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SCHOOL OF HUMANITIES AND SOCIAL SCIENCES

ENGLISH LOANWORDS IN KITIGANIA: A MORPHO-PHONOLOGICAL ANALYSIS ON DEGREES OF ADAPTATION

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DECLARATION

This research project is my original work and has not been presented for a degree in any other university.

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To my parents, James Kirea and Janet Ntuti; my wife, Ann, and my sister, Judith Murugi

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ABSTRACT

This study is an OT investigation of the morpho-phonology of English loanwords in Kitigania, a dialect of Kiimeru language. The subject of loanwords and adaptation is pivoted on the assumption that Kitigania has had a long time contact with the English language. This English-Kiimeru language contact can be traced back to the coming of missionaries to Kenya in the late 1890's and the subsequent colonial experience. The study therefore endeavours to: identify English loanwords in Kitigania; investigate the morpho-phonological processes in the adaptation of loanwords; and examine the extent to which the adapted loanwords deviant from the source word. Of significant interest are the phonological and morphological changes that English words undergo in order for them to be accommodated in Kitigania. On account of these, the researcher adopted purposive sampling technique in identifying four social language domains from which speech samples were recorded. Purposive sampling was instrumental in obtaining speech samples rich in loanwords. Further, purposive sampling excluded the possibility of tape recording non-native speakers of Kitigania. The loanwords that were realized from these speech samples were then counter-checked through structured interviews with competent speakers of Kitigania, who were also purposively sampled. The study confirms that Kitigania has borrowed extensively from English. Further, it established that phonological processes such as assimilation, consonant hardening and weakening, deletion, consonant substitution, epenthesis and prefixation of noun class morpheme markers constitute morpho-phonological processes responsible for the adapted English loanwords in Kitigania. The study notes that English loanwords in Kitigania constitute phonemic loans, and hence the close semblance of the adapted loanwords with the input forms. The OT analysis of the phonological and the morphological processes in the adaptation of English loanwords in Kitigania attests that OT can sufficiently account for the morpho-phonological processes in loanword adaptation in Kitigania. In addition, the findings of the study are beneficial to media practitioners in Kimeru who along their duty, are at times forced to adapt a word on the spot. The study has further enriched linguistic study of Kitigania, a dialect of Kiimeru language.

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LIST OF ABBREVIATIONS

CV - Syllable structure where a consonant is followed by a vowel

CON - Set of constraints; the universal constraint component of the Optimality Theory. The ranking of the universal CON is the only difference between languages

EVAL - Evaluator, the constraint component of Optimality Theory which selects a member of a set which is to be the actual output of the grammar

GEN - Generator, the functional component of Optimality Theory which constructs a set of candidate output forms that deviate from the input in various ways

OT - Optimality Theory

LIST OF SYMBOLS

/ /	Broad Transcription
[ ]	Narrow Transcription
→	Is realized as ….
ø	Is deleted
#____	Word Initial
_____#	Word Final
*****	Violation
☞	Optimal Candidate
!	Fatal Violation

OPERATIONAL DEFINITION OF TERMS

Adaptation - Modifications of a word in sound structure to conform to the native sound pattern

Baraza – A meeting convened to discuss day-to-day affairs of people in the same locality

Borrowing - The use of a lexical item in language A by speakers of language B

Calque – A loanword realized from word-to-word translation of the source word

Candidates – possible realizations of an input in which the optimal is chosen from

Deletion - Process whereby sounds or words are left out of spoken words or phrases

Epenthesis -The insertion of a vowel or consonant into a word to make its pronunciation easier.

Faithfulness –A constraint that requires some kind of similarity between the output form and its input

Input –The original word in the donor language before it is phonologically and morphologically modified

Lingua franca - A common language used by speakers of different languages.

Loanword - A word of one language taken into another and naturalized.

Output – The adapted word in the receiving language

Phonemic loans –A phonemically transliterated loanword

Segment - This term may be defined as any discrete unit that can be identified, either physically or auditorily, in the stream of speech

CHAPTER ONE

BACKGROUND TO THE STUDY

1.0 Introduction

This chapter serves to introduce the study and state its focus. It provides background information regarding lexical borrowing, as well as the adaptation of the borrowed words. The chapter also outlines the statement of the problem, objectives of the study, the research questions, the rationale of the study, and the scope and limitations of the study.

1.1 Background to the Study

The principal concern of this study is to analyze the morpho-phonological aspects of words which Kitigania has borrowed from English with a view to examining degrees of adaptation. According to Trask (1996) borrowing is one of the most common ways through which all languages acquire words (p. 18). For lexical borrowing to take place, Winter (1992) remarks that a contact situation between two languages must be there. Indeed, one of the implications of contact between Kitigania and English is introduction of English lexical items into Kitigania via borrowing. Dimmendaai (2011) observes that heavy lexical borrowing may result in the introduction and productive use of inflectional and derivational morphemes in receiving language (p.187). He further remarks that in most cultures, borrowing lexical items is most probable, since the lexicon of a language is more predisposed to borrowing than the grammar (p.271). The study of loanwords may fit within different fields of linguistics, such as sociolinguistics, semantics, morphology or even phonology. In investigating

the adaptation processes which apply on English loanwords in Kitigania, we hope to unearth interesting structural features of the target language.

This study adopts Fasold and Connor-Linton's (2006) definition of borrowing as the adoption of elements from another language or dialect into the target language. They note that borrowed elements are usually lexical items known as loanwords, but morphological and syntactic patterns can also be borrowed (p.294). The choice of English as donor language in this study is informed by Crystal's (2003) assertion that English has acquired the status of a 'global language' following its widespread use in communicating matters regarding technology, entertainment and politics. As such, Kitigania, just like many other languages in the world, has borrowed lexical items from the English language. Considering that loanwords are usually members of specific semantic fields, words borrowed by Kitigania from English can be viewed as occupying a semantic or stylistic gap not taken up by a native word.

As foreign words enter a language, they usually undergo various modifications in sound structure to conform to the native sound patterns. This is referred to as phonological adaptation. Adaptation processes are prompted by the differences between the donor and recipient languages, in terms of sound inventory and the syllable structure. The processes may entail sound substitutions, epenthesis and deletion. Kager (1999) observes that repairing options aim at avoiding syllable ill-formedness in the target language. According to Kager, the borrowed word must be subjected to repair options in order to match the phonotactics of the recipient language. This morpho-phonological analysis of English loanwords into Kitigania seeks to establish the integration of the said words with regard to the Kitigania phonology on one hand, and the morpheme structure on the other. Palome (1990) views morpho-phonology as simply a term which implies a link between the areas of

phonology and morphology. He notes that though the definition and status of morpho-phonology is debatable, many scholars agree that morpho-phonology is a definable interface between phonology and morphology.

Kitigania is spoken in Kenya around the volcanic Nyambene Hills in Meru North District, Meru County. It is one of the dialects of Kiimeru, the language of the Ameru people of Kenya, the north eastern Bantu group which has occupied Meru South District, Meru Central, Meru North, and Tharaka Districts of Eastern Province.

Although there have been divergent academic discourses about the various dialects of the Kiimeru language, all researchers who have studied Kiimeru agree that Kitigania is one of its dialects. Indeed, Fadiman observes:

> Before the colonial conquest in 1906, the name 'Meru' was used by only five of the present nine subgroups that make up the tribe: the Igoji, Miutine, Imenti, Tigania, and Igembe. Soon after the conquest, British administrators decided to include the peoples of Tharaka, who live east of the Meru speakers on the adjacent arid plains. In the 1920s, still other British officials added the peoples of Cuka (then spelled 'Chuka'), Muthambi, and Mwimbi, whose regions boarder the five original Meru speakers to the south (Fadiman, 2012 p.5)

Further, Nkubitu (1993) recognizes only four dialects of Kiimeru: Kiigembe, Kitigania, Kiimenti, and Kimwimbi. Kanana (2011) explores the lexical and phonological variations that exist among various dialects of Kiimeru, treating Kitigania as one of Kimeru dialects.

Guthrie (1970) classifies Kiimeru under which Kitigania falls, as zone E53. Kitigania speakers (also known as the Atigania) are majorly found around Nyambene Hills, Meru North District; particularly Tigania East and Tigania West Sub counties of Meru County. It is worth noting that there seems to be variations within Kitigania spoken by the inhabitants of these two Sub-Counties with regard to vocabulary and tone.

1.2 Kitigania Phonological Parameters

The thesis of this study is to discuss the strategies that Kitigania speakers use to accommodate English words in their vocabulary. The study discusses the phonetic and the phonotactic changes that loanwords undergo in order to be accommodated in Kitigania. In order to discuss the phonemic and phonotactic adjustments that arise from adaptation processes, the study provides a brief description of the differences between Kitigania and English segmental phonologies. This description provides the background against which the observations pertaining to adaptation processes are understood.

1.2.1 Kitigania Consonant System

While examining Kiimeru word formation processes, Taitumu (2014) discusses both the consonantal and vowel inventories of Kiimeru. The current study has drawn most of the information on phonemic inventory from Taitumu's study.

Kitigania consonant inventory comprise of 23 consonants. The pre-nasalized stops and fricatives are written as digraphs. However, they are realized as single segments. Kitigania consonants occur at onset positions of the syllable. In the presentation of Kitigania phonemic inventory, we present the grapheme, IPA symbol, sample word for each grapheme, transcription of the sample word, and the gloss. This information is tabulated as follows:

Table 1.1 Kitigania Consonant Inventory

Grapheme	IPA Symbol	Sample Word	Transcription	Gloss
B	/β/	Baara	/βa:ɾa/	Those ones
Mb	/ᵐb/	Mbaara	/mba:ɾa/	War
Sh	/ʃ/	Shiara	/ʃiaɾa/	Fingers
Nd	/ⁿd/	Nda	/nda/	Stomach
Nth	/nð/	Nthaka	/nðaka/	Young man
Th	/ð/	Thaanga	/ða:ᵑga/	Provocation
T	/t/	Ta	/ta/	Throw away
Nt	/ⁿt/	Ntaka	/ntaka/	Red
R	/ɾ/	raara	/ɾa:ɾa/	Put up
Rr	/r/	Karrakarra	/karakara/	Restlessness
L	/l/	Malila	/malila/	Tendons
Nch	/ɲc/	Nchabi	/ɲca:βĩ/	Black beans
Y	/j/	Aya	/aja/	Carry on back
Nj	/ᶮɟ/	Njara/ njuno	/ɲɟaɾa/	Hands/ Proverbs
N	/n/	Noora	/nɔ:ɾa/	Sharpen
Nk	/ᵑk/	Nkoro	/ᵑkoɾo/	Heart
Ng	/ᵑg/	Ngoroe	/ŋgoɾoɛ/	Pig
M	/m/	Maiya	/maija/	Stones
Ny	/ɲ/	Nyaara	/ɲa:ɾa/	Dry up
ng’	/ŋ/	ng’ambe	/ŋambɛ/	Cow
W	/w/	Weru	/weɾ ũ/	Light
Ch	/c/	Chaala	/ca:la/	Choose
K	/k/	Karrakarra	/karakara/	Restlessness
G	/ɣ/	Geria	/ɣɛɾia /	Try

The above Kitigania consonant inventory can be phonetically analyzed as follows:

Table 1.2 Phonetic Analysis of Kitigania Consonants

	Bi-Labial	Dental	Alveolar	Post Alveolar	Palatal	Velar	Glottal
Plosive			t		c	k	
Nasal	M		n		ɲ	ŋ	
Fricative	B	ð		ʃ		ɣ	
Liquid			l r ɾ				
Glide	W				j		
Pre-Nasal Stops	^{m}p ^{m}b		^{n}d		^{ɲ}ʄ	^{ŋ}k ^{ŋ}g	

One of the key observations here is that Kitigania consonant phonemic inventory contains several prenasalized segments. The segments are: prenasalised bilabial plosive, /^{m}b/; prenasalised alveolar plosive, /^{n}d/; prenasalized velar plosive, /ŋk/ and ᵑg; as well as the prenasalized palatal stop, /^{ɲ}ʄ/. The phonemes voiced alveolar fricative /z/ and the voiceless alveolar fricative /s/ do not occur in Kitigania. In addition, Kitigania contains a bilabial fricative /β/ which does not exist in English. These observations will be critical in our analysis of the phonological processes that result to fully integrated English loanwords in Kitigania.

1.2.2 Kitigania Vowel System

Kitigania has seven vowels. These phonemes of vowels are as follows: /a, a: ɛ, ɛː, ɪ, i, o, u,u: e, e:, ɔ ɔː/ Ki- Tigania does not have the diphthongs and triphthongs found in English language. However, the quality of length in vowels is evident in Kitigania.

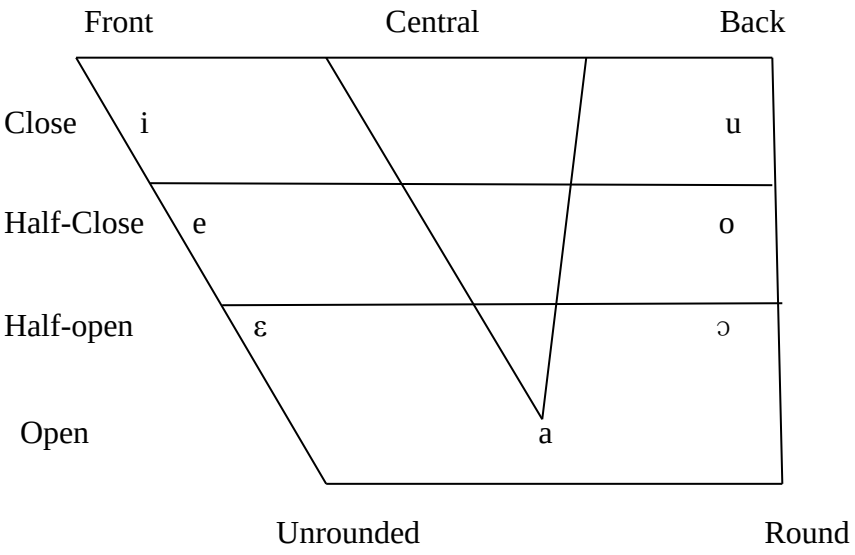
Therefore, we have long and short vowels which are distinguished in writing by doubling the vowel.

Table 1.3 Kitigania Vowel Inventory

Grapheme	IPA Symbol	Sample Word	Transcription	Gloss
A	/a/	Antũ	/anto/	People
Aa	/a:/	Aara	/a:ɭa/	There
E	/ɛ/	Enketha	/ɛŋkɛða /	Hiccup
Ee	/ɛ:/	Mũendee	/moɛⁿdɛ:/	Laxity
I	/ ɪ/	Ĩr inda	/eɭiⁿda/	Dress
Ii	/i:/	Riinda	/ɭi:ⁿda/	Ferment
O	/ɔ/	Ũrongo	/oɭɔŋgɔ/	Lies
Oo	/ɔ:/	Toonga	/tɔ:ŋga/	Touch
U	/u/	Ruũra	/ɭuoɭa/	Open
Uu	/u:/	Thuura	/ðu: ɭa/	Choose
Ĩ	/e/	Ĩtaino	/etainɔ/	Heel
Ĩĩ	/e:/	Ĩĩra	/e: ɭa/	That one
Ũ	/o/	Thaũra	/ðaoɭa/	Untie
ũ ũ	/o:/	Thũũra	/ðo: ɭa/	Get annoyed

The above Kitigania vowel inventory can be phonetically analyzed as follows:

Figure 1.1 Phonetic Description of Kitigania Vowels

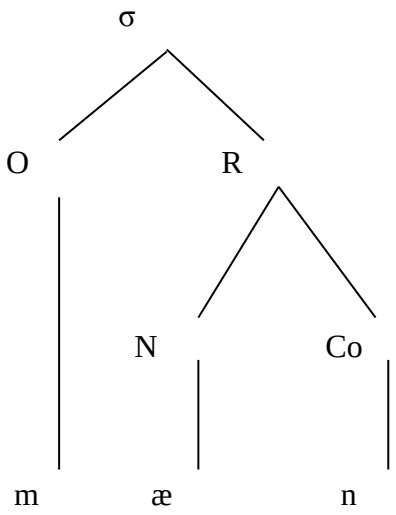


As observed in table 4.10 and 4.11, Kitigania contains two additional vowel graphemes that are not found in English. These graphemes include: Ĩ and Ũ. The two are represented by the vowel phonemes are /e/ and /o/. They replace certain diphthongs when English loanwords are adapted in Kitigania.

Adaptation of English loanwords in Kitigania involves phonotactic adjustments. It is therefore imperative to examine Kitigania syllable structure so as to account for the changes at syllable level which ensue from the adaptation process.

1.2.3 Kitigania Syllable Structure

Kitigania has simple syllable structure. The Kitigania syllable does not have complex margins. Katamba (1989) observes that a syllable has two constituents, namely the ONSET which comes at the beginning and the RHYME which follows it. This can be schematically represented as follows:



σ Syllable

O Onset

R Rhyme

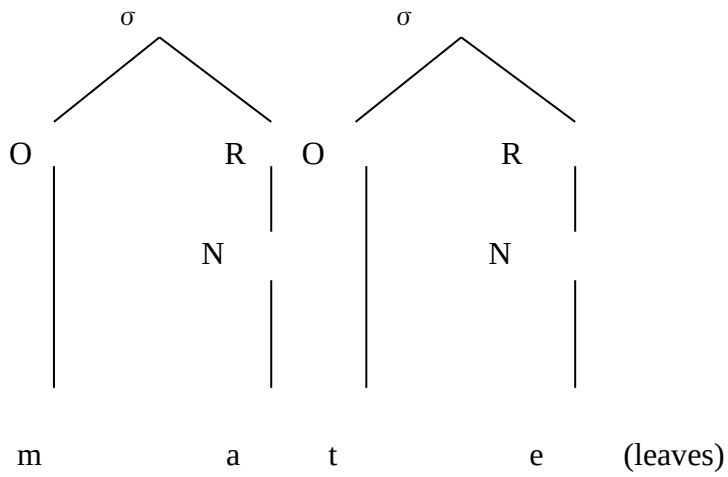
N Nucleus

Co Coda

(Katamba, 1994)

Kitigania has open syllables with no complex onsets. This can be presented as follows:

Figure 1.2 Kitigania Syllable Structure



However, Kitigania has various syllable types. For instance, it is possible to have a single vowel syllable in K-Tigania. This can be illustrated using the following examples:

V aa (here)

CV ta (throw away)

CCV Mwana (Child)

N M'Itaaru (Male Name of a Person)

Evidently, other than CCV structure that is made up strictly of consonant-glide cluster, Kitigania syllable does not have consonant clusters. Further, the syllables are open. Whereas Kitigania has a simple monophthong vowel inventory that constitutes short and long vowels, English vowel system is quite complex, with monophthongs, diphthongs and triphthongs. Vowels are distinguishable through height, front-ness or back-ness, spread or rounded as well as length.

English phonemic inventory contains some phonemes which have no equivalent in Kitigania. For instance, the obstruents /b/, /d/, /p/, and /ʤ/ are prenasalized in Kitigania. Additionally, the fricative /z/ does not exist in Kitigania. Further, English syllables may have consonant clusters as well as coda. This contrasts sharply with Kitigania syllable structure that prohibits consonant clusters as well as coda.

A morpho-phonological analysis of English loanwords in Kitigania pivots on the phonological and morphological modifications applied on the borrowed items so as to conform to the Kitigania morphological and phonological models. The modifications range from segmental alternations such as substitution, deletion, epenthesis, assimilation and so on, to suprasegmental alternations that are prompted by the constraints in the borrowing language's morpheme structure.

1.2 Statement of the Problem

The degree to which a loanword is modified can vary considerably: some loanwords are hardly changed at all and may seem quite 'foreign sounding' to native speakers of the borrowing language. Other words may be so radically modified that to the native speaker their shape is indistinguishable from that of a native word.

Whenever a word is borrowed from language A to language B, there are several possible treatments it is accorded in order to match up the phonotactics of the target language. Some of the possible treatments are: adopting the word with its foreignness with little modification; altering the structure to fit the borrowing language's phonotactics but the original word is still conceivable; and complete alteration to the extent that the original word is inconceivable.

These being the possible treatments, it would be important to investigate the specific treatment that English loanwords are accorded when they are being adopted into the Kitigania lexicon. The study investigates factors that control such phonological processes as phoneme substitution, which ensure that the adapted word maintains sufficient phonological and phonetic similarity with the foreign form. It also scrutinizes the phonological and morphological factors that condition the variation in processes targeted towards fixing ill-formed syllable structures in Kitigania.

