Thesis

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Loanword nativization: a generative view of the phonological adaptation of Gîkûyû loanwords

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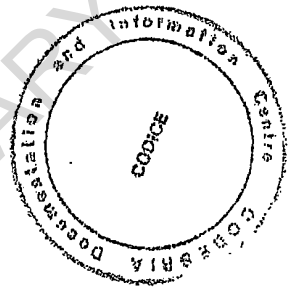
LOANWORD NATIVIZATION: A GENERATIVE VIEW OF THE PHONOLOGICAL ADAPTATION OF GÎKÛYÛ LOANWORDS

T H E S I S



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DECLARATION

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

ALICE NYAMBURA MWÎHAKI

This thesis has been submitted with our approval as University Supervisors.

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ABSTRACT

This is a phonological study of the Gîkûyû loanwords derived from English. Using an inductive approach to data analysis and a multi-linear framework of description, the study identifies three aspects of loanword adaptation: phonemic, phonotactic, and prosodic. Phonemic adaptation addresses the grammatical constraints of unitary sound substitution: namely phonemic merger and phonemic split. Phonotactic adaptation defines the harmonic motivation of phonemic combination and distribution in the loanword. Prosodic adaptation considers the principles of syllabification and the assignment of the prosodic features.

Four generalizations are drawn from this research. The phoneme is a minimal distinctive unit which responds to the phonetic, semantic, and morphological, constraints of the lexical structure. The syllable functions at the core of the phonological organization whereby it regulates the combination of the phonemes, the prosodic features, and the appropriate phonetic shape of the phonological word. The phonological word is a most fundamental grammatical licenser which ultimately programmes the function of the phoneme, the syllable, and each of the prosodic features. The phoneme, the syllable, and the phonological word, are essential constructs of the phonological organization and, therefore, speech production and speech perception.

SPECIAL SYMBOLS

Together with the relevant phonetic transcription, as pertains to the English and Gîkûyû sound systems, the representation of this study uses the symbols listed below. These symbols are regularly used in phonetic descriptions for brevity in the formalization of phonological rules.

V	Vowel Unit
C	Consonantal Unit
[]	Phonetic Trascription
//	Phonemic Representation
#	Word Boundary
σ	Syllable Unit
$	Syllable Boundary
>	Diachronic Change
->	Synchronic Change
<->	Synchronic Variation
≡	Phonemic Identity (Preservation)
{}	Morphemic Representation
X	Metrical Grid
H	High Tone
L	Low Tone
|	Association Line
≠	Deassociation
|↖|	Reassociation or Spreading
/-	Phonetic Environment

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CHAPTER ONE

THE INTRODUCTION

1.1 Focus of the Study

This study investigates the phonological principles of the adaptation of Gîkûyû loanwords derived from English. Gîkûyû is a Bantu language of the A category, characterized by a concordial feature agreement (see Guthrie 1967; Heine 1978). This language has had some contact with English for over a century. In comparison with Gîkûyû, English represents an advanced technological culture. Since technological advancement is a source of prestige, it provides a motivation for cultural and lexical borrowing.

The prestige accruing from English is enhanced by the fact that this language has functioned as the official medium for the educational, the legal and governmental establishment longer than half a century (see Gorman in Whiteley, 1974). This function cultivates a favourable climate for lexical borrowing with the more prestigious language being the primary donor. Thus, loanwords derived from English are a salient feature of the Gîkûyû lexicon.

The term loanword refers to a lexical item derived from another language, generally accompanied by the morphemic

form of the cognate word and a new concept, but bearing the phonological shape of the recipient language. The available linguistic literature generally agrees that loanwords represent the innovations which cannot be accounted for in terms of inheritance, but which can be systematically related to items in the donor language (see Anttila 1972: 154-6; Bynon 1977: 216-24; Hock 1986: 380-425).

On introduction into a new language, loanwords undergo a process of nativization in conformity with the grammatical constraints of the recipient system. Though nativization is significant for lexical and derivational morphology, the most critical aspect of modification involves the adaptation of the phonological structure. Adaptation is a term used to define phonological nativization. The process of adaptation is not always observable but can be inferred from a comparison of items in the recipient system with corresponding elements in the donor language.

The process of adaptation involves the replacement of the phonological properties of the loaner language with the equivalent elements of the recipient system. The strategy most commonly mentioned in literature todate is the substitution of the most similar native sound, in terms of physical and perceptual correlation, for any foreign segment which does not occur in the recipient language.

In many cases, this process is quite straightforward in its application. For instance, in the modification of the English word [bʌs] into its Gîkûyû reflex [mbaθi], the sounds /mb/, /a/, and /θ/, function as the phonemic correspondences of /b/, /ʌ/ and /s/, respectively.

In some cases, the explanation is not that simple. For instance, phonemic constraints do not show the motivation for the epenthetic /i/, observable in the example given above. Neither can they account for all the innovations observable in the modification of the words [blæŋkɪt] > [moreŋgeti] and [træktə] > [karaɣita], nor explain the resyllabification process occurring in the derivation of [hɒspɪtl] > [θiɸitare], among other phonological changes.

Some adaptation procedures indicate telescoping. The term telescoping describes the cases whereby the modification processes go through changes no longer directly derivable but which can be inferred from the general inertia of sound change (see Hyman, 1975: 173-5; Foley, 1977: 107-12). The inertia development principle stipulates that change follows universally progressive tendencies.

Diversity of strategy is important in that it introduces a multi-faceted view of loanword adaptation. It therefore

poses an interesting challenge to the student of lexical-phonology in particular and linguistics in general. This study is an attempt to rise to the challenge involved.

1.2 Statement of the Problem

This is a phonological study of Gîkûyû loanwords. The study attempts to develop a systematic explication of the phonological constraints and/or grammatical motivation of loanword adaptation. Its ultimate goal is to present a rational account of the phonological principles of loan-word adaptation as manifested in Gîkûyû. Since the notion of adaptation involves a combination of the mechanisms of language change and survival, it would be beneficial to discover the device(s) by means of which a given system sustains its structure in the face of lexical borrowing.

This research is motivated by two considerations. First-ly, loanwords are a salient feature of the Gîkûyû lexicon yet no study on the Gîkûyû loanword phenomenon is availa-ble. Secondly, the available general literature and spec-ific studies on the adaptation of loanwords focus on the phoneme to the exclusion of the other phonetic parameters such as the syllable and the phonological word (see p. 15). A consideration of the various innovations indicates that phonemic factors cannot account for all the manif-est changes. A basic contention of this study is that the

constraints of loanword adaptation go beyond the phoneme to include larger segments of the phonological structure.

1.3 Hypotheses of the Study

This study posits two general hypotheses:

i) Various grammatically significant constraints motivate the phonological adaptation of Gîkûyû loanwords.

ii) The basic constraints of loanword adaptation can have valuable implications for speech perception.

1.4 Objectives of the Study

This study aims to meet two general objectives:

i) to define the phonemic, the phonotactic, and the prosodic constraints of the Gîkûyû loanword adaptation;

ii) to determine the relevance of the findings for Gîkûyû phonology, speech production and speech perception.

1.5 Scope and Limitations

This is a synchronic phonological study. Though critical to the general process of loanword nativization etymological, lexical and morphological questions are peripheral to the analysis. These constraints are only incorporated where they reveal the motivation of irregular derivation.

Gîkûyû loanwords are derived from the various languages with which it has had contact. The principal among these

are Kiswahili and English. This study is restricted to the loanwords believed to be derived from English.

It is, of course, granted that Kiswahili is a significant donor of the Gîkûyû loanwords. On account of genealogical affiliation these languages share predictable phonological correspondences. The adaptation involved, therefore, lacks the opportunities and challenge found in English. English presents a greater challenge for the researcher because it functions on a phonological system which is clearly distinct from the structure of Gîkûyû. Hence, it provides an ideal opportunity for illustrating the phonological differences which can distinguish languages.

While there is evidence that some of the words employed in the analysis involved are indirect loans from other languages of Europe (see Langacker, 1973: 182-3), it is not expedient for this study to trace the authentic origins. The issue of origin introduces etymological problems which are rather peripheral to a synchronic study. The basic premise of this study is that the loanwords used are traceable to English and are believed to have been introduced into Gîkûyû, either directly or indirectly via Kiswahili. While granting that Gîkûyû speakers have had contact with other varieties, it can be assumed that they were mainly exposed to the British English.

Gîkûyû consists of several dialects. For the purpose of consistency in phonetic transcription, this study adopts the constraints of the southern dialect as spoken in the lower region of Mûrang'a district. This dialect is so named by pioneer studies on the grammatical structure of Gîkûyû (see Barlow 1960; Armstrong 1967; Mûtahi 1983). The southern speech is particularly distinguishable by means of two types of sounds: (1) the voiced prenasalized obstruent instead of the oral or devoiced counterpart and (2) the voiceless palatal rather than the dental sibilant or the homorganic affricate, found in other dialects.

Despite variation in the sound system, there are no morphological or lexical differences significant enough to affect the outcome of this study. The findings made of the southern speech are believed to be true of the phonology of Gîkûyû in general. By implication, the conclusions reached are significant for the language as a whole.

1.6 Rationale for the Study

The loanword phenomenon is considered the most prevalent form of lexical borrowing. A strong psychological reality can therefore be associated with the procedures employed in the adaptation of loanwords. (For the significance of psychological reality, see Linnel (1979)). Furthermore, prominent linguists (e.g. Kiparsky in Lyons 1970; Anttila

1972; Anderson 1973) are convinced that the processes involved in loanword adaptation can provide great insight into language use and language structure. Since change is an inexorable property of language, the insight into the sources, processes and results of change is paramount to the understanding of the language phenomenon itself.

In view of the available studies on African languages, it would appear that there is relatively little work on the adaptation of loanwords. There is then a probability that some valuable information can be derived from this study. Anttila (1972: 380-3) claims that concern with change helps the student of language better understand order and consistency. This claim validates the assumption that an analysis of the adaptation of loanwords provides a better opportunity for understanding the phonological phenomena, than when descriptions are preoccupied with one language.

This claim is mostly significant for the African students of linguistics. Sometimes, these students have to grapple with unfamiliar data principally derived from European languages. It is rather difficult to justify the use of foreign words where alternatives from regional languages can be found. This study makes available data which are more familiar and hence more helpful in the understanding of the principles which govern the phonological function.

It is assumed that some of these principles can provide significant insight into the ideal apparatus for defining the physiological constraints of speech perception.

This study embraces the psycholinguistic view of speech perception. Psycholinguists advocate the motor theory of perception. This theory stipulates that perception takes place with the help of an individual's sensory organs and is completed with the creation of an image of the perceived structure and subsequent working with it (see Liontiev, 1981: 31-8). The motoric approach, therefore, interprets speech perception in relation to speech production.

It is plausible that the basic constraints of loanword adaptation are essential constructs of this theory. This claim suggests that this study has critical implications for neurolinguistics. Neurolinguistics is the branch of psycholinguistics, specialized in the study of the neural control systems responsible for the organization and the use of speech (see Laver in Lyons 1970; Crystal 1987).

Until recently, phonetics has limited itself to the study of the articulation. It is now in the process of expanding its apparatus to include the study of neurolinguistic programme planning (see Fry 1979; Fromkin 1985). The value of establishing a neurolinguistic control programme

can be considered from a theoretical and a practical perspective. On the one hand, it is appropriate that phoneticians attempt to provide a comprehensive account of the sound system. On the other hand, discoveries about the properties of the neural control of speech can have application for most disciplines particularly interested in speech (see Crystal, 1985: 7-39; Catford, 1988: 1-2).

Besides theoretical rationale, therefore, justification for this study can be found in its relevance to other disciplines. For instance, insights gained from this study can be used to secure objective answers to specific problems in language education and language cultivation. A fundamental premise of this study is that its findings can enable second language (L2) educators, and language developers make logical and informed decisions.

Valuable information for L2 teaching-learning can be derived from this study. Language educators maintain that the greatest obstacle to L2 phonological acquisition is the substratum influence provided by first language (L1) transference (see Witkins, 1972: 197-204). The underlying assumption is that people who acquire different languages learn different patterns of sensitivity to acoustic cues.

Contrastive analysis is a basic pedagogic strategy, meant

to address the problem of divergent phonological systems (see James 1980). This strategy is developed on the basis of a general assumption that whenever the structure of (L2) differs from that of (L1), difficulty in learning and error in performance should be expected. This study provides insight into interlanguage pronunciation errors.

Interest in language education can lead to a concern with language cultivation (see Ferguson in Cobarrubias and Fishman 1983; Kennedy 1983). An essential activity of the language cultivation process is lexical modernization by scholars for various needs of the academic expression. A large part of lexical modernization concerns the creation of new nomination to function as the counterparts or the translation equivalents to the terminology used in the languages of more technologically advanced nationalities.

New nomination shows a strong tendency towards loanwords. The strategies involved in loanword adaptation should, therefore, serve as guiding principles of innovation in order to ensure consistency with the properties of the relevant phonological systems. These properties function as criteria for defining legitimacy, acceptance and hence diffusion of lexical innovations within a given language. The process of diffusion ensures that new nomination is broadly effective, rather than elitist and restricted.

Language cultivation efforts extend to lexicography. A basic challenge for lexicographers can be found in the compilation of dictionaries. A comprehensive dictionary should distinguish native from non-native forms (consider the Oxford Dictionary of English, 1989). The assumption is that such dictionaries facilitate the construction of adequate grammars. This study provides a large quantity of non-native words for any lexicographer interested in compiling a Gîkûyû dictionary or glossary (see appendix).

The issues raised in connection with language education and language cultivation are crucial for a multi-lingual society, such as that found in Kenya. Kenya's educational policy advocates a trifocal system, whereby all languages of the society are developed as a multi-faceted societal resource. This policy hopes to facilitate a meaningful realization of social awareness and social identity at three levels: the ethnic, national, and international.

One strategy for the implementation of this policy requires that along with the development of English and Kiswahili, the vernacular languages undergo systematic cultivation. A sustained cultivation of the indigenous languages enhances the acquisition of valuable tools for cultural, technological, and intellectual advancement.

At a more abstract level, the implementation process can involve creating awareness and developing understanding of language as a social phenomenon and a cultural entity, with reference to the indigenous languages of Kenya. The realization of such a goal would enhance a meaningful appreciation of the role of language in culture. In so doing, they enable students appreciate language as a dynamic tool for group identity and acculturation. This study hopes to make a contribution to the literature on the linguo-cultural implications of lexical borrowing.

1.7 Literature Review

This study recognizes two main perspectives of literature review: a general examination of the notion of lexical borrowing and the analyses of the loanword phenomenon. The general literature on linguistic borrowing identifies three major mechanisms for lexical transfer: loan shift, loan translation and loanword. The focus of this review is on the treatment of loanwords, in consideration of phonological adaptation and related formal modification.

Literature on the loanword phenomenon addresses three questions which are definitive for the notion of lexical borrowing: the substance, the motivation, and grammatical implications. These questions are considered in varying degrees, depending on the author's focus and interest.

Some authors (e.g. Hockett 1958; Weinrich 1963; Lyons 1968, 1981; King 1969; Anderson 1973; Langacker 1973; Fromkin and Rodman 1988) have restricted themselves to substance and motivation. There is a consensus that it is possible to borrow an item from any field of the lexicon. Members of the open classes, however, appear more prone to borrowing, and nouns are the most readily borrowed words anywhere. This distribution could be a reflection of the sizes of the word classes themselves, including the fact that a great majority of the borrowed words are names of materials and ideas denoting cultural concepts.

Generally citing the experience of English, the authors mentioned above highlight need and prestige motives. The need motive occurs in relation to nomination requirements arising out of cultural borrowing. The notion of prestige is involved where loanwords co-exist with native forms as doublets. Since cultural borrowing is a consequence of unequal prestige, these motives can be said to overlap.

The works examined above raise important linguistic and psychological questions. These descriptions are however not adequate treatments of the loanword phenomenon. More descriptively adequate literature is presented by three authors (namely: Anttila 1972; Bynon 1977; Hock 1986).

Among other questions affecting the mechanisms of lexical borrowing, these authors address the grammatical implications of loanword nativization. Mainly drawing on the languages of Europe, three main aspects of nativization are developed: the phonological, the morphological, and the lexical. This study focuses on phonological nativization, specifically identified as the adaptation of loanwords.

Although all aspects of nativization are significant, as inferred from the fact that they are represented in the general literature on linguistic borrowing as well as the specific studies on the loanword phenomenon, the emphasis is placed on the importance of an immediate phonological adaptation. This is on account of the articulatory and hence the perceptual requirements of phonetic processing.

In order to function in the morphosyntactic system of the borrowing language, the new words need to be 'pronounciable'. The aforementioned literature, however, addresses phonemic adaptation to the exclusion of the other phonetic variables such as the syllable and the phonological word. This approach is perpetuated in specific studies, as observed in the treatment of the African languages.

Mainly owing to the unequal technological development, African languages tend to borrow relatively heavily from

their European counterparts (see Anderson, 1973: 89-95). Both the general literature and specific studies indicate that the former are progressively receptive to lexical items denoting new technical and cultural ideas. Specific studies are only available on Kiswahili and on Kîkamba.

Lexical borrowing in Kîkamba is examined in a brief survey by Whiteley (1963). This survey outlines processes which define phonological and morphological nativization of loanwords. It also outlines the cultural constraints of lexical nativization. This survey is valuable in that it defines three basic aspects of loanword nativization.

Brief references to Kiswahili loanwords are presented in connection with language cultivation efforts (see Johnson 1948; Whiteley 1967; Mbaabu 1985). These references are principally concerned with the question of motivation for borrowing, with regard to new nomination needs, and do not dwell on the processes or constraints involved in the nativization strategies. More comprehensive studies are carried out by the following three researchers.

Ball (1971) presents a comparative study of the factors which constrain the phonological modification of words derived from Arabic and English. The principal factors are correlatable with the family, religious, educational,

and occupational backgrounds. The study provides insight into sociological constraints of lexical nativization.

Houpe (1978) attempts a statistical analysis of loanwords occurring in the *Baraza*, a Kiswahili weekly journal, in three years: 1961, 1968, and 1975. This research focuses on the variation, or consistency, in the use of loanwords over a period of fourteen years. The study attempts to define correlation in three ways: year of use, subject of discourse, and the lexical category. Such an approach is significant for stylistic as well as discourse analysis.

These two studies address lexical concerns involving the contextual constraints rather than specific principles of language structure. A study of a more specific structural interest is carried out by Zawawi (1974). Zawawi presents a systematic analysis of morphological assimilation. This analysis focuses on the modification of the nouns of non-Bantu origin, in relation to their response to the Ki-swahili concordial feature agreement. The study provides valuable insight into the Kiswahili nominal class system.

Although research on the Kiswahili loanwords is far from exhaustive, the availability of these studies constitutes proof that scholars have paid much greater attention to Kiswahili than other African languages. The preference is

understandable in view of the national and international recognition of Kiswahili. More significantly, this disproportionate attention can be attributed to the role of Kiswahili in the school and the university curriculum.

As a young language of the academic expression, Kiswahili is the focus of language cultivation efforts. This arises because language researchers are probably more sensitized to the structure of Kiswahili than that of any other African language. It is, however, important to realize that the African linguistics will remain relatively underdeveloped unless research extends to other languages.

1.8 Research Methodology

The methodology employed in this study involved four activities: loanword (data) identification, data collection, data analysis, and presentation of research findings. Loanword identification calls for a systematic comparison of the lexical items occurring in Gîkûyû and English, based on three criteria: a semantic affinity of concepts, a phonemic correspondence of lexemes, and the direction of borrowing depending on the nature of the referent(s).

Establishing the Gîkûyû loanwords which are adopted from English is a straight-forward exercise. The relative ease of this exercise depends on two vital factors. Firstly,

there is a great phonetic discrepancy between the Gîkûyû and the English phonological structure. Secondly, these languages shared little or no cultural experience prior to the 20th century. If a Gîkûyû lexeme, therefore, shows a systematic formal and conceptual correspondence with an English item, it is assumed to be a loanword in Gîkûyû.

The direction of borrowing, therefore, presents little difficulty. The researcher invokes two lexical principles (see Hock, 1986: 409-11). The first stipulates that lexical borrowing usually takes place from the more to the less prestigious culture. Secondly, languages rarely borrow basic lexical items which define the core of human experience but rather adopt names for concepts acquired in the course of cultural diffusion. These principles are enhanced by the fact that many loanwords are members of specific semantic fields referring to institutions, technical skills, artifacts and social relationships, not easily associated with the indigenous Gîkûyû culture.

Data collection proceeded through a participant-observer survey. This involved informal interviews and discussions with native Gîkûyû speakers. The interaction encompassed a wide range of topics relating to the family, religion, education, health, dress, travel, agriculture, commerce and leisure. As such, the data incorporated in this study

are derived from a varied cultural background relating to the home, church, school, industry, among other aspects of the socio-economic lifestyle of the Agîkûyû community.

Care was taken to accomplish the survey with the highest degree of informality to ensure a natural and spontaneous interaction. All conversation was taperecorded and the relevant data subsequently sifted for transcription. The transcription of the English words was verified through the use of two dictionaries: Longman Dictionary of Contemporary English (1992) and Oxford Advanced Learner's Dictionary (1994). Once transcribed, loanwords were classified in order of the initial sounds, beginning with vowels and proceeding to consonants. This mode of classification ensures that the English phonemic inventory is adequately represented. The analysis and description, however, considered sounds in all phonetic environments.

Normally, loanwords are nativized to the extent that they are not easily recognizable by the casual observer. Occasionally, fully and partially adapted forms co-exist. Where reflexes depict variants, the norm was noted by virtue of the regular usage and the cause of the irregular version subsequently investigated. Throughout the analysis, the English forms were treated as the underlying forms of the Gîkûyû derivatives (described as reflexes).

Data analysis adopted an inductive approach. The latter progressed through four activities: (i) identifying the specific processes and the general adaptation strategies, (2) investigating the source of deviation, (3) determining the general principles, and (4) evaluating the significance of phonological principles for speech perception.

These activities were employed at three distinct levels of the phonological structure: phonemic, phonotactic, and prosodic. These are the aspects of phonological function which form the most substantive components of this study. While the conclusions were mainly drawn on the basis of the observable generalities, the consistency of deviancy and its constraint(s) were also taken into consideration.

On account of the various discrepancies observed in the English spelling system, the representation of the illustrative data employs the use of the phonetic transcript instead of the orthographic script. This method of representation facilitates a more direct observation of the significant phonetic correspondences and/or substitution.

The presentation of this study attempts to meet four objectives of a scientific inquiry: observation, description, explanation, and evaluation (see Botha 1971; Anderson, 1973). The observational requirement is met by means

of the concise statement of the adaptation strategies and processes observed, along with the illustrative data. Descriptive adequacy is concomitant with the precise formalization of the general rules which define the relationships identified. Explanatory power is assumed present in the explicit definition of the principles and the interrelationships which account for the linkage of different procedures. Interpretative value can be found in the attempt made to determine the theoretical implications and application of the new knowledge for speech perception.

The general approach to analysis, interpretation, explanation, and evaluation adopted in this study, is compatible with the concept of phonology as an system of relationships. In this treatment, every element is conceived as an integral component of the phonological structure and the conception of each process depends on its reciprocal relatinship with other properties of the system. The reciprocal inter-relationships are defined with reference to the basic phonological parameters. An illustrative description of vital inter-relationships among the basic parameters of phonological function in general, and Gîkûyû in particular, is presented in chapter two.

CHAPTER TWO

GÎKÛYÛ PHONOLOGICAL PARAMETERS

2.1 Introduction

The ultimate goal of this chapter is to outline the basic parameters of the phonological function with reference to Gîkûyû. Essentially, loanword adaptation could be considered the response of a foreign word to the native phonological structure of the recipient language. As such, a survey of the phonological parameters of Gîkûyû serves as a relevant point of reference for the adaptation process.

Parameter is a term used to describe the essential phonetic variables. Parametric phonetics views speech as a single physiological system in which the articulatory variables are continually interacting in time (see Catford 1988: 1-10). This model represents a polysystemic view of speech and is hence compatible with the multilinear theories of phonology employed in this study.

2.2 Theoretical Foundation

This study takes its broad theoretical orientation from generative grammar in general and generative phonology in particular. Generative grammar conceives language as a cognitive rule-governed structure. Generative research is

therefore constrained by a basic tenet that the speakers of a language internalize a finite system of linguistic rules that governs their use of that language. In view of this principle, loaword adaptation can be interpreted as the foregrounding of a set of phonological rules.

