | r | j | | |

### 2.4.2. English Vowels

The English vowel system is more intricate than Lwidakho and Kiswahili. It is characterised by vowel distinctions from pure vowels to diphthongs. The difference comes in where the diphthongs are gliding vowels from one vowel sound to another unlike pure vowels which are composed of one vowel sound

**Table 8: The Pure Vowels of English** (partly taken from Gimson (1970: 97-126))

| | Front | Central | Back |
|---|---|---|---|
| High | iː ɪ | | uː ʊ |
| Mid | e | ə ɜː ʌ | ɔː |
| Low | æ | | ɑː ɒ |

The English vocalic inventory is also composed of diphthongs and triphthongs. According to Gimson (1970:126), the production of diphthongs is characterised by glide formation within one syllable. The examples of diphthongs are /eɪ/, /aɪ/, /ɔɪ/, /əʊ/, /ɪə/, /eə/ and /ʊə/. He further

posits that the first elements of diphthongs bear the length and stress of the vowel glide although there are exceptions like /ɪə and ʊə/ sounding where the second element is sounded.

The production of /eɪ/ starts slightly below the half-close front position moving towards /ɪ/ (Gimson, 1970: 128).Take for example 'today'. The second diphthong /aɪ/ also begins in a similar way with the first element. It begins with an open vowel between the front and the back and greatly resembles /ʌ/ (Roach (2002: 23). Take for example 'nice'. Thirdly, /ɔɪ/ according to Gimson (1970: 131) is produced by a movement towards the front high vowel /ɪ/ from the point between half open and open positions. Take for example, 'boy'. The fourth diphthong /əʊ/ as Roach (2002: 23) states begins from the short central vowel /ə/ schwa position with slightly curled lips in anticipation of the glide towards /ʊ/. Take for example 'about'. The fifth diphthong /ɪə/ according to Roach (2002: 22) starts a little closer than the front high vowel /ɪ/. An example is the word 'beard.' The sixth diphthong /eə/ found in the English word 'aired' starts from the point of the front vowel /e/ as it glides towards the schwa (Roach, 2002: 22). Moreover, /aʊ/ starts with a vowel similar to the open vowel /ɑː/ followed by a glide towards /ʊ/ which is usually not completed producing a diphthong between the close-mid and open-mid with a slight lip rounding. A case in point is the English word 'loud' (Roach, 2002: 22). Lastly, the diphthong /ʊə/ used in the word 'tour' slightly begins closer than /ʊ/ gliding towards the schwa (Roach, 2002: 22).

Triphthongs according to Roach (2002: 22) are complex vowels of the English language whose production is characterised by a glide from one vowel to another then onto a third one rapidly produced without any interruption. They are composed of the previously discussed closing diphthongs onto which the schwa vowel is added.

eɪ + ə= eɪə 'player'

aɪ + ə= aɪə 'fire'

ɔɪ + ə= ɔɪə 'royal'

əʊ + ə= əʊə 'mower'

aʊ + ə= aʊə ‘power’

The inventory of sounds in Lwidakho and English displays a lot of variation. English for instance has twenty four consonants whereas Lwidakho has twenty five. There are also many voicing distinctions for sound segments within the same place and manner of articulation in English as opposed to Lwidakho. All Lwidakho plosives are voiceless whereas the English language exhibits both voiced and voiceless plosives. Secondly, whereas English only has three nasals /m, n, and ŋ/, Lwidakho has four nasals / m, n, ɲ, and ŋ/.The difference is due to the palatal nasal /ɲ/. Thirdly, English has a voicing distinction for its fricatives excluding the glottal fricative /h/. The other fricatives are /f, v, θ, ð, s, z, ʃ and ʒ/. The fourth distinction is found in the affricates where English has a voice distinction for its palatoalveolar affricates /tʃ/ and /dʒ/. Lwidakho on the other hand lacks voice distinction for its two affricates besides having an additional alveolar affricate /ts/ which misses in English. The affricates of Lwidakho are /ts/ and /tʃ/. Pre-nasalized consonants are also a preserve of Lwidakho as the English language lacks the sequence of nasals preceding non-nasals functioning as one segment within the same syllable. The examples of pre-nasalized consonants in Lwidakho are /mb, nd, nz, ɲdʒ and ŋg/. Lwidakho also has one alveolar trill /r/ which is absent in English. However, both languages are characterised by one alveolar lateral /l/. Lastly, both languages have three approximants but differ in the palatoalveolar approximant /r/ in English and the alveolar tap in Lwidakho /ɾ/. The rest of the approximants in both languages are similar namely /w/ and /j/.

The vowels of Lwidakho and English display many differences. The Lwidakho language only has seven vowels whereas English has twenty. The vowels of Lwidakho are / i, ɪ, e, ɛ, a, u and o/. In addition, the vowels of English are distinguished in terms of pure vowels characterised by a single vowel sound and diphthongs which are composed of two vowels. Pure vowels in English are /iː, ɪ, e, æ, ɑː, ɒ, ɔː, ʊ, uː, ʌ, ɜː and ə/. There is a glide from the first element of diphthongs towards the direction of the second vowel. The examples of glides in English are /eɪ/, /aɪ/, /ɔɪ/, /əʊ/, /ɪə/, /eə/ and /ʊə/. Lastly, the English vowels can combine diphthongs together with the schwa resulting in triphthongs. The following are examples of triphthongs in English; /eɪə, aɪə, ɔɪə, əʊə, and aʊə/.

The front vowels of Lwidakho and English are four. Unlike Lwidakho which distinguishes /e/ from /ɛ/, English only has one given that there are no differences in tongue root position. For the purpose of this study, /e/ was used. In addition, English has /æ/ which Lwidakho does not have. There are also three central vowels in English namely /ʌ, ɜ: and ə/ which are absent in Lwidakho. The only central vowel in Lwidakho is /a/ which misses in English. Lastly, the Lwidakho back vowels are only two; /u/ and /o/. On the contrary, the English back vowels are five namely /ɑ:, ɒ, ɔ:, ʊ, and u:/. A further difference is seen where English uses the back low-mid vowel /ɔ:/ while Lwidakho has the back high-mid vowel /o/.

Therefore, due to these phonemic variations between Lwidakho and English languages, it is interesting to decipher how the sound segments absent in the loan languages are substituted as hypothesized in the first chapter or introduced as new phonemes all together in the Lwidakho sound repertoire.

## 2.5. Conclusion

This chapter has presented the sound segments of Lwidakho, Kiswahili and English. The consonant and vowel phonemes have been discussed followed by a precise comparative study of the three languages that has indicated variations among them.

It was established that English has twenty four consonant phonemes while Lwidakho has twenty five. Kiswahili had the highest number of consonant phonemes at thirty one. In addition, only Kiswahili and Lwidakho have prenasalized consonants. Kiswahili has six prenasalized consonants whereas Lwidakho has five.

All English and Kiswahili plosives have the voiced and voiceless counterparts. Lwidakho plosives on the other hand are all voiceless. To add on that, Kiswahili and Lwidakho nasals total to four whereas English has three nasals. The extra nasal in Lwidakho and Kiswahili is the palatal nasal /ɲ/. Generally, Lwidakho fricatives are voiceless except the voiced bilabial fricative /β/. This voiced bilabial fricative does not also appear in both Kiswahili and English sound systems.

Moreover, the alveolar trill /r/ is only present in the Kiswahili and Lwidakho consonant phonemes as it is absent in the English consonants.

Vowels exhibited a lot of differentiation in all the three languages. Kiswahili has five vowels namely / i, ɛ, a, ɔ and u/. The vowels of Lwidakho are seven namely / i, ɪ, e, ɛ, a, u and o/.Of the three languages, English had the most vowels at twenty. These were further classified as pure vowels which present one vowel sound and diphthongs. Diphthongs are vowels gliding from the first vowel element to the next. The English pure vowels are twelve namely /iː, ɪ, e, æ, ɑː, ɒ, ɔː, ʊ, uː, ʌ, ɜː and ə/. The remaining eight are the vowel glides comprising of /eɪ/, /aɪ/, /ɔɪ/, /əʊ/, /ɪə/, /eə/ and /ʊə/. Lastly, the English vowels are composed of a group of phonemes known as complex vowels which have three vowels thereby demanding a quick glide among all the three vowels in quick succession. These complex vowels are triphthongs. English has five triphthongs namely /eɪə, aɪə, ɔɪə, əʊə and aʊə/.

In conclusion, the chapter has demonstrated that Lwidakho, Kiswahili, and English differ in terms of their vowels and consonants. It should however be noted that they equally have similar segments in some cases. Considering that words borrowed from other languages usually come with the phonemes from the source language to the borrowing language, it is the phonological system of the borrowing language that dictates which sounds are retained unaltered and which ones are replaced. A detailed study of the phenomenon is presented in the next chapter.

# CHAPTER 3

## THE ADAPTATION OF ENGLISH AND KISWAHILI CONSONANTS IN LWIDAKHO

### 3.1. Introduction

The previous chapter on the phonemic inventories revealed variations among the languages under study. It was established that English, Kiswahili and Lwidakho exhibit differences in their phonemic inventories. A case in point is the absence of the voicing contrasts in Lwidakho which conversely is characteristic of Kiswahili and English sound systems. Whenever words are borrowed from Kiswahili and English into Lwidakho, constraints governing the Lwidakho phonological system dictate the adaptation strategy. The general tendencies apparent in the data involve the retention of the foreign consonant or substitution. Crystal (2008:463) defines the replacement of one item by another at a particular structural place in linguistics as substitution. Substitution as hypothesized in the first chapter is the phonological process by which foreign segments are mapped onto the Lwidakho sound inventory.

In order to answer the question on what the adaptation strategy is, the theory of Optimality was employed. The main tenets of Optimality Theory were discussed in section 1.7. Following Miao (2005: 81), I proposed the constraints IDENT (Manner), IDENT (Place) and IDENT (Voice) for all consonant changes. This means that whether the consonants are preserved or substituted the optimal candidates should be most identical to the input (source language segment) in terms of manner of articulation features, place of articulation and state of glottis.

The manner of articulation features used in this study are [$_{-}^{+}$nas], [$_{-}^{+}$cons], [$_{-}^{+}$cont], [$_{-}^{+}$approx], and [$_{-}^{+}$son]. They represent nasals, consonants, continuants, approximants and sonorant respectively. Secondly, place of articulation features are bilabial, labiodental, dental, alveolar, palatoalveolar, palatal, velar, and glottal sounds. The state of glottis is either voiced or voiceless.

The constraint hierarchy is IDENT (Manner) >> IDENT (Place) >>IDENT (Voice). Dominance decreases from the left towards the right. Therefore, the winning candidate should have the least violation of the dominant constraints. Given that IDENT (Manner) is the most dominant constraint; its violation is fatal for a candidate throwing them out of the competition. Candidates that do not violate this constraint are regarded as faithful. Therefore, faithfulness as used in the context of the present study refers to the property of the output segments resembling their inputs

in terms of the features [$_{-}^{+}$nas], [$_{-}^{+}$cons], [$_{-}^{+}$cont], [$_{-}^{+}$approx] and [$_{-}^{+}$son]. This means that an optimal candidate can violate the lower ranked constrains IDENT (Place) and IDENT (Voice) as long as it upholds IDENT (Manner) and obeys the principle of economy. The deviant segments on the other hand are those that violate the manner constraints. In most cases, they are eliminated but in some few cases they are preferred to the optimal candidates.

The introduction of the chapter is covered under section 3.1 whereas the English and Lwidakho consonant adaptation patterns are in 3.2. Kiswahili and Lwidakho consonant adaptation patterns are covered in 3.3. Section 3.4 deals with loanword adaptation within Optimality Theory. Lastly, the chapter conclusion is given in section 3.5.

### 3.2. The Adaptation of English Consonants in Lwidakho

The differences in the sound systems of English and Lwidakho necessitate the replacement or preservation of English consonants borrowed in Lwidakho. It should however be noted that even sound segments present in both languages can undergo changes as a result of borrowing. This section focuses on consonant adaptation patterns. The data is presented in tables and analysed with a few examples. The optimality theory constraint tables are presented in the last section 3.4.

#### 3.2.1. Nasals

The Lwidakho sound inventory presented in chapter 2 outlines four nasals, namely /m/, /n/, / ɲ/, and /ŋ/. On the contrary, English language only has three nasals, that is, /m/, /n/, and /ŋ/. However, Lwidakho has an extra palatal nasal /ɲ/ which is absent in English. Generally, English nasals are faithfully mapped onto Lwidakho nasals but there are also cases of deviations even where the nasal in question is present in the donor and the borrowing languages. The data of English nasal adaptations in Lwidakho summarized in Table 9, shows that the bilabial, alveolar, and palatal nasals /m/, /n/ and /ŋ/ account for the highest faithful mapping of 100%. It is also clear that where deviations in nasal inputs and outputs exist, the changes only affect the place of articulation with the manner of articulation completely unaffected. The change in place of articulation is evident by the change from of the alveolar nasal /n/ to the palatal nasal /ɲ/. The velar nasal changes to a palatal nasal too. The transformation from /kæ**m**-peɪn/ into /ka-**mb**e-ɪnɪ/ demonstrates that nasals influence an adjacent plosive in a different syllable. Since the Lwidakho sound system lacks prenasalized consonants consisting of a nasal and a voiceless plosive, the voiceless bilabial plosive /p/ is voiced to combine with the bilabial nasal in the

preceding syllable into a prenasalized bilabial plosive /mb/. The alveolar nasal /n/ is preserved as it is characteristic of both languages.

**Table 9: English Nasal Adaptations into Lwidakho**

| Input | Output | Total number of observed output | Percentage |
|---|---|---|---|
| a) /m / | /m/ | 5 | 100% |
| b) /n/ | /n / | 17 | 100% |
| | / ɲ / | 2 | 100% |
| c) /ŋ / | /ŋ / | 1 | 100% |
| | / ɲ / | 2 | 100% |

The faithful nasal adaptations of consonants in the data are given in (1) below. It is noted that /m/ and /n/ do not change when loanwords from English are borrowed into Lwidakho. On the other hand, /ŋ/ changes to/ɲ/ but ends up preserving the highly ranked manner of articulation feature as a constituent of a prenasalized consonant /ɲdʒ/.

| **(1) English** | **Lwidakho** | **sound change** | **Gloss** |
|---|---|---|---|
| /pʊd-ɪ**ŋ**/ | /ɪ-pu-tɪ-**ɲdʒ**ɪ/ | **ŋ>ɲdʒ** | pudding |
| **English** | **Lwidakho** | **Preserved** | **Gloss** |
| /kæm-peɪ**n**/ | /ka-mbe-ɪ**n**ɪ/ | **n>n** | campaign |
| /æ**n**-ə-lɒg/ | /a**n**a-lo-ko/ | **n>n** | analog |
| /wɒtʃ-**m**ən/ | /wo-tʃɪ-**m**a-nɪ/ | **m>m** | watchman |

### 3.2.2. Plosives

There are more plosives in English than Lwidakho. This is as a result of voice distinction characteristic of the bilabial, alveolar, and velar plosives in English. The examples of English plosives include /p/, /b/, /t/, /d/, /k/ and /g/. In contrast, voicing is not a distinctive feature in Lwidakho plosives since all plosives are voiceless in the language. They are /p/, /t/ and /k/. Therefore, it is expected that English plosives will be faithfully mapped onto their Lwidakho equivalents. There are also instances of consonant preservation. Take the case of /**p**lɒt/ becoming /ɪ-**p**u-lo-tɪ/ where the voiceless bilabial plosive is retained in Lwidakho.