1.3 Research Objectives

The research sought to achieve the following objectives:

1. To identify English words from various semantic fields which have been borrowed into Kitigania.
2. To investigate how English words get adapted to Kitigania.
3. To find out the extent to which English loanwords are modified once adapted into Kitigania.

1.4 Research Questions

The following were the research questions:

1. What are the English words that have been borrowed into Kitigania?
2. How are English phonemes and syllable structures adapted into Kitigania?
3. To what extent are borrowed words modified once they are adapted to Kitigania?

1.5 Research Assumptions

This study was moulded on the basis of the following research assumptions:

1. Kitigania has borrowed English words.
2. The English language has words that are phonologically and morphologically incompatible.
3. The extent to which a loanword is modified during the adaptation process varies.

1.6 Rationale for the Study

An inquiry into the morpho-phonology of English loanwords in Kitigania would be insightful to researchers who may want to study linguistic change among speakers of Kitigania. It would also add to literature on the phonological system of Kitigania. The way in which loanwords are re-shaped may reveal important details about the morphology and phonology of the recipient language, and hence help in the writing of Kitigania grammar.

Considering the scantiness of literature that deals with borrowings in Kitigania, this exploration of the morpho-phonological processes which are at play in the adaptation of English loanwords in Kitigania is anticipated to provide a linguistic judgment of general phonological and morphological changes that describe the underlying phonological representations. Further, the analysis might be crucial in establishing rules against which predictions can be made as to whether the target language would adopt a foreign segment, substitute it or even delete it considering given circumstances. This would particularly be beneficial to media practitioners in Kiimeru who along their duty are sometimes forced to adapt a word on the spot.

In addition, the study could also be an important documentation of Kitigania morpho-phonology which has not enjoyed much attention from linguistic researchers.

1.7 Scope and Limitations of the Study

The study was limited to the morpho-phonological analysis of English loanwords in Kitigania, a dialect of Kiimeru, the language of the Ameru people. The researcher sought to describe the rules that determine segmental and phonotactic adaptation of loanwords.

For the purposes of this study, a corpus of English loanwords extracted from spontaneous speech of Kitigania speakers from Tigania East Sub-County of Meru County was analyzed. The choice of this area was critical since this region is regarded as the homeland of Kitigania speakers in Kenya. Therefore, it provided an optimal site for collecting English loanwords in Kitigania. The preference of English as donor language was motivated by the fact that English differs from Kitigania sharply both in phonotactics and segmental inventory, hence the need for adaptation.

The study fits within the confines of morpho-phonology; a field of study in linguistics which relates the domains of morphology and phonology. The researcher explored both the segmental and the phonotactic adaptation processes with the hope that the phonological and morphological processes appreciated would be instrumental in the understanding of the Kitigania phonology.

Loanwords undergo prosodic changes on introduction to the recipient language, as well as semantic alterations from the borrowing process. However, both the supra-segments and the semantic changes which ensue from the borrowing processes were deemed to fall outside the scope of this study.

Given that some Kitigania speakers are bilingual, and that there exists the sub-dialects of Kitigania, the researcher anticipated challenges regarding variation in

pronunciation of borrowed items. However, the use of multiple respondents was essential in overcoming this challenge.

In order to account for the processes used in resolving foreign syllable structures that are unacceptable in Kitigania, as well as explain other phonological and morphological processes evident in loanword adaptation, the study was limited to the tenets of Optimality Theory (OT). Optimality Theory hypothesizes that resolutions of conflict between competing constraints are reflected in the surface forms of a language. According to Kager (1999), the optimal forms are a consequence of sustaining the least serious violations in a given set of constraint.

1.8 Chapter Summary

This chapter has put the study in context by outlining its background, the statement of the problem, the research questions, objectives and assumptions. The phonological parameters of Kitigania which establishes the background against which adaptation is investigated has also been discussed. Further, the chapter has presented the rationale of the study as well as the scope and limitations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE AND THEORETICAL FRAMEWORK

2.0 Introduction

This section constitutes two parts: literature review and theoretical framework. The literature review section explores literature that is directly related to the focus of our study, while theoretical framework discusses Optimality Theory against which the data of this study is analyzed. The reviewed research works on the phonology and morphology of the dialects of Kiimeru language offers insight on the morpho-phonology of Kitigania and further puts in context the contribution of previous studies and the existing gaps filled by this study.

2.1 Review of Related Literature

There is substantial scientific work done on Kiimeru language by various scholars. These works range from simple description of Kiimeru, sociolinguistic variation between various dialects, to critical examination of morphological aspects of Kiimeru. Although, literature that deals in-depth in borrowings in Kitigania is scanty, these studies are relevant to this research. Besides other dialects of Kiimeru that have been studied, Bantu languages which bear close semblance with Kitigania such as Gikuyu and Kitharaka provide valuable phonological and morphological insights to our study.

Considering that borrowing is a consequence of language contact, the review of literature related to this study is divided into two: literature on the contact between Kitigania and English, and linguistic analysis of Kiimeru and other related Bantu languages.

2.1.1 Kitigania Contact with English

The focus of this study is to analyze the morpho-phonology of words Kitigania has borrowed from English. However, the phenomenon of Kitigania speakers borrowing lexical items from English is founded on the contact between Kitigania and English. Fadiman (2012 p.128) observes that the first white man to settle among the Ameru was William Astor Chanler, an American in 1892. However, he observes:

> The first appearance of Achunku ("red" men, i.e. Europeans) in the Meru regions caused smoldering conflict between elders and warriors to burst into full flame. The whites first came as guests and later leaders of the Kamba, Swahili, Somali or Zanzibar-Arab caravans that habitually journeyed to Mount Kenya every dry season, exchanging cloth, trinklets, and coastal bead for tusks, honey, and sufficient goats and grain to feed their porters (Fadiman, 2012 p.127)

Though Fadiman describes this encounter between the Ameru and the British as tense, English was thereafter adopted not only as the medium of instruction throughout the education system, but also the official language in the country. This establishes the contact of Kitigania with English which has prompted borrowing of lexical items by Kitigania speakers from English.

Thomason (2001) observes that borrowing is one of the indicators that one language has had influence on another in a contact situation. While giving examples of languages of sacred books as well as other writings connected with major religions, Thomason (2001 p.2) notes that co-existence of speakers of two (or more) languages is not a prerequisite condition for language contact to occur. Indeed, she attributes the spread of Latin and New Testament Greek to Christianity. Certainly, the British colonial experience in Kenya and subsequent introduction of Christianity by the British missionaries is the genesis of the language contact situation between Kitigania and English.

Our analysis of English words loaned to Kitigania is validated by this contact situation. Trask (1996 p.20) observes that the prestige that the English language has acquired wordwide has enabled it to chiefly become a donor language. According to Andrews (1999 p.41), speaking English is regarded as a status symbol among most of the youth in the world today. These observations attest to the inevitability of Kitigania borrowing from the English language.

2.1.2 Linguistic Studies of Kiimeru and Other Related Languages

Kanana (2011) examines the linguistic features of six dialects of Kiimeru language; Chuka, Imenti, Muthambi, Igoji, Mwimbi and Tharaka, and argues that dialectical boundaries are a result of certain phonetic-phonological and morphological aspects. Considering that adaptation of loanwords involve mapping the phonemes of the donor language to the phonemes of the recipient language, her discussion on the phonological variations is beneficial to this study since it sheds more light on the phonemic inventory of the Kitigania dialect.

Gacunku (2005) examines phonological irregularity and variation in Kiimeru nominal concordial system. She provides a thorough discussion of Kimeru phonological processes. She observes that Kiimeru has a CV structure and the other realizations such as V, VV, or VCV are consequences of historical phonological process. Although she discusses the Kiimeru syllable structure, she does not delve into the phonological and morphological processes in loanword adaptation, which forms the core of our study. However, her observations on the Kiimeru syllable structure provided significant insight into Kiimeru phonology and morphology which is vital in our discussion on morphological adjustments that apply to the English words once they are adapted into Kitigania.

Marete's (1981) work on grammatical agreement in Kimeru syntax was relevant to this study. Although his work is basically a syntactic analysis, he provides insights into the phonological processes that act on the forms of agreement morphemes, changing their phonetic shapes. In deed, Marete argues that prenasalisation is prevalent in Kimeru, and he goes further to identify the prenasalized stops in Kimeru. Further, Iribe (2011) discusses hormoganic nasal assimilation (also known as prenasalization) as a phonological process in Bantu languages. Notably, none of them discusses the productivity of this phonological process in loanword adaptation, particularly in Kitigania. However, here observations were valuable to this study as they offered a basis for a discussion on the morpho-phonological analysis of morpheme insertions in words Kitigania has borrowed from English.

Studies that closely resemble our work were done by Waitera (2014) and Ndambuki (2013). Waitera examines the morphophonological changes in borrowed words from English to Lubukusu, using Natural Generative phonology (NGP). On the other hand, Ndambuki examines nativisation of English loanwords into Kikamba using OT. Much as the two scholars have investigated English loanwords in Lugha and Kikamba, the two languages differ from Kitigania, a dialect if Kiimeru, both in phonemic inventory and morphological processes. However, there works provided insights into adaptation processes.

Taitumu (2014) discusses word formation processes from Osiomalogical Approach. Just as in other Proto Bantu languages where there exists regular association of pairs to show singular plural dichotomy in nouns, Taitumu notes that Kiimeru noun class 7/8 has the prefixed class morpheme {e/ge} in singular and {i} in plural. This prefixation of noun class marker is a morphological process that allows nouns to fit in their respective noun classes. Taitumu does not; however, discuss the loanwords

neither does he examine the phonological changes that condition the noun class marker morphemes. This study investigates the prefixation of noun class markers evident in some English loanwords as a morpho-phonological process, using OT. Indeed, such prefixation triggers other phonological processes which this study examines.

In her investigation of the impact of morphological adaptation processes, Karuru (2013) observes that borrowed words appear as similar as possible to the source words while at the same time adopting the morphology of the recipient language. Among other morphological processes, she discusses prefixation and substitution as strategies that the Kikuyu language applies in making words borrowed from Kiswahili and English easy to use in Gi-Gichugu. She remarks that replacement of the English initial syllables with new syllables aligns the borrowed words with the lexicon of the Gi-Gichugu. Her study however does not cover the phonological aspect of borrowing, neither does it apply OT in the analysis of data, which our study does. Nonetheless, her findings were crucial in analyzing morphological modification of English loanwords in Kitigania given that both Gikuyu and Kiimeru are Bantu languages.

Ngure (2005) examines the loss of prenasalization in the northern and southern varieties of Gikuyu. He notes that the fact that English and Kiswahili are compulsory subjects in the Kenyan education system might have contributed to the emergence of a nasal feature deletion-rule, which affects the nasals preceding the voiced oral stops. His findings were insightful in accounting for variations in the adapted forms.

While investigating English loanwords in Gikuyu, Mwihaki (2001) observes that the phonological properties of the English language are substituted by equivalent elements in Gikuyu in the course of phonological adaptation. Her findings fall in line

with Kaye and Nykiel (1979) who argue that loanwords are adapted phonologically to meet certain constraints on possible words or morphemes imposed on them by the target language. Mwihaki offers an in-depth analysis of phonological and morphological analysis of words borrowed from English to Gikuyu. However, Gikuyu and Kiimeru differs phonologically and morphologically, and it would be vital to examine adaptation of English loanwords in Kiitigania as well. As such, her work was a resourceful basis for our analysis.

2.2 Theoretical Framework

The data collected in this study was analyzed using the tenets of Optimality Theory (OT) as developed by Prince and Smolensky (1993) and later amended by Kager (1999). OT is founded on the premise that Universal Grammar is a set of constraints which are ranked according to their degrees of violability. OT stipulates that what makes natural languages different can be explained from the perspective of the different ranking which the universal constraints are given in different languages.

There are three key properties of OT (Prince and Smolensky, 1993; Kager, 1999) which address the concept of mapping input structures to output structures. These are:

a) GEN (the operational component) which is responsible for taking an input and generating a set of output forms that deviate from input in various ways
b) CON (the universal constraint component) which consist of two types of constraints/ markedness and faithfulness constraints; and provide criteria for deciding between candidates generated by GEN
c) EVAL which contains the constraint hierarchy in particular language and chooses the output candidate which has incurred least violations of the constraints

In view of these properties, the process of mapping input to output therefore entailed GEN receiving an input and producing a group of candidates. These candidates are then evaluated by EVAL against language- specific constraints. Kartunnen (1998) in The Treatment of Optimality in Computational Linguistics argues that GEN is most likely a regular relation and that many if not all Optimality Theory constraints represent regular languages. The optimal candidate is identified on the account of violating the least number of constraints. This can be illustrated by taking two candidates; P and Q. Among the candidate set that is generated by GEN, candidate Q is optimal if it incurs fewer violations of constraints that occur higher in the constraint hierarchy of a given language.

The markedness and faithfulness constraints in CON are typically in opposition. The conflict arise from the fact that markedness constraints require that the output form should satisfy all the requirements of a well-formed word in the target language, while faithfulness constraints require that the output form should bear a close resemblance to input. This opposition in markedness and faithfulness constraints creates tension. In order to resolve this tension, the constraints in are ranked. Taking two candidates X and Y, for instance, violation of a lower ranked constraint by a candidate X is considered less serious than violation of a higher ranked constraint by candidate Y. The notion of the seriousness of violation is established on the principle of ranking, and the best possible output candidate from the set presented is reached by assessing the seriousness of the violations incurred.

In OT analysis, the constraints are presented schematically as follows:

CANDIDATE SET	CONSTRAINT 1	CONSTRAINT 2	CONSTRAINT 3	CONSTRAINT 4
☞a.CANDIDATE A				
b.CANDIDATE B				
c.CANDIDATE C				

Tableau 1: Schematic Presentation of Feature Constraints in OT

Tableau 1 illustrates analysis of data in OT. Candidates are listed down the left most column as candidate A, candidate B and candidate C, while the constraints are listed across the top row as constraint 1, constraint 2, constraint 3, and constraint 4. Domination of the constraints is shown on the left-to-right order. Violation of a constraint is shown by *, while satisfaction of a constraint is shown by a blank cell. Fatal violation of a constraint is shown by a '!' and the most harmonic candidate is indicated using a pointing finger, ☞.

In our analysis, the choice of the optimal candidate among those presented in the candidate set depends on how Kitigania ranks the universal constraints. Hence, the analysis involves formulation of markedness constraints such as prohibition of consonant clusters at word initials as well as prohibition of codas, and ranking them using the data collected. The study provides a logical elucidation of how Kitigania open syllable structure overcomes the closed syllable structure of donor language during the adaptation process. Optimality Theory argues that every grammar can handle every possible input. Indeed, Chacha (2009) has discussed interaction of two different rankings of constraints, NOCODA (also *CODA) and ONSET, in Arabic borrowings in Kiswahili, a Bantu language. Given that Kimeru is also a Bantu language; the two constraints are significant in our analysis of the syllable structure of

the English loanwords in Kitigania. According to McCarthy and Prince (1994), NOCODA is one of the markedness constraints and it forbids syllables from ending in consonants. As such, any English word getting to Kitigania goes through GEN to generate several candidates with different phonological realizations. The choice of the optimal candidate involves interaction of the markedness and faithfulness constraints such as DEP-IO. In OT analysis, epenthesis is important since it achieves two markedness constraints: *COMPLEX and NOCODA. *COMPLEX prohibits consonant clusters, while NOCODA promotes open syllables. While satisfying these markedness constraints, the faithfulness constraint that prohibits epenthesis of segments, DEP-IO, is violated.

There are various phonological processes that come into play in the adaptation of English loanwords in Kitigania. One such process is vowel epenthesis. For instance, adaptation of the English loanword “shirt” to Kitigania “shaati” /ʃaːtɪ/, involves satisfying the markedness constraint NOCODA, which requires that syllables be open, and a violation of the faithfulness constraint, DEP-IO, which is violated by vowel epenthesis. OT presentation of this process is presented in tableau form as:

Input: Shirt

Output: Shaati /ʃaːtɪ/

Tableau 1.1 OT Analysis of Data

CANDIDATE	NOCODA	MAX-IO	DEP-IO
☞ a. ʃa:.tɪ			*
b. ʃa:t.ɪ	*!		*
c. ʃa:t	*!		

From the tableau above, the constraint of NOCODA ranks higher than MAX-IO (no consonant deletion) and DEP-IO (no epenthesis). The domination of NOCODA is suggested in the tableau by virtue of coming before MAX-IO and DEP-IO; the supremacy of constraints is from left to right. The choice of optimal candidate (a) is based on the ranking argument: *CODA >> MAX-IO, DEP-IO. Violation of constraint is indicated by violation mark (*) and a pointing finger indicates the optimal candidate.

The concept of adaptation arises from the discrepancies in phoneme inventory in Kitigania and English, as well as the fact that English orders its constraints differently from Kitigania. Therefore, English loanwords have to undergo phonological adjustments in order to be accommodated in the phonology of Kitigania. These phonological adjustments include phoneme substitutions, consonant deletions, consonant hardening and weakening; and cluster simplification or insertion. OT demonstrates how the input (borrowed word) is mapped onto an output (the winning adapted loanword) in its production, and explains why certain adapted forms are chosen over others.

In our analysis, we have discussed the interaction of the following markedness and faithfulness constraints in realizing fully integrated loanwords:

2.21 ONSET = Syllables must have onsets

2.22 NOCODA (*CODA) = Syllables are open

2.23 ∗COMPLEX = No complex syllable margins

2.24 *P = Assign one violation for voiceless bilabial plosive [p]

2.25 *OBS VOI = Voiced obstruent are prohibited

2.26 *GLOTTAL = Assign one violation mark for every glottal segment

2.27 DEP-IO = Output segments must have input correspondents (No epenthesis)

2.28 MAX-IO = Input segments must have output correspondents (No deletion)

2.29 IDENT $_{[FEATURE]}$ = Input consonants must keep the same features in their output correspondents

(Prince & Smolensky, 1993/2004; Kager, 1999; McCarthy 2002, 2004)

The constraints numbered 2.21- 2.26 are markedness constraints while 2.27 – 2.29 gives the faithfulness constraints. In OT analysis of English loanwords in Kitigania, these constraints can be ranked as:

*CODA, *COMPLEX, *OBSVOI, >> MAX-IO, DEP-IO >> IDENT $_{[FEATURE]}$ >> ONSET

Other markedness constraints such as *GLOTTAL, *P, EDGEMOST [L, e] and *LATERAL may be introduced to handle various phonological and morphological processes in loanword adaptation.

2.3 Chapter Summary

A review of literature related to this study has been presented in this chapter. We have cited works by various scholars on the linguistic study of Kiimeru and other related languages. By examining how their works compare with the present study, the chapter presents a research gap which the study seeks to fill. In addition, the chapter discusses the theoretical framework that this work is hinged on. The tenets of Optimality Theory and how they will apply the analysis of our data is examined in this chapter.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter outlines the research design, the target population, the sample and sampling techniques, as well as the data collection methods. Ethical considerations made by the researcher, have also been discussed in this chapter.

3.1 Research Design

This study took a descriptive design. Given that the focus of our study is analysis of the morphological and phonological processes involved in the adaptation of English loanwords into Kitigania, the researcher set out to hypothesize on the phenomenon of borrowing and loanword adaptation before describing the actual adaptation processes. Selinger and Shohamy (2013) observe that descriptive design is suitable in investigating an aspect of a language without manipulating its natural occurrence. To this end, the descriptive design enabled the researcher to focus on the phenomenon of lexical borrowing, as it occurs in Kitigania, to the exclusion of all other linguistic motivations of borrowing, before discussing the processes of adaptation of the borrowed items.

3.2 Location of the Study

This study was carried out in Tigania East Sub-County. The data for analysis was limited to Kitigania spoken in Mucii Mikuru, Mikinduri, Kigucwa, Athwana, Thangatha and Ametho locations of Tigania East Sub-County. The choice of this area

was suitable taking into account that most of the residents of Tigania East Sub-County, from whom the researcher enlisted respondents, are native speakers of Kitigania. As such, the phonological variation in the integrated loanword was low. In addition, the study area is occupied by a linguistically homogeneous population. Hence, it was most favorable for obtaining suitable speech samples containing loanwords which are fully integrated into Kitigania.