Generative phonology (GP) was first expounded by Chomsky and Halle and reached its most definitive form with the publication of the Sound Pattern of English (SPE) in 1968. The SPE model recognizes two levels of the phonological representation: the phonemic and the phonetic. In this connection, the SPE model addresses two fundamental questions: the nature of phonemic representations and the properties of rules which link them to phonetics. By establishing a balance between elements and rules, the SPE programme is credited with internal formal coherence.

GP has, however, not developed as a unified theory. It consists of various models all of which take their reference from SPE. Despite its historic importance, SPE became the centre of controversy, largely on account of abstractness and reductionism (see Anderson, 1985: 328-39).

The abstractness limitation is conceived in relation to systematic phonemic representations. The latter attempt to define phonological function by means of componential

phonemic features (see Hyman 1975: 72-90). These representations are far removed form phonetic relations and, as such, lack a genuine claim to psychological reality. Phonologists otherwise amenable to the basic assumptions of SPE phonology take exception to extreme abstractness.

To counter the abstractness limitation, concreteness theories have evolved. The first to emerge were the naturalist models: notably natural generative and natural process phonology. It has been argued that the naturalist models merely constitute reactions to the perceived excesses of SPE, without advancing alternative programmes (see Dogil 1984; Clark, Yallop 1990). Instead, they perpetuate SPE reductionism in phonological representations.

Reductionism is conceived in terms of a monosystemic view of phonological organization (see Foley 1977: 5-6). It is an approach which represents the phonological structure as a linear string of discrete phonemic units. A linear view of phonological organization is unrealistic since it concentrates analytic attention on the phoneme, thus ignoring the significance of dynamic variables such as the syllable, the phonological word, stress, and tone. Linear theories are therefore not equipped to handle the phonotactic and prosodic aspects of loanword adaptation.

A much needed corrective to SPE reductionism is provided by the polysystemic view of phonological structure. This view is a logical corollary of the multi-linear approach to speech representation advocated by autosegmental and metrical phonology. These models are unified by the fact that they advocate a hierarchical organization of speech.

These theories are further unified by the fact that they demonstrate a commitment to the principles of the SPE programme. This is interpreted to mean that these models constitute a continuation of the original assumptions and goals of generative phonology (see Goldsmith, 1990: 1-7).

In view of these claims, a synthetic framework comprising autosegmental and metrical phonology forms the descriptive foundation of this study. These theories have evolved over a period of several decades in response to the perceived value of prosodic structure. The principles and development of these theories are expounded by Goldsmith (1990). Further insight into the guiding tenets can be derived from various reviews (e.g. Anderson 1985; Clark and Yallop 1990; Durand 1990; Katamba 1991; Carr 1993).

Autosegmental and metrical phonology are subsumed under one heading on the basis of philosophical and practical considerations. On the one hand, these models represent a

correlatable attempt to revise the linear conception of phonological structure within the original tenets of generative phonology. On the other hand, they can be said to have complementary areas of application. They were first developed to deal with the phenomena of tone and stress, respectively, but were eventually expanded to accomodate significant aspects of the relevant phonological systems.

2.2.1 Autosegmental Phonology

Autosegmental phonology (hence AP) is an approach whereby representations have several independent levels that are linked to each other. An AP representation posits two or more parallel tiers of the phonological organization. Each tier consists of a string of segments with the elements on each successive tier differing with regard to the features specified in them. In this analysis the term segment is generalized to a unit of mental organization.

The basic tier in the entire phonological representation is the skeletal tier. The latter comprises the phonematic units of language. It regularly alternates syllabic (V) and non-syllabic (C) slots. This tier forms the anchor point for elements on the various other tiers. Features not specified on this tier are known as the autosegments.

Autosegment is a term used to highlight the fact that, in

this theory, the independence of the various parameters is crucial. Besides the autosegments, AP representations include association lines which relate the various tiers. The association lines represent simultaneity in time and therefore co-registration of parameters. A pair of tiers, along with the set of association lines which mediate them, is described as a chart. Three basic autosegmental tiers are represented: phonemic, syllabic and tonal.

The phonemic tier represents the specific sounds of the words of the particular language in question. A phonemic representation of the word #GîkûyûÌ [ɣekojo] is depicted.

(2.1) skeletal tier C V C V C V
| | | | | |
phonemic tier ɣ e k o j o

In the autosegmental analysis, the term phoneme does not necessarily suggest a distinctive function. Rather, it is used as a convenient label for signalling the level of a minimal perceptible unit of the phonetic structure.

The syllabic tier depicts the phonotactic patterns of the phonemes of a given language. The phonotactic constraints of an open syllable system are portrayed in the syllable (σ) delimitation of the word [ɣekojo], depicted in (2.2).

(2.2) skeletal tier CV CV CV

\/ \/ \/

syllabic tier σ σ σ

The tonal tier represents the perceptual correlates of pitch variation during phonation. A register tone, for instance, is specified for each syllable rhyme as either high (H), low (L) or mid (M), depending on a given language. The contrastive tones of the Gîkûyû words [mwaki] (fire) and [mwaki] (builder) are perceived as follows.

(2.3) Skeletal tier CV CV CV CV

| | | |

tonal tier L H H L

The formal procedures of AP make it possible to capture fundamental relationships which are otherwise excluded from the SPE descriptions. AP is, however, not equipped to handle the stress structure. For the purpose of stress representation, AP is complemented by metrical phonology.

2.2.2 Metrical Phonology

Metrical phonology (hence MP) is a syllable-based theory which investigates the structure of stress and rhythm in speech. An integrated treatment of speech stress and rhythm suggests a correlation of the functional properties, depending on the constraints of the individual language. A language may be organized on syllable or stress timing.

Linguistic stress is essentially the relative prominence of the syllables and higher level units of an utterance. In some languages, stress is perceived as a hierarchical organization of speech units based on the syllables. This principle is not applicable to languages with fixed word stress. In either case, the stress structure conditions correlate with the constraints on the metrical structure.

The notion of a metre refers to the constant use of a periodically recurrent unit. It can be assumed that the succession of the latter creates its own inertia so that perception is eventually automatized (see Lotman, 1976: 35-7). A metric unit is perceived as both isochronous (having equal timing) and isodynamic (articulated with relatively equal stress). Speech rhythm is specifically linked to isochronous and isodynamic units of a language.

Speech rhythm is definable as the temporal organization of metric units. Languages are spoken with only one of two speech rhythms: syllable-timed and stress-timed (see Abercrombie 1967; Ladefoged 1982; Roach 1983; Lass 1984; Catford 1988). In a stress-timed language the correlates of isochronism are perceived in connection with a stress unit. The situation is different in a syllable-timed language. In the latter, speech rhythm depends on the principles which govern syllable structure conditions.

Speech rhythm cannot be adequately examined in a lexical treatment of phonology. The rhythm of speech incorporates relationships extending beyond lexical to phrasal phonology. This study restricts itself to the properties which define the word level metrical structure representation.

In metrical analysis, the utterance is broken into constituents in a hierarchical order such as the syllable, the foot, and the phonological word. These levels correspond to rhyme, secondary, and primary stress. The development of metrical analysis depends on two formalisms: one using metrical grid and the other metrical trees.

The metrical grid expresses internal relative strength of constituents whereas the metrical tree indicates the phonotactic relations. Thus the precise formal way in which stress structure is expressed differs in these approaches but they share the goal of representing the hierarchical organization of the phonetic stress. This can be inferred from relations existing among the various stress units.

A metrical tree is essentially a binary branching constituent structure similar to syntactic representations, and alternating strong and weak nodes. Ideally, metrical trees express a rhythmic repetition of stress on successive syllables. This principle is, hence, only sustainable

in a stress language such as English, which uses a regular hierarchy of phonetically distinctive stress levels.

For a tone language such as Gîkûyû, this principle is violated. In the continuum of Gîkûyû speech, all syllables not bearing primary stress are perceived to be isodynamic (with equal force). This situation implies that metrical trees are not viable for representing the Gîkûyû stress structure. An alternative is found in the metrical grid.

The metrical grid depicts horizontally the basic beats (hence X) in the utterance, and vertically the relative strength assigned to each beat in the rhythm of the word. The more Xs over a beat, the more prosodically prominent it is considered. For comparison, the respective metrical grids for #Gîkûyû# and #phonology# are represented.

(5)

primary Stress	x	x
secondary stress	x	x x
rhyme stress	x x x	x x x x
wordforms	ɣe ko jo	fə nɒ lə ǰi

It can be assumed that languages depicting only one discernible stress per word have no phonetic means of assigning secondary stress. This can be interpreted to mean that the principles which organize syllables into stress

into feet are not applicable. For such a language, stress representation involves the assignment of the primary and the rhyme stress without the intervening secondary level.

The situation is indicative of a direct correspondence of the grid linkage and the tonal association, as far as the prosodic structure of Gîkûyû is concerned. This correlation can be evaluated from two perspectives. Firstly, it means that the apparatus advocated by autosegmental and metrical phonology is capable of providing an integrative treatment of the phonological analysis and description.

An integrative approach guarantees plausibility to a grid based stress representation of a tone language. It can then be reinterpreted to mean that the grid formalism is a viable tool for the representation of the stress structure of Gîkûyû. For all the subsequent stress analysis, therefore, this study adopts the use of metrical grids.

Essentially, these models successfully portray an internal formal coherence of the phonological relationships. Success consists largely in the opportunity the representations grant to see connections in two ways: the association of features at one level and the linkage of parameters at various levels of the phonological organization.

The foregoing representation can be said to constitute evidence that the formal apparatus provided by autosegmental and metrical phonology is descriptively adequate. It is, therefore, assumed to be capable of establishing relationships which are more transparent than those found in studies adopting a uni-linear approach to phonology in general, and the phonological structure of Gîkûyû in particular (consider Njage 1982; Mûtahi 1983; Mbûgua 1990).

In conclusion, the descriptive models of autosegmental and metrical phonology provide a much more accountable and also a more realistic approach to the analysis and description of phonological phenomena. The Validity for this claim is substantiated by the following illustrative representation of the phonological parameters of Gîkûyû.

2.3 Gîkûyû Phonological Parameters

A study of loanword adaptation is essentially an inquiry into the role of the recipient phonological structure in the nativization of foreign wordforms. In view of this assumption, an outline of the phonological parameters of Gîkûyû functions as a valuable point of reference. The outline is not to be treated as an exhaustive description of the phonological structure of Gîkûyû. Rather it is to be considered a broad survey, meant to provide a minimum foundation for an examination of loanword adaptation.

The representation which follows draws on the secondary data available in the literature on the phonological structure of Gîkûyû. Reference is made to various studies (e.g. Leaky 1959; Barlow 1960; Armstrong 1967; Ford 1974; Clements, Ford 1977; Gathenji 1981; Njage 1982; Mûtahi 1983; Mbûgua 1990). A review of these studies indicates that four parameters are definitive for the Gîkûyû phonological word: the phoneme, syllable, tone, and stress.

2.3.1 Phonemic Representation

Since particulars of the phonemic inventory of Gîkûyû are available in previous studies (e.g. Mbûgua, 1990: 53-9), this analysis does not address the procedures whereby phonic material is accorded either phonemic or allophonic status. Rather, it is concerned with the task of mapping the stablished phonemes onto an autosegmental framework.

2.3.1.1 Vowel System

Gîkûyû operates on a seven vowel inventory as follows: /i/, /e/, /ɛ/, /a/, /ɔ/, /o/, and /u/. These sounds are depicted in the initial position of the words represented below. Their occurrence is, however, not restricted to the initial position but can occur in any phonetic environment within a word. Owing to the fact that Gîkûyû is predictably an open syllable system, vowels function more regularly in the word medial and word final positions.

(6)

sound units		illustration	
graphemes	phones	data	gloss
i	/i/	[ina]	sing
î	/e/	[eta]	call
e	/ɛ/	[ɛθa]	search
a	/a/	[aria]	speak
o	/ɔ/	[ɔha]	bind
û	/o/	[oka]	come
u	/u/	[uɣa]	say

The Gîkûyû vowel is optionally short or long. Short vowels are either simple or composite units (see Carr 1993: 209-13). Vowels in this language can therefore be represented in three ways: single, geminate, or contour units.

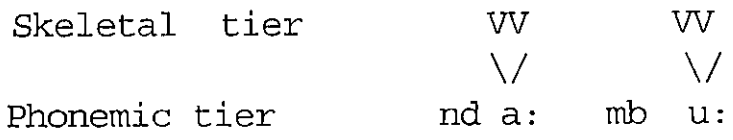
Single vowels are simple units whose perceptual duration corresponds to one mora. Mora is a unit of timing equivalent to the duration taken to articulate a V or CV structure (see Ladefoged 1982: 225-6; Lass 1984; 250-60). Mono-moraic vowels have a one-to-one association with positions on the skeletal tier as observed in the words [nda] (stomach) and [mbu] (lamentation), depicted below.

(7)

Skeletal tier	V	V
	|	|
Phonemic tier	nd a	mb u

Geminate vowels are long units whose duration corresponds to two morae. They are doubly linked to skeletal slots as depicted in the words [nda:] (louse) and [mbu:] (fluff).

(2.8)



Considering the data represented in (2.7) and (2.8), it is observable that the Gîkûyû vowel length, subsequently reinterpreted as syllable weight, is distinctive.

A contour vowel is a mono-moraic unit consisting of non-identical properties, and has a two-to-one linkage to skeletal slots. This association is depicted in (2.9), in connection with the words [ria] (weed) and [mae] (water).

(2.9)

The representation of vowels in an autosegmental framework, depends on two factors: perceptual quantity of articulatory duration and internal composition of phonemic segments. These criteria extend to the consonantal units.

2.3.1.2 Consonant System

The sound inventory of Gîkûyû comprises eighteen primary consonants. In the southern dialect, they are manifested

as: /ᵐb/, /ɸ/, /m/, /t/, /θ/, /ⁿd/, /n/, /r/, /š/, /ñj/, /ñ/, /k/, /ᵑg/, /ŋ/, /ɣ /, /w/ and /h/. These sounds are depicted in the initial position of the following words.

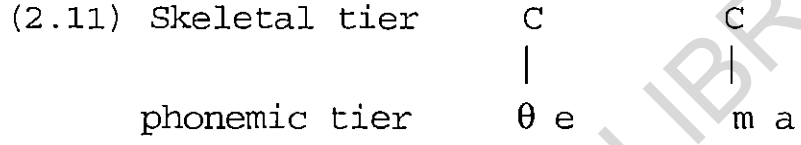
(10)

sound units		illustrations	
graphemes	phones	data	gloss
b	/ɸ/	[ɸata]	value
mb	/ᵐb/	[ᵐbori]	goat
m	/m/	[mata]	saliva
t	/t/	[teri]	soil
th	/θ/	[θahu]	taboo
nd	/ⁿd/	[ⁿduma]	darkness
n	/n/	[noɣo]	monkey
r	/r/	[riθɔ]	eye
c	/š/	[šɔrɔ]	trumpet
nj	/ñj/	[ñjamba]	hero
ny	/ñ/	[ñomba]	house
y	/j/	[jaja]	housegirl
k	/k/	[keña]	gourd
g	/ɣ/	[ɣoto]	ear
ng	/ᵑg/	[ᵑgare]	leopard
ng'	/ŋ/	[ŋɔmbe]	cattle
w	/w/	[wera]	work
h	/h/	[hoᵑgo]	hawk

All consonants of this language are phonetically realized as either simple or composite units. They are therefore represented as either single or contour structures.

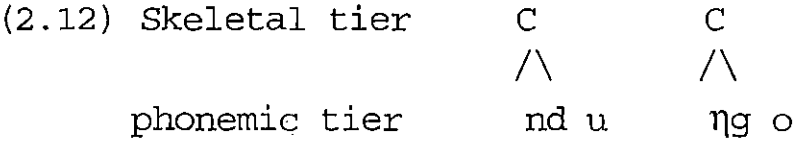
The notion of a single consonant refers to either a purely oral or nasal phoneme but not a combination of these properties. Single consonants have a one-to-one association with slots on the skeletal tier, as depicted in (2.11), for the words [θe] (land) and [ma] (truth).

(2.11)



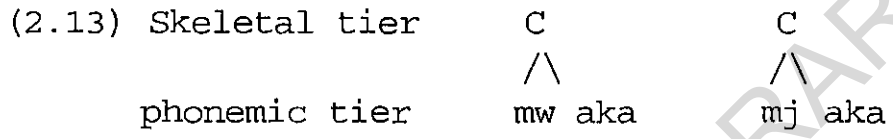
Contour consonants are usually conceptualized at two levels: primary articulation and secondary formation. Cases of primary articulation refer to the prenasalized obstruents. These obstruents represent unitary sequences of [+nasal,-nasal], the former predictably homorganic and non-distinctive. Contour units of this composition have a two-to-one association with positions on the skeletal tier. This association is depicted in the words [ndu] (knees) and [ŋgo] (firewood), represented in (2.12).

(2.12)



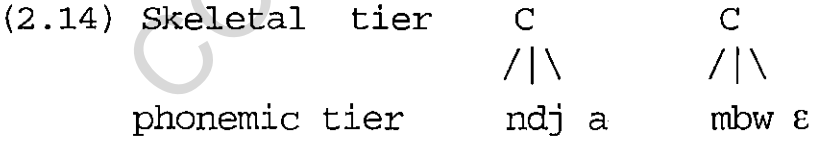
Secondary formations arise where a consonant of primary articulation is either palatalized or velarized, alongside an underlying vowel. These processes are possible for all consonants except the glides themselves. The resultant sounds are unitary sequences of [+cons,-cons], as observable in the wordforms [mwaka] (year) and [mjaka] (years). Contour units of this nature have a two-to-one linkage to the skeletal tier, as illustrated in (2.13).

(2.13)



Prenasalized consonantal forms depict a co-occurrence of three phonetic properties: [+nasal,-nasal]-cons]. This is observable in the monosyllabic wordforms [ndja] (feast) and [mbwɛ] (fox), represented below. The representation of these phonemes involves a three-to-one association with positions on the skeletal tier, as illustrated in (2.14).

(2.14)



The representation of consonants corresponds to that of the simple and the contour vowels in one way: both can be said to involve single and double association of the phonemes to positions on the skeletal tier. Any instance

of double or multiple association implies a physical and temporal interlock. This leads to reciprocal assimilation and coarticulation of units (see Ladefoged, 1982: 52-6).

It can be noted that multiple associations have a maximum of three linkages to skeletal positions. From this can be inferred a well-formedness condition which restricts the maximum number of co-occurring primary phonetic features (see Hyman, 1975: 42-5), and/or constituent elements, for permissible phonemic units be they vowels or consonants.

Vowels and consonants have been represented separately simply for analytic convenience. Otherwise, it should be noted that for the native speaker, the association of phonemic units to appropriate skeletal positions occurs simultaneously for the consonants and vowels of a given word. This can be interpreted to mean that the principles which govern sound perception apply directly to the word as a whole, as well as the constituent syllable units.

2.3.2 Syllable Structure Representation

The most direct way of analysing the syllable structure of a given language involves an examination of monosyllabic wordforms. This approach is validated on the premise that a word boundary (#) is also a syllable boundary ($) (see O'connor and Trim, in Jones and Laver, 1972).

Gîkûyû exemplifies an open syllable system. In this system the significant syllable constituents are the onset (O) and the nucleus (N), where the latter doubles as the rhyme (R). For an obligatory open syllable system, the more productive mode of classification involves a consideration of phonetic (interpreted as syllable) weight.

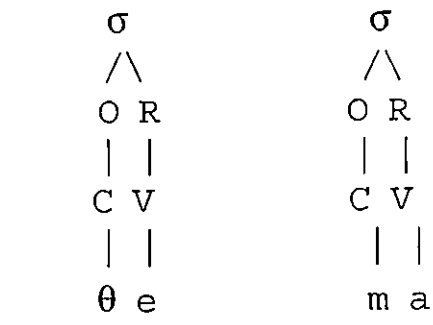
Syllable weight refers to the perceptual correlates of quantity in terms of moraic timing (see Lehiste, 1970: 6-10). Syllables are classified as either light or heavy, depending on the rhyme association to skeletal positions.

2.3.2.1 Light syllables

In the following analysis, representations depict either single or contour constituents. In a light syllable, the rhyme associates to a single skeletal position. It is, thereby, reinterpreted as a non-branching rhyme. Light syllables can be represented in four ways, depending on the phonematic composition of the constituents.

One form of a light syllable comprises singular phonematic constituents. It corresponds to phonemic structure in that its constituents have a one-to-one association with positions on the skeletal tier. This is observable in the words, [θe] (land) and [ma] (truth), depicted in (2.15).

(2.15) syllabic tier

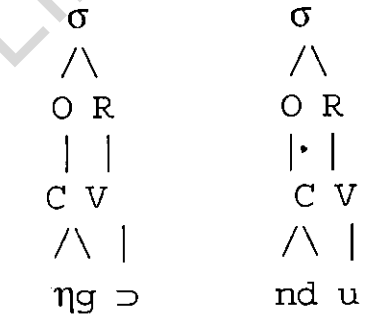


skeletal tier

phonemic tier

Another form of a light syllable depicts a contour onset which is multiply associated to a position on the skeletal tier. Multiple associations of the onsets to skeletal positions are observed in the words: [ŋgɔ] (shield), [ndu] (knees), [mbja] (rat), [ŋgwa] (thunder), as follows.

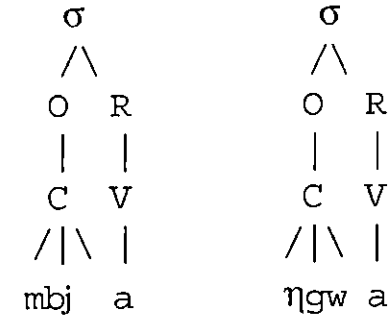
(2.16)(a) syllabic tier



skeletal tier

phonemic tier

(b) syllabic tier

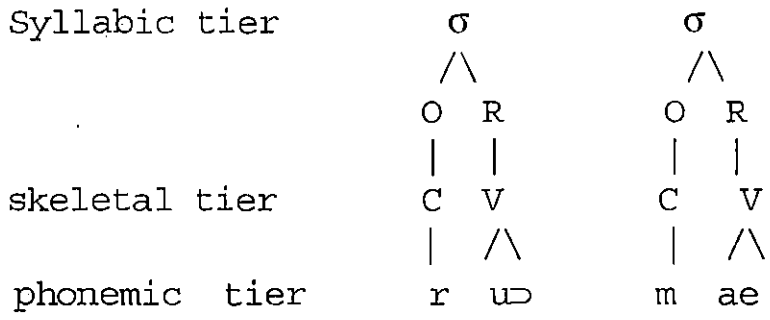


skeletal tier

phonemic tier

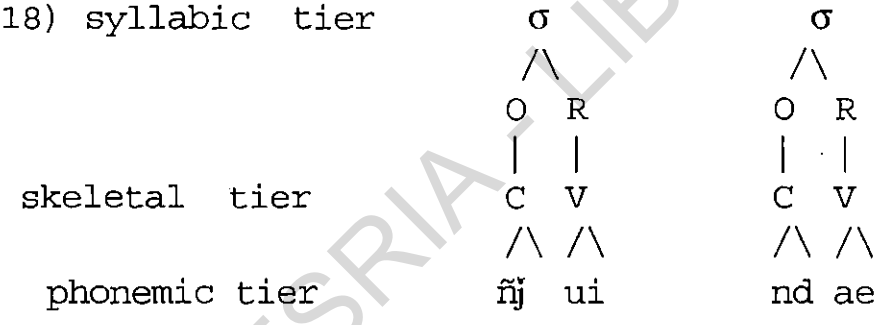
The converse of this linkage incorporates a rhyme which doubly associates to phonemic components, as in the words: [ruɔ] (pain) and [mae] (water) depicted in (2.17).

(2.17)



In certain forms of a light syllable, both constituents doubly associate to phonemic units. This association occurs where a prenasalized obstruent functions contiguous to a contour vowel. This can be observed in the words [ñǰui] (chick) and [ndae] (riddle), represented in (2.18):

(2.18)



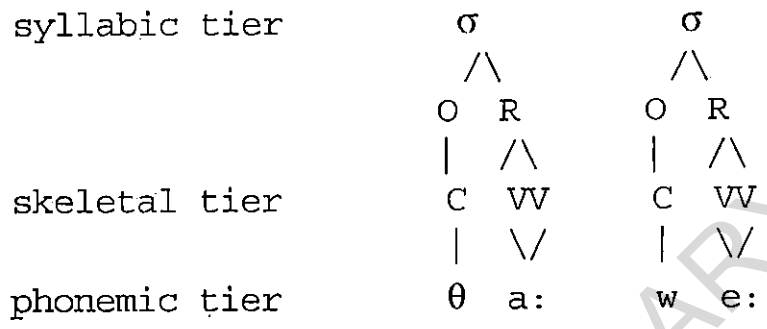
One observation is made: a triply associated C does not link to a doubly associated V. Significantly, a corresponding restriction condition functions in heavy syllables.

