AN EXAMINATION OF THE DISCREPANCIES BETWEEN THE GRAPHEMIC AND THE PHONOLOGICAL STRUCTURE OF GIKUYU

BY

KURIA PETER MBURU

A THESIS SUBMITTED IN PARTIAL FULFILMENT FOR THE AWARD OF THE DEGREE OF MASTER OF ARTS IN ENGLISH LANGUAGE AND LINGUISTICS OF THE KENYATTA UNIVERSITY

SEPTEMBER, 2005
DECLARATION

I declare that, to the best of my knowledge, this thesis contains no material that has previously been presented for the award of a degree in any University.

This work is therefore original except where due citation has been made.

KURIA PETER MBURU

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

Dr. Mwangi, P.
Department of English and Linguistics
Kenyatta University

Dr. Ndung’u, R.
Department of English and Linguistics
Kenyatta University
DEDICATION

This work is dedicated to my wife Wanjirũ Kuria and my children Waithĩra and Mbũrũ, and to my late Grandfather Vita Kuria wa Njũgũna whose usage of 'v' in his name provoked me into undertaking this research.
ACKNOWLEDGEMENTS

I am greatly indebted to my supervisors, Dr. Mwangi Phyllis and Dr. Ndungu Ruth for their invaluable contributions, suggestions and advice. They complemented each other perfectly to make my work a success. May I, however, hastily add that any errors in this work are wholly mine and not their responsibility.

I am thankful to my respondents. Without them, I could never have carried out the research.

My gratitude also goes to my colleagues Michael Gacara, Martin Mburu and Frida Kanana and all the other members of the English and Linguistics Department of Kenyatta University for all the help they gave me.

Lastly, my gratitude goes to my family who sacrificed all they did and believed with me that ‘hatiri kiega kiumaga hega
# TABLE OF CONTENTS

DECLARATION ........................................................................................................ II
DEDICATION ........................................................................................................ III
ACKNOWLEDGEMENTS ........................................................................................ IV
TABLE OF CONTENTS ........................................................................................ V
LIST OF TABLES .................................................................................................... VII
LIST OF CHARTS .................................................................................................. VIII
LIST OF SYMBOL AND ABBREVIATIONS ........................................................ IX
DEFINITION OF TERMS ...................................................................................... X
ABSTRACT ........................................................................................................... XI

## CHAPTER ONE ................................................................................................. 1

**INTRODUCTION**

1.0 AN INTRODUCTION TO GIKUYU LANGUAGE ........................................... 1
1.1 BACKGROUND TO THE PROBLEM .......................................................... 3
1.2 STATEMENT OF THE PROBLEM .............................................................. 4
1.3 RESEARCH QUESTIONS .......................................................................... 5
1.4 RESEARCH OBJECTIVES ...................................................................... 5
1.5 RESEARCH ASSUMPTIONS ................................................................... 6
1.6 RATIONALE OF THE STUDY ................................................................. 6
1.7 SCOPE AND LIMITATION OF THE STUDY ............................................ 8
1.8 CONCLUSION ............................................................................................ 9

## CHAPTER TWO ............................................................................................... 10

**LITERATURE REVIEW AND THEORETICAL FRAMEWORK** ..................... 10

2.0.1 INTRODUCTION .................................................................................. 10
2.0.2 GENERAL LITERATURE ON GIKUYU ............................................... 10
2.0.3 LITERATURE ON ORTHOGRAPHY – PHONOLOGY ............................ 12
   2.0.3.1 LITERATURE ON OTHER LANGUAGES .................................. 12
   2.0.3.2 LITERATURE ON GIKUYU ......................................................... 15

**THEORETICAL FRAMEWORK** ................................................................. 17

2.1.1 RELATED PHONOLOGICAL THEORIES ......................................... 19
2.1.2 THE AUTOSEGMENTAL PHONOLOGY THEORY ............................... 19
2.1.3 PHONOLOGICAL RECODABILITY ................................................... 22
2.1.4 LINGUISTIC MENTAL REPRESENTATION ....................................... 25
2.2 CONCLUSION ........................................................................................... 27

## CHAPTER THREE ........................................................................................... 28

**RESEARCH METHODOLOGY** ................................................................. 28

3.1 DATA SAMPLING ................................................................................... 28
3.2 SAMPLING OF SUBJECTS ..................................................................... 29
3.3 DATA COLLECTION ................................................................................ 32
   3.3.1 SOURCES OF DATA ..................................................................... 32
   3.3.2 TOOLS OF DATA COLLECTION .................................................. 33
   3.3.3 QUESTIONNAIRE ....................................................................... 33
List of Tables

Table 1: Respondents: sex, instruction and dialect .............................. 32

Table 2: Kiambu: frequencies of graphemes for females and males with and without formal instruction in reading and writing Gikuyu without formal instruction in reading and writing Gikuyu ................................................. 40

Table 4: Nyeri: Frequencies of Graphemes for females and males with and without formal instruction in reading and writing Gikuyu .......................................................... 46

Table 5: Non-native Gikuyu speakers: Frequencies of Graphemes for females and males with and without formal instruction in reading and writing Gikuyu ............................................. 48

Table 6: Borrowed words and their adaptation into Gikuyu orthography ................................................................. 74
Charts

Chart I: Consonantal Chart: Phonemes under study.................37
Chart II: Gĩkũyũ Phonemes under study and their corresponding graphemes........................................38
Chart III: Phonemes and Graphemes generated in the study ........78
Chart IV: Consonantal chart: Phonemes generated in the study .....79
# LIST OF SYMBOLS AND ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G.P.</td>
<td>Generative Phonology Theory</td>
</tr>
<tr>
<td>S.P.E.</td>
<td>Sound Patterns of English</td>
</tr>
<tr>
<td>L1</td>
<td>First Language</td>
</tr>
<tr>
<td>A.P.</td>
<td>Autosegmental Phonology Theory</td>
</tr>
<tr>
<td>C</td>
<td>Consonant</td>
</tr>
<tr>
<td>V</td>
<td>Vowel</td>
</tr>
<tr>
<td>W.F.C.</td>
<td>Well-Formed Condition</td>
</tr>
<tr>
<td>/</td>
<td>Notation within which a Phoneme is enclosed</td>
</tr>
<tr>
<td>&lt;&gt;</td>
<td>Notation within which a Letter/Grapheme is enclosed</td>
</tr>
<tr>
<td>⊗</td>
<td>Tie-bar</td>
</tr>
</tbody>
</table>

Note on transcription: The transcription used for phonetic transcription is the International Phonetic Alphabet (IPA), Roach (1983).
# DEFINITION OF TERMS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grapheme</td>
<td>A unit of script (Sampson, 1985:22), for example <code>&lt;b&gt;</code></td>
</tr>
<tr>
<td>Orthography</td>
<td>A given set of written marks together with a particular set of conventions for their use. (Sampson 1985:19)</td>
</tr>
<tr>
<td>Phonemic Orthography</td>
<td>An orthography where words are spelt as they are pronounced. (Pike, 1947)</td>
</tr>
<tr>
<td>Conventional Orthography</td>
<td>In this study, it refers to the orthography that is taught in schools.</td>
</tr>
<tr>
<td>Unconventional Orthography</td>
<td>In this study, it refers to that orthography that is not taught in schools.</td>
</tr>
<tr>
<td>Phone</td>
<td>Sound segment</td>
</tr>
<tr>
<td>Phoneme</td>
<td>The smallest unit of sound capable of distinguishing meaning, for example <code>/r/</code></td>
</tr>
<tr>
<td>Homorganic Phoneme</td>
<td>A successive occurrence of different articulations which are considered phonetically one sound, for example <code>/mb/</code>.</td>
</tr>
<tr>
<td>Phonological recodability</td>
<td>Systematic retrieval of phonological Information from graphemic representation (Koda, 1997)</td>
</tr>
</tbody>
</table>
ABSTRACT

There are few studies on the relationship between Gikuyu phonology and Gikuyu orthography. This study is an examination of the discrepancies between the graphemic and the phonological structure of Gikuyu. Eight consonantal phonemes and their graphemic representation are under study. Discrepancies are identified and accounted for using the Autosegmental Phonology Theory (Goldsmith, 1990), Phonological Recodability (Koda, 1997) and Linguistic Mental Representation (Mattingly, 1992). Words that are borrowed from other languages are also examined to find out the extent of their adaptation into Gikuyu orthography.

To achieve our objectives, we picked respondents from the Gikuyu dialects of Kiambu, Muranga and Nyeri. Non-native Gikuyu readers/speakers were also picked. They were all presented with words that had been translated into English from Gikuyu and asked to translate them back into Gikuyu. We have analysed their responses using the tenets of A.P. Theory from a psycholinguistic approach.

One of our findings is that there are discrepancies which are as a result of dialect and lack of instruction in reading and writing Gikuyu. Another of our findings is that the mental representation of one language, for example English, may interfere with the representation of Gikuyu phonemes.
graphemically. We also observe that borrowed words are nativized into Gĩkũyũ first phonologically then graphemically, and that this is an on-going process.

Our recommendations are three-fold. First, a study needs to be done to establish the presence of the nasal segment in homorganic phonemes with a view of either maintaining or dropping the representation of the element graphemically. Secondly, we recommend a review of the orthography to include <f>, <v> and <p>. Lastly we have recommended that the Ministry of Education should re-examine the evaluation of the teaching and learning of Gĩkũyũ in schools so as to achieve the objectives in the syllabus.

This thesis is presented in five chapters. Chapter one deals with preliminary information. Chapter two contains a review of related literature. In chapter three, the theoretical framework and research methodology used in the study are presented. Chapter four is a presentation and analysis of data. Chapter five is a summary of the findings, conclusion and recommendations.
CHAPTER ONE

INTRODUCTION

1.0 An Introduction to Gikuyu Language

This study deals with data on Gikuyu language. Gikuyu is a Bantu language that is spoken mainly in the Central and Rift Valley provinces of Kenya. The language falls under the Niger-Congo subfamily of languages. In his classification of languages, Guthrie (1967) places it in zone E, group 50. It is language number 51. The 1999 census in Kenya estimates that it is spoken by about 5.3 million speakers. (2000, March 1, Daily Nation)

1.1 Background To The Problem

All human speech sounds form the central pool of (speech) sounds which are represented by a phonetic transcription known as the International Phonetic Alphabet (IPA) (Roach, 1983). Every language takes a limited number of sounds from the central pool of speech sounds to form its phonetic inventory (Massamba, 1996:2). A phonological study of the language examines the structure and function of the inventory: the sounds that are likely to occur, their possible combinations and any restrictions to these combinations.

