THE ADAPTATION OF ENGLISH WORDS IN TONGA

BY

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DECLARATION

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APPROVAL

This dissertation of **KAPILI CHIGALI** as be approved as fulfilling the requirements or partial fulfilment of the requirements for the award of the degree of Master of Arts in Linguistic Science by the University of Zambia.

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ABSTRACT

This study is an investigation into '*The Adaptation of English Words in Tonga'*. The study is carried out from within the optimality theoretical framework, a linguistics model developed as a direct response to a "*conceptual crisis at the centre of phonological thought*" concerning the role of output constraints. The theory provides that the phonological system of the recipient language is encoded as a system of constraints, and that these constraints account for how the donor word is adapted when adopted. As it has often been argued, when words are adopted into a new language, they are not accepted in their original form or shape, but rather restructured to conform to the articulatory and grammatical features of the receiving language. This study thus focuses on among other things the processes the Tonga language uses to adapt words from the English language that are phonologically different.

The study collected a corpus of three hundred and fifty five words from both secondary and primary sources. Out of these, one hundred and thirteen were used for analysis – sixty three being in line with objective one and fifty with objective three. In relation to the behaviour of vowel sounds in the adaptation of English words in Tonga, the study has revealed that vowel length in Tonga, the recipient language, is not always determined by the phonetic length of the corresponding vowel in English- the source language. In other words, there is lack of predictability on when there is likely to be compliance to vowel lax-tense dichotomy on account of any lexical or phonological feature of the source word. There behaviour thus can be accounted for in three different ways: (i) a long vowel in the English word is not always retained as a long vowel when the word has been nativised or adapted in Tonga; (ii) some English words with long vowels will have them maintained at exactly the same level in Tonga. (iii) some of the [**–** tense**]** words in English turn out to be [**+** tense] in Tonga.

In relation with objective three, fifty words were analysed and the study has established that three phonological processes of **insertion**, **deletion** and **feature change** are employed by the Tonga language as adaptation strategies for the phonologically different words from English. The study has further revealed that insertion is the most dominant or productive process in the adaptation of English words in Tonga as compared to deletion and feature change. The main reason for this is that insertion, particularly the one involving vowels, is a strategy used by many languages to attain open syllables and also to break illicit consonant clusters that are not allowed in most Bantu languages.

Keywords*: Adaptation, Constraints, Tonga, Insertion, Deletion, Feature Change, Vowel Sound.*

DEDICATION

This research work is dedicated to Beloved Late Wife and Best Friend Gloria Matimba Mazovu Chigali who passed on as I neared completion of this project.

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Above everything and everyone else, Honour and Glory be to God Almighty for bringing me thus far in my academic pursuit. I particularly thank Him for keeping me in perfect health throughout my study period and for blessing me with the intellectual capabilities I used in accomplishing this project.

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List of Abbreviations and Symbols

CON	Constraint
EVAL	Evaluator
GEN	Generator
OT	Optimality Theory
TV	Television
ZNBC	Zambia National Broadcasting Corporation

→	is produced as/is realized as
*	Violation
!	Serious or Fatal Violation
☞	Optimal Candidate
[ ]	Phonetic Transcription
/ /	Phonemic Transcription

CHAPTER ONE
INTRODUCTION

1.1 Introduction

The chapter introduces the study: '*Adaptation of English words in Tonga'*, which is investigated from within the theoretical construct of optimality, a theory propagated by the linguists Prince and Smolensky in 1993. The study seeks to show how exactly English words get adapted to the Tonga's lexicon as it relates to the articulatory system either by replacing the foreign phoneme with one of its own that is phonetically similar, or retaining the phoneme from the source language (English), thus acquiring a new phonemic distinction through borrowing. Principally, the study is motivated by the fact that few (or, no known) studies have comprehensively discussed Tonga loanwords or adoptives within the broader theoretical framework of Optimality.

The study is further motivated by the recognition that in almost all the languages of the world, words have at least one of the three origins: they are either inherited from an ancestral language; are a product of internal innovation or they are loanwords- which happens to be a production of external innovation (Vansina, 1990). The third aspect of loanwords or adoptives happens to be the focus of this study. And because both the type and number of phonemes in the phonemic inventory or the phonological systems of languages differ from one language to the other, the borrowing language requires having some strategies for dealing with foreign sounds that are not present in its system. According to Usher and Simpson (1994), in such a situation, the recipient language normally pursues one of the two strategies: it will either replace the foreign phoneme with one of its own that is phonetically similar, or retain the phoneme from the source language thus acquiring a new phonemic distinction through borrowing. These authors further argue that with the first strategy, the loanword is usually completely nativised so much that the speaker may be unaware of the origin of the word; while in the second strategy, the loanword may retain a non-native flavour because of the presence of the borrowed phonemes. The above argument or description is but a case of lexical adaptation.

The chapter commences by providing background information to the study, background to the Tonga language, history of lexical borrowing and the contact between Tonga and English. Thereafter, it gives the statement of the actual problem under investigation, the purpose and explaining the rationale for the study. The chapter also spells out the specific objectives for the

study, the research questions, the significance, the scope and theoretical framework adopted for the study. It ends by providing the operational definitions and finally spelling out how ethical issues were considered.

1.2 Background

The documentation of language contact situations has always been of special interest to linguists from time immemorial the world over. Many linguists from as far back as around 1881 have written on language contact situations. Out of such documentations, one of the main sociolinguistic assumptions that has been drawn is that no language is adequately sufficient in meeting its linguistic requirements and thus exists in isolation without any influence from other languages (Sankoff 2001:110). Thus, it is from such an assumption that Kashoki (1999:1) categorically states that "all languages are inadequately equipped to express concepts, ideas or objects embedded in an alien culture when confronted with a completely different sociocultural environment or context." He further argues that this is usually the case because each language is developed to express only or primarily the concepts and material objects that are applicable to its own native culture. Kashoki (1999) illustrates this point by giving an example of the internationally acclaimed language of English. He argues that despite the enormity of its rich and extensive vocabulary, English also often fails to express even the simplest of ideas and the commonest of objects peculiar to its culture. For example, the concept of *kusunsa* in Tonga (that is, scooping relish from a plate with a lamp of nshima), may not have an equivalent in English because such an act does not exist in the English culture or because *nshima* is not part of the English culutre. Therefore, the argument here is that a language lacking a particular concept is most likely going to borrow the word associated with it upon coming into contact with a culture in which it is a well- established lexical item. Henceforth, to fill up such a linguistic gap or *critical lexical lacunae*, each language needs to borrow from other languages and this brings us to the concept of loanwords or adoptives.

The view that languages are lexically inadequate, as shared by Kashoki (1999), is exactly the same observation made by Haspemath and Tadmor (2009:55) when they state that "no language is entirely devoid of loanwords regardless of how much it tries to close itself up from external influence." Haspemath and Tadmor (2009) further asset that even the classical languages of Chinese, Sanskrit, Arabic, Greek, and Latin which have been highly restrictive have not been spared from such influences of having to borrow from other languages. For example, borrowed words have entered written and spoken Chinese from many sources.

Throughout China, Buddhism has introduced words from Sanskrit and Pali with a good example being '***nirvana***' (pronounced as **nirvānā** and written as **涅槃** in Chinese). Based on this scenario therefore, one big concluding question that can be advanced is that if such restricted classical languages afore-mentioned have been penetrated by a great many borrowed words, what more of Zambian languages which are neither classical nor puristic? Henceforth, it is not surprising that most of the Zambian languages (both majority and minority) are replete with numerous numbers of loanwords or adoptives. For example, this study listed three hundred and fifty five suspected English words in Tonga (not exhaustively though), while that of Kangwa's (2008) '*Loanwords in Bemba'* listed a staggering nine hundred (900) loanwords. And this is not only peculiar to Zambian or African languages, but rather all the languages of the world including the internationally acclaimed language, English. It can also be further predicted that such figures will keep on growing as advancements in science and newer technologies are likely to continue bringing in more new concepts, ideas and objects in the linguistic world respectively. No wonder, Sapir (1921) concluded that it would be very difficult to find and point to a language that is completely isolated and free from any form of influence especially after being in contact with another, least of all among the primitive peoples. Of course, this study does not regard any peoples as primitive.

However, according to Kangwa (2007), socio-cultural factors have always played a key role in the resistance to borrow by certain languages. For example, if the recipient language is perceived to be prestigious, such as French and Spanish, and it is the object of much loyalty, then the aspect of borrowing from other languages is reduced or restricted. And the language that is known for such is French. The French are so proud of their language that they feel it can express almost all ideas and concepts without necessarily having to borrow from other languages. Therefore, because of such positive feelings, many French people are resistant to borrowing and opt to use their own French terms which they feel are more appropriate.

Besides prestige, the other factor behind restricted borrowing is puristic attitudes towards certain languages (Danesi and Rocci, 2009). And to maintain the purity of their languages, some countries have developed official policies for language preservation. This can mean doing all or any of the three things: discouraging or even forbidding the use of loanwords in official meetings and documents; establishing an official language policy taskforce that coins new words; and encouraging the spread of the country's language outside the national boundaries. France again, is known for its strong stance on official language policies. For example, the

Academic Francaise oversees the evolution of the French language by its work on the French dictionary (Danesi and Rocci, 2009). Therefore, the French government has set up committees (taskforces) to propose French words in the place of foreign words. Laws too have been put in place to prohibit the use of foreign terms in official documents and even in advertising.

1.2.1 Background to the Tonga Language

Tonga, the language under investigation, also known as Chitonga, is a Bantu language predominantly spoken by the Tonga people of the Southern Province of Zambia. To a limited extent, the language is also spoken in some parts of Kabwe rural, Chibombo, Chisamba and Mumbwa Districts of the Central Province of Zambia. As a Bantu language, Tonga, M64a is classified under Group 60 of Zone M together with Lenje, M61; Soli, M62 and Ila, M63 by Guthrie (1948). It is also said to have two other dialects of Toka, M64b and Leya, M64c (ibid).

Tonga is one of the major lingua franca in Zambia and together with Bemba, Lozi, Nyanja, Kaonde, Lunda and Luvale constitutes the seven regional official languages (cf. Manchishi 2004; Simwinga 2006; Nkolola-Wakumelo 2013; Jimaima 2016; Banda & Jimaima 2017; Jimaima & Banda 2019a; Jimaima & Banda 2019b). The regionalisation was done after independence, when the Zambian government promulgated seven languages as regional official languages out of the 72 dialects as languages of wider communication by province and by district, in case of North Western Province. It should be succinctly pointed out that these are also the languages that are used in the public media and the educational domains besides English. For example, Tonga as a language is taught as a school subject at both primary and secondary levels in the entire Southern Province and some parts of Kabwe rural, Chisamba, Chibombo and Mumbwa respectively (cf. Jimaima & Simungala 2019).

According to the Zambia 2010 census of Population and Housing, Tonga speakers were estimated to be at 11.4 % of the total population of slightly over 11 million people. The Tonga people are also believed to have been the earliest inhabitants or Bantu settlers of Zambia-having arrived around the Iron Age period (Hopgood, 1992).

Tonga, or Chitonga, is said to have developed as spoken language and was not put into the written form until the arrival of the missionaries in the area in the eighteenth century. It is often argued that the language was not standardised, and speakers of the same dialect may have different spellings for the same word once put in the written context. For example, the same name of people may be written with either an ‘H’ or ‘S’ as in ‘Hangoma and Siangoma’

depending on the brand of the language spoken in which part of Southern Province (Moonga and Water, 1997). And according to Nkolola (1997), the two major identified brands or dialects of Tonga are that of Valley Tonga and Plateau Tonga- though the exact number of clusters and the details under each cluster are not known. As the name suggest, Valley Tonga is spoken in the Zambezi Valley, with catchment area extending to places such as Siavonga, Gwembe and Sinazongwe. On the other hand, Plateau Tonga is on the plateau and includes such places as Kalomo, Choma, Monze, Pemba and Mazabuka respectively (Jimaima, 2014; Jimaima 2008).

1.2.2 Contact between Tonga and English

Language contact has been part of the social fabric of everyday life for hundreds of millions of people the world over. As already alluded to under 1.2, out of such contact situations, one of the main sociolinguistic assumptions that has been drawn is that no language will ever exist in isolation without any influence from other languages. Where such contacts extend over a long period of time, the most expected sociocultural linguistic results is the extensive borrowing of words from one language to another. And out of such language contact situations, certain factors are usually seen as playing a major role in the process of borrowing. In the Zambian context, Kangwa (2007) in his study of "*English-Derived Words in Bemba*" outlines trade, missionary activities, colonial administration and labour migration as the four major earliest contact factors that are responsible for the process of borrowing. In other words, these periods represent times of major cultural contact between English and Bemba speakers and those speaking other languages. The factors that Kangwa outlines in his study are not only peculiar to Bemba but to Tonga as well. However, in the case of Tonga, contact with English was largely through missionary activities, which also came along with the introduction of Western Education and the English language during the colonisation of Zambia by Britain than with trade and labour migration. That notwithstanding, it cannot be denied, however, that the labour migrations to Zimbabwe and South Africa were as critical in injecting foreign words into Tonga language as other factors. In fact, few would deny the fact that lexical borrowing continues to date. Therefore, it is through such factors that more words have probably been borrowed from English by Tonga and of course other Zambian languages than from the other internationally acclaimed languages such as French, Latin and others.

In terms of missionary activities, Snelson (1974) states that by the early eighteenth century missionaries from the Paris Mission, Jesuit Fathers, Seventh Day Adventist Church, Bethren in Christ, Church of Christ, Primitive Methodist and many others set up many missionary

stations in the Southern Province of Zambia. For example, some of the most prominent stations that were opened early enough are Chikuni by the Jesuits Fathers under Joseph Moreau in 1905 in Monze District, Rusangu by the Seventh Adventist Church under an American William Anderson in 1905 and Livingstone by the Church of Christ in 1905. Others are Macha by the Brethren in Christ in 1906 and Mapanza in 1911. From such contacts and through evangelism, the Tonga language borrowed a great many church-based words which the missionaries had brought with them as part of the programme of converting the native population to Christianity. Therefore, we find a remarkable representation of imported religious terms such as '***Bbaibbele***' for '**Bible**', '***Pasika***' for '**Passover**' including Bible Christian names such as '***Johani***' for '**John**', '***Petelo***' for '**Peter**' and '***Davida***' for '**David**'. It should be mentioned here that most words considered as English words were also borrowed from other languages. For example, 'Bible' has its origin from Greek. That notwithstanding, the study will treat all such cases as of English origin, ignoring the complex etymology associated with them.

Along the broad rubric of Christian activities by the missionaries is also formal education, which, in its western form can probably be singled out as the most dominant of the forces in the process of loanwords we are talking about here. In fact, Snelson (1974) argues that it is missionaries of the Christian church that brought modern education to Northern Rhodesia-Southern Province inclusive. This was the case because at each mission station, there was also a school whose main aim besides teaching Christianity was to teach the natives elementary education mainly reading, writing and arithmetic. The argument here is that formal education has relied so much, from its earliest days of introduction in the country, on the single dominant language of English as the principal medium of instruction. This has subsequently played a key role in exposing learners to the vocabulary of this foreign language, thereby causing them to transfer to their own languages much of the English (lexical) repertoire that they acquire. This therefore accounts in large part to the comparatively large volume of words derived from English that have now been permanently incorporated into the Tonga language.

Today, science and technology seem to be the leading areas towards the huge adoption of loanwords among many languages. In other words, scientific and technological terminologies are one of the main reasons why there are so many loanwords and foreign words being adopted today. For example, in technical fields such as computer science, one wonders whether and how long languages such as Tonga will ever find equivalent words for '*hardware*', '*internet' 'flash disc' 'website* '*software*', '*mouse'* and '*simcard*' to mention but just a few. Therefore, keeping constantly updated with the unstoppable developments of science and new

technologies, especially in the twenty first century, will not be an easy task and languages will need to find solutions for the technical terms that come with these latest developments. This, too will be one of the major linguistic challenges facing many languages because there will always be words of difficult or even dubious translation. Thus, we can easily conclude that as long as technological advancement continue in certain parts of especially the western world, the adoption and use of loanwords will forever remain a very common practice.

2.2.3 Natural Classes of Sounds in Tonga and English

Although this is not a comparative study, this section of the dissertation presents the phonemic charts of consonants and vowel sounds of the two languages under investigation- English and Tonga. This has been deemed necessary because, in order to see nativisation or adaptation at segmental level, it is important to provide some observable and marked differences between Tonga and the source languages (English) from which words are borrowed. The absence of certain phonemes means that Tonga is forced to adopt some words in their form rather than nativizing them. This rendered such words to be marked on the scale of markedness. For example, in Tonga, such phonemes as /r/, / θ/, /ð/, /q/ among others do not exist. Therefore, for a sound such as /r/, Tonga would only use the lateral /l/, which is phonologically similar to it. Henceforth, it is for this reason that words such as '***r***eport/facto***r***y' get adapted as '***l****i*pooti/fakito***l****i*', with the trill being realised as a lateral. Further, this has also been found necessary because these are the symbols that will be used in the analysis of data as we account for how English words get adapted in Chitonga. The presentation starts with the phonemic charts of English consonants and vowels, then later those for Chitonga respectively.

	Bilabial	**Labio-Dental**	**Dental**	**Alveolar**	**Post-Alveolar**	**Palatal**	**Velar**	**Glottal**
Plosives	**P b**			**t d**			**k g**	
Fricatives		**f v**	**θ ð**	**s z**	**ʃ ʒ**			**H**
Affricates					**tʃ dʒ**			
Nasals	**M**			**N**			**ŋ**	
Laterals				**L**				

Approximants				**R**		**J**		

Figure 3: ***English Consonant Chart***

Rouch, 2009:52

When gathered, these are all of the consonants that we have described into a single chart. Altogether, the main English consonants are twenty four (24) in number. Below too are the Primary Cardinal Vowels of the English language.

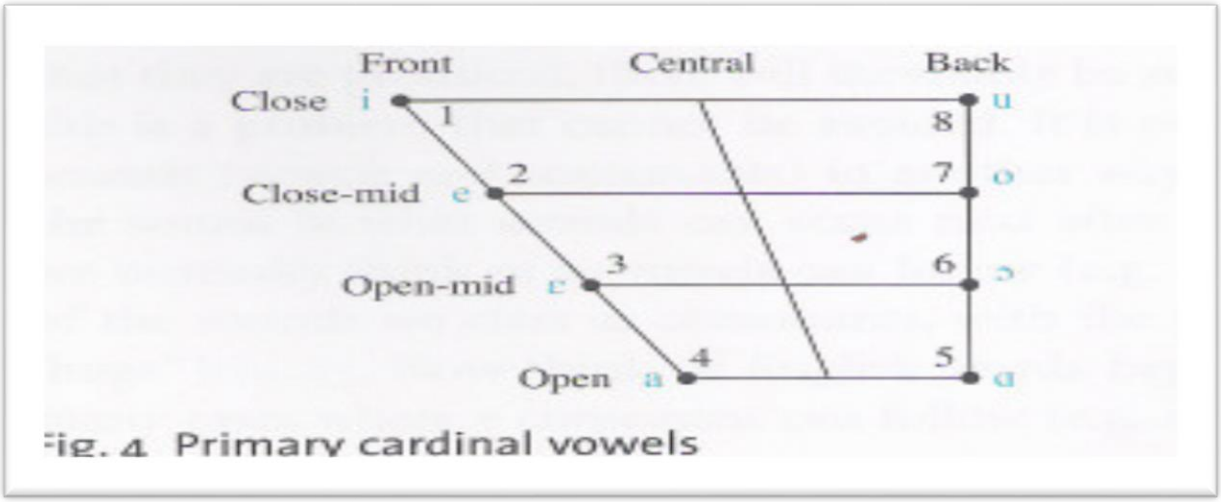

Fig. 4 Primary cardinal vowels

Figure 4: ***English Primary Vowels***

Rouch, 2010:12

The consonant and vowel charts of the Tonga language are as presented below too:-.

	Bilabial	**Dental**	**Alveolar**	**Post-Alveolar**	**Palatal**	**Velar**	**Labio-Velar**	**Glottal**
Plosives	**p b**		**t d**			**k g**		
Fricatives	**β**	**f v**	**s z**	**ʃ ʒ**		**ɣ**		**h ɦ**
Affricates								
Nasals	**M**		**n**		**ɲ**	**ŋ**		
Laterals			**l**					

Approximants					**j**		**w**	

Table 2: ***Phonemic Chart of Tonga Consonants***

Source: ***Haan'gombe 2015:3***

As it can be noted, the Tonga Phonemic chart has no inter-dentals for the reason being that there are no words requiring the "**th**" [**θ/ð**] combination of sounds as it is in English. Additionally, in Tonga, there are only five (5) primary vowels as shown in the figure below:-

Tongue Height	**Front**	**Back**
High	**i**	**u**
Mid	**e**	**o**
Low		**a**

Figure 6: ***Phonemic Chart of Tonga Vowels***

2.2.4 Letter Combinations at Orthographic Levels in Tonga and English

Having demonstrated that the two languages under investigations have different phonemic inventories through the presentation of the phonemic chats of consonant and vowels, this section further gives some of the observable and marked difference between Tonga, the recipient language, and English, the source languages at orthographic level. Orthographically, English has certain letter combinations which are not realised at orthographic level in Tonga during the process of adaptation. For example, an orthographic representation of the entry '*paraffin*' will not be realised as carrying the double 'f' in Tonga, just as it is in its transcribed form /*pærəfɪn*/. In Tonga therefore, this entry gets realised at orthographic level as '*palafini*', without double 'ff'. Additionally, the letter 'r', which is said not to exist in the Tonga orthography, is realised as 'l'. Similarly, the word 'address' /*ədres*/ will not be realised with a double 'dd' in Tonga at the orthographic level. Subsequently, in the adaptation process of this entry, at the phonemic level, the consonant cluster to be broken with insertion will not be dealing with the double /dd/ but /dr/, where the /u/ is inserted. Generally, a sequence of letters such as 'ss', 'ff', 'dd', 'tt', 'zz' in English has no effect on the adaptation process of English

words in Tonga. It is important to underscore here that what is observable at orthographic level in English has limited effect at orthographic level in Tonga.

1.3 Statement of the Problem

The phenomenon of adopting words from other languages has been occurring throughout the existence of humanity. Arguably, it still occurs today and will continue to occur at all times in all the languages of the world across all nations as long as intercultural contact and communication continues too. Undoubtedly too, this penetration or injection of foreign words from other languages will always play a significant role in supplementing and enriching the vocabularies of the host languages. However, how adopted words adapt in the recipient languages is what has been at the centre of research by linguists. Thus, unlike other studies done on English loanwords in Zambian languages such as Bemba by Kangwa (2007) and Kashoki (1999), this particular study focuses on examining the adaptation of English words in Tonga. This has been deemed necessary in order to test the theoretical position that in a situation of language contact, when words are adopted, they are not accepted in their original form or shape, but rather restructured to conform to the articulatory and grammatical features of the recipient language thereby (whence) becoming indistinguishable from native words (Denesi 1984:110). Therefore, this study too seeks to explore deep into the Tonga words of English origin. In other words, the study seeks to determine how English words are altered to conform to the phonological canons of the Tonga language. Therefore, stated as a question, the problem under investigation is "How do English words adapt to the articulatory and grammatical canons of the Tonga language?"

1.4 Aim or Purpose of the Study

The main aim and purpose of this study is to account for the adaptation of English words in Tonga within the Optimality Theory lenses.

1.5 Objectives of the Study

The study has the following specific objectives-:

i) To compile a comprehensive list of English words in Tonga.

ii) To unravel the behaviour of vowel sounds in the adaptation of English words in Tonga.

iii) To account for the adaptation of English words in Tonga using the Optimality Theory.

1.6 Research Questions

The study attempted to answer the following questions;

i) What words in Tonga can be traced to have been borrowed from English?
ii) What is the behaviour of vowel sounds in the adaptation of English words in Tonga?
iii) How does the adaptation of English words in Tonga get accounted for using the Optimality Theory?

1.7 Significance of the Study

According to Apel and Muysken (1987), most African languages have had contact with European, Asian and other African languages mainly as a result of colonialism, trade, migration and technological advancements. Such intercultural contact situations have always generated a lot of interest amongst linguists as they try to find out how indigenous languages have gone on to adapt new lexical items in their vocabulary. Therefore, the significance of this study lies in the expansion of the body of knowledge drawn from different perspectives, on the continued research of the loanword phenomena in African languages in general and Zambian languages in particular. On the Zambian front, it is anticipated that through this study, many other Zambian linguist will be provoked to carry out similar researches on many other Zambian languages- including the minority ones.

1.8 Scope of the Study

Essentially, this study focuses on the adaptation of English words in Tonga using the Optimality Theory. Therefore, its scope is limited only to the corpus of the identified Tonga lexical items believed to have been borrowed from the English Language.

1.9 Operational Definitions

The following are the key terms and their operational definitions as used in this study:-

Adaptation: The process of change in order to suit a new or particular environment.

Candidate : A possible realisation of an input in which the optimal form is chosen from.

Constraint : A structural requirement that may either be satisfied or violated.

Donor Language: A language from which a loanword has been borrowed (Haspelmath 2009:37).

Evaluator : The function that evaluates all the possible candidates and select the optimal output.

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

Generator : The function that generates a set of possible candidates analyses, based on the universal well-formedness constraints.