2.3.2.2 Heavy Syllables

A heavy syllable is thus named by virtue of a double association of the rhyme to positions on the skeletal tier. A double association results in a branching rhyme and signifies phonetic weight. Heavy syllables are manifested

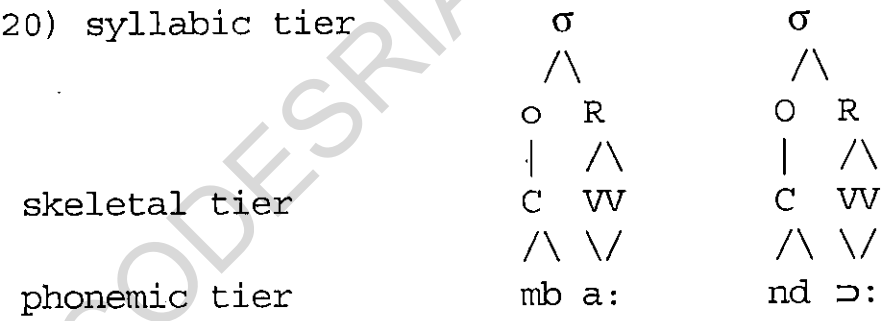
in two ways depending on the composition of the onset. In certain compositions of heavy syllables, the onset incorporates a single consonant. This is observed in the words [θa:] (watch) and [we:] (malice), depicted in (2.19).

(2.19)



Another form of a heavy syllable incorporates a doubly associated contour onset. The monosyllabic forms [mba:] (frost) and [nd⊃:] (bucket) illustrate this association.

(2.20)



Comparable to the composition of the light forms, heavy syllables whereby the onset in triply associated are not manifested. Correlation with constraints on the structure of light syllables implies the existence of a principle which controls phonemic linkage to a syllable structure.

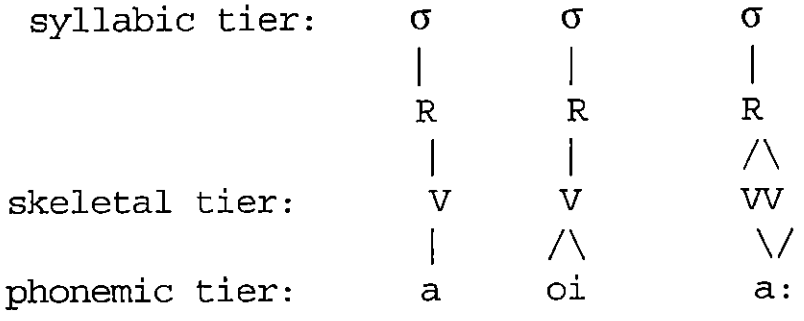
This principle can be reinterpreted to mean one thing: though the onset is irrelevant for the classification of syllables, its composition is crucial for determining the conditions which govern well-formedness in a syllable.

The analysis of monosyllabic words leads to the conclusion that CV is the regular syllable structure of Gîkûyû. This assumption is attested to in a syllabification rule which places syllable boundaries after vowel units (for syllabification rules, see Lass 1984: 262-7), as follows:

(2.21)	# ando #	->	a $ ndo	(People)
	# ka:na #	->	ka: $ na	(baby)
	# moira #	->	moi $ ra	(Witness)

The delimitation depicted above indicates that unitary V forms are permissible syllables. V syllables are observed in the words: #a $ ra $ ta# (friends), #oi $ ra# (evidence), and #a: $ re# (daughters), as depicted below.

(2.22)



The manifestation of V syllables leads to one conclusion: CV is not an obligatory but the optimal syllable (OS) of the Gîkûyû phonological system. In many phonological processes, the OS functions as the preferred syllable structure. By virtue of linkage to the accentual features, the syllable is considered essential for prosodic function.

2.3.3 Prosodic Structure Representation

Prosody is a term used in reference to the properties of the phonological structure which are characteristic of the speech continuum, extending all the way to wellformed discourses (see Catford, 1988 : 206-7). At the lexical level, the notion of prosodic structure is generally used to refer to the phonetic correlates of tone and stress.

2.3.3.1 Tonal Representation

Gîkûyû is mainly a register tone language with two tonal levels: high (H) and low (L) (see Armstrong, 1967; Ford, 1974). In this language, the domain of tone is the syllable. Primary rules of tone association assign one pitch per syllable, irrespective of the phonetic quantity. Tone can commence on either a L or a H pitch, depending on whether the word is a noun (N) or verb (V), respectively.

Despite the fact that tone is perceived as a property of the whole syllable, it is usually specified on the rhyme.

Thus, depending on the composition of the rhyme, three manifestations of tone can be perceived: as either short, long, or occasionally gliding. In conformity with the relevant phonological shape, tone can be represented in three ways: as either a single, geminate or contour unit.

Tone constitutes a single unit in a syllable whose rhyme is composed of a simple vowel. The single tone therefore depicts a one-to-one association with positions on the skeletal tier. This linkage is observable in the words, [ita]$_N$ (battalion) and [ïta]$_V$ (choke), depicted in (2.23):

(2.23) skeletal tier : CV CV CV CV
| | | |
tonal tier: L H H L

Geminate tones are discernible in the heavy syllables which regularly occur in disyllabic words. In agreement with the linkages of the heavy syllables, therefore, geminate tones associate with two contiguous positions on the skeletal tier. Doubly associated tones are observable in the initial syllables of the disyllabic words [ka:na]$_N$ (baby) and [ka:na]$_V$ (deny), represented in (2.24):

(2.24) skeletal tier: CVV CV CVV CV
\/ | \/ |
tonal tier: L H H L

Tone surfaces as a contour structure in the syllables depicting composite vowels. Monosyllabic words incorporating geminate vowels also manifest contour tone. Contour tones are discernible as either LH or HL gliding, depending on whether the wordform is a noun (N) or a verb (V).

Gliding tones have a two-to-one linkage to positions on the skeletal tier. This linkage can be observed in the words [hja]N (horns) and [hja]V (burn), represented below:

(2.25) skeletal tier: C V C V

/\ /\

tonal tier: L H H L

The tendency towards an obligatory tone assignment can be interpreted to mean that pitch placement is an essential property of the Gîkûyû lexicon. It can be observed that, in this language, tone is lexically and morphologically distinctive. For instance, it is possible to derive four meanings from the word #iria#. Concomitant with the individual meanings, four tonemes are discernible as follows:

(2.26)

toneme	meaning	
L H	milk	
H L	lake	
H H	those	' a demonstrative '
L L	those	' referential '

The existence of a specifiable lexical and morphological function indicates that tone constitutes a dynamic aspect of Gîkûyû. On account of great variability relative to the individual words tonal structure is not amenable to a general rule. The association of tone, however, portrays a strong correlation with the structure of rhyme stress.

2.3.3.2 Stress Representation

The phonological structure of Gîkûyû operates on a fixed word stress. Stress falls on the penultimate syllable (see Barlow 1960: 6). This rule is formalized as follows:

(2.27) $\sigma \rightarrow$ [+stress] / $-\sigma\#$

This rule can be interpreted to mean that, in this language, the primary stress serves a demarcative function whereby it signals a word boundary. Thus, multisyllabic words of this language manifest one primary stress per word irrespective of the phonological shape of wordforms.

Given the fact that primary stress is predictable, this analysis is concerned with the representation of the metrical rhyme. Metrical rhyme stress refers to the basic perceptual beats of an utterance, in this case a phonological word. Four manifestations of rhyme stress in a word are discerned: single, double, triple, and quadruple.

Single stress is a property of the monosyllabic words. This is perceived in the words: [ñ̆ja] (compound), [hio] (knives) and [θa:] (watch/clock), represented in (2.28).

(2.28) rhyme stress x x x

wordforms ñ̆ja hio θa:

In a mono-syllabic word, the level of primary stress is irrelevant since there is no discernible change. In the circumstances, the rhyme stress alone is represented.

Rhyme stress constitutes a double beat in the disyllabic wordforms. This correlation is discernible in the utterance, [mondo##moiro] (black person), depicted in (2.29).

(2.29) word stress x x

rhyme stress x x x x

wordforms mo ndo moi ro

Triple rhyme stress occurs in trisyllabic words, as in [morata] (friend) and [ϕororori] (nation) represented below.

(2.30) word stress x x

rhyme stress x x x x x x

wordforms mo ra ta ϕo ro ri

Rhyme stress forms a quadruple entity in quadrisyllabic words. Correlation is observable in the words [motorerɛ] (lifestyle) and [keraθimɔ] (blessing), depicted below.

(2.31)

word stress	x	x
rhyme stress	x x x x	x x x x
word form	mo to re rɛ	ke ra θi mo

Rhyme stress becomes a property of the whole syllable on account of the coarticulation of the relevant phonematic units. As such, stress representation defines a correlation of the phonological shape of words and their metrical structure. In this language, rhyme stress portrays a syllable dependent isochronism. This can be interpreted to mean that rhyme stress is critical to the physical and perceptual correlates of the structure of speech rhythm.

2.4 Conclusion

The foregoing representation of phonological parameters is definitive. It demonstrates the descriptive adequacy of the theoretical models employed, namely: autosegmental and metrical phonology. The validity for this claim depends on a consideration of the inter-linkage occurring among the phonological parameters represented above.

The illustration incorporated at the different levels of the representation portrays a graphic linkage of parameters. The most systematic co-ordination is observable in the association of tone, stress and syllable structure. A systematic association of tone and syllable rhyme to positions on the skeletal tier also implies a co-ordination of the phonemic forms and the prosodic structure.

The notion of syllable structure incorporates elements which define the phonematic and the phonemic constraints of the phonological system. From a phonematic point of view, it is observable that both the syllable and the phoneme are subject to a principle which governs feature restriction conditions. This principle can be interpreted to mean that there is a formal correlation of the conditions which govern the phonological shape of the syllable and the structural composition of the phonemic units.

A co-ordination of the speech segments suggests a general harmony of the phonetic properties which define the phonological structure. In effect, the phonological paraters of a given system function as an integral unity. It can, then, be assumed that this integration of purpose is operative in the adaptation of loanwords. The unity of phonological function is defined in relation to the phonemic, phonotactic, and prosodic adaptation strategies.

CHAPTER THREE

PHONEMIC ADAPTATION

3.1 Introduction

The notion of phonemic adaptation implies contrast. It is on the basis of contrast that sound correspondences are drawn. Correspondence is defined in relation to context free rules of phonemic substitution. These rules indicate permissible units and their paradigmatic alternation.

The most direct form of substitution is one which merely affects some features of a given sound, without impinging on its contrastive identity. In this study, for instance, it can be observed that the prenasalized plosives are the regular reflexes of their oral counterparts. Beyond the level of contrast, the relations become more complicated. Not only does the componential makeup of sounds change but the phonemic relationships undergo differentiation.

The terms merger and split are used to describe converse strategies of differentiation (see Hock, 1986: 52-7). The notion of merger is applied where several sounds in the loaner language have one reflex. A split occurs when the opposite happens, and a sound in the loaner language has several reflexes. This analysis is, hence, constrained by

two strategies of loanword adaptation: the formation of phonemic mergers and the occurrence of phonemic splits.

The analysis also addresses cases of phonemic equivalence (reinterpreted as preservation). Though the problem of adaptation is more concerned with change or differentiation, it is likely that useful information can be gained from a consideration of phonemic preservation. The notion of preservation presupposes a degree of phonemic identity, irrespective of the perceptual systemic differences.

The sounds are examined either individually or in groups depending on the adaptation strategy. It is considered an analytically sound procedure to approach the problem of phonemic adaptation through the two basic phonematic categories of speech sounds: the vowels and the consonants.

3.2 Vowel Adaptation

The analysis which follows develops progressively through three manifestations of the English vowels: monophthongs, diphthongs and triphthongs (see Roach, 1983: 6). It is assumed that this progression enhances the understanding of the inter-relationships inherent in a vowel system.

3.2.1 Monophthongs

Twelve monophthongs function in the English vowel system.

These sounds are identifiable as: /i/, /ɪ/, /e/, /æ/, /ə/, /ɜ/, /ʌ/, /ɑ/, /ɒ/, /ɔ/, /ʊ/, and /u/. They are presented according to manifest adaptation strategy, irrespective of their categorization in terms of phonetic properties.

3.2.1.1 Vocalic Merger

Merger is a tendency of the central and the high vowels. In the phonological structure of English, these vowels occur in correlated sets of two or more phonemic units.

3.2.1.1.1 Central Vowels

Four units are describable as the central vowels of the phonological structure of English: /ə/, /ɜ/, /ʌ/, and /ɑ/ (see Hyman, 1975: 40; Ladefoged, 1982: 34). The central vowels regularly adapt to /a/, as illustrated below.

(3.1) ə > a :

məši:n	>	mašini
ænsə	>	añja
kælɪndə	>	karɛnda

(3.2) 3 > a :

š3:t	>	šati
č3:č	>	šaši
sk3:t	>	θikati

(3.3) ʌ > a :

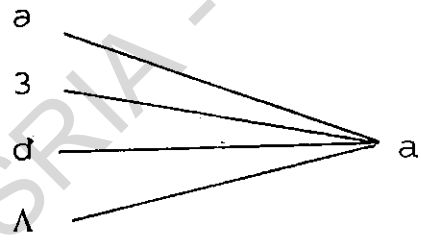
bʌs	>	mbaθi
lʌnč	>	rañǰi
dʌzn	>	ndaθani

(3.4) ɑ > a :

kɑ:ki	>	ɣa:ki
gɑ:d	>	ŋgati
skɑ:f	>	θikaɸu

From these derivatives, a phonemic merger is conceived:

(3.5)



This merger is attributed to phonetic factors. On account of the restricted physiological space associated with the lower region of the oral cavity, it can be assumed that the physical and perceptual properties of the low vowels occurring in English are minimally differentiated (See Lyons, 1981: 80). At the same time, Gîkûyû operates on a single low vowel. This vowel can be considered a natural reflex of the central low vowels in the loaner language.

This generalization does not include sequences of the schwa and the liquid. In this environment, /ə/ responds to phonotactic constraints. As a result, it is involved in a process describable as resyllabication (see 4.2.3).

3.2.1.1.2 Low Back Vowels

The mid vowel, /ɔ/, is regularly preserved. It also functions as the regular reflex of /ɒ/, as illustrated below.

(3.6) ɔ ≡ ɔ :

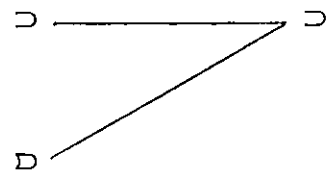
fɔ:m	>	ɸɔmu
lɔ:ri	>	rɔri
tɔ:č	>	tɔši

(3.7) ɒ > ɔ :

bɒm	>	mbɔmu
sɒks	>	θɔɣiθi
naɪlɒn	>	nairɔni

This derivation constitutes a phonemic merger as follows:

(3.8)



This merger is attributed to phonetic and phonological constraints. On the one hand, the vowels involved share some basic phonetic properties: [+back, +round, -high]. On the other hand, a phonological source of motivation can be inferred from the rather limited occurrence of /ɔ/ in the loanwords. It can be interpreted to mean that this merger targets a maximal distinctive load. It, therefore, enhances the phonological function of /ɔ/ in Gîkûyû.

The mergers represented above are attributable to two fundamental factors. On the one hand, a strong phonetic affinity is established between the groups of reflexes concerned. And, in comparison with English, Gîkûyû functions on a rather restricted vowel inventory. A clear vocalic merger is sustained where the derivation is confined to the phonemic function. In the presence of other factors, phonemic mergers co-occur with phonemic splits.

3.2.1.2 Co-occurrence of Split and Merger

The co-occurrence of phonemic merger and phonemic split is observed in the adaptation of the high vowels. High vowels occur in pairs as either back or front. The back vowels are /u/, /ʊ/, and the front vowels are /i/, /ɪ/.

3.2.1.2.1 High Back Vowels

The tense high vowel /u/ is regularly preserved, and also

functions as a reflex of the lax counterpart, as follows.

(3.9) u ≡ u :

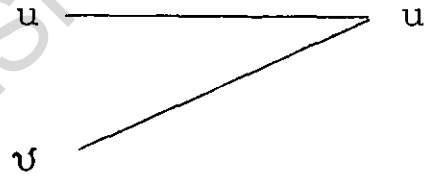
su:p	>	θuɸu
sku:l	>	θukuru

(3.10) ʊ > u :

bʊ́k	>	iɸuku
šʊ́gə	>	šukari
bʊ́čəri	>	mbušere

Despite the rather limited occurrence of /ʊ/ in loans, a phonemic merger is conceived as represented in (3.11):

(3.11)



In one word, the derivation of /u/ resists merger. It concerns the adaptation [ru:pi:] > [roɸia]. Deviation is attributed to morphological constraints. A morphological conditioning involves a reanalysis of the first syllable to derive a nominal marker, {ro}, usually associated with nouns identifiable as members of class eleven (see 6.4).

3.2.1.1.2 High Front Vowels

Comparable to the back counterpart, /i/ is regularly preserved irrespective of phonetic environment. This vowel is also a predictable reflex of the high lax form. The behaviour of the front high vowels is represented below.

(3.12) i ≡ i :

či:f	>	šiɸo
məši:n	>	mašini
di:zl	>	ndiθoro

(3.13) ɪ > i :

ɪnč	>	iñji
pɪn	>	mbini
sɪlvə	>	θiriɸa

These derivatives can be said to form a merger. The high front vowels, however, also modify into /e/ as follows.

(3.14)(a) i > e :

nɜ:sri	>	naθare
bʊčəri	>	mbušere

(b) ɪ > e :

rɪsi:t	>	reθiti
kəmɪti	>	kamete

This deviation is due to etymological conditioning. In an attempt to explain the origin of the seven vowel system in some Bantu languages, Bantuists (e.g. Guthrie, 1967) postulate a process of phonemic modification. It involves a restructuring of the high vowels /i/ and /u/ to derive the mid correlates, /e/ and /o/. It is logical to assume that the etymological constraints function alongside the morphological conditioning to derive phonemic splits.

3.2.1.3 Vocalic Split

For derivatives to be considered valid constituents of a phonemic split, phonetic viability has to be established. Cases of clear vocalic split are observed in the adaptation of the mid and the low front vowels, /e/ and /æ/.

3.2.1.3.1. Mid Front Vowel

The high mid vowel, /e/, regularly translates into /ɛ/. Some of the remaining occurrences are preserved, while certain instances modify into /i/, as illustrated below.

(3.15) e > ɛ :

desk	>	ndɛθiki	
vest	>	ɸɛθiti	
sent	>	θɛndi	(currency)

(3.16) e ≡ e :

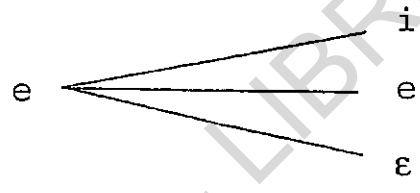
deri	>	nderi
gəzet	>	ŋgaθeti
dɪtensn	>	ndite:ni

(3.17) e > i :

sɪment	>	θimiti
enjɪn	>	iñjini

This derivation constitutes a phonemic split, as follows:

(3.18)



The derivation of /i/ is attributed to phonotactic conditioning in terms of vowel spreading (see 4.3.1). Plausibility of /e/ > /ɛ/ modification can be inferred from a correlation of componential features. These vowels share all but the properties of the phonetic feature [tense].

Besides phonetic correlation, a case of phonological levelling can be argued. Levelling is a term used to refer to the processes whereby proportions of distinctive function are targeted (see Hock, 1986: 167-79). Without the /e/ > /ɛ/ derivation, there probably, could result a great

discrepancy in the distinctive load of the Gîkûyû mid front vowels. A comparable process of equitable distribution is observed in the monophthongization of /eɪ/ into two equally regular reflexes: /e/ and /ɛ/ (see 3.2.2.2).

3.2.1.3.2 Low Front Vowel

The low front vowel, /æ/, regularly adapts to /a/. With one exception, the remaining cases translate into the lax front vowel, /ɛ/, as illustrated in (3. 19) and (3.20).

(3.19) æ > a :

ænsə	>	añja
klæs	>	keraθi
pækɪt	>	mbaɣiti

(3.20) æ > ɛ :

bæŋk	>	ɸɛŋgi
bætri	>	mbɛtiri
stæmp	>	θitɛmbo

Given the fact that /a/ is the only low vowel which is functional in the phonological structure of Gîkûyû, the regular derivation of /æ/ > /a/ is seen as a natural development. An /æ/ >/ɛ/ modification can also be considered

plausible, given structural correlation which incorporates all the phonetic features but the values of [low].

The derivation of /ɛ/ could be a consequence of indirect borrowing. This assumption is based on Kiswahili lexical correspondences (consider the words [bɛŋki], [bɛtri], and [stɛmpu]). It is also possible that the variation involved arises out of a need for further phonological levelling whereby some /a/ derivatives subsequently modify into /ɛ/.

The plausibility for the second assumption derives from the fact that one case of /æ />/ɛ/ derivation is not traceable to Kiswahili. It concerns the adaptation of the English expression, [θæŋk# #ju], into its reflex, [θɛŋgio].

In one word, /æ/ modifies into /e/ as observed in the adaptation of [blæŋkɪt] > [moreŋgeti]. It is probable that this derivation results from non-contact assimilation to the surrounding vowels on account of height correlation. Considering the phonetic distance of /æ/ and /e/, this study assumes a telescoped stage involving /ɛ/. A relative chronology of sound change is, therefore, hypothesized.

(3.21) æ > ɛ > e

vocalic split can be considered to define a strategy for accommodating the different needs of the lexical structure. This strategy rarely affects geminate vowels. Geminate vowels regularly monophthongize, as observable in the derivation of the words [maši:n] > [mašini], [fɔ:m] > [ɸɔmu], and [sku:l] > [θukuru]. Vowel length (reinterpreted as syllable quantity) is, however, preserved where it serves a lexically distinctive function. This role is addressed under the adaptation of syllable quantity, an aspect of prosodic adaptation (see 5.3.3).

Two salient observations relate to the adaptation of the monophthongs in general. Firstly, the cannonical vowels /i/, /a/, and /u/, function as the focal points of merger whereas the mid vowels are more involved in phonemic split. Secondly, the primary phonetic features, [high] versus [low], [back] versus [front], [round] versus [spread], are regularly sustained. On account of the stability of the basic categorial features, the monophthongs are treated as basic templates on which to interpret the adaptation of the diphthongs and the triphthongs.

3.2.2 Diphthongs

Among the vowel units of English are observed six diphthongs: /aɪ/, /aʊ/, /ɪə/, /eɪ/, /eə/, and /əʊ/. The adaptation of the units manifests two strategies: preservation of the contour structure or the monophthongization of the diphthongal form.

3.2.2.1 Contour Preservation

The preservation of contour structure is observed in the adaptation of the closing diphthongs /aɪ/, /aʊ/, and the centring counterparts /ɪə/, /eə/. These pairs of diphthongs manifest a correlation of the adaptation process.

The closing diphthongs, /aɪ/ and /aʊ/, regularly translate into their perceived equivalents, as illustrated below.

(3.22)(a) aɪ > ai :

maɪl	>	mairo
laɪn	>	raini

(b) aʊ > au :

saʊnd	>	θauti
skaʊt	>	θikauti

The reflexes depicted above co-occur with the variants /ae/ and /ao/, respectively, as represented in (3.23).

(3.23)(a) aɪ > ae :

faɪn	>	ɸaeni
saɪn	>	θaeri

(b) aʊ > ao :

taʊn > taoni

kraʊn > keraoni

This study interprets the variation involved as another instance of levelling. The latter is necessitated by the fact that both sets of reflexes exist in the phonological structure of Gîkûyû. In some loanwords these diphthongs monophthongize into the correlated mid vowels as follows.

(3.24)(a) aɪ > ɛ :

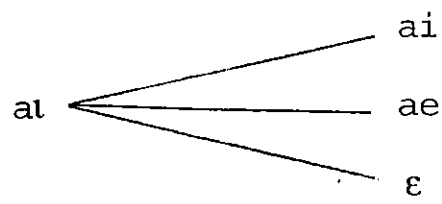
draɪvə > ndɛrɛɸa

laɪsns > rɛɸɛni

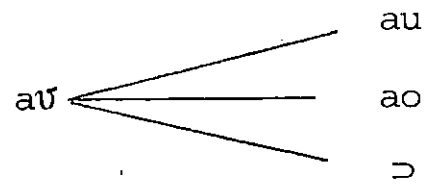
(b) aʊ > ɔ : paʊdə > mbɔta

Deviation may be a consequence of indirect borrowing. It is probable that these vowels were adopted from Kiswahili (consider the lexical correspondences: [dɛrɛva], [lɛsɛni], and [pɔda]). Besides considering the path of borrowing, it is important to note that this derivation is phonetically viable. In the productive synchronic processes of Gîkûyû, a reciprocal assimilation of the high and the low vowels results in coalescence (see Mbûgua, 1990: 195-8). Hence, phonemic splits are conceived as portrayed below.