In the previous section, 3.2.1, nasals adapted from English into Lwidakho violated the place of articulation in order to avoid the violation of the highly ranked manner of articulation constraint. Plosives on the other hand exhibit some variability despite the fact that a majority of the plosives conform to the manner of articulation parameter. All the alveolar and velar plosives are faithfully adapted in Lwidakho at 100%.The bilabial plosives /p/ and /b/ faithful adaptation is at 84.62% and 85.71% respectively. Interestingly, their deviant adaptation is the voiced bilabial fricative /β/ at 15.38% and 14.28% respectively. These bilabial plosives undergo spirantisation or fricativisation changing from stops to the voiced bilabial fricative. It is noted that the deviation conforms to the place of articulation for both plosives. It also conforms to voicing for the voiced bilabial plosive /b/. For instance, /hɒs-**p**ɪ-tl/ changes to /ɪ-sɪ-**β**ɪ-ta-ɾɪ/. Despite violating the highly ranked manner feature of continuants and the lowly ranked feature of voice, the feature of place is observed given the fact that both the input and output are bilabials. It is also noted that the voiceless glottal fricative is deleted. This deletion is attributed to the tendency of the glottal fricative having weak vowel-like formants rendering them susceptible to deletion. The details of deletion are tackled in chapter 4. In /**g**ri:s/ changing to /ɪ-**k**ɪ-ri-sɪ/, the feature of manner is upheld because the output is also a plosive. The second constraint in rank is also conformed to as both sounds are velar. However, the feature of voice is violated due to the devoicing of the input segment. The nativization process also introduces new phonemes in Lwidakho. The voiced bilabial plosive /b/, voiced alveolar plosive /d/ and the voiced velar plosive /g/ are only accepted together with nasals resulting in prenasalized consonants /mb/, /nd/ and /ŋg/ respectively. The change of /kæm-**p**eɪ**n**/ into /ka-**mb**e-ɪnɪ/ where /p/ is nasalized by the bilabial nasal on the left across the syllable boundary resulting in /mb/.

**Table 10: Adaptation of English Plosives into Lwidakho**

| Input | Output | Total number of observed output n | Percentage |
|---|---|---|---|
| a) /p/ | /p/ | 9 | 84.62% |
| | /β/ | 1 | 15.38% |
| | /b/ | 2 | 84.62% |
| b) /b/ | /p/ | 6 | 85.71% |
| | /β/ | 1 | 14.28% |
| c) /t/ | /t/ | 13 | 100% |
| | /d/ | 2 | 100% |
| d) /d/ | /t/ | 6 | 100% |
| e) /k/ | /k/ | 14 | 100% |
| | /g/ | 1 | 100% |
| f) /g/ | /k/ | 6 | 100% |

The faithful adaptations of plosives are presented in (2). This is evidenced by their preservation of the highly ranked manner feature.

| (2) **English** | **Lwidakho** | **sound change** | **Gloss** |
|---|---|---|---|
| /**d**ɪdʒɪ-**t**l/ | /**t**i-tʃɪ-**t**o/ | **d>t** | digital |
| /**g**riːs/ | /ɪ-**k**ɪ-ri-sɪ/ | **g>k** | grease |
| /**b**laʊz/ | /ɪ-**p**u-la-usɪ/ | **b>p** | blouse |
| **English** | **Lwidakho** | **Preserved** | **Gloss** |
| /**p**lɒt/ | /ɪ-**p**u-lo-tɪ/ | **p>p** | plot |
| /suː**t**/ | /ɪ-su-**t**ɪ/ | **t>t** | suit |
| /steɪ**k**/ | /ɪ-sɪ-tɛ-**k**ɪ/ | **k>k** | steak |

Unlike the previous case of nasals which were all faithfully adapted, Lwidakho is characterised by some instances of deviations that are nonetheless the accepted outputs of the language. The

change from the voiced and voiceless bilabial plosive to the voiced bilabial fricative was identified earlier as fricativisation.

| (3) **English** | **Lwidakho** | **sound change** | **Gloss** |
|---|---|---|---|
| /hɒs-**p**ɪ-tl/ | /ɪ-sɪ-**β**ɪ-ta-ɾɪ/ | **p>β** | hospital |
| /sʌ**b**-tʃi:f/ | /sa-**β**u-tʃi-fu/ | **b>β** | subchief |

### 3.2.3. Fricatives

The fricatives of Lwidakho are voiceless with the exception of the voiced bilabial fricative. They include /β/, /f /, /s/, /ʃ/, /x/ and /h/. It therefore follows that voice is not a distinctive feature in Luidakho fricatives. On the other hand, English fricatives which comprise of /f/, /v/, /θ/, /ð/, /s/, /z/, /ʃ/, /ʒ/ and /h/ are characterised by voice distinction except the voiceless glottal fricative. The other difference between English and Lwidakho fricatives is the absence of the bilabial and velar fricatives in English which are characteristic of Lwidakho. Lastly, Lwidakho unlike English lacks the dental fricatives.

It is generally predicted that fricatives from English are replaced by fricatives closely resembling them in the Lwidakho phonemic inventory. The data reveals that the manner feature is highly preserved in fricative substitution at the expense of place of articulation and voicing features. There is nonetheless one exceptional case of affrication of the English dental fricatives that are substituted for by affricates. This is because Lwidakho lacks the dental fricatives. Affricates which comprise of stops and fricatives preserve the manner feature of continuants. Take the example of /fɑ:**ð**ə/ becoming /fɑ-**ts**a/ in which the lower ranked place of articulation and voice are violated to preserve the manner feature of continuants. All fricatives are faithfully adapted at 100% from the corpus data. The English /æd-**v**ə-keɪt/ becomes /a-tɪ-**β**o-ke-tɪ/ in Lwidakho because there is no voiced labiodental fricative. Therefore, substitution is necessary within the labial region which violates the place of articulation feature but upholds the lower ranked voice constraint. Apart from substitution, there are also instances of consonant preservation where the sound segments in both languages are similar. Consider the voiceless alveolar fricative which is retained when /ɒf-ɪ**s**/ becomes /o-βɪ-**s**i/.

**Table 11: English Fricatives Adaptation in Lwidakho**

| Input | Output | Total number of observed output n | Percentage |
|---|---|---|---|
| a) /f / | /f / | 7 | 100% |
| | /β/ | 1 | 100% |
| b) /v/ | /β/ | 1 | 100% |
| c) /θ/ | /ts/ | 2 | 100% |
| d) /ð/ | /ts/ | 1 | 100% |
| e) /s/ | /s/ | 13 | 100% |
| | /z/ | 1 | 100% |
| f) /z/ | /s/ | 3 | 100% |
| g) /ʃ/ | /ʃ/ | 1 | 100% |

English fricatives are faithfully adapted into Lwidakho by retaining the manner feature. This is done through the preservation of the input sounds, substitution of voiced consonants by voiceless ones and vice versa. The examples given in (4) illustrate the general patterns employed in the adaptation of fricatives.

| (4) **English** | **Lwidakho** | **sound change** | **Gloss** |
|---|---|---|---|
| /æd-**v**ə-keɪt/ | /a-tɪ-**β**o-ke-tɪ/ | **v> β** | advocate |
| /fɑː**ð**ə/ | /fa-**ts**a/ | **ð>ts** | father |
| /kæ**θ**-l-ɪk/ | /ka-**ts**o-ɾɪ-kɪ/ | **θ>ts** | Catholic |
| /blaʊ**z**/ | /pu-la-u**s**ɪ/ | **z>s** | blouse |

| **English** | **Lwidakho** | **Preserved** | **Gloss** |
|---|---|---|---|
| /ɒf-ɪ**s**/ | /o-βɪ-**s**i/ | **s>s** | office |
| /pær-ɪ**ʃ**/ | /ɪ-pa-ɾɪ-**ʃ**ɪ/ | **ʃ>ʃ** | parish |
| /**f**riː-wiːl/ | /ɪ-**f**u-re-ja/ | **f>f** | freewheel |

### 3.2.4. Affricates

Lwidakho has the alveolar and palatoalveolar affricates, /ts/ and /tʃ/ respectively. Consequently, voice is not a distinctive feature in Lwidakho affricates. The English sound inventory on the other hand has only the voiceless and voiced palatoalveolar affricates /tʃ/ and /dʒ/.Therefore, voice is a distinctive feature of the English affricates. In the adaptation of English affricates into Lwidakho, it is observed that the affricates are replaced by other affricates. There are no deviant adaptation cases of the English affricates in Lwidakho loan words because the manner of articulation feature which is the highest ranked constraint is observed. Given that /dɪ**dʒ**-ɪ-tl/ becomes /ti-**tʃ**ɪ-to/, it is noted that the manner of articulation together with the place of articulation are retained as the voice feature is violated due to devoicing. There also is the preservation of some affricates. For example /**tʃ**ek/ which is retained as /ɪ-**tʃ**e-kɪ/. There is also a change from the voiceless palatoalveolar affricate to the voiced palatoalveolar affricate. This similar to the plosive adaptation where the occurrence of a nasal and a consonant resulted in prenasalized consonants. The Lwidakho sound system lacks the voiced palatoalveolar affricate /dʒ/ but it is introduced as a palatal prenasalized consonant. The change is attributed to the alveolar nasal preceding the voiceless palatoalveolar affricate /tʃ/ in the input. This occurs when /lʌ**ntʃ**/ becomes /ɪ-ɾɑ-**ɲdʒ**ɪ/.

**Table 12: Adaptation of English Affricates in Lwidakho**

| Input | Output | Number of observed output n | Percentage |
|---|---|---|---|
| a) /tʃ/ | /tʃ/ | 4 | 100% |
| | /dʒ/ | 1 | 100% |
| b) /dʒ/ | /tʃ/ | 3 | 100% |
| | /dʒ/ | 1 | 100% |

Basing on the data, the adaptation of affricates from English to Lwidakho is faithful at 100% as expressed in (5).The voiceless palatoalveolar affricates are preserved as the voiced palatoalveolar affricates are substituted by their voiceless palatoalveolar affricates during nativization. The only instance of sound change exhibited is thus devoicing.

| (5) **English** | **Lwidakho** | **sound change** | **Gloss** |
|---|---|---|---|
| /bæn-dɪ**dʒ**/ | /ɪ-pe-ndɛ-**tʃ**ɪ/ | **dʒ>tʃ** | bandage |
| /dɪ**dʒ**-ɪ-tl/ | /ti-**tʃ**ɪ-to/ | **dʒ>tʃ** | digital |
| /lʌ**ntʃ**/ | /ɪ-ɾɑ-**ɲdʒ**ɪ/ | **ntʃ>ɲdʒ** | lunch |

| **English** | **Lwidakho** | **Preserved** | **Gloss** |
|---|---|---|---|
| /**tʃ**ek/ | /ɪ-**tʃ**e-kɪ/ | **tʃ>tʃ** | cheque |
| /sʌb-**tʃ**i:f/ | /sa-βu-**tʃ**i-fu/ | **tʃ>tʃ** | sub chief |

### 3.2.5. Glides

There is a similarity between the English and Lwidakho glides. The two languages have the bilabial and palatal approximants /w/ and /j/, respectively. It is therefore expected that English words with glide phonemes will be faithfully mapped onto Lwidakho glides. This is corroborated by the data because the glides are either preserved with no sound change or are replaced by other glides. Consonant preservation is exhibited in /k**w**ɒg-maɪə/ being realized as /k**w**o-ku-ma-ja/ where the bilabial approximant is retained. It is further noted that the triphthong /aɪə/ is reduced to the palatal glide /j/ and the central low vowel /a/.This is because Lwidakho tends to lack diphthongs. The word is rare in Lwidakho though as it was observed from one speaker of Lwidakho who is well exposed to the English language. It is likely to enjoy greater usage as a loanword as time goes by. Interestingly, the bilabial approximant adaptation is the palatal approximant in one instance. This ensures that the adaptation of glides does not violate the manner of articulation while allowing for the violation of the place of articulation. Take for instance /fri:-**w**i:l/ which becomes /ɪ-fu-re-**j**a/.

**Table 13: The adaptation of English glides in Lwidakho.**

| Input | Output | Number of observed output n | Percentage |
|---|---|---|---|
| / w/ | /w/ | 4 | 100% |
| | /j/ | 1 | 100% |
| / j/ | /j/ | 1 | 100% |

Glides are faithfully adapted from English into Lwidakho at 100% as shown in (6).This is done through preservation or substitution of consonants. This faithful adaptation is realized through the preservation of glides and substitution for other glides.

| (6) **English** | **Lwidakho** | **sound change** | **Gloss** |
|---|---|---|---|
| /fri:-**w**i:l/ | /ɪ-fu-re-**j**a/ | **w > j** | freewheel |
| **English** | **Lwidakho** | **Preserved** | **Gloss** |
| /kəm-p**j**u:-tə/ | /ɪ-ko-mb**j**u-ta/ | **j>j** | computer |
| /k**w**ɒg-maɪə/ | /k**w**o-ku-ma-ja/ | **w>w** | quagmire |
| /**w**ɒtʃ-mən/ | /**w**o-tʃɪ-ma-nɪ/ | **w>w** | watchman |

### 3.2.6. Liquids

The phonemic inventory of liquids in English and Lwidakho is similar to some extent. They both have the alveolar lateral /l/. However, Lwidakho has an additional alveolar tap /ɾ/ that acts as an allophone of the lateral /l/ mostly occurring when preceded or followed by front vowels. On the one hand, English has the palatoalveolar approximant /r/. On the other hand, Lwidakho has the alveolar trill /r/. Consequently, the English palatoalveolar approximant is substituted by the Lwidakho alveolar trill during loanword nativization. The alveolar lateral accounts for the highest faithful mapping onto the Lwidakho alveolar lateral and lateral flap at 100%.This preserves the manner features. Consider the preservation of the alveolar lateral in the adaptation

of /b**l**aʊz/ into /pu-**l**a-usɪ/. This is because both languages have the alveolar lateral. In addition, the allophonic alveolar lateral flap substitutes the alveolar lateral in most cases where it precedes front vowels. Take the case of /æ**l**-ɪks/ which is adapted as /a-ɾe-kɪ-sɪ/ in Lwidakho. The English palatoalveolar approximant /r/ has the most unfaithful adaptation at 93.31% because it is substituted by the Lwidakho alveolar trill /r/. For instance, /g**r**iːs/ becomes /ɪ-kɪ-**r**i-sɪ/. However, the data reveals the faithful adaptation the English palatoalveolar approximant /r/ to the Lwidakho alveolar tap /ɾ/ at 7.69%. Take the case of /**r**eɪl-weɪ/ becoming /ɪ-**ɾ**e-ɾwɛ/.

**Table 14: The Adaptation of English Liquids into Lwidakho**

| Input | Output | Number of observed output n | Percentage |
|---|---|---|---|
| /r/ | /r/ | 12 | 92.31% |
| | /ɾ/ | 1 | 7.69% |
| /l/ | /l/ | 6 | 100% |
| | /ɾ/ | 6 | 100% |

Therefore, the faithful adaptation of liquids in Lwidakho is displayed in the preservation of the alveolar lateral. It is also exhibited in the substitution of the alveolar lateral by the alveolar tap. Lastly, the change from the English palatoalveolar approximant to the Lwidakho alveolar tap is also faithful. All these faithful adaptations are presented in (7) below.

| (7) **English** | **Lwidakho** | **sound change** | **Gloss** |
|---|---|---|---|
| /**r**eɪl-weɪ/ | /ɪ-**ɾ**e-ɾwɛ/ | **r>ɾ** | railway |
| /b**l**æŋ-kɪt/ | /mu-**ɾ**ɪ-ɲdʒɛ-tɪ/ | **l>ɾ** | blanket |
| /æ**l**-ɪks/ | /a-**ɾ**e-kɪ-sɪ/ | **l>ɾ** | Alex |
| /sɪ**l**-vɪa/ | /sɪ-**ɾ**ɪ-βɪ-a/ | **l>ɾ** | Sylvia |
| **English** | **Lwidakho** | **Preserved** | **Gloss** |
| /æn-ə-**l**ɒg/ | /ɑna-**l**o-ko/ | **l>l** | analog |

| | | | |
|---|---|---|---|
| /b**l**aʊz/ | /pu-**l**a-usɪ/ | **l>l** | blouse |
| /b**l**ɒk/ | /rɪ-pu-**l**o-ko/ | **l>l** | block |

The instances of deviant adaptation in liquids are displayed in the change from the English palatoalveolar approximant to the Lwidakho alveolar trill. This is attributed to the violation of the highly ranked manner features. The examples in (8) illustrate the unfaithful mapping of liquids.

(8)

| **English** | **Lwidakho** | **sound change** | **Gloss** |
|---|---|---|---|
| /p**r**ez-ɪ-dənt/ | /pu-**r**ɛ-sɪ-te-ndɪ/ | **r>r** | president |
| /g**r**iːs/ | /ɪ-kɪ-**r**i-sɪ/ | **r>r** | grease |
| /f**r**æŋk/ | /fu-**r**a-ŋga/ | **r>r** | Frank |

### 3.3. The Adaptation of Kiswahili Consonants in Lwidakho

Kiswahili and Lwidakho are more closely related than English and Lwidakho since they both are Bantu languages. In spite of this, their sound systems are different. The previous chapter proposed thirty three consonants in Kiswahili against twenty five in Lwidakho. As it will be seen in the section that follows, Kiswahili sounds undergo various changes as they are adapted into Lwidakho.