Input : The original word in the donor language before it is phonologically modified

Loanword : A lexical item derived from another language.

Markedness : A constraint that requires that output forms meet some criterion of structural well-formedness.

Output : The nativised word in the receiving language

Receiving/Recipient Language: The language into which a loanword has been borrowed (Haspelmath 2009:37).

1.10 Ethical Consideration

The researcher ensured that before embarking on data collection, clearance was obtained from the University of Zambia Ethics Committee. With this, the researcher ensured that all issues of ethical confidentiality and privacy of personal rights of participants were protected. Their full consent was thus sought before participating in the study after the objective of the study was explained verbally. Finally, all the references made to relevant authorities were acknowledged to avoid plagiarism.

1.11 Structure of the Dissertation

This dissertation is made up of six chapters, with each one of them addressing specific areas of research concerns. Chapter One provides a background to the enquiry and begins by describing Tonga, the language under study and its first contact with the internationally acclaimed language of English. It then proceeds to give the statement of the problem and spells out the purpose of the study, objectives of the study and the research questions meant to address the specific objectives. The chapter concludes by outlining the significance of the study, the scope of the study and provides a summary of issues discussed in the chapter.

The second chapter deals with literature review. The chapter sets off by providing a brief background to the study of English words in Tonga and the reasons for borrowing. It later reviews available literature which is of direct relevance to the study of the loanword phenomenon in Zambia, Africa (especially of Bantu languages), and the world at large. The review of related literature is meant to place the current study into perspective with similar studies so as to enrich and justify its undertaking.

Chapter Three presents the theoretical framework under which the study was underpinned. The chapter gives a brief background to the theory, its underlying principles, the major components and its applicability to the current study.

The fourth chapter expands the research design and methodological framework which guided the study by presenting more detailed information on the data collection and data analysis aspects of the dissertation. Included in the chapter are the study area, study population, study sample and sampling procedures, data collection instruments and procedures, and data analysis.

Chapter five of the dissertation presents the data, its analysis and discussion of the findings, in accordance with the objectives of the study. The chapter uses the Lax-Tense Dichotomy to help explain the behaviour of vowel sounds of English loanwords in Tonga. The adaptation of English loanwords in Tonga is done from the Syllable Reconfiguration angle. Therefore, in line with objective iii, this chapter discusses the phonological processes that are involved in the adaptation of English words in Tonga. These processes are discussed and analysed within the Optimality Theory framework, which was used to guide this study.

The sixth and final Chapter of the dissertation provides a summary of the findings, highlights the main implications of the study, draws the conclusions of the study and gives recommendations for further research.

1.12 Chapter Summary

This chapter introduced the study to the adaptation of English words in Tonga. It began by offering a background to the study and then proceeded to give the statement of the problem and spelled out the purpose of the study, objectives of the study and the research questions

meant to address the specific objectives. The chapter concluded by outlining the significance of the study, the scope of the study and provided a summary of issues discussed in the chapter. The next chapter reviews related literature to the adaptation of English words in Tonga.

CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction

The previous chapter focussed on introducing the study to the adaptation of English words in Tonga. This present chapter provides a review of some of the available literature that is considered to be of direct relevance to the study of the loanword phenomenon in Zambia, Africa and the world at large. This is deemed necessary in order to place the investigation within the context of similar studies, thereby enriching it besides providing a justification for it.

2.1 Historicising the study of loanwords

Language contact situations have always been on the focus of interest ever since philologists (people who study language and its development) became aware of the fact that there is no language which would be completely free of foreign elements and that languages influence one another on almost all fronts. In fact, as Hoffer (2002) postulates, there has been research into language contact situations ever since philologists started investigating the rather intricate etymologies of certain words in languages. Here, they necessarily had to take into account the historical development of the language in question and also all the possible contacts this language could have had in the past. In addition to this, they also had to take into account the influences that other languages, mostly neighbouring, have had on the languages they investigated. And as some authors have noticed, out of such contacts, one of the easily observable results of intercultural contact and communication is the set of *loanwords* or *adoptives* that are imported into the vocabularies of the languages involved (Ndambuki, 2007).

However, though the study of the loanword phenomenon dates back to as early as 1881 (Whitney, 1881), it is Haugen's (1950) article on borrowing that sparked the beginning of the current interest in the topic. The early study of the process of borrowing and its results emphasized items from the linguistic systems such as vocabulary, phonology and grammar. Since then, Scholars in the field of contact linguistics, sociolinguistics, cultural anthropology and other areas have been documenting the amount, rate, and types of borrowings and borrowing processes as they occur.

2.2 Definition of Borrowing/Loanword

In this study, '*borrowing*' is taken as the whole process of importing linguistic items from one linguistic system into another, and as a process that occurs any time two cultures are in contact over a period of time. This position is also held by Matras (2007) who states that the term 'borrowing' is used as a cover-term for the adoption of a structural feature into a language as a result of some level of bilingualism in the history of the relevant speech community. Within this entire process are different types of *loanwords* or *borrowed words*. Etymologically, the term loanword is derived from the German word *lehnwort*- which refers to a word that has become virtually native in the new language with little or no distinguishing characteristics (Hughes, 2000; Philip, 2014). The term has however been differently defined by different linguists though in somewhat related manner. To begin with, Haugen (1950:163), whose article on borrowing marks the genesis of the current interest in the topic, very aptly defines borrowing as "the reproduction in one language of patterns previously found in another". It is however argued that the use of the word 'reproduction' does not necessarily imply that a mechanical imitation takes place, but rather that the nature of the reproduction may considerably vary from the original, as would usually be reflected in the new meaning the word takes in another language.

Kashoki (1999:10) says, "by 'loanwords', 'loan', 'borrowed word' or 'adoptive' (as used interchangeably in sociolinguistics literature), reference is here made to that item borrowed from one language (whether similar or dissimilar) into another which has a reasonable degree of permanence in the recipient language, is wider to a spectrum of speakers and is in common use or general occurrence." This definition thus rules out for inclusion those lexical items that are not sufficiently or only partially assimilated, are not in common usage or may merely be a

manifestation of the twin sociolinguistics behaviours of code-switching and code-mixing. Asher (1994) looks at 'loanword' as a term referring to a word that has entered a language through borrowing from some other language.

Crystal (2008) defines a loanword as a linguistic unit (usually a lexical item) which has come to be used in a language or dialect other than the one where it originated. Crystal further argues that in loanwords, both the *form* and *meaning* are borrowed or 'assimilated' with some adaptation to the phonological system of the new language. This is in contrast to other loan processes such as loan blends where the meaning is borrowed with only part of the form, loan shifts where the meaning is borrowed, and the form is native and loan translations where the morphemes in the borrowed word are translated item by item.

One thing that should be noted however is that, strictly speaking, the terms borrowed word or loanword conflict with the ordinary meaning because there is no literal lending process. What this means is that there is no physical *transfer* of words from one language to the other; neither is there any *returning* of the borrowed words to the source language by the recipient language. As observed, both Haugen (1950) and Hockett (1958) acknowledge the inherent absurdity in the use of these terms for a process which takes place without the consent, or even the awareness of the lender. They further postulate that the item borrowed too, is not returned because it never left the source language.

2.3 Scale of Borrowability

It has often been stressed by linguists that what is of paramount importance for lexicon-based historical linguistics is to get a clearer idea about the *differential borrowability* of different types of words. Subsequently, it has been presented that the most important type of constraint on borrowing that has been discussed in literature is the ***Scale of borrowability*** (also called ***Scale of Adaptability*** or ***borrowing hierarchy***) (Haspelmath, 2004). According to Matras (2007:31), 'borrowability' is the likelihood of a structural category to be affected by contact-induced change of some kind or another. And from a strictly structure-oriented point of view, one might also interpret this as the "ease" with which a category can be re-shaped through contact.' Matras (2007) further postulates that when we speak of "ease" of borrowing, we are referring implicitly at least to the communicative behaviour of speakers in a bilingual setting and to changes in that behaviour that have a long-lasting effect on the shape of the language

that they use. What interests us in this connection is the likelihood that, in respect of a particular structure which serves a particular function in language processing, speakers might give up the separation of two sub-components within their linguistic repertoire – the two "languages" – and begin to employ the structure in question regardless of the choice of language. To this effect, borrowing studies since at least Whitney's work in 1881 have included this Scale of Borrowability along which linguistic features are distributed. The scale has nouns on one end, followed by other parts of speech, then affixes, infections, then sounds. Similarly, Field (2002: 38) proposes the scale as having ***content items*** followed by ***function words*** then ***agglutinating affixes*** with ***fusional affixes*** at the end (thus presented as: content item > function word > agglutinating affixes > fusional affixes respectively). Such scales have been interpreted in four ways as follows:

i. **Temporal**: A language borrows elements on the left before it borrows elements further to the right.
ii. **Implicational:** A language that contains borrowed elements on the right also contains borrowed elements further to the left.
iii. **Quantitative**: A language borrows more elements belonging to the types on the left than elements belonging to the types further to the right.
iv. **Probabilistic:** Elements belonging to the types on the left are more likely to be borrowed than elements further to the right (ibid).

Therefore, based on this scale and of course its interpretation, it can widely be acknowledged that lexical items are more likely to be borrowed than grammatical items, and that words are more likely to be borrowed than bound morphemes(Moravcsik 1978). Field (2002) too, adds the claim that agglutinative affixes are borrowed more easily than fusional affixes.

However, although some examples of morphological and syntactic borrowings occur, Whitney's (1881) conclusion was that "whatever is more formal or structural in character remains in that degree free from the intrusion of foreign material." What this means is that from a purely linguistic perspective, the most important fact is that different spheres of the vocabulary are borrowed more easily, others significantly less easily. Therefore, from Whitney's assertion, and what has been given by Moravcsik (1978) above, it would surely be difficult to adopt certain morphological and syntactic elements such as bound morphemes and elaborate verbal inflections into other languages based on their formality and structural functions.

Further, this scale too is in line with Bynon (1977) who notes that it is generally the open classes: nouns, verbs and adjectives that are more readily borrowed than the 'closed' classes (pronouns conjunctions, prepositions). He notes that nouns are the most borrowed class everywhere, because the great majority of borrowed words are the names of new objects and materials. He claims that borrowing from closed classes may only be possible in situations of intense linguistic exchange since it presupposes the cross-linguistic equation of syntactic patterns, whereas "mere lexical borrowing" from open classes would require only a minimum number of bilingual speakers in the transmission process (Bynon 1977: 231). Myers-Scotton (2002:240) also gives another reason that nouns are preferably borrowed 'because they receive, and not assign thematic roles'. Therefore, she argues that their insertion in another language is less disruptive of predicate-argument structure. As will become apparent in the chapter about the findings/discussion, the argument that nouns dominate the borrowing process can also be attested to from the corpus of the Tonga loanwords that were gathered during data collection. In all semantic fields, nouns dominated the lists.

2.4 Motivations for Borrowing

The motivations or reasons for borrowing or adopting words from one language to another are numerous and various in character. In this study, we discuss only two- *Need* and *Prestige,* which are considered the most important of them all (Danesi and Rocci 2009:161; Rosenhouse and Kowner 2008:284). As observed earlier, the main linguistic factor or reason for borrowing on which most linguists agree is the **need** of "*filling conceptual gaps*" in the recipient language- that is, the necessity of naming new objects, concepts or processes, especially from the fields of science and technology (Danesi and Rocci 2009:161; Rosenhouse and Kowner 2008:284). This is called "lexical innovation" (Weinreich 1953:56). In the case of Tonga, good examples of words that can be given are the names of the drugs or medicines found in hospitals such as '*Panado*'[panado], '*Aspirin*' [Asipulini] and others. As will be illustrated later, there would be no other terms in Tonga that can be used for these, other than taking them literally as they are designated in the donor languages. Similarly, the English language has also borrowed such words as *whisky* from the Scots, *yogurt* from the Turkish *tomato* from the Nahuati and many other loans. These terms have been literally taken the way they are and it remains to be seen whether the English language will someday find their equivalents. The loanwords in such borrowings are usually members of specific semantic fields referring to technical fields, science

and technology, and institutions such as the church, the military etc. Loanwords are therefore viewed as filling a semantic or stylistic slot not occupied by a native word.

In terms of need however, some linguistic scholars have also argued that borrowing is a much easier process of dealing with the afore-said linguistic lacunae as compared to the aspect of having to crack one's head to coin new terms for new concepts, ideas, objects and others. Thus, Katamba (2005:139) asserts that adopting an already exiting word is much easier than making up an original one from nothing." Danesi and Rocci (2009:161) also arrived at the similar conclusion that borrowing is "*a practical strategy*" for enriching language vocabulary instead of creating new words for new notions as it takes much less cognitive effort.

Secondly, there is the question of prestige. On prestige, it has often been argued that at any given time in any given place, some languages typically enjoy more prestige than others, and speakers of less prestigious languages are often eager to show off their command of a more prestigious language by introducing some of its words into their own speech" (Trask, 1977:175). For example, the use of English loanwords in other language contexts becomes more frequent since they sound new, sophisticated, modish, different, or erudite and may be considered a result of the "intellectualization" of the society (Bator 2010:41; Haspelmath and Tadmor 2009:48). From the Tonga perspective, the examples that can be given here may include such words as 'Accountant' [Akkauntaanti], 'Clerk' [kalaliki]. Such words come with a lot of prestige just like the professions themselves. And in making reference to Africa, and Zambia in particular, Kangwa (2007) notes that sometimes, individual prestige demands that the self-respecting town Africans embellish their style with a super abundance of borrowings from other languages which have great status- which English has never run short of from way back in the days. In other words, the prestige that certain languages such English have, or the positive feelings that people may have towards it are important factors in the process of borrowing. The use of loanwords therefore is aimed, for example, to show a speaker's understanding and familiarity with the prestigious language of English. And if something is prestigious, we may just feel the need to imitate and borrow it. As Campbell (2004) puts it, certain foreign terms are borrowed because they are highly esteemed. He argues that, for example, English could have perfectly done well with only some of its native terms such as *pig meat/pig flesh* and *cow meat/cow flesh*. However, for reasons of prestige, *pork* and *beef* were borrowed from the French words of *porc* and *bouef* because French had a higher social status

and was considered more prestigious than English- especially during the Norman French dominance of English between 1066 and 1300.

As mentioned above, not all the reasons for word borrowing are purely linguistic. The most significant extralinguistic cause is probably political, cultural, religious or economic dominance of one language over another (Bator 2010:41). For example, a number of words from English came into the Tonga language through trade, missionary activities, colonial administration and labour migration as the four major earliest contact factors that are responsible for the process of borrowing. Rosenhouse and Kowner (200:287) also take into consideration some other possible extralinguistic factors that essentially may contribute to the borrowing of words and their integration. By these factors the linguists mean a persistent learning of English at school, free availability of English-speaking sources through reading English books and newspapers, watching English programmes and films, frequent use of the Internet and contact with other (foreign) people, as well as an opportunity to travel the world and communicate in English as a lingua franca.

2.5 The Related Literature outside Africa

Haugen's "*The Analysis of Linguistic Borrowing*" in 1950 and Weinreich's "*Languages in Contact: Findings and Problems*" in 1953 are usually looked upon as the defining works on the world stage in the generated interest on the studies in the field of lexical borrowing. As Hoffer (2002) points out, Haugen's work summerised and extended the previous researches and thus forms the basis for much of the later researches in the same field of borrowing. It should however be noted that Haugen's goal was to "define more precisely the terminologies used in linguistic analysis of borrowing such as *loanwords, loan translation, loan blends* and *loan shifts,* and to set up certain hypotheses concerning the process of borrowing (1950:210). On the other hand, Weinreich's work was the pivotal work on the studies of the impact of one language on another. He treated borrowings within the topic of *bilingualism* and as an example, at least at first, of **interference**, or "deviation from the norms of either language" (1953:1). And according to Weinreich, **Interference** here involves the rearrangement of the linguistic systems of phonology, vocabulary, morphology and syntax, not merely the addition of elements (Ibid).

At this point, it should be made succinctly clear that the study of especially loanword phonology had a very long history even far before the defining works of Haugen and Weinreich in the 1950s. For example, Hoffer (2002), states that the earliest works on loanwords or lexical borrowing could have been those of Whitney in 1881. And among the other European and American scholars who tried to write or wrote on the same subject of loanwords before 1950 include Sapir (1921), who wrote on '*How Languages Influence One Another*' and notes how, for example, Chinese flooded Korean and Japanese with vocabulary and how English borrowed an immense number of words and productive affixes from French, yet in neither case was the borrowing reciprocated; Jespersen (1923), whose study identified the types of elements which are borrowed and revealed that vocabulary and phonology are borrowed more readily than morphology, syntax and stylistic features. His study also revealed that languages have different levels of resistance and susceptibility to loans. Pedersen (1924) and Bloomfield (1933), who much of his argument deals with borrowed forms and how they are integrated into the syntax and inflection system of the native language.

And as stated above, many more works from different perspectives on lexical borrowing or loanwords came after the pioneering works of Haugen (1950) and Weinreich (1953) respectively. It should however be noted that much of these works during this period were surveys carried out to answer pertinent questions and observations with regard to language contact situations. In other words, introductory books or papers on language contact often endeavoured to provide substantial discussions on the loanword phenomenon. Therefore, notable among such works are those of Lehmann (1962), Labov (1966), Hockett (1979), Domique (1983), Antilla (1989), Hoffer(1990), Winford (2003), Bowden (2005), Matras (2009) Haspelmath (2009), and Haspelmath and Tadmor (2009) Ahmed (2012), Kuitert (2013) to mention but some.

2.6 Studies of Loanwords in Africa

Loanword nativisations in many African languages in general and Bantu languages in particular, have also been explored by a number of scholars. For example, we have works like those of Mwihaki (1998), who carried out a *phonological study of Gikuyu loanwords borrowed from English* in Kenya. The study identifies three aspects of loanword adaptation: phonemic, phonotactic and prosodic respectively. Phonemic adaptation addresses the grammatical constraints of unitary sound substitution with Phonotactic adaptation defining the harmonic

motivation for phonemic combination and distribution in the loanword while Prosodic adaptation considers the principles of syllabification and the assignment of the prosodic features. The main distinguishing factor between Mwihaki's study and the present study is on theoretical orientations. Whereas Mwihaki's study employs Autosegmental and Metrical Phonology in the analysis of loanwords, this study takes an Optimality Theoretic approach, which is a more recent theory of phonological analysis. In 2003, Owino did a study on the '*phonological nativisation of Dholuo Loanwords'* in Kenya. A number of findings up in this study may have implications for a theory of loan phonology. For example, the data analysed in this study, especially on integration of vowel phonemes, has clearly demonstrated that there is little, if any, evidence to be found in loanword assimilation for any claims about abstract phonological representations. Instead, one finds a strong indication that the speaker-hearer of the target system can be very discriminating in his judgement of the phonetic value of the foreignisms as compared with the surface phonetics of his own system.

Ndambuki (2007) did '*A constraint-based analysis of Kikamba nativised loanwords'* in Kenya. His study has established that since the phonotactics of the donor language and the recipient language are different, the latter uses some strategies to adapt the phonologically different words. The main strategies used are insertion, deletion, and feature change. The findings of the research have also shown that the loan word phenomenon can be accounted for using a constraint-based approach. Therefore, using the Optimality Theory, an explanation for the motivation to use different syllable repair strategies has been provided. The research has also shown that Kikamba avoids codas and consonant clusters by all means but other factors like religious 'faithfulness' has made the recipient language to tolerate foreign consonant clusters. The conflicting demands between faithfulness constraints and markedness constraints in the nativization process produce phonological structures not found in the indigenous Kikamba language.

Others are Mahlangu (2007), who investigated and described how Ndebele, a South African Bantu language, phonologically and morphologically adopt lexical items from Africaans and English. Mahlangu's study considers the possible rules that Ndebele applies in the adoption of foreign words. The study reveals that not all Afrikaans and English consonant clusters conform to the Ndebele consonant system. In other words, some of the donor languages' consonant clusters do not conform to the CV syllable structure of Ndebele as is the case of most African languages. However, although the approach taken by Mahlangu (2007) is different from the one taken by the present study, his study is relevant as it lays foundation for the phonological

analysis of Tonga which is also a Bantu language. Omachonu (2008) presented '*A Comparative Optimality Account of Primary Stress Assignment in Standard British English (SBE) and Nigerian English (NE),*' from the view point of Igala users of English as a second language. The study demonstrates how the constraint ordering in Standard British English is 'naturally' reordered in Nigerian English observing that the different constraint orderings, notwithstanding these constraints are the same, are present in each of these varieties. The study has also shown that Optimality Theory satisfies the requirement that any serious theory of phonology must rely heavily on well-formedness constraints, which means it must be committed to universal grammar, a fact that places the theory at an advantage over its predecessors. This study has also given eminence to Optimality Theory by taking a constraint-based approach to analyze loanwords, a departure from rule-based phonology.

Mwita (2009), did '*A constraint-based analysis on the adaptation of Swahili loanwords from Arabic*'. Using a constraint-based analysis, Mwita (2009) shows the processes that loanwords undergo when they are adapted from Arabic into Kiswahili. The paper shows that Kiswahili prefers vowel epenthesis to vowel syncope or apocope in the resyllabification of loanwords. The paper also establishes that though Kiswahili is an open syllable language, loanwords have forced it to take up closed syllables so as not to violate the sonority hierarchy within the syllable. He further notes that the incorporation of loanwords into Kiswahili has resulted in an expansion of the Kiswahili syllabry, that is, it has increased the use of other syllable structures which are not very common in Kiswahili such as CCV and CCCV. Mwita's study is relevant to the current study as both use similar phonological processes of loanwords analysis using the Optimality Theory approach.

From 2010, there are works like those of Kayigema (2010), who did a study on *Loanword Allocation in Kinyarwanda*. Among other things, this particular study reveals that Based on the comparative study of borrowing languages dealt with in this work, it is strongly believed that bilinguals play an important role in the import of foreign words. They are the ones who primarily use foreign words before passing them onto other people in the community. He observes that people in contact with more foreigners are very likely to borrow a larger number of foreign words for their native language. He thus concludes by asserting that the larger a multilingual and multicultural community will be, the more loanwords it will adopt. Secondly, Morphology, syntax, phonology, orthography, and semantics are interrelated in a loanword study. However, syntax seems to be less affected than other language areas. It is quite understandable that people borrow more words and sounds than grammatical structures. Words

and their meanings, letters, sounds, and suprasegments from a donor language adapt to the sentence structure of the beneficiary language. The last works reviewed are those of Matiki(2016), who did *Patterns of Lexical Borrowing in Chichewa* in Malawi. This study examined lexical borrowability in Chichewa. It has documented the nature of borrowing in terms of semantic field, word classes and source languages. The way loanwords are assigned to various semantic fields has obvious advantages in providing insights. The data for the study comprises loanwords collected from the Chinyanja Monolingual Dictionary (CLS 2000). The study has confirmed that nouns are the most borrowable lexical items; a pattern that is consistent with other loanword studies. English is by far the biggest donor language of loanwords to the Chichewa lexicon, accounting for more than half of all the loanwords listed in the dictionary. The colonial legacy of the English language in Malawi and its position in the education system has contributed immensely to its dominance as a donor language. In terms of semantic fields, most loanwords in Chichewa fall within the modern world category as well as in the clothing and grooming category.

As it can be observed from the works cited, loanwords have been studied from a number of perspectives covering almost all the major levels of linguistic analysis- that is, from the phonological, morphological, syntactic, pragmatic and semantic perspectives. Therefore, all these studies are relevant to the present study in the sense that they provide insights into the dynamics of borrowing in particular, and language change in general, relative to the ways in which loanwords are assigned to various semantic fields and also the various methods, strategies and processes employed in their study. In other words, particular consideration is given to these studies as they have immense contributions to the current study in many ways.

2.7 Studies of Loanwords in Zambia

On the Zambian front, as a pioneer researcher in the study of loanwords in Zambian languages, Kashoki's works lay a solid foundation for the present study. From 1972 to 1976, and as a member of the Institute of African Studies at the University of Zambia, Kashoki undertook what was designed to be a long-term study entitled "*Language Adaptation: A Study of Loanwords in Four Zambian Language*". Primarily, the study was intended to be a major contribution to the then on-going efforts at the University of Zambia aimed at updating the lexicographies of the official Zambian languages. Therefore, within the afore-mentioned study, he published many papers in relation to loanwords in general. Notable among these works is: "*Three Zambian languages go to town*" (Kashoki, 1975). The study sought to establish lexical

adaptability within the context of a single language, to a concern with comparative patterns of borrowing among several related languages. Put more plainly, the study sought to establish whether a number of languages similar in structure (as almost all Zambian languages are), when exposed to more or less the same cultural forces, show signs of adapting in *convergent* or *divergent* ways. The languages of study here were Lozi, Nyanja and Tonga. The findings revealed (at the time of the study) that the degree of borrowing for these three languages in technical fields such as broadcasting and telecommunication, mining, commerce, industry and other areas involving specialised, scientific and technical terminologies was, notably, relatively low in comparison to other languages such as Bemba which already had that greater contact with the outside world due to mining activities. Kashoki's (1975) findings in this study are slightly different from the findings of the current study in the sense that, the same technical fields where the degree of borrowing was reportedly low then, are the same fields where more loanwords are drawn from today. Nevertheless, the current study still learnt a lot from it.