(3.25) (a)



(b)



The front-centring diphthongs, /ɪə/ and /eə/, occur once each and modify into /iɛ/ and /ɛa/, as represented below.

(3.26) ɪə > iɛ : θɪatə > θiɛta

(3.27) eə > ɛa : speə > θuɸɛa

Converse processes, involving raising and lowering, are depicted. From these, assimilation to the more stable properties of the co-occurring vowels, /i/ and /a/, can be assumed. Furthermore, a gradual lowering of the vocalic height in the word as a whole can be observed.

Height gradation suggests a case of phonotactic conditioning. The latter is motivated by a need for prosodic harmony in the phonological word as a whole. Vowel gradation is further observed in the monophthongization strategies.

3.2.2.2 Monophthongization

Monophthongization regularly occurs in the adaptation of the closing diphthongs, /eɪ/ and /əʊ/. This process could be facilitated by the physical and perceptual proximity of the components of each diphthong. The front diphthong, /eɪ/, regularly modifies into the following reflexes.

(3.28)(a) eɪ > e :

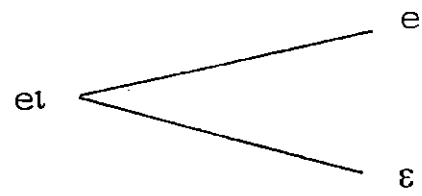
eɪkə	>	eka
peɪǰ	>	ɸeñǰi
čeɪnǰ	>	šeñǰi

(b) eɪ > ɛ :

reɪl	>	rɛri
treɪ	>	turɛ:
čeɪn	>	šɛni

These derivatives suggest the following phonemic split:

(3.29)



The plausibility of the adaptation of /eɪ/ into either /e/ or /ɛ/ is attested to in the morphological nativization of

the English grammatical homonym [ceɪñǰ]. This homonym is integrated into the Gîkûyû lexicon in both the nominal (N) and the verbal (V) forms, as represented in (3.30).

(3.30) $[ceɪnǰ]_N$ > [šeñǰi]

$[ceɪnǰ]_V$ > [šɛñǰia]

Two developments can be assumed in view of the monophthongization of /eɪ/: (1) that the process involves prior deletion of the second element, and (2) that the verbal form is probably a subsequent derivation. The first assumption is validated on the principle of the inertia of sound change (see Foley, 1977: 107-112). This study, therefore, hypothesizes a progressive process of lowering involving the following relative chronology of change:

(3.31) eɪ > e > ɛ

One word deviates from the trend depicted above. This relates to the adaptation of the English word [reɪdieɪtə] into the Gîkûyû translation equivalent [ririɛta]. This deviation is attributed to vowel spreading, an aspect of heterosyllabic (non-contact) assimilation (see 4.3.1.2).

Irrespective of deviation, one feature remains constant:

the monophthongization of /eʊ/ occurs as a consequence of deletion. In a similar manner, the adaptation of /əʊ/ involves simplification into /ɔ/ and, in some cases, subsequent modification into /o/, as depicted below.

(3.32) əʊ > ɔ:

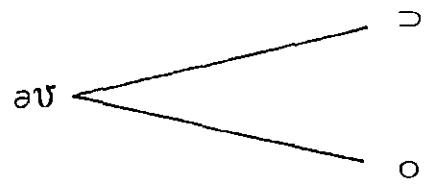
nəʊt	>	nɔti
kəʊt	>	iɣɔ:ti
səʊdə	>	θɔta

(3.33) əʊ > o :

məʊtəkɑ:	>	motɔka
rəʊzəri	>	roθario

Variation of reflexes imply a phonemic split as follows:

(3.34)



From the regular derivatives, reciprocal assimilation can be inferred. Deviation plausibly results from subsequent conditioning. The latter involves the morphologization of word initial syllables, to derive the nominal markers for

classes three and eleven, {mo} and {ro}. Due to correspondences of the Bantu nominal markers, Bantuists advocate a numerical classification system (see Goldsmith 1990:6).

While there is a possiblity that the adaptation of /aʊ/ can involve either raising or lowering, the more plausible procedure is that of prior derivation of /ɔ/, with subsequent raising to /o/. This procedure has morphological and etymological bases of validation. Hence, the following relative chronology of change is hypothesized.

(3.35) aʊ > ɔ > o

The adaptation of diphthongs responds to different needs of the grammatical function. While the regular processes define phonemic constraints, the deviants indicate either etymological or morphological factors. These constraints suggest correlation with the adaptation of monophthongs.

A correlation of the constraints of single and contour vowels validates the conception of diphthongs as temporal and perceptual equivalents of monophthongs. The process of monophthongization, especially, establishes a definite link between the single and the contour vowels. This link is further developed in the treatment of triphthongs.

3.2.3 Triphthongs

Among the English vowels are observed four triphthongs: the centring forms, /aʊə/, /aɪə/, and the closing equivalents, /ieɪ/, /iəʊ/. These triphthongs manifest a systematic simplification into doubly associated contour units.

For descriptive expedience, this strategy is reinterpreted as a process of diphthongization. Triphthongs are, however, grouped according to specific adaptation procedures irrespective of their internal componential make-up.

Three triphthongs, /aʊə/, /aɪə/ and /ieɪ/, can be said to undergo correlated procedures. They simplify into /au/, /ai/, and /iɛ/, respectively, as represented in (3.36).

(3.36) aʊə > au : taʊəl > tauro

(3.37) aɪə > ai :

baɪərəʊ > mbairo

plaɪəz > ɸuraiθi

(3.38) ieɪ > iɛ : reɪdieɪtə > ririɛta

From the derivatives depicted above, a prior deletion of the final element of each triphthong can be assumed. This

element is considered the least perceptible component of a triphthong (see Roach, 1983: 22). The plausibility of deletion, hence, derives from perceptual considerations.

Subsequent to deletion, the resultant diphthongs modify into the perceived equivalents in the phonemic inventory of Gîkûyû. Despite a correlation of procedure, the front closing triphthong is distinct for the reason that its derivative suggests subsequent lowering of /ie/ into /iɛ/.

The procedure depicted above is rather different from the stategy involved in the adaptation of the back closing triphthong, /iəʊ/, which modifies into /io/ as follows.

(3.39) iəʊ > io : reɪdiəʊ > rendio

In this case, diphthongization can be said to develop out of a coalescence of the mid and the final constituents of the triphthong. This claim is based on the assumption of an equal phonetic strength of the componential elements.

The adaptation of triphthongs is similar to that of correlatable diphthongs in that both types of contour vowels incorporate converse processes of raising and lowering. Another salient tendency of the adaptation of triphthongs

concerns the fact that the initial constituents are regularly preserved. This is attributable to the stable properties of these units in their capacity as cannonical vowels. A more critical observation concerns correlation of the adaptation strategies, as far as these relate to triphthongs and diphthongs. This correlation implies a co-ordination of the adaptation of the contour vowels.

A systematic linkage of the vowel system can be inferred from the regularity of the diphthongization procedures. Automatic diphthongization could mean that the recipient language cannot sustain triphthongs. This development is due to the fact that triphthongs, or their equivalents, are not utilized in the phonological structure of Gîkûyû.

On account of this constraint, a hierarchy of derivation is involved. In this hierarchy, triphthongs diphthongize into their closest reflexes. Diphthongs either translate into their perceived equivalents, or otherwise monophthongize into plausible substitutes in the native Gîkûyû speaker's vowel inventory. Predictably, the monophthongs regularly adapt to the closest phonemic correspondences.

According to the foregoing analysis, it is logical to conclude that the Gîkûyû speakers are intuitively aware of basic structural properties of vowels. This assumption

is consistent with a conviction that native speakers have internalized the system of general rules and specific relationships which governs the set of vowels utilized in their language. A correlation of the general principles of vowel and consonant adaptation can be established.

3.3 Consonant Adaptation

This analysis distinguishes two categories of consonants: single units and nasal + obstruent clusters (NOC). This distinction is considered critical to a realistic analysis of consonant adaptation for one basic reason: where clusters occur, the adaptation of the nasal and the obstruent in question deviates from the regular procedures.

3.3.1 Single Consonants

Twenty three consonants are observed among the English sounds. They are presented in order of their analysis as follows: /j/, /w/, /h/, /m/, /n/, /ŋ/, /r/, /l/, /f/, /v/, /θ/, /s/, /z/, /š/, /ž/, /č/, /ǰ/, /p/, /b/, /t/, /d/, /k/, and /g/. Comparable to the treatment of vowels, this arrangement roughly conforms with the application of the three major adaptation strategies mentioned above, namely: phonemic preservation, merger, and split.

3.3.1.1 Preserved Consonants

The notion of sound preservation suggests the equivalence

of a sound in the loaner language with one in the recipient system. Sounds are presumed to be equivalent if there is a correspondence of the phonetic properties. Phonemic preservation is observed in the approximants and nasals.

3.3.1.1.1 Approximants

The term approximant functions as a cover label for the glides, the liquids, and the voiceless glottal fricative (see ladefoged, 1982: 61-2). This analysis focuses on the glides and the fricative. Occurrences of /w/, /j/, and /h/, are regularly preserved as illustrated below.

(3.40) j ≡ j :

jd:d	>	jandi
ju:θ	>	juθi

(3.41) w ≡ w :

wɔ:d	>	wɔndi
wɑrənt	>	warandi

(3.42) h ≡ h :

hɔ:l	>	hɔ:ru
hedmən	>	hɛndimɛni

The preservation of the approximants introduces a, rather

interesting aspect of phonemic adaptation. These sounds can be considered dispensable in the sense that they regularly feature in stylistic variation (see Dogil in Gibbon and Richter 1984: 91-97). In this case, preservation is attributed to maximalization of phonological function.

In view of the entire phonemic inventory of Gîkûyû, the phonological function of the approximants is rather limimited. This limitation introduces a need to maintain the maximum load possible for these approximants. The need to maximize phonological load can also be inferred from the fact that the approximants are sometimes inserted word-initially. This is observed in two derivations: [ədvɑ:ns] > [waruɸañji] and [ʌvn] > [hɔɸuna]. This process enhances the phonological function of the approximants involved.

3.3.1.1.2 Nasals

This analysis focuses on nasals which have retained their sonority and hence their distinctive force. Three nasals are observed in the phonology of English: /m/, /n/, /ŋ/.

(3.43) m ≡ m :

mæp	>	maɸu
fɔ:m	>	ɸɔmu

(3.44) n ≡ n :

pɪn	>	mbini
tenɪs	>	tɛnɛθi

(3.45) ŋ ≡ ŋ :

kɪŋ	>	kiŋi 'as in drafts'
hæŋə	>	haŋa

The illustration represented above depicts nasals either in the word final position or in the environment of vowels. These phonetic environments contribute to phonemic preservation. In these environments, the nasals are not exposed to the neutralizing force of phonemes accorded greater phonetic strength (see Foley, 1977: 145-6).

In general, phonemic preservation is attributable to both phonological and phonetic constraints. The assumption of a phonological constraint concerns an attempt to maintain a relatively proportional distinctive load. This assumption is validated on the basis of the rather limited frequency of the sonorants depicted above, in the loanwords.

The significance of phonetic conditioning can be inferred from the articulatory, and hence the perceptual, distance of the consonants involved in every category of preserved

phonemes. It can be observed that each class of sounds is articulated in a distinct physiological space. The physical and perceptual distance involved is, therefore, not conducive to other strategies of the adaptation process.

3.3.1.2 Consonantal Merger

Consonantal merger arises in the adaptation of liquids and fricatives. This is due to the fact that they occur in homorganic sets, unlike the sonorants examined above.

3.3.1.2.1 Liquids

Irrespective of the phonetic environment, /r/ is regularly preserved and also comprises the regular reflex of the lateral, as illustrated in (3.46) and (3.47).

(3.46) r ≡ r :

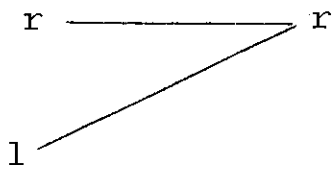
rʌbə	>	raɸa
gri:n	>	ŋgirini
lɔ:ri	>	rɔri

(3.47) l > r :

lʌnč	>	rañǰi
glæs	>	ŋgiraθi
faɪl	>	ɸairo

This adaptation constitutes a phonemic merger as follows:

(3.48)



Owing to the fact that the lateral does not function in Gîkûyû phonology, a merger of the underlying liquids can be considered natural. The exception to this rule is the syllabic liquid. The latter regularly modifies into /o/, a process reinterpreted as resyllabication (see 4.2.3).

3.3.1.2.2 Fricatives

In the phonological structure of English, fricatives occur in three homorganic sets: labial, dental and palatal.

3.3.1.2.2.1 Labial Fricatives

For simplicity, the labio-dental fricatives, /f/ and /v/, are described as labial. They adapt to /ɸ/, as illustrated.

(3.49) f > ɸ :

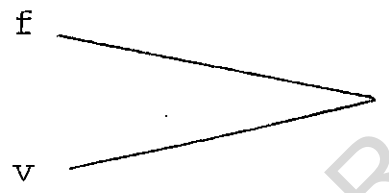
fɔ:m	>	ɸɔmu
ɒfɬs	>	waɸiši
ʧi:f	>	šiɸo

(3.50) v > ɸ :

vest	>	ɸɛθiti
sɪlvə	>	θiriɸa
stəʊv	>	θitɔɸu

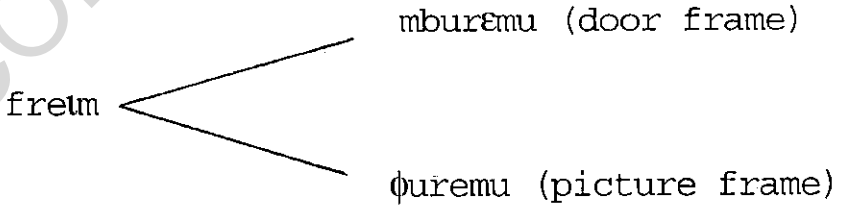
A phonemic merger is derived, as represented in (3.51):

(3.51)



This merger arises because Gîkûyû operates on one labial fricative, unlike English which utilizes two distinctive forms. In the circumstances, the bilabial fricative is a plausible reflex of the labio-dental counterparts. In one case, /f/ culminates in a phonemic split as portrayed:

(3.52)



This split is attributed to a semantic reanalysis. It arises out of a need to distinguish the margins of a door from the correlatable support of a picture or photograph.

3.3.1.2.2.2 Dental Fricatives

Three dental fricatives are observable in English words: /θ/, /s/ and /z/. These consonants regularly adapt to /θ/.

(3.53) θ ≡ θ :

θæŋkju	>	θɛŋgio
θiətə	>	θiɛta
ju:θ	>	juθi

(3.54) s > θ :

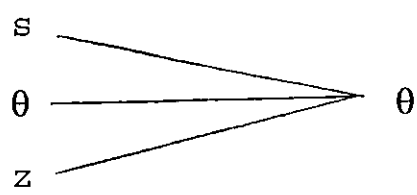
sku:l	>	θukuru
desk	>	ndeθiki
bʌs	>	mbaθi

(3.55) z > θ :

dʌzn	>	ndaθani
gəzet	>	ŋgaθeti
blaʊz	>	mburaoθi

From this adaptation, the following merger is conceived:

(3.56)



Similar to the constraints on the labial sounds, Gîkûyû operates on one dental fricative. It is natural for the dental fricatives to adapt to the homorganic counterpart.

3.3.1.2.2.3 Palatal Sibilants

On account of a correlation of the adaptation strategy, the palatal affricates are considered alongside homorganic fricatives under the label of sibilant (see Ladefoged 1982: 39-40, 261-2). Four palatal sibilants are observable: /š/, /ž/, /č/, and /ǰ/. While the voiced affricate is involved in a phonemic split (see 3.3.1.4), the rest regularly adapt to the voiceless fricative, /š/.

(3.57) š ≡ š :

š3:t	>	šati
məši:n	>	mašini
brʌš	>	ɸurašie

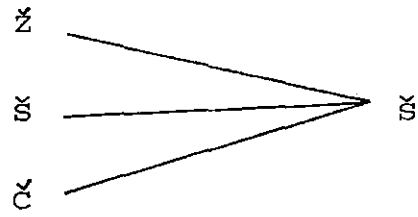
(3.58) ž > š : gærɑ:ž > ŋgɛrɛši

(3.59) č > š :

č3:č	>	šaši
kɪčɪn	>	kišɛni
tɔ:č	>	tɔši

Irrespective of the limited function of the voiced palatal fricative, a phonemic merger is conceived as follows:

(3.60)



Similar to the dental fricative, /θ/, the preservation of /š/ arises out of the perceived phonetic equivalence. It is, therefore, logical that this fricative should function as the regular reflex of the homorganic sibilants.

In a manner comparable to the strategies involved in the adaptation of vowels, merger among consonants is a consequence of phonetic constraints. This strategy serves as a solution for the constraints of a more restricted phonemic inventory. A clear merger occurs where a group of sounds is concerned with a purely phonemic function. In the event of other constraints, consonantal splits occur.

3.3.1.3 Consonantal Split

Consonantal split is a characteristic of the plosives. On account of phonetic correlation, homorganic sets are analysed together. This treatment enhances the accountability of the regular processes as well as the deviation.

3.3.1.3.1 Labial Plosives

The bilabial plosive, /p/, regularly adapts to /ϕ/ whereas

the remaining forms modify into /mb/, as depicted below.

(3.61) p > ɸ :

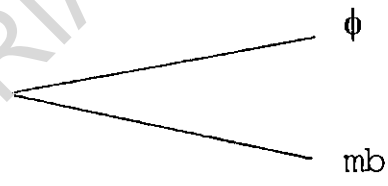
pensl	>	ɸɛñǰo
kɒpi	>	kɔɸe
mæp	>	maɸu

(3.62) p > mb :

pɪn	>	mbini
pɪkčə	>	mbiša
pækɪt	>	mbaɣiti

This development points to the following phonemic split:

(3.63)



The regularity of /p/ > /ɸ/ derivation is a consequence of phonetic correlation in view of the properties of voicing and labiality. These sounds are only distinguishable by means of the values of the phonetic feature [continuant]. Deviation arises out of morphological conditioning. These nouns are integrated into the N- class (classes 9-10), and thereby adopt the {N} class marker. Subsequent to the

adoption, homorganic assimilation to the contiguous obstruent occurs to derive /mb/, the regular reflex of /b/.

(3.64) b > mb :

bɪl	>	mbi:ro
bʌs	>	mbaθi
breɪk	>	mbureki

The other cases of /b/ regularly adapt to the homorganic fricative while the rest modify into /m/ as illustrated.

(3.65) b > ɸ :

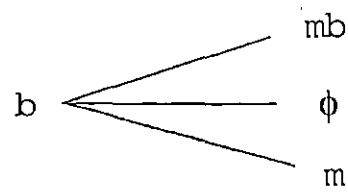
bʊk	>	iɸuku
kʌbəd	>	kaɸati
bæŋk	>	ɸɛŋgi

(3.66) b > m :

bɪskɪt	>	moθuɣwiti
baɪsɪkl	>	moiθikiri
blæŋkɪt	>	moreŋgeti

From these derivatives, this phonemic split is conceived:

(3.67)



while the /b/ > /mb/ results from a phonemic correspondence, deviation is attributable to phonotactic and morphological conditioning. The /b/ > /ɸ/ modification is associated with either intersyllabic softening or prenasal dissimilation (see 4.3.2). One intersyllabic instance of /ɸ/ derivation arises out of the prothesis of the high vowel, /i/, where the latter functions as the singular marker for class five. In a similar manner, /b/ > /m/ occurs in the words where the initial syllables are morphologized to derive the class three nominal marker, {mo}, indicated above (see 3.2.2).

The morphologization procedure described above plausibly incorporates a telescoped stage involving /ɸ/, indicating that loanword nativization is a gradual progressive process. These assumptions imply a relative chronology of sound change.

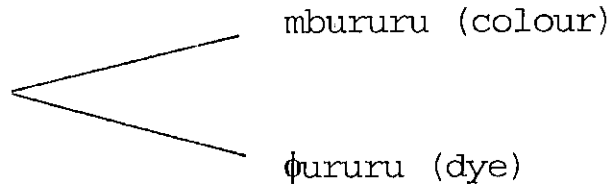
(3.68) b > ɸ > m

This relative chronology is validated on the basis of the lexical alternation of the reflexes of the English words [baɪsɪkl] > [moiθikiri] and [brʌš] > [morašie]. These reflexes co-exist with the more restricted optional variants, namely: [ɸaiθikiri] <-> [maiθikiri] and [ɸurašie] <-> [ɸuraši].

The plausibility of the modification of /b/ to /mb/ and /ɸ/

is inferred from a case of semantic reanalysis. Similar to the adaptation of the word [freɪm], (see 3.52), the homonym, [blu:], derives two lexical reflexes as follows.

(3.69)



This reanalysis arises out of a need to distinguish the concept of a fast colour from the correlated dye. Semantic reanalysis is re-interpreted as lexicalization.

3.3.1.3.2 Dental Plosives

Except for one occurrence, the voiceless dental plosive, /t/, is regularly preserved, as illustrated in (3.70).

(3.70) t ≡ t :

tɪkɪt	>	tiɣiti
petrəl	>	ɸɛtoro
stɔ:	>	θitɔ:

The exception occurs in a /t/ > /k/ derivation, observable in the adaptation of [træktə] > [karaɣita]. Deviation is conditioned by a morphologization process whereby the initial syllable of a singular derivative is conceived as

a plural morpheme, {to}, to be replaced by the correlated singular morpheme, {ka}. Hence, this derivation is not phonetically motivated. As such it is not a valid constituent of a phonemic split. For similar cases of morphologization, (see Bynon, 1977: 230-1; Hock, 1986: 404).

In conclusion, the adaptation of /t/ is not directly affected by phonemic splitting. Some /t/ derivatives are, however, constituents of a phonemic split of the voiced counterpart, /d/. The latter regularly adapts to the homorganic prenasalized plosive as illustrated in (3.71).

(3.71) d > nd :

deri	>	nderi
drɔ:	>	ndirɔ:
kd:d	>	kandi

Three cases of /d/ adapt to the voiceless counterpart while two modify into the liquid as illustrated below.

(3.72) d > t :

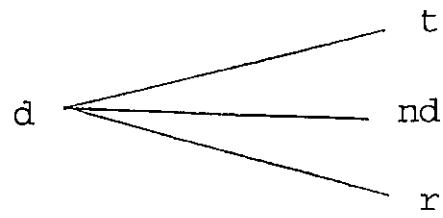
gd:d	>	ŋgati
kʌbəd	>	kaɸati
pɑ:dre	>	ɸatere

(3.73) d > r :

sæləd	>	θarare
reɪdieɪtə	>	ririɛta

On account of homorganicity, all the derivatives are phonetically viable. A phonemic split is, hence, conceived:

(3.74)



This split is due to phonotactic constraints. The liquid derives from vocalic spreading while [gɑ:d] > [ŋgati] adaptation is attributed to prenasal delinking (see 4.3.1.2. and 4.3.2.2.2.). The [kʌbəd] > [kaɸati] and [pɑ:dre] > [ɸatere] derivations are attributed to a constraint involving post fricative softening. This assumption is generalized to a derivation of /ǰ/ > /š/ depicted below (consider [kæbǰ] > [kaɸiši] illustrated in (3.83)).

3.3.1.3.3 Velar Plosives

In two cases, /k/ deletes as observable in the adaptation of [pɪkča] > [mbiša] and [pʌŋkča] > [ɸañja]. This study hypothesizes a perceptual constraint whereby a syllable-final plosive is obscured by the acoustic effect of the contiguous, syllable initial strident. It can, therefore, be assumed that the deletion of /k/ is not motivated by the phonological constraints of Gîkûyû. Other occurrences of /k/ are regularly preserved as illustrated in (3.75).

(3.75) k ≡ k :

kɑ:lə	>	kara
klæs	>	keraθi
kælɪndə	>	karɛnda

Some occurrences of /k/ modify into the homorganic fricative, while others restructure into the homorganic prenasalized plosive as represented in (3.76) and (3.77).