3.3 Target Population

The population from which the sample was derived comprised male and female native speakers of Kitigania. They were drawn from different social, educational, religious and professional backgrounds. Andersen (2001) observes that significant growth occurs in many aspects of language during adolescence (p.5). In this study, only respondents who were above eighteen years were enlisted. By choosing respondents who were above eighteen years of age, the researcher presupposed that their speech would have fully developed (Andersen, 2001). Consequently, speech samples were obtained from the adult participants.

3.4 Sample and Sampling Techniques

The study adopted the purposive sampling technique to identify four semantic domains from which speech samples were obtained. These domains were: religion, trade, agriculture and technology. The researcher presupposed that these semantic domains would provide considerable number of English loanwords. Consequently, two participants in each domain were purposefully selected for observation. A total of eight (8) participants were selected. These participants comprised dealers in second-hand clothes, sellers of phones and other electronics, traders in green vegetables,

preachers and facilitators in farmer education workshops. Their transactions were tape-recorded inoder to obtain samples of their speech.

Besides participant-observation, purposive sampling was used to identify twenty four (24) informants, who took part in informal interviews. This number comprised both male and female native speakers of Kitigania. The researcher used purposeful sampling to select informants who had the required information.

3.5 Data Collection

The principal data for this study consists of English loanwords in Kitigania. The researcher anticipated to collect and analyze eighty (80) loanwords. However, a total of one hundred and twenty four (124) loanwords were collected. Out of this number, only sixty (67) loanwords were selected for analysis. The selected loanwords adequately illustrated the phonetic and the phonotactic processes evident in adaptation of English loanwords in Kitigania. Including the other thirteen loanwords in our analysis, to make the anticipated figure of eighty loanwords, would only have overstated the observations made in our investigation. The following table gives a sample of the loanwords analyzed in our study:

Table 3.1: Sample Loanwords

LOANWORD	**GLOSS**
Shukuru /ʃukuru/	School
Rura /ɾuɾa/	Ruler
Yunibachĩtĩ / junıβacete/	University
Raaba (ɾaβa)	Rubber (Eraser)
Mbasi /ᵐbası /	Bus
Njeti /ɲɟɛːtı/	Jet
Ngea /ᵑgea/	Gear
Ndichũrũ /ndıcɔɾɔ/	Diesel
Turera /tuɾɛɾa/	Trailer
Mbisha /ᵐbıʃa/	Picture
Karabati /kaɾaβatı/	Culvert
Mburiiki /ᵐbuɾekı/	Brake
mũrĩngĩti /moɾeŋgetı/	Blanket
Shiiti /ʃiːtı/	Sheets (Bed Sheets)
Chikaati /cıkaːtı/	Skirt
Igoti /eɤɔtı/	Coat
Shaati /ʃaːtı/	Shirt
Chitubu /cıtɔβu/	Stove
Turee /tuɾɛː/	Tray
Njagi /ɲɟaɤı/	Jug
Ĩtangi /etaŋgı/	Tank
Eneri /ɛnɛɾi	Henry
Ũtĩri /oteɾı/	Hotel

This data was obtained using two procedures, namely: participant-observation and structured interviews.

3.5.1 Participant-Observation

The researcher visited two second-hand clothes markets, two green vegetable markets, two electronic shops, two churches and one farmer-education workshop in the research area. The churches were selected on the basis of denomination; one protestant denomination and the mainstream. In each of these settings, the researcher collected loanwords by listening and tape-reording what was said in each setting. This way, loanwords that pertain to trade, dressing, technology, religion and agriculture were collected.

A total of nine speech samples were realized, and forty five (45) loanwords obtained. The speech samples constituted sermons of Kitigania-speaking preachers; buyer-seller transactions in electronics shops, fresh-vegetable markets and mitumba (second-hand clothes) markets; and facilitators in farmer-education workshop. Apart from the sermons, where each lasted thirty minutes, other tape-recorded speech samples lasted about five minutes. The recorded speech samples were later played and the loanwords were identified and transcribed. The researcher's intuition was key in identifying the loanwords in these speech samples.

The audio record ensured quality in the transcription of the loanwords since it could be replayed for the researcher to get the accurate pronunciation of the loanword.

3.5.2 Structured Interviews

In order to maximize data for analysis, the researcher also enlisted four purposefully sampled informants from each of the six villages visited in the research area, name; Mucii Mikuru, Mikinduri, Kigucwa, Athwana, Thangatha and Ametho. A total of twenty four (24) informants were chosen. The informants were asked questions on different areas of life such as dressing, education, religion, technology and agriculture

with a view of extracting loanwords. Through these interviews, seventy eight (78) more loanwords were realized.

Interviews were beneficial to the study since their use facilitated collection of data from respondents who could not read or write. In addition, they provide space for the respondents to explain themselves, and the researcher to seek clarification in cases where variation in pronunciation was noted.

3.6 Data Presentation and Analysis

The data consisted of phonemic loans only. This was first noted while piloting the tools for data collection, and later confirmed by the data realized from the field. Our early realization that Kitigania does not have calque loans motivated us to collect loanwords across the age, gender and education variables. The loanwords collected were transcribed on paper, glossed and presented in frequency tables. In order to describe the phonological and morphological structure of English words in their native phonology, as well as their realizations after they are borrowed and adapted into Kitigania, phonemic transcription was used. After transcription, loanwords were classified according to the phonological processes that result into the adapted lexical items in Kitigania.

In order to account for the morpho-phonological adjustment of the loanword, the study analyzed the phonological and morphological derivation of the loanword against the principles of Optimality Theory framework using tableaus. Taking English words as the input, OT evaluated several candidates against given constraint hierarchies with the aim of identifying the optimal candidates. The morpho-phonological factors responsible for the observed distribution of phonemes in the adapted loanwords, as well as phonotatic adjustments that ensue are discussed.

A summary of the phonological and morphological changes that loanwords undergo in order to be incorporated in Kitigania is presented in tables. Finally, conclusions are made.

3.7 Ethical Considerations

Throughout the study period, the researcher adhered to research ethics. First, the researcher obtained an authorization letter and a permit from National Commission for Science Technology and Innovation (NACOSTI) allowing him to carry out the research. Secondly, the study ensured voluntary participation of respondents. The respondents were briefed on the nature of the research and how the findings would be handled once the research is completed. Unless the participants authorized disclosure of their identity, the identity of individuals from whom the data was obtained is kept strictly anonymous. In addition, data that was collected through observation was tape recorded with the consent of the participants and was only used for purposes of this study.

3.8 Chapter Summary

This chapter has discussed the methodology used in the collection and analysis of the data. It highlights the research area, research population, sample and sample size, data collection instruments and how the data was presented and analyzed. In addition, the ethical considerations that were made in data collection are presented.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.0 Introduction

This chapter presents the data, the analysis of the data and interpretation. With regard to the research objectives, it comprises two sections. The first section discusses the OT analysis of the adaptation processes, while the second section explores the variability of adapted loanwords from their input forms in a bid to determine the degrees of adaptation.

4.1 Loanword Adaptation

English phonemic inventory contains a number of segments that can be mapped directly into Kitigania's. These segments are similar to those of Kitigania with regard to places and manner of articulation. However, Kitigania consonant inventory contains digraphs, while English consonantal inventory comprise of mono-segmental segments only. From the data collected, we established four phonemic gaps. These gaps arise from the fact that Kitigania contains segments that have no equivalent in English. These gaps include the voiced bilabial plosive /b/; the voiced alveolar stop /d/, the voiced alveolar fricative /z/, voiceless alveolar fricative /s/ and the voiced labio- dental fricative /v/. Kitigania replaces these foreign English segments with phonetically similar segments, as exemplified in the following examples:

Bank → Mbanki /^{m}baŋki/

Culvert →Karabati /kaɾaβati/

Fertili**ze**r →Bataraicha /βataɾaica/

The deviations in phoneme output in the adaptation of English loanwords in Kitigania involve contrasts in place and manner of articulation and voicing. In our study, we did not consider the feature of aspiration because aspiration in Kitigania is a matter of the speaker's emotional state, and does not introduce any phonemic contrast. As earlier observed, some of the phonemes in loanword are not found in the source language. However, those that are not found in Kitigania are replaced by their closest counterparts in Kitigania.

Manner features such as [consonantal], [sonorant], [strident], [continuant], [nasal] and [lateral]; place features of [labial], [coronal] and [dorsal]; and the [voice] features are important in phoneme substitution process evident in the adaptation of loanwords. These features can be analyzed as follows:

i. Manner [+/- son] (sonorant) [+/- strid] (strident) [+/- cont] (continuant)
[+/- nas] (nasal) [+/- lat] (lateral)

ii. Place [+/- labial] [+/- coronal] [+/- dorsal]

iii. Voicing [+/- voiced]

The idea of close phonemes in phoneme mapping involves such parameters as place and manner of articulation, as well as voice. In general, this study adopts the following ranking argument in the analysis of the phonetic adaptation of the loanwords:

*CODA, *OBSVOI, *SEGMENT, *FEATURE >> MAX-IO, DEP-IO >>IDENT $_{[FEATURE]}$ >> *COMPLEX, ONSET

There are various phonological and morphological processes that come into play in the adaptation of English loanwords in Kitigania. These include assimilation, consonant hardening and weakening; deletion, epenthesis, and prefixation of noun class morphemes, as discussed below:

4.1.1 Assimilation

(a) Homorganic Nasal Assimilation

Hormoganicity is a common phonological phenomenon in Bantu languages. It is a form of regressive assimilation where a nasal is assimilated to the obstruent that follows it. Mberia (2002) contends that the nasal /n/ has four surface variants which he identifies as /n/, /m/, /ŋ/ and /ɲ/. The choice of one instead of the other is determined by the place of articulation of the obstruent that comes after it. Mberia (2002) sees the selection of these variants as a case of harmonizing the point of articulation of the nasal consonant with the obstruent following it.

Hormoganic nasal assimilation is exemplified in the adaptation of /b/, /p/, /d/ and /ɡ/. These phonemes are not found in the inventory of Kitigania. What exist are the prenasalised stops, /^{m}b/, /^{n}d/, /^{m}p/ and /^{ŋ}ɡ/. The occurrence of prenasalised stops can be represented in the following rules:

i) /b/ → [^{m}b]

$$\begin{bmatrix} -\text{Cont} \\ +\text{Lab} \\ +\text{Voice} \\ -\text{Nas} \end{bmatrix} \longrightarrow \begin{bmatrix} -\text{Cont} \\ +\text{Lab} \\ +\text{Nasal} \\ +\text{Voice} \end{bmatrix} \; / \; \underline{\quad} \; \begin{bmatrix} -\text{Cons} \end{bmatrix}$$

The voiced bilabial plosive /b/ does not exist in Kitigania. What exists in Kitigania is the voiced bilabial fricative /β/. English loanwords containing the voiced bilabial plosive /b/ is either pre-nasalized as /^{m}b/ or substituted by voiced bilabial fricative /β/. It is normally pre-nasalized when it occurs at word initial positions. However, when it is used as a syllable onset in any other position of a word, it is realized as /β/ as shown in the following examples:

Rubber (Eraser) → Raba /ɾaβa/

The deviation of the output from the input can be accounted for in OT using features such as place, voicing and manner. For instance,

Input: Bus /bʌ **s/**

Output: Mbaachi **[**^{m}baːcɪ**]**

The output, prenasalised bilabial plosive /^{m}b/, deviates from the input /b/ in manner of articulation features, IDENT (manner). The output therefore must satisfy the markedness constraint *OBSVOI, as well as the faithfulness constraints IDENT $_{[NAS]}$ and IDENT $_{[LAB]}$.

The constraints can therefore be ordered as follows:

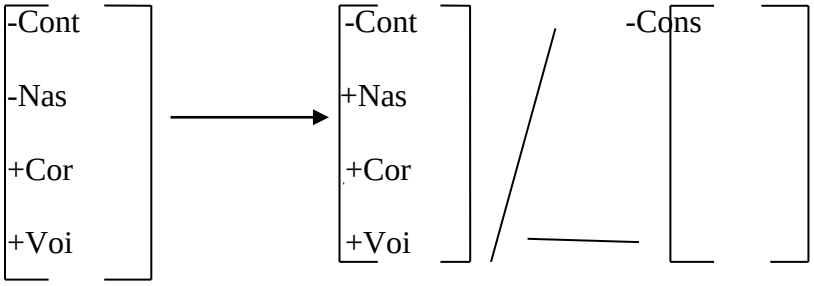
*CODA, *OBSVOI >> MAX-IO >> IDENT $_{[LAB]}$, IDENT $_{[VOI]}$, IDENT $_{[NAS]}$

Tableau 2: /b/ → [ᵐb]

/bʌ **s**/	*CODA	*OBSVOI	MAX-IO	IDENT[LAB]	IDENT[NAS]	IDENT [VOI]
☞a.[ᵐba:.cɪ]					*	
b. [a:.cɪ]			*!			
c. [ba:.cɪ]		*!				
d.[ⁿda:.c]	*!			*	*	
e. [bʌ **s**]	*!	*				

The output phoneme [ᵐb] results from the interaction of markedness constraint * OBSVOI which prohibits occurrence of voiced obstruent [b] and the faithfulness constraints IDENT [NAS] and IDENT [LAB]. Candidate (a) wins against the other candidates generated by GEN because it does not violate markedness constraints, *CODA and * OBSVOI.

ii) /d/ → [ⁿd]



The voiced alveolar stop /d/ is pre-nasalized when it occurs as syllable onset, irrespective of the position of the syllable in a word, as exemplified in the following examples:

Card → Kaandi /ka:ⁿdɪ/

Diesel → Ndichũrũ /ⁿdɪcɔɾ ɔ/

The place and voicing features, IDENT-IO (place) and IDENT-IO (voicing), remain unchanged in the adaptation of /d/. Again, the interaction of the markedness constraint *OBSVOI which penalizes occurrence of /d/ and the faithfulness constraints IDENT $_{[NAS]}$ and IDENT $_{[COR]}$ gives the harmonic segment [^{n}d].

The ranking of the constraints can therefore be set as:

*CODA, *OBSVOI >> MAX-IO >> IDENT $_{[NAS]}$, IDENT $_{[COR]}$

From this ranking argument, the optimal candidate must retain the place and voice features of the input phoneme, as illustrated in tableau 3:

Input: Deal /di:l/

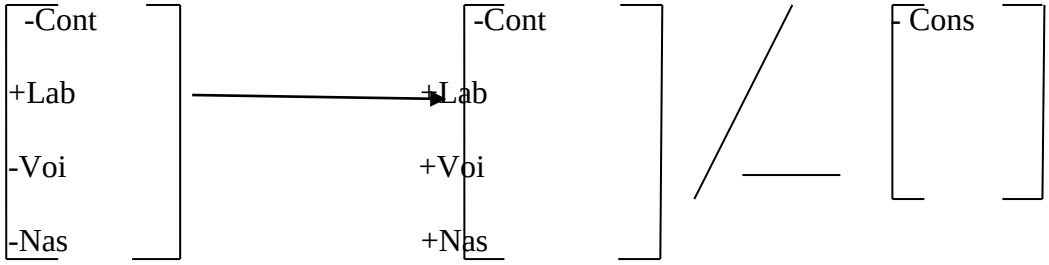
Output: Ndiiru [^{n}di:ɾɔ]

Tableau 3: /d/ → [^{n}d]

/di:l/	*CODA	*LATERAL	*OBSVOI	MAX-IO	IDENT[$_{NAS}$]	IDENT$_{[COR]}$
☞a.[**^{n}di**: ɾ ɔ]						
b.[**di**:ɾ ɔ]			*!			
c.[**i**: ɾ ɔ]				*!		*
d. [di:l]	*!	*	*			

The output form [^{n}d] deviates from the input form /d/ in manner features, IDENT (manner). The winning candidate must therefore satisfy the faithfulness constraints IDENT $_{[NAS]}$ and IDENT $_{[COR]}$. Candidate (b) and (d) are disqualified due to the fatal violations (*!) of the markedness constraints. As such, candidate (a) surfaces as optimal because it satisfies the markedness and faithfulness constraints that define a well-formed phoneme in the adaptation of /d/.

iii) /p/ → [^{m}p]



As observed in the adaptation of /b/, the voiceless bilabial plosive /p/ is also pre-nasalized when it occurs as a syllable onset, irrespective of the position of the syllable in a word. Given that the input /p/ is voiceless, a constraint that prohibits occurrence of /p/, *P, is necessary. The output form [^{m}p] deviates from the input /p/ in manner features and the ranking of constraints is set as:

NOCODA, *OBSVOI, *P >> MAX-IO >> IDENT $_{[NAS]}$, IDENT $_{[LAB]}$, IDENT $_{[VOI]}$

Input: Pump /pʌmp/

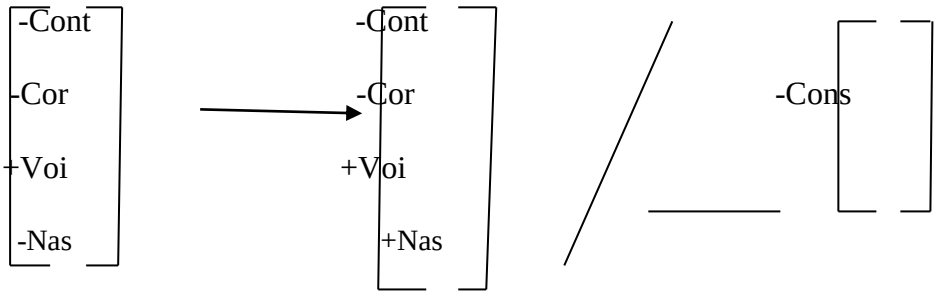
Output: Mpoompo /^{m}pɔ:^{m}pɔ/

Tableau 4: /p/ → [^{m}p]

/pʌmp/	*CODA	*OBSVOI	*P	MAX-IO	IDENT [NAS]	IDENT [LAB]	IDENT [VOI]
☞a.[^{m}pɔ:.^{m}pɔ]					*		
b.[pɔ:^{m}pɔ]			*!				
c.[bɔ:.bɔ]		*!			*		*
d.[pʌmp]	*!		*				

From the ranking argument in the tableau above, the optimal candidate must retain the place features of the input phoneme; the manner features demonstrate more flexibility than the place features. Candidate (a) therefore emerges the most harmonic output form since it satisfies the markedness constraints *OBSVOI, *CODA and *P. Candidates (b), (c) and (d) are disqualified for violating the most perceptible constraints, *CODA, *OBSVOI and *P.

iv) /ɡ/ → /ᵑɡ/



The phoneme /ɡ/ does not exist in Kitigania. What exists is the velar fricative /ɤ/. As such the voiced velar plosive /ɡ/ is prenasalised as /ᵑɡ/ in the course of adaptation as evident in the following examples:

Gas → Ngachi /ŋgacɪ/

Green → Ngiriini /ŋgɪɾ iːnɪ/

Gear →Ngea /ŋgɛa/

Hence:

*CODA, * OBSVOI >> MAX-IO >> IDENT $_{[NAS]}$, IDENT $_{[DOR]}$

This can be presented in a tableau as follows:

Input: Grenade /ɡrənеɪd/

Output: Nguruneti /ŋuɾunetɪ/

Tableau 5: /ɡ/ → /ᵑɡ/

/ɡrəneɪd/	*CODA	* OBSVOI	MAX-IO	IDENT[NAS]	IDENT[DOR]
☞a.[ᵑɡu.ɾ u.ne.tɪ]				*	
b. [ⁿdu.ɾ u.tɪ]			*!	*	*
c. [ɡu.ɾ u.ne.tɪ]		*!			*
d. [ɡrə.neɪd]	*!	*			

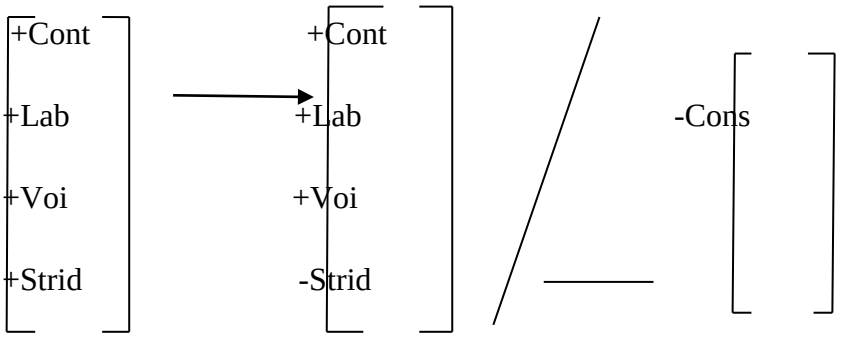
Substitution of the velar plosive /ɡ/ with the prenasalised velar plosive /ᵑɡ/ implies that the ouput form deviates from the input in manner features, IDENT [NAS]. IDENT [DOR] ensures that the output form corresponds with the input in place of articulation features, and its violation is penalized. Candidate (b) is therefore disqualified for violating this constraint. Candidate (a) wins over candidate (c) and (d) because it satisfies the first two constraints.