In 1982, Kashoki partnered with Musonda and did a study on "*Lexical Adaptability in Bemba and Luunda: Some Implications for Present-Day Communication*". This study was merely an extension to the earlier studies on borrowing and only differed in its aim and focus. Where emphasis earlier was primarily on documenting lexical and related changes taking place in language study, this particular study attempted to indicate some of the lexical changes that had occurred in the two dialects under investigation (Bemba and Luundu), and to subject them to a comparative analysis aimed at demonstrating whether or not the lexical development involved was tending towards lesser or greater linguistic differentiation. And the basic assumption to the study was that communication in Zambia, as indeed in other parts of Africa, was being facilitated or complicated relative to the degree to which languages or dialects were developing in convergent or divergent ways. The findings presented in this study suggest that, on the whole, word borrowing in Bemba and Luundu had not resulted in greater lexical dissimilarity between the two dialects. In fact, the language distance noted with respect to basic vocabulary appears to have been maintained even after considerable word borrowing by both dialects. Further, it was revealed that mutual intelligibility between Bemba and Luundu was still comprehensible despite the presence of adoptives from foreign languages.

"*Sources and Patterns of Word Adoption in Bemba*" is another study done by Kashoki (1990). The two main aims of this study were to identify the major sources of lexical adoptives and to establish patterns of word adoption in Bemba. From the data gathered and cited, the study

revealed that the bulk of adoptives in Bemba have been derived from English, Swahili, Kabanga, Nyanja and Ndebele (not necessarily in that order though). However, English is revealed as the dominant language foreign to the indigenous cultures of Zambia that has been and still remains to this day, the foremost donor language in the word adoption process evident in Bemba. On patterns, and when considering word adoptions, the study revealed that Bemba syllable structure and consonant cluster patterns do not permit the occurrence of consonant clusters such as those (eg, pl, spl, st etc) of the English type. In terms of sources for loanwords, Kashoki's study and the current study learn from each other in the sense that both show English as still the major contributor of loanwords among many Zambian languages. For "*Loanwords in Silozi, Cinyanja and Citonga*" (Kashoki, 1999), the main objective of this study was to offer complete or comprehensive listing of the loanwords as observed, recorded, checked and rechecked for each of the languages under investigation.

The most recent work is that of Kangwa (2007). The study was mainly phonological with its main objectives being to classify the English-derived loanwords into Bemba parts of speech and to show by using phonological rules how prothesis, anaptyxis, syncope and apocope are applied to English-derived loanwords in Bemba. On classification to parts of speech, as is the case with many other languages, Kangwa's study also revealed that a bigger chunk of loanwords belong to the noun class category. On the phonological aspect, the study showed that a great many loanwords, with a few exceptions though, are fully naturalised into Bemba through the use of certain phonological processes or strategies such substitution, insertion and deletion. For example, it has been observed that phoneme substitution subjects the English-derived loanwords to Bemba restrictions on possible phonemes and their distribution. However, the study also shows that the choice of replacement is determined by phonetic similarities- e.g. d-t as in Adam-Ataamu. This particular study is quite relevant to the present one as they both seem to trade on the same path to loanword analysis.

Undoubtedly, the most extensive publications on loanwords in Zambian languages as can be noted above are those of Kashoki (1977, 1990, 1999). He has written on loanwords in Cibemba, Cinyanja, Silozi and Citonga respectively. Others are Musonda and Kashoki (1982) and Kangwa (2007). However, although Kashoki has written a paper on loanwords in Tonga, his work was more taxonomical as he mainly focussed on presenting a list of perceived loanwords with little analysis in relation to the various levels of linguistic analysis. For example, he writes in his works of 1999 that the major objective of that report was to offer a complete listing of

the loanwords as observed, recorded, checked and rechecked for each language in the course of the study (Kashoki, 1999). In addition to this, the only other thing he does is to attach the plural morphemes to the roots of the listed adoptives and also indicating the source language for each loanword as either derived from English, Kabanga or Swahili. Therefore, this study is different from Kashoki's as it goes further to analyse English derived words in Tonga using phonological processes such as epenthesis and prothesis under insertion, and apocope, syncope and aphaeresis under deletion. Additionally, the loanword phenomenon in Tonga, and indeed any other study in other Zambian languages has not been adequately studied using modern theories of phonology. Therefore, this study is also different from other studies done before as none of them employed the Optimality Theory as the method of analysis. This therefore, among other things justifies the reason for embarking on such a study.

2.8 Chapter Summary

This chapter has provided a review of some of the available literature that is considered to be of direct relevance to the study of the loanword phenomenon in Zambia, Africa and the world at large. This is deemed necessary in order to place the investigation within the context of similar studies; thereby enriching it besides providing a justification for it.

The next chapter presents the theoretical framework under which the current study was underpinned.

CHAPTER THREE
THEORETICAL FRAMEWORK

3.0 Introduction

The previous chapter provided a review of some of the available literature that is considered to be of direct relevance to the study of the loanword phenomenon in Zambia, Africa and the world at large. The present chapter presents the theoretical framework under which the study was underpinned. The chapter gives a brief background to the theory, its underlying principles, the major components and its applicability to the current study.

3.1 Background to the Optimality Theory

This study is guided by the Optimality Theory (henceforth OT) developed by the linguists Prince and Smolensky in 1993. Prince and Smolensky (1993) introduced OT as a framework in Theoretical Linguistics in an effort to formalise analyses in phonology firstly and of course other areas of linguistic study later such as syntax, morphology and semantics. As Prince and Smolensky (1993:1) succinctly put it, OT was especially developed as a direct response to a "conceptual crisis at the centre of phonological thought" concerning the role of output constraints.

According to Kager (1999:8), the theory consists of a set of universal constraints out of which specific grammars are structured. In fact, according to McCarthy and Prince (1994:3) this Principle of Universality is one of the underlying hallmarks - and in connection to Chomsky's Generative Grammar, the original basis of Optimality Theory. These scholars argue that Constraints are universal and universally present in every grammar. Additionally, the central idea in Optimality Theory is that the surface forms of a language reflect resolutions of conflicts between competing constraints or demands. In other words, at the heart of the Optimality Theory is the insight that some aspects of language generations are easier to understand as a system of interacting constraints than as a system of ordered rules. These constraints are

universal but each language puts them in a unique ranking. However, it should also be noted that although languages differ in the ranking of constraints, any violation that takes place must be minimal. The theory too, posits that a surface form is '*optimal*' if and only if it incurs the least serious violations of a set of constraints, taking into account their hierarchical rankings. What this means is that, a surface form is '*optimal*' in the sense that it incurs the least serious violations of a set of violable constraints, all ranked in a language-specific hierarchy. This difference in the ranking of constraints thus gives priorities to some constraints over others. In fact, Kager (1999) stresses that such rankings are purely based on '*strict domination*'- that is, if one constraint outranks another, the higher-ranked constraint has priority regardless of the violations of the lower-ranked one. For example, in Tonga both consonant clusters and closed syllables are not permitted or tolerated. This means that in Tonga, the constraints that forbid consonant clusters and codas are ranked higher than other constraints. However, such violations must be minimal, which predicts the economy property of grammatical processes. For instance, if constraint Cl is ranked above C2 and C3 (that is, Cl *dominates* C2 and C3), then the output may perform worse than its competitor on both C2 and C3, as long as it performs better on Cl. To cite an example from Prince and Smolensky (1993), "azzzzz" is alphabetized before "baaaaa" because alphabetical order is based on the leftmost distinguishing letter, regardless of how much the letters farther to the right might seem to encourage a different order.

Kager (1999:9) defines a surface form as "a structural requirement that may either be satisfied or violated by the output form". A form satisfies a constraint if it fully meets the structural requirement, while any form not meeting this requirement is said to violate it. In other words, the surface form is that form which provides the input to the phonological component of the grammar, and which thus most closely, corresponds to the structure of the sentence (utterance) we articulate or hear.

The Optimality Theory has especially been adopted as the theoretical framework for this study for it treats the donor language word as the underlying form for the recipient language. In the other words, it has been adopted because of the assumption that the phonological system of the recipient language is encoded as a system of constraints, and that these constraints account for how the donor word is adapted when borrowed. For example, in a 1970 *Linguistic Inquiry Article*, Charles Kisseberth identified a 'conspiracy' in Yawelmani – a language spoken by the Yokuts in the central valley of California: rules of vowel insertion and deletion conspire to

place every consonant adjacent to a vowel. Kisseberth proposed introducing constraints (such as *CCC, forbidding three-consonant clusters) to block or trigger rules, which could then be simplified and made more similar across languages. Output constraints were increasingly exploited in the literature, but many aspects of their use were unclear. How should a constraint be designated to block or trigger a rule? What if output constraints conflicted? How could non-absolute preferences be expressed? For example, Yawelmani, allows the sequences CiCC and CCiC, but underlying CCC is repaired to CiCC. Therefore, in addition to the constraint *CCC and the rule of i-insertion, there must be a constraint preferring CiCC over CCiC. But this second constraint is violable, because CCiC sequences do occur. OT addressed these problems by eliminating rules entirely in favour of constraints, and specifying how constraints interact.
Until then, everything done in phonological analyses was only within the rule-based frameworks. However, as noticed above, rules had a limit on how far they could go. For example, Rule-based frameworks account for linguistic patterns through the sequential application of transformations to lexical entries. Thus, variation between two pronunciations of the English plural suffix—[s] in cats but [z] in dogs—is explained by a rule that devoices the suffix after voiceless consonants (like [t]). The input cat + /z/, assembled from entries in the speaker's mental dictionary, is transformed by rule into the output cat[s]. In OT therefore, the output is instead chosen through competition with other candidates- that is, a constraint requiring adjacent consonants to match in voicing favours cat[s] over cat[z].

By the early 1990s, the theory took centre stage in theoretical linguistics and its basic tenets rapidly became not only familiar but also revolutionary, and this doubtlessly contributed to its success. Additionally, the theory developed ideas long present in linguistics, but gave them new characteristics, thus considerably changing the understanding of the grammar. In other words, OT provided linguists with new ways to work and new theoretical problems to crack, although some have rejected it as being fundamentally misguided.

3.2 Major Components of the Optimality Theory

The Optimality Theory has three major basic operational components or functions in grammar analysis called the Generator (GEN) and Evaluator (EVAL) and Constraint (CON) respectively (McCarthy 2001).

3.2.1 The Generator (GEN)

The Generator (GEN) is that functional component that generates or creates a potentially infinite set of possible linguistic candidates whose faithfulness properties can be considered in relation to a particular input (Crystal 2008, Kager 1999). In other words, GEN is that functional component that provides or constructs a range of candidate output forms, such as words or sentences, and specifies the relationship between the candidate output forms and the input. GEN is universal, meaning that the candidate forms emitted by GEN for a given input are the same in every language. These candidates are also very diverse which might be a phonological underlying representation, a syntactic D-structure, or a morphosyntactic feature specification. The candidates record, by some means, how they differ from the input. This record is used by constraints that evaluate candidates for their faithfulness to the input. This property of GEN has been called *inclusivity* or *freedom of analysis and stipulates that* GEN is free to generate any conceivable output candidates for some input or any amount of structure may be posited. Precisely because GEN is universal, it must at a minimum supply candidates varied enough to fit all of the ways in which languages can differ. For example, languages disagree on how they syllabify a consonant cluster like *br* (cf. English *alge.bra* vs. Arabic *jab.rT* 'algebraic'), so GEN will offer competing candidates that differ along this dimension, leaving the choice of the right one to the language-particular rankings (McCarthy 2001). Therefore, according to his description, the concept of GEN and Input are closely connected to each other. A given input, typically selected from the lexicon of a language is examined by the function of GEN, which then creates a list of candidates related to the input. Therefore, GEN '*spits out*' a highly general, theoretically infinite list or set of candidates which are more or less modelled after the input form (McCarthy and Prince, 1993:5).

3.2.2 The Evaluator (EVAL)

Once GEN has provided the candidates, the operational component or function of Evaluator (EVAL) takes effect in order to close the gap between the list of candidates by evaluating it using some constraint hierarchy, and selects its **most harmonic** or **optimal** member as the output of the grammar. In other words, EVAL comparatively evaluates the list of candidates with respect to the ranking of constraints (CON) in order to select the most optimal candidate output (Kager 1999:19). Therefore, the core universal elements of the OT architecture are summarized in the two **Figures 1 and 2:-**

Figure 1: **Basic OT Architecture (McCarthy 2001:10)**

The explanation from this figure is that GEN receives an input and emits a set of candidates that, in some precise way, depend upon the input. EVAL applies the language-particular constraint hierarchy H to this candidate set, locating its most harmonic member. The most harmonic candidate is the output which may either be a phonological surface form, a syntactic S-Structure, or some other linguistic object.

The model in (Fig 1) is the simplest architecture compatible with OT's basic assumptions. It maximally exploits OT's capacity for *global*, *parallel* evaluation. The output of an entire linguistic component, such as the phonology, is obtained from the input in a single pass through GEN and EVAL, which means that the candidates offered by GEN may show the effects of several notionally distinct processes simultaneously. The constraints applied by EVAL then rank these candidates for their global fitness, evaluating the effects of all of those processes in parallel.

3.2.3 Constraints (CON)

As stated in passing above, at the heart of Optimality Theory lies the idea that language, and in fact every grammar, is a system of conflicting forces. These '*forces*' are embodied by constraints, each of which makes a requirement about some aspect of grammatical output forms. Constraints are typically conflicting; in the sense that to satisfy one constraint implies the violation of another. Given the fact that no form can satisfy all constraints simultaneously, there must be some mechanism of selecting forms that incur 'lesser' constraint violations from others that incur 'more serious' ones. This selection mechanism involves hierarchical ranking of constraints, such that higher-ranked constraints have priority over lower-ranked ones. For example, for a given input, the recipient language generates and then evaluates an infinite set of output candidates, from which it selects the optimal candidate, which is the actual output-the loaned word. Evaluation takes place through a set of hierarchically ranked constraints (Con1 >> Con2 >>… Con3), each of which eliminates some candidate outputs, until a point is

reached at which only one output candidate survives. This elimination is represented schematically in **Fig. 2.** As demonstrated, only candidate 'd' is optimal and therefore survives:

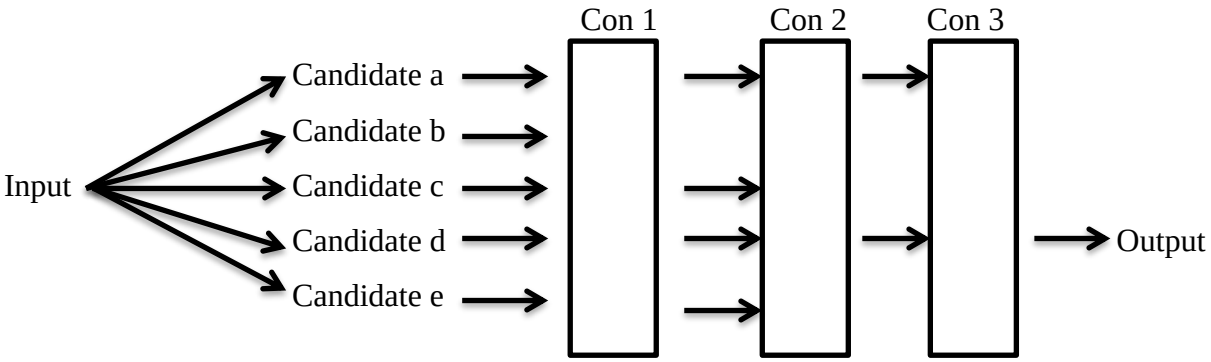

Fig. 2: Input-Output Mechanism in OT (Kager, 1999:22)

According to Ndambuki (2007), evaluation proceeds as follows. The structures to be compared, which make up the candidate set, are first evaluated with respect to the highest ranked constraint. In case two or more candidates receive an equal score, they are judged by the next highest constraint. In case there is still more than one surviving candidate, they are judged on the third constraint, and so on. The candidate that finally survives this procedure is optimal and thereby grammatical.

The optimal output candidate is the one that is '*most harmonic*' with respect to the set of ranked constraints. '*Harmony*' is a kind of relative well-formedness, taking into account the severity of the violations of individual constraints, as determined by their hierarchical ranking (Kager, 1999). That is, violation of a higher-ranked constraint incurs a greater cost to harmony than violation of a lower-ranked constraint. Some violations must occur in every output candidate, as constraints impose conflicting requirements. Accordingly, a lower-ranked constraint can be violated to avoid the violation of a higher-ranked one, but violation is always kept to a minimum.

Ndambuki (2007) states that a candidate that violates only a highly ranked constraint does worse on the hierarchy than one that does not, even if the second candidate fared worse on every other lower-ranked constraint. He further illustrates that given two candidates, A and B, A is better than B on a constraint if A incurs fewer violations than B. Candidate A is better than B on an entire constraint hierarchy if A incurs fewer violations of the highest-ranked constraint distinguishing A and B. A is optimal in its candidate set if it is better on the constraint hierarchy than all other candidates.

3.3 Interaction of Markedness and Faithfulness

The two forces that are engaged in a fundamental conflict in every grammar are the conflicts of '*Markedness*' and '*Faithfulness*' (Kager 1999:4). Markedness, which we use here as a general denominator for the grammatical factors that exert pressure toward *unmarked types of structure* is an analytic principle in linguistics, whereby pairs of linguistic features, seen as oppositions, are given different values of positive (**marked**) and neutral or negative (**unmarked**). The idea here is that all types of linguistic structures have two values: one which is '*marked*' and the other '*unmarked*'. Kager (1999:2) puts it that '*Unmarked*' values are cross-linguistically preferred and basic in grammar, while the '*Marked*' values are cross-linguistically avoided and are used by grammars to only create contrasts. In its most general sense, this distinction refers to the presence versus the absence of a particular linguistic feature. For example, the formal feature for marking plural in most English nouns is the affixation of an 's' at the end of a noun. The plural is therefore 'marked', and the singular is 'unmarked'. Similarly, front unrounded vowels are unmarked as compared to front rounded vowels, open syllables as compared to closed syllables, short vowels as compared to long vowels, and voiceless obstruents compared to voiced obstruents.

Markedness is counterbalanced by *Faithfulness*, understood here as the combined grammatical factors *preserving lexical contrasts*. And according to Crystal (2008:185) 'Faithfulness is the degree to which one form (typically the output) preserves the properties of another form (typically the input). Faithfulness constraints penalize differences between the input and output representations. A grammar that is maximally '*faithful*' to a lexical contrast is one in which output forms are completely congruent with their lexical inputs with respect to some featural opposition. Or, to put it differently, the total amount of lexically contrastive variation of some feature is realized in all of the grammar's output forms. For example, a lexical contrast of voicing in obstruents is preserved in output forms regardless of their phonological context (at

the end of a word, between vowels, etc.). Thus one may think of faithfulness as the general requirement for linguistic forms to be realized as close as possible to their lexical 'basic forms'. In other words, Faithfulness constraints assume that there is an underlying phonemic representation (input) in the lexicon, and they prevent the words (output) from being distorted beyond recognition by the markedness constraints. Thus, from a functional angle, the importance of faithfulness is clear: to express contrasts of *meaning*, any language needs a minimal amount of formal *contrast* (Kager, 1999). Once you have your possible constraints ordered, the *optimal candidate* is decided by how many violations are incurred. The notion of minimal violation or best satisfaction is defined in terms of this ranking (Guo, 1999). Tableau 1 represents one situation of minimal violation.

Input / /	Constraint A	Constraint B	Constraint C
☞ Candidate 1			*
Candidate 2		*!	
Candidate 3	*!		

Tableau 1: **Minimal Violation**

Tableau 1 above shows that constraint A is ranked higher than constraint B, followed by constraint C in language X. The violation of a higher-ranked constraint is fatal. Thus, though all candidates violate only one constraint respectively, Candidates 2 and 3 are eliminated since they violate higher ranked constraints. Candidate 1 violates the lower ranked constraint with minimal penalty and is selected as the optimal output. In the top-left hand cell, the input is placed between forward slashes. Violation of a constraint is marked by * while satisfaction is indicated by a blank cell. The sign '!' signifies a fatal or serious violation, the one that is responsible for a candidate's non optimality, whereas the symbol '☞' indicates the optimal candidate. Shading emphasizes the irrelevance of the constraint to the fate of the nonoptimal candidate (Guo, 1999).

According to the Optimality Theory, every language can handle every possible input. For instance, a language without complex clusters must be able to deal with an input such as 'table' /teɪbl/. In Tonga, this is realized as tebule **/tebule/**. In this tableau below, the **candidate a.** is selected as the optimal output form based on the interaction of highly ranked markedness constraints in Tonga of NOCODA and *COMPLEX, and the faithfulness constraint of DEP-V

= no V epenthesis. The winning candidate, /tebule/, only violates a lower ranked constraint of DEP-V through the insertion of /u/ which has been done to break the consonant cluster of /bl/ in the input. This insertion of /u/ to break the illicit consonant cluster in the input has also resulted in the increase of syllables from two to three. Candidate **b**. has missed out on being selected because of the same consonant cluster mentioned above while candidates **c**., **d**., and **e**. all violate a serious constraint of NO-CODA which is highly ranked in the hierarchy. The information above can be presented in a tableau as shown below.

Input : table /teibl/

Output : tebule /tebule/

Input: table/teibl/	NO-CODA	*COMPLEX	NUC	DEP-V
a. ☞ te.bu.le				*
b. te.ble		*!		
c. teb.l	*!		*	
d. Te.bl	*!	*!	*	
e. teb.le	*!			

Tableau: table /teibl/→ tebule /tebule/

3.4 Constraints interaction and Ranking

It is important, at this point, to list a number of constraints that interact in the adaptation of English words in Tonga and these are:

NOCODA:	Syllables must not have a coda (syllables are open)
***COMPLEX** (no complex):	No consonant cluster is allowed within a syllable
***SYLLABIC-C**:	No syllabic consonants
***COMPLEXVOW**:	No string of vowels within a syllable
ONSET:	Syllables must have onsets
NUC (nucleus):	Syllables must have nuclei
DEP-C:	Output consonants must have input correspondents (no C insertion)
DEP-V:	Output vowels must have input correspondents (no V insertion)

MAX-V:	Input vowels must have output correspondents (no V deletion)
MAX-C:	Input consonants must have output correspondents (no C deletion)
IDENT-IO (voice):	The specification for the feature [voice] of an input segment must be preserved in its output correspondent
IDENT-IO (F):	The specification for the feature of an input segment must be preserved in its output correspondent
***VOICED-CODA**:	Coda obstruents are voiceless
DEP-IO:	Every segment in the output must have a correspondent in the input (no insertion of a segment)
MAX-IO:	Every segment in the input must have a correspondent in the output (no deletion of a segment)

(Source: Kager, 1999)

It is within this framework that English words have been analysed in this dissertation.

3.5 Applicability of the Theory to the Study

In the past decades, we have seen the study of loanwords evolve from a minor curiosity to a phenomenon meriting serious and sustained study. Central among these studies has been the study of loanword adaptation: that is, the transformations words go through when they are borrowed from one language (source language - L2) to another (borrowing language - L1), and the integration between languages. These two areas have raised several theoretical issues that have grasped the attention of many researchers. Undoubtedly though, the most significant motivation has been that of adapting loanwords and how the integration of the incoming form, to conform to the L1 system, is achieved. In adapting a loan, the speaker tries to remain faithful to the source word while still making the loan conform to the native language's (L1) segmental inventory, phonotactic constraints, and prosodic structures (Ndambuki, 2007).

The second and most recent motivation has been the conceptual shift in our field of loanwords study from *rules* to a *constraints and repair* model of sound change. Loanword adaptation is constraints and repairs in "real time". Until around the early 1990s, everything done in phonological analyses was only within the rule-based frameworks. However, it was noticed that, rules had a limit on how far they could go. For example, Rule-based frameworks account for linguistic patterns through the sequential application of transformations to lexical entries.

Thus, variation between two pronunciations of the English plural suffix—[s] in cats but [z] in dogs—is explained by a rule that devoices the suffix after voiceless consonants (like [t]). The input cat + /z/, assembled from entries in the speaker's mental dictionary, is transformed by rule into the output cat[s]. In OT, the output is instead chosen through competition with other candidates: a constraint requiring adjacent consonants to match in voicing favours cat[s] over cat[z]. Therefore, unlike the traditional rule-based perspective that sets up rules for the adaptation, constraint-based frameworks, such as the Optimality Theory (OT) achieve adaptation merely by constraint interaction (Prince and Smolensky 1993).

By the early 1990s, the theory took centre stage in theoretical linguistics and its basic tenets rapidly became not only familiar but also revolutionary, and this doubtlessly contributed to its success. Additionally, the theory developed ideas long present in linguistics, but gave them new characteristics, thus considerably changing the understanding of the grammar. In other words, the Optimality Theory provided linguists with new ways to work and new theoretical problems to crack, although some have rejected it as being fundamentally misguided. Constraint interaction through ranking is the basis of description and explanation in OT.