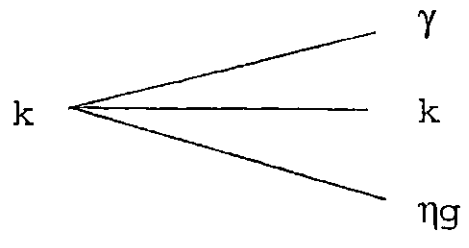
(3.76) k > γ :

kɑ:ki	>	γa:ki
keɪk	>	γɛki
kəʊt	>	iγɔ:ti

(3.77) k > ŋg: kɜ:či:f > ŋgašiɸo

A partial phonemic split is derived as represented below:

(3.78)



The irregular derivations are attributable to phonotactic and morphological constraints. The former results from an application of Dahl's law of dissimilation which accounts

for the suppletion of the velar plosive to the homorganic fricative (see 4.3.2.1). The latter involves the adoption of the /N/ class marker of nouns. Comparable to the process depicted in (3.62), this leads to homorganic nasal assimilation to derive the prenasalized form, /ŋg/. /ŋg/ is the regular reflex of /g/ as depicted in (3.86).

(3.79) g > ŋg :

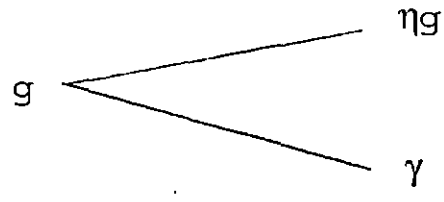
gəʊl	>	ŋgɔ:ru
gælən	>	ŋgɛrɛni
glæs	>	ŋgiraθi

In one instance, /g/ adapts to the homorganic fricative.

(3.80) g > ɣ : jʌg > ñʃaɣe

Although the /g/ > /ɣ/ derivation is manifested only once, a phonemic split is conceived, as represented below.

(3.81)



Similar to the behaviour of labial and dental plosives, deviation can be attributed to phonotactic constraints in

terms of prenasal delinking (see 4.3.2.2). A correlation of the adaptation strategies of plosives is, therefore, established. Correlation extends to the voiced affricate.

3.3.1.3.4 The Voiced Affricate

Correlating to other voiced non-continuants, /ǰ/ regularly adapts to the prenasalized counterpart as seen in (3.82).

(3.82) ǰ > ñǰ: jʌǰ > ñǰafiǰi

peʧǰ > ɸeñǰi

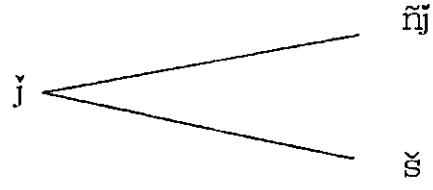
meʧǰə > meñǰa

In one case /ǰ/ modifies into the homorganic fricative.

(3.83) ǰ > š: kæbʧǰ > kaɸiši

Irrespective of a rather disproportionate representation, a phonemic split is conceived as portrayed in (3.84).

(3.84)



Deviancy can be attributed to phonotactic conditioning. Assibilation is assumed to be a result of assimilation to

the preceding fricative. This claim further subscribes to the claim of post fricative softening (see 3.3.1.3.2).

Phonemic split is available to a grammatical explanation. Whereas the regular derivation suggests phonemic conditioning, deviation implies either phonotactic or morphological constraints of the grammatical function. Similar to vowels, deviants are considered legitimate components of phonemic splits where phonetic viability is plausible.

So far, the question of phonemic adaptation manifests a graphic correspondence of the strategies which define the vowel and the consonant processes. From these strategies, a direct correlation of procedure and phonematic unit can be established. This correlation is further observed in the adaptation of the nasal + obstruent clusters.

3.3.2 Nasal + Obstruent Clusters

The nasal + obstruent clusters (hence nasal clusters) can be considered unitary phonemic forms in so far as they are perceptible fixtures in the phonology of English (see Roach, 1983: 107). Ten nasal clusters are observed: /mp/, /mb/, /nt, /nd/, /ns/, /nz/ /nč/, /nǰ/, /ŋk/, and /ŋg/.

Crucial to the conceptualization of a nasal cluster is a phonological principle which recognizes three syllabicity

values (see Goldsmith, 1990: 55). Syllabicity values are specified as [+syll] (V), [-syll] (C), and [osyll] (X), elements. X represents a neutrally syllabic value with no distinctive force. This is true of the homorganic nasals.

The conception of a unitary nasal cluster implies a twin process of deassociation of the nasal from a neutrally syllabic position to reassociate to a negatively syllabic slot. This process is formalized in the following manner.

(3.85) feature tier [+nas] [+pla]

skeletal tier X C

It can be assumed that the principles involved in this association operate in the adaptation of nasal clusters. Two types of clusters are distinguished: a sequence of nasal + plosive, and, a succession of nasal + sibilant.

3.3.2.1 Nasal + Plosive Clusters

Clusters of nasal + plosive occur in two forms: voiced and devoiced, depending on the voicing value of the plosives. The voiced clusters translate into their perceived equivalents in the phonological structure of Gîkûyû.

(3.86) mb ≡ mb :

dɪsembə > ndiθɛmba

membə > mɛmba

(3.87) nd ≡ nd :

vərændə	>	ɸaranda
kælɪndə	>	karɛnda

(3.88) ŋg ≡ ŋg :

bæŋgl	>	ɸaŋgiri
brengʌn	>	ɸiriŋgani

The adaptation of these clusters corresponds to the preservation of single consonants. In both cases a sense of phonemic equivalence is inferred. A more distinct process of adaptation affects devoiced clusters. Reassociation of the nasal co-occurs with the voicing of the obstruent.

(3.89) mp > mb :

kæmp	>	kambe
stæmp	>	θitɛmbo

(3.90) nt > nd :

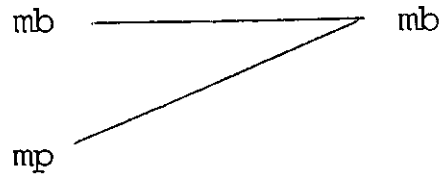
sent	>	θɛndi (currency)
wɒrənt	>	warandi

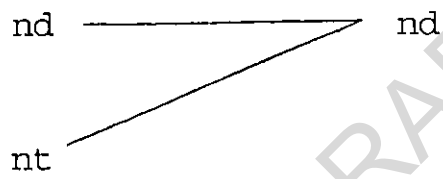
(3.91) ŋk > ŋg :

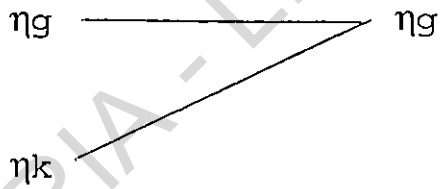
bæŋk	>	ɸɛŋgi
tæŋk	>	itaŋgi

It can be observed that every devoiced cluster adapts to

the voiced counterpart. The resultant reflexes, therefore, create phonemic mergers with the derivatives of the voiced homorganic clusters as represented below.

(3.92) 

(3.93) 

(3.94) 

The manifest primacy of homorganicity suggests a basic significance of articulatory phonetics. The centrality of physiological constraints is, however, neutralized by the acoustic influence of stridents. This can be inferred from the adaptation of the nasal + sibilant clusters.

3.3.2.2 Nasal + Sibilant Clusters

Plausibly, nasal + sibilant clusters regularly undergo a process of obligatory palatalization as depicted below.

(3.95) ns > ñǰ :

ænsə	>	añǰa
kaʊnsl	>	kañǰo
skəʊns	>	θiɣɔñǰi

(3.96) nz > ñǰ : sʌmənz > θamañǰi

(3.97) nč > ñǰ :

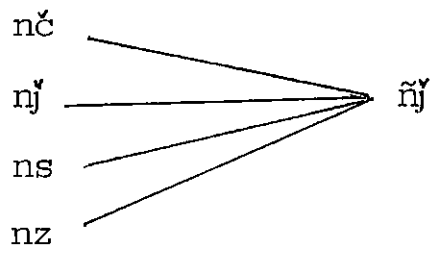
ɪnč	>	iñǰi
lʌnč	>	rañǰi
benč	>	ɸɛñǰi

(3.98) nǰ > ñǰ :

ceɪnǰ	>	šeñǰi
spʌnǰ	>	θuɸañǰi

The derivatives depicted above can be said to define a phonemic merger whereby nasal + sibilant clusters adapt to the prenasalized affricate, as represented in (3.99).

(3.99)



For the nasal + sibilant clusters, homorganicity is not an essential factor. The more viable constraint can be found in the acoustic affinity of strident sounds (see Hyman, 1975: 40). Stridency could constitute a dynamic property which nasals assimilate prior to palatalization.

It can be assumed that Gîkûyû speakers perceive the nasal clusters as correspondences of the prenasalized obstruents. This assumption can be invalidated on the basis of the cluster /ns/. Some clusters culminate in simplification, as observed in [dæns] > [ndaši], [laɪsns] > [rɛθɛni], [ɪm3:jnsi] > [manjɛnɛti], and [dɪtensn] > [ndite:ni].

This deviation occurs in order to accommodate phonotactic and prosodic conditioning. Phonotactic constraints are assumed in cases depicting post fricative softening and prenasal dissimilation (see 3.3.1.3.2 and 4.3.2.2), respectively. Prosodic conditioning is inferrable where a loanword depicts a resyllabification strategy (see 5.2).

The process of simplification is considered important for the reason that it bridges the gap between the single and the contour consonants. It therefore substantiates the claim that these forms have an equal phonemic status. This assumption can be further validated on the premises

that correlated grammatical principles govern the adaptation of single consonants as well as the nasal clusters.

3.4 Conclusion

Three adaptation strategies are demonstrated. They are identified as phonemic preservation, merger, and split. A specific grammatical motivation constrains the application of each strategy. Phonemic preservation indicates a perceptual and a physical phonetic correspondence. The formation of merger functions as a solution for the constraints of a more restricted phonemic inventory, where Gîkûyû is concerned. Phonemic split arises out of a need to accomodate the phonotactic, morphological, lexical and etymological constraints of the grammatical function.

In conclusion, Gîkûyû speakers are able to perceive the structural properties of the sounds they encounter in the English words. Furthermore, it can be assumed that Gîkûyû speakers in particular and native speakers in general have a tacit knowledge of the interaction of phonemic constraints and other aspects of the grammatical system as a whole and the phonological structure specifically. A salient aspect of the phonological structure is phonotactic function. The notion and the principles of phonotactic adaptation are addressed in the following chapter.

CHAPTER FOUR

PHONOTACTIC ADAPTATION

4.1 Introduction

Chapter three deals with the context free processes of loanword adaptation which define the permissible phonemic units and their paradigmatic variation. This chapter is concerned with the context sensitive processes of sound modification. The latter define the admissible phonematic structure as well as the optimal phonemic sequences.

The question of sound sequencing is defined as phonotactic association. Traditionally, the term phonotactics is used in relation to the principles which govern specific arrangements of the phonemes of a particular language according to the observable regularities of sound patterns. In the autosegmental analysis, phonotactic association is conceptualized as a relationship of phonemic licensing.

The essence of a licensing function derives from the fact that there are prosodic units which are recognizable as licensers. A licenser is endowed by the grammar of the object language to determine well-formedness conditions at a given level (see Goldsmith, 1990: 123-4). Two licensers are considered: the syllable and phonological word.

4.2 Syllable Level Licensing

This section is concerned with the licensing function in a tautosyllabic association. It defines the role of the Gîkûyû syllable structure in view of its interaction with the processes involved in the adaptation of loanwords.

Phonotactic adaptation at the level of the syllable is constrained by distinct syllable structure conditions, as far as the languages of this study are concerned. Unlike the Gîkûyû syllable, the English counterpart may incorporate three consonant clusters (see Roach, 1983: 56-62).

The syllable level phonotactic association involves two aspects of the phonological function. In one aspect, the optimal syllable structure (CV) functions as the primary licencer. In the other, the syllable constituents, the onset and the rhyme, operate as secondary licencers.

4.2.1 Optimal Syllable as Primary Licencer

The concept of a primary phonological licenser implies an essential phonematic function involving the distribution of C and V units. The significance of this function is inferred from a systematic modification of the skeletal structure. In the course of the adjustment, the skeleton restructures into CV sequences as represented below.

(4.1) Skeletal Modification Phonemic Derivation

CVC	>	CVCV	pɯn	>	mbini
CCV	>	CVCV	drɔ:	>	ndirɔ:
VCVC	>	CVCVCV	ɒfɪs	>	waɸiši
CVCC	>	CVCVCV	vest	>	ɸɛθiti
CCVC	>	CVCVCV	glæs	>	ŋgiraθi
CVCVC	>	CVCVCV	pækɪt	>	mbaɣiti
CVCCV	>	CVCVCV	setlə	>	θɛtɛra
CCVCV	>	CVCVCV	spænə	>	θuɸana
CCVCCV	>	CVCVCVCV	trækta	>	karaɣita
VCCVCC	>	CVCVCVCV	ədvɑ:ns	>	waruɸanji
CVCCVC	>	CVCVCVCV	hedmən	>	hɛndimɛni
CVCVCVC	>	CVCVCVCV	vɪtəmɪn	>	ɸitamɛni

By virtue of the fact that CV functions as the regular syllable of Gîkûyû (see 2.3.2), this study assumes that loanwords undergo an immediate syllabification process. Syllabification refers to a language particular process, which associates a linear string of phonemes with the syllable structure. The notion of syllabification depends on a phonological principle. The latter requires that all the words of a language are delimitable into syllables which are roughly constant (see Goldsmith, 1990: 104-8).

In the case of Gîkûyû speech, syllabification can be said to involve a predictable delimitation of CV units. This principle creates a problem for the native speaker when confronted with the English consonant clusters. The basic question concerns the native speaker's response to the consonant clusters, in the course of syllabification.

The adaptation strategies suggest a total syllabification approach. This approach means that the regular syllable structure is imposed on all loanwords. If no segment is available for an obligatory skeletal position (such as a vowel rhyme) the structure is built anyway, modelled on the optimal syllable. This approach has the advantage of being both natural and direct in its application.

It is reasonable to assume that the primary phonotactic adaptation incorporates two processes: syllabification and skeletal modification. A simultaneous application of the phases involved is conceived as represented in (4.2).

(4.2)(a) underlying representation :

phonemic tier	pɪn	stɔ:	desk
	|||	|||	||||
skeletal tier	CVC	CCV	CVCC

(b) syllabification :

skeletal tier	CV C	C CV	CV C C
	\/ ≠	≠ \/	\/ ≠ ≠
syllabic tier	σ	σ	σ

A language particular syllabification principle links a V to the preceding C, and a C to the following V. The application of this principle results in unlinked Cs. For an open syllable system, an unlinked C is inadmissible. In order to correct the inadmissible structure a V unit is inserted as part of skeletal modification.

(c) skeletal modification:

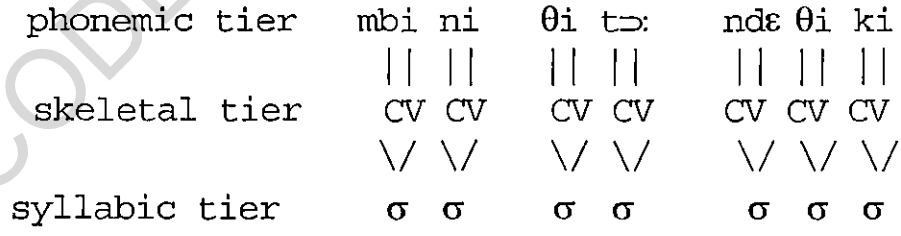
CVC > CVCV

CCV > CVCV

CVCC > CVCVCV

The modification of the skeletal structure is concomitant with phonemic adaptation and linkage to newly introduced V segments. This development is represented as follows.

(d) surface representation :



V epenthesis is reinterpreted as a language particular solution to unsyllabifiable wordforms. The epenthetic V functions to fill an empty skeletal position. The notion of an empty position derives from the obligatory nature of the V rhyme in the syllable structure conditions (SSC)

of Gîkûyû. Consequently, V epenthesis functions as a strategy for the preferred structure preservation. Since the preferred syllable structure in this language is a CV unit, V epenthesis is formalized in the following rule.

(4.3) 0 > V / C -

The primacy of the CV unit in the phonological structure of Gîkûyû is attested to by the fact that CV... sequences in the English words are preserved, as illustrated below.

(4.4)(a) underlying representation :

phonemes	sɔ:	kp la	beɪ kə ri
	||	|| ||	|| || ||
skeleton	CV	CV CV	CV CV CV
	\/	\/ \/	\/ \/ \/
syllables	σ	σ σ	σ σ σ

(b) surface representation :

phonemes	θɔ:	ka ra	mbɛ kɛ ri
	||	|| ||	|| || ||
skeleton	CV	CV CV	CV CV CV
	\/	\/ \/	\/ \/ \/
syllables	σ	σ σ	σ σ σ

The primacy of the CV unit, in so far as the phonological structure of Gîkûyû is concerned, is further inferred from the treatment of the unitary V syllables. Despite being permissible structures of this language, the V syllables optionally modify into CV forms as follows.

(4.5)(a) underlying representation :

phonemic tier	ɔ fɪ s	ʌ v n
	| || |	| | |
skeletal tier	V CV C	V C C
	| \/ |	| | |
syllabic tier	σ σ	σ

(b) surface representation :

phonemic tier	wa ɸi ši	hɔ ɸu na
	|| || ||	|| || ||
skeletal tier	CV CV CV	CV CV CV
	\/ \/ \/	\/ \/ \/
syllabic tier	σ σ σ	σ σ σ

The prominence of the CV unit can be interpreted to mean that in the perception of Gîkûyû speech, CV constitutes a concrete unit. In such a relationship the contiguous C and V are coarticulated (see Brosnahan and Malmberg, 1970: 72). The notion of coarticulation implies physical interlock as well as temporal overlap. Consequently, a reciprocal assimilation of these constituents is implied.

This claim suggests that there is clearly a level at which the componential make-up of the phonemes of a word is irrelevant and a sequence of C and V functions as a unit. The plausibility of a unitary conception of CV sequencies was expressed as early as the 19th century (see Haldeman, in Firth 1948: 51). This assumption is considered a logical foundation for the syllabic alphabet, where CV languages are concerned (see Sloat, 1978: 56-8).

This study postulates the CV unit as the upper bound primitive with the individual C and V forms as the lower bound primitives. Primitives constitute basic theoretical constructs (see Brosnahan & Malmberg 1970: 72; Lass 1984: 236-8). The significance of the individual C and V units can be inferred from their role as secondary licensers. A secondary licensing function implies concern with the level of phonemic distribution. From this view, C and V units are re-interpreted in terms of their distributional role, as syllable onset and syllable rhyme, respectively.

4.2.2 Syllable Onset as a Secondary Licenser

The licensing function of syllable onsets is conceived in terms of the epenthesis of specific vowels. This strategy is interpreted as the association of a consonant to an unlinked V. Such an association is observed in the epenthesis of three vowels: /i/, /u/, and /o/, respectively.

4.2.2.1 /i/ Epenthesis

The high vowel, /i/, associates to nine consonants: /t/, /θ/, /nd/, /n/, /š/, /ñǰ/ /k/, /ŋg/, and /γ/, as follows.

(4.6) 0 > i / t- :

su:t	>	θu:ti
nəʊt	>	nɔti
š3:t	>	šati

(4.7) 0 > i / nd- :

drɔ:	>	ndirɔ:
kɑ:d	>	kandi
wɔ:d	>	wɔndi

(4.8) 0 > i / θ-:

stɔ:	>	θitɔ:
vest	>	ɸɛθiti
tents	>	tɛnɛθi

(4.9) 0 > i / n-:

četn	>	šɛni
latn	>	raini
gæləŋ	>	ŋgɛrɛni

(4.10) 0 > i / š-:

č3:č	>	šaši
tɔ:č	>	tɔši
gærɑ:ž	>	ŋgɛrɛši

(4.11) 0 > i / ñj-:

lʌnč	>	rañji
četñj	>	šeñji
pelj	>	ɸeñji

(4.12) 0 > i / k-:

ketk	>	ɣɛki
bretk	>	mbureki
desk	>	ndɛθiki

(4.13) 0 > i / ŋg-:

glæs	>	ŋgiraθi
tæŋk	>	itaŋgi
bæŋk	>	ɸɛŋgi

(4.14) 0 > i / ɣ-:

sɒks	>	θɔɣiθi
tæksi	>	tɛɣiθi
trækta	>	karaɣita

All true consonants of the tongue stricture associate with /i/ epenthesis. This association can be taken to indicate a need for a phonetic feature [tongue], comparable to the features [labial] and [glottal]. In view of this assumption, a general rule is formulated as follows:

(4.15) $0 > i \; / \; C \; \begin{matrix} |+\text{ton}| \\ |-\text{voc}| \end{matrix} \; -$

The manifest flexibility of /i/ is attributed to an approximate palatal position (see Fromkin, 1985: 86-8). In this position, /i/ is centrally placed to diffuse forwards and backwards, linking to tongue stricture consonants. Deviation from this linkage involves the vowel /u/.

(4.16) (a) bʊk > iɸuku

sku:l > θukuru

(b) spənə > θuɸana

speə > θuɸɛa

This deviation is due to vocalic spreading (see 4.3.1.1) and regressive assimilation, respectively. As concerns the latter, the assumption is that the derivation is a result of assimilation to the contiguous bilabial fricatives. This claim can be validated on the basis of the examination of /u/ epenthesis.

4.2.2.2 /u/ Epenthesis

The vowel, /u/, is the second most pervasive epenthetic vowel. It regularly associates to the labials as indicated below.

(4.17) 0 > u / mb-:

breɪk > mbureki

blaʊz > mburaoθi

blu: > mbururu

(4.18) 0 > u / ɸ-:

flænl > ɸurana

mæp > maɸu

stəʊv > θitɔɸu

(4.19) 0 > u / m-:

bɒm	>	mbɔmu
fɔ:m	>	ɸɔmu
ǰæm	>	ŋǰamu

The linkage involved leads to a conclusion that these sounds share perceptual correlates to the extent that /u/ can be conceived as a labial vowel. The following rule, therefore, summarizes the constraints of /u/ epenthesis.

(4.20) $0 > u / C -$
[+lab]

The plausibility of the rule depicted above is found in the sense that /u/ shares a phonetic affinity with the labiovelar glide. For different reasons, deviation occurs in the word final and word initial syllables, as follows.

(4.21) 0 > o /-# :

stæmp	>	θitæmbo
kri:m	>	kerimo
či:f	>	šiɸo

(4.22) 0 > o / # m-:

brʌš	>	morašie
blæŋkɪt	>	moreŋgeti

The deviation depicted word finally is attributed to etymological nativization. In this environment, /u/ modifies into /o/ to facilitate phonological levelling. Secondly, the deviation observed in the word initial syllables co-occurs with the adaptation of /b/ into /m/, rather than /mb/. Both cases are conditioned by a morphological constraint. The latter often reanalyses certain word initial syllables to derive the singular morpheme, {mo}. This morpheme functions as the class three nominal marker.

Questions of etymological or morphological conditioning do not rule out phonotactic constraints. For instance, it is possible that the proximity of /o/ to /r/ enhances the viability of the derivation represented in (4.22). The plausibility of phonotactic conditioning can be argued in relation to the following description of /o/ epenthesis.

4.2.2.3 /O/ Epenthesis

The tense mid back vowel, /o/, is regularly inserted in the environment of the liquid, as illustrated in (4.23).

(4.23) 0 > o / r- :

bɪl	>	mbiro
faɪl	>	ɸairo
maɪl	>	mairo

The following rule formalizes the linkage depicted above.

(4.24) $0 > o / C -$ (C: [+voc])

The association of /o/ to the liquids can be said to be a pervasive occurrence. For a fuller appreciation of this claim, see the strategies described as resyllabication and vowel spreading (4.2.3 and 4.3.1.1). These processes involve substitution of /o/ for a syllabic lateral, and reduplication of the same in the environment of a trill. The observable correlation leads to an assumption that a strong phonetic affinity exists to the extent that /o/ can be considered a liquid vowel. The value of this claim derives from the fact that it correlates with hypotheses posited in connection with the epenthesis of /i/ and /u/.

On the whole, the fundamental significance of vowel epenthesis can be found in the fact that specifiable phonetic features motivate the insertion of particular vowels. A motivated association implies the existence of a strong phonetic correlation of properties of certain vowels and those of particular classes of the consonants of Gîkûyû.

The question of correlation can be re-interpreted to mean that the C in each phonematic articulation has a specific function. At one level, it associates to a V position and

at the other, it regulates the choice of the epenthetic V. In essence, the regularity manifest in each epenthetic association substantiates the thesis on onset licensing.