The data analyzed in section 4.6 (a) indicate that hormoganic nasal assimilation is mainly responsible for the adapted forms that contain the plosives /b/, /d/, /p/ and /ɡ/. Apart from the voiceless velar plosive /k/ which occurs in Kitigania, the bilabial plosives /b/ and /p/, the alveolar plosive /d/, and the velar plosive /ɡ/ do not occur in Kitigania. They are therefore replaced by the prenasalised plosives. Iribe (2011) observes that homorganic nasal assimilation aims at, among other factors, simplifying articulation of various phonological items and doing away with complexities. The acquisition of nasal features by the obstruent simplifies the articulation of the phoneme in English loanwords that might not be found in Kitigania phonemic inventory.

(b) Place Assimilation

Place assimilation is another loanword adaptation process discussed in this study. Place assimilation involves segments becoming more similar in place features. For instance, substitution of the voiced labio-dental fricative /v/, which does not exist in Kitigania, with the voiced bilabial fricative /β/ can be seen as a case of place assimilation. The output deviates from the input with respect to the place features only. Hence:

/v/ → [β]



When the English voiced labial-dental fricative /v/ is adapted into Kitigania, it changes into a voiced bi-labial fricative /β/. As noted earlier, this is because the voiced labial dental fricative /v/ does not exist in Kitigania, as exemplified in the following:

University → Yunibasĩtĩ **/** junıβasete/

Veranda → Baranda /βaɾ a^{n}da/

Vest → Bechiti /βɛcitı/

Whenever a word containing /v/ is adapted, the /v/ is substituted by /β/. Both /v/ and /β/ are voiced fricatives. The manner of articulation remains the same, while the place of articulation changes. Since aspiration contrasts in Kitigania is a matter of speaker's

attitude towards the subject, voicing contrasts after adaptation are not critical in this study.

In the phonological process of place assimilation, we propose the following constraint ranking:

*CODA, * OBSVOI >> MAX-IO >> IDENT $_{[VOI]}$, IDENT $_{[LAB]}$

The tableau below analyses the candidates of the word “television”:

Input: Television /telɪviʃən/

Output: Terebĩshoni [tɛɾ ɛβeʃonɪ]

Tableau 6: /v/ → [β]

/telɪvɪ· n/	*CODA	* OBSVOI	*LATERAL	MAX -IO	DEP -IO	IDENT [VOI]	IDENT [LAB]
☞a.[tɛ.ɾɛ.βe.ʃo.nɪ]					*		
b. [tɛɾ ɛgeʃonɪ]		*!					*
c.[ɛ.ɾ ɛ.pe.ʃnɪ]				*!		*	
d. [telɪ.vi.ʃən]	*!		*				*

From the tableau, the most harmonic candidate, candidate (a), differs from a faithful output in place features, IDENT-place constraint that is ranked lowest. Adaptation of the voiced labial dental fricative /v/ shows flexibility in place features only. Candidates (b) and (d) are quickly disqualified for violating markedness constraints, *CODA and *OBSVOI, respectively. Candidate (c) loses against candidate (a) because it violates MAX-IO. This leaves candidate (a) as the winner.

Considering that place assimilation involves one segment acquiring the place features of another, substitution of the voiced labial dental fricative /v/ with the voiced bilabial fricative /β/ is a case of place assimilation. Both phonemes are voiced fricatives, and

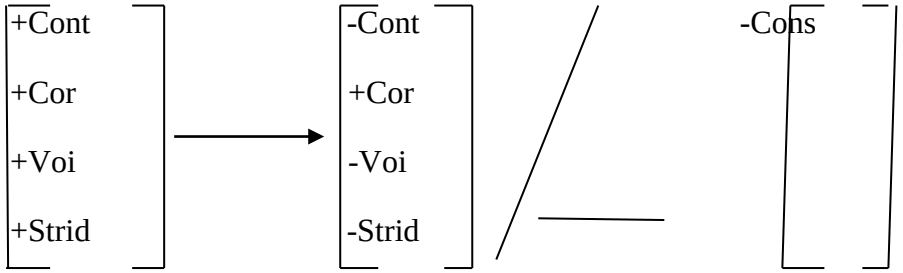
only differ in the place of articulation. Since /v/ does not occur in Kitigania, trying to configure the articulatory organs to deliver /v/ ends up bringing out /β/.

(c) Voice Assimilation

i) Devoicing

Consonant devoicing involves deletion of the voice property of the voiced obstruents. This phonological process is evident in the adaptation of English loanwords that contain voiced alveolar fricative /z/. The phoneme /z/ does not occur in Kitigania. In the adaptation of a loanword that contains this phoneme, the voice property is deleted so that the phoneme is phonetically realized as a voiceless alveolar plosive /c/. This can be represented by the rule:

/z/ → [c]



The voiced alveolar fricative **/z/** is substituted with the voiceless palatal plosive **/c/.** This is normally the case irrespective of the position of the phoneme in the syllable. In the adaptation of /z/, the voicing features show greater flexibility than manner and place features. IDENT $_{[VOI]}$ and IDENT $_{[COR]}$ constraints are therefore vital in realization of the output [c]. Hence, we propose the following ranking of constraints:

*CODA, *OBSVOI >> MAX-IO >> IDENT $_{[COR]}$, IDENT $_{[VOI]}$

These constraints can be presented schematically as:

Input: Size /saɪz/

Output: Chaichi [caɪcɪ]

Tableau 7: /z/ → [c]

/saɪz/	*CODA	*OBSVOI	MAX-IO	IDENT [COR]	IDENT$_{[VOI]}$	ONSET
☞a. [ca.ɪ. cɪ]					*	*
b. [sa.ɪz.]	*!					*
c. [a.ɪ. c]	*!		*			*
d. [ca.ɪ. ɟɪ]		*!		*		

The optimal candidate differs from a faithful output in manner features, IDENT $_{[CONT]}$ and voice features, IDENT $_{[VOI]}$, constraints. This implies that in the adaptation of the voiced alveolar fricative /z/, variability is on voice and manner features. Therefore, candidates (b) and (c), by violating *OBSVOI and *CODA respectively, commits a fatal violation and are automatically disqualified, leaving candidate (a) as the most harmonic.

This observation is made in loanwords where the voiced alveolar fricative /z/ does not occur in word initial position:

Input: Fertilizer /fɜ:təlaɪzə/

Output: Bataraicha [βataɾaɪca]

Tableau 8: /z/ → [c]

/fɜ:təlaɪzə/	*CODA	*OBSVOI	MAX-IO	IDENT [COR]	IDENT [VOI]	IDENT [NAS]	ONSET
☞a.[βa.ta.ɾa.ɪ.ca]					*		*
b.[fɜ:.tə.la.ɪzə]		*!					*
c. [βa.ta.ɾ a.ɪ.a]			*!				*
d.[βat.aɾa.ɪ.^{n}da]	*!						*

Again, the optimal candidate differs from a faithful output in IDENT [CONT] and IDENT [VOI]. Candidates (b) and (d) commit fatal violations and are automatically disqualified. Candidate (a) emerges the optimal candidate, winning against candidate(c) because it commits minimal violations.

From the data we collected, there was only one phoneme that demonstrated devoicing as a loanword adaptation process. The voiced alveolar fricative /z/ lost the voice feature on adaptation to become the voiceless palatal stop /c/. This is a case of devoicing. Since the alveolar fricative /z/ does not occur in Kitigania, the rule /z/ → /c/ is replacive. The loanwords which contained the voiced phoneme had it replaced by the voiceless alveolar stop [c] irrespective of it phonetic environment.

ii) Voicing

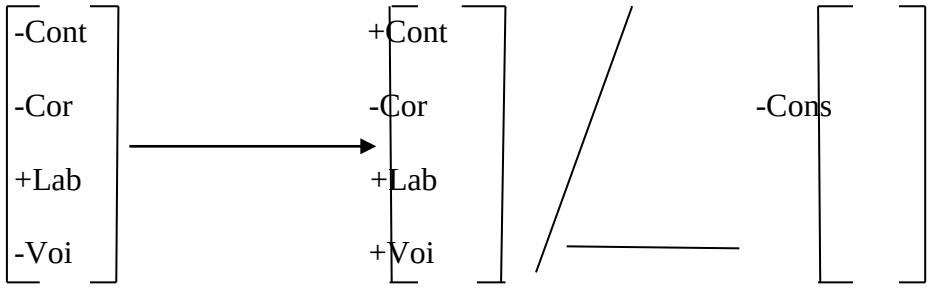
Consonant voicing is a phonological process that involves acquisition of the voice feature by the voiceless consonants. When voiceless bilabial stop /p/ is adapted into Kitigania, it is substituted with either /β/ or /^{m}b/, both of which are voiced. This is exemplified in the following examples:

Cap → Kĩĩbu /keeβu/

Picture → Mbisha /^{m}bɪʃa/

We postulate two rules that explain this phenomenon as follows:

i) /p/ → [β]



In this scenario, the voiceless bilabial plosive /p/ becomes a voiced bilabial fricative /β/. This was particularly so when /p/ occurs just before the vowel /ɔ/ or forms the coda of the input forms. To account for the voicing of /p/ the markedness constraint *P which penalizes occurrence of /p/ critical, hence the ranking:

*CODA, *OBSVOI, *P >> MAX-IO >> IDENT $_{[NAS]}$, IDENT $_{[VOI]}$, IDENT $_{[CONT]}$

Schematically, this can be presented as:

Input: Report /rɪpɔ:t/

Output: Riboti /ɾ iβɔtɪ/

Tableau 9: /p/ → [β]

/rɪpɔ:t/	*CODA	*P	MAX-IO	IDENT [NAS]	IDENT$_{[VOI]}$	IDENT$_{[CONT]}$
☞ a.[ɾ i.βɔ.tɪ]						*
b. [rɪ.pɔ:t.]	*!	*				
c. [ɾ iɔ.tɪ]			*!			
d.[ɾ i.^{n}dɔt]	*!			*		

In tableau 16 above, candidate (b) violates the markedness constraint *P, while candidate (d) violates *CODA. Consequently, they are automatically disqualified.

Candidate (c) deletes a phoneme, hence violating MAX-IO. This leaves candidate (a) as the most harmonic output.

The following loanword manifests a similar phenomenon:

Input: Soup /su:p/

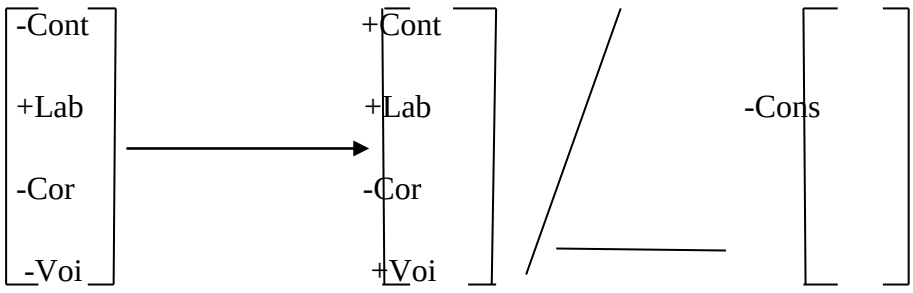
Output: Chubu /cuβu/

Tableau 10: /p/ → [β]

/su:p/	*CODA	*P	MAX-IO	IDENT [LAB]	IDENT [VOI]	IDENT [CONT]
☞ a. [cu.βu]						*
b. [cu.pu]		*!				*
c. [su:p.]	*!	*				*
d. [u.^{m}bu]			*!			

In tableau 10 above, candidate (b) and (c) violate the fatal constraints *P and *CODA respectively and are immediately disqualified. Candidate (d) violates MAX-IO and loses against candidate (a) which emerges the most harmonic candidate.

ii) /p/ → [^{m}b]



Normally, the bilabial plosive /b/ and /p/ are pre-nasalized in the adaptation of loanwords. However, the data revealed that there are instances when the voiceless

bilabial plosive /p/ changes to pre-nasalized bilabial plosive [^{m}b]. The constraints responsible for such observation can therefore be ordered as follows:

*CODA, *OBSVOI, *P >> MAX-IO >> IDENT $_{[LAB]}$, IDENT $_{[NAS]}$, COMP [ONSET]

The following tableau exemplifies this:

Input: Company /kəmpeɪn/

Output: Kambũũni /ka^{m}bo:nɪ/

Tableau 11: /p/ → [^{m}b]

/kəmpənɪ/	*CODA	*OBSVOI	*P	MAX-IO	IDENT [LAB]	IDENT$_{[NAS]}$	*COMP [ONSET]
☞a. [ka^{m}bo:nɪ]							
b.[ka.po:.nɪ]			*!			*	
c. [ka.^{n}do:n]	*!				*		
d.[kə.mpeɪ.n]	*!					*	*
e. [ka.o:n]	*!			*			

Violation of the constraint *P that prohibits realization of /p/ is fatal. Candidate (b) violates the markedness constraint *P and it immediately loses. Candidates (b), (d) and (e) violate the highest ranked constraints and are immediately disqualified. Candidate (d) loses against candidate (a) which emerges the winner.

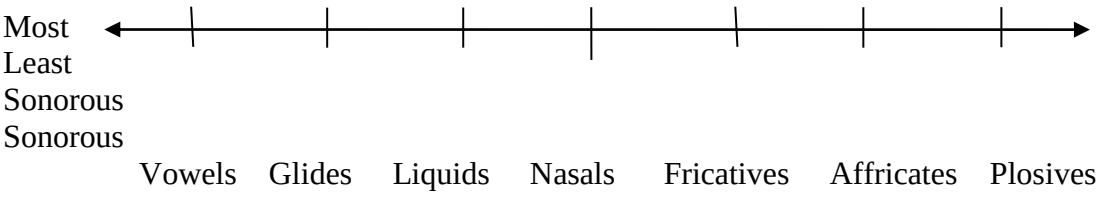
From the corpus of data we collected, we noted that voicing is operational in the adaptation of the voiceless labial dental fricative /f/ and the voiceless bilabial plosive /p/. Both phonemes are not found in Kitigania inventory. The labial dental fricative /f/ is realized as a voiced bilabial fricative /β/, while the voiceless bilabial plosive /p/ is

realized as a prenasalised voiced bilabial plosive /^{m}b/. This phonological process evident in the accounted for 2.7 % of the total loanwords analyzed.

4.1.2 Consonant Hardening and Weakening

Consonant hardening and weakening is another phonological process that is instrumental in the adaptation of English loanwords in Kitigania. Hardening /weakening of consonants refers to the phonological processes where a phoneme is articulated with greater /lesser force due to the built up pressure in the vocal cords. Ashby and Maidment (2005) observe that consonants can be put in a continuum beginning from the strongest to the weakest. According to them, the stronger the consonant is, the more it differs from vowels. The concept of hardening and weakening can also be understood from the sonority scale standpoint, anchored on the relative energy in the production of the sound (Ciments, 1990). The least sonorous a phoneme is, the harder it is, and the most sonorous it is the weaker that phoneme is.

Figure 4.1 Sonority Scale



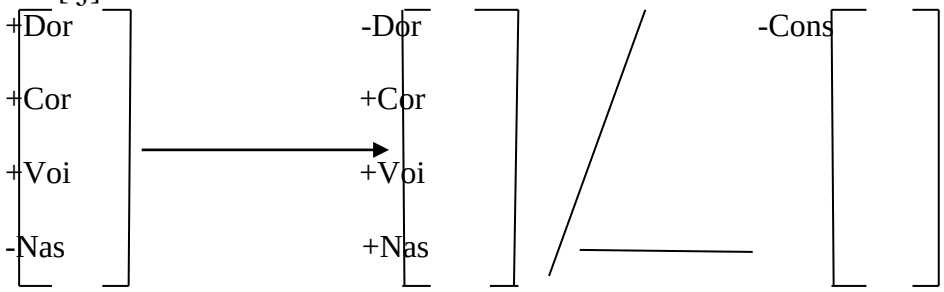
(Sonority Scale – after SIL International 1999)

In the adaptation of English loanwords in Kitigania, some phonemes deviate from their input counterparts in terms of sonority, as is exemplified below.

a) Consonant Hardening

The data we collected indicated that there are two phonemes which harden on being incorporated into Kitigania. The two phonemes are: the voiced palatal alveolar affricate /ʤ/, and the alveolar lateral /l/.

i) /ʤ/ → [ᵑʄ]



The voiced alveolo-palatal affricate /ʤ/ does not exist in Kitigania. When Kitigania borrows words that contain this sound from English, the phoneme is substituted with the prenasalized palatal plosive [ᵑʄ] as illustrated in the following words:

Juice → Njuichi /ᵑʄuɪcɪ/

Jug → Njagi /ᵑʄaɤɪ/

Judge →Njaanji /ᵑʄaːᵑʄɪ/

This change of an affricate to a plosive is a case of consonant hardening. The two are voiced and only differ in manner features. In OT analysis, the substitution of the affricate with a plosive involves deviation of the output from the input with regard to manner features. The place, IDENT-place, and voicing, IDENT-voicing, constraints remain unchanged.

As such, the constraints can be ranked as follows:

*CODA, *AFFRICATE >> MAX-IO >> IDENT [NAS], IDENT [VOI], IDENT [DEL REL]

This can be demonstrated in the analysis of the loanword below:

Input: Jacket /ʤəkɪt/

Output: Njaketi /ᵑʄaːkɛtɪ/

Tableau 12: /ʤ/ → [ᵑɟ]

/ʤəkɪt/	*CODA	*AFFRICATE	MAX-IO	IDENT [NAS]	IDENT$_{[VOI]}$	IDENT [DEL REL]
☞**a.[**ᵑɟ**a**:kɛtɪ]				*		*
b.[ʧa:kɛt]	*!				*	
c.[ʤə.kɪt]	*!	*				*
d. [a:kɛtɪ]			*!			

As is the case with other pre-nasalized phonemes, the optimal candidate must preserve the place and voice features of the input form. Candidate (c) is therefore disqualified for violating the highest constraint, *AFFRICATE. Candidate (a) wins against other candidates generated by GEN.

Other loanwords adapted in this manner include:

Input: Charger [phone charging device] /ʧa:ʤə/

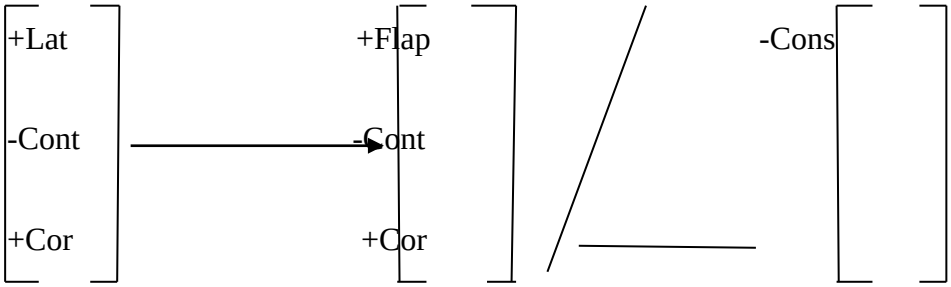
Output: Chanja /caᵑɟa/

Tableau 13: /ʤ/ → [ᵑɟ]

/ʧa:ʤə/	*CODA	*AFFRICATE	MAX-IO	IDENT [NAS]	IDENT$_{[VOI]}$	IDENT$_{[DEL REL]}$
☞a.[caᵑɟa]				*		*
b.[ʧa:ʤə]		*!				
c. [ca.a]			*!			
d. [ca.ⁿd]	*!		*	*		*

Violation of markedness constraints *CODA and *OBSVOI is fatal. As such, candidate (b) is disqualified for violating *OBSVOI. Candidate (a) wins because it satisfies the highest ranked constraints, as well as faithfulness constraints.

ii) /l/ → [ɾ]



From the data collected, there is a tendency by speakers of Kitigania to replace sound /l/ with [ɾ]. The lateral /l/ is either realized as trill /r/ or a flap [ɾ] when English loanwords are adapted in Kitigania. This phenomenon is evident in environments where the lateral /l/ does not occur in word initial positions. The following data exemplifies this observation:

Style →Chitaero /cɪtaɛro/

Ruler →Rura /ɾ uɾ a/

Given that laterals are more sonorous than the flap, the substitution of the lateral with a flap can be categorized under consonant hardening. OT analysis of this substitution will suppose a markedness constraint [*Lateral], which prohibits the realization of /l/ as a lateral. This constraint ranks higher than manner and place constraints.