Therefore, the Optimality Theory has especially been adopted as the theoretical framework for this study for it treats the donor language word as the underlying form for the recipient language. In other words, it has been adopted because of the assumption that the phonological system of the recipient language is encoded as a system of constraints, and that these constraints account for how the donor word is adapted when borrowed. Henceforth, the theory will among other things: inform *faithfulness*- that is, it will clearly show how English words strive to retain features of the input word phonologically and morphologically. Secondly, it will also inform the interaction of the two grammatical forces of *markedness* and *unmarkedness*. It will demonstrate how the markedness and the faithfulness constraints compete with each other to yield the desired outputs that are compatible with the syllabification system of the Tonga language. In other words, it will show how the extent of nativisation will either be unmarked if it resembles the target language or marked if it retains most features of the source language. Finally, the theory will also throw some light on how evaluation will be used as the basis for judging faithfulness among other things.

3.6 Chapter Summary

The present chapter presents the theoretical framework under which the study was underpinned. The chapter gives a brief background to the theory, its underlying principles, the major components and its applicability to the current study.

The next chapter provides details of the research procedures and techniques that were employed in the study in order to provide answers to the questions raised in the first chapter. Therefore, this chapter provides the details in relation to the type of research designs employed in the study, the study area, sample size and sampling techniques, data collection instruments, procedures and analysis respectively. Further, the chapter gives justifications for choosing each of the procedures and techniques used in the study.

CHAPTER FOUR
METHODOLOGY

4.0 Introduction

The previous chapter presented details of the theoretical framework under which the study was underpinned. The present chapter provides details of the research procedures and techniques that were employed in the study in order to provide answers to the questions raised in the first chapter. Therefore, this chapter provides the details in relation to the type of research designs employed in the study, the study area, sample size and sampling techniques, data collection instruments, procedures and analysis respectively. Further, the chapter gives justifications for choosing each of the procedures and techniques used in the study.

4.1 Research Methodology

Methodology is a very important aspect of a research, as such, it becomes apparent to briefly explain what it is and what is involved under it. By definition, Crotty (1994:3) refers to methodology as "the strategy, plan of action, process or design lying behind the choice and use of particular methods and linking the choice and use of methods to the desired outcomes". Rajasekar et al. (2013: 5) also describes research methodology as "…the procedures by which researchers go about their work of describing, explaining and predicting phenomena". In other words, it refers to the specific procedures or techniques used to identify, select, process, and analyze information about a topic.

The other thing about methodology is that it provides research with its philosophy, the values and assumptions which drive the rationale for the investigation as well as the standards that have been utilised for the interpretation of information and the drawing of conclusions (Bailey,

1994). It provides the focus and approach for the study and it is the process through which researchers pinpoint the methods that have been used in the research in order to address the specific questions raised (Crotty, 1998). In other words, the methodology section allows the reader to critically evaluate the study's overall validity and reliability as it among other things, answer the questions on how the data was collected and analysed.

4.1.1 Research Design

Kerlinger (1986:279) defines a research design is a plan, structure and strategy of investigation so conceived as to obtain answers to research questions or problems. Kumar (2011) also defines a research design is a procedural plan that is adopted by the researcher to answer questions validly, objectively, accurately and economically. In other words, a research design is a complete scheme or programme of the research which includes an outline of what the investigator will do from writing the hypotheses and their operational implications to the final analysis of data (Kerlinger 1986:279). It can further be described as a blueprint or detailed plan for how a research study is to be completed: operationalizing variables so they can be measured, selecting a sample of interest to study, collecting data to be used as a basis for testing hypotheses, and analysing the results (Thyer 1993: 94). It is in other words a roadmap for the researcher's journey to the conclusion of their research.

However, when preparing a research design for a particular research problem, a consideration of the following is critical: objectives of the research study; method of data collection to be adopted; source of information (sample design); tool for data collection; and whether data analysis will either involve the qualitative or quantitative approach (Kumar, 2011)..

This study, '*The Adaption of English words in Tonga'* uses the Descriptive Research Design. A Descriptive Research Design is a scientific method which involves observing and describing the behaviour of a subject without influencing it in any way. This design is ideal in describing systematically and accurately the facts and characteristics of a given area of interest such as the adaptation of English words in Tonga. Therefore, this design was favoured over others because the objectives of the current study are ones meant to describe, explain and interpret conditions of the present- that is, '*what is'* with regards the loanwords phenomenon as we try to discover the associations and relationships between English and Tonga.

4.1.2 The Qualitative Approach

Since the objectives of the current study were purely descriptive, explanatory and to a larger extent non-statistical in nature, the *Qualitative Approach* was used within the descriptive research design, so as to obtain an in-depth understanding of the data gathered. The qualitative approach or research is a method of inquiry that can be employed in a number of academic disciplines both in the social and natural sciences, including non-academic contexts such as market research, business and service demonstration. Denzin and Lincoln (2005:6) define the qualitative approach to research as a type of scientific method that seeks to understand a given research problem or topic from the perspective of the local population. It is also further added that qualitative approach is the examination, analysis, and interpretation of observations for the purposes of discovering underlying meanings and patterns of relationships, including classification of types of phenomena and entities in a manner that does not involve numerical models (Patton and Cochran, 2002:6). Mack et al (2005:1) also postulates that the major strength of qualitative research lies in its ability to provide complex textual description of how people experience a given research issue. In other words, it provides information about the "*human*" side of an issue. Qualitative researchers hold that the understanding of the phenomena, or situation, or event comes from exploring the totality of the situation (for example phenomenology and symbolic interaction), often with access to the large amounts of "*hard-data*" (Savin-Baden and Major, 2013:7). Therefore, this approach has been favoured because it gives an in-depth understanding of the human behaviours, experiences, attitudes, intensions and motivations on the basis of observations and interpretations to find out the way people think and feel about certain phenomena or situations. Here, the researcher gives more weight to the views of the participants and tries to answer the "*what*", "*why*" and "*how*" questions of the phenomena rather than the "*how many*", or "*how much*", which are answered by the quantitative methods (Patton and Cochran, 2002:5).

4.3 Study Area

This study was mainly conducted in Serenje District, with respondents being lecturers and students at Malcolm Moffat College of Education and Kalomo District of Southern Province, Zambia where the researcher interacted with High School teachers of Chitonga from selected schools. Serenje is a not a Tonga speaking community. However, the researcher purposively selected language lecturers and students studying linguistics who are both pure native speakers

of Tonga. In Lusaka, the researcher interacted with Television (TV) and Radio Presenters from the Tonga Section of Zambia National Broadcasting Corporation (ZNBC).

4.4 Study Sample Size

The sample of participants in the study was composed of two (02) language lecturers from Malcolm Moffat College of Education, two (02) high school teachers of Chitonga, twelve (12) college students studying linguistics, and two (02) radio and television (TV) presenters from the Tonga section of ZNBC. All these are native speakers of Tonga and also have proficiency of the English language.

4.5 Sampling Techniques

To rationalise the collection of data, the researcher chose in an appropriate manner, the restricted set of persons and events from which the actual information was drawn. The researcher employed particularly the purposive technique to help in collecting valuable information on the adaptation of English words in Tonga. This strategy was used as it provided the researcher with an opportunity to select only the target population and programmes (on both radio and TV) with the best information to quickly help achieve the objectives of the study.

4.6 Time Line and Methods of Data Collection

The data collection exercise was done over a period of six weeks in the selected study areas. To ensure the research's authenticity, both primary and secondary data were collected using the following methods: interwies, both structured and unstructured; desk research; programme guide; observations, both participant and non-participant and intuition respectively. Primary data were collected from Serenje, Kalomo and Lusaka- the study areas, whereas secondary data were collected through desk research from the University of Zambia library.

4.6.1 Interviews

The researcher carried out interviews which are essentially 'any person-to-person interaction, either face to face or otherwise, between two or more individuals with a specific purpose in mind'. Face-to-face structured and unstructured interviews were used as the researcher wanted the respondents to bring out authentic information on '*The adaptation of English Words in Tonga*'.

4.6.2 Desk Research

Desk research provided the study with secondary data which was solicited from secondary sources such as books, articles and reports that were studied to validate the information collected from the primary sources. This was done from the University of Zambia library, where such selected publications on especially language contact situations were consulted.

4.6.3 Programme Guide

The radio and television programme guides obtained from the Zambia National Broadcasting Corporation (ZNBC) also acted as tools for data collection. Here, this was meant to provide, the researcher with an opportunity to listen to Tonga programmes aired on both radio and television while taking down any words suspected to be borrowed from English.

4.6.4 Observations

Observation, which is a purposeful, systematic and selective way of watching and listening to an interaction or phenomenon as it takes place (Kumar, 2011), is another of the methods of data collection used in this study. Both participatory and non-participatory observations were used where the researcher listened to spoken discourses in Tonga while jotting down suspected borrowed words as people engaged in both formal and informal conversations.

4.6.5. Introspection/Intuition

Besides conducting interviews, listening to spoken discourses in Tonga, listening to programmes aired in Tonga on both radio and television and reading certain materials, the researcher also used *introspection* as one of the methods to gather data. By definition, introspection is the examination of one's own conscious thoughts and feelings. It is sometimes referred to as tacit knowledge and Crystal (2008) argues that Native-speaker intuitions are always a crucial form of evidence in linguistic analysis. Rightly so, this method was found useful as Tonga is the researcher's mother tongue and generally provided a privileged access to the researcher's own mental states which were not mediated by other sources of knowledge. Therefore, that individual experience of the mind is unique as Introspection can determine any number of mental states including: sensory, bodily, cognitive, emotional and so forth.

4.7 Data Analysis and Processing

Data analysis and processing started immediately during the data collection exercise by thematically arranging field notes according to research questions and in relation to the

objectives. The identified English words in Tonga or loanwords were tabulated in relation to different semantic fields. The data gathered was analysed using the qualitative data analysis methods within the framework of Optimality Theory propounded by Prince and Smolensky (1993). These methods involved describing the main phonological processes used in the adaptation of the collected English loanwords in Tonga.

4.8 Chapter Summary

The present chapter provided details of the research procedures and techniques that were employed in the study in order to provide answers to the questions raised in the first chapter. Therefore, this chapter provided the details in relation to the type of research designs employed in the study, the study area, sample size and sampling techniques, data collection instruments, procedures and analysis respectively. Further, the chapter gave justifications for choosing each of the procedures and techniques used in the study.

The next chapter presents and discusses the research findings.

CHAPTER FIVE
DATA PRESENTATION AND DISCUSSION OF FINDINGS

5.0 Introduction

The present chapter concerns itself with the presentation, analysis and discussion of the research findings in relation to the objectives and the theoretical framework adopted for the study. The objectives of the study are:

i) To compile a comprehensive list of English words in Tonga.

ii) To unravel the behaviour of vowel sounds in the adaptation of English words in Tonga.

iii) To account for the adaptation of English words in Tonga using the Optimality Theory.

During data collection, three hundred and fifty five (355) words were gathered (a full list of this corpus is presented as appendix at the end of the document). However, for the purposes of the analysis to be done in this chapter, only the one hundred and fourteen (114) words that were randomly selected are tabulated. Therefore, in relation to the first objective, the following tabulation is, but of the few words that were gathered as drawn from various semantic fields. For each Tonga word, there is its English counterpart, the source language and class it belongs too. The 'source' column serves to indicate the probable etymology or donor language of the lexical adoptive in question. Further, the aspect of word class has been included to test the assumption that most of the borrowed words are from the noun category. As Van Hout and Muysken (1994:42) explain, "a very important factor that involves one of the primary motivations for lexical borrowing is to extend the referential potential of a language; and since reference is established primarily through nouns, these are the elements borrowed most easily." Further, Myers-Scotton (2002:240) also argues that nouns are easily borrowed preferentially because they receive, and not assign thematic roles, so their insertion in another language is less disruptive of predicate-argument structure.

Table 5. 1. **List of words used in analysis**.

S/N	ENGLISH WORDS (TRANSCRIPTION)	SOURCE LANGUAGE	TONGA LOANS	WORD CLASS
1	Alarm /əlɑ:m/	English	Alamu	Noun
2	Balloon /bəlu:n/	English	Bbaluni	Noun
3	Boot /bu:t/	English	Bbusu	Noun
4	Cheap (adj) /ʧi:p/	English	Ku-cipa	Noun
5	Cheek(adj) /ʧi:k/	English	Nciki	Noun
6	Clerk /klɑ:k/	English	Kalaliki	Noun
7	Course /kɔ:s/	English	Kkosi	Noun
8	Curtain /kɜ:tən/	English	Nketani	Noun
9	Degree /dɪgri:/	English	Digili	Noun
10	Deacon/di:kən/	English	Daikona	Noun
11	Fork /fɔ:k/	English	Nfoloko	Noun
12	Grease /gri:s/	English	Gilizi	Noun
13	Guitar /gɪtɑ:/	English	Gita	Noun
14	Horse /hɔ:(r)s	English	Hosi/Haci	Noun
15	Machine /məʃi:n/	English	Muncini	Noun
16	Mortuary /mɔ:jurɪ/	English	Mocali	Noun
17	New (adj) /nju:/	English	Nyowani	Adjective
18	Nurse /nɜ:s/	English	Nesi	Noun
19	Parking(v) /pɑ:kɪŋ/	English	Ku-paking'a	Verb
20	School /sku:l/	English	Cikolo	Noun
21	Spoon /spu:n/	English	Supunu	Noun
22	Torch /tɔ:tʃ/	English	Tocci	Noun
23	Week /wi:k/	English	Mvwiki	Noun
24	Wheel /wi:l/	English	Vwili	Noun
25	Bar /bɑ:/	English	Bbaa	Noun
26	Card /kɑ:d/	English	Kkaadi	Noun
27	Course /kɔ:s/	English	Kkoosi	Noun
28	Court /kɔ:t/	English	Kkooti	Noun
29	Dirt /dɜ:t/	English	Dooti	Noun
30	Farm /fɑ:m/	English	Faamu	Noun

31	Form /fɔːm/	English	Foomu	Noun
32	Garden /gɑːd(ə)n/	English	Gaadeni	Noun
33	Jar /ʤɑː/	English	Jaa	Noun
34	Key / kiː/	English	Kii	Noun
35	Report /rɪpɔːt/	English	Lipooti	Noun
36	Tar /tɑː/	English	Taala	Noun
37	Tea /tiː/	English	Tii	Noun
38	Team /tiːm/	English	Tiimu	Noun
39	Teapot /tiːpɒt/	English	Tiipoti	Noun
40	Term /tɜːm/	English	Teemu	Noun
41	Shirt /ʃɜːt/	English	Shaati	Noun
42	Simcard /sɪmkɑːd/	English	Simukkaadi	Noun
43	Store /stɔː/	English	Cintoolo	Noun
44	Suit /suːt/	English	Nsuuti	Noun
45	Sweet /swiːt/	English	Nswiiti	Noun
46	Ward /wɔːd/	English	Waadi	Noun
47	Yard /jɑːd/	English	Yaadi	Noun
48	Hall /hɔːl/	English	Hoolo	Noun
49	Bag /bæg/	English	Bbeeke	Noun
50	Bowl /bəʊl/	English	Bboo	Noun
51	Bull /bʊl/	English	Bbuulu	Noun
62	Chain /tʃeɪn/	English	Ceeni	Noun
53	Coat /kəʊt/	English	Kkooti	Noun
54	Dull (adj) /dʌl/	English	Daalu	Noun
55	Dress /dres/	English	Delee(n)si	Noun
56	Goal /gəʊl/	English	Goolo	Noun
57	Hour /aʊə/	English	Woola	Noun
58	Loan /ləʊn/	English	Looni	Noun
59	Slate /sleɪt/	English	Sileeti	Noun
60	Socks /sɒks/	English	Nsookesi	Noun
61	Tent /tent/	English	Teente	Noun
62	Phone /fəʊn/	English	Fooni	Noun

63	Zip /zɪp/	English	Ziipu	Noun
64	cupboard /kʌbəd/	English	Kabati	Noun
65	table /teibl/	English	Tebule	Noun
67	school /sku:l/	English	Cikolo	Noun
68	spoon/spuːn/	English	Supunu	Noun
69	kettle/ketəl/	English	Nketulo	Noun
70	sickle/sikəl/	English	Sikela	Noun
71	lamp/læmp/	English	Lampi	Noun
72	spanner /spænə/	English	Cipanela	Noun
73	doctor/dɒktə/	English	Dokotela	Noun
74	address/ədres/	English	Adulesi	Noun
75	matches/mætʃiz/	English	Mancisi	Noun
76	machine/məʃi:n/	English	Muncini	Noun
77	wheelbarrow/wi:lbærəʊ/	English	Wilibbala	Noun
78	envelop/envələʊp/	English	Invwulupu	Noun
79	bun/bʌn/	English	Bbansi	Noun
80	watch/wɒtʃ/	English	Wacci	Noun
81	club/clʌb/	English	Kilabbu	Noun
82	pill/pɪl/	English	Piilusi	Noun
83	bulb/bʌlb/	English	Bbalubbu	Noun
84	beans/bi:nz/	English	Bbiinsi	Noun
85	ball /bɔ:l/	English	Bbola	Noun
86	Sabbath /sæbəθ/	English	Nsabata	Noun
87	cake /keɪk/	English	Kkekke	Noun
88	pot /pɒt/	English	Mpoto	Noun
89	clock/klɒk/	English	Nkoloko	Noun
90	gold/gəʊld/	English	Ngolide	Noun
91	cookies/kʊki:z/	English	Nkukisi	Noun
92	bicycle/baɪskəl/	English	Bbasikolo	Noun
93	pin/pɪn/	English	Mpini	Noun
94	size/saɪz/	English	Nsaizi	Adjective
95	Elizabeth/ilɪzəbeθ/	English	Elizabeti	Noun

96	onion/ʌnjən	English	Hanyinsi	Noun
97	paraffin/pærəfɪn/	English	Palafini	Noun
98	spanner/spænə/	English	Cipanela	Noun
99	depot/depəʊ/	English	Depo	Noun
100	window/wɪndəʊ/	English	Windo	Noun
101	bull/bʊl/	English	Bbuulu	Noun
102	overall/oʊvərɔ:l/	English	Ovolosi	Noun
103	dull/dʌl/	English	Dalu	Adjective
104	ball /bɔ:l/	English	Bbola	Noun
105	stove/stəʊv/	English	Citofu	Noun
106	twelve/twelv/	English	Twelufu	Noun
107	cupboard /kʌbəd/	English	Kabati	Noun
108	cement/səment/	English	Samende	Noun
109	bottle/bɒtl/	English	Bbodela	Noun
110	catholic/ kæθəlɪk/	English	Katolika	Adjective
111	office/ɒfɪs/	English	Opesi	Noun
112	sabbath /sæbəθ/	English	Nsabati	Noun
113	bank/bæŋk/	English	Bbanga	Noun
114	Elizabeth/ilɪzəbeθ/	English	Elizabeti	Noun

All these words are *loosely* taken to be sourced from English. However, it must be borne in mind that many of them entered English through other languages such as Greek, Latin, French, Germany, Spanish, and many more. It is for this reason that Philip (2014) describes it as a language with an insatiable appetite to borrow as it has borrowed from well over 146 languages.

Further, from the table above, it can be observed that English has injected a great many words in Tonga. Unlike Kashoki (1999/2012) who sees loanwords arising from a select domain, data used in this study demonstrate that nearly all domains of language use are productively engaged in English words adaptation.

5.1 Findings

Presented below are the actual findings of the study according to the objectives.

5.1.1 Behaviour of Vowel Sounds in the adaptation of English Words in Tonga

In relation to objective ii, which is '*to unravel the behaviour of vowel sounds in the adaptation of English words in Tonga*', this section seeks to establish what happens when, for example, the English word has a long vowel in it. The question to ask is, 'Do we still get the same long vowel in Tonga or what happens?' To help in answering such questions, we employ feature analysis to display this data.

Under the concept of markedness in OT, the features which are being used to define the place of articulation of vowels as we endeavour to unravel the behaviour of vowel sounds in the adaptation of English words in Tonga are *tense* and *lax*. Tense and lax are phonetic features of sound set up by Jakobson and Halle (1956) in their distinctive feature theory of phonology. The authors describe tense as one of the main features set up to handle variations in manner of articulation. Tense sounds have been defined both articulatorily and acoustically. Therefore, from this perspective, Tense sounds are those produced with a relatively strong muscular effort, involving a greater movement of the (supraglottal) vocal tract away from the position of rest and a relatively strong spread of acoustic energy (Crystal, 2008:271). On the other hand, Lax sounds are those produced with less muscular effort and movement, and which are relatively short and indistinct, involving a relatively weak spread of acoustic energy as in centralized vowels (Crystal, 2008:271). Examples are vowels articulated nearer the centre of the vowel area such as in *bit* and *put*. Thus, the vowels [i] and [u], for example, would be [+tense]; while [ɪ] and [a] would be [−tense]. The actual representational difference is as tabulated below; and in each pair, the first vowel is generally produced with greater tension of the tongue muscles than its counterpart and is often a little longer in duration.

Tense (Long)	**Lax (Short)**
i beat /**biːt**/	**ɪ** bit /**bɪt**/
e bait /**beɪt**/	**ɛ** bet /**bet**/
u boot /**buːt**/	**ʊ** put /**pʊt**/
ɔ bore /**bɔː**/	**o** boat /**boʊt/bəʊt**/

Table 5.2: ***Tense vs Lax***

Source: ***Fromkin, Roadman and Hyams, 2003:256***

These features are in binary opposition and are marked by the [+/-] values. The [+] (plus) value entails the presence of the feature while the [–] (minus) values signifies its absence. Therefore, the following are the observations or findings that the study established:-

i. It was observed that a long vowel in the English word is not always retained as a long vowel when the word has been nativised or adapted in Tonga. Table 4.1 shows this distinction:

Table 5.3 The behaviour of long vowels of English words in nativised words.

English	**+ Tense**	**- Tense**	**Tonga**
Alarm /ə**lɑ:**m/	+ Tense	- Tense	Alamu
Balloon /bə**lu:**n/	+ Tense	- Tense	Bbaluni
Boot /b**u:**t/	+ Tense	- Tense	Bbusu
Cheap (adj) /t**ʃi:**p/	+ Tense	- Tense	Ku-cipa
Cheek(adj) /t**ʃi:**k/	+ Tense	- Tense	Nciki
Clerk /kl**ɑ:**k/	+ Tense	- Tense	Kalaliki
Curtain /k**ɜ:**tən/	+ Tense	- Tense	Nketani
Degree /dıgr**i:/**	+ Tense	- Tense	Digili
Deacon/d**i:**kən/	+ Tense	- Tense	Daikona
Fork /f**ɔ:**k/	+ Tense	- Tense	Nfoloko
Grease /gr**i:**s/	+ Tense	- Tense	Gilizi
Guitar /gıt**ɑ:/**	+ Tense	- Tense	Gita
Horse /h**ɔ:(**r)s	+ Tense	- Tense	Hosi
Machine /mə**ʃi:**n/	+ Tense	- Tense	Muncini
Mortuary /m**ɔ:**jurı/	+ Tense	- Tense	Mocali
New (adj) /nj**u:/**	+ Tense	- Tense	Nyowani
Nurse /n**ɜ:**s/	+ Tense	- Tense	Nesi
Parking(v) /p**ɑ:**kıŋ/	+ Tense	- Tense	Ku-paking'a
School /sk**u:**l/	+ Tense	- Tense	Cikolo
Spoon /sp**u:**n/	+ Tense	- Tense	Supunu
Torch /t**ɔ:**tʃ/	+ Tense	- Tense	Tocci
Week /w**i:**k/	+ Tense	- Tense	Mvwiki

Wheel /w**i:**l/	+ Tense	- Tense	Vwili

From these English words presented here, the findings reveal that generally, the long vowels are not retained in Tonga. Therefore, these Tonga words are described as – tense due to the absence of the long vowels. Using OT nomenclature, the nativised English words in Tonga fail to retain the feature [+Tense] because such words strive to faithfully reflect the segmental nature of the Tonga language. This however, is not to deny the presence of [+Tense] in Tonga phonology but rather to admit that given the potential conflict between [-Tense] and [+Tense] in a given context of English word adaptation, the [-Tense] wins over [+Tense]. The study takes the view that on the question of faithfulness and markedness, Tonga settles for unmarkedness and flouts the faithfulness principal which calls for the output to remain as closely related to the input as possible.

ii. The second observation made is that during the adaptation process, some English words with long vowels will have them maintained at exactly the same level in Tonga.

Table 5.4: The behaviour of long vowels of English words in nativised words.