#### 3.3.1. Nasals

There are four nasals in Lwidakho and Kiswahili. These are /m/, /n/, /ɲ/ and /ŋ/. It is predicted that nasal phonemes in Kiswahili will be mapped onto Lwidakho nasals due to their similarities. This ensures that the highest ranked manner features are not violated. The bilabial, nasal, and palatal nasals are preserved. Basing on the Kiswahili data, all nasals demonstrated a 100% faithful adaptation into Lwidakho. However, differences were experienced especially in nasal compounds. The place of articulation feature of the nasal element of prenasalized consonants changes in some cases. Consider velar nasal /ŋ/ which changes to the palatal nasal /ɲ/ when /sɛ-**ŋ**ɛ-ŋgɛ/ becomes /lu-se-**ɲ**ɛ-ɲdʒɛ/. The disparities in place of articulation feature adaptation are characteristic of the velar nasal. This is attributed to the fact that the velar nasal is followed by

the front mid vowel /ɛ/. The velar nasal is fronted to the palatal region in anticipation of the front vowel it precedes and the front mid vowel in the preceding syllable. This explains the changes exhibited in the data. Table 15 presents a summary of nasal adaptations from Kiswahili to Lwidakho.

**Table 15: The Adaptation of Kiswahili Nasals into Lwidakho**

| Input | Output | Number of observed output<br>n | Percentage |
|---|---|---|---|
| a) /m/ | /m/ | 24 | 100% |
| b) /n/ | /n/ | 9 | 100% |
| c) /ɲ/ | /ɲ/ | 1 | 100% |
| d) /ŋ/ | /ŋ/ | 1 | 100% |
| | /ɲ/ | 2 | 100% |

The adaptation of Kiswahili nasals in Lwidakho is uniform. It follows a systematic pattern which ensures that all nasal consonants are either preserved or replaced by other nasals. The examples of these adaptations are given in (8) for single simple nasal consonants and prenasalized consonants.

| (8) **Kiswahili** | **Lwidakho** | **sound change** | **Gloss** |
|---|---|---|---|
| /ki-**ɲ**ɔ-zi/ | ʃɪ-**ɲ**o-sɪ/ | **ɲ>ɲ** | barber shop |
| /sɛ-**ŋ**ɛ-ŋgɛ/ | /lu-se-**ɲ**ɛ-ɲdʒɛ/ | **ŋ>ɲ** | barbed wire |
| **English** | **Lwidakho** | **Preserved** | **Gloss** |
| /ɣa-ra-**m**a/ | /ɪ-kɑ-ra-**m**a/ | **m>m** | cost |
| /m-**n**a-zi/ | /mu-**n**a-sɪ/ | **n>n** | coconut |

### 3.3.2. Plosives

The Lwidakho and Kiswahili plosives are differentiated by voice. Whereas voice is a distinctive feature in Kiswahili excluding the palatal plosive, all Lwidakho plosives are voiceless. Therefore, voice is not distinctive in Lwidakho plosives. The Kiswahili language plosives are /p/, /b/, /t/, /d/, /ɟ/, /k/, and /g/. Lwidakho on the other hand only has three plosives, that is, /p/, /t/, and /k/. It therefore follows that in the adaptation of Kiswahili loanwords, voiced plosives are substituted by their voiceless counterparts or introduced as new sounds altogether. An instance of devoicing is seen in the change from /**b**u-ŋgɛ/ to /ɪ-**p**u-ŋgɛ/.This is because the absence of the voiced segments in the Lwidakho sound system necessitates their substitution with their voiceless counterparts. However, the data indicates that voiced plosives are permitted in Lwidakho only when they combine with nasals to form prenasalized consonants.

The voiceless plosives of Kiswahili are only fully preserved in the alveolar plosive /t/ at 100% as in /m-ka-**t**a-ba/ becoming /mu-kɑ-**t**a-pa/. The voiceless bilabial plosive recorded the second highest preservation at 80% with the input /**p**a-zi-a/ generating the output /ɪ-**p**a-sɪ- a/. The voiceless velar stop /k/ had the least preservation at 40.90% slightly being edged over by the deviant voiceless palatoalveolar affricate /tʃ/ at 40.91% and the voiceless palatoalveolar fricative /ʃ/ being the least at 18.18%. The examples of these voiceless velar deviations from the data are /**k**i-pa-ndɛ/ changing to /**ʃ**ɪ-pa-ndɛ/ and /pi-**k**i-pi-**k**i/ on the other hand becomes /pɪ-**tʃ**a-pɪ-**tʃ**ɪ/. The two variations are attributable to the front high vowel /i/ which triggers palatalization. This explains why the voiceless velar plosive in /m-ta-**k**a-ti-fu/ is preserved /mu-ta-**k**a-tɪ-fu/ because it follows the central low vowel that does not create the environment for palatalization evident in the high front vowel. The last instance of deviation in the adaptation of plosives to nasals seems to be motivated by the need to simplify the ease of pronunciation in line with other nasal onsets in /**p**ɛ-rɛ-mɛ-ndɛ/ becoming /ʃɪ-**m**ɛ-rɛ-me-ndɛ/.

Table (16) gives a detailed summary of all the plosive sound changes from the Kiswahili language into Lwidakho. It is worth noting that generally the faithful adaptation of plosives outnumbers the deviant sound changes.

**Table 16: The Adaptation of Kiswahili Plosives in Lwidakho**

| Input | Output | Number of observed output n | Percentage |
|---|---|---|---|
| a) /p/ | /p/ | 4 | 80% |
| | /m/ | 1 | 20% |
| b) /b/ | /p/ | 14 | 82.35% |
| | /b/ | 2 | 11.76% |
| | /β/ | 1 | 5.88% |
| c) /t/ | /t/ | 11 | 100% |
| d) /d/ | /t/ | 3 | 37.50% |
| | /d/ | 5 | 62.50% |
| e) /ɟ/ | /tʃ/ | 3 | 100% |
| f) /k/ | /k/ | 9 | 40.90% |
| | /ʃ/ | 4 | 18.18% |
| | /tʃ/ | 9 | 40.91% |
| g) /g/ | /k/ | 1 | 25% |
| | /g/ | 1 | 25% |
| | /tʃ/ | 1 | 25% |
| | /dʒ/ | 1 | 25% |

The faithful adaptations of plosives in Lwidakho from Kiswahili as discussed above preserved manner of articulation features by resorting to preservation of the foreign segments or devoicing the voiced sound segments. The examples in (9) indicate plosive adaptation in Lwidakho from Kiswahili faithfully.

| (9) **Kiswahili** | **Lwidakho** | **sound change** | **Gloss** |
|---|---|---|---|
| /**b**u-ŋgɛ/ | /ɪ-**p**u-ŋgɛ/ | **b>p** | parliament |
| /ka-ti-**b**a/ | /ɪ-ka-tɪ-**p**a/ | **b>p** | constitution |
| /**d**u-ka/ | /ɾɪ-**t**u-ka/ | **d>t** | shop |
| /si-**g**a-ra/ | /ɪ-sɪ-**k**a-la/ | **g>k** | cigarette |
| **English** | **Lwidakho** | **Preserved** | **Gloss** |
| /m-ta-**k**a-ti-fu/ | /mu-ta-**k**a-tɪ-fu/ | **k >k** | holy |
| /du-**k**a/ | /ɾɪ-tu-**k**a/ | **k>k** | shop |
| /ba-ru-**t**i/ | /ɪ-pa-ru-**t**ɪ/ | **t>t** | explosive |
| /**p**a-zi-a/ | /ɪ-**p**a-sɪ-a/ | **p>p** | curtain |

There are other deviant adaptation strategies for plosives apart from palatalization. There are also changes from plosives to fricatives. This is known as spirantisation or fricativisation. A case in point is the voiced bilabial plosive becoming a voiced bilabial fricative where /**b**a-ti/ changes to /ɾɪ-**β**a-tɪ/. The change ensures that the place of articulation and the voice are not violated and opts to violate the manner of articulation.

| (10) **Kiswahili** | **Lwidakho** | **sound change** | **Gloss** |
|---|---|---|---|
| /pi-**k**i-pi-**k**i/ | /pɪ-**tʃ**a-pɪ-**tʃ**ɪ/ | **k>tʃ** | motorbike |
| /**ɟ**ɛ-**l**a/ | /ɪ-**tʃ**e-ɾa/ | **ɟ>tʃ** | prison |
| /**p**ɛ-rɛ-mɛ-ndɛ/ | /ʃɪ-**m**ɛ-rɛ-me-ndɛ/ | **p>m** | sweet |
| /**b**a-**t**i/ | /ɾɪ-**β**a-**t**ɪ/ | **b>β** | iron sheet |
| /bi-**k**i-ra/ | /pɪ-**tʃ**ɪ-ɾa/ | **k>tʃ** | virgin |
| /ndɛ-**g**ɛ/ | /ɪ-ndɛ-**tʃ**ɛ/ | **g>tʃ** | aeroplane |
| /**k**i-pa-ndɛ/ | /**ʃ**ɪ-pa-ndɛ/ | **k>ʃ** | identity card |

### 3.3.3. Fricatives

Fricatives in Lwidakho include /β/, /f/, /s/, /ʃ/, /x/ and /h/. Kiswahili on the other hand has more fricatives that comprise of /f/, /v/, /θ/, /ð/, /s/, /z/, /ʃ/, /ɣ/ and /h/. Consonant preservation is generally expected to map Kiswahili phonemes onto Lwidakho in cases of phonemic similarities. However, for the sound segments absent in Lwidakho substitution takes centre stage using closely resembling Lwidakho consonants. The adaptations of /f/, /v/, /z/ and /ɣ/ exhibit uniformity at 100%. Conversely, the fricatives /s/ and /ʃ/ have some variations in their places of articulation. It is also noted that except for the voiced velar fricative /ɣ/, all the Kiswahili fricative adaptations in Lwidakho are fricatives too. This confirms that the manner feature is ranked higher in Lwidakho fricatives. The voiceless labiodental fricative /f/ is preserved in /m-ta-ka-ti-**f**u/ becoming /mu-ta-ka-tɪ-**f**u/. This is because the Kiswahili and Lwidakho share the consonant. However, where the sound phoneme lacks in Lwidakho, close substitutes are resorted to. Consider the voiced alveolar fricative /z/ which is devoiced to match the Lwidakho sound system in the change from /pa-**z**i-a/ to /ɪ-pa-**s**ɪ-a/. This substitution ensures that the manner of articulation and place of articulation features remain similar though it violates the voicing.

**Table 17: The Adaptation of Kiswahili Fricatives in Lwidakho**

| Input | Output | Number of observed output n | Percentage |
|---|---|---|---|
| a) /f/ | /f/ | 4 | 100% |
| b) /v/ | /f/ | 1 | 100% |
| c) /s/ | /s/ | 10 | 100% |
| | /ʃ/ | 1 | 100% |
| d) /z/ | /s/ | 7 | 100% |
| e) /ʃ/ | /ʃ/ | 2 | 100% |
| | /s/ | 1 | 100% |
| f) /ɣ/ | /k/ | 3 | 100% |

The faithful adaptation of fricatives in Lwidakho represented in (11) is indicative of the fact that the preservation of manner of articulation features is prioritized. The adaptation strategy ensures that fricatives are either retained or substituted by other fricatives.

| (11) **Kiswahili** | **Lwidakho** | **sound change** | **Gloss** |
|---|---|---|---|
| /m-lɛ-**v**i/ | /mu-ɾe-**f**ɪ/ | **v>f** | drunkard |
| /pa-**z**i-a/ | /ɪ-pa-**s**ɪ-a/ | **z>s** | curtain |
| /**s**i-ku-ku/ | /**ʃ**ɪ-ku-ku/ | **s>ʃ** | holiday |
| /m-**ʃ**u-ma/ | /mu-**s**ɪ-ma/ | **ʃ>s** | candle |
| **English** | **Lwidakho** | **Preserved** | **Gloss** |
| /**ʃ**u-kra-ni/ | /**ʃ**u-ku-ɾa-nɪ/ | **ʃ>ʃ** | gratitude |
| /**s**a-mba-za/ | /**s**a-mba-sa/ | **s>s** | to distribute |
| /m-ta-ka-ti-**f**u/ | /mu-ta-ka-tɪ-**f**u / | **f>f** | holy |

On the other hand, the only deviant adaptation pattern in the data is observed in the voiced velar fricative. This is as a result of the Lwidakho sound inventory lacking the voiced velar fricative. Unlike the previous case of resorting to the voiceless equivalent in Lwidakho, a voiceless velar plosive is the substitute candidate. Few examples are illustrated in (12) where the highest ranking constraints of manner of articulation together with the least ranked constraint of voice are violated by the optimal candidates.

| (12) **Kiswahili** | **Lwidakho** | **sound change** | **Gloss** |
|---|---|---|---|
| /**ɣ**a-ɾa-ma/ | /ɪ-**k**ɑ-ɾa-ma/ | **ɣ>k** | cost |
| /**ɣ**ɔ-ɾɔ-fa/ | /ɪ-**k**o-ro-fa/ | **ɣ>k** | skyscraper |

### 3.3.4. Affricates

The phonemic inventory of Kiswahili has one palatoalveolar affricate /tʃ/. It is faithfully adapted into the Lwidakho palatoalveolar affricate /tʃ/ at 100% from the data. In spite of the few illustrations in Kiswahili, the same pattern was observed in the adaptation of English affricates. The only variation in the English affricates was in voicing preserving the higher ranked features of manner and place. The affricates are preserved in the adaptation of /m-**tʃ**ɛ-lɛ/ into /mu-**tʃ**e-ɾɛ/.

**Table 18: The Adaptation of Kiswahili Affricates in Lwidakho**

| Input | Output | Number of observed output n | Percentage |
|---|---|---|---|
| tʃ | tʃ | 2 | 100% |

The data on Kiswahili affricate adaptation into Lwidakho revealed a faithful mapping of affricates to affricates in (13). This is because of the shared phonemic inventories. Consequently, the affricates are preserved in the borrowing language.

| (13) **Kiswahili** | **Lwidakho** | **Preserved** | **Gloss** |
|---|---|---|---|
| /m-**tʃ**ɛ-lɛ/ | /mu-**tʃ**e-ɾɛ/ | **tʃ>tʃ** | rice |
| /**tʃ**a-ɲɟɔ/ | /ɪ-**tʃ**a-ɲdʒo/ | **tʃ>tʃ** | vaccination |

### 3.3.5. Liquids

There are two liquids in Kiswahili /l/ and /r/. Lwidakho liquids are three namely /l/, /r/, and /ɾ/.The alveolar tap is at times allophonic to /l/. Generally, liquids in Kiswahili are mapped onto the Lwidakho liquids owing to the similarity of their phonemic inventories. Consider table (18) for a summary of the adaptation of Kiswahili liquids into Lwidakho. The data reveals that the alveolar tap dominates the alveolar lateral approximant at 75%. The Kiswahili alveolar trill, on the other hand, is faithfully mapped onto the Lwidakho trill at 71.43% with adaptation to the alveolar tap at 21.43% and the remaining 7.14% is accounted for by mapping the alveolar trill to the alveolar lateral approximant. The alveolar lateral approximant is preserved in adapting /m-sa-**l**a-ba / into /mu-sa-**l**a-pa/. The substitution of the alveolar lateral approximant by the alveolar lateral flap is also faithfully illustrated by changing /ɣa-**l**i/ into /ka-**ɾ**i/. The results further indicate that it is only the alveolar trill that exhibits deviant adaptations namely the alveolar lateral approximant and the alveolar lateral flap. Both of these deviant adaptations are phonologically unconditioned. Take for instance, the transformation from /za-bu-**r**i/ into /ɪ-sa-pu-**ɾ**i/ in which the manner feature approximancy differentiates the input from the output.