The orthography of a language endeavors to represent the phonemic inventory ‘by means of permanent visible marks’ (Sampson, 1985:26). In a ‘phonemic’ orthography, words are spelt as they are pronounced, for example:
Gikuyu is a Kenyan language that has been widely studied. Many aspects of the language have been described. Yet, the language, like many other indigenous Kenyan languages, has no standard orthography or a linguistic statement on what should be used (Njogu, 2002). The language has in its inventory the consonantal sounds /mb/, /m/, /v/, /θ/, /n/, /n/, /ŋ/, /ŋ/, /ŋ/, /l/, /w/, /h/, /j/ and /s/ represented as <mb>, <b>, <m>, <v>, <θ>, <n>, <n>, <c>, <nj>, <ŋ>, <k>, <ng>, <ny>, <w>, <h>, <y>, and <g> respectively (Mwihaki, 1998:37; Kago, 2001). As in other languages, discrepancies occur between the phonemic inventory and the orthography of Gikuyu. For instance, the phoneme /n/ in nditiini (detain) may be represented with <d> in one publication, and with <nd> in another. Likewise, the phoneme /ŋ/ may be represented with <ng> as in ngarì or <g> as in ‘gari’. One publication may represent /θ/ with <f> as in ndeke while another, or the same in a different section, represents it with <v> as in nde.ve. (see appendix III for more examples from different magazines).

Thus, Gikuyu readers/learners may get confused when they find a single phoneme arbitrarily represented with two or more graphemes and there is no clear
indication of what to use and when. As a language, Gikuyu is constantly in contact with other languages such as English and Kiswahili. These languages have phonetic inventories which are different from the one Gikuyu has. The use of phonemes that are borrowed from these languages could also influence the orthography of Gikuyu.

In other instances, the Gikuyu language writers, for example magazine writers (see appendix III), sometimes introduce letters that represent phonemes not found in the phonemic inventory of the language that is taught to learners of Gikuyu (see Kago, 2001).

Such include:

\[
\begin{align*}
<v> & \quad \text{in vata (need)} \\
<l> & \quad \text{in famili (family)} \\
<p> & \quad \text{in praimari (primary)} \\
<sh> & \quad \text{in shiringi (shilling)}
\end{align*}
\]

This may also cause confusion to readers/learners.

It was from this background that we set out to examine the discrepancies between Gikuyu orthography and the phonological structure of the language using the Autosegmental Phonological (AP) Theory (Goldsmith, 1990).
Recodability (Koda, 1997) and Linguistic Mental Representation (Mattingly, 1992).

1.2 Statement Of The Problem

In the absence of a standardized orthography, discrepancies occur between the phonemes of the Gikuyu language and their graphemic representations. For instance, the phoneme /D/ is variously represented with <b>, <f> and <v> even in the same word, for example in:

- bata (need) - <b>
- fata (need) - <f>
- vata (need) - <v>

Such discrepancies obviously affect the speaker's/learner's ability to write and read well and with ease in Gikuyu. In this descriptive research, we set out to find out what discrepancies occur and accounted for them phonologically and graphemically. Towards this end, we applied the tenets of Autosegmental Phonological Theory, Phonological Recodability Theory and Linguistic Mental Representation Theory in an analysis of the discrepancies.

Gikuyu is a language in contact with other languages. It borrows and loans words to those languages. We described the extent to which borrowed words are adapted to Gikuyu orthography. We made a recommendation on the review of the
current orthography and a possible expansion of the orthography to include the borrowed words.

1.3 Research Questions

The research addressed the following questions:

1. What are some of the consonantal discrepancies found between Gikũyũ phonology and Gikũyũ orthography?

2. How would the Autosegmental Phonology, Phonological Recodability and Linguistic Mental Representation Theories account for those discrepancies?

3. What is the extent of adaptation of borrowed words in Gikũyũ orthography?

1.4 Research Objectives

The objectives of the research were:-

1. To identify and describe some of the discrepancies found between Gikũyũ phonology and Gikũyũ orthography

2. To account for the discrepancies using the Autosegmental Phonology, Phonological Recodability and Linguistic Mental Representation Theories.

3. To describe the extent to which borrowed words are adapted to Gikũyũ orthography.
1.5 Research Assumptions

The research proceeded from the following assumptions:

1. There are discrepancies, made by some writers of Gikuyu, between some Gikuyu phonemes and their orthographical representation.

2. The discrepancies can be accounted for graphemically and phonologically using the Autosegmental Phonology, Phonological Recodability and Linguistic Mental Representation Theories.

3. Borrowed words are adapted to Gikuyu orthography.

1.6 Rationale of the Study

Discrepancies occur between the Gikuyu phonemic inventory and Gikuyu orthography. These discrepancies contribute to difficulties in learning as well as reading Gikuyu. As Wanjau (1989) notes, the designers of Gikuyu orthography were non-native speakers. They did not write words as they were pronounced by the native speakers. This resulted in a poorly designed orthography. Consequently, some readers/learners of Gikuyu have problems in reading/writing the language. Findings from this research could help us identify and understand the practical problems Gikuyu learners/readers encounter.

Kenya’s educational policy advocates a system where the vernacular in a school’s catchment area (in this case Gikuyu) is taught in the lower primary and is also used as the medium of instruction as a prerequisite to learning English and Kiswahili (Kenya Institute of Education, 1992). Indeed, while some subjects
have been dropped from the Revised and Rationalised syllabus, for example, Art and Craft, (Ministry of Education, 2002), vernacular has been given more emphasis. It is hoped that through this policy, the learner will develop sufficient command of the vocabulary and sentence structure in mother tongue and that social awareness and social identity will be achieved. For the implementation of this policy, the vernacular language has to undergo systematic cultivation. The findings from this research could contribute towards this pedagogic goal of the acquisition of a valuable tool for cultural, technical and intellectual development. They could be beneficial to curriculum designers, teachers and learners of Gikũyũ.

There have been many group and individual efforts to standardize Gikũyũ orthography. They include the early Christian Missionaries, the United Kikuyu Language Committee in the 1940s, Gakaara wa Wanjau, Kimani Njogu, among others. Up to now, there is no standard Gikũyũ orthography and no linguistic statement that indicates what is to be used. This research is a contribution towards this endeavor. The findings could be of interest to publishers of Gikũyũ texts such as the Bible, story books, magazines and newspapers.

Gikũyũ is a language that is constantly in contact with other languages such as English and Kiswahili. These have different phonetic inventories from the Gikũyũ one. The language, being dynamic, borrows from and loans words to
these languages. This study could help to establish how such contact has influenced the orthography of Gikuyu and how such influences have been adapted into Gikuyu. The findings could, therefore, be of benefit to socio-linguists investigating languages in contact.

1.7 Scope and Limitation of the Study

This is a phonological study that examines the discrepancies between the phonemic and the orthographic inventory of Gikuyu. The choice of Gikuyu is based on the researcher's first language competence as well as the fact that all languages are equal with respect to their suitability for study (Sampson 1985:11). It has also been observed from the literature that this area has not been sufficiently researched.

Although there are discrepancies between the orthographical representations of both consonantal and vocalic phonemes, we did not study vocalic phonemes. This is because as Wanjau (1989) notes, the United Kikuyu Language Committee resolved some discrepancies with the vocalic phonemes. Only eight consonantal phonemes and their orthographic representations are examined. They are among those with the most discrepancies (as observed in a pre-survey) and their study produced adequate and valid data.
In this study, we treat Gĩkũyũ as one language that should have one orthography. Although Gĩkũyũ has several dialects, we are of the view that they should all be represented in one orthography. This is in keeping with the tradition of other scholars, such as, Armstrong (1967), who did not take dialect into account when developing the Gĩkũyũ orthography.

1.8 Conclusion

In this chapter, we have set out the background of our research problem. We have stated the problem, raised the questions and objectives of this study. We have endeavoured to give the rationale of this study as well as the scope and limitations. In chapter II, we review literature that is related to orthography/phonology.
CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.0.1 Introduction

Literature on orthographic/phonological phenomena is available on other languages but scanty on Gĩkũyũ. We have first reviewed general literature on Gĩkũyũ language. Next, we have reviewed literature on orthography-phonology, first on other languages and then on Gĩkũyũ.

2.0.2 General Literature on Gĩkũyũ

Any study that deals with Gĩkũyũ phonology-orthography must of necessity refer to other studies in Gĩkũyũ if only because they have some segments written in the language. Here, some of these studies have been reviewed.

Mutahi (1977) gives a detailed classification of Gĩkũyũ dialects spoken around Mt. Kenya region. His grouping is based on geographical, economic, political and linguistic factors. He identifies Kabete, Metumi and Gaki dialects. Mutahi’s study deals with dialectal issues and is comparative in nature unlike the current one which is an indepth analysis of phonemes and their orthographic representations.
Several studies on morphology or morphology and another component of language have been done. One such study was carried out by Njoroge (1978). He investigates how nouns are derived from verbs. He uses the Transformational Generative Grammar theory. His study is morphological unlike this one which is phonological.

Morphosyntactic studies have been carried out by Gathenji (1981) and Mwangi (2001). Gathenji studied verbal extensions of Gĩkũyũ using the Functional Grammar approach. Mwangi dealt with verb morphology in Gĩkũyũ using the Merger Theory (Marantz, 1984) and the Incorporation Theory (Baker, 1988). Mwangi’s concern was the distinction between derivational and inflectional morphology as well as verbal extensions and their syntactic implications. In both studies, the method of data collection used is similar to the one we use though in this study phonological issues are addressed and the objectives are different.

In a morphological-phonological study, Kamau (2002) investigates verbal affixes in Gĩkũyũ using the Lexical Phonology – Morphology Theory. He studies the phonological changes on roots and affixes resulting from affixation. Kamau’s work differs from this study in that it is morpho-phonological while this one is phonological. The theories are also different.
There have also been several studies on Gikũyũ grammar. Both Barlow (1960) and Gecaga and Kilkirday (1953) present grammars whose main objective is to provide a link between English-speaking people and the Agikũyũ. They do not address the issue of orthography.