English	**+ Tense**	**+ Tense**	**Tonga**
Bar /bɑ:/	+ Tense	+ Tense	Bbaa
Card /kɑ:d/	+ Tense	+ Tense	Kkaadi
Course /kɔ:s/	+ Tense	+ Tense	Kkoosi
Court /kɔ:t/	+ Tense	+ Tense	Kkooti
Dirt /dɜ:t/	+ Tense	+ Tense	Dooti
Farm /fɑ:m/	+ Tense	+ Tense	Faamu
Form /fɔ:m/	+ Tense	+ Tense	Foomu
Garden /gɑ:d(ə)n/	+ Tense	+ Tense	Gaadeni
Jar /ʤɑ:/	+ Tense	+ Tense	Jaa
Key / ki:/	+ Tense	+ Tense	Kii
Report /rɪpɔ:t/	+ Tense	+ Tense	Lipooti
Tar /tɑ:/	+ Tense	+ Tense	Taala
Tea /ti:/	+ Tense	+ Tense	Tii
Team /ti:m/	+ Tense	+ Tense	Tiimu

Teapot /ti:pɒt/	+ Tense	+ Tense	Tiipoti
Term /tɜ:m/	+ Tense	+ Tense	Teemu
Shirt /ʃɜ:t/	+ Tense	+ Tense	Shaati
Simcard /sɪmkɑ:d/	+ Tense	+ Tense	Simukkaadi
Store /stɔ:/	+ Tense	+ Tense	Cintoolo
Suit /su:t/	+ Tense	+ Tense	Nsuuti
Sweet /swi:t/	+ Tense	+ Tense	Nswiiti
Ward /wɔ:d/	+ Tense	+ Tense	Waadi
Yard /jɑ:d/	+ Tense	+ Tense	Yaadi
Hall /hɔ:l/	+ Tense	+ Tense	Hoolo

From these English words presented here, the findings reveal that generally, the long vowels are also retained in Tonga. Therefore, the analysed Tonga words here are described as [+ tense] too, due to the presence of the long vowels. Thus, using the OT nomenclature, these nativised English words in Tonga successfully managed to retain the feature [+ Tense] because the segmental features of these words are at par. Henceforth, [+ tense] in English = [+ tense] in Tonga.

iii. The third and final observation with regards the behaviour of vowel sounds of English words in Tonga is that some of the **[**– tense**]** words in English turn out to be [+ tense] in Tonga. The composition of such words vary, but among them are mainly monosyllabic words with either a single vowel in a word (such as *bag*), two vowels following each other in a word (such as *coat*), or those with two vowels and a consonant carrying a vowel sound (such as *hour*). The findings of the study of such words are presented in the table below:-

Table 5.5: The behaviour of vowels sounds of English words in nativised words.

English	**- Tense**	**+ Tense**	**Tonga**
Bag /bæg/	- Tense	+ Tense	Bbeeke
Bowl /bəʊl/	- Tense	+ Tense	Bboo
Bull /bʊl/	- Tense	+ Tense	Bbuulu
Chain /tʃeɪn/	- Tense	+ Tense	Ceeni

Coat /kəʊt/	- Tense	+ Tense	Kkooti
Dull (adj) /dʌl/	- Tense	+ Tense	Daalu
Dress /dres/	- Tense	+ Tense	Delee(n)si
Goal /gəʊl/	- Tense	+ Tense	Goolo
Hour /aʊə/	- Tense	+ Tense	Woola
Loan /ləʊn/	- Tense	+ Tense	Looni
Slate /sleɪt/	- Tense	+ Tense	Sileeti
Socks /sɒks/	- Tense	+ Tense	Nsookesi
Tent /tent/	- Tense	+ Tense	Teente
Phone /fəʊn/	- Tense	+ Tense	Fooni
Zip /zɪp/	- Tense	+ Tense	Ziipu

Table 5.3 shows the behaviour of diphthongs and triphthong once adapted to Tonga. Following Roach (2009:17), diphthongs are vowel sounds that consist of or show a movement or glide from one vowel to another. Examples of such include /**əʊ/** as in the word **bowl [bəʊl]**, /**əɪ/** as in the word **chain [tʃeɪn]**, and /**əʊ/** as in the word **goal [gəʊl].** On the other hand, triphthongs are vowel sounds which consist of or show a movement or glide from one vowel to another, and then to the third one, all produced rapidly and without interruption such as /**aʊə/** in the word **hour** [**aʊə]**. From the data presented above, it has been observed that during the process of English word adaptation to Tonga, diphthongs and triphthongs change into long monothongs, taking the shape of the first sound of the glide. Therefore, out of this, we can easily make a prediction that all English words containing either diphthongs or triphthongs will turn out as having long vowels in Tonga.

5.1.2 Conclusion

From these findings, it can thus be concluded that vowel length in Tonga (which is the recipient language) is not always determined by the phonetic length of the corresponding vowel in English, the source language. In other words, there is lack of predictability on when there is likely to be compliance to vowel lax-tense dichotomy on account of any lexical or phonological feature of the source word. Therefore, using the qualitative data analysis methods within the framework of Optimality Theory, the study has revealed that the behaviour of vowel sounds of English words in Tonga can be accounted for in three different ways: (i) a long vowel in the English word is not always retained as a long vowel when the word has been nativised in

Tonga; (ii) some English words with long vowels will have them maintained at exactly the same level in Tonga. (iii) some of the [– tense**]** words in English turn out to be [+ tense] in Tonga. However, based on the explicitness of the third finding, the study hypotheses that in the context in which diphthongs/triphthongs are the input, the output vowel in the target language is always [+Tense] and never [-Tense]. In other words, we can easily predict that future borrowings in English containing diphthongs and triphthongs will always change into long vowels in Tonga.

5.2 Analysis of the Adaptation of English Words in Tonga Using the Optimality Theory

The adaptation of English words in Tonga is done from the Syllable Reconfiguration angle. Therefore, in line with objective (iii), this section discusses the phonological processes that are involved in the adaptation of English words in Tonga. These processes are discussed and analysed within the Optimality Theory framework, which was used to guide this study. In the analysis however, particular attention is paid to the interaction between constraints in the selection of the optimal candidate of the adopted words. Through this kind of analysis, the adaptation of English words in Tonga is examined too.

As alluded to in Chapter One, and in line with objective (iii), this particular study focuses on examining the adaptation of English words in Tonga. This has been deemed necessary in order to test the theoretical position that in a situation of language contact, when words are adopted, they are not accepted in their original form or shape, but rather restructured to conform to the articulatory and grammatical features of the receiving language thereby (whence) becoming indistinguishable from native words. Additionally and according to Ndambuki (2013) the borrowed word may also contain some phonemes that are not found in the phonemic inventory of the recipient language. The recipient language is, therefore, faced with the challenge of dealing with non-conforming syllables and foreign phonemes in the borrowed words. Thus, with such a scenario, the main question to ask would be, 'How do English words adapt to the articulatory and grammatical canons of the Tonga language?" To answer this very important question, the study identified three main phonological processes that are directly involved, and these are *insertion* and *deletion;* and *feature change*.

5.2.1 Insertion

This section discusses insertion as one of the phonological processes or strategies in the adaptation of English words in Tonga. Following Crystal (2008:247), the current study takes

insertion as a basic operation within the framework of transformational grammar which introduces or inserts a new structural element into a string. Specifically, insertion is viewed as a process that involves the addition of a sound segment into a word. This sound segment could either be a vowel or a consonant. In this particular study, two types of insertion- that is, Epenthesis and Prothesis were found to be at play in the adaptation of English words in Tonga. From a Phonetic and Phonological angle, epenthesis refers to the addition or insertion of one or more sounds in the middle or final position of a word while prothesis is the addition or insertion of a sound segment in word initial or in the initial position of a word.

In optimality-theoretic terms, following Ndambuki, (2013), insertion involves violation of DEP-IO, a faithfulness constraint that requires output segments to have input correspondents. In the analysis, the two sub-constraints of DEP-IO; that is, DEP-C = output consonants must have input correspondents and DEP-V = output vowels must have input correspondents were considered. The two types of insertion, epenthesis and prothesis are further discussed and exemplified below.

5.2.1.1 Epenthesis

This part here discusses epenthesis as one of the categories under the broader concept of insertion. As defined earlier, epenthesis refers to the addition of one or more sounds in the middle or final position of a word. It is further divided into types namely: ***anaptyxis*** and ***excrescence***- with anaptyxis being the addition or insertion of an extra vowel between two consonants for added ease of pronunciation, while excrescence is the addition or insertion of a consonant anywhere within a word. At this point, it is important to state that insertion, particularly that of vowels, is a strategy used by many languages to attain open syllables and also to break illicit consonant clusters not allowed in certain languages- especially Bantu languages, to which Tonga belongs. Such languages prefer unmarked or open syllable structures of (V) or (CV) respectively. Therefore, epenthesis violates faithfulness as the inserted vowel in the output does not have an input correspondent. However, it satisfies the open syllabicity requirement of (NOCODA) and helps to break consonant clusters hence achieving the unmarked or open syllable structures. Here it is often argued that the grammar of recipient languages find it easier to insert segments as opposed to deleting them.

This illustration is done using a *Tableau*, a table of rows and columns used to demonstrate the Evaluator process. The top leftmost cell contains the input representation to which candidate

forms are being related. The relevant candidates are listed beneath this, with the optimal candidate indicated by a hand symbol (☞). The relevant constraints are listed across the top of the table, the higher rankings being shown from highest on the left to lowest on the right. Solid lines between constraints indicate crucial rankings; broken lines indicate non-crucial rankings. Asterisks (*) show constraint violations, while an exclamation mark (!) shows the most serious violation which completely eliminates a candidate. A shaded area indicates a constraint that has become irrelevant because of the violation of a higher-ranked constraint.

Below therefore, is an optimalitic analysis and description of insertion (anaptyxis and excrescence) as a process in the adaptation of English words in Tonga. The words are not analysed alphabetically.

5.2.1.1.1 Anaptyxis

1. **Input : cupboard /kʌbəd/**
   Output : kabati /kabati/

Imput: cupboard/kʌbəd/	NO-CODA	ONSET	DEP-V	IDENT-IO (voice)
a. ☞ ka.ba.ti			*	*
b. ka.bat	*!			*
c. kab.at	*!	*		*
d. kab.at.i	*!	**	*	*

Tableau 5:1 Cupboard /kʌbəd/→kabati /kabati/

In this analysis, four candidates, which are all possible realisations of the input, have been generated by the operational or functional component of Generator (GEN). After assessing the candidates, the other operational component of Evaluator (EVAL) has selected candidate **a**. as the optimal form as it violates only DEP-V (output vowels must have input correspondents-No V insertion) because of the insertion of /i/ in the last syllable. This epenthizing or insertion of /i/ is used to deal with the coda and this has resulted in the increase to the number of syllables for the input from two to three in the output. Like all the other candidates, **a.** also violates constraint IDENT-IO (Voice) = (the specification for a feature [voice] of an input segment must be preserved in its output correspondent). As it can be noted, all the candidates have

violated this constraint by changing the voiced /**d**/ in the input [cupboar**d**] to the voiceless /**t**/ in the output [kaba**t**i]. Therefore, since all the candidates violate it, it cannot be used to determine the optimal candidate thus shading the cells. Candidates **b**. **c**. and **d**. all violate the constraint NO-CODA= syllables must not have a coda (syllables are open). This is a very serious violation as this constraint ranks the highest in Tonga. Tonga, like many other Bantu languages have open syllables.

2. **Input : table /teibl/**
   Output : tebule /teβule/

Input: table/teibl/	NO-CODA	*COMPLEX	NUC	DEP-V
a. ☞ te.bu.le				*
b. te.ble		*!		
c. teb.l	*!		*	
d. Te.bl	*!	*!	*	
e. teb.le	*!			

Tableau 5:2 table /teibl/→ tebule /teβule/

In this tableau, the **candidate a.** is selected as the optimal output form based on the interaction of highly ranked markedness constraints in Tonga of NOCODA and *COMPLEX, and the faithfulness constraint of DEP-V = no V epenthesis. The winning candidate, /tebule/, only violates a lower ranked constraint of DEP-V through the insertion of /u/ which has been done to break the consonant cluster of /bl/ in the input. This insertion of /u/ to break the illicit consonant cluster in the input has also resulted in the increase of syllables from two to three. Candidate **b**. has missed out on being selected because of the same consonant cluster mentioned above while candidates **c**., **d**., and **e**. all violate a serious constraint of NO-CODA which is highly ranked in the hierarchy.

3. **Input :school /sku:l/**
   Output :cikolo /ʤɪkolo/

Input: school/sku:l/	NO-CODA	*COMPLEX	NUC	DEP-V
a. ☞ʤɪ.ko.lo		*!		**
b. ʤɪ.ol	*!	*!		
c. ʤ.ko.l	*!	*!	*	*

d. dʒk.lo		*!	*	*
e. dʒ.kol	*!		*	*

Tableau 5.3 school /sku:l/→cikolo /dʒɪkolo/

Candidate **a**. has been selected as the optimal candidate despite violating the faithfulness constraint through the epenthetic segments of /i/ in the first syllable and /o/ in the second and third syllables which have no counterparts in the input. At the same time, the output satisfies the markedness constraint that requires syllables to be open in Tonga. After the re-syllabification, we get an output form which has three syllables compared to the monosyllabic input. This is therefore, how this English word [school] has gotten adapted to the grammatical canon of the Tonga articulatory system. The other candidates could not be selected because of violating the higher constraint of NO-CODA.

4. **Input** **spoon/spu:n/**
   Output **supunu/supunu/**

Input: **spoon/spu:n/**	NO-CODA	*COMPLEX	NUC	DEP-V
a. ☞su.pu.nu				***
b. Spu:n	*!	*!	*	*
c. Spun	*!	*!		
d. Su.pu.n	***!**		*****	******
e. sp.nu		***!**	*****	*

Tableau 5.4 spoon/spu:n/→ supunu/supunu/

The consonant cluster [sp] is disallowed in Tonga. It is, therefore, broken by the insertion of /u/ between /s/ and /p/. The coda too is dealt with by inserting /u/ at the end of the word. This increases the number of syllables from one to three. Candidate **a.** is the optimal one as it has the unmarked open syllables that are preferred by Tonga and violets only the least ranked constraint of DEP-V. The other candidates seriously violate the high-ranked constraints in Tonga hence not being selected as optimal candidates.

5. **Input :kettle/ketəl/**

Output :nketulo/nketulo

Input: kettle/ketəl/	NO-CODA	*COMPLEX	NUC	DEP-C	DEP-V
a. ☞ nke.tu.lo				*	**
b. nke.tu.l	*!		*	*	*
c. nk.etu.l	**!	*!	*	*	*
d. nke.tul	*!	*!		*	*

Tableau 5.5 kettle/ketəl/→ nketulo/nketulo

In this entry, GEN has generated four candidates. To break the consonant cluster [tl] in the input, /u/ is inserted between /t/ and /l. This epenthesis process has affected the syllabary of the word as it increases the number of syllables from two to three. Five constraints – NOCODA, *COMPLEX, NUC, DEP-C and DEP-V – have interacted in the selection of the optimal output form. EVAL has selected candidate **a.** as the winner since it incurs minimal violations as compared to the others. It should also be noted that all these candidates have violated the markedness constraint of DEP-C through the insertion of the nasal /n/ in the first syllable.

6. Input :sickle/sikəl/

Output :sikela/sikela/

Input: **sickle/sikəl/**	NO-CODA	*COMPLEX	NUC	DEP-V
a. ☞ si.ke.la				*
b. sik.ela	*!			*
c. ske.l	*!	*!	*	*
d. s.ke.la			*	*
e. si.kel.a	*!			*

Tableau 5.6 sickle/sikəl/→ sikela/sikela/

The consonant cluster [ckl] is not allowed in Tonga. It is, therefore, broken by the insertion of /e/ between /k/ and /l/. This resulted in an increase to the number of syllables from two in the input to three in the output. Candidate **a.** is the optimal one as it has the unmarked open syllables

that are preferred by Tonga and violets only the least faithfulness ranked constraint of DEP-V. The other candidates b., c., and e. cannot be considered for selection as optimal because they seriously violate the high-ranked constraint of NO-CODA which is not permitted in Tonga where only open syllables are allowed.

7. Input :lamp/læmp/

Output :lampi/lampi/

Input lamp/l læmp/	NO-CODA	ONSET	DEP-V
a. ☞ la.mpi			*
b. lam.pi	*!		*
c. la.mp.i	*!	*	*

Tableau 5.7 lamp/læmp/→ lampi/lampi/

The constraints that interact in the selection of the optimal output form are the faithfulness constraints NOCODA and ONSET against the markedness constraint DEP-V = no vowel epenthesis. Since candidate **a**. incurs minimal violation of a lower ranked constraint, it is the preferred optimal output form. It can be observed that whereas the input is monosyllabic, the output has two syllables.

It should however be noted that the nasals [m,n] can combine with other consonants such as [c, ma**nci**si; n,**nke**tani; m, **mpo**to etc] plus a vowel in African languages as the only permissible combinations involving consonants. Here, it is argued that such consonant combinations [**nc**i, **mp**o, **nk**e] are treated as co-articulated consonants representing single phonemes in Tonga and not as clusters per se.

8. Input :spanner /spænə/

Output :cipanela /cipanela/

Input spanner/spænə/	NO-CODA	*COMPLEX	ONSET	NUC	DEP-V
a. ☞ ci.pa.ne.la					***
b. cip.ane.la	*!				**
c. cpa.ne.l	*!	*!		*	*
d. cip.a.nla	*!	*!	*		*
e. c.ipa.nel.a	**!		*	*	***

Tableau 5.8 spanner/spænə/→ cipanela/cipanela/

Candidate **a**. is the only one which satisfies the open syllabicity requirement hence being selected as the optimal output form and violets only the markedness constraint of DEP-V which entails no insertion of vowel sounds. The insertion of /i/ in the first syllable is meant to break the disallowed cluster [sp]. Further, the insertion of /a/ in the last syllable is necessitated by the need to deal with the coda. Subsequently, this has led to an increase in the number of syllables from two in the input to four in the output. The other candidates have fallen off from the competition because they seriously violet NO-CODA and others which is a higher ranked constraints than DEP-V violated only by candidate **a**.

9. Input doctor/dɒktə/

Output dokotala/dokotela/

Input doctor/dɒktə/	NO-CODA	*COMPLEX	ONSET	NUC	DEP-V
a. ☞ do.ko.te.la					**
b. dok.ote.la	*!				**
c. do.ko.tla		*!			**
d. dok.o.te.l	**!		*	*	*
e. do.ko.tel	*!				*

Tableau 5.9 doctor/dɒktə/→ dokotala/dokotala/

Five candidates, which are all possible realisations of the input have been generated by the operational or functional component of Generator (GEN). The other operational component of Evaluator (EVAL) has selected candidate **a**. as the optimal form as it violates only the faithfulness constraint of DEP-V (output vowels must have input correspondents- No V insertion) through the insertion of /o/ and /a/ in the first and second syllables of the input. /o/ has been epenthesized to specifically break the consonant cluster [cd] whereas /a/ has been inserted after the consonant /r/ in the final position in order not to make a fatal violation of NO-CODA (syllables must not have a coda- syllables are open). After re-syllabification, we get an output form which has four syllables compared to the disyllabic input. This is therefore, how this English word [doctor] has been adapted to the grammatical canon of the Tonga articulatory

system. The other candidates could not be selected because of violating the higher constraints in the hierarchy.

10. Input address/ədres/

Output adulesi/adulesi/

Input address/ədres/	NO-CODA	ONSET	NUC	DEP-V
a. ☞ a.du.le.si		*		**
b. ad.le.s	*!	*	*	
c. adu.les	*	*	*	*
d. a.dul.esi	*!	*		**
e. a.dul.si	*!	*		**

Tableau 5.10 address/ədres/ → adulesi/adulesi/

Here, in the selection process of the optimal candidate of this particular entry, four constraints of NO-CODA, ONSET, NUC and DEP-V have interacted. After filtration of the candidates by EVAL, **a.** has been selected as the optimally preferred candidate having satisfied the open syllable requirements and it does not violate the higher ranked NO-CODA constraint. Therefore, it emerges as the winner amongst this set of candidates. It can also be observed that the insertion of /u/ to break the cluster [dr] and /i/ to deal with the illicit in the last has increased the syllabicity of the input. Additionally, the phoneme [r] has been replaced with [l] since it does not exist in the Tonga phonemics. Therefore, it is through all these insertions and moderations that the English word [address] has been adapted into Tonga as [adulesi].

5.2.1.1.2 Excrescence

This section elaborates on excrescence, which is part of epenthesis, and provides concrete examples on how words are analysed in the adaptation process. It should however be stated that consonant insertion (excrescence) is not as common as vowel epenthesis in Tonga words and its existence is limited to very few phenomena. Quick mention must here be made that this process of excrescence is not necessarily discussed in terms of syllable reconfiguration, but rather just as another type of insertion which adheres to the orthographic representation of the Tonga language in the adaptation process of English words in Tonga. Nevertheless, it should also be noted that consonant insertion will always go along with vowel insertion. As explained earlier, excrescence is the addition or insertion of a consonant anywhere within a word. And in

showing how excrescence is achieved, possible insertion points within a word have been proposed- that is, establishing whether the inserted consonant might belong to the first, second or third syllable in an adoptive. This means that all possible structures are activated and compete for selection as shown in the examples discussed here below.

11. Input :**matches/mætʃiz/**

Output **:mancisi/mancisi**

Input matches/mætʃiz/	NO-CODA	*COMPLEX	NUC	DEP-C	DEP-V
a. ☞ ma.nci.si		*!		*	**
b. man.ci.si	*!			*	**
c. man.ci.s	**!		*	*	*
d. m.anc.is	**!	*!	*	*	*
e. ma.nc.is	**!	*!		*	*

Tableau 5.11 matches/mætʃiz/→ mancisi/mancisi

In the selection of the optimal candidate here, five constraints have interacted, each showing how the inserted consonant can be accommodated in the adapted structure. In the case of the inserted **'n'**, as can be seen from the tableau above, five possible interactions were activated: candidate **a.** placed inserted consonant **'n'** as onset of the second syllable; candidate **b.** and **c.** treat the inserted **'n'** as a coda of the first syllable; candidate **d.** treats the inserted consonant **'n'** as a coda together with **'c'** while candidate e treats **'n'** as a syllabic consonant in the second syllable.

After an evaluation by the operational component of Evaluator (EVAL), candidate '**a.'** has been selected though it violets the constraint of *COMPLEX. In order to come to terms with the articulatory canon of Tonga, the consonant /n/ has been inserted in the second syllable. Additionally, /i/ has been epenthesised in order to deal with the coda and this has led to an increase in the number of syllables from two to three in the output. These other candidates could not be considered for selection because they violet the high ranked constrain of NO-CODA. Henceforth, this is how the English word /matches/ gets adapted to /mancisi/ in Tonga.

12. Input :machine/məʃi:n/

Output :muncini/muncini/

Input machine/məʃi:n/	NO-CODA	*COMPLEX	NUC	DEP-C
a. ☞ mu.nci.ni		*!		*
b. mun.ci.ni	*!			*
c. mun.ci.n	*!		*	*
d. mu.nci.n	*!	*!	*	*
e. m.unc.ini	*!	*!	*	*

Tableau 5.12 machine/məʃi:n/→ muncini/muncini/

The sounds /ʃ/ and /tʃ/ are realised as /nci/ following the phonemic inventory of Tonga. Therefore, the insertion of the nasal /n/ has been necessitated in order to satisfy the phonemic inventory of Tonga. In the adaptation of this word, in addition to the insertion of the consonant /n/, there is also the change of vowels from /u/and /e/ in the input to /i/ and another /i/ in the output. Candidates **b**., **c**., **d**. and **e.** could not compete for selection on account of violating the higher constraint of NO-CODA. Therefore, this leaves only **a**. as the optimal candidate.

13. Input :wheelbarrow/wi:lbærəʊ/

Output :wilibbala/wilibala/

Input wheelbarrow/wi:lbærəʊ/	NO-CODA	*COMPLEX	DEP-C	DEP-V
a. ☞ wi.li.bba.la		*!	*	***
b. wil.bba.l	**!	*!	*	*
c. wil.bla	*!	*!		*
d. wi.bb.ala	*!	*!	*	**

Tableau 5.13 wheelbarrow/wi:lbærəʊ/ → wilibbala/wilibala/

In the adaption of this English word into Tonga, four constraints, NO-CODA, *COMPLEX, DEP-C and DEP-V, interact in the selection of the optimal output form. To begin with, excrescence here is seen through the insertion of another /b/ sound to the already existing one in the second syllable of the input. This study has revealed that the /**b**/ sound in English is mainly realised as a strong sound which is represented as '***double***' consonants /**bb**/ and transcribed as /**b/** in Tonga. This has been allowed in order to conform to the aspect of inserting

another consonant to denote a hard sound in the recipient language. This assertion will further be explained when analyzing the process of prothesis. The insertion of vowels has helped deal with codas which are not permitted in Tonga. It is therefore for this reason that candidate **a**. has been selected as the optimal output form against the others which incurred the most serious violations.

14. Input :envelop/envələʊp/

Output :imvwulupu/imvwulupu/

Input envelop/envələʊp/	**NO-CODA**	***COMPLEX**	**ONSET**	**DEP-C**	**DEP-V**
a. ☞ i.mvwu.lu.pu		***!**	*	*	*
b. i.mvwu.lup	***!**	***!**	*	*	*
c. i.mvlu.p	***!**	***!**	*	*	*
d. imvwul.upu	***!**	*		*	*
e. i..mv.lu.pu	***!**	***!**	*	*	*

Tableau 5.14 envelop/envələʊp/ → imvwulupu/imvwulupu/

In this example, the optimal output form is selected through the interaction of the markedness constraints of NOCODA, *COMPLEX, and ONSET with the faihfuness one of DEP-C and DEP-V respectively. The input has two syllables with the first syllable having a consonant cluster while the second one has a coda which are disallowed in Tonga. The insertion of the consonants in the first syllable conforms to the Tonga orthography while the insertion of a vowel in the last syllable takes care of the resultant coda. After the re-syllabification, we get an output form which has four syllables compared to the disyllabic input. Subsequently, candidate **a**. is selected as the optimal one having satisfied all the adaptation requirements against the others that violate the highly ranked markedness constraint NO-CODA. In other words, each of the rejected candidates has a syllable containing a coda which is disallowed in the recipient language, Tonga.