**Table 19: The Adaptation of Kiswahili Liquids in Lwidakho**

| Input | Output | Number of observed output n | Percentage |
|---|---|---|---|
| /l/ | /l/ | 2 | 25% |
| | /ɾ/ | 6 | 75% |
| /r/ | /r/ | 10 | 71.43% |
| | /l/ | 1 | 7.14% |
| | /ɾ/ | 3 | 21.43% |

Table (19) shows that the faithful adaptation of liquids takes various dimensions. On the one hand, the phonemes are preserved whereas on the other hand, the input phonemes are substituted by phonemes with similar manner of articulation. The data in (14) presents the faithful adaptation of Kiswahili consonants into Lwidakho.

| (14) **Kiswahili** | **Lwidakho** | **sound change** | **Gloss** |
|---|---|---|---|
| /ɣa-**l**i / | /ka-**ɾ**i/ | **l>ɾ** | expensive |
| **Kiswahili** | **Lwidakho** | **Preserved** | **Gloss** |
| /m-sa-**l**a-ba / | /mu-sa-**l**a-pa/ | **l>l** | cross |
| /mwis-**l**a-mu / | /mwi-sa-**l**a-mu/ | **l>l** | Muslim |
| /ba-**r**a-fu/ | /ɪ-pa- **r**a-fu/ | **r>r** | ice |
| /ba- **r**u-ti/ | /ɪ-pa- **r**u-tɪ/ | **r>r** | explosive |

In addition, there are instances of unfaithful adaptation of Kiswahili liquids into Lwidakho. The data in (15) illustrates the deviant adaptation of the Kiswahili alveolar trill into Lwidakho alveolar lateral approximant and alveolar tap. These deviant adaptations seem to be phonologically unconditioned from the data.

| (15) **Kiswahili** | **Lwidakho** | **sound change** | **Gloss** |
|---|---|---|---|
| /si-ga- **ɾ**a/ | /ɪ-sɪ-ka-**l**a/ | **ɾ>l** | cigarette |
| /m-su-ma- **ɾ**i/ | /mu-su-ma-**ɾ**ɪ/ | **ɾ >ɾ** | nail |
| /za-bu- **ɾ**i/ | /ɪ-sa-pu-**ɾ**i/ | **ɾ >ɾ** | Psalms |

### 3.3.6. Glides

Pursuant to the fact that Lwidakho and Kiswahili share the same glides, that is, the bilabial and palatal approximants /w/ and /j/, respectively, it is predicted that glides in Kiswahili are mapped onto Lwidakho glides. The data shows that the bilabial approximant is mapped onto the Lwidakho approximant at 100%. The data indicates that the Kiswahili glides are maximally preserved in Lwidakho. For instance, the palatal approximant in /u-la-**j**a/ is retained in the Lwidakho adapted form as /βu-la-**j**a/.

**Table 20: The Adaptation of Kiswahili Glides into Lwidakho**

| Input | Output | Number of observed output n | Percentage |
|---|---|---|---|
| a) /w/ | /w/ | 3 | 100% |
| b) /j/ | /j/ | 2 | 100% |

The similarity of Kiswahili and Lwidakho glides account for the highest preservation percentages in the data. Consequently, the input and output phonemes reflect a faithful adaptation pattern with all the ranked constraints of manner, place and voice upheld.

| (16) **Kiswahili** | **Lwidakho** | **Preserved** | **Gloss** |
|---|---|---|---|
| /m**w**is-la-mu/ | /m**w**i-sa-la-mu/ | **w>w** | Muslim |
| /u-ki-m**w**i/ | /βu-tʃɪ-m**w**i/ | **w>w** | AIDS |
| /u-la-**j**a/ | /βu-la-**j**a/ | **j>j** | abroad |
| /ma-la-**j**a/ | /ma-la-**j**a/ | **j>j** | prostitutes |

### 3.3.7. Prenasalized consonants

A comparison of Lwidakho and Kiswahili phonemic inventories reveals that both languages have prenasalized consonants. However, as it was pointed out in chapter 2, there exists a distinction in the permissible nasal and consonant combination. The prenasalized consonants in Lwidakho language are /mb/, /nd/, / nz/, /ɲdʒ/ and /ŋg/. On the other hand, the Kiswahili phonemic inventory of prenasalized consonants comprises of /mb/, /nd/, /nz/, /ɲɟ/ and /ŋg/. It therefore logically follows that Kiswahili prenasalized consonants that are similar to Lwidakho should be faithfully preserved as dissimilar ones are substituted by other closely related phonemes. For instance, /sa-**mb**a-za/ is faithfully adapted to /sa-**mb**ɑ-sa/ where the bilabial prenasalized consonant is preserved. On the other hand, variant adaptations are also evident in the velar prenasalized consonants. Interestingly, a similar pattern that was observed in nasals is replicated where velar prenasalized consonants are preceded or followed by front vowels are substituted by their palatal counterparts. This is due to the fronting of the velar prenasalized consonants. A case in point is the change from /sɛ-ŋɛ-**ŋg**ɛ/ into /lu-se-ɲɛ-**ɲdʒ**ɛ/.

**Table 21: The Adaptation of Kiswahili Prenasalized Consonants in Lwidakho**

| Input | Output | Number of observed output n | Percentage |
|---|---|---|---|
| a) /mb/ | /mb/ | 2 | 100% |
| b) /nd/ | /nd/ | 3 | 100% |
| c) /ŋg/ | /ŋg/ | 1 | 33.33% |
| | /ɲdʒ/ | 2 | 66.67% |

Faithful adaptation of prenasalized consonants are presented in (17) below. The data shows that Kiswahili prenasalized consonants are preserved in Lwidakho or substituted by others depending on the environment of the phonemes.

| (17) **Kiswahili** | **Lwidakho** | **sound change** | **Gloss** |
|---|---|---|---|
| /sɛ-ŋɛ-**ŋg**ɛ/ | /lu-se-ɲɛ-**ɲdʒ**ɛ/ | **ŋg>ɲdʒ** | barbed wire |
| /kɛ-**ŋg**ɛ-lɛ/ | /ɪ-tʃe-**ɲdʒ**ɛ-rɛ/ | **ŋg>ɲdʒ** | bell |

| Kiswahili | Lwidakho | Preserved | Gloss |
|---|---|---|---|
| /sa-**mb**a-za/ | /sa-**mb**ɑ-sa/ | **mb>mb** | to distribute |
| /bu-**nd**u-ki/ | /ɪ-pu-**nd**u-tʃɪ/ | **nd>nd** | gun |
| /ki-pa-**nd**ɛ/ | /ʃɪ-pa-**nd**ɛ/ | **nd>nd** | identity card |
| /bu-**ŋg**ɛ/ | /ɪ-pu-**ŋg**ɛ/ | **ŋg> ŋg** | parliament |

### 3.4. Loanword Adaptation in Optimality Theory

This section presents a representation of the Kiswahili and English loanword adaptations within the constraint interaction grammar. The parameters used in the description of consonants namely the state of glottis, place of articulation and manner of articulation are ranked as constraints. Thereafter, the hierarchy of the ranked constraints is used to explain the constraints governing loanword adaptations.

#### 3.4.1. Nasal Adaptation

The adaptation of nasals from English and Kiswahili into Lwidakho greatly preserves the manner features with variations only observed in the place of articulation. Voice is non-distinctive in Lwidakho nasals as they all are voiced. Consequently, Manner is ranked higher than place and voice in Lwidakho constraint hierarchy.

Given the fact that the GEN component generates infinite candidate sets, /a**n**a-lo-ko/, /a**m**a-lo-ko/ and /a**t**a-lo-ko/ are the possible candidates generated for ranking in Table (22). The alveolar nasal does not violate any of the ranked constraints. It is followed by the bilabial nasal which violates the second highest ranked constraint of place of articulation. Lastly, the voiceless alveolar plosive is knocked out of the competition since it fatally violates the highest ranked constraint of manner of articulation. This is because it is [-nas] and [-son]. The optimal candidate /a**n**a-lo-ko/ is preferred for its economy as it does not violate any constraint .Its closest competitor /a**m**a-lo-ko/ on the other hand, has one violation of the constraint IDENT (Place). Therefore, the winning candidate indicated by the pointing finger is /a**n**a-lo-ko/.

**Table 22:** /æ**n**-ə-lɒg/ **>** /a**n**a-lo-ko/ ‘analog’

| /æ**n**-ə-lɒg/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /a**n**a-lo-ko/ ☞ | | | |
| /a**m**a-lo-ko/ | | ***** | |
| /a**t**a-lo-ko/ | ***! [+nas ], [+son]** | | |

Table (23) presents a similar phenomenon in Kiswahili where the palatal nasal is retained in the Lwidakho adaptation. The optimal candidate /ʃɪ-**ɲ**o-sɪ/ does not violate any constraint. /ʃɪ-**ŋ**o-sɪ/ violates IDENT (Place) whereas /ʃɪ-**l**o-sɪ/ violates the manner feature of **[+nas ]** .

**Table 23:** /ki-**ɲ**ɔ-zi/ >/ʃɪ-**ɲ**o-sɪ/ ‘barber shop’

| /ki-**ɲ**ɔ-zi/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /ʃɪ-**ɲ**o-sɪ/ ☞ | | | |
| /ʃɪ-**ŋ**o-sɪ/ | | ***** | |
| /ʃɪ-**l**o-sɪ/ | ***![+nas ]** | | |

Table (24) which maps /wɒtʃ-**m**ən/ onto /wo-tʃɪ-**m**a-nɪ/ follows the same pattern. The optimal candidate /wo-tʃɪ-**m**a-nɪ/ does not violate any of the ranked constraints. Its closest competitor /wo-tʃɪ-**n**a-nɪ/ violates the second highest ranked constraint IDENT (Place) while observing other constraints. The third candidate /wo-tʃɪ-**β**a-nɪ/ is however eliminated for its fatal violation of the highest ranked constraint IDENT (Manner) features [+nas], [+son], and [-cont].

**Table 24:** /wɒtʃ-**m**ən/**>** /wo-tʃɪ-**m**a-nɪ/ 'watchman'

| /wɒtʃ-**m**ən/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /wo-tʃɪ-**m**a-nɪ/ ☞ | | | |
| /wo-tʃɪ-**β**a-nɪ/ | ***! [+nas ], [+son], [-cont]** | | |
| /wo-tʃɪ-**n**a-nɪ/ | | ***** | |

Table (25) illustrates the effect of the nasal environment in the choice of the winning candidate. The optimal candidate /lu-se-**ɲ**ɛ-ɲdʒɛ/ violates the second highest ranked constraint IDENT (Place). On the other hand, its closest competitor /lu -sɛ-**ŋ**ɛ-ŋgɛ/ does not violate any constraint but is still not preferred. The last candidate /lu-se-**g**ɛ-ɲdʒɛ/ is eliminated from the competition as it fatally violates the highest ranked constraint IDENT (Manner) features [+nas], and [+son]. However on closer analysis, the choice of the optimal candidate is linked to palatalization of the velar nasal as it is sandwiched between the front mid-low vowel /ɛ/. As a result, the velar nasal is fronted to the palatal nasal.

**Table 25:** /sɛ-**ŋ**ɛ-ŋgɛ/ > /lu-se-**ɲ**ɛ-ɲdʒɛ/ 'barbed wire'

| /sɛ-**ŋ**ɛ-ŋgɛ/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /lu-se-**ɲ**ɛ-ɲdʒɛ/ ☞ | | * | |
| /lu-se- **g**ɛ-ɲdʒɛ/ | ***! [+nas ], [+son],** | | |
| /lu -sɛ-**ŋ**ɛ-ŋgɛ/ | | | |

### 3.4.2. Fricative Adaptation

The adaptation of fricatives in Lwidakho largely preserves the manner of articulation features. There is also the tendency of conforming to the major region of articulation. This is consistent with the findings of Broselow (2001) and Miao (2005). According to Broselow (2001), major articulatory regions are highly preserved at the expense of stridency and voicing in the substitution of phonemes as quoted by Miao (2005: 82). Consequently, it is expected that

fricatives exhibiting place of articulation variation in phoneme substitution usually preserve the major articulatory region of the donor language phonemes. The three major articulatory regions previously identified are labial, coronal, and dorsal. The constraint ranking of the adaptation of fricatives in Lwidakho is thus expressed as Manner of articulation >>Major articulatory region>> Place of articulation>>Voice.

The preservation of the manner features is not limited to fricative to fricative mapping. This is manifested in the deviant mapping of fricatives alien to Lwidakho to affricates. A case in point is the dental fricatives in English which are replaced by the voiceless alveolar affricate in Lwidakho. This is attributed to the plosive + fricative elements in an affricate credited with the retention of manner features. The optimal candidate /fa-**ts**a/ violates two least ranked constraints against its closest competitor /fa-**β**a/ with two. Lastly, /fa-**t**a/ is knocked out of the contest for violating the constraint IDENT (Manner) feature [+cont]. Consider Table (26) for illustration.

**Table 26:** /fɑː-**ð**ə/ **>** /fa-**ts**ɑ/ 'father'

| /fɑː-**ð**ə/ | IDENT (Manner) | IDENT (Major Artirclt.) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|---|
| /fa-**ts**a/ ☞ | | | ***** | ***** |
| /fa-**t**a/ | ***![+cont]** | | * | * |
| /fa-**β**a/ | | * | * | * |

The voiceless labiodental fricative is faithfully retained in Table (27). Consequently, the optimal candidate /**f**u-ra-ŋga/ does not violate any constraint. The closest competitor /**β**u-ra-ŋga/ is less economical despite upholding the two highest ranked constraints as it violates two least ranked constraints. The third candidate /**p**u-ra-ŋga/ is knocked out due to violating IDENT (Manner) feature [+cont].

**Table 27:** /**f**ræŋk/ >/**f**u-ra-ŋga/ 'Frank'

| /**f**ræŋk/ | IDENT (Manner) | IDENT (Major Artirclt.) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|---|
| /**f**u-ra-ŋga/ ☞ | | | | |
| /**β**u-ra-ŋga/ | | | * | * |
| /**p**u-ra-ŋga/ | ***![+cont]** | | * | |

The voiced alveolar fricative is substituted by its voiceless alveolar fricative in Table (28). The devoicing is resorted to because Lwidakho lacks voiced alveolar fricative. The optimal candidate /ɪ-pa-**s**ɪ-a/ violates the least ranked constraint IDENT (Voice). The second best candidate /ɪ-pa-**ʃ**ɪ-a/ violates two lower constraints IDENT (Place) and IDENT (Voice). Consequently, it is ruled out by the economy principle. Moreover, the fatal violation of the IDENT (Manner) features [-son], [-appr], and [+cons] eliminates /ɪ-pa-**j**ɪ-a/.

**Table 28:** /pa-**z**i-a/ > /ɪ-pa-**s**ɪ-a/ 'curtain'

| /pa-**z**i-a | IDENT (Manner) | IDENT (Major Artirclt.) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|---|
| /ɪ-pa-**s**ɪ-a/ ☞ | | | | * |
| /ɪ-pa-**ʃ**ɪ-a/ | | | * | * |
| /ɪ-pa-**j**ɪ-a/ | ***![-son],[-appr], [+cons]** | | | |

The next instance of devoicing is seen in the substitution of the voiced labiodental fricative by the voiceless labiodental fricative in Table (29). This is because Lwidakho only has the voiceless labiodental fricative. The optimal candidate /mu-ɾe-**f**ɪ/ only violates IDENT (Voice) with the runners up /mu-ɾe-**β**ɪ/ violating IDENT (Place) and IDENT (Voice). Conversely, /mu-ɾe-**t**ɪ/ is eliminated for violating IDENT (Manner) feature [+cont].

**Table 29:** /m-lɛ-**v**i/ > /mu-ɾe-**f**ɪ/ 'drunkard'

| /m-lɛ-**v**i/ | IDENT (Manner) | IDENT (Major Artirclt.) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|---|
| /mu-ɾe-**f**ɪ/ ☞ | | | | * |
| /mu-ɾe-**β**ɪ/ | | | * | * |
| /mu-ɾe-**t**ɪ/ | ***![+cont]** | * | * | * |

Table (30) illustrates the faithful adaptation of the voiceless palatoalveolar fricative which is preserved. The winning candidate /**ʃ**u-ku-ra-nɪ/ does not violate any of the ranked constraints. Unlike previous examples that were characterized by an instance of higher ranked constraint violation, both candidates /**s**u-ku-ra-nɪ/ and /**ts**u-ku-ra-nɪ/ only violate the second last ranked constraint IDENT (Place). They are as a result eliminated.