2.0.2 Literature on Orthography – Phonology

2.0.2.1. Literature on other Languages

Pike (1947) gives some principles for the formation of a practical orthography. He advocates the use of a separate symbol for each phoneme and emphasizes that borrowed words should be spelt as they are pronounced by native speakers using the symbols utilized by the assimilating language. This study takes cognizance of these principles and strives to find out to what extent they have been followed or flouted.

Gelb (1952) notes that writing stubbornly resists linguistic change; that it is more conservative than speech. While pronunciation changes over time, spelling does not. Thus a word like ‘aren’t’ will retain that spelling although it may be pronounced as ‘ain’t’. He briefly examines the issue of discrepancies between the English phonetic inventory and its orthography, for example, where /i/ is represented by <i> as in big, <e> as in event and <o> as in women. This is an issue that constituted the thrust of this study, albeit on Gikũyũ.
Sampson (1985) studies the typology, history and psychology of the writing systems of the world. He briefly discusses discrepancies between the English phonetic inventory and her orthography. He observes that English, like French, remarkably departs from the principle of one phoneme – one grapheme, for example in the words 'knee' or 'right', /ni:/ and /rait/ respectively. He compares English with Spanish and notes that Spanish has a more phonemic orthography. He cites studies on revision of the English orthography and suggests that an ideal orthography should be a compromise between the interests of the writer (that is, be highly phonemic) and the interests of the reader (that is, be highly visible). We find these arguments and suggestions highly relevant in this study because Gikuyu does present such a compromise but in so doing, discrepancies are generated.

The issue of adherence to a strict alphabetic principle (the principle of an isomorphic relation between letter and phoneme) is addressed by Besner and Smith, and Frost and Katz (cited in Frost and Katz, 1992). They apply this to Spanish which conforms closely to the principle, and to Hebrew which does not. We apply the same principle to Gikuyu when we examine the effects of discrepancies in the acquisition of reading and writing skills.

A study by Ryann (in Schmitt and McCarthy, 1997) looks at learning second language vocabulary from a psycholinguistic angle. She notes that learning the
orthographical form of a word results in a person being able to recognize a written word (that is, being able to read), and to produce a word in a form that other readers can also recognize (that is, having control over the realization of sound and meaning in the written form – writing and spelling accurately). Her arguments are relevant to this study especially when the factors that give rise to discrepancies between the phonetic inventory and their orthography on one hand, and the effects of these discrepancies on the other, are examined.

Koda (in Coady and Huckin, 1997) studies vocabulary acquisition in second language with particular attention to orthographic considerations. She discusses phonological recodability – how phonological information can be retrieved from the graphemic representation. In this, two elements are critical. The first is the basic unit of orthographic representation (a linguistic unit). The second is the regularity of symbol-to-sound correspondence. The second element is important in this study. As Koda observes, diverse phonological processing mechanisms are likely when phonographic orthographies vary in the regularity of their grapheme–phoneme correspondence. Koda identifies three properties by which alphabetic orthographies can be classified. These are regularity of one-to-one correspondence; regularity of phonemic assignment; and regularity of graphemic assignment. She then shows how English violates these properties. For example, one phoneme such as /f/ is assigned two graphemic units such as ‘gh’ in ‘laugh’; one grapheme serves several purposes, for example <o> in ‘woman’ and ‘to’; one
phoneme is represented by two or more graphemes, for example /s/ in 'cite' and 'site'. Likewise, our study has shown how Gikũyũ writers and readers violate these properties too.

2.0.2.2 Literature on Gikũyũ

Among the studies in Gikũyũ phonology – orthography is Armstrong (1967). She proposed a vocalic and consonantal orthography for Gikũyũ. Her consonantal orthography was based on the one-phoneme-one letter principle. Though her proposal did not become the standard orthography for Gikũyũ, her work was an important reference in our study because most Gikũyũ writers and readers have adapted the letters she proposed.

According to Wanjau (1991), Christian missionaries came up with the first Gikũyũ orthography. He notes that the designers of the orthography were non-native speakers of Gikũyũ and so did not write the words as they were pronounced by the native speakers. Wanjau (1989:4) notes the problem of difficult reading emanating from a poorly designed orthography, ‘rüthiomĩ rungĩndikwo na njũra njũru nogwo rũrũthomagwo na thĩĩna’. He also notes that although the United Kikuyu Language Committee in the 1940s resolved some discrepancies in the representation of some vocalic sounds, consonantal discrepancies were not resolved. We study the discrepancies in the representation of some consonantal sounds that were not resolved.
In the 1980s, a group comprising Gĩkũyũ writers, teachers, editors, book reviewers and publishers met with the aim of standardizing the Gĩkũyũ orthography (Prof. Kimani Njogu, Personal Interview - 2002). One of the issues they addressed was whether the number of consonants in the Gĩkũyũ orthography should be increased so as to cater for new sounds entering the phonemic inventory of Gĩkũyũ as a result of contact between Gĩkũyũ and other languages. The group was disbanded before it could come up with resolutions. We address this and other issues in this study especially in relation to adapted words.

A phonological study by Mwihaki (1998) uses the Metrical Theory and the Autosegmental Phonology Theory to study nativization of loanwords in Gĩkũyũ. She uses the syllable concept to investigate stress and rhythm in speech. Though her work has different objectives from this one and it does not deal with orthography, it is very relevant. As far as we could ascertain, Mwihaki’s study was the only one on Gĩkũyũ that uses the Autosegmental Theory, one of the theories we use in our research.
THEORETICAL FRAMEWORK

2.1.1 Related Phonological Theories

This research is phonological and as such, there are several theoretical constructs to choose from. They include Generative Phonology (Chomsky and Halle, 1968), Natural Generative Phonology (Hooper, 1979), Metrical Phonology (Hayes, 1980), Lexical Phonology-Morphology (Kiparsky, 1982) and Autosegmental Phonology Theory (Goldsmith, 1990). We first present a brief overview of the theories and then expound on the Autosegmental Phonology Theory, one of the theories that we have used in this research. We also present a discussion of Phonological Recodability (Koda, 1997, Kay, 1987) and Linguistic Mental Representation (Mattingly, 1992).

The first theory that is related to our study is the Generative Phonology Theory (G.P.). This theory was posited by Chomsky and Halle in the 'Sound Patterns of English' (SPE), (1968). It is an offshoot of Generative Grammar which conceives language as a cognitive rule-governed structure. Generative Phonology proposes two levels of phonological analysis – an underlying (phonemic) level and a surface (phonetic) level. The underlying level is mapped onto the surface level through explicit and systematic rules. This theory is not appropriate for this study which goes beyond the association of the phonemic and phonetic levels into the representation of the surface level orthographically.
The second theory, the Natural Generative Phonology Theory (Hooper, 1979) was a reaction to the G.P. Theory. The theory states that generalizations that are surface – true and transparent are more natural as contrasted with the underlying generalizations posited by Chomsky and Halle.

It proposes three rules:-

(i) phonological rules (p-rules) that contain only phonetic information
(ii) morphophonemic rules (m-p rules) which change feature in environments described in morphosyntactic or lexical terms
(iii) Sandhi rules that apply across word boundaries

The theory does not cater for the representation of phonological forms orthographically. We, therefore, could not use it in this study.

The third theory, the Metrical Phonology Theory (Hayes, 1980) seeks to describe stress patterns in a language. Stress is represented by a unit called foot. The stress pattern of a word is represented in a binary branching constituent structure which shows relative prominence of sister constituents. This research does not deal with stress and so this theory is inappropriate.

The fourth theory is the Lexical Phonology – Morphology Theory (Kiparsky, 1982). It states that the derivational and inflectional processes of a language can
be organized in a strata of levels. Each level is associated with a set of ordered phonological rules for which it defines the morphological processes in word formation. This ordering establishes lexical rules and post-lexical rules. This theory deals mainly with affixation which is outside the scope of our study.

We need a theory or theories that would cater for a comparison between phonemes and their orthography. As such, we have taken an eclectic approach where the Autosegmental Phonology Theory (Durand, 1990), Phonological Recodability (Koda, 1997, Kay 1987) and Linguistic Mental Representation (Mattingly, 1992) were found the most appropriate for this study.

2.1.2 The Autosegmental Phonology Theory

The Autosegmental Phonology (AP) Theory (Durand, 1990) is a modification (as are all the theories cited above) of the Standard Generative Phonology Model as presented in the SPE. It was originally developed as a theory of tonal phenomenon. Later it was extended to other phonological phenomena such as pitch-accent, nasality and concatenative (infixing) morphology. This is the theory adopted in this research. It is used to describe the data that was collected as well as account for the phonological/graphemic observations.

Most relevant to this research was the theory’s tenets of tiers and association lines. While SPE orders phonological and phonetic segments linearly, AP views segments as multi-linearly ordered in a form of separate levels/tiers that occur
parallel to each other. Each tier consists of a string of segments. The elements on each successive tier differ with regard to the features specified in them. The basic tier in the phonological representation is the skeletal tier (also called the C.V. Tier or the Timing tier). The C.V. tier is basic in that it plays 'a central role in the organization of the entire phonological structure, serving as the anchor point for elements on the various other tiers' (Goldsmith, 1990:48). The C.V. tier comprises the phonematic units of language where syllabic (V) and non-syllabic (C) slots regularly alternate. Any segments not on the skeletal tier are called autosegments.