4.2.3 Syllable Rhyme as a Secondary Licenser

This analysis is concerned with lateral resyllabication. The notion of resyllabication implies a process involving a reanalysis and subsequent modification of the rhyme structure. Critical to the process of resyllabication is the existence of distinct constraints on syllable rhyme, as far as Gîkûyû and English are concerned. Like most world languages, the rhyme of the Gîkûyû syllable is an obligatory V unit. In contrast, the nucleus of an English syllable can consist of either a lateral or a nasal. This analysis focuses on the syllabic lateral of English.

Syllabic laterals modify into /o/, as depicted in (4.25).

(4.25) l > o /-# :

kaʊ̃nsl	>	kañ̆o
pensl	>	ɸɛñ̆o
dʌbl	>	ndaɸo

The motivation for resyllabication can be derived from phonetic and phonological factors. A liquid is basically

a consonant bearing some vocalic properties (see Hyman, 1975: 42-5). From the point of view of the Gîkûyû syllable structure conditions, a syllabic consonant is perceived as ill-formed. Hence, the syllabic lateral adapts to the vowel with which it shares a close phonetic affinity.

In some instances this rule is violated. This is observed in the modification of a syllabic lateral into /a/, as occurs in the adaptation of the word [flænl] > [ɸurana]. Deviation is attributed to indirect borrowing (consider the Kiswahili lexical correspondence [fulana]), and is accounted for in terms of vowel spreading (see 4.3.1.1).

The process of resyllabication can involve more than one unit. This occurs in sequences of the schwa and the lateral. Sequences of schwa and lateral modify into /o/.

(4.26) əl > o /-# :

petrəl	>	ɸɛtoro
ɟenrəl	>	ɲɟɛnoro
kɔ:prəl	>	kɔɸuro

The laterals involved in this derivation occur contiguous to the syllable nuclei, alongside which they function as rhyme constituents. To the Gîkûyû native speaker, these laterals are perceived as a reduplication of the nucleus,

a situation which constitutes structural and functional redundancy. It is logical to assume prior assimilation of the schwa to the lateral with subsequent resyllabication.

In conclusion, the process of resyllabication is accounted for in terms of phonological constraints. This claim implies that, for the phonological structure of Gîkûyû, the presence of the V nucleus is crucial to the phonotactic function. By extension, the hypothesis on the licensing function of the syllable rhyme is validated.

On the whole, the fundamental importance of the syllable level phonotactics is demonstrated in connection with the phonematic and the phonemic linkage. The primacy of the syllable unit in relation to phoneme organization can be inferred from the generality of the rules formulated. Cases of deviation are inevitable because not all phonotactic processes are motivated by the syllable level conditioning. Some processes respond to constraints that extend beyond the level of the syllable to the word domain.

4.3 Word Level Licensing

The preceding section addresses the licensing properties of the syllable level phonotactics. In this section, the notion of phonotactic adaptation is developed to incorporate motivation at the level of the phonological word.

Essential to the notion of the word level phonotactics is an autosegmental principle which licences the phonemic substance at the domain of the word. It stipulates that phonemic segments are integrated into the larger structure of the discourse by being part of the prosodic system, not at the level of the syllable but that of the phonological word as a whole (see Goldsmith, 1990: 107-8).

The analysis of the word level phonotactic adaptation addresses the problem of heterosyllabic association. Two regular categories of heterosyllabic (non-contact) linkage of the phonemic units are distinguished: (1) vocalic assimilation, and, (2) Consonantal dissimilation.

4.3.1 Vocalic Assimilation

The notion of heterosyllabic vocalic assimilation is reinterpreted as a case of phonemic spreading. Speading is a term used to describe the process whereby an identical unit extends into a contiguous syllable (see Hyman, 1975: 222-3). This distribution may be progressive or regressive, depending on the placement of the conditioning unit. Vocalic spreading affects vowels and the liquid.

4.3.1.1 Vowel Spreading

Spreading is regularly observable in relation to the vowels of Gîkûyû. The various cases of vowel reduplication

are systematically represented below, in order of their relative vertical placement (tongue height correlation).

(4.27) /i/ distribution :

enǰɪn	>	iñǰini
sɪ'ment	>	θimiti
pəli:s	>	ɸiriθi

(4.28) /u/ distribution :

blu:	>	mbururu
sku:l	>	θukuru
bʊ̈k	>	iɸuku

(4.29) /e/ distribution :

pɑ:dre	>	ɸatere
kəmɪti	>	kamete
bʊ̈čəri	>	mbušere

(4.30) /o/ distribution :

petrəl	>	ɸɛtoro
di:zl	>	ndiθoro
ǰenrəl	>	ñǰɛnoro

(4.31) /ɛ/ distribution:

beɪkəri	>	mbɛkɛri
setlə	>	θɛtɛra
tenɪs	>	tɛnɛθi

(4.32) /a/ distribution :

flænl	>	ɸurana
dʌzn	>	ndaθani
nɜ:sri	>	naθari

It can be observed that except for the maximally diffuse forms, /i/ and /u/, the process of vowel spreading regularly affects two syllables. The procedure involved is conceived progressively, and generalized as follows.

(4.33) (a) Underlying representation:

vowels	ɪ ə	e ə	ʌ
skeleton	CVCCV	CVCCV	CVCC
consonants	s lv	s tl	d zn

(b) skeletal and phonemic modification:

vowels	i a	ɛ a	a i
skeleton	CVCVCV	CVCVCV	CVCVCV
consonants	θ r ɸ	θ t r	ndθ n

(c) progressive vowel spreading :

vowels	i a	ɛ a	a i
skeleton	CVCVCV	CVCVCV	CVCVCV
consonants	θ r ɸ	θ t r	nd θ n

(d) surface representation:

vowels	i i a	ɛ ɛ a	a a i
skeleton	CVCVCV	CVCVCV	CVCVCV
consonants	θ r ɸ	θ t r	nd θ n

A significant observation concerns the fact that where derivatives depict variants, vowel spreading remains constant. This relationship is illustrated in (4.34).

(4.34)

beɪsn	>	mbešeni	<->	mbɛθɛni
gæləŋ	>	ŋgarani	<->	ŋgɛrɛni
gærɑ:ž	>	ŋgarañji	<->	ŋgɛrɛši

Consonantal conditioning can be inferred for the spreading of /o/, in view of the presence of the liquid. It is difficult to determine any correlated constraints for the other vowels. Lack of correlation in terms of contiguous phonotactic association can be taken to mean that the general motivation depends on non-contact assimilation of the vowels in their distribution in the individual words.

The lax vowels /ɪ/ and /ə/, for instance, are regularly displaced. This could mean that these vowels share close phonetic correlation. Correlation can also be inferred from their function as optional variants in the phonetics

of English. Consider #permit#, #jacket#, and #vitamin#, whereby the last vowels are optionally either /ɪ/ or /ə/.

In view of Trubetzkoy's system of phonological features, the distinctive function of these vowels can be said to be neutralizable (see Schane, 1973: 59-61). The issue of a neutralizable force points to the perceptual significance of phonetic strength, as it relates to the function of these vowels in the phonological structure of English. Since the affected vowels rank at the bottom of the phonetic strength hierarchy, their displacement is plausible.

The derivation of /ɛ/ in the penultimate positions of the reflexes, [ɸamɛti], [ñǰakɛti], and [ɸitamɛni] can be the outcome of a phonotactic constraint culminating in vowel gradation, from the anti-penultimate to the ultimate syllable. Hence, vowel gradation is considered an aspect of non-contact assimilation which targets prosodic harmony.

The effect of the phonetic strength or vowel gradation, however, cannot account for the displacement of /e/ as in the adaptation of the forms [enǰɪn] > [iñǰini] and [sɪment] > [θimiti]. This is attributed to the presence of /i/ in contiguous syllables of the words involved. The implicit dynamism of vocalic spreading extends to the liquid.

4.3.1.2 Liquid Spreading

The notion of liquid spreading is associated with the two irregular derivatives of /d/ > /r/, depicted in (4.35).

(4.35) d > r :

sælad	>	θarare
reɪdieɪtə	>	ririɛta

Vocalic spreading can involve whole syllables. Syllable reduplication is observable in the modification of the English homonym [blu:] into [mbururu] and [ɸururu], where derivatives represent correlated concepts of colour and dye, respectively. In each word, reduplication affects both vowel and liquid. Correlation of vowel and liquid spreading is inferred from the fact that the contiguous units do not seem to affect the process in either case.

The value of vocalic spreading can be inferred from the phonological shape of the words involved. This strategy regularly affects trisyllabic wordforms. It, therefore, implies a prosodic constraint which targets perceptual symmetry, in an otherwise assymetrical structure. For tonal systems, the phonological symmetry is perceived in relation to the rhyme composition (see Fry, 1979: 20-7). Structural symmetry is usually connected with the ease of

articulation and the aesthetics of speech (see Abercrombie 1967: 95-7). The latter is also assumed to motivate the various consonantal dissimilation processes.

4.3.2 Consonantal Dissimilation

Consonantal dissimilation is manifested in two ways. They are (1) velar softening, and (2) prenasal delinking.

4.3.2.1 Velar softening

A salient feature of the phonological structure of Gîkûyû is the suppletion of /k/ to the homorganic fricative, if followed by either the dental, palatal or velar voiceless obstruent (see Leaky 1959; Gathenji 1981; Mbûgua 1990). This principle affects loanword adaptation as follows.

(4.36) k > ɣ /- $ t :

pækɪt	>	mbaɣiti
trækta	>	karaɣita

(4.37) k > ɣ /-$θ :

sɒks	>	θɔɣiθi
tæksi	>	tɛɣiθi

(4.38) k > ɣ /-$ š :

skɒč	>	θiɣɔši
ægrɪkʌlča	>	ŋgiriɣaša

Velar softening affects all the the voiceless consonants of the tongue stricture. As observed above in connection with /i/ epenthesis (see p. 112), this strategy seems to indicate a need for the phonetic feature [tongue]. A general feature-based rule is therefore formulated, to capture the dissimilation strategy, in the following manner.

(4.40)

$$\begin{array}{ccccc} C & > & C & / & -\$C \\ \left|\begin{array}{l}\text{-voic}\\ \text{-cont}\\ \text{+back}\end{array}\right| & & \left|\begin{array}{l}\text{+voic}\\ \text{+cont}\end{array}\right| & & \left|\begin{array}{l}\text{-voic}\\ \text{+ton}\end{array}\right| \end{array}$$

As observable from this rule, the most sinificant property of dissimilation relates to the voicing quality. The principle governing this differentiation in general, however,is identified as Dahl's Law of Dissimilation (see Kenstowicz and Kisseberth, 1977: 81-3). This law functions in various ways in some Bantu languages and is productive in the phonological structure of Gîkûyû, as regularly manifested in the adaptation of loanwords.

Despite its pervasiveness in the native lexicon, this law is blocked in some loanwords as observable in the derivation of [kɪčɪn] > [kišɛni], [ǰækɪt] > [ñǰakɛti], and [sk3:t] > θikati]. These derivatives represent instances of incomplete adaptation. An incomplete adaptation arises when a loanword is subjected to restricted usage: usually in

connection with formal institutions, technical and specialized usage, as of certain elitist language registers (see Anttila 1972: 171-3; Hock 1986: 395-7). These claims validate an assumption that communication constraints can affect the level or alternatively the progress of the adaptation of loanwords.

Two tendencies of partially adapted loanwords are worth noting. They relate to the phonemic and the lexical alternation. The first is observable in the loanwords which incorporate optional variants as depicted in the alternation of the palatal and dental fricatives. These alternants occur in the reflexes of the English wordforms [skɜ:t], [skaʊt], and [sku:l].

(4.41) š <-> θ:

šikati	<->	θikati
šikauti	<->	θikauti
šukuru	<->	θukuru

Lexical correlation can be inferred from doublets incorporating an alternation of a partially adapted loanword with either a native, or a completely nativized variant perceived to be equivalent (see Hock 1986: 401-11). This is observed in the reflexes of the English cognates [kɪčɪn], [skɜ:t], and [ǰækɪt], referred to above. The reflexes [kisɛni], [θikati], and [ñǰakɛti], function as varaints of the lexical forms: [rikɔ],

[kerinda] and [kaɣɔ:ti], respectively. The word [kaɣɔ:ti] is the diminutive variant of the lexeme [iɣɔ:ti] (coat).

These tendencies indicate indeterminacy regarding the use of some loanwords. The situation arises because the use of loanwords is sensitive to the constraints of the communicative setting. The variation depicted in (4.41), for instance, can be attributed to usage in the education register. Incomplete adaptation, therefore, introduces a psychological element into the process of loanword nativization. This is further observed in prenasal delinking.

4.3.2.2 Prenasal Delinking

The notion of prenasal delinking is applied in connection with the processes which disallow a succession of prenasalized obstruents in contiguous syllables (see Herbert in Trail et. al. 1994). For the purpose of coherence, this analysis revisits the adaptation of the plosives /p/, /b/, /d/, /g/, and the nasal cluster /ns/. The paradigmatic relationships of these obstruents are examined in chapter three (see 3.3.1.3 and 3.3.2.2).

4.3.2.2.1 Labial Delinking

The labial plosive, /p/, regularly adapts to /ɸ/. It also modifies into the homorganic prenasalized plosive, /mb/,

(see 3.3.1.3.1). In certain cases, the adaptation of /p/ derives alternant reflexes as illustrated in (4.42).

(4.42) mb <-> ɸ :

paʊdə > ɸɔnda <-> mbɔta

paʊnd > ɸaondi <-> mbaoni

It can be considered a logical assumption that the change depicted, involves progressive modification as follows:

(4.43)

p	>	ɸ	>	mb
d	>	nd	>	t

A notable aspect of the alternation depicted relates to the metathesis of the prenasalized sounds. In each pair of variants, the prenasalized property shifts from the second to the first syllable. It can be assumed that the juxtaposition of prenasalized obstruents is constrained by a well-formedness condition. This study postulates a principle which blocks the co-occurrence of prenasalized sounds in contiguous syllables. This claim is validated on the basis of the behaviour of correlated obstruents.

In the word initial position, /b/ regularly translates into the prenasalized counterpart (see 3.3.1.3.1). This

process is blocked in some environments, where it adapts to the homorganic fricative, as illustrated in (4.44).

(4.44) b > ɸ :

benč	>	ɸɛñǰi
bæŋk	>	ɸɛŋgi
bæŋgl	>	ɸaŋgiri

Given the regular constraints of phonemic adaptation, the underlying wordforms carry a potential for a sequence of prenasalized syllables in the same word. This development is blocked by means of a process of labial frication.

4.3.2.2.2 Dental Delinking

The dental plosive, /d/, regularly adapts to the prenasalized counterpart (see 3.3.1.3.2). In one case, it undergoes a process of devoicing, as represented in (4.45).

(4.45) d > t : gɑ:d > ŋgati

This modification is not immediately justifiable, since the regular derivation of /d/ > /nd/ is observable in the adaptation of [kɑ:d] > [kandi]. The problem arises out of a correspondence of sound position in the borrowed forms.

Irrespective of correlation of the immediate environment,

in terms of sound position in the word, the overall phonetic implications differ for each of these derivatives. Unlike the word [kɑ:d], the form [gɑ:d] has a potential for a succession of prenasalized syllables. A process of dental devoicing blocks a second prenasalized derivation.

4.3.2.2.3 Velar Delinking

Correlating to the other voiced plosives, /g/ regularly adapts to the prenasalized counterpart (see 3.3.1.3.3). In one case, however, /g/ undergoes frication as follows:

(4.46) g > ɣ : ǰʌg > ñǰaɣe

In view of the phonemic constraints of the recipient language, the English word, [ǰʌg], has a potential for contiguous prenasalized syllables. The plosive undergoes frication in order to block the derivation of a prenasalized form. This correlates with the dental softening examined above and the palatal delinking addressed below.

4.3.2.2.4 Palatal Delinking

The notion of palatal delinking applies to the adaptation of the nasal + sibilant cluster, /ns/, in view of its regular reflex, /ñǰ/ (see 3.3.2.2). One case of /ns/ modifies into the palatal fricative as represented below.

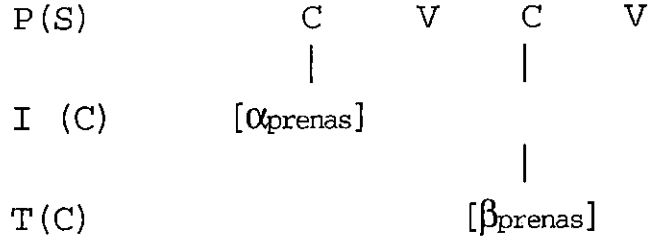
(4.47) ns > š : dæns > ndaši

It is plausible that palatal softening occurs, in the course of which the obstruent deassociates the preceding nasal property. The notion of softening presupposes a telescoped stage involving the prenasalized affricate. The derivative /š/ can, therefore, be assumed to progress through the following relative chronology of change:

(4.48) ns > ñǰ > š

A correlation of the processes involved in prenasal delinking implies that an optimalization rule is responsible for blocking the formation of contiguous prenasalized syllables. The formulation of this rule adopts the if (I) and then (T) conditions (C), advocated by standard generative phonology for the representation of permissible (P) morpheme structure (S) (see Hyman 1975: 111; Lass 1984: 261). The conceptual rule is formalized in (4.49).

(4.49)



Three loanwords apparently violate this rule. This can be

observed in the adaptation of the forms [bæ̆j] > [mbañ̆ji], [bɒnd] > [mbondi] and [jʌ̆j] > [ñ̆jañ̆ji]. These derivatives depict partial adaptation, probably due to the fact that their use is mostly restricted to the law register. This possibility further substantiates the claim made above, to the effect that communication constraints can influence the level and the progress of the adaptation process.

An instructive aspect of prenasal delinking concerns its focus on the contiguous syllables. Since the syllable is a fundamental unit of speech processing, it is plausible that the processes culminating in phonemic dissimilation target greater perceptual distinction. Comparable to the converse process of vocalic assimilation, consonantal dissimilation accounts for deviancy in both phonemic and syllable level phonotactic adaptation. This role can be interpreted to mean that the violation of a regular process does not necessarily indicate an arbitrary development. Deviancy points to distributional constraints.

An interesting aspect of the distributional relationships concerns the demarcation of roles against strategies. The assimilation processes target vocalic units whereas the dissimilation strategies focus on consonantal forms. The significance of this differentiation can be found in the application of two complementary principles of the speech

function: the maximum ease of articulation and sufficient perceptual separation of segments (see Ladefoged, 1982: 241-4). These requirements of the speech function seem to link to assimilation and dissimilation, respectively.

The application of these principles in the adaptation of loanwords is taken as evidence that they are essential properties of the phonological function. It also can be assumed that these principles are integral aspects of the prosodic constraints which define the well-formedness conditions of the phonological word. The regularity of the processes involved, therefore, constitutes proof that the distribution of sounds in the word has fundamental implications for speech production and speech perception.

4.4 Conclusion

This chapter has provided an illustrative account of the notion of phonotactic adaptation at two levels. The need to distinguish syllable and word level phonotactics is explicit in the following summary of salient assumptions.

The syllable is an essential unit of speech production. It functions at the core of phonological organization, constraining and regulating the combination of vowels and consonants. The most salient features of the syllable level phonotactic adaptation are defined at two levels:

phonematic linkage, and phonemic association of the onset and the rhyme positions, in a tautosyllabic relationship.

Syllabification is a basic requirement of the adaptation of loanwords, and by extension, speech programming and processing. The process of syllabification, therefore, suggests a fundamental significance of the phonological function of the word as a unit of speech production.

The phonological word is conceived to be an essential unit of speech perception. By extension, the word is a significant element of phonological description. Without considering the word as a whole, it would be difficult to determine or define the constraints of the strategies governing heterosyllabic assimilation and dissimilation.

The application of word level phonotactic representation does not imply that the function of the syllable becomes irrelevant. Fundamental principles of syllable level phonotactics continue to influence the adaptation process in terms of the preferred structure preservation. This interaction can be interpreted to mean that the word and the syllable are interdependent. The significance of this inter-relationship is defined more clearly in the next chapter, under the rubric of prosodic adaptation.

CHAPTER FIVE

PROSODIC ADAPTATION

5.1 Introduction

So far, this study has dealt with phonological relations among individual phonemes either in their paradigmatic or syntagmatic linkage. This chapter goes beyond phonemic and phonotactic function to address prosodic adaptation. The notion of prosody refers to the constraints of the structure of a phonological word, as a performance unit.

The performance, as opposed to the competence, model of language presupposes an independent existence of prosodic units such as the syllable and the phonological word (see Lehiste, 1970: 154-6). The problem of prosodic adaptation is approached from two perspectives: (1) modification of prosodic units, and (2) adjustment of prosodic features.

5.2 Prosodic Unit Adaptation

This section focuses on the phonological word as a formal structure. The conditions which govern well-formedness in a phonological word are examined under the notion of prosodic licensing. The latter suggests a level at which two strategies of loanword adaptation can be addressed: (1) word resyllabification, and (2) syllable deletion.

5.2.1 Word Resyllabification

One aspect of loanword adaptation involves a process of resyllabification. Resyllabification refers to a process whereby the phonological shape of a loanword undergoes systematic restructuring, with regard to the constituent syllable composition. The need for resyllabification is motivated by the fact that clearly distinct word structure conditions function in the languages of this study.

Occasionally, there is a correspondence of the phonematic shape of cognate forms. It can be predicted that, in such a case, the structure of the English wordforms may be perceived to be well-formed and therefore carried over into Gîkûyû. In other cases, loanwords regularly undergo restructuring as pertains to the syllable composition.

The following analysis is, therefore, constrained by the phonological shape of the borrowed form. Generally, the phonological shape of words is conceived in terms of the constituent syllables. Four shapes are mostly recognized: monosyllabic, disyllabic, trisyllabic and quadrisyllabic.

5.2.1.1 Monosyllabic Wordforms

Except for one case (consider the adaptation of [sɔ:] > [θɔ:]), monosyllabic words modify into disyllabic and trisyllabic derivatives as illustrated in (5.1).

(5.1) $ bʌs $ > mba $ θi

$ š3:t $ > ša $ ti

$ čeɪŋ̌ $ > še $ ñǰi

(5.2) $ breɪk $ > mbu $ re $ ki

$ sɔks $ > θɔ $ γi $ θi

$ desk $ > ndɛ $ θi $ ki

From this illustration, it is apparent that the number of derived syllables depends on the underlying distinctive consonants. This statement may lead to the conclusion that the phonological shape of derivatives is constrained by the underlying phonematic shape. This assumption is invalidated, in view of two cases. In one case, loanword adaptation involves desyllabication of /ɪ/, as follows.

(5.3) $ waɪə $ > wa $ ja

This derivation is correlatable with an indirect loanword via Kiswahili. In the latter, the syllabicity of /ɪ/ is preserved, as depicted in the following representation.

(5.4) $ taɪə $ > tae $ ri

Correlation is drawn on the basis of resyllabification. It can be assumed that the process depicted targets a disyllabic shape. In view of these derivations, this study postulates a case of word structure optimalization. Optimalization refers to a process of modification which targets an ideal rather than a permissible wordform. This postulate derives credibility from a claim that, in many world languages, the disyllabic form functions as the optimal form of word structure (see Lehiste, 1970: 163-7).

5.2.1.2 Disyllabic Wordforms

By virtue of a correspondence of phonematic composition, about a fifth of the disyllabic words preserve their phonological shape. The rest regularly restructure into trisyllabic and quadrisyllabic forms as represented below.

(5.5)

ɒ $ fɪs	>	wa $ ɸi $ ši
mə $ ši:n	>	ma $ ši $ ni
dʌ $ zn	>	nda $ θa $ ni

(5.6)

bɪs $ kɪt	>	mo $ θu $ ɣwi $ ti
blæŋ $ kɪt	>	mo $ re $ ŋge $ ti
træk $ tə	>	ka $ ra $ ɣi $ ta

The generalizations made in relation to the modification

of the monosyllabic words generally hold true for their disyllabic counterparts. One exception can be noted: a phonological shape is preserved if a consonant deletes.

The deletion of a consonant is observable in the derivation of [pʊkčə] > [mbisa] and [pʌŋkčə] > [θañja]. This constitutes proof that the phonological shape of derivatives does not always depend on the underlying phonematic structure. Further proof can be found in trisyllabic forms.

5.2.1.3 Trisyllabic Wordforms

Many of the underlying trisyllabic words depict a CVCVCV pattern. Predictably, this pattern is preserved. Trisyllabic words depicting other phonematic shapes regularly modify into quadrisyllabic forms, as depicted in (5.7).