15. Input :bun/bʌn/

Output :bbansi/bansi/

Input bun/bʌn/	NO-CODA	*COMPLEX	ONSET	DEP-C	DEP-V
a. ☞ bba.nsi		**!		*	*
b. ba.ns.i	*!	*!	*	*	*
c. b.ans.i	**!	*!	*	*	*
d. ba.ns	*!	*!		*	

Tableau 5.15 bun/bʌn/→ bbansi/bansi/

Excrescence (insertion of a consonant sound anywhere within a word) in this analysis is seen through the insertion of the consonant sound /s/ in the newly created second syllable of the output form out of the monosyllabic input. In order to avoid the coda, which is disallowed in Tonga, the recipient language, /i/ has also been epenthesised. This re-syllabification has lead into the output being bisyllabic. Therefore, in the adaption process, candidate **a**. has taken precedence over the others despite violating the markedness constraint of *COMPLEX. This is because the other candidates violate NO-CODA, which is hierarchically more fatal than the other constraints.

16. Input :watch/wɒtʃ/

Output :wacci/waci/

Input watch/wɒtʃ/	NO-CODA	*COMPLEX	NUC	DEP-C	DEP-V
a. ☞ wa.cci		*!		*	*
b. wa.c	*!		*		
c. wac.ci	*!			*	*
d. w.ac	**!		*		

Tableau 5.16 watch/wɒtʃ/ →wacci/waci/

In this set of four candidates as generated by the Evaluator (EVAL), b. violates two constraints with one them (NO-CODA) being a fatal one. Candidate **c**. violates three constraints while **d**. violates two. In order to conform to the Tonga articulatory system, the second syllable in the output allows the insertion of another consonant sound /c/ to denote the hard sound which is represented by a cluster /cc/ in Tonga. Therefore, this is the markedness constraint

(*COMPLEX- no consonant cluster allowed within a syllable) candidate **a.** violates as it gets selected as the optimal output form in addition to DEP-C (no consonant insertion) and DEP-V (no vowel insertion).

17. Input :club/clʌb/

Output :kilabbu/kilabu/

Input club/clʌb/	NO-CODA	*COMPLEX	DEP-C	DEP-V
a. ☞ ki.la.bbu		*!	*	**
b. kil.ab	*!			*
c. Klab	*!	*!		
d. ki.la.b	*!	*!		*
e. ki.lab	*!			*

Tableau 5.17 club/clʌb/→ kilabbu/kilabu/

In the adaption process of this word, and especially in relation to excrescence, it can be noticed that candidate **a**. which has also emerged as the optimal one, a consonant cluster has been allowed in the last syllable of the output thereby violating *COMPLEX. This has been allowed in order to conform to the aspect of inserting another consonant to denote the correct orthographic representation in accordance with Tonga, the recipient language. Additionally, /i/ has been inserted to break the consonant cluster in the onset while /u/ is epenthesised in order to deal with the illicit coda hence violating DEP-C and DEP-V respectively. These adaptation processes have led to candidate **a**. having the unmarked open syllables preferred in Tonga and also increasing the number of syllables from one to three. Subsequently, it is selected as the optimal form in a set five candidates. The other candidates have been left out as they violate the high ranked constraint of NO-CODA.

18. Input :pill/pɪl/

Output :piilusi/pi:lusi

Input pill/pɪl/	NO-CODA	*COMPLEXVOW	NUC	DEP-C	DEP-V
a. ☞ pii.lu.si		*		*	**
b. pil.si	*!			*	*
c. piil.usi	*!	*		*	**
d. pii.lu.s	*!	*	*	*	*
e. Pii.lu.s	*!	*	*	*	*

Tableau 5.18 pill/pɪl/→ piilusi/pi:lusi

Notably, three vowels have been inserted as the output filters through the Evaluator. /i/ is inserted to conform to the orthographic representation of Tonga for long vowels. This however, has resulted into four candidates, except one in the set, to violate constraint *COMPLEXVOW (No string of vowels within a syllable). /u/ is epenthesised to deal with the illicit coda. /s/ comes in as the newly inserted consonant, with /i/ at the end to avoid a coda as Tonga subscribes to open syllables. These are therefore the parameters that make candidate **a.** being adopted as the optimal output form against candidates b., c., d. and e. Additionally, the other candidates violate the high ranked constraint of NO-CODA hence losing out in the competition.

19. Input :bulb/bʌlb/

Output :bbalubbu/balubu/

Input bulb/bʌlb/	NO-CODA	*COMPLEX	NUC	DEP-C	DEP-V
a. ☞ bba.lu,bbu		****!**		******	*******
b. Bba.lu.b	***!**	***!**	*****	*****	******
c. Bba.lub	***!**	***!**		*****	******
d. Ba.lu.b	***!**		*****		*****
e. Ba.lb	***!**	***!**	*****		

Tableau 5.19 bulb/bʌlb/→ bbalubbu/balubu/

Here, the optimal output form is selected through the interaction of the constraints NO-CODA, *COMPLEX, NUC, DEP-V and DEP-V respectively. The insertion of the consonant sound /b/ in both syllables of the output conforms to the orthographic representation of Tonga for 'hard sounds'. This study has revealed that the /**b**/ sound in English is mainly realised as a voiced bilabial plosive /b/ which is represented as '***double***' consonants /**bb**/ and transcribed as /**b/** in Tonga as opposed to a voiced bilabial fricative /β/. This is similar to the case of *long vowels*, which are also denoted by a full colon in English phonetic representation but realised as *double vowels* in Tonga. The consonant cluster /lb/ in the input is broken through the insertion of /u/. Further, to get rid of the coda after the insertion of the second /b/, the vowel /u/ has been added too. These insertions have given rise to an increase in the number of syllables from one in the input to three in the output. Henceforth, candidate **a**. is selected as the optimal one having satisfied all the adaptation requirements against the others that violate the highly ranked constraint of NO-CODA.

20. Input :beans/bi:nz/

Output :bbiinsi/bi:nsi/

Input beans/bi:nz/	NO-CODA	*COMPLEX	*COMPLEXVOW	DEP-C	DEP-V
a. ☞ bbii.nsi		**!	*	**	*
b. Bbi.ns	*!	**!		*	
c. Bin.si	*!				
d. Bi.ns	*!	*!		*	

Tableau 5.20 beans/bi:nz/→ bbiinsi/bi:nsi/

Excrescence is here seen through the insertion of /s/. In order to deal with the coda that is created but not allowed in Tonga, the vowel /i/ is epenthesised at the end of the string. The insertion of another consonant /b/ in the first syllable and another vowel of the output conform to the orthographic representation of Tonga for 'hard sounds' or plosive and long vowels. In the adaption process, this is what makes candidate **a.** emerge among others to be selected as the optimal candidate. The other entries fall out on account of violating the high ranked constraint.

5.2.1.1.3 Prothesis

As already alluded to, Prothesis is the second part of insertion and refers to the addition or insertion of a sound segment in word initial or in the initial position of a word. Here, it is argued that the addition or insertion of a sound segment in the initial position does not change the meaning as prefixes do; neither does it change the structure of the word, rather, it is meant to make the pronunciation of the word easier. In the case of Tonga, prothesis is mainly meant to adhere to its orthographic representation for co-articulated sounds. As one of the phonological processes in the adaptation of English words in Tonga, this study has revealed that prothesis mainly occur through the insertion of the nasal sounds, /n/ and /m/ and also the plosives /k/ and /b/. The insertions of the nasals appear not to have any peculiar behaviour or pattern. However, that of the plosives, particularly /b/, seems to be observed in most of the English words that begin with or have a syllable containing the /b/ sound. The study has revealed that the /**b**/ sound in English is mainly realised as a strong /**b**/ and is represented by a double consonant [**bb**] in the Tonga orthography. To justify this assertion, we can consider the following examples:-

English	**Tonga**
Book	**Bb**uku
Bank	**Bb**anga
Bag	**Bb**eeke
Bottle	**Bb**odela

In Tonga, the symbol used in its phonetic representation is /**b**/. This is similar to *long vowels*, which are also denoted by a full colon in English phonetic representation but realised as *double vowels* in Tonga.

Therefore, the process of prothesis in the adaption of English loanwords in Tonga is as demonstrated below. Consideration is more on the aforementioned nasals [n/m] and plosives [b/k] respectively.

21. Input :ball /bɔ:l/

Output :bbola /bɔla/

Input / bɔ:l/	**NO-CODA**	**NUC**	**DEP-C**	**DEP-V**
a. ☞ bbo.la			*	*
b. bo.l	*!	*		
c. bol.a	*!			*

Tableau 5.21 ball /bɔ:l/ → bbola /bɔla/

Candidate **a**. is selected as the optimal one as it conforms to the orthographic representation of the Tonga phonological system by adding another consonant /b/ in the first syllable. It has to be made succinctly clear that without the insertion of another consonant /b/, we could have come up with '*bola*' as the output form and this could have meant something else away from the object under focus. /a/ has been epenthesised at the end to deal with the coda, thereby increasing the number of syllables to two in the output form. Candidate **a**. has also been selected as the optimal candidate over **b**. and **c**. since it does not violate NO-CODA, which is a much more fatal violation in the hierarchy.

22. Input :Sabbath /sæbəθ/

Output :nsabata /nsabata/

Input sabbath/sæbəθ/	NO-CODA	NUC	DEP-C	DEP-V	IDENT-OI(F)
a. ☞ nsa.ba.ta			*	*	*
b. nsab.ata	*!		*	*	*
c. nsa.ba.t	*!	*	*		*
d. sab.at	**!	*			*

Tableau 5.22 Sabbath /sæbəθ/→ nsabata /nsabata/

Four candidates, which are all possible realisations of the input, have been generated by GEN. Additionally, five constraints of NO-CODA, NUC, DEP-C, DEP-V and IDENT-IO (voice) have interacted in the selection of the preferred candidate. After going through EVAL, candidate **a**. as been emitted as the optimal form as it violates only the lower ranked faithfulness constraints of DEP-C and DEP-V through the insertion of /n/ in the initial position and the epenthesising of /a/ at the end to avoid a fatal violation of NO-CODA (syllables must not have a coda- syllables are open). It should however, be noted that in the Tonga articulatory system the combination /ns/ is not taken as a consonant cluster but rather co-articulate sounds acting as a single sound referred to as nasal complex. Therefore, violation of the constraint *COMPLEX (no consonant cluster is allowed within a syllable) is almost redundant under prothesis. It should also be noted that Tonga does not have the /**θ**/ sound. This feature thus changes to /**ta**/, its nearest equivalent in Tonga. Consequently, all the candidates violate the constraint IDENT-IO (F). Therefore, the adaptation of the English input '*sabbath*' to '*nsabata*' is realised through the insertion of the nasal /n/ in word initial and the change of the /**θ**/ feature to what is applicable according to the Tonga phonemic inventory. The other candidates find it difficult to compete because of violating the higher constraints in the hierarchy.

23. Input :cake /keɪk/

Output :kkekke /keke/

Input cake/keɪk/	NO-CODA	NUC	DEP-C
a. ☞ kke.kke			**
b. Kke.k	*!	*	*
c. Ke.k	*!	*	

Tableau 5.23 cake /keɪk/→ kkekke /keke/

Despite violating DEP-C, a constraint which forbids consonant insertion, candidate **a.** has remained faithful to NO-CODA and NUC thereby being selected as the optimal candidate in

order to satisfy the requirement in Tonga of doubling certain consonants to indicate hard sounds. Therefore, the addition of /k/ in both syllables has been done to attain this. The other candidates **b**. and **c**. could not be considered as they violate a higher constraint of NO-CODA in addition to constraint NUC, which states that syllables must have nuclei.

24. Input :pot /pɒt/

Output :mpoto /mpɔtɒ/

Input pot/pɒt/	NO-CODA	ONSET	NUC	DEP-C	DEP-V
a. ☞ mpo.to				*	*
b. mpo.t	*!		*	*	
c. m.po.t	*!!		**		
d. mp.o.to	***!**	*****			

Tableau 5.24 pot /pɒt/→ mpoto /mpɔtɒ/

Tableau 24. shows that candidate b. is radically discarded and it is not exempted from exclusion as it fatally violates the highly ranked constraint NO-CODA. Additionally, candidates **c.** and **d.** too fall out as they fatally contravene the markedness higher ranked constraint of NOCODA besides ONSET and NUC respectively. Candidate **a.** beats all its rivals and surfaces as the optimal candidate on the grounds that it satisfies the prothetic requirements through the addition of a consonant in word initial and insertion of /o/ to avoid a coda. These additions and insertions have resulted in an increase in the syllabicity of the output to two from one in the input. Therefore, it is through these additions and insertions that '*pot*' gets adapted to '*mpoto*' in Tonga.

25. Input :clock/klɒk/

Output :nkoloko/nkoloko

Input clock/klɒk/	NO-CODA	NUC	DEP-C	DEP-V

a. ☞ nko.lo.ko			*	**
b. nkol,oko	*!		*	**
c. nklo.k	*!	*	*	
d. nko.lok	*!		*	*

Tableau 5.25 clock/klɒk/→ nkoloko/nkoloko/

In this tableau, prothesis has been realised through the insertion of the nasal /n/ in front of the entire string. To break the cluster /cl/, the vowel /o/ has been epenthesised. To deal with the coda in the input or to attain open syllables, another /o/ has been inserted at the end and this has increased the number of syllables of the output to three from the initial two in the input. A further analysis of the other candidates reveal that b. c. and d. are all discarded and not considered for selection on account that they contravene the most fatal constraint. Consequently, a. emerges as the optimal candidate as it remains faithful especially to NO-CODA.

26. Input :gold/gəʊld/

Output :ngolide/ngolide/

Input gold/gəʊld/	NO-CODA	DEP-C	DEP-V
a. ☞ ngo.li.de		*	*
b. ngol.ide	*!	*	*
c. ng.oli.de	*!	*	*
d. ngo.lid	**!	*	

Tableau 5.26 gold/gəʊld/→ ngolide/ngɔlide/

The phonological process of prothesis in the adaptation of '*gold*' to '*ngolide*' is realised through the insertion of the nasal /n/ in word initial of the output. The consonant cluster /ld/ is also broken through the addition of /e/ at the end in order to achieve an open syllable. Therefore, from the four candidates generated by GEN, a. surfaces through EVAL as the winning candidate despite violating the faithfulness constraints of DEP-C and DEP-V respectively. Candidates b. and c. contravene NO-CODA once each while d. violates it twice and hence falls out of possible selection.

27. Input cookies/kʊki:z/

Output nkukisi/ŋukisi

Input **cookies/kʊki:z/**	NO-CODA	NUC	DEP-C	DEP-V
a. ☞ nku.ki.si			*	*
b. nku.kis	*!		*	
c. nk.ki.s	**!	*	*	
d. nku.k.si	*!	*	*	*

Tableau 5.27 cookies/kʊki:z/→ nkukisi/ŋukisi

As can be noticed, all the candidates violate the faithfulness constraint of DEP-C through the insertion of the nasal /n/ in word initial in adherence to the Tonga phonemic inventory according to the process of prothesis. Candidate d. violates all the four constraints that are interacting in this competition including the fatal one of NO-CODA. c. and b. are also at variance with the same constraint in addition to the others. This therefore, is what leaves a. to emerge victorious and be selected as the optimal output form despite violating DEP-C and DEP-V which are in conformity with and a requirement in the Tonga articulatory system according to prothesis.

28. Input :bicycle/baɪskəl/

Output :bbasikolo/basikɒlɔ

Input bicycle/baɪakəl/	NO-CODA	NUC	DEP-C	DEP-V
a. ☞ bba.si.ko.lo			*	**
b. bba.s.klo	*!	*	*	
c. bbas.ko.lo	*!		*	*
d. Bba.si.ko.l	*!	*	*	*

Tableau 5.28 bicycle/baɪskəl/→ bbasikolo/basikɒlɔ

The insertion of a consonant such as another /b/ to have /bb/ in the first syllable is in conformity with the Tonga articulatory system to represent hard sounds as opposed to creating a consonant cluster. In the input, the cluster /cl/ is broken by the epenthesis of /o/. These processes violate the faithfulness constraints of DEP-C and DEP-V but satisfy the markedness constraint: NOCODA. Thus, candidate a. emerges the winner as it only minimally violates the lower-ranked constraints in Tonga. Notably, this adaptation process has also increased the number of syllables from two to four.

29. Input :pin/pɪn/

Output :mpini/mpini/

Input pin/pɪn/	NO-CODA	NUC	DEP-C	DEP-V
a. ☞ mpi.ni			*	*
b. mp.ini	*!	*	*	*
c. mpi.n	*!	*	*	
d. m.pi.ni	*!		*	*

Tableau 5.29 pin/pɪn/→ mpini/mpini/

Candidate a. is chosen as the optimal output form as it contravenes only the lower ranked constraints but remains faithful to the higher ranked ones. Further, it also adheres to the unmarked open syllables that are preferred by Tonga. This is in contrast to the other candidates that violate the higher constraints. As stressed earlier in other analyses, /mp/ in this particular instance is not taken as a consonant cluster, but rather as co-articulated sounds that act as a single unit to conform to the phonemic inventory of Tonga.

30. Input :size/saɪz/

Output :nsaizi/nsaizi/

Input size/saɪz/	NO-CODA	*COMPLEX VOW	ONSET	DEP-C	DEP-V
a. ☞ nsa.i.zi			*	*	**
b. ns.ai.zi	*!	*		*	*
c. nsai.zi		*		*	*
d. nsa.i.z	*!		*	*	*

Tableau 5.30 size/saɪz/→ nsaizi/nsaizi/

In this analysis, GEN has given us four candidates with five constraints interacting in the selection of the optimal output form. Candidate d. is dismissed for violating four constraints, among them the more serious one of NO-CODA. Candidate c. is discarded for violating especially *COMPLEXVOW – which does not permit a string of vowels within a syllable besides DEP-C and DEP-V. **b.** equally falls out on account of contravening NO-CODA, *COMPLEX and the faithfulness constraints of DEP-C and DEP-V. Therefore, in the adaptation process, **a.** is considered the optimal candidate as it remains faithful to the most fatal constraint although it violates the other lower ranked ones. Prothesis is thus attained through the insertion of the nasal /n/ in the initial position and the epenthesising of the vowel /a/ in

order to be in conformity with the Tonga articulatory system. This has subsequently increased the number of syllables from one in the input to three in the output.

5.2.2 Conclusion

From the analysis that has been done thus far, two different types of insertion have been presented: epenthesis and prothesis respectively. As the analysis has revealed, epenthesis (or vowel insertion) accounts for most or is the most dominant process in the adaptation of English words in Tonga. Tonga, just like most Bantu languages, prefers unmarked or open syllable structures of (V) or (CV). As it has also been noticed, insertion particularly that of vowels is a strategy used by many languages to attain open syllables and also to break illicit consonant clusters that are not allowed. Consonant insertion has been found not to be as common as vowel insertion. For Tonga, consonant insertion- which can either be anywhere within a word (excrescence) or at word initial (Prothesis), is mainly meant to adhere to its orthographic representation. As one of the phonological processes in the adaptation of English words in Tonga, this study has revealed that prothesis is to a large extent attained through the insertion of the nasal sounds, /n/ and /m/ and also the plosives /k/ and /b/. Good examples here could be: comb→**n**kamu; pan→**m**pani; ball→**bb**ola and cook→**kk**u**kk**i. In the case of nasals, the resultant combinations such as '**nk**' and '**mp**' are not treated as consonant clusters but rather co-articulated sounds that act as single sound units in order to conform to the articulatory system or phonemic inventory of Tonga. The insertion of the nasals appears not to have any peculiar behaviour or pattern. However, that of the plosives, particularly /b/, seems to be observed in most of the English words that begin with or have a syllable containing the /b/ sound. The study has revealed that the /**b**/ sound in English is mainly realised as a strong /**b**/ and is represented by a double consonant [**bb**] in the Tonga orthography. Examples include: **B**i**b**le→ **Bb**ai**bb**ele**; b**ull→**bb**uulu**; b**ul**b**→**bb**au**bb**u and many others.

5.3 Deletion

This part of the dissertation discusses deletion as one of the three major processes involved in the adaptation of English words in Tonga. Further, concrete examples coupled with elaborate explanations are provided for each of the words analysed. Linguistically though, deletion or elision is a term used in phonetics and phonology to refer to the omission of sound segments in a word or phrase (Crystal, 2008). The term derives from a Latin word meaning '*to strike out*' and specifically refers to the omission of vowels, consonants or even the entire syllables in

words or phrases. Though quite imposing in some languages, deletion is not a very common phenomenon in the adaptation of English words in Tonga as insertion. This is probably in respect to the assertion that languages find it much easier to insert than delete segments. In the adaptation process, deletion of any segment violates the faithfulness constraint of MAX-IO, which states that every segment in the input must have a correspondent in the output (no deletion of a segment). This constraint has MAX-C (no consonant deletion) and MAX-V (no vowel deletion) as its sub-constraints.

Deletion or elision falls into three distinct types- aphaeresis, syncope and apocope. Aphaeresis is the elision or omission of a sound segment in the initial position of a word while syncope refers to the loss of a sound in word-medial position. On the other hand, apocope is the deletion of a sound segment in the word-final position of a word. It should at this point be stressed that, just like insertion, deletion in the adaptation process of words is motivated by the desire to break illicit codas or consonant clusters and subsequently achieve open syllabicity, and most importantly, to deal with some of the foreign phonemes that are not found in the phonemic inventory of the recipient language. Therefore, presented below are the few examples where words have undergone deletion in the adaptation process.

5.3.1 Aphaeresis

Aphaeresis is the elision or omission of a sound segment in the initial position of a word. The loss could either be of one or more sounds from the beginning of a word, especially the loss of an unstressed vowel, thus producing a new form called an aphetism. Note should also be taken that this process takes place on account of three reasons: if the input starts with a segment that is not found in the receiving language; if the re-syllabification of the word produces so many syllables necessitating deletion of the first syllable or if that segment is weak or unstressed. Let us consider the following example:-

31. Input :Elizabeth/ilɪzəbeθ/

Output :lizabeti/lizabeti

Input Elizabeth/ilɪzəbeθ/	NO-CODA	NUC	DEP-V	MAX-V
a. ☞Ø.li.za.be.ti			*	*
b. Ø.liz.abe.t	*!	*		*
c. Ø.li.zab.eti	*!		*	*
d. Øli.za.bet	*!			*

Tableau 5.31 Elizabeth/ilɪzəbeθ/→ lizabeti/lizabeti

Of the four candidates generated by GEN, b., c. and d all are in conflict with the high ranked constraint of NO-CODA. Additionally, all the candidates violate MAX-V, but a. remains faithful to the first two constraints. Essentially however, the front, close-mid vowel /e/ gets elided on account of being an unstressed vowel in this environment. This therefore, is how 'Elizabeth' ends up being 'lizabeti' in Tonga. There is also an aspect of feature change as the /θ/ sound which does not exist in Tonga changes to its nearest equivalent /ti/.

32. Input onion/ʌnjən

Output hanyinsi/ hanyinsi

Input onion/ʌnjən	NO-CODA	DEP-C	DEP-V
a. ☞ha.nyi.nsi		***	**
b. han.yi.ns	**!	***	*
c. ha.nyi.ns	*!	***	*
d. han.yi.nsi	*!	***	*

Tableau 5.32 onion/ʌnjən → hanyinsi/ hanyinsi/

The adaptation process of this word has undergone more than just deletion. Firstly, the back, closed-mid rounded vowel, which constitutes a full syllable, has been deleted and replaced with a glottal stop /h/. To have a complete syllable, which consists of a consonant and vowel, an insertion of /a/ had to be made. And to avoid a coda that is created in the last syllable, another consonant /s/ and vowel /i/ insertions are done to achieve open syllables which are permitted in Tonga. The insertion of the consonants in the second and third syllables of the output are in conformity with the Tonga orthographic representation and not necessarily faithfulness to *COMPLEX. These insertions have led to an increase in the number of syllables from two in the input to three in the output. Therefore, these processes are what have led to candidate a. being selected as the optimal candidate besides not violating the higher constraint which the other candidates are in conflict with. The output too has attained easy pronunciation as compared to the input through this process.

5.3.2 Syncope

Syncope as explained here refers to the loss of a sound segment in word-medial position. Like Kikamba (Ndambuki, 2013), much of what was witnessed in Tonga is only syncope of consonants and not that of vowels. The explanation for this could be because Tonga allows strings of vowels in words. Additionally, Tonga also uses vowels to break illicit consonant clusters and deal with codas which are not allowed in the language. Here are some examples:-

33. Input :paraffin/pærəfɪn/

Output :palafini/palafini/

Input paraffin/pærəfɪn/	NO-CODA	ONSET	DEP-V	MAX-C
a. ☞ pa.la. Øfi.ni			*	*
b. pal. Øfi.ni	*!		*	*
c. pa.la.Øfin	*!			*
d. pal.a.Øfi.n	**!	*		*

Tableau 5.33 paraffin/pærəfɪn/→ palafini/palafini/

In this example, syncope is first noticed through deletion of the phoneme /r/ which does not exist in Tonga. In order to conform to the Tonga phonemic inventory, it is replaced with the nearest equivalent, the lateral /l/. Secondly, at orthographic level, to get rid of the consonant cluster /ff/, which is not permitted in Tonga, one /f/ has also been deleted. Thirdly, to deal with the coda in the last syllable of the input, /i/ has been epenthesised at the end. Therefore, in the adaptation process of this word, these deletions, insertions and replacements are the ones responsible for selecting candidate a. as the optimal output form amongst the candidates generated by GEN. The other three candidates all fall out on account of being in conflict with the constraints that are higher in the hierarchy such as NO-CODA.