The tiers are associated by 'association lines', a mental mechanism that relates the different tiers. For these association lines to successfully perform the required role, there must be the Well-Formed Condition (WFC). In this research the skeletal tier is considered to be made up of the phonemes of Gikuyū. The phonematic tier is related to the autosegmental tier, which is made up of the graphemes, by association lines. The WFC to be observed is that each grapheme will be associated with (at least) one phoneme and that the association lines do not cross. Where this is observed, then an ideal phonemic orthography is achieved. A few examples are necessary to show how we analysed data using the A.P. Theory.
The multiple association of phonemic material to skeletal positions is an important feature in autosegmental analysis. Two successive segments on a single tier can be associated with a single slot on the skeletal tier. In this study nasal obstruent clusters, for example, /ŋg/, /nib/, /nd/ count as two-to-one associations, for example:

(i) ngari (ant-bear)

\[
\begin{array}{c}
\text{skeletal tier} \\

c \downarrow v \downarrow c \downarrow v \\
\text{graphemic tier} \\
n \overset{\text{ng}}{\text{a}} \overset{\text{r}}{\text{i}}
\end{array}
\]

(ii) andū (people)

\[
\begin{array}{c}
\text{skeletal tier} \\
\downarrow v \downarrow c \downarrow v \\
\text{graphemic tier} \\
a \overset{\text{n}}{\text{d}} \overset{\text{ū}}{\text{ù}}
\end{array}
\]

In the example above, the WFC is not violated because each grapheme is associated with (at least) one slot and the association lines do not cross. The theory is, therefore, useful in analyzing the data that was collected.
2.1.3 Phonological Recodability

The AP association lines enable us to analyse phonological recodability (Koda, 1997:40). This refers to the systematic retrieval of phonological information from graphemic representation. From the examples in the section above, it is possible to get the phonemes from the graphemic representation. Thus,

(i) \( \hat{\text{ng}} a r i \) (phonematic tier)
\[ n g a r i \] (graphemic representation)

(ii) \( a \hat{n}d \o \) (phonematic tier)
\[ a n d \ddot{u} \] (graphemic representation)

In the first example, the graphemes \(<\text{n}>\) and \(<\text{g}>\) are associated with /\(\hat{\text{ng}}\)/, \(<\text{a}>\) with /\(a/\), \(<\text{r}>\) with /\(r/\) and \(<\text{i}>\) with /\(i/\). In the second example, \(<\text{a}>\) yields the phoneme /\(a/\), \(<\text{n}>\) and \(<\text{d}>\) yield /\(n\ddot{d}/\) and \(<\ddot{u}>\) yields /\(\ddot{u}/\). We, therefore, used the theory to analyse discrepancies and also to prove the achievement, or otherwise, of phonological recodability.

In the analysis of borrowed words, the words should be spelt as they are pronounced by native Gikũyũ speakers using the graphemes utilized by the Gikũyũ language (Pike, 1947). Where this does not happen, it is possible to show
the lack of phonological recodability using the ordering of segments in tiers and the association lines. For instance,

Bamīrī (family)

Φ a m e r e (phonematic tier)

= = =

f a m ĭ l ĭ (graphemic tier)

In the analysis above, phonological recodability is not observed between the phonemes /Φ/ and /ɾ/ with their graphemes <b> and <ɾ> respectively. Instead /Φ/ is presented with <f> and /ɾ/ with <l>. These two graphemes <f> and <l> would give the phonological information of /f/ and /l/. This results in discrepancies.

Kay (1987) notes that the difference between initial and final segments needs to be considered in grapheme-phoneme conversion. Using the concept of phonological recodability, the researcher examines the grapheme-phoneme conversion of initial and medial word segments.

Compensatory Processes such as lengthening, may occur as a result of the process of affixation. For example, when the Gikuyū diminutive marker ‘ka’ is prefixed to a word with an initial nasal-obstruent cluster, in the resultant word, the nasal obstruent acquires a secondary fricative feature and the nasal segment is dropped. Consider:
ngiti (dog)

(Diminutive marker)

\[
\begin{array}{cccccc}
\text{c} & \text{v} & \text{c} & \text{v} & \text{c} & \text{v} \\
\hline
\text{k a + n g i t i} & \text{graphemic tier}
\end{array}
\]

kagiti (small dog)

\[
\begin{array}{cccccc}
\text{c} & \text{v} & \text{c} & \text{v} & \text{c} & \text{v} \\
\hline
\text{k a + n g i t i} & \text{graphemic tier}
\end{array}
\]

In the example, the nasal feature will not be linked to any position in the skeletal tier and will, therefore, not be realized phonetically. This results in the linkage condition. Failure to observe the condition will lead to the new word being realized phonetically as /kaggite/ and orthographically as ‘kangiti’, instead of /kasite/ phonologically and ‘kagiti’ orthographically.
2.1.4. Linguistic Mental Representation

A person who knows a language has a mental representation of the language’s linguistic structure which includes the phonological and phonetic structure, (Mattingly 1992:13). That linguistic awareness is largely acquired and the principal stimulus for the acquisition is literacy, (Mattingly 1992:14). Through experience with reading and writing, the writer/reader masters the mapping between the signs (graphemes) and the units (phonemes). The researcher has used the AP Theory to explain how writers/readers of Gikuyu conceptually represent phonemes with graphemes. First, as noted above, the role literacy plays is crucial for acquiring linguistic awareness. From the data collected, the researcher, using association lines, explains the contribution or otherwise, of formal education towards acquisition of the appropriate grapheme-phoneme mapping.

Secondly, the mental representation of a Gikuyu writer/reader may be influenced by the presence of the mental representations of other languages. Consequently, a writer/reader may interchange graphemes from both linguistic structures. Thus, the writer may use <f> in place of <b>, a grapheme from the English graphemic inventory. A case in point is the word ‘famili’ (family) cited above. Such a phenomenon is explained using association lines.
The lack of isomorphism (one phoneme – one grapheme relationship) in English may also be a cause of misrepresentation of phonemes by Gĩkũyũ writers who have mental representations for both languages. For example, since English represents the phoneme /fl/ with both <f> (fat) and <gh> (laugh), the Gĩkũyũ writer may carry out a similar process in writing <g> and <ng> to represent the phoneme /ŋg/. This would explain why both <g> and <ng> would be used in the word ‘garĩ’ and ‘ngarĩ’ (leopard).

Users of an alphabetic script write by ear (Frith in Sampson, 1985). This means that they write what they perceive. The writers make some utterance (at least to themselves), creating a linguistic representation (Mattingly 1992:15) which they proceed to write down. In Gĩkũyũ, utterances by different writers may result in the usage of different graphemes. This can be shown using the Autosegmental Phonology tenets of tiers and association lines. For example,

```
(mind) /f/ /v/ /p/ (linguistic representation of different speakers)
  |   |   |  
  /f/ /v/ /p/ (graphemic representation)  
  |   |   |  
  <f> <b> <v> <p> (grapheme)
```

perception
The researcher will, therefore, be describing the process of mapping between the phoneme and the graphemes as a result of the way the subject perceives the phoneme.

2.2. Conclusion

In this chapter, we have reviewed literature that relates to this research. We have discussed how a practical orthography is formed, discrepancies between the English phonetic inventory and its orthography and the alphabetic principle. Also reviewed is the psycholinguistic approach as expounded by Ryann (1997) and Koda (1997). We shall especially be applying Koda's argument in our data analysis. But first, we present a discussion of the theoretical framework in which the research is carried out in the next chapter.

We have also dealt with the theoretical framework within which the study was carried out. We have explained how the tenets of the Augosegmental Phonology Theory were applied in the study. We have also discussed how Phonological Recodability and Linguistic Mental Representation Theories were used to account for the graphemic/orthographic discrepancies. We proceed to discuss the research methodology that was undertaken.
CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Data Sampling

The data needed for this study was both phonemic and orthographic. Gikuyu language has eighteen consonantal phonemes (Mwihaki, 1998:37). These are /mb/ /nd/ /ŋ/ /t/ /k/ /ŋ/ /n/ /ŋ/ /ŋ/ /ŋ/ /ŋ/ /w/ /h/ /j/ and /s/. Out of these, the phonemes that were sampled are the homorganic phonemes /mb/, /nd/ /ŋ/ and /ŋ/; the alveolar-palatal affricate /t/, the bilabial fricative /f/, the velar fricative /s/ and the alveolar trill /r/, and their respective orthographic representation <mb>, <nd>, <ŋ>, <ŋ>, <c>, <b>, <g> and <r>. In a pre-survey, we had discovered that these are the phonemes that have the most glaring discrepancies with their symbolizations as presented by respondents.

Gikuyu words constituted the secondary orthographic data for the study. Their phonetic transcriptions were the secondary phonemic data.

The words were translated into English and presented to subjects who were asked to translate them into Gikuyu. This yielded the primary orthographic data for the study.
3.2 Sampling of Subjects

The researcher needed Gikuyu readers/learners (subjects) from whom primary data was obtained. Judgment sampling was used to select subjects from each of the Gikuyu dialect areas of Kiambu, Muranga and Nyeri districts identified as Kabete, Metumi and Gaki dialects respectively by Mutahi, 1977. The dialectal distribution was mainly for linguistic representation in all the areas where the language is spoken. The subjects were picked by using pre-sampling interviews and through the ‘friend of a friend’ method (Seliger, 1989). In the pre-sampling interviews, we asked potential respondents oral questions regarding their district of origin and whether they had gone through formal training in reading and writing Gikuyu. This helped to determine who qualified for the research and in which category.

Through the friend of a friend method, we approached people who earmarked their friends who qualified for the research. Questionnaires were then sent through them to their friends.

In the proposal we had targeted seventy (70) subjects. Each would generate sixty four responses. The total would be four thousand four hundred and eighty responses. We felt that this amount of data would be adequate for making generalizations in a descriptive research. Any responses that would be inadequate would also be catered for by this number. The subjects were:
1. Five male and five female native Gikuyu speakers from each dialectal area who have undergone formal training in the reading and writing of Gikuyu.

2. Thirty male and female native Gikuyu speakers from all the dialectal areas who have not undergone formal training in the reading and writing of Gikuyu.

3. Five male and five female speakers to whom Gikuyu is a second language learnt through formal instruction.

In each category, there were both sexes so as to compare the males against the females whose ‘linguistic forms are considered to be “better” than male forms’ (Trudgill, 1974:85).

Sixty two respondents participated in the research. This was a respondent rate of 89%. They included thirty-one (31) female speakers of Gikuyu. Sixteen (16) of them had had formal instruction in reading and writing Gikuyu. From each Gikuyu dialect there were five(5) such speakers. The other subject had her first language (L1) as Pokomo which, like Gikuyu, is a Bantu language.

The other fifteen (15) female subjects had no formal instruction in reading and writing Gikuyu. Five (5) were from Kiambu, three (3) from Murang’a and four
(4) from Nyeri. The other three (3) were non-native speakers. One had Maasai as her L₁, and another Kipsigis, both Nilotic languages which differ phonologically from Gīkūyū. The other one had Luhyia, a Bantu language, as her L₁.