**Table 30:** /**ʃ**u-kra-ni/ > /**ʃ**u-ku-ra-nɪ/ 'gratitude'

| /**ʃ**u-kra-ni/ | IDENT (Manner) | IDENT (Major Artirclt.) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|---|
| /**ʃ**u-ku-ra-nɪ/ ☞ | | | | |
| /**s**u-ku-ra-nɪ/ | | | * | |
| /**ts**u-ku-ra-nɪ/ | | | * | |

All the previous illustrations have demonstrated instances of faithful adaptation. There are also other instances of deviant fricative adaptation in Lwidakho from Kiswahili. The voiced velar fricative which is absent in Lwidakho is substituted by the voiceless velar plosive. This adaptation violates the highest ranked constraint IDENT (Manner). According to Optimality Theory, the violation should eliminate the candidate but the data confirms that the deviant form is the acceptable form. This unfaithful adaptation can be explained by the sociolinguistic situation of the Kiswahili words in question. A majority of non-native or non-near native speakers of Kiswahili usually articulate the voiced velar fricative either as a voiced velar plosive

or a voiceless velar plosive depending on the word in question. For instance, /**ɣ**a-ra-ma/ is pronounced by many as /**g**a-ra-ma/. This results in a velar plosive adaptation as opposed to the velar fricative. In spite of the fact that /ɪ-**h**a-ra-ma/ violates no constraint together with /ɪ- **x**a-ra-ma/ which only violates the least ranked constraint, /**ɣ**a-ra-ma/ is employed as the optimal candidate in Lwidakho loanwords. The finger pointing upwards is used in the present study to indicate a phoneme that violates highest ranked constraints but is nonetheless the winner.

**Table 31:** /**ɣ**a-ra-ma/ >/ɪ-**k**ɑ-rɑ-mɑ/ 'cost'

| /**ɣ**a-ra-ma/ | IDENT (Manner) | IDENT (Major Artirclt.) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|---|
| /ɪ-**k**a-ra-ma/ | ***![+cont]** | | | * |
| /ɪ-**h**a-ra-ma/ | | | | |
| /ɪ- **x**a-ra-ma/ | | | | * |

### 3.4.3. Affricate Adaptation

The manner and major articulatory region features are faithfully retained in the adaptation of English and Kiswahili loanwords in Lwidakho. On the other hand, the place and voice constraints are violated in some cases to satisfy the higher ranked constraints.

The voiceless palatoalveolar affricate in Table (32) is faithfully adapted into Lwidakho through preservation. /wo-**t**ɪ-mɑ-nɪ/ is knocked out by violation of the constraint IDENT (Manner) feature [+cont]. The second best candidate /wo-**ʃ**ɪ-mɑ-nɪ/ violates IDENT (Place).The optimal candidate /wo-**tʃ**ɪ-mɑ-nɪ/ does not violate any constraint.

**Table 32:** /wɒ**tʃ**-mən/ > /wo-**tʃ**ɪ-ma-nɪ/ 'watchman'

| /wɒ**tʃ**-mən/ | IDENT (Manner) | IDENT (Major Artirclt.) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|---|
| /wo-**tʃ**ɪ-ma-nɪ/ ☞ | | | | |
| /wo-**ʃ**ɪ-ma-nɪ/ | | | * | |
| /wo-**t**ɪ-ma-nɪ/ | ***![+cont]** | | * | |

Lwidakho lacks the voiced palatoalveolar affricate which is present in English. Therefore devoicing is resorted to in the substitution of the absent palatoalveolar affricate as shown in Table (33). The optimal candidate /**tʃ**a-ma-nɪ/ only violates IDENT (Voice). The other losing candidates /**ʃ**ɑ-mɑ-nɪ/ and /**ts**a-ma-nɪ/ conversely violate two lower ranked constraints IDENT (Place) and IDENT (Voice). Applying the economy principle of Optimality Theory leads to the selection of /**tʃ**a-ma-nɪ/ with only one least constraint violation as the winning candidate.

**Table 33:** /**dʒ**ɜː-mə-ni/ > /**tʃ**a-ma-nɪ/ 'Germany'

| /**dʒ**ɜː-mə-ni/ | IDENT (Manner) | IDENT (Major Artirclt.) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|---|
| /**tʃ**a-ma-nɪ/ ☞ | | | | * |
| /**ʃ**ɑ-ma-nɪ/ | | | * | * |
| /**ts**a-ma-nɪ/ | | | * | * |

The example in Table (34) also illustrates the faithful adaptation of affricates in Lwidakho from Kiswahili. The candidate /mu-**t**e-ɾɛ/ is eliminated from the competition for violating the highest ranked constraint IDENT (Manner) feature [+cont]. The second best candidate /mu-**ʃ**e-ɾɛ/ loses out since it violates IDENT (Place). The optimal candidate /mu-**tʃ**e-ɾɛ/ does not violate any constraint.

**Table 34:** /m-**tʃ**ɛ-lɛ/ > /mu-**tʃ**e-ɾɛ/ 'rice'

| /m**tʃ**ɛlɛ/ | IDENT (Manner) | IDENT (Major Artirclt.) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|---|
| /mu-**tʃ**e-ɾɛ/ ☞ | | | | |
| /mu-**ʃ**e-ɾɛ/ | | | * | |
| /mu-**t**e-ɾɛ/ | ***![+cont]** | | | |

### 3.4.4. Plosive Adaptation

The general pattern underlying the adaptation of plosives is the preservation of manner of articulation features. There are however few deviations to this from the data. Due to the similarity of the voiceless bilabial plosive in English and Lwidakho, the phoneme is faithfully adapted through preservation. Consequently, the voiced bilabial fricative which violates the highest ranked IDENT (Manner) feature [-cont] exits the contest. The second best candidate with the voiceless alveolar plosive is the next in the line of elimination as it violates the constraint IDENT (Place).

**Table 35:** /**p**lɒt/ > /ɪ-**p**u-lo-tɪ/ 'plot'

| /**p**lɒt/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /ɪ-**p**u-lo-tɪ/ ☞ | | | |
| /ɪ-**β**u-lo-tɪ/ | *![-cont] | | * |
| /ɪ-**t**u-lo-tɪ/ | | * | |

Lwidakho sound inventory does not also have the voiced bilabial plosive. Therefore, there is need to substitute voiced bilabial plosive in the input with the voiceless bilabial plosive in Table (36). The optimal candidate /ɪ-**p**o-ro-tɪ/ does not violate any constraint with the candidate /ɪ-**β**o-ro-tɪ/ eliminated for violating IDENT (Manner) feature [-cont]. The voiceless velar plosive in /ɪ-**k**o-ro-tɪ/ violates least ranked constraints IDENT (Place) and IDENT (Voice)

**Table 36:** /**b**əʊlt/ > /ɪ-**p**o-ro-tɪ/ 'bolt'

| /**b**əʊlt/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /ɪ-**p**o-ro-tɪ/ ☞ | | | * |
| /ɪ-**β**o-ro-tɪ/ | *![-cont] | | |
| /ɪ-**k**o-ro-tɪ/ | | * | * |

Table (37) presents the faithful adaptation of the voiceless alveolar plosive through preservation. This is due to the similarity between the source and the borrowing language. The optimal candidate /ɪ-su-**t**ɪ/ does not exhibit any violations. The second best candidate /ɪ-su-**k**ɪ/ violates the constraint IDENT (Place). Lastly, the candidate /ɪ-su-**tʃ**ɪ/ is eliminated for violating the IDENT (Manner) feature [-cont].

**Table 37:** /suː**t**/ > /ɪ-su-**t**ɪ/ 'suit'

| /suː**t**/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /ɪ-su-**t**ɪ/ ☞ | | | |
| /ɪ-su-**tʃ**ɪ/ | *![-cont] | * | |
| /ɪ-su-**k**ɪ/ | | * | |

The voiced alveolar plosive in (38) follows a pattern of substitution through devoicing because Lwidakho lacks the voiced alveolar plosives. The candidates /ɾɪ-**β**u-ka/ and /ɾɪ-**ts**u-ka/ are eliminated for violating the highest ranked IDENT (Manner) feature [-cont]. Lastly, /ɾɪ-**t**u-ka/ which is the winning candidate violates the least ranked constraint IDENT (Voice).

**Table 38:** /**d**u-ka/ > /ɾɪ-**t**u-ka/ 'shop'

| /**d**u-ka/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /ɾɪ-**t**u-ka/ ☞ | | | * |
| /ɾɪ-**β**u-ka/ | *![-cont] | * | |
| /ɾɪ-**ts**u-ka/ | *[-cont] | | |

Similarly, the voiced velar plosive in Table (39) is substituted by its voiceless counterpart in Lwidakho. /ɪ-sɪ-**x**a-la/ is eliminated for violating the IDENT (Manner) feature [-cont] whereas /ɪ-sɪ-**ŋ**a-la/ is eliminated for violating the IDENT (Manner) features [-nas] and [-son]. The optimal candidate /ɪ-sɪ-**k**a-la/ violates the least ranked constraint IDENT (Voice).

**Table 39:** /si-**g**a-ra/ > /ɪ-sɪ-**k**a-la/ 'cigarette'

| /si-**g**a-ra/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /ɪ-sɪ-**k**a-la/ | | | * |
| /ɪ-sɪ-**x**a-la/ | ***![-cont]** | * | |
| /ɪ-sɪ-**ŋ**a-la/ | ***![-nas] [-son]** | | * |

Plosives also present with some cases of deviant adaptation. Consider Table (40) in which the voiceless bilabial plosive becomes a bilabial nasal. This violates the IDENT (Manner) features [-nas] and [-son]. There also seems to be no phonological conditioning for this change. I propose that it is motivated by the tendency of simplifying sound patterns to rhyme with the other nasals in following syllables of the word. The candidate /ʃɪ-**m**ɛ-rɛ-me-ndɛ/ is preferred to the /ʃɪ-**p**ɛ-rɛ-me-ndɛ/ despite the latter upholding all the constraints.

**Table 40:** /**p**ɛ-rɛ-mɛ-ndɛ/ > /ʃɪ-**m**ɛ-rɛ-me-ndɛ/ 'sweet'

| /**p**ɛ-rɛ-mɛ-ndɛ/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /ʃɪ-**m**ɛ-rɛ-me-ndɛ/ | ***![-nas] [-son]** | | * |
| /ʃɪ-**p**ɛ-rɛ-me-ndɛ/ | | | |

Table (41) presents another deviant adaptation in Lwidakho which is caused by palatalization. The high front vowel /i/ leads to the fronting of the voiceless velar plosive resulting in the voiceless palatoalveolar affricate. Consequently, despite violating the manner feature [-cont]

together with the constraint IDENT (Place), the voiceless palatoalveolar affricate is preferred to the more faithful voiceless velar plosive.

**Table 41**: /pi-**k**i-pi-**k**i/ >/pɪ-**tʃ**ɑ-pɪ-**tʃ**ɪ/ 'motorbike'

| /pi-**k**i-pi-**k**i/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /pɪ-**tʃ**a-pɪ-**tʃ**ɪ/ | *! [-cont] | * | |
| /pi-**k**i-pi-**k**i / | | | |

### 3.4.5. Glide Adaptation

The adaptation of glides in Lwidakho is largely uniform with the manner feature, place feature, and voice feature preserved. However, there is only one instance where the place feature is deviant from the data. The English bilabial approximant is faithfully adapted into Lwidakho as they are similar. The optimal candidate in Table (42) /k**w**o-ku-ma-ja/ does not violate any constraint. However, the second candidate /k**j**o-ku-ma-ja/ violates the constraint IDENT (Place). On the other hand, /k**m**o-ku-ma-ja/ is eliminated for violating the highest ranked constraint IDENT (Manner) features [+appr], [-nas], and [+cont]. It can further be noted that the triphthong /aɪə/ is reduced to the palatal approximant and vowel /ja/ only. This is because vowel glides are not characteristic of Lwidakho.

**Table 42:** /k**w**ɒg-maɪə/ > /k**w**o-ku-ma-jɑ/ 'quagmire'

| /k**w**ɒg-maɪə/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /k**w**o-ku-ma-ja/ | | | |
| /k**j**o-ku-ma-ja/ | | ***** | |
| /k**m**o-ku-ma-ja/ | ***![+appr], [-nas], [+cont]** | | |

A similar pattern of faithful adaptation is displayed in Table (43). The palatal approximant is preserved in the Lwidakho output. The optimal candidate /bu-la-**j**a/ exhibits no violation for all the ranked constraints. The second best candidate is /bu-la-**w**a/ as it only violates the constraint IDENT (Place). Lastly, the candidate /bu-la-**tʃ**a/ is eliminated for fatally violating the IDENT (Manner) features [+appr] and [+son].

**Table 43:** /u-la-**j**a/ > /bu-la-**j**a/ 'abroad'

| /u-la-**j**a/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /bu-la-**j**a/ ☞ | | | |
| /bu-la-**w**a/ | | * | |
| /bu-la-**tʃ**a/ | ***! [+appr], [+son]** | * | * |

Table (44) illustrates another aspect of glides faithful adaptation. The bilabial approximant is adapted into the palatal approximant thereby violating the constraint IDENT (Place). Nonetheless, /ɪ-fu-re-ja/ emerges as the optimal candidate since it preserves the highest ranked constraint IDENT (Manner). On the other hand, /ɪ-fu-re-na/ violates IDENT (Manner) features [+appr], [-nas] and [+cont] together with IDENT (Place). Lastly, /ɪ-fu-re-ka/ is also eliminated as it violates the IDENT (Manner) features [+cont], [+appr], and [+son].

**Table 44:** /fri:-**w**i:l/ > /ɪ-fu-re-**j**a/ **'**freewheel'

| /fri:-**w**i:l/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /ɪ-fu-re-**j**a/ ☞ | | * | |
| /ɪ-fu-re-**n**a/ | ***![+appr], [-nas] [+cont]** | * | |
| /ɪ-fu-re-**k**a/ | ***![+cont], [+appr] [+son]** | * | * |

### 3.4.6. Liquid Adaptation

The relative similarity of the donor languages and Lwidakho in liquids precipitates the preservation of manner features. With the exception of the alveolar trill, liquids adaptation patterns are largely uniform.

Table (45) illustrates the faithful adaptation of the alveolar lateral where it is preserved in the optimal candidate /ana-**l**o-ko/. The adaptation into the alveolar trill in /ana-ro-ko/ is eliminated due the violation of IDENT (Manner) feature [+appr]. To add on that, /ana-**n**o-ko/ is also eliminated as it violates IDENT (Manner) features [-nas], and [+appr].

**Table 45:** /æn-ə-**l**ɒg/ > /ana-**l**o-ko/ analog

| /æn-ə-**l**ɒg/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /ana-**l**o-ko/ ☞ | | | |
| /ana-**n**o-ko/ | ***![-nas],[+appr]** | | |
| /ana-ro-ko/ | ***! [+appr]** | | |

The alveolar lateral is also at times faithfully adapted into Lwidakho alveolar lateral flap. This usually happens in the environment of a front vowel after the alveolar lateral. It should however be noted that there are some exceptions. In Table (46) the optimal candidate /ka-**ɾ**i/ does not violate any constraint. The alveolar trill in /ka-ri/ is eliminated because it violates the IDENT (Manner) feature [+appr]. Lastly, the alveolar lateral satisfies all the constraints but is not usually used due to the front vowel that creates room for its allophone. It is thus next option in adaptation.

**Table 46:** /ɣa-**l**i/ >/ka-**ɾ**i / ‘expensive’

| /ɣa-**l**i/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /ka-**ɾ**i / ☞ | | | |
| /ka-ri / | *![+appr] | ***** | |
| /ka-**l**i / | | | |

Table (47) presents a case of deviant liquid adaptation. This is because of the change from the English palatoalveolar approximant to the Lwidakho trill. This violates the highly ranked IDENT (Manner) feature [+appr]. It is also notable that both the Lwidakho alveolar lateral and alveolar lateral flap are faithful adaptations but are nonetheless not selected.

**Table 47**: /g**r**iːs/>/ɪ-kɪ-ri-sɪ/ grease

| /g**r**iːs/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /ɪ-kɪ-ri-sɪ/ | *![+appr] | | |
| /ɪ-kɪ-**ɾ**i-sɪ/ | | | |
| /ɪ-kɪ-**l**i-sɪ/ | | | |

### 3.4.7. Prenasalized Consonant Adaptation

Kiswahili and Lwidakho have prenasalized consonants. It is predicted that there should be a faithful adaptation where both languages have same phonemic inventories. However, in cases where they differ particularly in the voicing of the consonant component of the nasal compounds, the Lwidakho phonological constraints dictate the phoneme adaptation strategy. There is also a case of deviant mapping from a plosive nasal compound to an affricate one.

Table (48) illustrates the faithful adaptation of the bilabial prenasalized plosive. The preservation of the phoneme guarantees the faithfulness. The optimal candidate /sa-**mb**a-sa/ does not violate any constraint unlike /sa-**ng**a-sa/ which violates IDENT (Place). Lastly, /sa-**ɲdʒ**a-sa/ is eliminated because it violates IDENT (MANNER) [-cont].