34. Input :spanner/spænə/

Output :cipanela/cipanela

Input spanner/spænə/	NO-CODA	ONSET	DEP-V	MAX-C
a. ☞ ci.pa. Øne.la			**	*
b. cip.aØne.la	*!		*	*

c.	ci.paØn.ela	*!		**	*
d.	cip.a.Øne.la	*!	*	**	*

Tableau 5.34 spanner/spænə/→ cipanela/cipanela/

At the orthographic level, the consonant cluster /nn/ in the second syllable of the input has been done away with through the deletion of one of the two. The other deletion made is that of the approximant /r/, which has been elided because such a phoneme is not there in Tonga. The insertion of /i/ in the first syllable is meant to break the disallowed cluster [sp]. Further, the insertion of /a/ in the last syllable is necessitated by the need to deal with the coda. This has finally led to an increase in the number of syllables from two in the input to four in the output. Therefore, candidate **a**. is the only one which satisfies the open syllabicity requirement hence being selected as the optimal output form as it violates only the lower ranked faithfulness constraint of DEP-V and MAX-C.

5.3.3 Apocope

Apocope is the deletion of a sound segment or syllable in the word-final position or end of a word. The word is derived from a Greek word which means '*to cut off*' and the weak or unstressed sound segments or syllables are the ones that are easily elided. Here are the following examples to demonstrate its operations in the adaptation of English words in Tonga.

35. Input depot/depəʊ/

Output depo/depɒ/

Input depot/depəʊ	NO-CODA	ONSET	MAX-C
a. ☞ de.po.Ø			*****
b. dep.o.Ø	***!**	*****	*****
c. dep.o.Ø	***!**	******	*****

Tableau 5.35 depot/depəʊ/ → depo/depɒ/

In this analysis, three constraints are interacting and GEN has enlisted four candidates to compete for the optimal position. Candidates b. and c. are in conflict with the highest ranked markedness constraint of NO-CODA hence being excluded from the race. However, though candidate **a.** violates MAX-C due to the deletion of the syllabic consonant /t/, it fulfills the open syllabicity requirement and is selected as the optimal output form. In this instance, Tonga

does not decide to deal with the coda by inserting a vowel at the end instead, it opts to elide the weak syllabic consonant in the adaptation process.

36. Input :window/wɪndəʊ/

Output :windo/windɔ/

Input window/wɪndəʊ/	NO-CODA	NUC	MAX-C
a. ☞ wi.ndo.Ø			*
b. win.do.Ø	*!		*
c. wi.nd.o.Ø	*!	*	*

Tableau 5.36 window/wɪndəʊ/→ windo/windɔ/

In the example above, the coda of the second syllable in the input is deleted to make the syllable open. Tonga, the recipient language here, has preferred consonant deletion to vowel epenthesis in the adaptation process of this word. Potentially, the recipient language has found it much easier to delete it because it is an unstressed sound segment. Therefore, because candidate **a**. minimally violates MAX-C due to the deletion of the consonant /w/, it is selected as the optimal output form as it satisfies the main constraint of NO-CODA which forbids codas.

37. Input :bull/bʊl/

Output :bbuulu/bu:lu/

Input bull/bʊl/	NO-CODA	SYLLABIC-C	*COMPLEXVOW	DEP-C	DEP-V	MAX-C
a. ☞bbuu.lØu			*	*	**	*
b. bbu.u.lØu			*	*	**	*
c. bbu.u.lØ	*!	*!	*	*	**	*
d. bu.lØ	*!	*!				*
e. bb.u.lØu	*!	*!		*	*	*

Tableau 5.37 bull/bʊl/→ bbuulu/bu:lu/

The consonant in the input is not allowed in the recipient language. It is, therefore, deleted and a vowel inserted thus resulting in the creation of a new syllable which is open as preferred in Tonga. As stated in some of the analyses above, the insertion of another consonant sound /b/ in the first syllable and another vowel in the output conforms to the orthographic representation of Tonga for 'hard sounds' and 'long vowels' and not considered a cluster. Without the second

consonant in the syllable, the resultant word might be something else away from the object under focus. All these are requirements satisfied by candidate a., hence being adopted as the optimal form.

38. Input :overall/oʊvərɔ:l/

Output :ovolosi/ovolosi/

Input overall/oʊvərɔ:l/	NO-CODA	ONSET	DEP-V	MAX-C
a. ☞ o.vo.lo.si		*	**	*
b. o.vo.lo.s	*!	*	*	*
c. ovo.los	*!		**	*
d. ov.lo.si	*!		**	*
e. ovl.o.si	*!	*	**	*

Tableau 5.38 overall/oʊvərɔ:l/→ ovolosi/ovolosi/

At the orthographic level, the cluster of /ll/ in the input is dealt with firstly by deletion of one consonant and later insertion of a vowel /o/. Therefore, all the candidates violate MAX-C which does not allow deletion of consonants. A totally new syllable [si] is also created in the input, thus increasing the number from two to four. However, after filtering through EVAL, candidate a. emerges as the optimal candidate as it remains faithful to the higher ranking constraint of NO-CODA which all the other candidates violate.

39. Input :dull/dʌl/

Output :dalu/dalu

Input dull/dʌl/	NO-CODA	DEP-V	MAX-C
a. ☞da.lu		*	*
b. dal.u	**!	*	*

c. d.al	**!		*

Tableau 5.39 dull/dʌl/ → dalu/dalu/

Candidates b. and c. have each fatally contravened the highest constraint of NO-CODA twice. After the elision of one consonant of the cluster in the input, /u/ has been epenthesised in order to have an open syllable. This re-syllabification has led to an increase in the number of syllables from one in the input to two in the output. Therefore, this is how 'dull' got adapted to 'dalu' in Tonga.

40. Input :ball /bɔ:l/

Output :bbola /bɔla/

Input / bɔ:l/	**NO-CODA**	**NUC**	**DEP-C**	**DEP-V**
d. ☞ bbo.la			*	*
e. bo.l	*!	*		
f. bol.a	*!			*

Tableau 5.40 ball /bɔ:l/ → bbola /bɔla/

Apocope in this analysis is observed in the deletion of one consonant in the cluster /ll/ of the input. After the deletion, /a/ has been epenthesised at the end to deal with the coda, thereby facilitating open syllabicity and subsequently increasing the number of syllables to two in the output form. Candidate **a**. has also been selected as the optimal candidate over **b**. and **c**. since it does not violate NO-CODA which is a much more fatal violation in the hierarchy. Additionally, the insertion of another consonant /b/ in the first syllable has been allowed so as to conform to the orthographic representation of the Tonga articulatory system for 'hard sounds'.

5.3.4 Conclusion

From the words that have been analysed, and in relation to the three different types of deletion, it has been observed that deletion is motivated by the desire to break illicit codas or consonant clusters and subsequently achieve open syllabicity. It could as well be to get rid of phonemes that do not exist in the recipient language. For aphaeresis, what has been noticed is that sound segments or syllables are elided on account of being weak or unstressed. In Tonga, much of the syncoped sounds are consonants as opposed to vowels. The main reason for this is probably

because Tonga allows strings of vowels in words in addition to using them to break illicit consonant clusters and deal with codas which are not allowed in the language. And just like aphaeresis, much of the apocoped sounds in Tonga are those that are either weak or unstressed.

5.4 Feature Change

This section discusses feature change as another of the last main phonological processes involved in the adaptation of English words in Tonga. According to Crystal (2008), a feature is any typical or noticeable property of spoken or written language. Therefore, feature change refers to any typical or noticeable property of spoken or written language that affects the pronunciation (phonetic change) or the sound system structure (phonological change) of a word. These features can be classified in terms of various levels of linguistic analysis, such as 'phonetic, phonological, grammatical, syntactic features' or in terms of dimensions of description, such as 'acoustic, articulatory or auditory.

Based on the phonemic charts of consonant and vowel sounds presented under 5.1 for the two languages, it is noticeably clear that both English and Tonga each have phonemes that are not found in the phonemic inventory of the other. For example, such phonemes as /r/, / θ/, /q/, /x/ and /ð/ do not exist in Tonga. Therefore, if a word has any of such phonemes, they are changed to the nearest equivalent in the recipient language. Thus, for a sound such as /r/, Tonga would only use the lateral /l/, which is articulatorily similar to it. Let is consider the following examples:-

41. Input :stove/stəʊv/

Output :citofu/citofu

Input stove/stəʊv/	NO-CODA	ONSET	NUC	DEP-V	IDENT-IO (voice)
a. ☞ ci.to.fu				*	*
b. cit.o.fu	*!	*		*	*
c. ci.to.f	*!		*	*	*
d. ci.tof	*!		*	*	*

Tableau 5.41 stove/stəʊv/→ citofu/citofu/

In this example, four possible realisations of the input have been generated by the operational or functional component of Generator (GEN). Five constraints too are interacting in the selection of the optimal candidate. In the adaptation of '***stove***' to '***citofu***', feature change is noticed through the change of voiced labio-dental fricative /v/ to a voiceless labio-dental fricative /f/. This however, does not mean that one phoneme /v/ does not exist in Tonga. Both phonemes are there but Tonga found it easier and much more convenient to use the voiceless one. The consonant cluster /st/ is broken through the epenthesis of the vowel /i/ with the /s/ changing to /c/. This has resulted in an increase of syllables from one in the input to three in the output. Therefore, after assessing the candidates, EVAL has selected candidate a. as the optimal output form despite being in confrontation with the faithfulness constraints *INDENT-IO (voice) which states that the specification for the feature [voice] of an input segment must be preserved in its output correspondent. This gives us a clear case of devoicing where the voiced labio-dental fricative /v/ is realized as the voiceless labio-dental fricative /f/. On the other hand, the other candidates b., c. and d. have been discarded as a result of fatally violating NO-CODA, the higher constraint, in addition to the other lower ranked constraints.

42. Input :twelve/twelv/

Output :twelufu/twelufu/

Input twelve/twelv/	NO-CODA	*VOICED-CODA	NUC	DEEP-V	IDENT-IO (voice)
a. ☞twe.lu.fu				*	*
b. twel.u.fu	*!			*	*
c. twel.ufu	*!			*	*
d. twe.lu.f	*!		*	*	*
e. twel.v	**!	*	*		

Tableau 5.42 twelve/twelv/ →twelufu/twelufu/

Noticeably, this example too provides us with yet another clear case of devoicing where the voiced labio-dental fricative /v/ is realized as the voiceless labio-dental fricative /f/. Candidate a. which is the optimal output form contravenes IDENT-IO (voice) as the voiced /v/ changes to the voiceless /f/. This however, does not prevent it from emerging as the favourite candidate as it also faithfully satisfies the markeness constraint *VOICED-CODA (coda obstruents are voiceless). The vowel /u/is epenthesised to break the disallowed cluster of /lv/ in Tonga leading

to an increase in syllables to three from one. Of the interacting constraints, candidates b., c., d. and e. each violates three of them thus disqualifying them in the competition.

43. Input : cupboard /kʌbəd/

Output : kabati /kabati/

Imput: cupboard/kʌbəd/	NO-CODA	ONSET	DEP-V	IDENT-IO (voice)
f. ☞ ka.ba.ti			*	*
g. ka.bat	*!			*
h. kab.at	*!	*		*
i. kab.at.i	*!	**	*	*

Tableau 5: 43 cupboard /kʌbəd/→kabati /kabati/

In this analysis, four candidates, which are all possible realisations of the input, have been generated by the operational or functional component of Generator (GEN). After assessing the candidates, the other operational component of Evaluator (EVAL) has selected candidate **a**. as the optimal form as it violates only DEP-V (output vowels must have input correspondents-No V insertion) because of the insertion of /i/ in the last syllable. This epenthizing or insertion of /i/ is used to deal with the coda and this has resulted in the increase to the number of syllables for the input from two to three in the output. Like all the other candidates, **a.** also violates constraint IDENT-IO (Voice) = (the specification for a feature [voice] of an input segment must be preserved in its output correspondent). As it can be noted, all the candidates have violated this constraint by changing the voiced alveolar plosive /**d**/ in the input [cupboar**d**] to the voiceless alveolar plosive /**t**/ in the output [kaba**t**i]. Therefore, since all the candidates violate it, it cannot be used to determine the optimal candidate thus shading the cells. Candidates **b**. **c**. and **d**. all violate the constraint NO-CODA= syllables must not have a coda (syllables are open). This is a very serious violation as this constraint ranks the highest in Tonga. Tonga, like many other Bantu languages have open syllables.

44. Input :cement/səment/

Output :samende/samende/

Input cement/səment/	NO-CODA	*VOICED-CODA	DEP-V	IDENT-IO (voice)
a. ☞ sa.me.nde		*	*	*

b.	sa.me.nd	*!	*		*
c.	sa.me.nt	*!			
d.	sam.e.nde	*!	*	*	*

Tableau 5: 44 cement/səment/ → samende/samende/

This is an opposite example from the other three presented above. The feature change here is from a voiceless alveolar plosive /t/ to a voiced alveolar plosive /d/ thus making it an example of voicing as opposed to devoicing. The insertion of /e/ in the last syllable of the output is not meant to break a cluster, but rather to deal with the coda in order to achieve an open syllable desired in Tonga. Interestingly though, the number of syllables has remained the same both in the input as in the output. As explained already, /nd/ should not be taken as a consonant cluster, but rather as a combination representing a single sound unit. In Tonga, the nasals /n and m/ can combine with many other consonant sounds to create such combinations as /nd/, /mp/, /nk/ which are allowable. Therefore, in the adaptation process of this entry, candidate a. is selected as the optimal form as it does not violate the markedness constraints of NO-CODA, which the other candidates are in conflict with.

45. Input :bottle/bɒtl/

Output :bbodela/bɔdela/

Input bottle/bɒtl/	NO-CODA	IDENT-IO (voice)	DEP-C	DEP-V
a. ☞ bbo.de.la		*	*	*
b. bbod.ela	*!	*	*	*
c. bb.o.de.la	*!	*	*	*

Tableau 5: 45 bottle/bɒtl/→ bbodela/bɔdela/

Four constraints have interacted in the selection of the optimal candidate. Candidates b. and c. violate all of the constraints that are interacting hence missing out of consideration for selection. This leaves a. standing out as the winning candidate. The combination /bb/ is allowed in Tonga, but /tl/ is considered a cluster hence the insertion of /e/ to break it. As noticed, the feature change in this case is of the voiceless alveolar plosive /t/ changing to a voiced alveolar plosive /d/ thus making it an example of voicing as opposed to devoicing.

46. Input :catholic/ kæθəlık/

Output :katolika/katolika/

Input catholic/kæθəlık/	NO-CODA	ONSET	DEP-V	IDENT-IO (F)
a. ☞ ka.to.li.ka			*	*
b. ka.to.lik	*!			*
c. ka.tol.ika	*!		*	*
d. kat.o.lik	**!	*		*

Tableau 5: 46 catholic/ kæθəlık/→ katolika/katolika/

The voiceless dental fricative /θ/ is among the sounds or phonemes that do not exist in the Tonga phonemic inventory. As argued earlier, when a word has any of such phonemes, they are changed to the nearest equivalent in the recipient language. It is therefore for this reason that in the adaptation process of this particular entry, the voiceless dental fricative /θ/ is changed to the voiceless alveolar plosive /t/. The last syllable of the input which has a coda is dealt with by the epenthesis of /i/, thereby increasing the number of syllables from three to four in the output. Although Candidate a. violates INDENT-IO (F) (The specification for the feature of an input segment must be preserved in its output correspondence) and DEP-V (no vowel insertion), it is selected as the optimal output form as these are considered lesser violations as compared to those contravened by the other candidates.

47. Input :office/ɒfıs/

Output :office/opesi/

Input office/ɒfıs/	CO-CODA	ONSET	DEP-V	IDENT-IO (voice)
a. ☞ o.pe.si		*	*	*
b. op.es	**!	**		*
c. op.e.si	*!	*	*	*

d. ope.s	*!	*		*

Tableau 5: 47 office/ɒfɪs/→ office/opesi/

The change is this particular entry is from /f/**,** a voiceless labio-dental fricative to /p/, a voiceless bilabial plosive. Candidate a. is the only one which satisfies the open syllable requirement hence it is selected as the optimal output form. The other candidates seriously violate NOCODA. The syllables have increased from two in the input to three in the output form.

48. Input :sabbath /sæbəθ/

Output :nsabata /nsabata/

Input sabbath/sæbəθ/	NO-CODA	NUC	DEP-C	DEP-V	IDENT-OI(F)
e. ☞ nsa.ba.ta			*	*	*
f. nsab.ata	*!		*	*	*
g. nsa.ba.t	*!	*	*		*
h. sab.at	**!	*			*

Tableau 5.48 Sabbath /sæbəθ/→ nsabata /nsabata/

Four candidates, which are all possible realisations of the input, have been generated by GEN. Additionally, five constraints of NO-CODA, NUC, DEP-C, DEP-V and IDENT-IO (voice) have interacted in the selection of the preferred candidate. After going through EVAL, candidate **a**. as been emitted as the optimal form as it violates only the lower ranked faithfulness constraints of DEP-C and DEP-V through the insertion of /n/ in the initial position and the epenthesising of /a/ at the end to avoid a fatal violation of NO-CODA (syllables must not have a coda- syllables are open). Since Tonga does not have the /**θ**/ sound, this feature thus changes to /**ta**/, its nearest equivalent in Tonga. Consequently, all the candidates violate the constraint IDENT-IO (F). Therefore, the adaptation of the English input '*sabbath*' to '*nsabata*' is realised through the insertion of the nasal /n/ in word initial and the change of the /**θ**/ feature to what is applicable according to the Tonga phonemic inventory. The other candidates find it difficult to compete because of violating the higher constraints in the hierarchy.

49. Input :bank/bæŋk/

Output :bbanga/ banga/

Input bank/bæŋk/	NO-CODA	*COMPLEX	DEP-C	DEP-V
a. ☞ bba.nga		*!	**	*
b. ban.ga	*!		*	*
c. ba.ng	*!	*!	*	
d. bban.ga	*!	*!	**	*

Tableau 5.49 bank/bæŋk/→ bbanga/ banga/

The /ŋk/ sound combination does not exist in the phonemic inventory of Tonga. Therefore, in the process of adaption, it changes to /ng/, which is the nearest equivalent in the recipient language. In Tonga, the nasal sound /ŋ/ can be followed by any of the vowels. Thus, the epenthesis of /a/ in the last or second syllable has necessitated the insertion of /g/ in order to satisfy the phonotactics of Tonga. As can be observed, the candidates **b**., **c**. and **d**. miss out on being considered for selection on account of violating the high ranked constraint of NO-CODA, thus leaving candidate **a.** as the optimal one.

50. Input :Elizabeth/ilɪzəbeθ/

Output :elizabeti/elizabeti

Input Elizabeth/ilɪzəbeθ/	NO-CODA	ONSET	NUC	DEP-V
a. ☞e.li.za.be.ti		*		*
b. e.liz.abe.t	*!	*	*	
c. e.li.zab.eti	*!	*		*
d. eli.za.bet	*!			

Tableau 5.50 Elizabeth/ilɪzəbeθ/→ elizabeti/elizabeti

Of the four candidates generated by GEN**, b.**, **c.** and **d.** are all in conflict with the high ranked constraint of NO-CODA. There is also an aspect of feature change as the dental fricative /θ/ sound which does not exist in Tonga changes to its nearest equivalent /ti/. Therefore, this is how '*elizabeth*' got adapted to '*elizabeti*' in Tonga.

5.4.1 Conclusion

From the words that have been analysed, and in relation to feature change, it has been observed that sound or feature change is motivated by the desire to deal with phonemes that are not found in the phonemic inventory of the two languages under investigation. Based on the phonemic

charts of consonant and vowel sounds presented for the two languages, it is noticeably clear that both English and Tonga each have phonemes that are not found in the phonemic inventory of the other. For example, for a sound such as /r/, Tonga would only use the lateral /l/, which is articulatory similar to it. Explained in another way, feature change could well be used to get rid of phonemes that do not exist in the recipient language and have them replaced with the convenient nearest equivalents. Additionally, the words analysed have also indicated that in the adaptation process, some of the voiced segments that are not found in the sound inventory of the recipient language are devoiced or vice versa. This is the reason as to why we would have the voiced /v/ change to the voiceless/f/ as in [sto**v**e – cito**f**u] and voiceless /t/ to the voiced /d/ as in [bo**tt**le – bbo**d**ela]. This led to the violation of the faithfulness constraint of IDENT-IO (voice) = the specification for the feature [voice] of an input segment must be preserved in its output correspondent.

5.4.2 Chapter Summary

This chapter dedicated itself to the presentation of data and discussion of the research findings according to the objectives as outlined in Chapter 1. The main phonological processes involved in the adaptation of English words in Tonga have been identified and described within the framework of the Optimality Theory developed by the linguists Prince and Smolensky in 1993. Therefore, Details of the findings were captured under each of these objectives and it has been revealed that the behaviour of vowel sounds in the adaptation of English words in Tonga is unpredictable, but can be accounted for in three different ways. On the actual adaptation processes, three processes of insertion, deletion and feature change have been found to be responsible. It must however be noted that within each of these are other sub-processes as shown in the figure below.

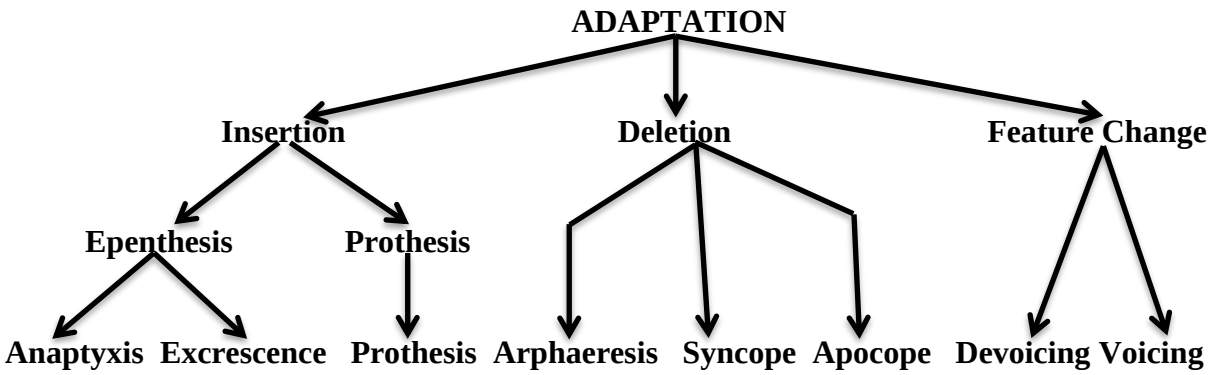

Figure 7: ***Phonological Processes in the Adaptation of English words in Tonga***.

The next chapter presents the overall summary of the findings, conclusion of the study and draws some recommendations for further study on the investigation of the loanword phenomena.

CHAPTER SIX
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.0 Introduction

The preceding chapter has presented the data, analysed it within the framework of the Optimality Theory and discussed the research findings in line with the research objectives. The chapter started by examining the behaviour of vowel sounds in loanwords and later focused on discussing the phonological processes that are involved in the adaptation of English loanwords in Tonga with particular attention paid to the interaction between constraints in the selection

of the optimal candidate of the adopted words. This chapter gives the summary of findings, conclusions, recommendations and suggestions for further research.

6.1 Summary of findings

This study is an investigation into 'The Adaption of English Words in Tonga'. Starting with objective **(ii)** which was, 'To unravel the behaviour of vowel sounds of English loanwords in Tonga', the following are the observations or findings that the study established:-

Firstly, it was generally observed that vowel length in Tonga (which is the recipient language) is not always determined by the phonetic length of the corresponding vowel in English, the source language. In other words, there is lack of predictability on when there is likely to be compliance to vowel lax-tense dichotomy on account of any lexical or phonological feature of the source word. Therefore, using the qualitative data analysis methods within the framework of Optimality Theory, the study has revealed that the behaviour of vowel sounds of English words in Tonga can be accounted for in three different ways:

i. A long vowel in the English word is not always retained as a long vowel when the word has been nativised or adapted in Tonga. From the English words presented here, the findings reveal that generally, the long vowels are not retained in Tonga. Therefore, the Tonga words are described as [– tense] due to the absence of the long vowels. Using OT nomenclature, the nativised English words in Tonga fail to retain the feature [+Tense] because such words strive to faithfully reflect the segmental nature of the Tonga language. This is not to deny the presence of [+Tense] in Tonga phonology. Except to admit that given the potential conflict between [-Tense] and [+Tense] in a given context of English word adaptation, the [-Tense] wins over [+Tense]. The study takes the view that on the question of faithfulness and markedness, Tonga settles for unmarkedness and flouts the faithfulness principal which calls for the output to remain as closely related to the input as possible.

ii. The second observation made is that during the adaptation process, some English words with long vowels will have them maintained at exactly the same level in Tonga. From these English words presented here, the findings reveal that generally, the long vowels are also returned in Tonga. Therefore, the analysed Tonga words here are described as [+ tense] too, due to the presence of the long vowels. Thus, using the OT nomenclature, these nativised English words in Tonga successfully

managed to retain the feature [+Tense] because the segmental features of these words are at par. Henceforth, [+ tense] in English = [+ tense] in Tonga.

iii. The third and final observation with regards the behaviour of vowel sounds of English words in Tonga is that some of the [– tense] words in English turn out to be [+tense] in Tonga. The composition of such words is peculiar to diphthongs and triphthomgs. From the data presented above, it has been observed that during the process of English word adaptation to Tonga, diphthongs and triphthongs change into long monothongs, taking the shape of the first sound of the glide. Therefore, based on the explicitness of this finding, the study hypothesis that in the context in which diphthongs/triphthongs are the input, the output vowel in the target language is always [+Tense] and never [-Tense]. In other words, out of this, we can easily make a prediction that all English words containing either diphthongs or triphthongs will turn out as having long vowels in Tonga.