The male respondents were also thirty-one (31) in number. Eighteen (18) of them had formal instruction in reading and writing Gīkūyū. There were five from each Gīkūyū dialect. The other three were non-native Gīkūyū speakers. Two of them were Dholuo speakers (a Nilotic language). The third was a Luhyia speaker.

The other thirteen male subjects had no formal instruction in reading and writing Gīkūyū. Five were from Kiambu, four from Murang’a, two from Nyeri and two were non-native Gīkūyū speakers. Of the non-native speakers, one was a Maasai and the other a Tutsi (Bantu) speaker.
Tabulated below is the distribution of the subjects described above.

Table 1: Respondents: sex, instruction and dialect

<table>
<thead>
<tr>
<th></th>
<th>With formal instruction</th>
<th>Without formal instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kiambu</td>
<td>Murang’a</td>
</tr>
<tr>
<td>Female</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Male</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

3.3 Data Collection

3.3.1 Sources of Data

To get the secondary data, we picked words that contained the graphemes and phonemes under study from various Gikuyu literature, namely, The Gikuyu Bible, storybooks such as 'Wirute Guthoma', newspapers and magazines. For each of the phonemes, four words were picked that have the phoneme at the initial position and four others with the phoneme in the middle position. Gikuyu has a C.V. structure and so there is no consonantal phoneme in the word-final position. A total of sixty four words were, therefore, picked. The position on the phoneme helped us to determine whether discrepancies were more prevalent in any one given word position. The basis for picking these words was the researcher's first language competence based on Chomsky's argument that a native speaker of a
language can tell what sequences of sounds are permissible in his language and which ones are not (Katamba, 1989, Massamba, 1996).

Although each respondent was expected to produce sixty-four responses from the sixty-four words, this did not always happen. In some instances, the respondents did not reproduce the expected word or left it out completely.

3.3.2 Tools of Data Collection

3.3.3 Questionnaire for Readers/Writers of Gĩkũyũ

The tool of data collection was a questionnaire where the words sampled from the Gĩkũyũ literature were presented to the respondents. The questionnaire (see appendix I) was made up of four sections.

(i) The first section consisted of some questions on reading and writing in Gĩkũyũ. They elicited data on the discrepancies found between Gĩkũyũ phonology and orthography as well as the effects of these discrepancies.

(ii) The second section contained a passage translated into English from Gĩkũyũ. The original passage was composed by the researcher to ensure that it contained words with the target phonemes both in the initial and medial positions. The subjects were asked to translate the passage back into Gĩkũyũ. The passage was presented in English. English was chosen so as to ensure that the researcher's pronunciation
of Gikuyu words in no way influenced the subject’s spellings. As Frith contends, users of an alphabet script write by ear, (cited in Sampson, 1985:208). We, therefore, wanted to eliminate that variable. The data thus acquired helped in identifying the discrepancies between the phonology and the orthography. We also observed whether words presented in a passage had more (or less) discrepancies than those presented out of context.

(iii) In the third section, the subjects were required to give the Gikuyu equivalents of the words that were given while indicating the ease or otherwise in translating them. Here, borrowed words were used so as to show the extent of their adaptation into Gikuyu orthography. Subjects were also expected to generate their own responses. The extent of adaptation would reveal discrepancies between the phonology and the orthography.

(iv) The fourth section in the questionnaire had words and phrases written in English with choices on their equivalents in Gikuyu. Subjects chose the most correct equivalent for each. It would be observed from the responses whether there would be a compromise between the interests of the writer and the interests of the reader (whether the orthography is highly phonemic and highly visible), Sampson, 1985. This again helped to identify the discrepancies and get the extent of adaptation of borrowed words.
3.4 Conclusion

In this chapter, we have explained how the data for the study was sampled and collected. We have discussed how the subjects were sampled and their characteristics. We have also discussed the setup of the questionnaire. We now proceed to show how that data was analysed in the following chapter.
CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.0 Introduction

In the following analysis, we first briefly describe the phonemes and graphemes under study. Data from respondents from the different Gĩkũyũ dialectal areas and the non-native Gĩkũyũ speakers is then presented. In this presentation, discrepancies found between Gĩkũyũ phonology and Gĩkũyũ orthography are identified and described. A phonological analysis using the Autosegmental Phonology Theory, Phonological Recodability and Linguistic Mental Representation theories then follows. This is done with the objective of accounting for the discrepancies using the theoretical constructs presented in Chapter 3. The theoretical constructs are used to determine whether there is systematic retrieval of phonological information from graphemic representation; whether words are spelt as pronounced by the speakers. Association lines are used to map information on the graphemic tier onto the phonological tier. Where there is no mapping, we expostulated possible reasons for this. We have highlighted the position of the phoneme/grapheme in a word and its relationship between Gĩkũyũ orthography and phonology. Lastly, we present an analysis of the adaptation of borrowed words into Gĩkũyũ orthography.
4.1 Data Presentation

4.1.1 The Secondary Data

There were eight Gikuyu consonantal phonemes that constituted the secondary data. These were: /mb/, /nd/, /ŋg/, /ŋj/, /tʃ/, /ɬ/, /ʃ/ and /r/.

The manner and place of articulation of these phonemes is shown in Chart I here below.

Chart I: Consonantal Chart: Phonemes under study

<table>
<thead>
<tr>
<th></th>
<th>Bilabial</th>
<th>Alveolar</th>
<th>Alveolar</th>
<th>Palatal</th>
<th>Velar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plosives</td>
<td>mb</td>
<td>nd</td>
<td></td>
<td></td>
<td>ŋg</td>
</tr>
<tr>
<td>Trill</td>
<td></td>
<td>r</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fricative</td>
<td>Φ</td>
<td></td>
<td></td>
<td></td>
<td>s</td>
</tr>
<tr>
<td>Affricate</td>
<td></td>
<td>tʃ</td>
<td>ıj</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Each of the phonemes in the secondary data has a grapheme that is conventionally assigned to it as shown in Chart II here below:
Chart II: Gikuyu Phonemes under study and their corresponding graphemes

<table>
<thead>
<tr>
<th>Phoneme</th>
<th>Grapheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>mb</td>
<td>mb</td>
</tr>
<tr>
<td>nd</td>
<td>nd</td>
</tr>
<tr>
<td>ng</td>
<td>ng</td>
</tr>
<tr>
<td>nj</td>
<td>nj</td>
</tr>
<tr>
<td>r</td>
<td>r</td>
</tr>
<tr>
<td>Φ</td>
<td>b</td>
</tr>
<tr>
<td>s̓</td>
<td>g</td>
</tr>
<tr>
<td>t̓j</td>
<td>c</td>
</tr>
</tbody>
</table>

In four instances, the phoneme was in the word initial positions, and in the medial word position in the other four instances. As will be shown in the following sections, unconventional phonemes and graphemes were generated by the subjects.

4.1.2 Responses from Kabete, Metumi and Gaki Dialects

We presented data to subjects from each of the dialects of Gikuyu and also to non-native Gikuyu speakers(cf 3.2.2.). Here below we tabulate responses from speakers of each dialect. Each table shows the frequency of occurrence of the
conventional grapheme for each phoneme against other graphemic representations. We first compare the responses between same sex respondents who differ only in regard to their having been or not been formally instructed in writing and reading Gĩkũyũ. We then compare the responses with those of the opposite sex with the same characteristics. General observations for each dialectal area in regard to these factors are made. Observations on specific phonemes are dealt with in the section dealing with the phonological account.

4.1.2.1 Kabete Dialect (Kiambu)

We first tabulate data for Kiambu dialect. Here, there were five respondents for each of the categories, for example, five female subjects who had formal instruction in reading and writing Gĩkũyũ. They were expected to generate a maximum of forty responses for each phoneme.
Table 2: Kiambu: frequencies of graphemes for females and males with and without formal instruction in reading and writing Gikũyũ

<table>
<thead>
<tr>
<th>Phoneme</th>
<th>Grapheme</th>
<th>Frequency for Female Subjects</th>
<th>Frequency for Male Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>With instruction</td>
<td>Without instruction</td>
</tr>
<tr>
<td>nd</td>
<td>nd</td>
<td>34</td>
<td>19</td>
</tr>
<tr>
<td>d</td>
<td></td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>mb</td>
<td>mb</td>
<td>29</td>
<td>26</td>
</tr>
<tr>
<td>b</td>
<td></td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>p</td>
<td></td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>ng</td>
<td>ng</td>
<td>33</td>
<td>23</td>
</tr>
<tr>
<td>g</td>
<td></td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>nj</td>
<td>nj</td>
<td>32</td>
<td>17</td>
</tr>
<tr>
<td>j</td>
<td></td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td>g</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>ch</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>r</td>
<td>r</td>
<td>26</td>
<td>28</td>
</tr>
<tr>
<td>l</td>
<td></td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>φ</td>
<td>b</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>f</td>
<td></td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>v</td>
<td></td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>p</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>g</td>
<td></td>
<td>37</td>
<td>28</td>
</tr>
<tr>
<td>ng</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>tf</td>
<td>c</td>
<td>21</td>
<td>29</td>
</tr>
<tr>
<td>s</td>
<td></td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>ch</td>
<td></td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>sh</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
Several observations can be made from the tabulation. First, unconventional graphemes were used by some respondents. These were \langle d\rangle, \langle g\rangle, \langle l\rangle and \langle ng\rangle for /nd/, /ŋg\rangle, /r/ and /s/ respectively, \langle b\rangle and \langle p\rangle for /mb/, and \langle j\rangle, \langle g\rangle and \langle ch\rangle for /ŋj/. Also used were \langle f\rangle, \langle v\rangle and \langle p\rangle for /f/ as well as \langle s\rangle, \langle ch\rangle and \langle sh\rangle for /ʃ/.

Second, the conventional grapheme had the highest frequency for almost all phonemes regardless of whether the subjects had formal instruction or not. In the two instances where this was not the case (\langle nd\rangle and /ŋj\rangle), the respondents had no formal instruction and were female. In nineteen cases, /nd/ was represented with the conventional grapheme \langle nd\rangle while in twenty instances, it was represented with \langle d\rangle. Phoneme /ŋj/ was represented with \langle nj\rangle in as many cases (17) as it was represented with \langle j\rangle. Possible reasons for this are dealt with in the section below on phonological analysis. It appears from the data that formal instruction in reading and writing is a contributing factor in enabling subjects to map graphemes onto their phonemes.