These constraints can be ranked in the following manner:

*CODA, *LATERAL >> MAX-IO >> IDENT [RHOTIC], IDENT [CONT], *COMP [ONSET]

The constraints can be presented in a tableau as follows:

Input: Stool /stu:l/

Output: chuturu /cutuɾ u/

Tableau 14: /l/ → [ɾ]

/stu:l/	*CODA	*LATERAL	MAX-IO	IDENT$_{[RHOTIC]}$	IDENT [CONT]	*COMPL [ONSET]
☞a.[cu.tu:.ɾ u]				*		
b.[cu.tu:.lu]		*!				
c. [cu.tu:.u]			*!			
d. [stu:l]	*!	*				*

Input: File /faɪl/

Output: Baero /βaɛɾ ɔ/

Tableau 15: /l/ → [ɾ]

/faɪl/	*CODA	*LATERAL	MAX-IO	IDENT$_{[RHOTIC]}$
☞ a) [βa.ɛ.ɾ ɔ]				*
b) [βa.ɛ.lɔ]		*!		
c) [βaɔ.]			*!	*
d) [faɪl]	*!	*		

In tableaus 14 and tableau 15, candidate (a) emerges as optimal because they satisfy the highest ranked constraint *LATERAL which prohibits the output phoneme to have the feature "lateral". Violation of this constraint by candidates (b) results in immediate disqualification.

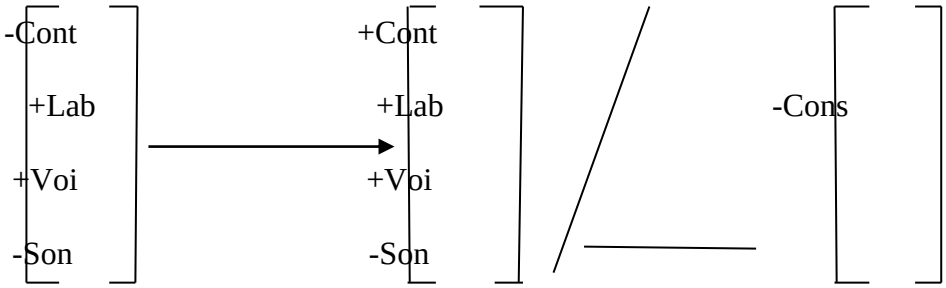
Consonant hardening and weakening presents an interesting phenomenon in the adaptation of English loanwords in Kitigania. It is worth noting that though some English segments that are absent in Kitigania inventory are substituted with their closest strong or weak counterparts in Kitigania, the alveolar lateral /l/ is substituted with the rhotic /r/, both of which constitute segments in Kitigania inventory. The change of features that ensue in this case of consonant hardening can therefore be explained as necessary in enhancing clarity in the perception of loanwords that contain the lateral.

Other than the consonants which undergo hardening as a loanword adaptation process, there are other phonemes that become weaker. I shall now discuss consonant weakening as demonstrated by the data that we collected.

b) Consonant Weakening

The data collected established that the voiced bilabial plosive /b/ can either be realized as the voiced bilabial fricative [β] or the bilabial nasal [m].

i) /b/ → [β]



When voiced bilabial plosive /b/ occurs as a syllable onset in any other position of a word other than initial, it is realized as a voiced bilabial fricative [β], as evident in the following example:

Bible → Baibo /βaιβo/

Cupboard → Kabaandi /kaβa:^{n}dɪ/

However, /b/ in the word “Bible” has two variations: the /b/ can either be substituted with [β] or pre-nasalized as [^{m}b].

The substitution of the voiced bilabial plosive /b/ with a voiced bilabial fricative [β] is therefore a case of consonant weakening since fricatives are more sonorous than the plosives. In its adaptation, the voice features as well as place features are maintained. However, the manner features change. In OT analysis, the constraints responsible for this phenomenon are ranked:

*CODA, *OBSVOI >> MAX-IO >> IDENT $_{[NAS]}$, IDENT $_{[VOI]}$, IDENT $_{[CONT]}$

This can be presented schematically as:

Input: Rubber /rʌbə/

Output: Raba /ɾaβa/

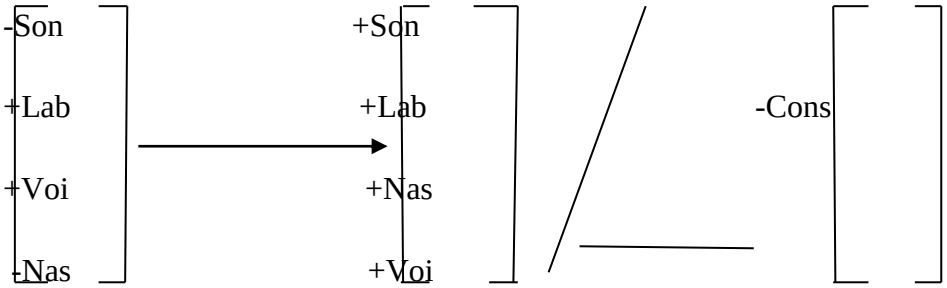
Tableau 16: /b/ → [β]

/rʌbə/	*CODA	* OBSVOI	MAX-IO	IDENT [NAS]	IDENT [VOI]	IDENT$_{[CONT]}$
☞a. [ɾ a.βa]						*
b.[ɾ a.ba]		*!				
c. [ɾ a.a]			*!			
d.[ɾ a.^{m}b]	*!			*		
e. [rʌ.bə]		*!				

The word “rubber” is bi-syllabic. The two syllables are open, and hence do not antagonize the syllable structure of the borrowing language. However, /b/ has been substituted by [β]. The output form deviates from the input form in manner features. From the candidate set generated by GEN, candidate (a) wins against the other

candidates because it satisfies both the markedness and the faithfulness constraints. Candidates (b) and (d) commit fatal violations and are immediately disqualified.

ii) /b/ → [m]



The data also revealed that there are instances when the voiced bilabial plosive /b/ is replaced by bilabial nasal /m/. The two loanwords that manifested this belong to class 1 nouns. Given that nasals are more sonorous than the plosives, the substitution of the voiced bilabial plosive /b/ with the bilabial nasal /m/ has been discussed as an instance of consonant weakening.

OT analysis of this phenomenon indicates that the output form maintains the features of voice and place but differs with the input with respect to manner features. The constraints can therefore be ranked as:

*CODA, *OBSVOI >> MAX-IO >> IDENT $_{[LAB]}$, IDENT $_{[NAS]}$, IDENT $_{[SON]}$ >> COMP $_{[ONSET]}$

This can be represented by the tableau below:

Input: Brush /brʌʃ/

Output: Murashi /mɔɾ aʃi/

Tableau 17: /b/ → [m]

/brʌʃ/	*CODA	*OBSVOI	MAX-IO	IDENT [LAB]	IDENT [NAS]	IDENT [SON]	*COMP [ONSET]
☞a.[mɔ.ɾa.ʃɪ]						*	
b.[bɔ.ɾ a.ʃɪ]		*!					
c.[pɔ.ɾ aʃ]	*!						
d.[ɔ.ɾ a.ʃɪ]			*!				
e. [brʌʃ]	*!	*					*

Candidates (b), (c), (d) and (e) are quickly disqualified for violating fatal constraints. The optimal candidate, candidate (a), does not violate the highest ranked constraints, *CODA and *OBSVOI.

Another word that is adapted in this manner includes:

Input: Blanket /blæŋkɪt/

Output: mũrĩngĩti /mɔɾeᵑgetɪ/

Tableau 18: /b/ → [m]

/blæŋkɪt/	*CODA	*OBSVOI	*LATERAL	MAX-IO	IDENT [VOI]	IDENT [NAS]	IDENT [SON]
☞a.[mɔ.ɾeᵑge.tɪ]					*	*	*
b.[pɔ.ɾeᵑ·ge.t]	*!				*	*	
c.[bɔ.ɾeᵑ·getɪ]		*!			*		
d. [ɔ.ɾeᵑ·get]				*!	*		
e. [blæ.ŋkɪt]	*!	*	*				

The phoneme /b/ which does not exist in Kitigania inventory is optimally mapped into Kitigania /m/ in the above case of consonant weakening. The optimal candidate (a)

differs from the faithful output in manner of articulation. Candidates (c) and (d) violate *OBSVOI and are ruled out.

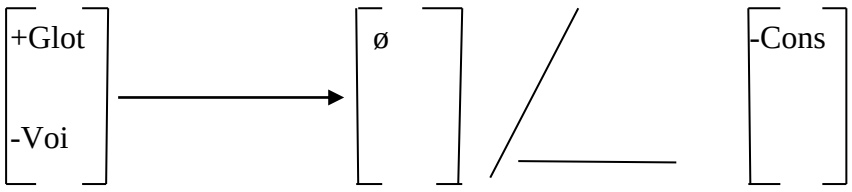
From the corpus of data that we collected, we noted that consonant weakening affected only the voiced bilabial plosive /b/. Other than in the word 'Bible' where /^{m}b/ and /β/ were in free variation, /b/ → [β] is determined by the position of the syllable that contains /b/ in the loanword. In cases where /b/ does not occur in word initial positions, /b/ → [β]. The loanwords in the second phenomenon of consonant weakening where /b/ → [m], are coincidentally nouns belonging to class 1.

4.1.3 Consonant Deletion

When English loanwords are adapted in Kitigania, some segment(s) may be left out. This phenomenon is called elision. Elision, also known as deletion, is a phonological process that involves omission of a segment or segments from a word. Segments may be left out in different positions of a word. The study established that three consonants are deleted in the course of adaptation of English loanwords in Kitigania. These consonants are: the voiceless glottal fricative /h/, the lateral /l/ and the voiced bilabial plosive /b/.

i) Deletion of glottal fricative /h/

/h/ → [ø]



The consonant /h/ does not exist in Kitigania. When a word that contains this sound is adapted in Kitigania, the consonant is normally deleted, as illustrated in the following examples:

Health [as in health Officer] →Erothi /ɛrɔðɪ/

Harrison → Arichoni /aɾ icɔnɪ/

The deletion of /h/ presupposes that occurrence of the voiceless glottal /h/ as onset is prohibited. As such, it is usually deleted when it is realized as onset of the input structure. Notably, apart from baptismal names with English origin, there was limited data that could further demonstrate this phenomenon.

Considering that a structure with /h/ is ill-formed in Kitigania, we propose the following markedness constraint:

*GLOTTAL – glottal fricative /h/ is prohibited

The constraint ranking therefore becomes:

*CODA, *GLOTTAL >> MAX-IO, DEP-IO

This can be schematically represented as follows:

Input: Henry /henri/

Output: Eneri /ɛnɛɾ i/

Tableau 19: /h/ → [ø]

/henri/	*CODA	*GLOTTAL	MAX-IO	DEP-IO
(a) [hɛ.nɛ.ɾɪ]		*!		*
(b) [ɛ.nɛɾ.]	*!		*	*
☞ (c) [ɛnɛ.ɾ i]			*	*
(d) [hen.rɪ]	*!	*		

The constraints *GLOTTAL which prohibits syllables from having the voiceless glottal fricative, /h/ and *CODA define well formed structures in the adaptation of /h/ in Kitigania. Their violation is therefore fatal. From the candidate set generated by GEN candidate (c) wins against candidate (b). Candidate (b) commits fatal violation of the markedness constraint *GLOTTAL.

The following data can also be analyzed in the same manner:

Input: Hotel /həʊtel/

Output: Ũtĩri /oteɾ ɪ/

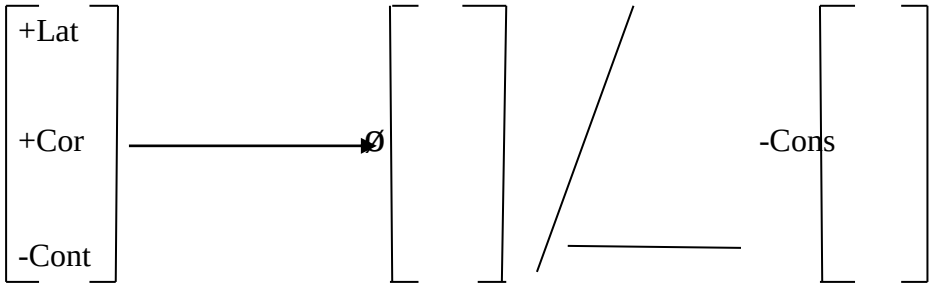
Tableau 20: /h/ → [ø]

/həʊtel/	*CODA	*GLOTTAL	*LATERAL	MAX-IO	DEP-IO	IDENT [LAT]
☞ a. [ote.ɾ i]				*	*	*
b. [ot.eɾ]	*!			*		*
c. [ho.te.ɾ i]		*!			*	*
d. [həʊ.tel]	*!	*	*			

Candidate (b) and (c) commit fatal violations of the highest ranked constraint, *CODA and *GLOTTAL respectively, leading to their disqualification. This leaves candidate (a) as the most harmonic candidate.

ii) Deletion of lateral /l/

/l/ → [Ø]



The data collected indicated that the lateral /l/is usually deleted when it occurs as coda in some loanwords. We hypothesized that the deletion of /l/ may be a consequence of wrong transmission of the loanword which arises when the second speakers of English omit the phoneme in their pronunciation. Further, Kitigania deals with lateral /l/ coda by inserting a vowel to create another syllable.

We propose the following constraint ranking:

*CODA, *LATERAL >> MAX-IO, DEP-IO >> IDENT [LAT]

The following data exemplifies deletion of the lateral /l/:

Input: Aerial /eəriəl/

Output: ĩĩrio /eːɾ iɔ/

Tableau 21: /l/ → [ø]

/eəriəl/	*CODA	*LATERAL	MAX-IO	DEP-IO	IDENT [LAT]
☞ a. [eːɾ ɪɔ]			*		*
b. [eː.ɾ ɪɔl]	*!				*
c. [eː.lɪɔ.]		*!	*		
d. [eəriəl]	*!	*			

Candidate (a) emerges the winner among the candidate set generated by GEN. It is chosen as the most harmonic candidate because it does not violate the highest ranked constraint, *CODA. Candidate (b) loses due to fatal violation of *CODA.

The following data analyzes the deletion of /l/:

Input: Pencil /pensl/

Output: Pencho /pɛ^{n}cɔ/

Tableau 22: /l/ → [ø]

/pensl/	*CODA	*LATERAL	MAX-IO	DEP-IO	IDENT [LAT]
☞ a. [pɛ.^{n}cɔ]			*		*
b. [pɛ.^{n}cɔl]	*!	*			
c. [pɛ.^{n}cɔ.lo]		*!		*	
d. [pensl]	*!	*			

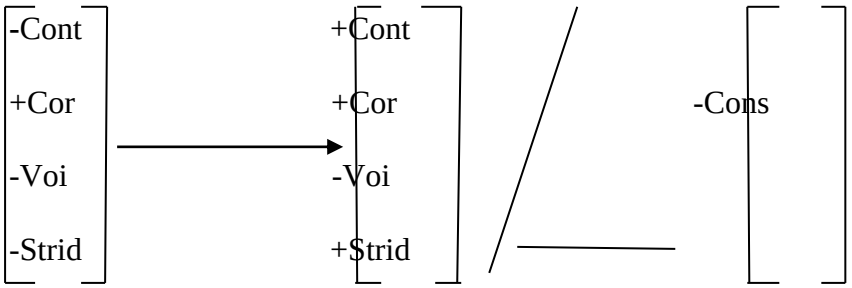
From the candidate set generated by GEN, candidate (a) is chosen by EVAL as the most harmonic candidate. The lateral [l] is deleted to create an open syllable.

Violation of *CODA and *LATERAL is fatal, and leads to immediate disqualification of candidates (b), (c) and (d). Candidate (a) emerges the winner.

It is worth noting that consonant elisions affect the glottal fricative /h/ and the palatal fricative /l/. The glottal fricative /h/ does not occur in Kitigania. However, the palatal lateral /l/ is found in Kitigania inventory. Kiimeru is a CV language and so are its dialects. When a word containing /l/ coda is loaned into Kitigania, /l/ is normally deleted or a vowel is epenthesized so as to create an open syllable.

4.1.4 Consonant Substitution

i. /c/ → /ʃ/



Both the voiceless palatal fricative /ʃ/ and the voiceless palatal stop /c/ occur in Kitigania. The data established that the voiceless post alveolar fricative /ʃ/ and voiceless palatal plosive /c/ occur in free variation in Kitigania. Therefore, they can be used interchangeably in adapted words without hindering meaning. The data below exemplifies substitution of /ʃ/ with /c/:

Clutch →Kĩraci /keɾ aʃi/ or /keɾ aci/

Sheet →Ciiti /ci:ti/

From these examples, it is apparent that the phoneme /c/ can faithfully be mapped into its equivalent in Kitigania. However, it can also be substituted with the

postalveolar fricative /ʃ/. When it is substituted with the palatal alveolar fricative, the constraint ranking is projected as follows:

NOCODA, *OBSVOI, *P >> MAX-IO >>IDENT-IO [COR], IDENT [STRID]

The output deviates from the input in the manner of articulation. Whereas the input is a voiceless alveolar plosive, the output is a voiceless postalveolar fricative.

The phonemic substitution that ensues from the occurrence of the two phonemes in free variation can be analyzed in OT as follows:

Input: Torch /tɔːʧ/

Output: Toshi /tɔːʃi/

Tableau 23: /c/ → [ʃ]

/tɔːʧ/	*CODA	*OBSVOI	MAX-IO	IDENT[COR]	IDENT[STRID]
a. [tɔð.]	*!				*
b. [tɔːʧ.]	*!				*
c. [tɔ.ɪ.]			*!		
☞ d. [tɔ.ʃɪ]					

In tableau 23 above, candidate (d) emerges the winner against the other candidates generated by GEN. It resembles the input in place, IDENT [COR] and voice features. However, it differs with output in manner features, IDENT [STRID]. Candidate (a) and (b) violate the highest ranked constraints, *CODA and *OBSVOI respectively and are immediately disqualified. This leaves candidate (d) as the most harmonic.

ii. **/s/ → /c/**

Input: Soup /su:p/

Output: Chubu /cuβu/

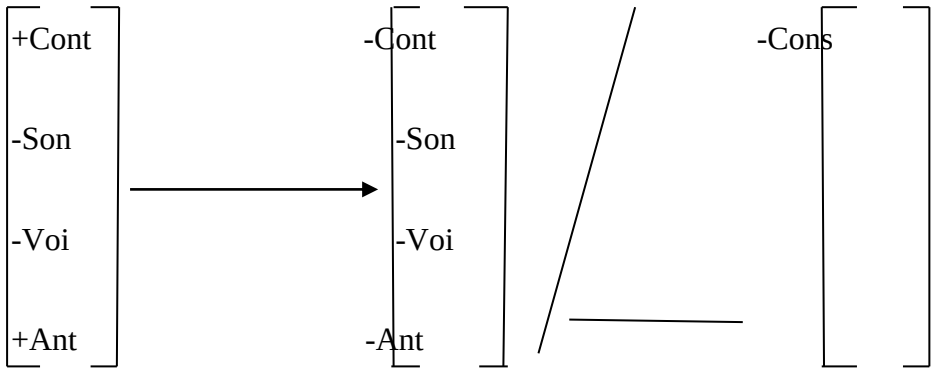


Tableau 24: /s/ → /c/

/su:p/	*CODA	*P	MAX-IO	DEP-IO	IDENT[DEL REL]
a. [suβ]	*!				*
b. [su:pu]		*!		*	*
c. [uβu]			*!	*	
☞ d. [cuβu]				*	
e. [su:p]	*!	*			*

In tableau 24 above, candidate (d) emerges the winner against the other candidates generated by GEN because it satisfies the highest ranked constraints. Candidates (a) and (b) violate *CODA and *P respectively, and they are immediately disqualified. Candidate (c) loses because it violates MAX-IO.

The choice of the voiceless postalveolar fricative or the palatal stop does not alter the meaning of the loanword. The two phonemes therefore occur in free variation. Although, the choice of one instead of the other may signal regional variation among

the Ameru, meaning of the loaned form is not impaired by the selection of either. In addition, the voiceless alveolar fricative /s/ is substituted with a voiceless palatal stop /c/ in Kitigania. This is because /s/ is not part of Kitigania phonemic inventory.