**Table 48:** /sa-**mb**a-za/ > /sɑ-**mb**ɑ-sɑ/ 'to distribute'

| /sa-**mb**a-za/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /sa-**mb**a-sa/ | | | |
| /sa-**ng**a-sa/ | | * | |
| /sa-**ɲdʒ**a-sa/ | ***![-cont]** | * | |

The alveolar prenasalized plosive in Table (49) is also faithfully adapted via preservation of the input phoneme in Lwidakho. The optimal candidate /ɪ-pu-**nd**u-tʃɪ/ does not violate any constraint. The next best candidate /ɪ-pu-**mb**u-tʃɪ/ violates the constraint IDENT (Place). Lastly, candidate /ɪ-pu-**nz**u-tʃɪ/ is eliminated for the fatal violation of IDENT (Manner) feature [-cont].

**Table 49:** /bu-**nd**u-ki/ >/ɪ-pu-**nd**u-tʃɪ/ 'gun'

| /bu-**nd**u-ki/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /ɪ-pu-**nd**u-tʃɪ/ ☞ | | | |
| /ɪ-pu-**mb**u-tʃɪ/ | | * | |
| /ɪ-pu-**nz**u-tʃɪ/ | ***![-cont]** | | |

Lastly, there is also a deviant adaptation of the prenasalized velar consonant. Table (50) illustrates the transformation of the prenasalized velar plosive into the prenasalized palatoalveolar affricate. The optimal candidate violates IDENT (Manner) feature [-cont] plus the constraint IDENT (Place). This is because of the preceding front mid-low vowel /ɛ/ which results in palatalization.

**Table 50:** /sɛ-ŋɛ-**ŋg**ɛ/ >/lu-se-ɲɛ-**ɲdʒ**ɛ/ 'barbed wire'

| /sɛ-ŋɛ-**ŋg**ɛ/ | IDENT (Manner) | IDENT (Place) | IDENT (Voice) |
|---|---|---|---|
| /lu-se-ɲɛ-**ɲdʒ**ɛ/ ☝ | *![-cont] | * | |
| /lu-se-ɲɛ- **ŋg**ɛ/ | | | |

### 3.5. Conclusion

This chapter looked at various segmental adaptation patterns of loanwords from English and Kiswahili into Lwidakho. The patterns of adaptation as noted from the data range from faithful to deviant. For the purpose of the present study, faithful adaptation patterns referred to instances where the manner features for consonants, continuants, nasals, sonorants, and approximants were similar for the input and output sounds. Conversely, deviant adaptation patterns characterised by input and output differences of the manner features. Nonetheless, both the deviant and the faithful mapping of phonemes undoubtedly revealed there are constraints behind the different adaptations.

The adaptation of patterns observed were preservation of the input phonemes. In this case, the input segment did not undergo any sound change in the output. The next pattern was substitution where the input phonemes underwent changes observed in the output. Whereas preservation guaranteed automatic faithful adaptation, substitution resulted in either faithful or deviant outputs.

Among the natural classes, nasals demonstrated faithful mapping as nasals were replaced by others with the only difference exhibited in the place of articulation and voice. Secondly, fricatives also largely demonstrated uniformity in adaptation. Fricatives were generally mapped onto other fricatives except where they were absent in Lwidakho in which case affricates were resorted to. Given that affricates share manner of articulation features with fricatives, these substitutions yielded faithful adaptations. Thirdly, affricates from English and Kiswahili were all mapped onto Lwidakho affricates with the only slight variation observed in place of articulation and voice. Fourthly, glides also recorded optimum faithful adaptation from the source languages into Lwidakho. The only difference noted was in place of articulation at a minimal level. Another phenomenon observed relates to the relationship between vowel glides and vowels. Lwidakho has the tendency of strengthening its vowel glides into glides which explains the absence of vowel glides within the same syllable in Lwidakho. Fifth, liquids exhibited variation only when mapping onto the alveolar trill and vice versa. All the other liquids shared manner of articulation features. Moreover, the adaptation of plosives was also largely faithful where devoicing was employed in determining substitute phonemes with others preserved. There was also the introduction of the voiced plosives into Lwidakho especially in the environment of

nasals resulting in prenasalized consonants. Deviant plosives in some cases were realized through spirantisation or fricativisation. Palatalization was also responsible for the deviant palatoalveolar fricatives and affricates. Lastly, prenasalized consonants were mapped from Kiswahili into Lwidakho. Although to a large extent the adaptations were faithful, there were also few deviations due to palatalization among other phonological processes.

The constraint hierarchies used in the explanation of the phonological adaptation of loanwords within the optimality theory framework were IDENT (Manner) >> IDENT (Place) >>IDENT (Voice) and IDENT (Manner) >> IDENT (Major articulatory region) >> IDENT (Place) >>IDENT (Voice).The former was used to analyse all the sound segments with the exception of fricatives which were analysed using the latter. The input form was the English or Kiswahili loanword whereas the output was the Lwidakho equivalent. In all the above constraints, dominance decreases from the left towards the right. Every input sound was matched against output using the ranked constraints to determine if they were identical in for instance, manner of articulation, place of articulation and voicing. Violation marks were used to determine the economy of the probable candidate sets. The winning candidate had the least violations and was indicated by a finger pointing to the right. However, there were cases where the loanwords used violated the highest ranked constraints in which case the finger pointed upwards.

It was confirmed that indeed the adaptation of loanwords from English and Kiswahili into Lwidakho was systematically guided by the constraints. Substitution was also largely employed in the adaptation of both faithful and deviant segments.

# CHAPTER 4

## THE SYLLABLE STRUCTURE ADAPTATION OF LOANWORDS IN LWIDAKHO

### 4.1. Introduction

This chapter focuses on the syllable structure constraints undergirding loanword adaptation. This is informed by the recognition of the differences on the permissible phonemes making a syllable. It also delves into the preferred repair strategy where there exist differences in the syllable structure between the donor and recipient languages. The Kiswahili syllable properties are covered in 4.2, the Lwidakho syllable properties are discussed under 4.3 and the syllable properties of English are expounded in 4.4. The syllable structure adaptation within Optimality Theory is covered in section 4.5 while the derivation of Lwidakho constraint ranking is tackled under 4.5.1. The chapter concludes with a summary in section 4.6.

### 4.2. The Kiswahili Syllable Structure

Mwaliwa (2014) provides a detailed account of the Kiswahili syllable structure within the Generative CV phonology. The Kiswahili syllable structure is largely open except for some borrowed words with codas which are allowed. However, the language does not permit coda consonants. The nasals of Kiswahili according to Mwaliwa (2014:118) are syllabic. The common Kiswahili syllable types are discussed below.

The first syllable type is the CV. This consists of a consonant and a vowel. For instance, /**p**i-**k**i-**p**i-**k**i/ which means ‘motorbike.’ It is noted that each of the consonant phonemes in bold combines with the high front vowel to make a syllable.

The second syllable type is the CVC. It consists of a vowel preceded by an onset and followed by a coda. An example is /**d**a**k**-ta-ri / meaning ‘doctor’.

The third one is CCV. This syllable type according to Iribemwangi (2008: 71) uses four consonant types. The five Kiswahili nasals occupy the initial position. These nasals precede an affricate, palatal stop or a plosive. The final position is occupied by any vowel. It is also common especially where a consonant is followed by a glide. Consider /**fjɛ-**ka/ which means ‘to slash.’

Lastly, Kiswahili has the V only syllable type which may either be composed of only a syllabic nasal or a vowel. For instance, /li-**a**/ meaning 'to cry. The central near back vowel forms a V syllable.

### 4.3. The Lwidakho Syllable Structure

Lwidakho is a Bantu language together with Kiswahili. As a general rule, Lwidakho has an open syllable and thus does not allow codas. In spite of the many similarities in their syllable structures, there are a number of differences. Some nasals in Lwidakho can occupy syllable peaks like /m/ and /ɲ/. Take the case of /m-mbu-ju/ meaning 'eggs'. Lwidakho syllable types are presented below.

The first Lwidakho syllable type is CV. Just like it is the case with many languages, Lwidakho is characterised with this syllable type consisting of a consonant and a vowel. Consider /**m**u-**t**ɑ-**k**ɑ-**t**ɪ-**f**u/ which means 'holy.'

Secondly, Lwidakho also has the CCV syllable type. It mostly consists of a consonant in the onset followed by the bilabial approximant. This syllable type is also common as evidenced by /**mwi**-xo/ which means a 'relative.'

Lastly, Lwidakho has the V syllable type. It resembles the Kiswahili syllable type given that the V place may be occupied by either the syllabic nasal consonant /m/ or a vowel. Compare the following: /**ɪ**-pɑ-sɪ-ɑ/ for 'curtain' and /**m**-mbu-ju/ meaning 'eggs.'

### 4.4. The English Syllable Structure

The English language unlike Kiswahili and Lwidakho falls in the Germanic language family. Consequently, there are many differences that characterize its syllable structure. According to Roach (2000:86) **l**, **r**, and nasals in English are syllabic. The most common syllabic consonants are **l** and **n**. The syllabic **r** is characteristic of many American accents and is normally referred to as the rhotic **r**. Lastly, the other set of nasals **m** and **ŋ** only become syllabic in the environment of assimilation and elisions processes (Ibid: 89).According to Roach (2000: 71-76), the following syllable types are possible:

The first syllable type is V. The English language allows zero onsets for its vowels although the back high vowel **ʊ** rarely occurs at the position. Take the example of the English article 'a.'

Secondly, the CV is found in syllable types with one onset. It should be however noted that this syllable type is rare with **ʒ** and **ŋ.** A case in point is /kɑ: / for Car.

The third syllable type is CCV. This is composed of two consonants and a vowel. Consider the word /stɑ:/ for star.

Fourth is CCCV. Which normally consists of a combination of consonants together with the initial‘s’. Consider the example /splɪnt/ for splint.

The fifth one is the closed syllable type CVC. The coda is called the final consonant since it is only one. The coda may be any consonant with the exception of **h, r**, **w** and **j**. Take for instance /bæg/ for bag.

Sixth is the CVCC. It is characterised by an onset followed by a double consonant cluster. Take for instance, /bæŋk/ for bank meaning a financial institution for keeping money.

The seventh syllable type comprises of a double onset and a triple coda cluster CCVCCC. Consider the example /twelfθ/ for twelfth.

There is also the triple onset preceding a vowel and a quadruple coda cluster in CCCVCCCC. Take for instance /skræmbld/ for scrambled.

To add on that, English also has a syllable comprising of a vowel and a coda, VC. Take for instance the preposition ‘on.’

Moreover, a syllable type comprising of a vowel and a two consonants in the coda, VCC is found in the English word, ‘act.’

A comparative analysis of the three languages reveals a lot of differentiation with regard to the syllable structures they allow. For instance, English language and Kiswahili allow closed syllables. Lwidakho on the other hand does not allow closed syllables. Moreover, whereas English allows up to four coda clusters, Kiswahili allows only one. All the languages have onsets. English has a large variety of consonant clusters allowed at the onset while Kiswahili and Lwidakho are limited to few consonants and glides plus nasals, plosives and glides. Therefore, in the adaptation of loanwords in Lwidakho and it is predicted that several repair

strategies will be employed to ensure conformity to the Lwidakho system. The major adaptation strategies with regard to the syllable structure are epenthesis and consonant deletion. Epenthesis is where a vowel is inserted in illicit consonant clusters for repair. Deletion is where illicit consonant clusters are deleted to adapt the borrowing language's syllabic constraints. First we recap on the consonant structures observed in the corpus data summarized in Table (51).

**Table 51:** Consonant structure of words in the data

| | ENGLISH | | KISWAHILI | |
|---|---|---|---|---|
| STRUCTURE | ONSET | CODA | ONSET | CODA |
| $C_1$ | 56 | 54 | 129 | 1 |
| $C_2$ | 21 | 9 | 17 | 0 |
| $C_3$ | 0 | 2 | 0 | 0 |
| Total | 77 | 65 | 146 | 1 |

Adapted from Miao (2005:17), with modification

$C_I$ means there is only one consonant.

$C_2$ means there is a two consonant cluster.

$C_3$ means there is a three consonant cluster.

The table clearly indicates that the English language has the highest number of consonant clusters at twenty one out of seventy seven for two consonant cluster onsets and Kiswahili records the highest onset consonants at one hundred and twenty nine out of one hundred and forty six. In the coda position, Kiswahili has only one final consonant and recorded zero on two consonants at the coda position. On the other hand, English recorded the highest number of its codas with one final consonant standing at 54, two consonant clusters at 9 while the three consonant clusters recorded only two from the data out of a possible sixty five.

### 4.5. Syllable Structure Adaptation in Optimality Theory

According to Guo (2001:2) there are basically three repair strategies that operate at the level of the syllable. They include feature change, vowel epenthesis, and deletion. The Lwidakho data corroborates all these adaptation strategies employed. Basing on the analysed data, most of the adaptation strategies employed in Lwidakho are feature changes in phoneme substitution and

inserting vowels to correct illicit consonant clusters. In addition, at the phonotactic level there were few instances of phoneme deletion in the course of repair represented below.

| | | |
|---|---|---|
| **(18)** /friː-wiː**l**/ | /ɪ-fu-re-jɑ/ | **l>deleted** |
| /**h**ɒs-pɪ-tl/ | /ɪ-sɪ-βɪ-tɑ-ɾɪ/ | **h>deleted** |
| /dɪdʒ-ɪ-t**l**/ | /ti-tʃɪ-to/ | **l>deleted** |
| /prɪn-sə-p**l**/ | /pu-rɪ-nzɪ-po/ | **l>deleted** |
| /fre**ndz**/ | /βɑ-fu-re-nzɪ/ | **ndz> nz (d-deleted)** |
| /kaʊn-ti kaʊns**l**/ | /kɑ-u-ndɪ-ka-nzo/ | **l>deleted** |

It is worth noting that all the instances of deletion occurred in English loanwords. The liquid (alveolar lateral) recorded the highest number of deletions at four. Take for instance, /friː-wiː**l**/ > /ɪ-fu-re-jɑ/ , /dɪdʒ-ɪ-t**l**/ >/ti-tʃɪ-to/ , /prɪn-sə-p**l**/> /pu-rɪ-nzɪ-po/, and /kaʊn-ti kaʊns**l**/ > /kɑ-u-ndɪ-ka-nzo/. The glottal fricative and the voiced alveolar plosive are each deleted once. These are /**h**ɒs-pɪ-tl/ >/ɪ-sɪ-βɪ-tɑ-ɾɪ/.The second last plosive that is sandwiched between the nasal and the fricative is deleted resulting in a prenasalized consonant /fren**d**z/ > /βɑ-fu-re-nzɪ/. All the laterals that are deleted are in the coda position against the Lwidakho syllable structure.

These findings are consistent with Fay and Culter (1997) who assert that liquids are weak owing to their vowel-like formants as quoted by Guo (2001: 7). Consequently, surrounding vowels are more salient than liquids. Due to their weakness, in the repair of the illicit syllable structure, the alveolar laterals are deleted instead of inserting vowels to rectify them. The voiceless glottal fricative is acoustically close to the vowel considering their level of vocal tract constriction and is thus deleted from the onset position.

These few instances of deletion lead us to the conclusion that epenthesis is more prevalent in Lwidakho loanword adaptation than deletion. Therefore, applying the same to Optimality theory, the constraint for epenthesis is hierarchically ranked higher than deletion.

In the derivation of Lwidakho constraint ranking, we begin with the markedness constraint governing the syllable structure. Section 4.2.0 demonstrates that the only onset consonant clusters allowed in Lwidakho are those consisting of prenasalized consonant clusters or the

combination of a consonant and a glide. Moreover, codas are not allowed in the Lwidakho syllable structure. Pursuant to these I propose the constraint;

a) COMPLEX*

Complex onsets are generally not allowed except few permissible ones in line with Lwidakho syllable structure.

b) NO CODA

No codas are allowed within the syllable boundary.