The responses for the conventional graphemes amongst female subjects is 78.3% as compared to the males responses which is 77%. This is not a significant difference.
4.1.2.2 Metumi Dialect (Murang’a)

The analysis that follows is on data collected from subjects from Murang’a. Here, there were five female subjects with formal instruction in reading and writing Gĩkũyũ and three females without instruction. There were five male subjects with formal instruction and four others without instruction. The total responses that were expected were forty, twenty-four, forty and thirty-two for the respective categories mentioned above.
Table 3: Murang’a: Frequencies of graphemes for females and males with and without formal instruction in reading and writing Gikuyu

<table>
<thead>
<tr>
<th>Phoneme</th>
<th>Grapheme</th>
<th>Frequency for Female Subjects</th>
<th>Frequency for Male Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>With instruction</td>
<td>Without instruction</td>
</tr>
<tr>
<td>ñd</td>
<td>nd</td>
<td>38</td>
<td>21</td>
</tr>
<tr>
<td>d</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>mb</td>
<td>mb</td>
<td>34</td>
<td>14</td>
</tr>
<tr>
<td>b</td>
<td></td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>p</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>nj</td>
<td>nj</td>
<td>34</td>
<td>13</td>
</tr>
<tr>
<td>j</td>
<td></td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>c</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>r</td>
<td>r</td>
<td>32</td>
<td>15</td>
</tr>
<tr>
<td>l</td>
<td></td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>b</td>
<td></td>
<td>32</td>
<td>7</td>
</tr>
<tr>
<td>f</td>
<td></td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>v</td>
<td></td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>p</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>g</td>
<td></td>
<td>39</td>
<td>24</td>
</tr>
<tr>
<td>ng</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>tj</td>
<td>c</td>
<td>24</td>
<td>22</td>
</tr>
<tr>
<td>s</td>
<td></td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>ch</td>
<td></td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>sh</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>th</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
From the tabulation above, it was observed that unconventional graphemes were also used. These were the same as those used in responses from Kiambu except for /ńj/ and /tʃ/. For /ńj/, <c> was used but not <ch> or <g>. For /tʃ/ the representations were the same as those of Kiambu but <th> was also used.

As was the case with Kiambu responses, the conventional graphemes have the highest frequency for all phonemes regardless of whether the subjects had formal instruction or not, except for /φ/ among the females without instruction. Here, seven responses were in the conventional grapheme <b> while thirteen were in <f>. It was also observed that the incidence of occurrence of unconventional graphemes is higher among those without formal instruction. This could possibly be attributed to lack of instruction in reading and writing Gĩkũyũ.

The percentage of responses for the conventional grapheme among female subjects is 90.8% while it is 89.7% for the males. This is again not a significant difference.

4.1.2.3 Gaki Dialect (Nyeri)

Analysed below are responses from subjects from Nyeri. The subjects included five female subjects who had formal instruction in reading and writing Gĩkũyũ, four others who did not have formal instruction, five males who had formal
instruction and two males who were not formally instructed. The total responses expected for each phoneme were forty, thirty-two, forty and sixteen for the respective categories mentioned above.
Table 4: Nyeri: Frequencies of Graphemes for females and males with and without formal instruction in reading and writing Gikuyu

<table>
<thead>
<tr>
<th>Phoneme</th>
<th>Grapheme</th>
<th>Frequency for Female Subjects</th>
<th>Frequency for Male Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>With instruction</td>
<td>Without instruction</td>
</tr>
<tr>
<td>n̄d</td>
<td>nd</td>
<td>40 7</td>
<td>36 3</td>
</tr>
<tr>
<td></td>
<td>d</td>
<td>0 12 3</td>
<td>9</td>
</tr>
<tr>
<td>m̄b</td>
<td>mb</td>
<td>35 15 32</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>b</td>
<td>2 2 4 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>2 0 0 0</td>
<td></td>
</tr>
<tr>
<td>njg</td>
<td>ng</td>
<td>40 18 37</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>g</td>
<td>0 2 1 7</td>
<td></td>
</tr>
<tr>
<td>nj</td>
<td>nj</td>
<td>32 7 28</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>j</td>
<td>3 3 6 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c</td>
<td>1 0 2 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ch</td>
<td>2 0 3 1</td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>r</td>
<td>27 13 29</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>l</td>
<td>1 5 0 0</td>
<td></td>
</tr>
<tr>
<td>Φ</td>
<td>b</td>
<td>34 7 31</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>f</td>
<td>0 9 3 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>v</td>
<td>1 1 0 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>0 3 0 1</td>
<td></td>
</tr>
<tr>
<td>ŝ</td>
<td>g</td>
<td>38 22 33</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>ng</td>
<td>0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>tj</td>
<td>c</td>
<td>28 9 16</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>ch</td>
<td>12 7 19</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>sh</td>
<td>0 5 3 1</td>
<td></td>
</tr>
</tbody>
</table>
It can be observed from the tabulation above that among the subjects with formal instruction, the conventional grapheme has the highest number of responses except <c>. It can also be observed that among the female respondents without formal instruction there were more instances of unconventional graphemes to represent the phonemes /nd/, /∅/ and /tʃ/, and that among the male respondents without formal instruction, phonemes /nd/ and /ŋ/ have more responses with unconventional graphemes than the conventional ones. This could be attributed to the lack of formal instruction in reading and writing Gĩkũyũ.

Female responses for the conventional graphemes are more at 86% while those for males are 82.3%. Although at 3.7% the difference is bigger than those of Kiambu and Murang’a responses, it is still insignificant for this study.

4.1.2.4. Non-native Gĩkũyũ speakers

The analysis below is on speakers whose L1 was not Gĩkũyũ. They included four females. One of them had formal instruction in reading and writing Gĩkũyũ, the other two did not.

There were five male respondents. Of these, three had formal instruction. The total number of responses expected from these respondents was five hundred and seventy six.
Table 5: Non-native Gikuyu speakers: Frequencies of Graphemes for females and males with and without formal instruction in reading and writing Gikuyu

<table>
<thead>
<tr>
<th>Phoneme</th>
<th>Grapheme</th>
<th>Frequency for Female Subjects</th>
<th>Frequency for Male Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>With instruction</td>
<td>Without instruction</td>
</tr>
<tr>
<td>n̄d</td>
<td>nd</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>d</td>
<td></td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>mb</td>
<td>mb</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>b</td>
<td></td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>p</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>n̄g</td>
<td>ng</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>g</td>
<td></td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>k</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>n̄j</td>
<td>nj</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>i</td>
<td></td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>g</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ch</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>r</td>
<td>r</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>l</td>
<td></td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>φ</td>
<td>b</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>f</td>
<td></td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>v</td>
<td></td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>p</td>
<td></td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>ʕ</td>
<td>g</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>ng</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>k</td>
<td></td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>tʃ</td>
<td>c</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>s</td>
<td></td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>ch</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>sh</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
It is noted from the tabulation above that as in the responses for all the Gikuyu dialects, the conventional orthography has the largest responses. All the unconventional graphemes produced by the native Gikuyu respondents are produced here. Of interest is that the non-native speakers who were uninstructed have also produced <k> to represent /ə/. It could be that these speakers do not have /ə/ in their L1. They probably perceive the sound as <k> and proceed to write it down as <k>.

In regard to /Ph/, we also note that the unconventional graphemes outnumber those of the conventional <b>. This could be as a result of L1 interference. It could be that the sound does not exist in their L1 and that what may exist are /f/, /v/ and /p/ which are represented as <f>, <v> and <p> respectively. The role of instruction is also seen in regard to phoneme /Ph/ since most of the instructed respondents produced the conventional grapheme.
4.2 A Phonological Analysis

The Autosegmental Phonology Theory is used to determine whether there is systematic retrieval of phonological information from graphemic representation (phonological recodability). To determine phonological recodability, we first analyse a word containing the phoneme under study, written with the conventional grapheme in the initial word position. For example, if phoneme /Φ/ is being analyzed, a word with the conventional grapheme <b> such as 'biū' (completely) is analysed. Unconventional graphemic representations of the same phoneme are then analysed. In the case of 'biū', other graphemes may be <f>, <v> and <p> to yield 'fiū', 'viū' and 'piū' respectively.

Second, another word with the same phoneme and conventional grapheme but in the medial word position, is analysed. Thus, for phoneme /Φ/, a word like 'mababaī' (pawpaws) is analysed. Other words with unconventional graphemes are then analysed. Such words could be 'mafafaī', 'mavavaī' and 'mapapaī'.

We begin by presenting an analysis of words containing homorganic phonemes.
4.2.1 Homorganic phonemes

1) /mɓ/

a) Initial position

Mbeka (money)

Conventional orthography

\[
\begin{array}{cccccc}
 m & b & e & c & a \\
\end{array}
\]

\[
\begin{array}{cccccc}
 mɓ & ε & tʃ & a \\
\end{array}
\]

unconventional orthographies

(i) \[
\begin{array}{cccccc}
 b & e & c & a \\
\end{array}
\]

\[
\begin{array}{cccccc}
 b & ε & tʃ & a \\
\end{array}
\]

(ii) \[
\begin{array}{cccccc}
 b & e & c & a \\
\end{array}
\]

\[
\begin{array}{cccccc}
 Φ & ε & tʃ & a \\
\end{array}
\]

From the analysis above, we observe that there is no phonological recodability between /mɓ/ and<br/>. The letter <b> can be interpreted as either /b/ or /Φ/ by a reader. In Gĩkũyũ phonology, the /mɓ/ phoneme has a single slot on the phonematic/skeletal tier. The nasal segment should not be dropped as in (i) above.
because this will produce a phoneme that is not present in the phonemic inventory of Gikuyū.