4.2 Vowel Epenthesis

Epenthesis involves the insertion of a segment or segments into a word. Vowel insertion is vital in loanword adaptation because it ensures that the borrowed word conforms to Kitigania phonotactics. From the data collected, we established that vowels are normally epenthesized in borrowed words to create open syllables and break consonant clusters that are illicit in Kitigania. Kleidler (2001) observes that a syllable is a principal unit in phonological analysis. He points out that a syllable organizes segmental melodies in terms of sonority, with syllabic units becoming the sonority peaks. Fery and Van de Vijver (2003) observe that ranking segments along a sonority scale is a point of controversy in linguistics. However, they provide a reasonably uncontroversial scale as:

> Stops < Fricatives < Nasals < Liquids < Glides < Vowels (Fery & Vijver, 2003 p. 356)

As noted earlier, Kitigania allows a CCV cluster of consonant-glide-vowel type (CGV). Any other cluster type is unacceptable. With regard to this, the markedness constraint, *COMP $_{[ONSET]}$, is demoted. However, SSP constraint (Sonority Sequencing Principle) which captures the preferred order of segments in a syllable (Fery & Van de Vijver, 2003), and *CODA which ensures that syllables are open, are ranked highest and their violation is fatal.

Evidently, epenthesis modifies the syllable structure of the borrowed word so that it can fit in the sound system of the recipient language. MAX-IO and DEP-IO constraints are also critical in the phonotactic analysis of loanwords in Kitigania. Our study has therefore adopted the following ranking argument:

Hence: SSP, *CODA, *FEATURE >> MAX-IO, DEP-IO >> *COMPLEX, ONSET

Epenthesis of /i/

The front high vowel /i/ is inserted in loanword adaptation to break consonant clusters or avoid syllable codas. This presupposes two rules:

a) Ø → [i] /C_CV) = insert [i] to break onset cluster
b) Ø →[i] /C− = insert [i] to create an open syllable

This is exemplified in the following examples:

a. Slippers → Chilibachi /cılıβacı/
b. Bus → Mbachi /^{m}ba:cı/

Considering that consonant clusters are impermissible in Kitigania, the vowel /i/ is inserted break a CC cluster in example (a); and to create an open syllable in example (b). Additionally, insertion of /i/ is not random. On the contrary, it is prompted by the presence of specific consonants in the consonant cluster or the coda of the input form.

The following consonants prompt the epenthesis of /i/, and the OT analysis of the output form:

a) Voiceless palatal fricative /s/ e.g.

Input: Skirt /skɜ:t/

Output: Chikaati /cɪka:tɪ/

Tableau 24: Ø → [i] /C _ CV

/skɜ:t/	SSP	*CODA	MAX-IO	DEP-IO	*COMPLEX	ONSET
(a) [ɪka:.tɪ]			*!	**		*
(b) [skɜ:t]	*!	*			*	
(c) [cɪ.ka:t]		*!		*		
☞ (d) [cɪ.ka:.tɪ]				**		

The optimal candidate (d) wins against candidate (a) because it does not violate the highest ranked markedness constraints of SSP and *CODA. In order to avoid coda and to break the onset consonant cluster, /ɪ/ is inserted after /s/ and /t/, thereby violating the faithfulness constraint DEP-IO. Candidate (b) and (c) are automatically disqualified for violating the highest ranked constraints in Kitigania.

b) Pre-nasalized alveolar plosive /ⁿd/

English loanwords that contain the voiced alveolar plosive /d/ acquire a hormoganic nasal during adaptation to become /ⁿd/, as shown in the following examples:

Deal → Ndiiru /ⁿdi: ɾ ɔ/

Card → Kaandi /kaːⁿdɪ/

The emergence of the optimal output after /ɪ/ epenthesis is shown in tableau (25) below:

Input: Card /kɑ:d/

Output: Kaandi /kaːⁿdɪ/

Tableau 25: Ø →[ɪ] /C_____#

/kɑ:d/	*CODA	*OBSVOI	MAX-IO	DEP-IO	IDENT [NAS]	ONSET
(a) [kɑ:d]	*!	*				
(b) [ka:.^{n}d]	*!			*	*	
(c) [ka:ɪ]			*!	*		*
☞ (d) [ka:^{n}dɪ]				*	*	

The input form is monosyllabic. However, after insertion of the front high vowel /ɪ/, the adapted loanword becomes disyllabic. The winning candidate (d), / ka:^{n}di/ is selected by EVAL since it has no fatal violation. In spite of violating the lower ranked constraint DEP-IO it satisfies *OBSVOI and *CODA. Candidates (a), (b) and (c) commit fatal violation, and hence, they are immediately dismissed.

c) Pre-nasalized palatal stop /ᶮɟ/

The voiced alveolo-palatal affricate /ʤ/ does not exist in Kitigania inventory. Therefore, the phoneme is substituted by a palatal plosive /ᶮɟ/ when it occurs in a loanword, as exemplified in the following data:

Jet →Njeti /ᶮɟɛ:tɪ/

Garage →Ngaranji /ᶮgaɾ aᶮɟɪ/

The presence of the prenasalised palatal plosive /ᶮɟ/ prompts /ɪ/ epenthesis. The phonotactic adjustment that results into the realization of the optimal candidate is shown on tableau (26) below:

Input: Change /ʧeɪnʤ/

Output: Shĩnji /ʃeⁿʒɪ/

Tableau 26: Ø → [ɪ] /VC_____#

/ʧeɪnʤ/	NOCODA	MAX-IO	DEP-IO	*COMPLEX
(a) [ʃnɾɪ.]		*!	*	*
(b) [ʃeⁿʒ]	*!		*	
☞ (c) [ʃe.ⁿʒɪ]			*	
(d) [ʧeɪnʤ.]	*!			

The three candidates in this example are generated by GEN as spelt out in OT. EVAL assesses them in line with the interaction of the markedness and faithfulness constraints. Candidate (c) emerges the winner, after violating the lowest ranked faithfulness constraint. Candidates (a) and (b) are disqualified for violating the fatal constraints.

d) Alveolar nasal /n/

The alveolar nasal /n/ can occur as syllable onset or coda in the input form. Most of the loanwords collected have closed syllables with /n/ occurring as a coda:

Sign (verb) → Chaini /caɛnɪ/

Line → Raini /ɾ aɪnɪ/

/ɪ/ is inserted to create an open syllable since closed syllables are prohibited in Kitigania. Further, insertion of /ɪ/ adds an extra syllable in monosyllabic loanwords. The phonotactic adjustment that gives rise to the optimal candidate is shown in Tableau (27) below:

Input: Line /laɪn/

Output: Raini /ɾ aɪnɪ/

Tableau 27: Ø →[ɪ] /C_____#

/laɪn/	*CODA	*LATERAL	MAX-IO	DEP-IO	ONSET
(a) [la.ɪn]	*!	*			*
(b)[la.ɪ]		*!	*		
(c) [a.ɪn.]	*!		*		*
☞ (d) [ɾ aɪ.nɪ]				*	

/ɪ/ epenthesis in this example serves to create an open syllable. After the insertion, the loanword becomes disyllabic. From the candidate set generated by GEN, candidate (c) emerges the winner since it does not violate the highest ranked markedness constraints. Candidates (a) and (b) commits a fatal violation and are quickly disqualified.

e) Pre-nasalized velar plosive /ᵑg/

The velar nasal /ŋ/ and the velar plosive /g/, which is absent in Kitigania inventory, are normally realized as a prenasalised velar plosive /ᵑg/ in adapted loanwords, as exemplified in the example below:

Glass [drinking glass] → Ngirasi /ᵑgɪɾ asɪ/

Gear → Ngea /ᵑgɛa/

In loanwords where /g/ occurs in consonant clusters, /ɪ/ is inserted to break the cluster. /ŋ/ occurs as a syllable coda. To create an open syllable, /ɪ/ is inserted. The phonotactic adjustment that results in emergence of the winning candidate is presented on Tableau (28):

Input: Shilling /ʃɪlɪŋ/

Output: Shiringi /ʃɪɾ iᵑgɪ/

Tableau 28: Ø →[ɪ] /C_____#

/ʃɪlɪŋ/	*CODA	MAX_IO	DEP-IO	IDENT [NAS]	ONSET
(a) [ɪ. ɾ ɪ.ᵑgɪ]		*!		*	*
(b) [ʃɪ.lɪŋ]	*!				
(c) [ʃɪ.ɾ i.ᵑg]	*!			*	
☞ (d) [ʃɪ.ɾ i.ᵑgɪ]				*	

The optimal candidate (d) incurs minimal violations and wins against candidate (a). Insertion of /ɪ/ has created an open syllable, hence satisfying *CODA. Candidates (b) and (c) however commits a fatal violations of *CODA and SSP and are disqualified immediately.

g) Voiceless alveolar plosive /t/

The voiceless alveolar plosive /t/ occurs as syllable onset or coda in the input form. In words where /t/ forms a syllable coda /ɪ/ is inserted to create open syllables as exemplified in the following data:

Shirt → Shaati /ʃa:tɪ/

Biscuit →Mbichikuiti /ᵐbɪcɪkuɪtɪ/

Tableau (29) shows the emergence of optimal output against a set of competing candidates:

Input: Shirt /ʃɜ**:t/**

Output: Shaati /ʃa:tɪ/

Tableau 29: Ø →[ɪ] /VC_____#

/ʃɜ**:t/**	SSP	*CODA	MAX-IO	DEP-IO	ONSET
(a) [ʃtɪ]	*!		*	*	
(b) [ʃa:t]		*!			
(b) [a:tɪ]			*!		*
☞ (c) [ʃa:.tɪ]				*	

The input structure has a coda. To create an open syllable, since Kitigania ranks *CODA higher, /ɪ/ is epenthesized after the voiceless alveolar plosive /t/. From the three candidates generated by GEN, candidate (c) is the most harmonic, since it violates the lowest ranked constraint. Candidates (a) and (b) loses because they violate the highest ranked constraints.

However, when /t/ forms a CC consonant cluster, /u/ is epenthesized to break the cluster e.g.

Truss →Turaachi /tuɾ a:cɪ/

Tray → Turee /tuɾ ɛ:/

The choice of the optimal candidate in the phonetic environment that motivates /u/ epenthesis after the voiceless alveolar plosive /t/ is presented in tableau (30) below:

Input: Tray /treɪ/

Output: Turee /tuɾ ɛ:/

Tableau 30: Ø → [u] /C_ CV

/treɪ/	SSP	*CODA	*DIPH	MAX-IO	DEP-IO	IDENT [RHOTIC]	*COMP
(a) [treɪ.]			*!				*
(b)[ɾ tuɛ:]	*!					*	*
(c) [tuɾ :]		*!			*	*	
☞(d)[tu.ɾɛ:]					*	*	

/u/ epenthesis makes the input a disyllabic word. In addition it breaks the consonant cluster at the onset. Among the four candidates generated by GEN, candidate (d) emerges the winner for violating the lower ranked constraints. Candidates (a) (b) and (c) commit fatal violation and are quickly eliminated.

Epenthesis of /e/

Epenthesis of /e/ is prompted by presence of the velar plosive /k/ in a consonant cluster. This can be presented by the following rule:

Ø → [e] /$C_{[k]}$ _ CV = Epenthesize [e] to break consonant cluster containing /k/

This is exemplified in the following loanwords:

Crown → Kĩrauni /keɾ aɔnɪ/

Cream → Kĩrimu /keɾ ɪmu/

However, we noted that the occurrence of /k/ as syllable coda in the input form prompts insertion of /i/ to create an open syllable. Therefore, insertion of /e/ serves to break consonant clusters that are impermissible in Kitigania.

The following is constraint analysis of this phenomenon:

Input: Clutch /klʌʧ/

Output: Kirachi /keɾ acɪ/

Tableau 31: Ø → [e] /C[k] _ CV

/klʌʧ/	SSP	*CODA	LINEARITY	*LATER	MAX-IO	DEP-IO	*COMP[ONS]
(a) [kɾ a.ɪ]					*!	*	*
(b) [ɾ ka.cɪ]	*!		*				
(c) [klʌʧ.]		*!					*
d.☞[ke.ɾa.cɪ]						*	

In this example, the insertion of /e/ breaks the consonant cluster at the onset of the input, consequently satisfying *COMPLEX. The GEN generates a set of four candidates. Candidate (d) is chosen by EVAL as most optimal, winning against candidate (a). The other candidates, candidate (b) and candidate (c), violate the fatal constraints and are immediately disqualified.

Epenthesis of [u]

From the data collected, we established that the insertion of /u/ to break consonant clusters and to create open syllables, as presented in the following rules:

a) Ø → [u] /#____ (CCV) = Insert [u] to break consonant clusters

b) Ø →[u] /VC_____# = Insert [u] to create open syllables

However, [u] epenthesis is not random. It is prompted by the presence of the following consonants:

a) Pre-nasalized bilabial plosive /ᵐb/

The voiced bilabial plosive /b/ is substituted with a prenasalised bilabial plosive /ᵐb/:

/b/ → [ᵐb]/#_____ (As observed in Tableau 2)

In instances where /b/ occurs in a CC cluster at syllable onset, the vowel /u/ is inserted to break the cluster, as shown in the following loanwords:

Brake → Mburiki /ᵐbuɾ ɛːkɪ/

Blouse → Mburaũchi /ᵐbuɾ aɔcɪ/

When a consonant cluster is broken, the output form adds another syllable. The adapted word can be analyzed in OT as follows:

Input: Brake /breɪk/

Output: Mburiki /ᵐbuɾ ɛːkɪ/

Tableau 32: Ø → [u] /C$_{[b]}$ _ CV

/breɪk/	SSP	*CODA	*OBSVOI	MAX-IO	DEP-IO	IDENT [NAS]	IDENT $_{[RHOT]}$	*COMP $_{[ONS]}$
(a) [l ɛ:kɪ]				*	*!		*	*
(b)[ɾ ^{m}bɛ:.kɪ]	*!					*		*
(c) [breɪk.]		*!	*					*
☞(d)[^{m}bu.ɾɛ:.kɪ]					*	*		

As observed in the previous section, the /b/ is changed to /^{m}b/ in a case of phoneme hardening. In addition, /u/ is inserted to break the onset consonant cluster in the input structure. /ɪ/ is also epenthesized to avoid violating the marked constraint *CODA. As a result, the adapted word ends up with three syllables. From the candidate set generated by GEN, candidate (d) emerges the winner because it only violates the lower ranked constraint. Candidates (a), (b) and (c) are dismissed for violating the fatal constraints.

b) Voiceless alveolar plosive /t/

When the voiceless alveolar plosive /t/ occurs in a CC cluster at syllable onset, the illicit phonotactics is adapted by the insertion of the vowel /u/. This can be represented by the rule:

Ø → [u] /C$_{[t]}$ _ CV = epenthesize /u/ to break consonant clusters containing /t/

The rule is exemplified in the following loanwords:

Trailer → Turera /tuɾ ɛɾ a/

Tray → Turee / tuɾ ɛ:/

The adapted loanword can be analyzed in OT as follows:

Input: Trailer /treɪlə/

Output: Turera /tuɾ ɛɾ a/

Tableau 33: Ø → [u] /C[t] _ CV

/treɪlə/	SSP	*CODA	*DIPH	LINEARITY	MAX-IO	DEP-IO	IDENT [RHOT]	*COMP [ONSET]
(a) [treɪlə]			*!					*
(b)[tuɾ.ɛɾ a]		*!				*		
(c)[ɾ tɛ.a]	*!			*	*			*
☞d[tu.ɾɛ.ɾ a]						*		

Candidate (d) is chosen by EVAL as the optimal candidate. Insertion of /u/ breaks the consonant cluster at the onset of the input structure, hence avoiding violation of the constraint *COMPLEX. Candidates (b) and (c) lose because they violate the higher ranked constraints.

c) Voiced bilabial fricative /β/ : Ø →[u] /VC[β]_____#

When the voiced bilabial plosive /b/ occurs as a coda in monosyllabic words, /b/ is substituted with a voiced bilabial fricative /β/ in a case of lenition. Additionally, the voiceless bilabial plosive is substituted with the voiced bilabial fricative /β/ in a case of voicing as well as weakening. This is exemplified in the following data:

Kĩĩbu /keeβu/ Cap

Kĩrabu /keɾ aβu/ Club

Chubu /cuβu/ Soup

The occurrence of /β/ as coda of the input form prompts insertion of /u/ to create an open syllable. OT analysis of the adaptation of loanwords that manifest this phenomenon can be presented in the tableau below:

Input: Soup /su:p/

Output: Chubu /cuβu/

Tableau 34: Ø → [u] /VC$_{[p]}$ _____#

/su:p/	*CODA	* P	*OBSVOI	MAX -IO	DEP-IO	IDENT [COR]	IDENT [VOI]	IDENT [CONT]	*COMP
(a) [cβu]				*	*!				*
(b) [su:p.]	*!	*							
(c)[cu.bu.]			*!		*				
☞d.[cu.βu]					*				

Candidate (c) is chosen by EVAL as the optimal candidate. Insertion of /u/ creates an open syllable since closed syllables are impermissible in Kitigania. This avoids the violation of the markedness constraint of *CODA. Candidate (a) has an unacceptable consonant cluster, hence violates the constraint *COMPLEX. Candidate (b) loses because it violates the highest ranked constraint, *CODA.

Epenthesis of [o]

In cases where /b/ → [m], there is tendency to insert /o/ after [m]. Therefore, [o] epenthesis is conditioned by presence /m/ in a consonant cluster. Hence:

Ø → [o] /$C_{[m]}$ — CV

In a rare case, we observed the voiced bilabial plosive /b/ being substituted by a bilabial nasal /m/ in a case of consonant weakening. This was observed in the adaptation of the following loanwords:

Blanket → Mũringiti /moɾ eŋgetɪ/

Brush → Mũrachi /mɔɾ acɪ/

The adapted loanword can be analyzed in OT as follows:

Input: Blanket /blæŋkɪt/

Output: Mũringiti /moɾ eŋgetɪ/

Tableau 35: Ø → [o] / $C_{[m]}$ —CV

/blæŋkɪt/	SSP	*CODA	*OBSVOI	MAX-IO	DEP-IO	*COMP [ONSET]
(a)[ɾ e.ŋge.tɪ]				*	*!	*
(b)[ɾme.ŋge.tɪ]	*!					*
(c)[mo.ɾe.ŋget]		*!			*	
(d)[blæ.ŋkɪt]		*!	*			*
☞(c)[mo.ɾe.ŋge.tɪ]					*	

From the candidate set generated by GEN candidate (d) is chosen by EVAL as the winner because it does not violate the markedness constraints in Kitigania namely,

SSP and *CODA. Candidate (a) and (b) are automatically disqualified for violating the two markedness constraints.

Epenthesis of [ɔ]

From the data collected, we established that the lateral /l/ is substituted with the flap /ɾ /. When the lateral /l/ occurs as the coda of the syllable in the input word, /ɔ/ is inserted after substituting /l/ with /ɾ / to create an open syllable. This can be represented by the following rule:

Ø → [ɔ] /VC [ɾ] _____#

This is demonstrated in the data below:

Diesel → Ndichũrũ /ⁿdɪcɔɾ ɔ/

Towel → Taurũ /tauɾ ɔ/

As such, insertion of /ɔ/ is prompted by the presence of the flap /ɾ / as the coda in mono or disyllabic borrowed words. The tableau below presents the constraint ranking of the adapted form:

Input: File /faɪl/

Output: Baero / βaɛɾ ɔ/

Tableau 36: Ø → [ɔ] /VC [ɾ] _____#

/ faɪl/	*CODA	*LATER	MAX-IO	DEP-IO	IDENT [LAB]	IDENT [RHOT]
(a) [ɛɾ ɔ.]			*	*!		*
(b) [feɪl.]	*!	*				
(c) [βaɛɾ .]	*!			*		*
☞(d)[βaɛ.ɾ ɔ]				*		*

Insertion of /ɔ/ creates an open syllable, thus avoiding violation of the markedness constraint *CODA. Candidate (c) wins against candidate (a) and (b) because it does not violate the higher ranked constraints.