The faithfulness constraints, on the other hand, comprise the following (McCarthy and Prince: 1995) cited in Sang (2009: 73);

a) MAX-10: Every input segment has an output correspondent
b) DEP-10: Every output segment has an input correspondent

The Lwidakho constraint hierarchy is thus expressed as follows:

COMPLEX* >> NO CODA >> MAX-10 >> DEP-10

Table (52) input /wɔː**d**/ has a coda which is not permissible in the Lwidakho syllable structure. Therefore, the optimal candidate /ɪ-wo-**t**ɪ/ not only conforms at the segmental level through devoicing but also combines with an inserted vowel after the voiceless alveolar plosive in line with Lwidakho syllable structure constraints. It only violates the least ranked constraint DEP-10 which prohibits insertion. Its competitors /wɔː**d**/ and /ɪ-wo-**t**/ are eliminated for violating the markedness constraint NO CODA.

**Table 52:** /wɔː**d**/ >/ɪ-wo-**t**ɪ/ 'ward'

| /wɔː**d**/ | COMPLEX* | NO CODA | MAX-10 | DEP-10 |
|---|---|---|---|---|
| /ɪ-wo-**t**ɪ/ ☞ | | | | * |
| /wɔː**d**/ | | *! | * | |
| /ɪ-wo-**t**/ | | *! | * | |

In Table (53) the Lwidakho syllable structure does not allow the complex onset consonant cluster /**st**ɔ:-ri/. It is eliminated as it fatally violates the highest ranked markedness constraint COMPLEX*. The optimal candidate /ɪ-**s**ɪ-**t**o-**r**ɪ/ repairs the illicit onset cluster through epenthesis thereby violating the least ranked constraint DEP-10. The second best candidate /**s**ɔ:- **r**i/ also encounters one violation of a higher ranked faithfulness constraint MAX-10 which prohibits deletion and is thus eliminated.

**Table 53:** /**st**ɔ:-**r**i/ > /ɪ-**s**ɪ-**t**o-**r**ɪ/ 'story'

| /**st**ɔ:-**r**i/ | COMPLEX* | NO CODA | MAX-10 | DEP-10 |
|---|---|---|---|---|
| /ɪ-**s**ɪ-**t**o-**r**ɪ/ ☞ | | | | * |
| /**st**ɔ:- **r**i/ | *! | | * | |
| /**s**ɔ:- **r**i/ | | | * | |

In Table (54), there are two consonant clusters one at the onset and the other at the coda position. Since both clusters are not in tandem with the Lwidakho syllabic structure constraints, vowel epenthesis takes place to repair them. The least ranked constraint DEP -10 is thus violated by the optimal candidate. However, its competitor /**fr**a-**ŋg**a/ is eliminated for violating COMPLEX*. On the other hand, /**f**u-**r**a**ŋg**/, is eliminated for violating the second highest ranked constraint NO CODA.

**Table 54:** /**fr**æ**ŋk**/ > /**f**u-**r**a-**ŋg**a/ 'Frank'

| /**fr**æ**ŋk**/ | COMPLEX* | NO CODA | MAX-10 | DEP-10 |
|---|---|---|---|---|
| /**f**u-**r**a-**ŋg**a/ ☞ | | | | * |
| /**fr**a-**ŋg**a/ | **! | | | * |
| /**f**u-**r**a**ŋg**/ | | **! | | * |

Table (55) presents another case of the coda in Kiswahili. Given that Lwidakho syllable structure does not permit codas, epenthesis is resorted to in /**t**a-**tʃ**ɪ-**t**a-ɾɪ/ consequently violating the lower ranked constraint DEP-10. The second best candidate /**t**a-ɪ-ta-ɾɪ/ is however eliminated for violating the faithfulness constraint MAX-10 that is ranked higher than DEP-10. The third candidate /**t**a**tʃ**-**t**a-ɾɪ/ is thrown out of the contest as it violates the second highest ranked constraint NO CODA**.** Interestingly, /**t**o- **k**ɪ- **t**a/ is borrowed from the English word 'doctor' and is mostly used as a proper noun.

**Table 55**: /**d**a**k**-**t**a-**r**i / > /**t**a-**tʃ**ɪ-**t**a-ɾɪ/ 'doctor'

| /**d**a**k**-**t**a-**r**i / | COMPLEX* | NO CODA | MAX-10 | DEP-10 |
|---|---|---|---|---|
| /**t**a-**tʃ**ɪ-**t**a-ɾɪ / ☞ | | | | * |
| /**t**a**tʃ**-**t**a-ɾɪ / | | ****!** | | * |
| /**t**a-ɪ-ta-ɾɪ / | | | * | |

Table (56) presents another coda in the first syllable. The onset cluster is licit in Lwidakho hence there is no need of repair. Candidate /**mw**i**s**-**l**a-**m**u/ eliminated for violating the markedness constraint NO CODA. The violation of the faithful constraint MAX-10 which bars deletion eliminates the candidate /**mw**i-**l**a-**m**u/. The optimal candidate /**mw**i-**s**a-**l**ɑ-**m**u/ violates the least ranked constraints which bars epenthesis but is nonetheless selected as the winner.

**Table 56:** /**mw**i**s**-**l**a-**m**u/ > /**mw**i-**s**a-**l**a-**m**u/ 'Muslim'

| /**mw**i**s**-**l**a-**m**u/ | COMPLEX* | NO CODA | MAX-10 | DEP-10 |
|---|---|---|---|---|
| /**mw**i-**s**a-**l**ɑ-**m**u/ ☞ | | | | * |
| /**mw**i**s**-**l**a-**m**u/ | | *! | | |
| /**mw**i-**l**a-**m**u/ | | | * | |

The adaptation in Table (57) follows a similar pattern where /**β**a-**f**u-**r**e-**ndz**ɪ/ and /**fr**e**ndz**/ are eliminated for the fatal violation of the highest ranked constraint COMPLEX.*. The first one due to the complex onset /**ndz**/ whereas the latter for the complex onset /**fr/.** The optimal candidate

/**β**a-**f**u-**r**e-**nz**ɪ/ violates MAX-10 and DEP-10 for the deletion of /d/ and the epenthesis of vowels to repair the illicit clusters, respectively.

**Table 57: /frendz/ >/βɑ-fu-re-nzɪ/** 'Quakers'

| **/frendz/** | COMPLEX* | NO CODA | MAX-10 | DEP-10 |
|---|---|---|---|---|
| **/βa-fu-re-nzɪ/** | | | * | * |
| **/βa-fu-re-ndzɪ/** | *! | | | * |
| **/frendz/** | *! | *** | | |

The optimal candidate in Table (58) **/kɑ-u-ndɪ-ka-nzo/** violates the faithful MAX-10 for the deletion of the alveolar lateral. In addition, DEP-10 is violated because of the vowels that are inserted to repair the syllable structure. The markedness constraint NO CODA is violated by the candidates **/kaʊn-di kaʊnsl/** and **/ka-u-ndɪ-kanz/** due to the coda clusters. The violation eliminated them from the competition. Consequently, the weak alveolar lateral is deleted in adapting to the Lwidakho syllable structure constraints.

**Table 58: /kaʊn-ti kaʊnsl/ >/kɑ-u-ndɪ-ka-nzo/** County council

| **/kaʊn-ti kaʊnsl/** | COMPLEX* | NOCODA | MAX-10 | DEP-10 |
|---|---|---|---|---|
| **/kɑ-u-ndɪ-ka-nzo/** | | | * | * |
| **/kaʊn-di kaʊnsl/** | | **!* | | |
| **/ka-u-ndɪ-kanz/** | | **!* | * | |

Lastly, Table (59) the candidates **/ɪ-sɪ-βɪ-tr/** and **/hɒs-pɪ-tl/** are eliminated for violating the highest ranked markedness constraint COMPLEX.* The optimal candidate **/ɪ-sɪ-βɪ-ta-rɪ/** is tolerated despite violating the least ranked constraints MAX-10 and DEP-10 in line with the principles of strict domination and violability of constraints. The weak voiceless glottal fricative is also deleted in the onset position in spite of the fact that the onset is well formed.

**Table 59: /hɒs-pɪ-tl/ > /ɪ-sɪ-βɪ-ta-rɪ/** ‘hospital’

| /hɒs-pɪ-tl/ | COMPLEX* | NOCODA | MAX-10 | DEP-10 |
|---|---|---|---|---|
| /ɪ-sɪ-βɪ-ta-rɪ/ ☞ | | | * | *** |
| /ɪ-sɪ-βɪ-tr/ | *! | | * | * |
| /hɒs-pɪ-tl/ | *! | * | | |

## 4.6. Conclusion

This chapter discussed the syllable structure adaptation of English and Kiswahili loanwords in Lwidakho. The syllabic properties of Lwidakho, Kiswahili and English were discussed. The general observation was that English had the most number of syllable types unlike Kiswahili and Lwidakho due to the Bantu languages’ tendency to restrict consonant clusters.

Lwidakho only has the open syllable type. This means that there are no codas in Lwidakho. Kiswahili on the other hand was largely accommodative of foreign syllable types from Arabic and English. Therefore, Kiswahili has some instances of closed syllable structures although open syllables are predominant. English has both closed and open syllables.

Although Kiswahili, English and Lwidakho exhibited onset consonant clusters, English demonstrated a lot of flexibility on the consonant clusters allowed in the onset position than Lwidakho and Kiswahili. English has more coda clusters than Kiswahili as it allows up to four coda clusters with Kiswahili only allowing one coda cluster.

The chapter further revealed syllable structure adaptation operates along the major lines of featural change, deletion of illicit phonemes and vowel epenthesis. Generally, foreign syllable structures are adapted in Lwidakho through changes to CV syllable types. This adaptation is attained through epenthesis and deletion of the illicit phonemes. Lwidakho greatly employs epenthesis of vowels as opposed to deletion. There were only six instances of consonant deletion of the alveolar lateral, the voiceless glottal fricative, and the voiced alveolar plosive sandwiched

between a nasal and a fricative. It was further noted that the deleted phonemes exuded some element of weakness. A case in point is the liquid weak formant that is close to vowels.

Using the findings on the syllable structure and preferred repair strategy the constraints COMPLEX$^{*}$ >> NO CODA >> MAX-10 >> DEP-10 were proposed with dominance decreasing from left to right. The constraint COMPLEX$^{*}$ was used to ensure the optimal candidates conformed to the syllable structure of Lwidakho. NO CODA ensured that no coda clusters were permitted. The faithfulness constraint MAX-10 ensured no phonemes are deleted while DEP-10 encouraged deletion while objecting to vowel epenthesis.

# CHAPTER 5

# CONCLUSION

This research has attempted to provide a phonological analysis of Lwidakho loanwords from Kiswahili and English. It investigated loanwords from English, a Germanic language and Kiswahili which is Bantu. The study sought answers for the processes responsible for mapping phonemes from source languages into Lwidakho. Secondly, the study investigated how English and Kiswahili syllable structures are adapted into Lwidakho. Lastly, there was also an investigation into the constraints that determine the repair strategy adopted in the adaptation of illicit syllable structures in Lwidakho. The researcher tested the hypothesis that substitution is the process that is responsible for the mapping of English and Kiswahili consonant into Lwidakho. The second hypothesis was that English and Kiswahili syllables are adapted into Lwidakho by being changed into CV syllables. Thirdly, epenthesis is the most preferred strategy in the adaptation of illicit consonant clusters in Lwidakho.

## 5.1. Findings

The second chapter delved into the phonemic inventory of the Kiswahili, English, and Lwidakho languages. The consonants and vowels of the three were discussed. It was found that there were a number of differences in the sound systems of these languages. Lwidakho had twenty five consonants. Kiswahili on the other hand had thirty one consonants while English had twenty four consonants. In addition, it was established that voice was not distinctive in Lwidakho phonemes. Kiswahili and English on the other hand largely exhibited the voice distinctions in their phonemes. The Kiswahili vowels totalled to five. Lwidakho vowels were seven, two more than Kiswahili with the difference being in the two front vowels /ɪ/ and /e/. English had the most number of vowels at twenty. The pure vowels were twelve with the diphthongs and triphthongs contributing eight vowels.

The third chapter focused on the adaptations of consonant from English and Kiswahili into Lwidakho. It was noted that consonants from the donor languages were faithfully or unfaithfully adapted into Lwidakho. Faithful adaptation in the context of this study implied situations where the input and the output shared manner features. The deviant or unfaithful adaptations on the

other hand referred to cases of discrepancy in the manner features of input against output consonants. This was motivated by the existing differences in the sound systems together with the interaction of constraints from the borrowing language. The constraints that governed the mapping were based on the distinctive features as Manner >> Place >> Voice. For fricatives, an extra constraint was included to make Manner >> Major articulatory region >>Place >> Voice. The manner features under study were [cont], [cons], [son], [nas], and [appr]. The major articulatory region was comprised of [labial], [coronal] and [dorsal]. The place of articulation included all the places from bilabial, labiodental, dental, alveolar, palatal, palatoalveolar, velar, and the glottal. Lastly, voice distinctions were also used. Substitution was proved to be responsible for the mapping of consonants from English and Kiswahili into Lwidakho under these mentioned constraints due to the systematic adaptation patterns observed. Consonants absent in Lwidakho were replaced by other Lwidakho equivalents. Moreover, other instances of substitution were motivated by phonological processes like palatalization, spirantisation and affrication even where the consonants were present in both the source and the borrowing language.

The fourth chapter discussed the syllable structure adaptation of loanwords from Kiswahili and English into Lwidakho. The syllabic properties of Lwidakho, Kiswahili and English were analysed. There were fewer differences between Kiswahili and Lwidakho. On the extreme end, English was distinct with fairly complicated syllable structures. The chapter primarily sought to identify how English and Kiswahili syllable structures are adapted in Lwidakho. It also investigated the most preferred repair strategy for illicit codas and consonant clusters from English and Kiswahili. It was observed that English and Kiswahili syllable structures were adapted into Lwidakho through conversion into CV syllables. The change into CV syllables structures was attained through vowel epenthesis and deletion. The constraint ranking using the data largely conformed to the hypothesis that epenthesis as opposed to deletion accounts for the major process of adapting alien syllable structures in Lwidakho. There were only five instances of deletion as a repair strategy. The constraint hierarchy that guides the adaptations at the syllable level is expressed as follows: COMPLEX$^{*}$ >> NOCODA >> MAX-10 >> DEP-10.

## 5.2. Recommendations for further Study

The present study attempted a study of Lwidakho loanword phonology within Optimality theory. It was previously noted that there are many dimensions underlying the phonological adaptation of loanwords. They include among others suprasegmental and morphological changes. This is because they are all intertwined in the various adaptation processes of loanwords.

Considering that Lwidakho is a tonal language, it would be interesting to unearth the tonal changes in loanword adaptation together with the constraints that govern such processes. In conforming to the borrowing language, phonemes change. Tonal patterns of the borrowed words also change because the source language and the borrowing language often exhibit idiosyncratic tonal systems.

Moreover, this study did not focus on the morphological angle of loanword adaptation within OT. The data indicates that the changes at the phonological level are accompanied with morphological adaptations. It is therefore recommended that interested scholars should attempt investigating the morphological changes loanwords undergo.

Lastly, with regard to segmental adaptation, my study was biased to consonant phonemes. There is also need for an in depth analysis into the vowel to vowel mapping in the future. The differences in vowel inventories imply that substitution is necessary where there exist disparities between the borrowing language and the source language.

## REFERENCES


Akwala, A. (2008). 'A Morphophonological Nativization of Lumarachi Loanwords-a case of Borrowing from Dholuo.' (Unpublished M.A. Thesis: University of Nairobi).

Archangeli, D. (1999). 'Introducing Optimality Theory.' Annual Review of Anthropology, Vol. 28 (1999), pp. 531-552.Retrieved on 9th February 2015 from http://www.jstor.org/stable/223405.

Benus, S. (2009).Optimality Theory and Phonetics-Phonology Interface. Muenchen: Lincom Europa.

Boen, P. (2014). 'Loanwords in Nandi from English and Kiswahili Languages.' (Unpublished M.A. Thesis: University of Nairobi).

Broselow, E. (2001). 'Perceptual and Grammatical Factors in Phoneme Substitution.' Paper presented at Phonological Similarity Workshop, LSA annual meeting 2001. Washington DC, January 4-7, 2001.

Campbell, L. (1998). Historical Linguistics: An Introduction. Edinburgh: Edinburgh University Press Syndicate.

Crystal, D. (Ed.) (2008). A Dictionary of Linguistics and Phonetics (6th ed.). Oxford: Blackwell Publishing.

Downing, L. (2009). 'Optimality Theory and African language phonology.' Selected Proceedings of the 38th Annual Conference on African Linguistics, ed. Masangu Matondo et al., 1-16. Somerville, MA: Cascadilla Proceedings Project.