(5.7)(a) vɪ $ tə $ mɪn > ɸi $ ta $ mɛ $ ni

mɪ $ kə $ nɪk > ma $ ka $ ni $ ka

baɪ $ sɪ $ kl > moi $ θi $ ki $ ri

(b) hɒ $ spɪ $ tl > θi $ɸi $ ta $ re

ɪn $ spek $ tə > θu $ ɸɛ $ γi $ ta

Two significant observations can be made in relation to the prosodic adaptation of the trisyllabic forms depicted

above. The phonematic shape of the first set of data is modified only as far as it affects the final syllables, since the preceding forms can be said to be well-formed. A new strategy functions in the modification of the second set of data. The adaptation process incorporates deletion of the word initial syllables, alongside the application of the more direct resyllabification procedure.

These procedures are valuable in two ways. Firstly, they point to the significance of the phonematic shape of the underlying syllables. Secondly, they suggest a constraint which extends beyond the syllable structure conditions (SSC). The existence of such a level can also be inferred from the adaptation of the quadrisyllabic wordforms.

5.2.1.4 Quadrisyllabic Wordforms

While certain quadrisyllabic wordforms restructure into trisyllabic reflexes, some preserve their phonological shape. Structure preservation is not motivated by the phonematic correspondence observable among the simpler phonological shapes. Rather, it is the outcome of a more innovative manipulation of the word structure conditions. This is observed in the derivations represented in (5.8).

(5.8)(a) ɪn $ tɜ:p $ rɪ $ tə > tə $ ɸu $ tə

(b) æ $ grɪ $ kʌl $ čə > ŋgi $ ri $ ɣa $ ša

ɪ $ mɜ: $ jn $ si > ma $ ñjɛ $ nɛ $ ti

vet $ rɪ $ nə $ ri > ɸɛ $ ti $ na $ re

There is one interesting development: it concerns the fact that syllable deletion is decisive in the derivation depicted above. In each case where the phonological shape is preserved, one syllable deletes. Where the derivative comprises a reduced constituent structure, the deletion of two syllables is involved. This development confirms a claim posited above, to the effect that the phonematic composition of underlying forms is not solely responsible for the phonological shape of the derivatives manifested.

It is an important fact that the prosodic adaptation of loanwords is sensitive to the phonematic shape of the underlying syllables. Otherwise, a fundamental premise of phonotactic adaptation would be nullified. It is also a sustainable argument that the prosodic adaptation of the monosyllabic and the disyllabic wordforms is relatively straightforward. As can be observed in the foregoing illustrations, this mostly involves the restructuring of the underlying forms into CV... sequences. This strategy is modified where the adaptation of the trisyllabic and the quadrisyllabic (polysyllabic) wordforms is involved.

It has been pointed out that some of the derivatives of the polysyllabic wordforms manifest syllable deletion. This development can be interpreted to mean that the syllable, though basic to phonological function in general, does not constrain the process of prosodic adaptation.

This study postulates a higher level prosodic unit which organizes syllables into the appropriate constituents. In the course of the re-organization of the prosodic shape of wordforms, this constraint employs syllable deletion as an adaptation strategy, where perceived necessary.

5.2.2 Syllable Deletion

Certain loanwords manifest syllable deletion. In view of the limited data, all the loanwords manifesting syllable deletion are examined together irrespective of the phonological shape of the individual form. The phonetic environment is, however, taken into consideration, as far as it relates to the position of a syllable in the word. Two positions are considered: word initial and word medial.

Syllable deletion at the word initial position occurs in the adaptation of several loanwords, as represented in (5.9). Three phonematic shapes of the relevant syllables are manifested, CV , V, and VC, as depicted below.

(5.9)(a) ('hɔ) $ spɪ $ tl > θi $ ϕi $ ta $ re
\
0

(b) ('æ)$ grɪ $ kʌl $ čə > ŋgi $ ri $ γa $ ša
\
0

(ɪ) $'mɜ: $ jn $ si > ma $ ñʃɛ $ nɛ $ ti
\
0

(ə)$'gri: $ mənt > ŋgi $ ri $ mi $ ti
\
0

(c) (ɪn)$ 'pek $ tə > θu $ϕɛ $ γi $ ta
\
0

(ɪn)$'tɜ:p $ (rɪ) $ tə > ta $ϕu $ ta
\ \
0 0

Neither a phonemic nor a phonotactic motivation is identifiable for the deletion of a syllable in the word initial position. This claim is based on two observations. Deleleted syllables differ in their phonematic shapes and also in their internal phonemic composition. These syllables function in distinct phonetic environments, in view of the accentual properties of the contiguous syllables.

The manifest differentiation of the phonetic environment is taken to indicate that the factors cited above are not

decisive for syllable deletion. Other than their position in the wordform, therefore, the deleted syllables share little else in terms of the phonetic conditioning.

The significance of the syllable position in a given word is, itself, questionable. It can be observed that in one example a medial syllable, as well as the word initial equivalent, is deleted (consider the modification of [ɪn $'tɜ:p $ rɪ $ tə] > [ta $ ɸu $ ta]). The deletion of word medial syllables affects CV forms, incorporating sonorant onsets. This relationship is observable in (5.10).

(5.10) mju $('nɪ)$ sɪ $ pl > mo $ θu $ ɸa $ re
\
0
'vet $(rɪ) $ nə $ ri > ɸɛ $ ti $ na $ re
\
0

Comparable to deletion in the word initial position, the phonetic environment of each deleted medial syllable is distinct in terms of the preceding and the succeeding elements. Hence, this observation further substantiates the assumption that the deletion of a unitary syllable does not necessarily depend on the phonetic environment. The constraint of syllable deletion can be determined in relation to the phonological shape of the words involved.

By virtue of the underlying phonematic shapes, each of the words involved has a potential of either five or six syllables. With the exception incorporating a trisyllabic derivation, other derivatives consist of four syllables. This development indicates that the maximum size allowed for a Gîkûyû phonological word is a quadrisyllabic form.

This study, therefore, postulates a maximality condition for word structure in the recipient language. By virtue of this condition, the phonological principles of Gîkûyû allow a maximum of four syllables for a well-formed word. The notion of a well-formedness maximality condition is adopted from metrical phonology, where it refers to the maximum number of feet allowed in the phonological words a language establishes (see Hogg, McCully, 1987: 214-6).

It can then be assumed that in the adaptation process, a maximality condition monitors the occurrence of all the potential syllables for each derived word in order to regulate their number. This condition, then, establishes the maximum number of syllables for each loanword, consistent with the constraints it encounters and the principles inherent in the prosody of the recipient language.

A closer focus on prosodic function reveals that syllable deletion is phonetically motivated. An examination of all

the affected syllables shows that each of the forms can be considered a weak syllable by virtue of its onset or rhyme, relative to those of the other syllables in the same word. This claim implies that weaker syllables are more likely to delete than their stronger counterparts. It is, therefore, based on an assumption of the application of the principles of a phonetic strength hierarchy.

Several facts point to the viability of phonetic strength as criteria for syllable deletion. The deleted syllables incorporate either a zero onset, one comprising sonorants or one composed of approximants. In view of the phonetic strength hierarchy, these sounds are considered weak consonants. As a result, they constitute weak syllables. The notion of a weak syllable is extended to the unitary V syllables, on account of the absence of the onsets.

Where, in seemingly identical syllable onsets, one unit is deleted and the other preserved (consider [vetrɪnari] > [ɸɛtinare]), the reason can be found in the constituent rhyme. For instance, ri is phonetically stronger than $rɪ$ by virtue of the more stable vowel unit. There is a plausibility that, in this case, the phonetic environment is involved in the deletion process. The deleted syllable would have featured in a word medial position. The latter

is a weakening position (see Sloat, 1978: 114-5). It, therefore, contributes to the reduction of the phonetic strength of the functional sonorant still further.

Besides the phonetic viability, the process of syllable deletion is considered phonologically motivated. This claim is founded on a systematic exploration of the lexical conditions of Gîkûyû grammar. The exploration reveals that phonological wordforms incorporating more than four syllables are not manifest in the native Gîkûyû lexicon.

The phonological reality of the word structure maximality condition should not be seen to reduce the significance of the Gîkûyû syllable for the adaptation of loanwords. It is particularly significant that a non-isochronous syllable structure gives way to the isochronous equivalent. The notion of a syllable dependent isochronism links to the accentual aspects of prosodic function. Syllable composition regulates the adaptation of prosodic features.

5.3 Prosodic Feature Adaptation

The prosodic structure incorporates the phonetic features of prominence. The word prominence is employed as a cover term to include the phonetic correlates of stress, tone, and quantity, as these function in the adaptation of loanwords. This analysis, hence, addresses three elements

of prosodic adaptation: (1) stress modification, (2) tone association, and (3) the assignment of phonetic quantity.

5.3.1 Stress Modification

Of significance to the notion of stress modification are distinct accentual constraints for the languages of this study. Stress in English can be ultimate, penultimate or antepenultimate, depending on phonetic weight in the word (see Hogg, McCully 1987: 75-82; Goldsmith 1990: 208-13). This is unlike the case for Gîkûyû, whereby word stress is fixed on the penultimate syllable (see 2.3.3.2).

The question of stress function is a complex one as it correlates with the syllable structure conditions. This examination attempts to reduce the complexity involved by developing an analysis based on the underlying metrical stress structure. Two perspectives are adopted in view of whether rhyme stress is a single or a multiple structure.

5.3.1.1 Single Stress

The single rhyme stress structure correlates with the phonological shape of monosyllabic wordforms. Since monosyllabic forms are without any perceptible change of the primary stress, the adaptation process affects the modification of rhyme stress. Subsequent to this is an application of the Gîkûyû stress rule as depicted in (5.11).

(5.11) (a)

primary stress			x
rhyme stress	x		x x
wordforms	mæp	>	maɸu

(b)

primary stress			x
rhyme stress	x		x x
wordforms	fɔ:m	>	ɸɔmu

(c)

primary stress			x
rhyme stress	x		x x x
wordforms	sku:l	>	θukuru

(d)

primary stress			x
rhyme stress	x		x x x
wordforms	klæs	>	keraθi

The derivation of the Gîkûyû rhyme stress is correlatable with the phonological shape of the derived wordforms. A correlation is sustained in multiple stress adaptation.

5.3.1.2 Multiple Stress

Except for the word #'ægrɪkʌlčə#, the multisyllabic forms depict one primary stress. On account of this constraint, these words are examined collectively irrespective of the syllable composition. Two treatments of a multiple stress

adaptation are identified: preserved or revised. These assumptions involve a consideration of stress position. Stress is assumed to be preserved, where there is a Correspondence of the underlying and the derived position.

5.3.1.2.1 Preserved Stress

Stress is conceived as preserved if it underlyingly falls on the penultimate syllable. It is, however, helpful to recognize two perspectives of stress preservation. From one perspective, the underlying constituent syllables are perceived to be well-formed units in view of the phonematic structure of Gîkûyû. This is assumed to be true for the disyllabic and trisyllabic forms depicted in (5.12).

(5.12)(a) primary stress x x
rhyme stress x x x x
wordforms mi:tə > mita

(b) primary stress x x
rhyme stress x x x x
wordforms lɒri > rɔri

(c) primary stress x x
rhyme stress x x x x x x
wordforms vərændə > ɸaranda

(d) primary stress	X			X
rhyme stress	X X X			X X X
wordform	dɪsembə	>		ndiθɛmba

Stress position is maintained in loanwords which have also undergone phonematic restructuring as represented below.

(5.13) (a) primary stress	X			X
rhyme stress	X X			X X
wordform	pɪkčə	>		mbiša
(b) primary stress	X			X
rhyme stress	X X			X X
wordform	pensl	>		ɸɛňǰo
(c) primary stress	X			X
rhyme stress	X X			X X X
wordform	kʌbəd	>		kaɸati
(d) primary stress	X			X
rhyme stress	X X			X X X
wordform	pækɪt	>		mbaɣiti

At the second level, the notion of stress preservation is rather controvercial as it is mainly founded on the principle

a correspondence of stress position, without considering the perceptual implications of the modified phonological shape. From a different perspective, the assumed cause of controversy is considered beneficial for the present analysis: it accords credibility to the notion of stress adaptation even when there is correspondence of position.

Although there is correlation of stress position, the modification of a phonological shape produces an overall melodic difference in the derivatives. The difference is perceived in the pre-stress phase, introduced into the trisyllabic derivations. This difference is more pronounced where the stress position is completely revised.

5.3.1.2.2 Revised Stress

Stress is said to be revised where there is a change of position. This usually happens where it occurs in either the ultimate or antepenultimate syllables of underlying wordforms. In either of these cases, stress shifts to the penultimate syllable of the derivatives in response to the Gîkûyû native stress rule, as illustrated in (5.14).

(5.14) (a)	primary stress	x		x
	rhyme stress	x x		x x x
	wordforms	məši:n	>	mašini

(b)	primary stress	x		x
	rhyme stress	x x		x x x
	wordform	pəli:s	>	ɸiriθi

The effect of the adjustment from the ultimate to the penultimate stress is not clearly distinct. This difference is offset by the perceptual correlates of a high tone which links to the final syllables of nouns (see 5.3.2).

Change in the word melody is more pronounced in the polysyllabic derivations, whereby a distinct left headed prominence is replaced by a less dynamic primary stress.

(c)	primary stress	x		x
	secondary stress	x x		x
	rhyme stresss	x x x		x x x
	wordforms	mɑʊtəkɑ:	>	motɔka

(d)	primary stress	x		x
	secondary stress	x x		x
	rhyme stress	x x x		x x x x
	wordforms	baɪsɪkəl	>	moiθikiri

Stress adaptation involves a multi-faceted procedure of reorganization, whereby the well formedness principles of

the phonological structure of Gîkûyû destress all feet and transfer primary stress to the penultimate syllable of the loanwords. This claim is based on two assumptions: (1) the processes of resyllabification and destressing occur simultaneously, and (2) the unstressed syllables of Gîkûyû are pronounced at the same level of intensity.

In view of these assumptions, two arguments can be used to describe the most salient facts of stress adaptation. A dynamic, culminative primary stress is replaced by a predictable, demarcative correlate. In the course of this re-organization, loanwords deassociate the constraints of a stress timing system to reassociate a syllable based isochronism. It can be assumed that this adjustment is essential for tone assignment, in view of a correlation between the grid formalism and tonal linkage (see 2.2.2).

5.3.2 Tone Association

The modification observed in the adaptation of stress conforms to the constraints of a tone language, such as Gîkûyû (see 2.3.3.1). In a tone language, pitch variation is a dynamic feature of the lexicon. For such a language, it is important to consider tone an inherent property of the syllables as constituents of the individual words. In effect, tone assignment is a well-formedness requirement of the structure of the Gîkûyû wordforms.

In this study, tone is conceived as a phonetic feature of the lexicon describable in terms of prescribed sequences of pitches per word. Pitch configurations are regularly governed by the phonological shapes of wordforms, and do not necessarily serve a distinctive function (see Cruttenden 1986: 8-9; Clark, Yallop 1990: 284-95). A distinctive morphologization of tone is, however, observable.

An adequate treatment of the tonal function, therefore, needs to address the processes involved in the morphosyntactic derivations (see Hyman 1976; Odden 1987). In such cases, the analysis transcends the domain of lexical into phrasal phonology. This study is confined to an examination of the phonetic function and morphonemic derivation.

Essentially, tone is a definitive feature of the lexical structure of Gîkûyû. This is in contrast with the situation in English whereby pitch cannot be associated with the lexical function itself (see Roach, 1983: 123-6). Since distinctive pitch variation is not a property of the English words themselves, this study considers tone adaptation as a process of appropriate pitch association.

The representation of tone linking, therefore, focuses on the derivatives rather than the underlying forms. In this connection, tone linkage is sensitive to the fact that an

appropriate pitch association usually correlates with the phonological shape of the word in question. Correlating with the multisyllabic derivatives, three shapes of tonal association are manifest: double, triple and quadruple.

5.3.2.1 Double Tone Association

The disyllabic derivatives incorporate two tonal pitches. They are regularly low (L) and high (H), as illustrated.

(5.15) (a) š3:t > šati
L H

(b) pɪn > mbini
L H

Where the lexical constraints dictate, this basic tonal pattern contrasts with any of three tonemes: LL, HH or HL (see 2.3.3.1). The use of distinctive tone is manifest in the morphologization of the English grammatical homonym [ceɪñj]. This homonym is incorporated into the lexical system of Gîkûyû in its nominal (N) and verbal (V) forms. Alongside the observable formal morphological assimilation, there is tonal variation as illustrated in (5.16).

(5.16) (a) [ceɪñj]N > [šeñji]N
L H

(b) [ɗeɯñ̃ʃ]v > [šɛñ̃ʃia]v
H L

Among some speakers, the verbal form retains the tense vowel in the first syllable but the tonal variation is consistent. The consistency involved is an indication of the basic significance of tone in this language. This is further substantiated in the trisyllabic derivations.

5.3.2.2 Triple Tone Association

Trisyllabic derivations adopt three tonal pitches. They are regularly LLH, as illustrated in (5.17).

(5.17) (a) desk > ndɛθiki
L L H

(b) klæs > keraθi
L L H

In certain loanwords, the tonal pattern depicted above contrasts with a set of HHL pitches. This occurs in the morphologization of a Gîkûyû derivative, [θɛrɛnda], from a reflex of the English word [sərendə]. The process employs tone alternation to derive a noun, (turncoat), out of the verbal correspondence of #surrender# as portrayed below.

(5.18)

[θɛrɛnda]N	<->	[θɛrɛnda]V
| | |		| | |
L L H		H H L

In a manner similar to the morphological derivation of the disyllabic form illustrated in (5.16), the English grammatical homonym [sɪment] is introduced into the Gîkûyû lexicon. Besides application of relevant word formation rules, the process of lexical innovation incorporates a distinctive tonal variation as represented in (5.19).

(5.19)

['sɪment]N	>	[θimiti]
		| | |
		L L H
[sɪ'ment]V	>	[θiminda]
		| | |
		H H L

Hyman (1975: 221-5) explains that the medial syllable of a trisyllabic wordform underlyingly associates to a contour tone. The latter can be either rising or falling, depending on the tones of the first and the last syllables. In order to create the register tones perceived in the derivatives, regressive assimilation takes place.

In the process of assimilation, the tone of the first syllable spreads into the second. A total absorption of the first tone, by the medial syllable, culminates in two

features: (1) a succession of register tones, and (2) the LH tonal patterns, observable in the disyllabic derivations. The significance of this correlation can be inferred from the re-duplication observed in the quadruple tonal association.

5.3.2.3 Quadruple Tone Association

Correlating with the regular structure of rhyme stress, the quadrisyllabic derivations regularly adopt four tonal pitches. These depict a regular alternation of LHLH tones as follows.

(5.20) (a) vetrɪnəri > ɸɛtinare
L H L H

(b) ægrɪkʌlčə > ŋgiriɣaša
L H L H

It can be observed that the alternation depicted above is a reduplication of the pattern observed in the disyllabic derivations (consider 5.15). This correlation, therefore, validates an assumption that a LH pitch pattern constitutes the fundamental tonal shape of the Gîkûyû nominal forms. One monosyllabic derivation can be said to confirm this assumption.

The prosodic adaptation of loanwords emerges with one monosyllabic derivative. This derivative manifests a contour tone in the shape of a LH glide, as represented in (5.21).

(5.21) sɔ: > θɔ:
/\
LH

Usually a long vowel is treated as a bimoraic unit correlating with a geminate tone. It is plausible that the geminate tone eventually modifies into a contour unit to produce the effect of tone structure optimalization.

The foregoing discussion on the tonal function can be said to validate one conclusion: that tonal linkage is a basic well-formedness condition requirement of the Gîkûyû phonological word. By virtue of this condition, it is assumed that the phonological principles of Gîkûyû require that word prosody incorporates a specific melodic configuration.

It is regularly observed that tone variation, in so far as it relates to the adaptation of loanwords, serves phonetic and morphological functions. In contrast to these roles, syllable quantity manifests a distinctive lexical function.

5.3.3 Quantity Assignment

The term quantity refers to the perceptual and physical correlates of the moraic duration (see Lehiste, 1970: 6-10). Mora represents the minimal unit of articulatory timing. It correlates with the perceptual temporal properties of either a V or a CV unit. The notion of phonetic quantity is reinterpreted as

either vowel duration or syllable weight depending on the general focus of the relevant analysis and related description.

On the strength of the coarticulation assumed of the utterance of CV sequences, this study considers phonetic quantity to be more specifically a property of the syllable unit. Even in stress languages such as English where syllables depict a more complex phonematic structure, the phonetic quantity is realistically perceived to be a property of the whole syllable.

Syllable quantity is observable in some loanwords. In all underlying occurrences, the syllable quantity serves a phonetic rather than a lexical function. Unlike the case in English, distinctive quantity is a salient feature of the Gîkûyû lexicon. Quantity is therefore preserved in loanwords if it serves a lexically distinctive function, as illustrated below.

(5.22)

stɔ:	>	θitɔ:
su:t	>	θu:ti
kɑ:ki	>	ɣa:ki
kɔ:t	>	iɣɔ:ti

This illustration can be treated as evidence that preservation of phonetic quantity is motivated by certain lexical needs of Gîkûyû. Except for the perceptual phonetic quantity, these

derivatives would be homonymic with the following forms.

(5.23)	θitɔ	'accusation'
	θuti	'a sense of craving'
	γaki	'a small fly'
	iγɔti	'the nape'

The significance of the lexical constraints is further demonstrated in connection with some loanwords which are previously devoid of quantity. The derivatives, however, incorporate distinctive quantity as observed in (5.24).

(5.24)	bʊl	>	mbi:ro
	gəʊl	>	ŋgɔ:ru

It can be assumed that these derivatives adopt phonetic quantity in order to eliminate a homonymic relationship with the following native lexemes of Gîkûyû.

(5.25)	mbiro	' a type of a wild fruit'
	ŋgɔru	' a type of wild animal'

On the strength of the foregoing illustration, it can be concluded that the preservation, or adoption, of phonetic quantity serves a specifiable lexical need: it functions

to block a semantic clash. This is motivated by an optimalization principle which favours a one-to-one linkage of form and meaning (see Anttila, 1972: 151-2). The latter is meant to ensure that lexemes are maximally distinct.

Comparable to the function of other prosodic features, a definitive significance of the phonetic quantity has been demonstrated. A precise specification of the role played by each prosodic feature, in the adaptation of loanwords, points to a systematic distinction of their phonological significance. Distinction of roles can be taken to evolve from the fundamental importance of prosodic phonology.

5.4 Conclusion

This chapter has discussed five perspectives of prosodic adaptation. It focuses on the formal constraints and the the accentual structure of a phonological word. These properties are definitive in establishing the essential importance of prosodic systems at the lexical level. Their significance is made explicit in several arguments.

Word resyllabification is a basic requirement of the adaptation process. The prosodic adaptation of loanwords, therefore, involves a specific response to the principles which govern the syllable, and by extension, the word structure conditions of the recipient language.

The structure of a phonological word is governed by a maximality condition which is definable in terms of constant constituent syllables. By employing syllable deletion in relation to the established phonetic strength heirarchy, this constraint limits word structure to four syllables. It can be assumed that the latter also links with the constraints of metrical structure in tone languages.

Metrical adaptation is a prerequisite for the prosodic function, particularly stress and tone. A correlation of the prosodic patterns and the phonological shape of words is also manifest. The function of prosodic features is, therefore, fundamental to the speech rhythm and melody.

On the whole, the prosodic adaptation of the Gîkûyû loanwords manifests an integrated programme whereby the formal and the accentual aspects of phonological function are co-ordinated. The integral nature of the prosodic structure suggests links to the phonemic and the phonotactic constraints. A linkage of the different aspects of loanword adaptation defines the phonological system as a formal and a functional unity. While this claim is a reflection on the phonological system of Gîkûyû in particular, there is a possibility that it is also a functional constraint of language structure in general.

CHAPTER SIX

THE CONCLUSION

6.1 Overview

This study set out to determine the phonological factors which govern the adaptation of Gîkûyû loanwords derived from English. The ultimate goal is to define the significance of the adaptation principles for Gîkûyû phonology and implications for speech production and perception.

This study was undertaken on the strength of two principal premises. Firstly, loanwords derived from English are a salient feature of the Gîkûyû lexicon but no study on the Gîkûyû loanword phenomenon is available. Secondly, Gîkûyû and English function on rather greatly differentiated phonological systems. This situation facilitates the viability of a structurally enriched investigation.

The research derives theoretical insight from the tenets of generative grammar in general and generative phonology in particular. Descriptions are modelled on two multilinear approaches: autosegmental and metrical phonology. On the basis of these models, the study identifies three aspects of loanword adaptation: phonemic, phonotactic, and prosodic. Linguistically significant generalizations define the findings of each aspect of the adaptation.

6.2 Summary of Major Findings

The phoneme forms the anchor point for all levels of loan word adaptation. Phonemic adaptation represents the various substitutional procedures of both single and contour units. Three basic strategies of phonemic adaptation are addressed: preservation, merger, and split (see 3.1).