We also noted that in loanwords that have the back lower vowel /u/ preceding coming the lateral /l/ in the input, /u/ is inserted at the end to avoid coda. The following loanwords exemplify this phenomenon:

School → Chukuru /cukuɾu/

Stool → Chuturu /cutuɾ u/

Tableau 37: Ø → [u] /VC _____#

/stu:l/	SSP	*CODA	*LATERAL	MAX-IO	DEP-IO	*COMP [ONSET]
(a) [ctu.ɾ u]	*!				*	*
(b) [stu:l]	*!	*	*	*		*
(c) [cu.tuɾ]		*!			*	
☞ (d) [cu.tu.ɾ u]					**	

There is a CC cluster and a coda in the input. The two are illicit in Kitigania. The lateral /l/ is substituted with the flap /ɾ / before inserting /u/ at the end to create an open syllable. Insertion of /u/ is condition by the presence of another /u/ in the structure.

From the candidate set generated by GEN, candidate (d) wins against candidate (a) because it does not violate the higher ranked markedness constraints in Kitigania. Candidates (b) and (c) are disqualified immediately for committing fatal violations.

Indeed, from the data discussed in 4.7.1, epenthesis is the most frequent phonological process in the adaptation of English loanwords in Kitigania. Out of the seventy two loanwords analyzed, thirty two underwent vowel epenthesis in their adaptation. This accounted for 32% of the total loanwords analyzed. Considering that Kitigania proposes open syllables and it does not allow consonant clusters and codas, epenthesis is critical in the modification of English syllables so that they can be accommodated in Kitigania. Although our discussion on consonant substitutions did not delve into epenthesis, it was evident that loanwords which demonstrated phoneme feature changes had their syllable structures adjusted by way of inserting a vowel either to avoid coda or break consonant clusters.

4.3 Noun Class Morpheme Insertions

Some English loanwords in Kitigania can be analyzed in terms of prefixed noun class morpheme markers. These loanwords include: “tank”, “book” and “coat”, as exemplified in the following examples:

Tank → Itangi /etaᵑgɪ/

Coat → Igoti /eɤɔtɪ/

Notably, there is insertion of the noun class morpheme marker {e} which morphologically serves to allow the borrowed word to fit in noun class 7/8. Other than prefixation of {e} morpheme, there is voice assimilation where the voiceless palatal plosive /k/ is substituted with the voiced velar fricative /ɤ/ in the loanword "Igoti" /eɤɔti/ (Coat). Further, the vowel /i/ is epenthesized after the voiceless alveolar plosive /t/ to create an open syllable. In OT analysis of morpheme prefixation, we introduce the markedness constraint:

EDGEMOST [L, e] = the morpheme {e} is located at the left edge; is a prefix

(McCarthy and Prince, 1993)

The following is the OT analysis of this phenomenon:

Input: Coat /kəʊt/

Output: Igoti /eɤɔtɪ/

Tableau 38: Ø → [e] /#____ CV

/**kəʊt**/	*CODA	EDGEMOST [L, e]	MAX-IO	DEP-IO	IDENT [VOI]	ONSET
☞ a.[e.ɤɔ.tɪ]				*		*
b. [e.ɤ.ɔt]	*!					*
c.[mo.ɤɔ.tɪ]		*!				
d. [kəʊt.]	*!	*				

The input undergoes two processes in the course of adaptation. First, the initial consonant /k/ in the input is substituted by velar fricative /ɤ/. This is a case of voice assimilation as discussed in section 4.6. Secondly, /i/ is inserted to create an open syllable, since *CODA ranks higher in Ki-Tigania. The optimal candidate (c) satisfies the higher ranked constraint, *COMPLEX and *CODA. Candidate (a) and (b) incur fatal violations and are quickly disqualified.

In the adaptation of the word ‘tank’, the voiceless palatal plosive /k/ is substituted with the voiced palatal plosive /ᵑɡ/. By acquiring hormoganic nasal features, the velar nasal /ŋ/ acquires plosive features to become /ᵑɡ/. To create an open syllable, /i/ is inserted at the end. The following is an OT analysis of the adaptation of this loanword in Ki-Tigania:

Input: Tank /tæŋk/

Output: Itangi /etaŋgɪ/

Tableau 39: Ø → [e] /#____ CV

/tæŋk/	*CODA	EDGEMOST [L, e]	MAX-IO	DEP-IO	IDENT [VOI]	ONSET
☞ a. [e.ta.ᵑɡɪ]				*		*
b. [e.ta.ᵑɡ]	*!					*
c. [ko.ta.ᵑɡɪ]		*!		*		
d. [tæŋk.]	*!	*				

/b/ → [Ø] / _____

From the data collected, one of the loanwords indicated that the voiced bilabial plosive /b/ is deleted in the adaptation:

Input: Book /bʊk/

Output: Ĩuku /euku/

Tableau 40: /b/ → [ø] / _____

/bʊk/	*CODA	EDGEMOST [L, e]	DEP-IO	MAX-IO	IDENT [VOI]	ONSET
☞a. [e.u.ku]				*		*
b. [euk]	*!			*		*
c. [au.gu]		*!		*	*	*
d.[bʊk]	*!	*				

The voiced bilabial plosive /b/ is deleted after the insertion of noun class morpheme /e/ at the initial position of the word. After deletion of /b/, the word is left with only a single consonant phoneme. Candidate (a) is chosen as the most optimal candidate because it satisfies the highest ranked markedness constraint *CODA.

4.4 Summary of Findings

In section 4.6 and 4.7, we have discussed various phonological and morphological processes that come into play in the adaptation of English loanwords in Kitigania. These processes include: assimilation, consonant hardening and weakening, consonant substitution, consonant elisions, epenthesis, and noun class morpheme insertions. The following table presents the frequency of the realization of each of the phonological and morphological processes discussed:

Table 4.1 Phonological Processes Responsible for Adaptation of Loanwords

Phonological Process	**No. of Loanwords Analyzed**	**Frequency**
a. Assimilation	19	28.3%
b. Consonant Hardening & Weakening	13	19.4%
c. Consonant Deletion	6	9%
d. Vowel Epenthesis	23	34.3%
e. Phoneme substitution	3	4.5%
f. Noun Class Morpheme Insertion	3	4.5%
TOTAL	67	100%

From the above table, epenthesis is the central phonological process in adaptation of English loanwords in Kitigania. Mwihaki (2001) observes that V epenthesis is the most productive strategy for the preservation of preferred structure in adaptation of English words in Gikuyu. While discussing morpho-phonological changes of borrowed words from English to Lubukusu (another Bantu language), Waitera (2014) notes that vowel insertion is motivated by changes in noun classes as well as phonological conditioning. In Kitigania, vowel epenthesis is purely obligated by phonological conditioning. Therefore, epenthesis serves to create open syllables as well as rid Kitigania of structures with consonant clusters. These phonological processes do not operate on the data in mutual exclusiveness. Indeed, a phonological process that resolves an illicit syllable structure and one that deals with the phoneme features to make them compatible with Kitigania will be operational on a given datum at the same time. For instance, the rule /z/ → [c] in the case of devoicing, demands that the loanword 'chaichi' /caɪcɪ/ (size) take /i/ epenthesis in order to create an open syllable. As such, epenthesis affects most of the loanwords with syllable structures foreign in Kitigania, as opposed to other feature change processes that affect selected phonemes. This explains why the frequency of epenthesis stands at 35.4%. In addition, homorganic nasal assimilation is a central phonological process in Bantu languages (Iribe, 2011). Considering that the phonemic inventory of Kitigania has a number of prenasalised phonemes, some of which replace foreign phonemes in Kitigania, the frequency of assimilation at 28.3% is higher than the other phonetic adaptation processes.

In the phonetic adaptation of English loanwords in Kitigania, some foreign phonemes are substituted with their closest counterparts in Kitigania. Hyman (1970) argues that sounds are borrowed on the basis of phonemic approximation. According to him,

during adaptation, the recipient language selects phonemes which come closest to the foreign phonemes. This study agrees with his assertion. While discussing morpho-phonological changes of borrowed words from English to Lubukusu, Waitera (2014) observes that substitution of certain consonants is necessary for the borrowed word to fit into the phonology of the borrowing language. From the data, we noted that the phonemes that replace English phonemes in adaptation deviate from their English counterparts in particular features. The following table presents the English phonemes that have been discussed under phoneme substitution, the Kitigania phoneme substitute on adaptation and the feature in which the two deviate:

Table 4.2 Summary of Variations in Consonant Substitutions

	Faithful Output	Deviant Output	Deviant Features
a. Labial dental fricative /v/	0	β	Place
b. Lateral /l/	1.4%	ɾ	Manner
c. Bilabial plosive /b/	0	m, ^{m}b or β	Manner
d. Alveolar plosive /d/	0	^{n}d	Manner
e. Alveolo-palatal affricate /ʤ/	0	^{n}ʃ	Manner
f. Voiced labial dental fricative /z/	0	c	Voice/ Manner
g. Bilabial plosive /p/	1.4%	^{m}p β	Manner
h. Velar plosive /g/	0	^{ŋ}g	Manner
i. Palatal alveolar stop /c/	4.5%	ʃ	Manner

As noted earlier, most of the phonemes that are not found in the phonemic inventory of Kitigania were substituted with their closest counterparts in Kitigania. However, the data revealed that Kitigania speakers did not substitute some foreign phonemes on rare occasions. Hence, there are only three phonemes that demonstrate faithful realization between the input and the output, namely: voiceless bilabial plosive /p/ at

1.4%, and the voiceless palatal stop /c/ at 4.5%. The higher percentage of occurrence of the voiceless palatal plosive /c/ is attributable to its occurrence in free variation with the voiceless postalveolar fricative /ʃ/. As such, it was possible to realize /c/ in loanwords where /ʃ/ is used. Much as the voiceless bilabial stop /p/ does not occur in Kitigania, its occurrence is attributable to easy configuration of articulatory organs in its production.

4.5 Variability in Modification of English Loanwords in Kitigania

The third objective of this study was to determine the extent to which the adapted English loanwords in Kitigania deviated from the source words which were used as input in our analysis in sections 4.1.1 to 4.2. By this juxtaposition, the study is able to ascertain the degrees of adaptation of English loanwords in Kitigania.

There are various factors that can be cited as possible reasons for the variability of English loanword in Kitigania. The following table shows the factors responsible for variation in modification of loanwords and their frequencies:

Table 4.3: Variations in Modification of Loanwords

Reason for Variability	**Frequency**
a) Differences in phonemic inventory	31.7%
b) Differences in syllable Structure	51.7%
c) Incorrect Transmission (Mispronunciation)	8.3%
d) Morphological Considerations	8.3%

In table 4.13, although the frequency of some factors that cause the adapted loanword to vary from source word is higher, the variation is not considerable. From the data

presented on section 4.1.1 -4.2, we noted that the output structures varied moderately from the input structures. For instance, Kambũũni /ka^{m}boːnɪ / for ‘company’ and Lũũni /lɔːnɪ/ for ‘loan’. Here, the adapted loanword does not vary so much as to be unrecognizable from the source word. The fact that our data comprised phonemic loans only would suitably explain this observation.

In our phonetic analysis of English loanwords in section 4.1.1 - 3, we noted that adaptation of phonemic loans involve systematic mapping of foreign phonemes to their closest counterparts in the borrowing language. For instance, the voiced labial dental fricative /v/ which does not occur in Kitigania is replaced by the voiced bilabial fricative /β/ in the loanword ‘bataraicha’ /*βataɾ aɪca*/ (fertilizer). The two phonemes differ in the manner features, hence the semblance of the adapted form with the source word.

Further, the OT analysis of English loanwords in Kitigania explained the minimal variability between the adapted English word and the source word. In OT analysis, two types of constraints interact to produce the adapted structures. These are the markedness constraints and the faithfulness constraints. Much as markedness constraints ensure well-formedness of the borrowed word in the borrowing language, faithfulness constraints ensure that there is greater semblance between the adapted form and the input.

Another factor that may account for the varied modification of phonemic loans is transmission of the loanword by second speakers of English, as illustrated in the loanword ‘ĩĩrio’ /eːɾ iɔ/ (aerial) and ‘pencho’ /pɛncɔ/ (pencil) in section 4.1.3. Second speakers of English will approximate to the native speakers’ pronunciation. However, it is still inevitable to miss a few sounds in their speech. The deletion of the final

lateral /l/ in the word ‘pencho’ /pɛnsɔ/ (pencil) is a suitable case of mispronunciation of the word by speakers of Kitigania. Hence, the word is transmitted to Kitigania speakers for adaptation without the final segment.

Morphologically, we noted that insertion of noun class morpheme markers resulted to prefixation in some 7/8/ noun class morpheme markers in Kitigania. For instance, the three loanwords that are adapted by prefixation of e morpheme; namely, ‘Itangi’ /etaŋgi/ (tank), “Iuku” /euku/ (book) and ‘Igoti’ /eɤɔti/ all belong to the category of nouns that form their plural by addition of “ma” morpheme. Prefixation is therefore motivated by morphological considerations of the borrowing language and hence the greater variability.

It is worth noting, however, that studies on languages where words are adapted according to meaning rather than pronunciation, (Miao, 2005) have shown greater departure of output structures from the input. For instance, the word “Microsoft” is adapted as “small-soft” (Miao, 2005)

4.6 Conclusion and Implications

Essentially, this research discusses the phonological and morphological processes that account for the realization of adapted English loanwords in Kitigania. The findings indicate that adaptation of English loanwords in Kitigania involves three processes, namely: mapping of foreign phonemes to closest Kitigania counterparts, the resolution of foreign syllable structures and prefixation of noun class morpheme markers.

Although Peperkamp & Dupoux (2003) argue that adaptation operates on the basis of perception only, Jacobs & Gussenhoven (2000) observe that adaptation is also

production-oriented. The findings of our study confirm that the study of loanword adaptation processes is multidimensional. As such, the variability in the degree of adaptation depends on both the perceptibility of foreign consonants and the production of phonemes. For instance, while the substitution of foreign phonemes with their closest counterparts in Kitigania, points to the contribution of perception in adaptation of English loanwords in Kitigania, the idea that adaptation is also production-oriented (Jacobs & Gussenhoven, 2000) can be supported by such phonological processes as consonant deletion and epenthesis. The explanation therefore would be that Kitigania speakers lack the capacity to produce particular foreign segments, and are hence delete them. Vowel epenthesis would also suggest inability of Kitigania speakers to produce particular phonotactic structures.

Generally, from our discussion on the phonotactic adaptation of English loanword in Kitigania, we can conclude that Kitigania prefers vowel epenthesis in the adaptation of foreign syllable structures. 34.3% of the data analyzed indicate vowel epenthesis, while 9% indicate phoneme deletion. However, phoneme substitutions and phonotactic adjustments do not operate on loanwords in mutual exclusiveness. For instance, in the adaptation of the word ‘blanket’ and ‘brush’ /b/ → [m] before the vowel /o/ and /ɪ/ are epenthesised to break consonant clusters ans avoid coda respectively.

Finally, the study confirms that OT can be used to explain the adaptation of English loanwords in Kitigania. The data confirms that faithfulness to manner features in phoneme substitutions precede place and voice features. Our study concurs with Kenstowicz (2003) observation that manner features are marked.

4.7 Chapter summary

We have presented and analyzed data in this chapter. Phonological processes that account for the adapted English loanwords in Kitigania are discussed. These processes include: assimilation, consonant hardening and weakening, consonant deletion, and vowel epenthesis. Insertion of noun class morpheme markers, which is a morphological process, has also been discussed. The data has been analyzed against the principles of Optimality Theory, and the choice of the optimal candidate explained. Finally, the variability in the degrees of adaptation has been discussed and the implications of the findings discussed.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter gives a summary of the major findings and conclusion. It also gives recommendations and suggestions for areas for further research on Kitigania, a dialect of Kiimeru language.

5.1 Summary of the Major Findings

This study has established that Kitigania has extensively borrowed from English. Consequently, the data we collected comprised of English loanwords which are adapted in Kitigania. These loanwords can be categorized under different semantic domains, namely: religion, administration, agriculture trade, technology, dressing and others. The findings of our study indicated that borrowing is prompted by semantic gaps that arise from introduction of new culture to Kitigania speakers by the English imperialists which was occasioned by the colonial experience. Indeed, the introduction of Christianity, modern methods of farming, trade and technology to the traditional structure of the Atigania necessitated borrowing.

The findings of our study show that restructuring of English loanwords in Kitigania is at two levels: phonological and morphological. The segmental and phonotactic adjustments of the loanwords are not random. The study established that there are six phonological processes that apply in the adaptation of the loanwords. These are: assimilation, consonant hardening, consonant weakening, consonant deletion, vowel epenthesis and noun class morpheme insertions.

While examining phonetic adaptation of English loanwords in Kitigania, our findings indicated that phoneme substitutions are phonologically constrained so that adequate phonetic/phonological similarity between the foreign input and the Kitigania output can be achieved. However, insertions of noun class morphemes marker was also noted in the adaptation processes. English phonemes that are foreign to Kitigania are replaced by their closest counterparts in Kitigania. The treatments of nine English phonemes in the adaptation of English loanwords have been investigated in our study, and the changes analyzed. We noted that the substitute phoneme in adaptation of English loanwords in Kitigania belongs to the same natural class with the one it substitutes. For instance, the voiced bilabial plosive /b/ is replaced by the prenasalized bilabial plosive /^{m}b/. The two phonemes have the same place features. For labial-dental fricative /v/; the palatal alveolar affricate /ʤ/ and the bilabial plosives /b/ and /d/, manner features and voicing features precede the place features. However, in the adaptation of voiced fricative /z/ and the lateral /l/ the place features precede the voicing features in the OT analysis.

In discussing the handling of English syllables in adaptation of loanwords, the study examined adaptation of English loanwords in Kitigania at the phonotactic level. Phonotactic analysis of English loanwords in Kitigania involved manipulation of English syllable structures so that they can be compatible with Kitigania syllable structure. English syllable contains consonant clusters at the margins. Kitigania on the other hand presupposes open syllables and disallows consonant clusters. Therefore, adaptation processes had to deal with these scenarios. Our findings indicated that vowel epenthesis was central in breaking complex consonant clusters. In addition, vowels were epenthesized to create open syllables where the borrowed word had a

closed syllable. The findings also indicated that consonant deletion was productive in creating open syllables.

Our study also sought to examine the extent to which the adapted English loanword in Kitigania varied from the donor word. Our findings indicated that English loanwords in Kitigania are essentially phonemic loans. Therefore, the variability observed in the adaptation of English loanwords in Kitigania results from the differences in both the segment inventory and the phonotactic structure of Kitigania and English. Whereas English has closed syllables, Kitigania has open syllables. Further, there are segments in English that have no equivalent in Kitigania. Variability in modification of loanwords arises from the phonemic gaps which exist in Kitigania as well as the inconsistencies in the pronunciation of second speakers of English during the transmission of the loanword. However, considering that phonemic loans are borrowed according to pronunciation, the adapted loanwords did not vary considerably with the English donor words.

5.2 Conclusion

This study confirms that variation in the modification of English loanwords in Kitigania is brought about by two factors, namely differences in phonological structure between English and Kitigania; and transmission of the loanword from the source to Kitigania speakers. In addition, the study established that phoneme substitution, vowel epenthesis and segment deletion are key processes in the adaptation of English loanwords in Kitigania.

5.3 Recommendations

This research has presented a scientific analysis of loanword phonology and morphology in Kitigania, a dialect of the Kiimeru language. The basis for the various modifications that English loanword undergoes in order to be accommodated in Kitigania has been examined. In such a study, the issue of there being more than one pronunciation for one adapted lexical item is pertinent. For instance, 'mbaimbo' / ^{m}bai^{m}bo/ and 'Baibo' /βaiβo/ are acceptable realizations of the English word 'Bible'. We therefore, recommend that researchers and language developers endeavor to determine which of the forms of the adapted loanword should be taken as standard.

Secondly, the phenomenon of cluster tolerance evident in the data presented in this study raises questions as to whether there can be a linguistic theory that can adequately address the underlying motivations for such cluster tolerance incidences. We recommend that language researchers use a theory that takes into account both the sociological and the phonological motivations of adapting English loanwords in Kitigania, so as to offer adequate explanations for this phenomenon.

Finally, we recommend that the findings of this study be used by upcoming journalists in media houses that air their content in Kitigania to determine the treatment that they should accord to terminologies referring to new technological or cultural concepts which they encounter along their duty to inform their Kitigania-speaking audience.