With regards objective (iii), which sought to account for the adaptation of English words in Tonga using the Optimality Theory, the study established that three phonological processes of insertion, deletion and feature change are employed by the recipient language as adaptation strategies for the phonologically different words. Insertion was found to operate at the two broader levels of epenthesis, which refers to the addition or insertion of one or two sound segments in the middle or final position of a word and prothesis, which specifically refers to the insertion of a consonant in word initial. Additionally, epenthesis is further split into anaptyxis, the addition of a vowel between two consonants and excrescence, which is the insertion of a consonant anywhere within a word.

From the analysis done, the study has revealed that epenthesis (or vowel insertion) accounts for most or is the most dominant process in the adaptation of English words in Tonga. Tonga, just like most Bantu languages, prefers unmarked or open syllable structures of (V) or (CV). As it has been noticed, insertion particularly that of vowels is a strategy used by many languages to attain open syllables and also to break illicit consonant clusters that are not allowed. Consonant insertion has been found not to be as productive as vowel insertion. For Tonga, consonant insertion- which can either be anywhere within a word (excrescence) or at word initial Prothesis), is mainly meant to adhere to its orthographic representation. As one of the phonological processes in the adaptation of English words in Tonga, this study has revealed that prothesis is to a large extent attained through the insertion of the nasal sounds, /n/ and /m/

and also the plosives /k/ and /b/. Good examples here could be: comb→**n**kamu; pan→**m**pani; ball→**bb**ola and cook→**kk**u**kk**i. In the case of nasals, the resultant combinations such as '**nk**' and '**mp**' are not treated as consonant clusters but rather co-articulated sounds that act as single sound units in order to conform to the articulatory system or phonemic inventory of Tonga. The insertion of the nasals appears not to have any peculiar behaviour or pattern. However, that of the plosives, particularly /b/, seems to be observed in most of the English words that begin with or have a syllable containing the /b/ sound. The study has revealed that the /**b**/ sound in English is mainly realised as a strong /**b**/ and is represented by a double consonant [**bb**] in the Tonga orthography. Examples include: **B**i**b**le→ **Bb**ai**bb**ele**;** **b**ull→**bb**uulu**;** **b**ul**b**→**bb**au**bb**u and many others.

In the study, deletion, which falls into three distinct categories of aphaereis, syncope and apocope, has been found as the other strategy in the adaptation of English words in Tonga. Though quite imposing in some languages, deletion is not a very common phenomenon in the adaptation of English words in Tonga as insertion. This is probably in respect to the assertion that languages find it much easier to insert than delete segments. From the words that have been analysed, and in relation to the three different types of deletion, the study has revealed that deletion is motivated by the desire to break illicit codas or consonant clusters and subsequently achieve open syllabicity. It could as well be to get rid of phonemes that do not exist in the recipient language. For aphaeresis, what has been noticed is that sound segments or syllables are elided on account of being weak or unstressed. In Tonga, much of the syncoped sounds are consonants as opposed to vowels. The main reason for this is probably because Tonga allows strings of vowels in words in addition to using them to break illicit consonant clusters and deal with codas which are not allowed in the language. And just like aphaeresis, much of the apocoped sounds in Tonga are those that are either weak or unstressed.

Feature change is the third and final process involved in the adaptation of English loanwords in Tonga. Based on the phonemic charts of consonant and vowel sounds for the two languages, it was noticeably clear that both English and Tonga each have phonemes that are not found in the phonemic inventory of the other. Therefore, loanwords that have English phonemes such as /**θ**/ that are not found in Tonga had to be changed to the nearest equivalents in the recipient language (Tonga) such as /ti/ in **Elizabeth/ilɪzəbeθ/**. Additionally, the words analysed have also indicated that in the adaptation process, some of the voiced segments that are not found in the sound inventory of the recipient language are devoiced or vice versa. This is the reason as

to why we would have the voiced /v/ change to the voiceless/f/ as in [sto**v**e – cito**f**u] and voiceless /t/ to the voiced /d/ as in [bo**tt**le – bbo**d**ela]. This led to the violation of the faithfulness constraint of IDENT-IO (voice) = the specification for the feature [voice] of an input segment must be preserved in its output correspondent.

6.2 Conclusion

From these findings, we can thus conclude that vowel length in Tonga (which is the recipient language) is not always determined by the phonetic length of the corresponding vowel in English- the source language. Using the qualitative data analysis methods within the framework of Optimality Theory, the study has revealed that the behaviour of vowel sounds of English loanwords in Tonga can be accounted for in three different ways as indicated above. With regards the actual adaptation of English loanwords in Tonga using the Optimality Theory, the study has established that three phonological processes of insertion, deletion and feature change are employed by the recipient language as adaptation strategies for the phonologically different words. From the analysis done, the study has revealed that epenthesis (or vowel insertion) is the most dominant process in the adaptation of English words in Tonga. The main reason for this is that insertion, particularly that of vowels, is a strategy used by many languages to attain open syllables and also to break illicit consonant clusters that are not allowed in most Bantu languages. The study has also revealed that all the vowels can be epenthesised in the adaptation process. Consonant insertion has been found not to be as productive as vowel insertion. For Tonga, consonant insertion- which can either be anywhere within a word (excrescence) or at word initial Prothesis), is mainly meant to adhere to its orthographic representation. Similarly, feature change has also been found to be a bit more productive than deletion.

6.3 Recommendations

Language contact situations have been there from time immemorial and will continue being there. Because of this, it can therefore be argued that no language is devoid of loanwords. It is therefore recommended that similar studies should be carried out- not only of majority languages, but minority languages too to help us fully understand their structures and the processes involved in the adaptation of words. This is deemed important because the study of the loanword phenomenon provides insight into the phonology of a language. This can further help in finding common grounds after carrying out comparative analyses of various languages.

Science and technology will continue to pour new terms with each innovation that comes. Therefore, keeping constantly updated with the unstoppable developments of science and new technologies, especially in the twenty first century, will not be an easy task and languages will need to find solutions for the technical terms that come with these latest developments. Thus, here we also recommend that technical committees be established at least in each major Zambian language to help find local terms that can be used for these new and foreign concepts. Otherwise, one wonders whether and how long languages such as Tonga will ever find equivalent words for '*hardware*', '*internet' 'flash disc' 'website* '*software*', '*mouse'* and '*simcard*' to mention but just a few.

After interacting with radio and TV presenters from the Tonga section of Zambia National Broadcasting Corporation where journalists meet new foreign terms when disseminating information to the masses, we recommend using the findings of the study as it has explained the mechanisms involved in the adaptation of English loanwords in Tonga.

Lastly and possibly more importantly, with increased emphasis from government to use local languages as languages of instruction at lower primary level from Grade 1 to 4, it is therefore being recommended here that the Ministry of General Education should have a review of the many texts that are being used as teaching materials in schools so as to include more of these adapted words that now constitute quite a considerable percentage of the words used in these local languages. This will help the young learners at that level to move with modern trends-especially with regards newly coined terms that are coming as a result of science and technology.

6.4 Suggestions for further study

Prince and Smolensky introduced the Optimality Theory in 1993 as a framework in theoretical linguistics as a direct response to a "conceptual crisis at the centre of phonological thought" concerning the role of output constraints. Being phonological, this study on the adaptation of English words in Tonga was guided by this theory. Though initially developed to deal with phonological matters, the theory was also later found to be useful and applicable in other areas of linguistic study such as syntax and morphology. We therefore suggest that future researchers should consider carrying out studies using OT in other levels of linguistic analysis such as syntax and morphology cited above. As it has been argued, OT offers a considerable change in

understanding the grammar of any language and provides linguists with new ways to work and new theoretical issues to crack.

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APPENDICES

Appendix 1: List of gathered Loanwords in the study

S/N	ENGLISH LOANWORDS	SOURCE LANGUAGE	TONGA LOANS	WORD CLASS
01	Kitchen	English	Ncikini	Noun
02	Kettle	English	Nketulo	Noun
03	Sickle	English	Sikela/shikela	Noun
04	Table	English	Tebule	Noun
05	Pan	English	Mpani	Noun
06	Fridge	English	Filiji	Noun
07	Cup	English	Nkapu	Noun
08	Stove	English	Citofu	Noun
09	Salt	English	Sautu	Noun
10	Sieve	English	Nsefa	Noun

11	Bucket	English	Bbakete	Noun
12	Towel	English	Taulo/Tawelo	Noun
13	Plastic	English	Pulasitiki	Noun
14	Flask	English	Fulasiki	Noun
15	Dish	English	Disi	Noun
16	Pot	English	Mpoto	Noun
17	Candle	English	Nkendulo	Noun
18	Matches	English	Mancisi	Noun
19	Brush	English	Bbulasho	Noun
20	Folk	English	Nfoloko	Noun
21	Mattress	English	Matulesi	Noun
22	Pillow	English	Pilo	Noun
23	Tumbler	English	Tambula	Noun
24	Bag	English	Bbeeke	Noun
25	Bottle	English	Bbodela	Noun
26	Paraffin	English	Palafini	Noun
27	Pin	English	Mpini	Noun
28	Spoon	English	Supunu	Noun
29	Key	English	Kii	Noun
30	Cupboard	English	Kabati	Noun
31	Tray	English	Tileyi	Noun
32	Curtain	English	Nketani	Noun
33	Drum (for liquids)	English	Dolamu/Dalamu	Noun
34	Sponge	English	Ciponci	Noun
35	Lamp	English	Lampi	Noun
36	Machine (for sewing)	English	Muncini	Noun
37	Comb	English	Nkamu	Noun
38	Polish	English	Polishi	Noun
39	Shelf	English	Shelufu	Noun
40	Spanner	English	Cipanela	Noun
41	Apron	English	Apuloni	Noun
42	Cotton (for sewing)	English	Kotoni	Noun

43	Shovel	English	Fosholo	Noun
44	Bowl	English	Bboo	Noun
45	Sugar	English	Cuka/shukela	Noun
46	Teapot	English	Tipoti	Noun
47	Sack	English	Saka	Noun
48	Chisel	English	Ncizelo	Noun
49	Tank	English	Tanka	Noun
50	Tent	English	Tente	Noun
51	Torch	English	Toci	Noun
52	Box	English	Bbokesi	Noun
53	Wheelbarrow	English	Wilibbala	Noun
54	Jar	English	Jaa	Noun
55	Lock	English	Loko	Noun
56	Aerial	English	Eliyo	Noun
57	Phone	English	Fooni	Noun
58	Wireless	English	Wailesi	Noun
59	Computer	English	Kompyuta/Kompyutala	Noun
60	Tape	English	Teepu	Noun
61	Bandage	English	Bbandeji	Noun
62	Pill	English	Piilusi	Noun
63	Thermometer	English	Samometa	Noun
64	Ward	English	Waadi	Noun
65	Ticket	English	Tiketi	Noun
66	Bus	English	Bbasi	Noun
67	Sledge	English	Cilayi	Noun
68	Doctor	English	Dokotela	Noun
69	Nurse	English	Nesi/Nasi	Noun
70	Battery	English	Bbatili	Noun
71	Bomb	English	Bbomba	Noun
72	Car	English	Kaa	Noun
73	Motor Car	English	Motokala	Noun
74	Engine	English	Injini	Noun

75	Drip	English	Dilipu	Noun
76	Chlorine	English	Kololine	Noun
77	Garage	English	Galaji	Noun
78	Bulb	English	Bbaubbu	Noun
79	Station	English	Citishini	Noun
80	Taxi	English	Tekisii	Noun
81	Watch	English	Waci	Noun
82	Studio	English	Situdiyo	Noun
83	Tune	English	Cuna	Verb
84	Newspaper	English	Nyuzipepa	Noun
85	Aspirin	English	Asipulini	Noun
86	Panado	English	Panado	Noun
87	Stamp (one pasted on envelop)	English	Sitampu	Noun
88	Stamp (for the date)	English	Citampa	Noun
89	Parking	English	Ku-paking'a	Verb
90	Bicycle	English	Bbasikolo	Noun
91	Gear	English	Giya	Noun
92	Mortuary	English	Mocali/Motuali	Noun
93	Printer	English	Pulinta	Noun
94	Tractor	English	Talakita	Noun
95	Trolley	English	Tololi	Noun
96	Truck	English	Tulaki	Noun
97	Tyre	English	Tayela	Noun
98	Book	English	Bbuku	Noun
99	Number	English	Nambala	Noun
100	Paper	English	Pepa	Noun
101	Term	English	Teemu	Noun
102	Secondary	English	Sekondali	Noun
103	Dull	English	Daalu	Adjective
104	Pencil	English	Pesulo	Noun
105	School	English	Cikolo	Noun

106	Collage	English	Kkoleji	Noun
107	Desk	English	Desiki	Noun
108	Bench	English	Bbeenci	Noun
109	Fail	English	Ku-feela	Verb
110	Ruler	English	Lula	Noun
112	Uniform	English	Yunifomu	Noun
113	Ink	English	Inki	Noun
114	University	English	Yunivesiti	Noun
115	Duster	English	Dasita	Noun
116	Degree	English	Digilii	Noun
117	File	English	Fayelo	Noun
118	Card	English	Kkaadi	Noun
119	Course	English	Kkoosi	Noun
120	Matron	English	Matuloni	Noun
121	Mistress	English	Misitulesi	Noun
122	Chalk	English	Ncoko	Noun
123	Slate (for writing on)	English	Sileeti	Noun
124	Calendar	English	Kalenda	Noun
125	Primary	English	Pulayimali	Noun
126	Envelop	English	Invwulupu	Noun
127	Foreman	English	Folomani	Noun
128	Captain	English	Kapitau/Kapitawo	Noun
129	Company	English	Kampani	Noun
130	Carpenter	English	Kaapenta	Noun
131	Clerk	English	Kilaki/Kalaliki	Noun
132	Cook	English	Kkukki	Noun
133	Mechanic	English	Makanika	Noun
134	Tailor	English	Tela	Noun
135	Manager	English	Maneja	Noun
136	Waiter	English	Weta	Noun
137	Office	English	Opesi	Noun
138	Copying	English	Ku-kkopa/Ku-kkopela	Verb

139	Chairman	English	Ceyamani	Noun
140	Contract	English	Kkontulaki/Kkontulakiti	Noun
141	Report	English	Lipooti	Noun
142	Strike (work stoppage)	English	Situlaiki	Noun
143	Pass	English	Ku-pasa	Verb
144	Lawyer	English	Loya	Noun
145	Pension	English	Penshoni	Noun
146	Messenger	English	Masinja	Noun
147	Ball-pen	English	Bboopeni	Noun
148	Dress	English	Duleesi	Noun
149	Guava	English	Gwaba	Noun
150	Bun	English	Bbaansi	Noun
151	Tea	English	Tii	Noun
152	Porridge	Englibsh	Poleji	Noun
153	Biscuit	English	Bbisiketi	Noun
154	Jacket	English	Jakete/Jekete	Noun
155	Suit	English	Nsuuti	Noun
156	Overall	English	Ovolosi	Noun
157	Blouse	Engish	Bbulauzi	Noun
158	Coat (garment for rain)	English	Kkooti	Noun
159	Shirt	English	Syaati	Noun
160	Tie	English	Tayi	Noun
161	Cake	English	Kkekke	Noun
162	Beaans	English	Bbiinsi	Noun
163	Sweet	English	Nswiti	Noun
164	Butter	English	Bbata	Noun
165	Wash	English	Ku-waca/Ku-wasya	Verb
166	Bubble Gum	English	Bbabbugamu	Noun
167	Chewing Gum	English	Ncingamu	Noun
168	Cabbage	English	Kkabici	Noun
169	Rape (vegetable)	English	Lepu	Noun
170	Carrot	English	Kalutu	Noun

171	Chocolate	English	Cokoleti	Noun
172	Coca cola	English	Kokokola	Noun
173	Coffee	English	Kofi	Noun
174	Fashion	English	Fasyoni/Faasho	Noun/Adj
175	Flour	English	Fulaulo	Noun
176	Pawpaw	English	Popo	Noun
177	Jam	English	Jamu	Noun
178	Banana	English	Bbanana	Noun
179	Orange	English	Olenji	Noun
180	Petticoat	English	Pitikoti	Noun
181	Pie	English	Paayi	Noun
182	Popcorn	English	Popokkoni	Noun
183	Wig	English	Wiigi	Noun
184	Zip	English	Ziipu	Noun
185	Jumper (cloth to wear)	English	Jampa	Noun
186	Cap	English	Nkepesi	Noun
187	Sweater	English	Nsweta	Noun
188	Socks	English	Nsookesi/Masookesi	Noun
189	Vest	English	Vesiti	Noun
190	Uniform	English	Yunifomu	Noun
191	Apple (fruit)	English	Apulo	Noun
192	Fanta	English	Fanta	Noun
193	Lemoni	English	Lemoni	Noun
194	Mango	English	Mango	Noun
195	Cookies	English	Nkukisi	Noun
196	Cotton	English	Kkotoni	Noun
197	Ball	English	Bbola	Noun
198	Cinema	English	Cinema	Noun
199	Goal	English	Goolo	Noun
200	Team	English	Tiimu	Noun
201	Club	English	Kilabbu	Noun
202	Balloon	English	Bbaluni	Noun

203	Bar	English	Baa	Noun
204	Beer Hall	English	Bbiyaholo	Noun
205	Picture	English	Pikica	Noun
206	Tickle (make laugh)	English	Tekunya	Noun
207	Concert	English	Nkosaati	Noun
208	Film	English	Filimu	Noun
209	Banjo	English	Bbanjo	Noun
210	Jackpot	English	Jakipoti	Noun
211	Referee	English	Leefu	Noun
212	Choir	English	Kwaya	Noun
213	Net	English	Neeti	Noun
214	Jive (type dance)	English	Ku-jiva	Noun
215	Record (player)	English	Lekoodi	Noun
216	Slate (for writing on)	English	Sileti	Noun
217	Piano	Spanish	Piyano	Noun
218	Goalkeeper	English	Golokipa/Goli	Noun
219	Win	English	Ku-wina	Verb
220	Store	English	Cintoolo	Noun
221	Money	English	Mali	Noun
222	Window	English	Windo	Noun
223	Bank	English	Bbanga	Noun
224	Hotel	English	Hotela	Noun
225	Butchery	English	Bbucali/Bbuca	Noun
226	Cheque	English	Ceki	Noun
227	Court (of law)	English	Nkuta/kkooti	Noun
228	Depot	English	Depo	Noun
229	Government	English	Mfulumende	Noun
230	Jail	English	Jele	Noun
231	Tar	English	Taala	Noun
232	Minister	English	Minisita	Noun
233	Bill	English	Bbiilu	Noun
234	Licence	English	Lasensi	Noun

235	Plot	English	Poloti	Noun
236	Receipt	English	Lisiiti	Noun
237	Card	English	Kkaadi	Noun
238	Company	English	Kampani	Noun
239	Cement	English	Samende	Noun
240	Packet	English	Pakete	Noun
241	Council	English	Kanselo	Noun
242	Councillor	English	Kkansela	Noun
243	Factory	English	Fakitoli	Noun
244	Garage	English	Galaji	Noun
245	Hall	English	Hoolo	Noun
246	Kitchen	English	Ncikini/Kkicini	Noun
246	College	English	Koleji	Noun
247	Library	English	Libbulali	Noun
248	Market	English	Maliketi	Noun
249	Member	English	Memba/Membela	Noun
250	Passport	English	Pasipoti	Noun
251	District	English	Cilikiti	Noun
252	Cheap	English	Ku-cipa	Adj
253	Compound(residential area)	English	Komponi	Noun
254	Yard	English	Yaadi	Noun
255	Church	English	Ceeci	Noun
256	Bible	English	Bbaibbbele	Noun
257	Sabbath	English	Nsabata	Noun
258	Sunday	English	Nsondo	Noun
259	Demon	English	Daimona	Noun
260	Eden	English	Edeni	Noun
261	Elizabeth	English	Elizabeti/Lizabeti	Noun
262	Pope	English	Poopo	Noun
263	Wine	English	Waini	Noun
264	Amen	English	Ameeni	Interjection
265	Father	English	Nu-fwala	Noun

266	Christ	English	Kklisitu	Noun
267	Christian	English	Mu-kklisitu	Noun
268	Apostle	English	Apositolo	Noun
269	Mission	English	Mishoni/Mishini	Noun
270	Missionary	English	Mishonali/Mishinali	Noun
271	Passover	English	Pasika	Noun
272	Catholic	English	Katolika	Noun
273	Christmas	English	Gilisimusi	Noun
274	Choir	English	Kwaya	Noun
275	Deacon	English	Daikona	Noun
276	Farm	English	Faamu	Noun
277	Garden	English	Galadeni	Noun
278	Gold	English	Ngolide	Noun
279	Silver	English	Nsiliva	Noun
280	Nursery (seedlings)	English	Nesi	Noun
281	Bull	English	Bbuulu	Noun
282	Yoke	English	Joko	Noun
283	Acre	English	Hekele/ Ekka	Noun
284	Deep Tank	English	Diputanki	Noun
285	Oil	English	Oilo	Noun
286	Pump	English	Pompi	Noun
287	Tank	English	Tanka	Noun
288	Wire	English	Waya	Noun
289	Beans	English	Bbiinsi	Noun
290	Scotch-Cart	English	Ci-kkocci/Ci-kkoccikala	Noun
291	Sledge	English	Ci-Layi	Noun
292	Carrot	English	Kalutu	Noun
293	Onion	English	Hanyinsi	Noun
294	Plough	English	Pulawu	Noun
295	Tractor	English	Talakita	Noun
296	Camel	English	Nkamela	Noun
297	Week	English	Nvwiki	Noun

298	Watch	English	Wacci	Noun
299	Clock	English	Nkoloko	Noun
300	Scale	English	Cikelo	Noun
301	Hour	English	Woola	Noun
302	Mile	English	Mailosi	Noun
303	Calendar	English	Kalenda	Noun
304	Glass	English	Gilazi	Noun
305	Bridge	English	Bbilici/Bbiliji	Noun
306	Petrol	English	Petulo/ Petilo	Noun
307	Cement	English	Samende	Noun
308	Plunk	English	Pulanga	Noun
309	Machine	English	Muncini	Noun
310	Pipe	English	Paipi	Noun
311	Brick	English	Bbilikisi	Noun
312	Spanner	English	Cipanela	Noun
313	Brake	English	Bbuleki	Noun/Verb
314	Battery	English	Bbatili	Noun
315	Bump	English	Bbampu	Noun
316	Chain	English	Ceeni	Noun
317	Concrete	English	Konkiliti/ Konkeli	Noun
318	Corner	English	Kkona	Noun
319	Grease	English	Gilizi	Noun
320	Window	English	Windo	Noun
321	Bolt	English	Bbautu/Bbalutu	Noun
322	Chisel	English	Ncizelo	Noun
323	Screw-driver	English	Sikulu-dalaiva	Noun
324	Shovel	English	Fosholo	Noun
325	Square	English	Sikweya	Noun
326	Wheelbarrow	English	Wilibbala	Noun
327	Bicycle	English	Bbasikolo	Noun
328	Engine	English	Injini	Noun
329	Wheel	English	Vwili	Noun

330	Diesel	English	Dizilo	Noun
331	Mend	English	Ku-menda	Noun
332	To change	English	Ku-cinca	Noun
333	Buttocks	English	Matako	Noun
334	Programme	English	Pulogilamu	Noun
335	Size	English	Nsaizi	Adj
336	Cheek	English	Nciki	Noun
337	To faint	English	Ku-fenta/	Noun
338	Gentleman	English	Gentelemani	Noun
339	New	English	Nyowana	Adj
340	Powder	English	Pauda	Noun
341	Rubbish	English	Malabishi	Noun
342	Whore	English	Mu-huule	Noun
343	To win	English	Ku-wina/	Verb
344	To search	English	Ku-secca/	Verb
345	Alarm	English	Alamu	Noun
346	Adam	English	Adamu	Noun
347	Address	English	Adulesi	Noun
348	Wheel	Engllish	Vwili	Noun
349	Valve	English	Nvaluvu	Noun
350	Vote	English	Ku-hoota/ Ku-voota	Verb
351	To paint	English	Ku-penta	Verb
352	Orange	English	Lalanje/ Fulenge	Noun
353	Comb	English	Nkamu	Noun
354	Packet	English	Paketi	Noun
355	David	English	Davida	Noun