Ebarb, K. (2014). 'Tone and Variation in Idakho and other Luhya Varieties.' (Unpublished Doctoral dissertation: Indiana University).Retrieved on 27th September, 2014 from http://www.academia.edu

Fay, D., & Culter, A. (1997). 'Malapropisms and the Structure of the Mental Lexicon.'Linguistic Inquiry. 8 (3): 505-20.

Fromkin, V., Rodman, R. & Hyams, N. (2011). An Introduction to Language (9th ed.). New York: Wadsworth, Cengage Learning.

Gimson, A. (1970). An Introduction to the Pronunciation of English (2nd ed.). London: Edward Arnold ( Publishers), Limited.

Guo, L**.** (2001). 'Mandarin Loanword Phonology and Optimality Theory: Evidence from transliterated American State names and Typhoon names.' Paper presented at The Seventh International Symposium on Chinese Phonology, Taipei, Taiwan.' Retrieved on 6th February 2015 from http://www.academia.edu

Haugen, E. (1950). The Analysis of Linguistic Borrowing. In Mwaliwa, H. 'An Analysis of the Syllable Structure of Standard Kiswahili Loanwords from Modern Standard Arabic.' (Unpublished Doctoral dissertation: University of Nairobi).

Iribemwangi, P. (2008). 'A Synchronic Segmental Morphophonology of Standard Kiswahili.' (Unpublished Doctoral dissertation: University of Nairobi).

Katamba, F. (1989). An Introduction to Phonology. Edinburgh Gate, Harlow: Pearson Education Limited.

Kenya National Bureau of Statistics (2010). The 2009 Kenya Population and Housing Census. Nairobi: Government Printing Press.

Kiparsky, P. (1973). 'Phonological Representations.' In Osamu Fujimura (Ed.). Three Dimensions of Linguistic Theory. Tokyo: T.E.C. Company Limited.

Lewis, P., Gary, S. & Charles, F. (Eds.). (2015). 'Ethnologue: Languages of the World,' (18th ed.).Dallas, Texas: SIL International. Retrieved on 4th February, 2015 from http://www.ethnologue.com.

Lidonde, A. (1978). 'A Generative Phonology of Lwitakho — A Luyia dialect.' (Unpublished M.A. Thesis: University of Nairobi).

Mbonankira, G. (2004). 'The Accommodation of Kiswahili and English Loanwords into Kinyarwanda.' (Unpublished M.A. Thesis: University of Nairobi).

McCarthy, J. (2002). A Thematic Guide to Optimality Theory. Cambridge: Cambridge University Press.

Miao, R. (2005). 'Loanword Adaptation in Mandarin Chinese: Perceptual, Phonological and Sociolinguistic Factors.' (Unpublished Doctoral dissertation: Stony Brook University).Retrieved on 20th March, 2015 from http:// www.rutgers.edu/roa.hmtl.

Mwaliwa, H. (2014). 'An Analysis of the Syllable Structure of Standard Kiswahili Loanwords from Modern Standard Arabic.' (Unpublished Doctoral dissertation: University of Nairobi).

O'Grady, W., Dobrovolsky, M. & Katamba, F. (Eds.). (1997). Contemporary Linguistics. London: Addison Wesley Longman Limited.

Prince, A. & Smolensky, P. (1993). Optimality Theory: Constraint Interaction in Generative Grammar. In Sang, H. 'Phonological Adaptations of English Loanwords in Naandi.' (Unpublished M.A. Thesis: Moi University).

.

Prince, A. & Smolensky, P. (2002). 'Optimality Theory: Constraint Interaction in Generative Grammar.' Unpublished manuscript. Retrieved on 29th January, 2015 from http:// www.rutgers.edu/roa.hmtl.

Roach, P. (2000). English Phonetics and Phonology. Trumpington Street, Cambridge: Cambridge University Press.

Roach, P. (2002). English Phonetics and Phonology. Trumpington Street, Cambridge: Cambridge University Press.

Sang, H. (2009). 'Phonological Adaptations of English Loanwords in Naandi.' (Unpublished M.A. Thesis: Moi University).

Were, G. (1967). Western Kenya Historical Texts: Abaluyia, Teso and Elgon Kalenjin.EAA CB

Yule, G. (2006). The Study of Language (3rd ed.). New York: Cambridge University Press.

## APPENDIX 1

| ENGLISH | LWIDAKHO | | GLOSS |
|---|---|---|---|
| IPA | | ORTHOGRAPHY | |
| /θɪə-tə/ | /tsɪ-ɛtɑ/ | tsieta | theatre |
| /wɔ:d/ | /ɪ-wo-tɪ/ | iwoti | ward |
| /lʌntʃ/ | /ɪ- ɾɑ-ɲdʒɪ/ | ilanji | lunch |
| /kæθ-l-ɪk/ | /kɑ-tso-ɾɪ-kɪ/ | katsoliki | Catholic |
| /prez-ɪ-dənt/ | /pu-rɛ-sɪ-te-ndɪ/ | puresitendi | president |
| /reɪl-weɪ/ | /ɪ-ɾe-ɾwɛ/ | ilelwe | railway |
| /fri:-wi:l/ | /ɪ-fu-ɾe-jɑ/ | ifureya | freewheel |
| /ɒf-ɪs/ | /o-βɪ-si/ | obisi | office |
| /gri:s/ | /ɪ-kɪ-ri-sɪ/ | ikirisi | grease |
| /hɒs-pɪ-tl/ | /ɪ-sɪ-βɪ-tɑ-ɾɪ/ | isibitali | hospital |
| /steɪk/ | /ɪ-sɪ-tɛ-kɪ/ | isitek | steak |
| /stɔ:-ri/ | /ɪ-sɪ-to-ɾɪ/ | isitori | story |
| /fɑ:ðə/ | /fɑ-tsɑ/ | fatsa | father |
| /kæm-peɪn/ | /kɑ-mbe-ɪnɪ/ | ikambeini | campaign |
| /fræŋk/ | /fu-rɑ-ŋgɑ/ | Furanga | Frank |
| /bəʊlt/ | /ɪ-po-ro-tɪ/ | iporoti | bolt |

| ENGLISH | LWIDAKHO | | GLOSS |
|---|---|---|---|
| | IPA | ORTHOGRAPHY | |
| /æn-ə-lɒg/ | /ɑnɑ-lo-ko/ | analoko | analogue |
| /dɪdʒ-ɪ-tl/ | /ti-tʃɪ-to/ | tichito | digital |
| /bæn-dɪdʒ/ | /ɪ-pe-ndɛ-tʃɪ/ | ipendechi | bandage |
| /nɔ:t/ | /ɪ-no-tɪ/ | inoti | zero |
| /wɒtʃ-mən/ | /wo-tʃɪ-mɑ-nɪ/ | wochimani | watchman |
| /eɪ-kə-fʌnd/ | /e-kɑ-fɑ-ndɪ/ | Ekafandi | Acre fund |
| /blaʊz/ | /pu-lɑ-usɪ/ | pulausi | blouse |
| /tʃeɪndʒ/ | /ɪ-tʃe-ɲdʒɪ/ | ichenji | change |
| /tʃek/ | /ɪ-tʃe-kɪ/ | icheki | cheque |
| /æd-və-keɪt/ | /ɑ-tɪ-βo-ke-tɪ/ | atiboketi | advocate |
| /grə-neɪd/ | /ɪ-ku-ru-ne-tɪ/ | ikuruneti | grenade |
| /gri:n/ | /ku-ri-nɪ/ | kurini | green |
| /pʊd-ɪŋ/ | /ɪ-pu-tɪ-ɲdʒɪ/ | iputinji | pudding |
| /su:t/ | /ɪ-su-tɪ/ | isuti | suit |
| /pær-ɪʃ/ | /ɪ-pɑ-rɪ-ʃɪ/ | iparishi | parish |
| /blɒk/ | /ɾɪ-pu-lo-ko/ | lipuloko | block |
| /sku:l/ | /ɪ-su-ku-lu/ | isukulu | school |

| ENGLISH | LWIDAKHO | | GLOSS |
|---|---|---|---|
| IPA | | ORTHOGRAPHY | |
| /bæn-dæn-ə/ | /ɪ-pɑ-ndɑ-nɑ/ | ipandana | bandana |
| /prəʊ-græm/ | /pu-ro-ku-rɑ-mu/ | purokuramu | program |
| /prɪn-sə-pl/ | /pu-rɪ-nzɪ-po/ | purinzipo | principal |
| /blæŋ-kɪt/ | /mu-ɾɪ-ɲdʒɛ-tɪ/ | mulinjeti | blanket |
| /frendz/ | /βɑ-fu-ɾe-nzɪ/ | Bafurenzi | Quakers |
| /feɪs-bʊk/ | /fe-sɪ-pu-ku/ | Fesipuku | Facebook |
| /ɪn-tə-net/ | /ɪ-ndɑ-ne-tɪ/ | indaneti | Internet |
| /kəm-pju:-tə/ | /ɪ-ko-mbju-ta/ | ikombyuta | computer |
| /kwɒg-maɪə/ | /kwo-ku-ma-jɑ/ | kwokumaya | quagmire |
| /æl-ɪks/ | /ɑ-ɾe-kɪ-sɪ/ | Alekisi | Alex |
| /sɪl-vɪa/ | /sɪ-ɾɪ-βɪ-ɑ/ | Silibia | Sylvia |
| /plaɪəz/ | /ɪ-pu-lɑ-ɪ-sɪ/ | ipulaisi | plies |
| /plɒt/ | /ɪ-pu-lo-tɪ/ | ipuloti | plot |
| /saɪ-prəs/ | /sɑ-ɪ-pu-rɑ-sɪ/ | saipurasi | cypress |
| /kaʊn-ti kaʊnsl/ | /kɑ-u-ndɪ-ka-nzo/ | kaundikanzo | county council |
| /sʌb-tʃi:f/ | /sɑ-βu-tʃi-fu/ | sabuchifu | sub chief |
| /dʒɜ:məni/ | /tʃɑ-mɑ-nɪ/ | Chamani | Germany |

## APPENDIX 2

| KISWAHILI | LWIDAKHO | | GLOSS |
|---|---|---|---|
| | IPA | ORTHOGRAPHY | |
| /pi-ki-pi-ki / | /ɪ-pɪ-tʃɑ-pɪ-tʃɪ/ | ipichapichi | motorbike |
| /m-ta-ka-ti-fu / | /mu-tɑ-kɑ-tɪ-fu/ | mutakatifu | holy |
| /dak-ta-ri/ | /tɑ-tʃɪ-tɑ-rɪ/ | tachitari | doctor |
| /ɣa-li/ | /kɑ-ɾi/ | kali | expensive |
| /m-sa-la-ba/ | /mu-sɑ-lɑ-pɑ/ | musalapa | cross |
| /mwis-la-mu/ | /mwi-sɑ-lɑ-mu/ | mwisalamu | Muslim |
| /u-ki-mwi/ | /βu-tʃɪ-mwi/ | buchimwi | Aids |
| /m-ɟu-mbɛ/ | /mu-tʃu-mbɛ/ | muchumbe | member of parliament |
| /za-bu-ri/ | /ɪ-sɑ-pu-ɾi/ | isapuli | Psalms |
| /bu-ndu-ki/ | /ɪ-pu-ndu-tʃɪ/ | ipunduchi | gun |
| /ba-i-skɛ-li/ | /ɪ-pɑ-sɪ-tʃɪ-ɾi/ | ipasichili | bicycle |
| /pa-zi-a/ | /ɪ-pɑ-sɪ-ɑ/ | ipasia | curtain |
| /m-lɛ-vi/ | /mu-ɾe-fɪ/ | mulefi | drunkard |
| /ba-ra-fu/ | /ɪ-pɑ-rɑ-fu/ | iparafu | ice |
| /m-su-mɛ-nɔ/ | /mu-su-me-no/ | musumeno | saw |
| /bi-ki-ra/ | /pɪ-tʃɪ-ɾɑ/ | pichira | virgin |
| /ba-ti-za/ | /pɑ-ti-sɑ/ | patisa | to baptize |

| KISWAHILI | LWIDAKHO | | GLOSS |
|---|---|---|---|
| | IPA | ORTHOGRAPHY | |
| /m-na-da/ | /mu-nɑ-tɑ/ | munata | animal auction place |
| /bi-di-i/ | /pɪ-ti/ | pitii | diligence |
| /ʃu-kra-ni/ | /ʃu-ku-rɑ-nɪ/ | shukurani | gratitude |
| /m-na-zi/ | /mu-nɑ-sɪ/ | munasi | coconut |
| /m-su-ma-ri/ | /mu-su-mɑ-rɪ/ | musumali | nail |
| /m-fɛ-rɛ-ɟi/ | /mu-fe-rɛ-tʃɪ/ | muferechi | tap |
| /bu-ŋgɛ/ | /ɪ-pu-ŋgɛ/ | ipunge | parliament |
| /m-swa-ki/ | /mu-swɑ-tʃɪ/ | muswachi | toothbrush |
| /m-ka-ta-ba/ | /mu-kɑ-tɑ-pa/ | mukatapa | contract |
| /sa-mba-za/ | /sɑ-mbɑ-sɑ/ | sambasa | to distribute |
| /ka-ti-ba/ | /ɪ-kɑ-tɪ-pɑ/ | ikatipa | constitution |
| /si-ku-ku:/ | /ʃɪ-ku:-ku/ | shikuuku | holiday |
| /ki-pa-ndɛ/ | /ʃɪ-pɑ-ndɛ/ | shipande | identity card |
| /m-ku-ta-nɔ/ | /mu-ku-tɑ-no/ | mukutano | meeting |
| /ba-ru-ti/ | /ɪ-pɑ-ru-tɪ/ | iparuti | explosive |
| /bi-ni-ka/ | /ɪ-pɪ-nɪ-kɑ/ | ipinika | kettle |
| /ɣɔ-rɔ-fa/ | /ɪ-ko-ro-fɑ/ | ikorofa | skyscraper |

| KISWAHILI | LWIDAKHO | | GLOSS |
|---|---|---|---|
| | IPA | ORTHOGRAPHY | |
| /sɛ-ŋɛ-ŋgɛ/ | /lu-se-ɲɛ-ɲdʒɛ/ | lusenyenje | barbed wire |
| /ndɛ-gɛ/ | /ɪ-ndɛ-tʃɛ/ | indeche | aeroplane |
| /si-ga-ra/ | /ɪ-sɪ-kɑ-lɑ/ | isikala | cigarette |
| /du-ka/ | /ɾɪ-tu-kɑ/ | lituka | shop |
| /ba-ti/ | /ɾɪ-βɑ-tɪ/ | libati | iron sheet |
| /ba-ra-za/ | /ɪ-pɑ-rɑ-sɑ/ | iparasa | community meeting |
| /ki-ba-ru-a | /ʃɪ-pɑ-rwɑ/ | shiparwa | a temporary job |
| /kɔ-di-ʃa/ | /ko-te-ʃɑ/ | kotesha | to let |
| /sti-ma/ | /ɪ-sɪ-tɪ-mɑ/ | isitima | electricity |
| /ki-ɲɔ-zi/ | /ʃɪ-ɲo-sɪ/ | shinyosi | barber shop |
| /ɣa-ra-ma/ | /ɪ-kɑ-rɑ-mɑ/ | ikarama | cost |
| /ɟɛ-la/ | /ɪ-tʃe-ɾɑ/ | ichela | jail |
| /ki-ta-bu/ | /ʃɪ-tɑ-pu/ | shitapu | book |
| /kɛ-ŋgɛ-lɛ/ | /ɪ-tʃe-ɲdʒɛ-ɾɛ/ | ichenjele | bell |
| /mʃu-ma-a/ | /mu-sɪ-mɑ/ | musima | candle |
| /pɛ-ɾɛ-mɛ-ndɛ/ | /ʃɪ-mɛ-ɾɛ-me-ndɛ/ | shimeremende | sweet |
| /m-tʃɛ-lɛ/ | /mu-tʃe-ɾɛ/ | muchele | rice |

| KISWAHILI | LWIDAKHO | | GLOSS |
|---|---|---|---|
| | IPA | ORTHOGRAPHY | |
| /tʃa-ɲɟɔ/ | /ɪ-tʃa-ɲdʒo/ | ichanjo | vaccination |
| /u-la-ja/ | /βu-lɑ-jɑ/ | bulaya | abroad |
| /ma-la-ja/ | /mɑ-lɑ-jɑ/ | malaya | prostitutes |