The notion of phonemic preservation assumes some level of phonetic equivalence. This assumption is founded on a correspondence of the componential features, despite the systemic differences which may distinguish a Gîkûyû from an English unit. Phonemic preservation is sustained where lone sounds types are hetero-organic. This is exemplified in the adaptation of the approximants and the nasals.

In most homorganic articulations, phonemic mergers arise. This is manifest in the adaptation of the central vowels, the liquids, and the fricatives. Mergers arise since, in comparison with English, Gîkûyû functions on a more restricted phonemic inventory. Some mergers co-occur with splits as observed in the adaptation of the high vowels.

Straightforward cases of phonemic split are observable in the adaptation of the mid and the low front vowels, the plosives, and the affricates. Generally, phonemic splits are the result of morphological, lexical and etymological

constraints. These constraints are re-interpreted as the extra-phonetic factors of the nativization process.

Morphological nativization occurs at all levels of the adaptation process and is best exemplified in the morphologization of word initial syllables to derive Gîkûyû nominal class morphemes or morphonemes. The lexicalization principle functions where an English homonym modifies into two reflexes. Etymological nativization is implied if the adaptation process indicates telescopation.

Related to the question of etymological nativization is the notion of phonological levelling. Phonological levelling is conceived where the adaptation process targets a more proportionate distribution of the Gîkûyû distinctive units. This is generally assumed true of the subsequent modifications of the high, the mid, and the front vowels.

Contour phonemes are constrained by the same strategies as the single units, with one difference. The English contour vowels undergo relative simplification processes whereby the triphthongs diphthongize, and some diphthongs monophthongize, into plausible reflexes in the phonological structure of Gîkûyû. The contour vowels, therefore, function as unitary equivalents of the single phonemes.

The significance of phonemic adaptation derives from two considerations. Firstly, each strategy affects correlatable sets of phonemic units. Secondly, every procedure is motivated by a specific grammatical factor and also facilitated by the phonetic conditions of Gîkûyû. Similar observations are made regarding phonotactic adaptation.

The notion of phonotactic adaptation incorporates two licensers of the grammatical structure of Gîkûyû: the syllable and the phonological word. The syllable licenses the tautosyllabic associations whereas the word regulates the hetero-syllabic (distributional) relationships (see 4.1).

Phonotactic adaptation at the syllable level is defined from two perspectives (see 4.2). From one perspective, the optimal Gîkûyû syllable functions as the primary licenser. A primary licensing role is conceived in relation to the modification of the skeletal (phonematic) structure. By means of a process of V epenthesis, the phonematic shape regularly restructures into CV... sequences.

Syllable constituents function as secondary licensers. A secondary licensing role is conceived in relation to the linkage of distinct phonemic units. The syllable onset licences the epenthesis of particular vowels: /u/, /o/, and /i/. These vowels function in specific environments:

after labials, the liquid, and the obstruents associated with the "body of the tongue" features, respectively.

Syllable rhyme functions as a secondary licenser where it conditions the resyllabication of the syllabic laterals. This conclusion is arrived at on the basis of the obligatory nature of the vowel rhyme, in the phonological structure of Gîkûyû. Since a syllabic consonant is inadmissible in this language, the syllabic lateral modifies into the vowel having a close phonetic affinity, /o/.

The syllable level phonotactic adaptation regulates relations between consonants and vowels (onset and rhyme). In contrast, the word level phonotactic adaptation concerns the effect of vowel on vowel and consonant on consonant. Two regular adaptation strategies are identified: vocalic assimilation and consonantal dissimilation (see 4.3).

Vocalic assimilation mainly occurs as a process of spreading, of the vowels and the liquid, into a contiguous syllable. For the liquid, the process manifests itself as a reduplication of whole syllables. This strategy generally links two syllables of trisyllabic derivatives.

In contrast, consonantal dissimilation delinks two syllables of derivatives. Consonantal dissimilation occurs in

two regular ways: as the velar suppletion of the voiceless plosive to the fricative, and as prenasal delinking.

The suppletion of the Gîkûyû velar plosive to the homorganic fricative is syllable based. It occurs where the voiceless velar plosive precedes a tongue stricture voiceless obstruent in a succeeding syllable. This principle is identifiable as an aspect of Dahl's law of dissimilation. The law describes certain dissimilation processes occurring in some Bantu languages. Among these is Gîkûyû.

Prenasal delinking is a label used by this study to describe a strategy whereby the adaptation process disallows the occurrence of contiguous prenasalized syllables in the loanwords. This objective is achieved by means of one of two processes: either the frication or the devoicing of one of the potentially prenasalized obstruents.

A notable aspect of the word level phonotactic adaptation is the correlation of the general strategies with the phonematic categories. While assimilation involves the vocalic units, dissimilation relates to the consonantal sounds. This correlation indicates the significance of phonematic linkage for the well-formed Gîkûyû prosody.

Prosodic adaptation is generally manifested in two ways:

the modification of the prosodic units and the adjustment or assignment of the prosodic features (see 5.1). The one is concerned with the formal constraints, and the other the accentual structure of the Gîkûyû phonological word.

The adaptation of the formal prosodic structure is effected through a procedure of resyllabification. Two strategies of resyllabification are identified (see 5.2). One procedure involves a straight-forward reorganization of the phonological shape of wordforms. This is achieved by means of the modification of the constituent syllable structure. At this level the underlying phonematic composition regularly functions as the conditioning factor.

At another level the resyllabification strategy incorporates deletion of the weakest syllable in a given word, depending on the functional phonetic strength heirarchy. Syllable deletion is constrained by a Gîkûyû maximality principle which restricts the maximum phonetic shape of a phonological wordform to four constituent syllables.

Resyllabification also involves a process of desyllabication to derive disyllabic reflexes. It is assumed that this derivation targets word structure optimalization. In many languages, a disyllabic wordform presents the ideal domain for the contrastive function of prosodic features.

The accentual aspect of prosodic adapation involves three features: stress, tone, and quantity (see 5.3). Each feature depends on a syllabic metre. This is crucial because the Gîkûyû prosody is based on a syllable sensitive isochronism. Metrical structure modification is, therefore, a prerequisite for the adaptation of prosodic features.

Stress adaptation occurs at two levels: that of the word and of the syllable. The first level culminates in a process that places primary stress on the penultimate syllable of each derivative. At the second level, rhyme stress modifies from an irregular into a regular occurrence consistent with the isochronous syllable pattern of Gîkûyû. Rhyme stress structure correlates with tone assignment.

Tonal pitch alternation is a well-formedness condition of the Gîkûyû phonological word. In the adaptation process, pitch alternation serves a phonetic rather than a lexical function. Where loanwords undergo morphologization procedures, the derivatives also adopt distinctive tones.

A lexically distinctive function is manifested in the use of syllable quantity. Distinctive quantity is employed to block homonymic relations with some of the native wordforms. This is inferred from the observable contrastive sets of certain loanwords and some native wordforms.

Each aspect of prosodic adaptation has a specific grammatical function. This claim is generalized to the whole adaptation process. It is especially significant because nearly all the Gîkûyû loanwords depict complete adaptation, consistent with the native lexical principles. Instances of partial adaptation point to restricted usage, associated with the education and the law regiters.

Some rather rare innovations are attributed to indirect borrowing via Kiswahili. These relate to cases of vowel height gradation and post fricative softening. It suffices that these derivations are: (1) phonetically viable and (2) have plausible phonotactic conditioning, motivated by the need for prosodic harmony. Logically, grammatically motivated modifications derive certain conclusions.

6.3 Conclusions

This study presents an illutrative account of different levels of loanword adaptation. In so doing it validates the multi-linear view of phonology. By extension, the study proves that the synthetic model of metrical and autosegmental phonology is descriptively adequate. An illustrative exposition of phonemic, phonotactic, and prosodic adaptation demonstrates the psychological reality of the phoneme, the syllable, and the phonological word. This claim is based on the Gîkûyû phonological reality.

The principles behind phonemic adaptation derive from the paradigmatic relations of the phonological structure. A psychological reality of phonemic adaptation can be demonstrated from phonetic and phonological perspectives.

From one phonetic perspective, a psychological reality is inferred from the structural correlation of single and contour phonemic units. Correlation is conceived from the simplification processes, the most significant being monophthongization of the English contour units. This strategy validates the assumption that single and contour phonemic units have a perceptual, temporal, equivalence.

From a different point of view, a psychological reality derives from the motivation of phonemic mergers. The formation of the mergers results from phonemic constraints, whereby the recipient language functions under a more restricted sound inventory. In spite of the significance of phonemic correlation and merger, however, preservation is considered logical in instances of phonetic equivalence.

From a phonological perspective, the psychological reality of phonemic adaptation is founded on the whole question of loanword nativization in view of the complex nature of the grammatical structure and function. In this case, the claim of psychological reality derives from the

manifest co-ordination of the different adaptation strategies with particular grammatical constraints of Gîkûyû.

The phoneme is therefore a flexible unit of speech. The observable flexibility means that the phoneme is responsive to the different needs of grammatical function and evolution. The question of grammatical evolution can be appreciated from a consideration of loanword nativization as a gradual, progressive process. This attribute relates to the postulated relative chronologies of sound change.

Essentially, the phoneme functions as a competence rather than a performance segment. As such, it is fundamentally an abstract unit of speech. In both functional and descriptive aspects, the phoneme is an unstable element. The observable instability is responsible for the variability of the processes, the rules, and the principles, which define the phonemic adaptation of Gîkûyû loanwords.

In contrast with the phoneme, the syllable is physically and perceptually a stable unit of speech. Stability is perceived in terms of the temporal constancy which arises out of the coarticulation of the constituent phonematic units. And since coarticulation is a consequence of the inertia of the articulatory organs, the syllable incorporates both a psychological and a physical reality.

The significance of the Gîkûyû optimal syllable (CV unit) is explicit in the predictable epenthesis of V units as a strategy for preferred structure preservation. In this connection, V epenthesis fuctions to fill an empty skeletal position. The notion of an empty position is conceived in view of the obligatory nature of the V nucleus.

Concrete syllable reality can also be inferred from the phonetic affinity existing between classes of consonants (syllable onsets) and specific vowel properties (syllable rhymes) in a tautosyllabic association. This affinity establishes an optimal relationship. In this relationship, the linkage of onset to the rhyme derives a concrete phonematic unit on account of reciprocal assimilation.

Owing to its constancy, therefore, the Gîkûyû syllable functions at the core of the phonological structure where it organizes phonemes into permissible and optimal sequences. It is not only recognizable as the basic phonotactic unit, but also the most appropriate domain for the representation of the Gîkûyû tone, stress, and quantity.

This study demonstrates that it would be difficult to describe the adaptation of any of the prosodic features without reference to either the syllable as a unit or one of its constituents. In this role, the syllable manifests

itself as the most basic unit for the co-ordination of the formal and the accentual elements of Gîkûyû in particular and possibly the phonological structure in general.

For any phonological system, the mode of co-ordination of the properties of speech is essential for the structure of language rhythm. As explained above, speech rhythm is associated with the isochronous, and isodynamic, units of the language in question (see 2.2.2). This means that the perceptual correlates of the Gîkûyû isochronism correspond to the syllable structure. Hence, the Gîkûyû syllable regulates the properties of the metrical rhythm.

It follows that the metrical structure constitutes a systemic entity. In this study it relates to the adaptation of loanwords from their stress-conditioned structures into the syllable-sensitive equivalents. For this reason, the syllabification and resyllabification of loanwords are obligatory strategies of the adaptation process.

Metrical rhyme structure is rather intricately linked to the various prosodic properties of the phonological word. The phonological word is recognizable as the ideal unit on which the phonemic, the phonotactic, and the prosodic properties are programmed. At this level all the phonological elements identified in this study are ultimately

licenced. Besides language rhythm, these properties incorporate the melodic and the harmonic aspects of speech.

Speech melody is achieved by means of a systematic alternation of phonetic pitch. The latter is, itself, overlaid on the rhythmic and harmonic properties of speech. Prododic harmony, on the other hand, is derived from the consistent heterosyllabic linkage observed in the strategies of syntagmatic association and distribution. It is a viable assumption that prosodic harmony is crucial to the application of the two converse principles of speech processing: the maximum ease of articulation versus a sufficient perceptual distinction of phonetic units.

Prosodic harmony enhances the compatibility of contiguous syllables of a given word. It is therefore an aspect of language aesthetics. Aesthetics is considered a valuable property as it is often carefully cultivated in speech itself and in different areas of linguistic creativity.

On account of the significance of prosodic function, the phonological word is subject to both optimality and maximality conditions. A disyllabic wordform constitutes the optimal structure. This can be considered an ideal domain for the metric perception of speech rhythm, a contrastive placement of register tones, and the distinctive function

of lexical quantity. These assumptions validate the conclusion that a clear demarcation of the function of prosodic properties enhances both the intellectual recognition and the aesthetic appreciation of Gîkûyû wordforms.

The prosodic structure, in general, is critical to the conception of a phonological word as a competence as well as a performance unit. It can therefore be assumed that perceptual requirements limit the phonological shape of words to four syllables. If speech is to function as an efficient tool of the linguistic expression, basic performance units of a tonal language such as the phonological word need to be easily perceived and articulated.

The notion of a word level maximality condition brings to mind observations made in chapter two regarding the constraints on the structure of the phoneme and the syllable (see 2.3). It is possible that structure restriction is a pervasive aspect of the language function, governed by general principles of speech processing and programming.

A correlation of the phonological parameters implies that native speakers have an intuitive knowledge of the system of rules which governs the grammatical structure of their language as an entity. This knowledge is both specific and general, otherwise the process of loanword adaptation

would disintegrate into a meaningless disorder. Instead, this study demonstrates the existence of a carefully co-ordinated system of phonological inter-relationships.

The inter-linkage occurring among the phoneme, the syllable, and the phonological word, functions as a hierarchy of relationships. In this hierarchy, the syllable combines phonemes, and the phonological word syllables, into well-formed structures. These units are therefore models of phonological organization. On account of their organizational role, the syllable and the phonological word are considered concrete units of speech perception.

This assumption has implications for psycholinguistics in general and neurolinguistics in particular. The relevant application relates to the properties of neurolinguistic programme planning. In this connection, this study makes two claims: (1) the syllable and the phonological word are essential units of neurolinguistic programming, and, (2) the syllable is the basic unit of speech timing.

These claims are founded on fundamental properties of the syllable and the phonological word in view of their function in loanword adaptation. The syllable functions as a model for phoneme organization. It manifests itself as a periodic segment, the agent which regulates the rhythm of

Gîkûyû speech. The phonological word is constrained by a maximality condition definable in relation to constituent syllables. It is assumed that basic constraints of loanword adaptation are essential units of speech perception.

These claims are made in the face of conflicting views on the nature of the basic unit of speech programming (see Laver in Lyons 1970; Palermo 1978: 94-104). Some phoneticians advocate recognition of the phoneme on account of its status as the minimal perceptible unit of speech. Most researchers are of the opinion that utterances are processed and thereby programmed on performance units more stable than a phoneme such as the syllable.

In general, all the constraints of loanword adaptation can be considered relevant to speech perception. This claim leads to an assumption that the way native speakers perceive the lexicon of their language and the intuitive use to which they subsequently put the perceived structure, as in the adaptation of loanwords, has valuable implications for theoretical and applied phonology. The particular value of this research can be determined in relation to the new knowledge which has come to light.

6.4 Evaluation

In view of available information on loanword nativization

and the phonological structure of Gîkûyû, this study can lay some claim to new knowledge. This knowledge relates to several adaptation strategies: phonemic substitution, vowel epenthesis, lateral resyllabication, prenasal delinking, and word resyllabification, evaluated as follows.

Specific grammatical factors determine the different strategies of phonemic substitution. Phonemic merger depends on phonetic identity and correlation, while phonemic split occurs as a response to the extra-phonetic constraints of the lexical structure: namely, semantic and morphological conditioning. The regular reflex in each case indicates phonetic identity or correspondence.

This study goes beyond the phoneme to address the function of the syllable and the phonological word. The critical role of the syllable is indicated by vowel epenthesis whereby the syllable structure modifies from an aperiodic into a periodic equivalent. This strategy derives the syllabic metre crucial to a syllable rhythm.

The strategies of vowel epenthesis and lateral resyllabication reveal harmonic sets of vowels and consonants. Three harmonic sets are identified: /u/ and the labials, /o/ and the liquid, and /i/ and the consonants of the tongue stricture. The association of /i/ indicates a need

for the recognition of a phonetic feature [tongue], comparable to the features [labial] and [glottal].

Prosodic harmony is derived from the converse strategies of heterosyllabic assimilation and dissimilation. These strategies are realized as instances of vocalic spreading and prenasal delinking, respectively. Phonetic harmony is considered crucial to the two complementary principles of speech processing: the maximum ease of articulation versus sufficient perceptual distinction of prosodic units.

A maximality principle restricts the phonetic shape of a phonological word to a maximum of four syllables. This principle motivates a resyllabification strategy which involves syllable deletion. A maximality principle is generalized to the feature restriction conditions of the structure of the phonemes and the syllables. It can be assumed that a restriction principle is necessary for the perception of segments with a variable phonetic shape.

It can be considered a logical conclusion that the issues raised in this evaluation are significant aspects of Gîkûyû phonology. Though made in reference to Gîkûyû phonology, however, it can be assumed that the principles involved are relevant to the Bantu structure, tone languages, and probably phonological function in general.

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APPENDIX

GÎKÛYÛ LOANWORDS DERIVED FROM ENGLISH

The following is a glossary of two hundred and forty-two Gîkûyû loanwords derived from English. An attempt is made to classify them in terms of the broad representative semantic fields, or areas of association, as follows.

CIVIL AND MILITARY ADMINISTRATION

baîni	<	fine
bairû	<	file
bameti	<	permit
banji	<	badge
barîndi	<	parade
bathi	<	pass
biringani	<	brengun
birithi	<	police (force)
bomu	<	form
borithi	<	police (station)
thiti	<	post (station)
camanji	<	summons
cibû	<	chief
cikauti	<	scout
igooti	<	Court (of law)

kabuteni	<	(army) captain
kambî	<	camp
kanjû	<	council
kîraûni	<	crown
koburû	<	(army) corporal
kuruti	<	recruit
manjeneti	<	(political) emergency
mbanji	<	badge
mbatûni	<	platoon
mbomu	<	bomb
mbûndi	<	bond
mînja	<	major (rank)
mûthubarî	<	municipal
nditîîni	<	detention (state)
ngati	<	guard
njanji	<	judge
retheni	<	licence
ribû	<	leave
thaîri	<	sin
thamanji	<	summons
therenda	<	surrender
thetera	<	settler
thubegita	<	inspector
thurutia	<	salute
turaibiki	<	traffic (police)

wabici	<	office
warandi	<	warrant
warubanji	<	(salary) advance
wocimeni	<	watchman

CLOTHING AND COSMETICS

baithirini	<	Vaseline
bangiri	<	bangle
bethiti	<	vest
bonda	<	powder
burana	<	flannel
bururu	<	blue (dye)
cati	<	shirt
cikati	<	skirt
gaaki	<	khaki
igooti	<	coat (attire)
kotoni	<	cotton
maithirini	<	vaseline
mburaûni	<	brown
mburaûthi	<	blouse
mbururu	<	blue
mûrîngîti	<	blanket
naironi	<	nylon
nairûni	<	nylon
ngacibû	<	kerchief

ngiree	<	gray
ngirini	<	green
njaketi	<	jacket
taurû	<	towel
thikabu	<	scarf
thikati	<	skirt
thogithi	<	socks
thuuti	<	suit

EDUCATIONAL EXPERIENCE

anja	<	answer
Baranja	<	France
bînji	<	page
bithi	<	fees
buraimarî	<	primary
coka	<	chalk
cukuru	<	school
hooru	<	hall
hûrundî	<	holiday
ibuku	<	book
inji	<	inch
kamîtî	<	committee
kandi	<	card
kanja	<	cancel
kîrathi	<	class

kîrigiti	<	cricket (field)
kobî	<	copy
kwaya	<	choir
mabu	<	map
mbairû	<	bairo
mbica	<	picture
mbota	<	powder
mbuku	<	book
natharî	<	nursery
ndethiki	<	desk
ngooru	<	goal
raba	<	rubber
raini	<	line
rura	<	ruler
tenethi	<	tennis
thikauti	<	scout
thukuru	<	school
wikendi	<	weekend

FOOD AND NUTRITION

bitameni	<	vitamin
cabaci	<	chappatti
geki	<	cake
hobuna	<	oven
kabici	<	cabbage

karati	<	carrot
keki	<	cake
kîrimû	<	cream
mbata	<	butter
mbîkoni	<	bacon
mboirû	<	boil (for boiled)
mbucîri	<	butchery
mûthugwiti	<	biscuit
ndîri	<	dairy
ngirebi	<	gravy
ngirîbi	<	gravy
njamu	<	jam
ranji	<	lunch
thigara	<	cigar
thigonji	<	scones
thubu	<	soup

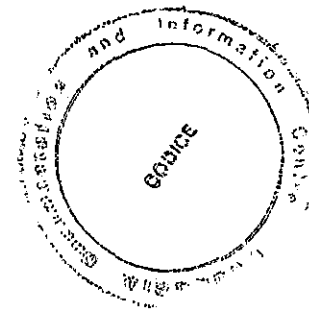
HOUSEHOLD APPLIANCES

burînji	<	fridge
giceni	<	kitchen
gotoni	<	carton
hang'a	<	hanger
itangi	<	tank
kabati	<	cupboard
kaurû	<	cowrie

kiceni	<	kitchen
mbetheni	<	basin
mbîcîni	<	basin
mbini	<	pin
mbotoraiti	<	spotlight
mburemu	<	(door) frame
mûraci	<	brush
mûraciî	<	brush
ndiroo	<	drawer
ngamu	<	gum
ngereni	<	gallon
njagî	<	jug
rîndiû	<	radio
rumu	<	room
thitobu	<	stove
thitoo	<	store
thoo	<	saw (tool)
thubana	<	spanner
thubanji	<	sponge
tibii	<	T.V.
toci	<	torch
turee	<	tray
wondurûbu	<	wardrobe

MOTOR AND AGRICULTURAL INDUSTRY

baithikiri	<	bicycle
banja	<	puncture
baranda	<	veranda
bengi	<	(Commercial) bank
benji	<	bench (terrace)
betûrû	<	petrol
bothita	<	post (office)
buraithi	<	pliers
burîmu	<	(picture) frame
cambiûni	<	champion
ceni	<	chain
cenjia	<	change (v)
cînji	<	change (n)
gîotheki	<	kiosk
îka	<	acre
injini	<	engine
kaburaita	<	carburettor
kambuni	<	company
kambûni	<	company
karagita	<	tractor
kîraciî	<	clutch
kware	<	(stone) quarry
mairu	<	mile
maithikiri	<	bicycle



makanika	<	mechanic
manînja	<	manager
marigiti	<	market
mbagiti	<	packet
mbathi	<	bus
mbaûni	<	pound (currency)
mbetiri	<	battery
mbiirû	<	bill
mburîki	<	break
mita	<	metre
motero	<	motel
mûithikiri	<	bicycle
mûtoka	<	motor-car
ndathani	<	dozen
ndemu	<	dam
ndereba	<	driver
ndibû	<	(cattle) dip
ndithûrû	<	diesel
ngaari	<	car
ngereci	<	garage
ngirigaca	<	agriculture
ngirimiti	<	agreement
ngirîndi	<	grade
ngurubu	<	group
noti	<	note (currency)

reba	<	Labour (as of Ministry)
reri	<	rail
ririeta	<	radiator
rita	<	litre
rori	<	lorry
rûbia	<	rupee
tabuta	<	interpreter
taîri	<	tyre
tegithi	<	taxi
tereni	<	train
thendi	<	cent
thiminda	<	cement (v)
thimiti	<	cement (n)
thiriba	<	silver (coin)
thitembû	<	stamp
thitînji	<	stage
thubea	<	spare (part)
waya	<	wire

OTHERS: HEALTH, LEISURE. AND RELIGION

betinarî	<	veterinary(officer)
kiriniki	<	clinic
ndagîtarî	<	doctor
thibitarî	<	hospital
wondi	<	ward

LEISURE

birimu	<	film
birumu	<	film
ndaci	<	dance
ndari	<	darling
thenema	<	cinema

RELIGION

baimbû	<	bible
bamîrî	<	family
batîrî	<	padre
caci	<	church
kîrîthima	<	christ-mas
kîrîcima	<	christ-mas
Gatoreki	<	Catholic
mîceni	<	mission (station)
ndithemba	<	December
rûthariû	<	rosary