In (ii), the dropping of the nasal segment results in the word 'beca' that has a totally different meaning (to converse heartily). For the phoneme to drop /m/ and remain as /Φ/, there would have to be a process of lengthening through affixation of, for example, a diminutive marker such as 'tū', thus

\[
\begin{align*}
\text{t übeca} & \quad t \quad ā + b \quad e \quad c \quad a \\
\text{(Graphemic tier)} & \\
\text{Nasal segment dropped} & \quad t \quad ō + mb \quad e \quad t\j dots a \\
\text{(phonemic tier)} & \\
\text{t übeca} & \quad t \quad ū \quad b \quad e \quad c \quad a \\
\text{(Graphemic tier)} & \\
\end{align*}
\]

But such a compensatory process is not evident.
b) Medial position

Conventional orthography

Kambiini (campaign)

<table>
<thead>
<tr>
<th>k</th>
<th>a</th>
<th>m</th>
<th>b</th>
<th>í</th>
<th>i</th>
<th>n</th>
<th>i</th>
</tr>
</thead>
</table>

Graphemic tier

| k | a | m | b | e | í | i | n | i |

Phonematic tier

Unconventional orthographies

(i) | k | a | b | í | i | n | i |

Graphemic tier

| k | a | Φ | e | í | i | n | i |

Phonematic tier

(ii) | k | a | b | í | i | n | i |

Graphemic tier

| k | a | b | e | í | i | n | i |

Phonematic tier

(iii) | k | a | m | u | p | e | n | i |

Graphemic tier

| k | a | m | u | p | e | n | l |

Phonematic tier

The word analysed above, whose gloss is ‘campaign’, is a borrowed one. The phoneme /mb/ is represented with <b> and <p>. We note again that <b> may be read as /b/ or /Φ/. Phoneme /b/ is not found in the phonemic inventory of Gikuyu. The grapheme could not be representing /Φ/ since the ‘ka’ in the word above is
part of the stem of the word and so there is no lengthening process. The phoneme /p/ is not part of the phonemic inventory of Gĩkũyũ and neither is <p> found in the orthography of the language. The two graphemes do not, therefore, map onto /mb/. It could be that the respondents do not perceive the nasal element and so write /b/ since, as Frith observes, ‘users of an alphabetic script write by ear’ (Frith in Sampson, 1985). We note that the word ‘campaign’ was presented to the subjects in English and they had to translate it to Gĩkũyũ. The subjects could have used <p> as a result of moving directly from what they could see to the corresponding word in their mental representation without relating the grapheme to its pronunciation, without ‘phonic mediation’ (Sampson, 1985:209).

It should also be noted that representations of /mb/ that are different from the conventional <mb> are used in both the initial and medial word positions. It is observed from the data that the responses for representation of /mb/ with <b> from respondents from Kiambu are thirty five, from Murang’a twelve and from Nyeri eleven. Most of these responses are from subjects who had no formal instruction in reading and writing Gĩkũyũ, that is twenty-seven, nine and five from the respective dialects. Non-native Gĩkũyũ speakers use <b> in twelve instances. In nine of them, the respondents had no formal instruction in reading and writing Gĩkũyũ.
2) /̱nd/

(a) Initial Position

Ndagitarĩ (doctor)

Conventional orthography

\[
\text{\textasciitilde}{\text{\textasciitilde}} \quad n \quad d \quad a \quad g \quad i \quad t \quad a \quad r \quad i \text{ graphemic tier}
\]

\[
\text\textasciitilde{\text\textasciitilde} \quad ̱d \quad a \quad ̱t \quad a \quad r \quad e \text{ phonematic tier}
\]

Unconventional orthography

\[
\text\textasciitilde\text\textasciitilde \quad d \quad a \quad g \quad i \quad t \quad a \quad r \quad i \text{ graphemic tier}
\]

\[
\text\textasciitilde\text\textasciitilde \quad d \quad a \quad \gamma \quad e \quad t \quad a \quad r \quad e \text{ phonematic tier}
\]

(b) Medial Position

mũgũnda (garden)

Conventional orthography

\[
\text\textasciitilde\text\textasciitilde \quad m \quad ũ \quad g \quad ũ \quad n \quad d \quad a \text{ graphemic tier}
\]

\[
\text\textasciitilde\text\textasciitilde \quad m \quad o \quad \acute{o} \quad ̱d \quad a \text{ phonematic tier}
\]
In both initial and medial word positions the phoneme /nʊd/ is represented with <d>. In Gĩkũyũ, the phoneme has a nasal segment and never occurs without it. The first word under analysis is borrowed from English through Kiswahili to Gĩkũyũ - doctor – daktari – ndagitari (Benson, 1964:288). The writers may have the mental representations of either English or Kiswahili which do not have the /nʊd/ phoneme in the initial position for the word. This explains why they possibly write it without <n>. In both positions, it could be that the writers do not perceive the nasal element and so write the words the way they perceive them, thus

mind /nʊd/

(nasal segment is dropped)

perception /d/

grapheme <d>

From the data, most of the responses where phoneme /nʊd/ is represented with <d> are from subjects without formal instruction. These were thirty-five responses from uninstructed subjects against six from instructed subjects from Kiambu, nine
against one from Murang’
a, twenty-one against one from Nyeri and six against three from non-native Gĩkũyũ speakers.

3) /ŋ̄g/  
   a) Initial position  
      ngari (vehicle)

Conventional orthography

\[
\begin{array}{cccc}
\text{n} & \text{g} & \text{a} & \text{r} & \text{i} \\
\end{array}
\]

\[
\begin{array}{cccc}
\text{ŋ̄g} & \text{a} & \text{r} & \text{i} \\
\end{array}
\text{ phonematic tier}
\]

Unconventional orthography

\[
\begin{array}{cccc}
\text{g} & \text{a} & \text{r} & \text{i} \\
\end{array}
\text{ phonematic tier}
\]

\[
\begin{array}{cccc}
\text{g} & \text{a} & \text{r} & \text{i} \\
\end{array}
\text{ graphemic tier}
\]

\[
\begin{array}{cccc}
\text{̄} & \text{a} & \text{r} & \text{i} \\
\end{array}
\text{ phonematic tier}
\]
b) Medial position

Ciringi (shilling)

Conventional orthography

\[
\begin{array}{c}
  c \quad i \quad r \quad i \quad n \quad g \quad i \\
  \underline{\text{graphemic tier}} \\
  t\tilde{f} \quad i \quad r \quad i \quad \tilde{\eta}g \quad i \\
  \underline{\text{phonematic tier}}
\end{array}
\]

Unconventional orthography

\[
\begin{array}{c}
  t\tilde{f} \quad i \quad r \quad i \quad g \quad i \\
  \underline{\text{phonematic tier}} \\
  c \quad i \quad r \quad i \quad g \quad i \\
  \underline{\text{graphemic tier}} \\
  t\tilde{f} \quad i \quad r \quad i \quad s \quad i \\
  \underline{\text{phonematic tier}}
\end{array}
\]

Discrepancies are found in both the initial and medial word positions. Phoneme /\tilde{\eta}g/ is represented with <g>. The grapheme <g> could represent either /s/ as in ‘ufagio’ (broom) or /g/ as in ‘gari’ (vehicle) in Kiswahili. The first phoneme could not possibly be the one that is represented since the speakers would be making a word different from the one they intend to utter. It is most likely that phoneme /g/ is the one that is being represented.
Both words ‘ngari’ (vehicle) and ‘ciringi’ (shilling) are borrowed, ‘ngari’ from Kiswahili and ‘ciringi’ from English to Gĩkũyũ. The word for vehicle in Kiswahili is ‘gari’. Speakers may have written the same word in Gĩkũyũ, as a result of having the mental representation of Kiswahili. Others may have written it as a result of dropping the nasal segment from the phoneme; the same process could have happened in the second instance. The speakers may not realize that the phoneme has a nasal segment and so when they represent it, they do not write it down.

Representations of /ŋg/ with <g> were also highest from Kiambu respondents at thirty against nineteen from Nyeri and fourteen from non-native Gĩkũyũ speakers. There were no such representations from Murang’a.

4) /ŋį/ 
   a) Initial position
   
   njigũ (wet)

   Conventional orthography

   \[
   \begin{array}{cccc}
   n & j & i & g & ũ \\
   \cline{1-5}
   \hat{n}j & i & o & \text{graphemic tier} \\
   \end{array}
   \]
In the word initial position, discrepancies occurred when /n̩j/ was represented with <j>. It could be that the writers did not perceive the nasal segment in the phoneme and so represented it without the segment. It could also be that the writers were more familiar with other languages such as English which do not have a nasal segment preceding /dz/ and have the phoneme represented with <j> as in words such as ‘judge’ and ‘jug’.

b) Medial position

Thibinanji (spinach)

Conventional orthography

\[
\begin{array}{ccccccccc}
\text{t} & \text{h} & \text{i} & \text{b} & \text{i} & \text{n} & \text{a} & \text{n} & \text{j} & \text{i} \\
\end{array}
\]

\[
\begin{array}{ccccccccc}
\text{t} & \text{h} & \text{i} & \text{b} & \text{i} & \text{n} & \text{a} & \text{n} & \text{j} & \text{i} \\
\end{array}
\]

graphemic tier

phonematic tier
Unconventional orthographies

(i) t h i b i n a j i graphemic tier

(ii) t h i b i n a c h i graphemic tier

(iii) t h i b i n a c i graphemic tier

In the medial position, there were three other representations of /nj/. These were <j>, <ch> and <c>. The writers were possibly creating a linguistic representation for Gikuyu which they wrote from their different perceptions of the phoneme.
Thus:

(mind) 

\[ /\text{nj}/ \]

(perception) 
\[ /\text{nj}/ /\text{dz}/ /\text{t}\text{j}/ \] - Linguistic representation of different speakers

(grapheme) \[ <\text{nj}> <\text{j}> <\text{ch}> <\text{c}> \] - Graphemic symbols

The grapheme \(<\text{nj}>\) is mapped onto the phoneme in the mind \(/\text{nj}/\). Some speakers mentally perceive \(/\text{dz}/\) and \(/\text{t}\text{j}/\). Since they possibly do not know how to represent what they perceive, they opt to create a linguistic representation for it. Some use \(<\text{j}>\), others \(<\text{ch}>\) while others use \(<\text{c}>\).