5.4 Areas for Further Research

This study has examined the treatment accorded to English lexical items coming into Kitigania. However, given that the motivation for borrowing is sociolinguistic in nature, the study has not delved into age and gender variables in borrowing. Nonetheless, loanwords are used by both men and women who speak Kitigania. As

such, an inquiry into the phenomenon of borrowing and adaptation of borrowed words from a sociolinguistic perspective can be beneficial in shedding more light on the observed variability in the integration of loanwords. Therefore, there remains an opportunity for empirical study on the differences between attitudes of both men and women as regards the use of English loanwords in Kitigania. While explaining variability of adapted English loanword from the input form, the study has only glimpsed at the role of transmission. The study established that inconsistencies in the transmission of the English loanwords in Kitigania can also explain the variations in loanword adaptation. As such, one may further interrogate Kitigania speakers' role in the transmission of English loanword, and the subsequent impact on the modification of English loanwords in Kitigania.

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APPENDICES

Appendix I: Research Data (2017)

	Loanword	Gloss
1.	Aĩrio /aeɬiɔ/	Aerial
2.	Mbanki /ᵐbaŋkɪ/	Bank
3.	Baibo /βaɪβo/	Bible
4.	Mbishobu /ᵐbɪʃɔβu/	Bishop
5.	mũrĩngĩti /mɔɾeŋgetɪ/	Blanket
6.	Mbulaũchi /ᵐbulaocɪ/	Blouse
7.	Mpoomu /ᵐpɔ:mu/	Bomb
8.	Ĩuku /euku/	Book
9.	Mburĩki /ᵐbuɬekɪ/	Brake
10.	Muraci /m/ɔɬaʃɪ/	Brush
11.	Mbasi /ᵐbasɪ/	Bus
12.	Kantii /kanti:/	Canteen
13.	Kaandi /ka:ⁿdɪ/	Card
14.	Chĩnji /ʃeᶯɟɪ /	Change
15.	Chanja /caᶯɟa/	Charger [phone charging device]
16.	Koraachi /kɔɬacɪ/	Chorus
17.	Kirĩchimachi /keɬecɪmacɪ/	Christmas
18.	Igoti /eɤɔtl/	Coat
19.	Kambũũni /kaᵐbo:nɪ/	Company
20.	Koburũ /kɔβuɬɔ/	Corporal
21.	Kĩrĩndĩti /keɬɛⁿdetɪ/	Credit [air time]
22.	Kĩrauni /keɬaɔnɪ/	Crown
23.	Karabati /kaɬaβatɪ/	Culvert

24. Ndiiru /ⁿdi: ʃɔ/	Deal
25. Ndichũrũ /ndɪcɔʃɔ/	Diesel
26. Bĩbute /βeβute/	Fifty
27. Baero /βaɛʃɔ/	File
28. Baini /βaɪnɪ/	Fine
29. Bataraicha /βataʃaɪca/	Fertilizer
30. Ngea /ŋgɛa/	Gear
31. Ngirendi /ŋgeʃɛⁿdɪ/	Grade (Exotic breed of cattle)
32. Nguruneti /ŋguʃunetɪ/	Grenade
33. Ngita /ŋgɪta/	Guitar
34. Eneri /ɛnɛʃi/	Henry
35. Ũtĩri /oteʃi/	Hotel
36. Njaketi /ɲɟa:kɛtɪ/	Jacket
37. Njeti /ɲɟɛ:tɪ/	Jet
38. Njaanji /ɲɟa:ɲɟɪ/	Judge
39. Njagi /ɲɟaɤɪ/	Jug
40. Lũũni /lo:nɪ/	Loan
41. Machini /macɪnɪ/	Machine
42. Misheni /meʃɛnɪ/	Mission
43. Naironi /naɪʃɔnɪ/	Nylon
44. Pencho /pɛⁿcɔ/	Pencil
45. Mbisha /ᵐbɪʃa/	Picture
46. Borithi /βɔʃiðɪ/	Police
47. Riboti /ʃiβɔtɪ/	Report
48. Rimũũti /ʃɪmo:tɪ/	Remote control device
49. Reberendi / ʃɛβɛʃɛⁿdɪ /	Reverend
50. Raba /ʃaβa/	Rubber (Eraser)
51. Rura /ʃuʃa/	Ruler

52. Chakaramenti	Sacrament
53. Cukuru /ʃukuru/	School
54. Ciiti /ʃiːtɪ/	Sheet
55. Chikati /cɪkatɪ/	Skirt
56. Chilibasi /cɪlɪβasɪ/	Slippers
57. Chuturu /cutuʃu/	Stool
58. Chitubu /cɪtɔβu/	Stove
59. Itangi /etaŋgɪ/	Tank
60. Terebĩchoni /tɛrɛβeʃonɪ/	Television
61. Turera /tuʃɛʃa/	Trailer
62. Turee /tuʃɛː/	Tray
63. Turaachi /tuʃaːcɪ/	Truss
64. Yunibachĩtĩ / junɪβacete/	University
65. Bindio /βiːndɪɔ/	Video

Appendix II: Interview Schedule

Nikwenda kumenya buura mariitwa yara Kitiania kiyukitie kuuma kiri Gicunku yatamukawa nikenda yakara ta ya Kitiania. Nontu bwa itumi kii, nikwenda kwaria na uuwe iguru ria rwaria rwa Kitiania rwa o ntuku o ntuku ikwithirwa uuwe nwicii kitiania bweya.

(In order to obtain English loanwords in Kitigania and establish the production of the adapted loanword, I would like to talk to you about your day-to-day use of Kitigania language because you are a competent Kitigania speaker.)

Section A: demographic information

Question: Inaa ukaraa?
(Where do you live?)
Subject: _____
Question: Uuwe uciaririi guntu kuu?
Are you originally from this place?
Subject: _____

Section B: Kitigania language competence

Question: Uuwe nwaariirie Kitinia kiri mugambo ywaku ywa mbere?
(Is Kitigania your first language?)
Subject: _____

Question: Nutumaira Kitiana maita ya maingi rwariene rokuu?
(How often do you speak Kitigania?)
Subject: _____
Question: Kwaumbika no umenye ciuwo bitumikaa kiri Kitiania indi bitiithairwa biri na kaumo kabio kiri Kitiania?
(Can you identify any word(s) that you always use in your conversation yet the word comes from another language other than Kitigania?)
Subject: _____

Question: Kwirio waiciithira ki rwaria rokuu ukiendaa kuuwa untu na Kitiania indi wacia kiuwo kia Kitiania kira gikuumba kuuwa bwongwa bura weendaa?
(Have you ever found yourself in a situation where in your conversation when you did not find a Kitigania word to express what you wanted to mean?)
Subject: _____
Question:Gukethiirwa uuwe uraiciithira antuune gukari uwu, ibii bwarairiia na i ciuwo birikuu watumiire?
(If the answer to the above is yes, what was the situation and which word(s) did you use instead?)

Subject: _____

Question: Ukithwanakia mantu ya Ciuwo biu watummiire, nukwona yaka biumbikia kuithirwa na kaumo ka bio kiri Gicunku?
Do you think these words have any connection with English language?
Subject: _____

Question: Ukethirwa witite kiathonee, ugaikua mucore okuu akimenyethania mutana oowe kiri acoree banku aitumaira kiuwo 'uu i mboisi ekua' niatia umenya nibuo buongua akuwa?
(Suppose you attend a party and hear your friend introducing his son as 'this is my mbois'. What would you understand them to be saying?
Subject: _____

Section C: Examples loanwords

Question: gukethirwa uuwe utaiciithira antuune a utumira riitwa riti ria Kitiania rii, o mbiira riitwa ria Kitiania rira umba utumira kuweta mantu ya:

(If you have never found yourself in a situation that required you to use a word which is not in Kitigania vocabulary, which Kitigania word would you use for the following scenarios:)

A: verbs

i. Muntu akuringire thimu na aiite mbere ya uyukia, uriuwa niatia akubwithia?
(Somebody beeps you on your phone, what do you say he/she has done?) Subject: _____

ii. Nukwenda mucore waku agwikiira stampu maratasine, niatia ukauwa nibue ukwenda akubuithiria na Gitiania?
(Suppose you want your colleague who holds an office to stamp some documents for you, what do you ask him to do in Kitigania:)
Subject: _____

iii. Weta kiri munene ukuu ukiendaa awikiira kirore baruene ira waewa ikenda wita ruutha, niatia wamwira akubwithirie witumaira Kitiania?
(You would like your boss to sign your letter allowing you to leave your work place, what do you ask him to do in Kitigania:)
Subject: _____

B: Nouns- Technology/ education

iv. Niatia tuitaa na Kitinia gantu kara gekairwa iguru ria nyumba ikenda terebiconi ikoona bweya?
(What do you call in Kitigania the antenna that boosts reception in your television?)
Subject: _____

v. Rira muntu etaa cukuru ya yunibasiti rii, tuuwaa agwita kubwithia kosi, kosi rii tumiita atia na Kitiania?
(What is the Kitigania equivalent of the word "course" as used in institutions of higher learning:)
Subject: _____

vi. Kuombika no umenye ciuwo bitumikaa rira tukuaria mantu ya thimu kana ngari, kana nkinya bira bitiithairua biri bia Kitiania? O mpa ciuwo biu.

(You might know words which normally feature when discussing phones or even vehicles and which are not originally Kitigania vocabulary. Please give me examples of such words.)

Subject: i. -

ii. -

iii.-

iv. -

v. -

Dressing

vii. Niatia twitaa na Kitiania nguo iraa twicianguraa nio ruui twarikia kweria?

(What do you call in Kitigania the garment used to wipe your body after taking a shower:)
Subject: _____

viii. Iratu biria twikaira twitite kweria biitawa atia na Kitiania?

(What do you call in Kitigania the footwear worn while going to the bathroom:)
Subject: _____

ix. Niati twitaa na Kitiania nguo ira twikunikaira nio utuku tumamii ikenda tutigaikue mpio?

(What do you call in Kitigania the garment you cover yourself with at night to keep warm:)
Subject: _____

Farming

x. Niatia twitaa na Kitiania icembe kira kioarwa itinkene ikenda kirima?

(What do you call in Kitigania the object fixed to a tractor which ploughs the land:)
Subject: _____

xi. Niatia twitaa na Kitiania mboleo ira tuuraa ndukene ya into bia kimera ikenda yatuma muthetu yugia na maciara yameya?

(What do we call in Kitigania the substance bought in agro chemical shops that we add to soils to make them fertile:)
Subject: _____

xii. Niatia twitaa kithanduku kira kibwithitue na maratasi ya maumu buru kira tutumaira wiika into?

(What do we call in Kitigania the container made of hard papers used for packing items:)
Subject: _____

Religion

xiii. Mariitwa yaa niya Kubatithua kana iya Kitiania yara mwana eyawa aciarwa?

(Are the following names surnames/middle names or baptismal names?)

Ngirioni-

Biribo-

Enderea-

Paoru-

Peteru -

Subject: _____

xiv. Uuwe nuitaa kanisene?

(Do you go to church?)

Subject: _____

xv. Kukethirua nuitaa kanisene, uraikua ciuwo bikiwetua i mutumiria bira waikirue ti bia Kitiania. O mbira ciuwo biu waikirue ti bia Ki-Tiania.

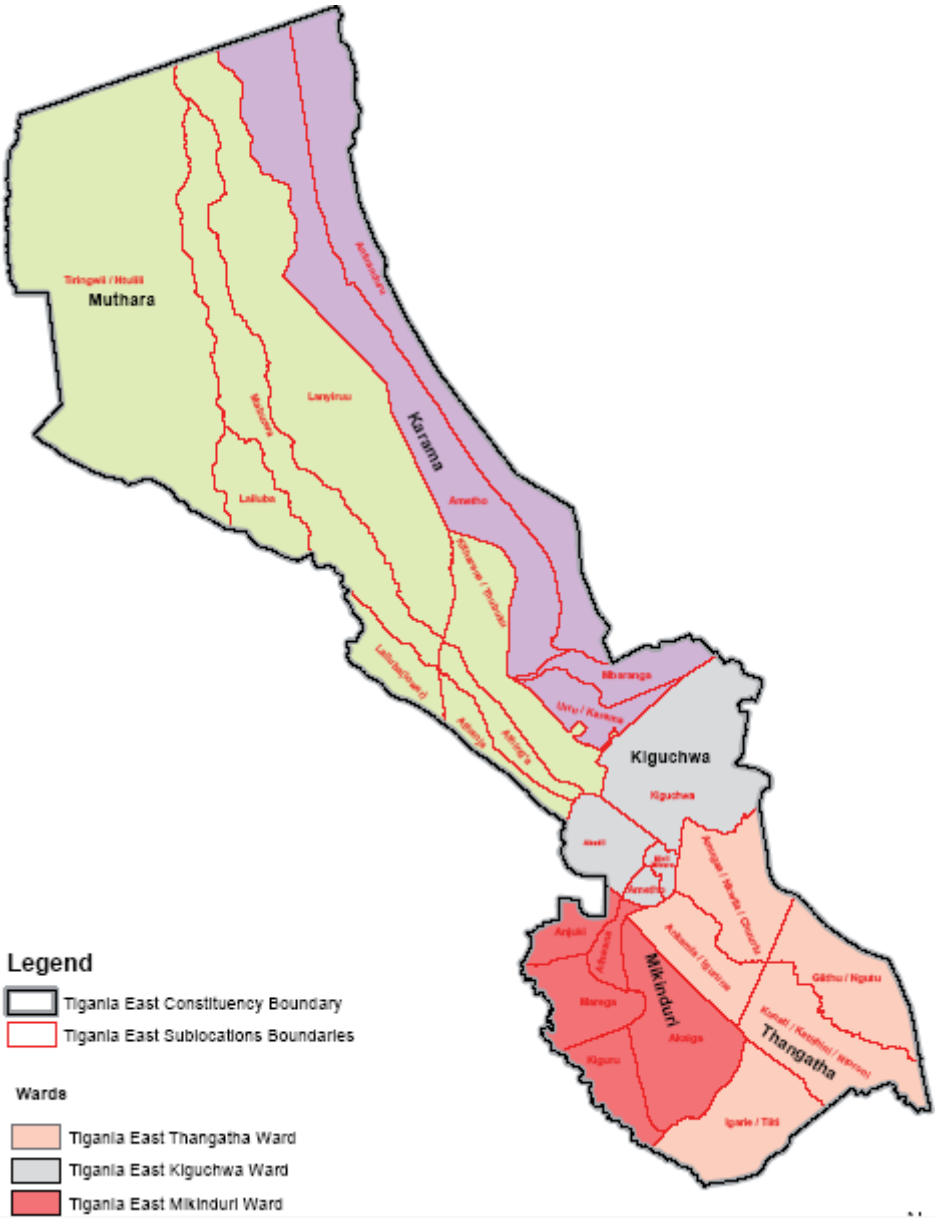
(If you go to church, you must have heard the preacher mention words which you understood not to belong to Kitigania. Please give me some of those words you identified as not belonging to Kitigania.)

Subject: _____

IBWEYA MUNO NONTU BWA WICIEYANA NA KWEYANA MAITA YAKU UNCOKERIA CIURIA BIAKWA

(THANK YOU VERY MUCH FOR YOUR TIME AND COOPERATION).

Appendix III: Map of Research Area



Appendix IV: Research Permit

THIS IS TO CERTIFY THAT:
MR. HERMAN MURIIRA KIREA
of KENYATTA UNIVERSITY, 0-10400
NANYUKI,has been permitted to conduct
research in *Meru County*

on the topic: *ENGLISH LOANWORDS IN KI-TIGANIA: A MORPHO-PHONOLOGICAL ANALYSIS ON DEGREES OF ADAPTATION*

for the period ending:
21st November,2017

Permit No : NACOSTI/P/16/95246/14415
Date Of Issue : 23rd November,2016
Fee Recieved :Ksh 1000

.....
Applicant's Signature

.....
Director General
National Commission for Science, Technology & Innovation

CONDITIONS

1. You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit.
2. Government Officer will not be interviewed without prior appointment.
3. No questionnaire will be used unless it has been approved.
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.
5. You are required to submit at least two(2) hard copies and one (1) soft copy of your final report.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice

REPUBLIC OF KENYA

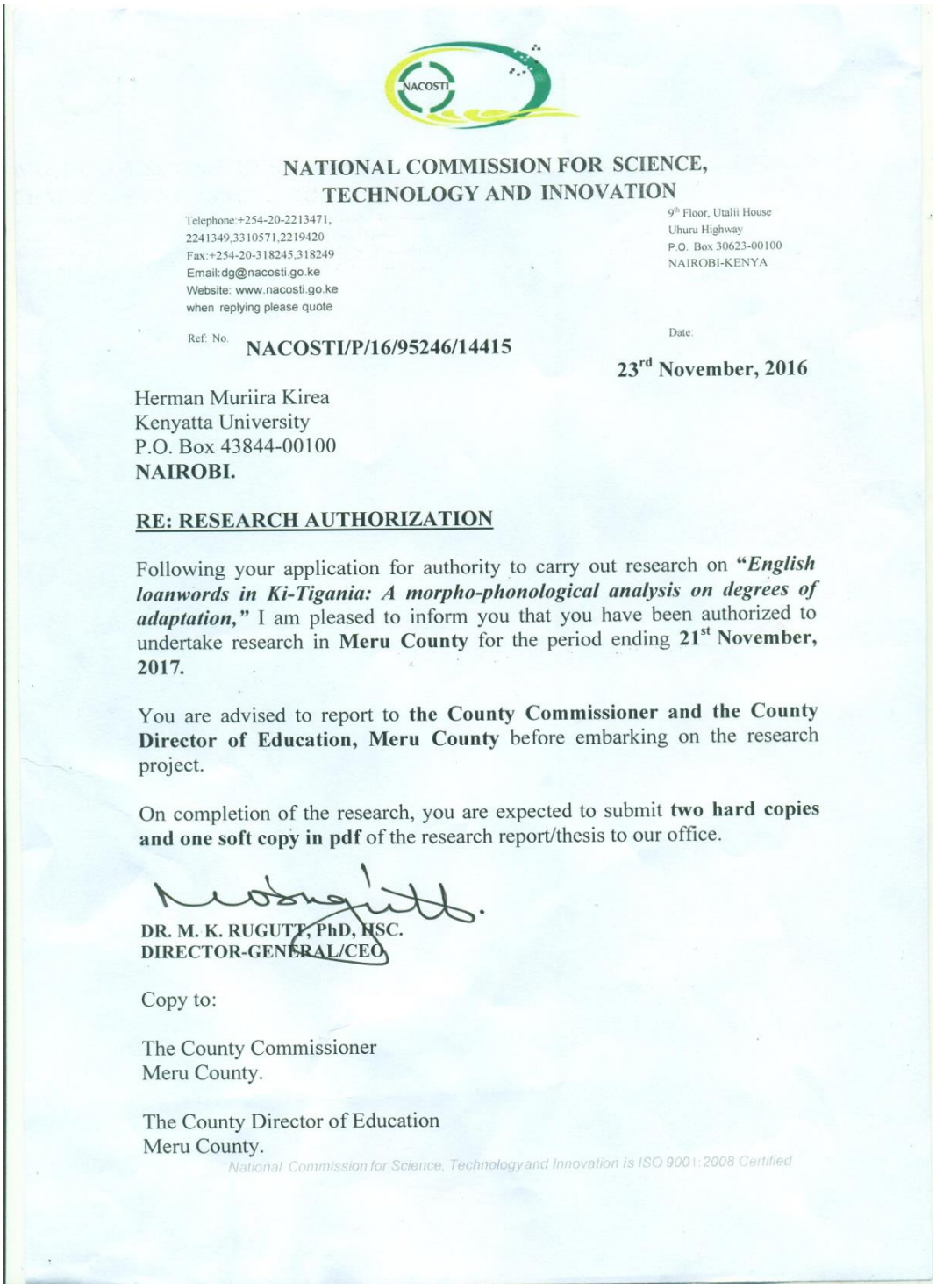
National Commission for Science, Technology and Innovation

RESEACH CLEARANCE PERMIT

Serial No.A 12030

CONDITIONS: see back page

Appendix V: Research Authorization Letter



NATIONAL COMMISSION FOR SCIENCE,
TECHNOLOGY AND INNOVATION

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9th Floor, Utalii House
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P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. NACOSTI/P/16/95246/14415

Date: 23rd November, 2016

Herman Muriira Kirea
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"English loanwords in Ki-Tigania: A morpho-phonological analysis on degrees of adaptation,"*** I am pleased to inform you that you have been authorized to undertake research in **Meru County** for the period ending **21st November, 2017.**

You are advised to report to **the County Commissioner and the County Director of Education, Meru County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

DR. M. K. RUGUTT, PhD, HSC.
DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Meru County.

The County Director of Education
Meru County.

National Commission for Science, Technology and Innovation is ISO 9001:2008 Certified