Respondents from Kiambu produced forty responses with \(<\text{j}>\) as compared to twenty-four from Murang’a and nineteen from Nyeri. There were two responses with \(<\text{ch}>\) from Kiambu, six from Nyeri and none from Murang’a. There was one response with \(<\text{g}>\) from Kiambu and none from the other dialects. Most of these responses came from subjects without instruction (seventy-five against thirty-nine).
4.2.2. The Alveolar – Palatal Affricate / tʃ/

a) Initial position

Cati (shirt)

Conventional orthography

\[
\begin{array}{c}
\text{c} \\
\text{a} \\
\text{t} \\
\text{i} \\
\text{tʃ a t i} \\
\text{graphemic tier} \\
\text{phonematic tier}
\end{array}
\]

Unconventional orthographies

(i) \[
\begin{array}{c}
\text{c} \\
\text{h} \\
\text{a} \\
\text{t} \\
\text{tʃ a t i} \\
\text{graphemic tier} \\
\text{phonematic tier}
\end{array}
\]

(ii) \[
\begin{array}{c}
\text{s} \\
\text{h} \\
\text{a} \\
\text{t} \\
\text{ʃ a t i} \\
\text{phonematic tier} \\
\text{phonematic tier}
\end{array}
\]

(iii) \[
\begin{array}{c}
\text{s} \\
\text{a} \\
\text{t} \\
\text{i} \\
\text{s a t i} \\
\text{graphemic tier} \\
\text{phonematic tier}
\end{array}
\]
b) Medial position

Ndirica (window)

Conventional orthography

\[
\begin{array}{c}
\text{graphemic tier} \\
\text{phonematic tier}
\end{array}
\]

Unconventional orthographies

(i) \[
\begin{array}{c}
\text{graphemic tier} \\
\text{phonematic tier}
\end{array}
\]

(ii) \[
\begin{array}{c}
\text{graphemic tier} \\
\text{phonematic tier}
\end{array}
\]

(iii) \[
\begin{array}{c}
\text{graphemic tier} \\
\text{phonematic tier}
\end{array}
\]
In both the initial and medial word positions, phoneme /tʃ/ has variously been represented with <ch>, <sh> and <s>. The discrepancies could be manifestations of different linguistic representations created by speakers whose mental perception of the phoneme is different.

Thus:

(mind)  
\[
/\text{tʃ}/ 
\]

(perception)  
\[
/\text{tʃ}/ \quad /\text{ʃ}/ \quad /\text{s}/ 
\]

- Linguistic representation of different speakers

(grapheme)  
\[
<\text{c}> \quad <\text{ch}> \quad <\text{sh}> \quad <\text{s}> 
\]

The respondents then write a grapheme that corresponds to their perception.

The two words analysed above are borrowed. The first word ‘cati’ (shirt) is borrowed from English. The phoneme /ʃ/ in the English word could be the same phoneme the writers were trying to represent in writing the word as ‘shati’. The second word ‘ndirica’ (window) is borrowed from the Kiswahili word ‘ndirisha’. Again, the writers using <sh> could be writing the word as it is written in Kiswahili, thus using the linguistic representation of Kiswahili.

From the data analysed, the speakers with the different audio-perceptions are from all the Gĩkũyũ dialectal areas. There are two responses for <ch> from Kiambu, fifteen from Murang’a and thirty-eight from Nyeri; six responses for <sh> from
Kiambu, five from Murang’a and nine from Nyeri. While Kiambu has nine responses for <s> and Murang’a has three, Nyeri has none. It does appear then that there are different realizations of the same phoneme in all the dialects.

4.2.3. The Bilabial Fricative /\phi/ 

a) Initial position

Biū (completely)

Conventional orthography

\[
\begin{array}{c|c|c}
| & i & ū \\
---&---&---
\end{array}
\]

\[
\begin{array}{c|c|c}
\phi & i & o \\
---&---&---
\end{array}
\]

Unconventional orthographies

(i)  

\[
\begin{array}{c|c|c}
v & i & ū \\
---&---&---
\end{array}
\]

\[
\begin{array}{c|c|c}
v & i & o \\
---&---&---
\end{array}
\]

(ii)  

\[
\begin{array}{c|c|c}
p & i & ū \\
---&---&---
\end{array}
\]

\[
\begin{array}{c|c|c}
p & i & o \\
---&---&---
\end{array}
\]
b) Medial position

Biribiri (pepper)

Conventional orthography

\[ b \quad i \quad r \quad i \quad b \quad i \quad r \quad i \] \text{graphemic tier}

\[ \Phi \quad i \quad r \quad i \quad \Phi \quad i \quad r \quad i \] \text{phonematic tier}

Unconventional orthographies

(i) \[ v \quad i \quad r \quad i \quad v \quad i \quad r \quad i \] \text{graphemic tier}

\[ v \quad i \quad r \quad i \quad v \quad i \quad r \quad i \] \text{phonematic tier}

(ii) \[ p \quad i \quad l \quad i \quad p \quad i \quad l \quad i \] \text{graphemic tier}

\[ p \quad i \quad l \quad i \quad p \quad i \quad l \quad i \] \text{phonematic tier}
Discrepancies occur when /Φ/ is represented with <v>, <p> and <f>. There are different representations in both the initial and medial word positions. The three representations, that is <v>, <p> and <f>, are for phonemes that are not part of the Gĩkũyu phonetic inventory. It could be that the writers are simply representing what they perceive that sound to be.

Murang’a has the highest number of responses (twenty-seven) that use <f> for /Φ/ followed by Kiambu (twenty-three). Indeed, this is the highest response for all the unconventional graphemes from the dialect. The responses with <f> of female uninstructed subjects is also high in all dialects (forty-one) when compared to the responses of the instructed female subjects (eight). The highest
number of responses with <v> for /Ø/ are from Kiambu (ten). Murang’a and Nyeri each has two. Grapheme <p> for /Ø/ is also used in all the dialects but is used more by uninstructed female respondents.

4.2.4 The velar - fricative /ɔ/

a) Initial position

Getha (harvest)

Conventional orthography

```
g e t h a

\~ \epsilon \circ \ a
```

phonematic tier

Unconventional orthographies

```
\widehat{n} g e t h a

\widehat{ng} \epsilon \circ \ a
```

phonematic tier

b) Medial position

Ndagĩka (a minute)
Conventional orthography

\[
\text{\text{\text{n d a g i k a}}}
\]
\[
\hat{\text{\text{n d a e k a}}}
\]

Unconventional orthographies

\[
\text{\text{n d a n g i k a}}
\]
\[
\hat{\text{\text{n d a ng e k a}}}
\]

Discrepancies occur when /ɛ/ is represented with <ng> in both initial and medial word positions. The writers add a nasal segment to the phoneme. This creates a discrepancy between what the writers write and what they utter. This could be attributed to the writers not knowing what to write. They could be unfamiliar with the representation of the phoneme.

From all the dialects, phoneme /ɛ/ has the least misrepresentations. Kiambu had three representations of /ɛ/ with <ng>, Murang’a had two and non-native speakers had two. There were no misrepresentations from speakers from Nyeri. It was observed that the speakers who used <ng> also used <g> in most other instances. They also correctly used <ng> to represent /ŋg/. This then suggests that these were probably slips that could have been occasioned by the respondents carelessness.
4.2.5 The Alveolar Trill /r/

a) Initial Position
Reri (rail)

Conventional Orthography

\[
\begin{array}{c}
\text{r} \\
\text{e} \\
\text{r} \\
\text{i} \\
\end{array}
\]

graphemic tier

\[
\begin{array}{c}
\text{r} \\
\text{e} \\
\text{r} \\
\text{i} \\
\end{array}
\]

phonematic tier

Unconventional orthographies

\[
\begin{array}{c}
\text{l} \\
\text{e} \\
\text{r} \\
\text{i} \\
\end{array}
\]

graphemic tier

\[
\begin{array}{c}
\text{l} \\
\text{e} \\
\text{r} \\
\text{i} \\
\end{array}
\]

phonematic tier

b) Medial Position
Mükoron (colonizer)

Conventional orthography

\[
\begin{array}{c}
m \text{ü} \\
\text{k} \\
\text{o} \\
\text{r} \\
\text{o} \\
\text{n} \\
\text{i} \\
\end{array}
\]

graphemic tier

\[
\begin{array}{c}
m \text{o} \\
\text{k} \\
\text{o} \\
\text{r} \\
\text{o} \\
\text{n} \\
\text{i} \\
\end{array}
\]

phonematic tier
From the analysis above, grapheme \(<l>\) is used to represent /r/ in both initial and final word positions. Phoneme /l/ is not found in the phonetic inventory of Gikuyu. The use of the phoneme in a word would not produce any change in the meaning of the word. Responses that had \(<l>\) representing /r/ were twenty-two from Kiambu, eight from Murang’a and six from Nyeri. While these were higher among subjects with instruction from Kiambu (sixteen), they were fewer for the same category from Murang’a (one) and Nyeri (one). It is possible that the speakers use \(<l>\) to represent a sound which they perceive to differ from a trill. This could be a tap or a flap /l/ which differs from a trill in that there is only a momentary interruption to the flow of air in the production of the flap whereas a trill consists of at least two taps.
4.3  **Borrowed Words**

The research also describes the extent to which words were adapted into Gĩkūyũ orthography. Consequently, words borrowed from other languages were presented to the subjects. The loaner languages were English and Kiswahili. Sounds would be preserved if their phonetic properties had a correspondence in both the loaner language and Gĩkūyũ. Where there was no such correspondence, the researcher expected the borrowing language (Gĩkūyũ) to adapt the sounds in a "phonetic orthography" where there would be a one-to-one correspondence between each phoneme and the symbolization of that phoneme (Koda, 1997). It was also expected that borrowed words would be spelt as pronounced by native speakers of Gĩkūyũ using the graphemes utilized by Gĩkūyũ. (Pike, 1947)

Table 6 here below shows the borrowed word, the loaner language, the grapheme that the respondents were expected to present, the conventional orthography of the borrowed word, and the variant reproductions of the same word.
<table>
<thead>
<tr>
<th>Borrowed Word</th>
<th>Loaner Language</th>
<th>Grapheme</th>
<th>Conventional Orthography</th>
<th>Other Orthographies</th>
</tr>
</thead>
<tbody>
<tr>
<td>campaign</td>
<td>E</td>
<td>mb</td>
<td>kambañi</td>
<td>kamupeni</td>
</tr>
<tr>
<td>veterinary</td>
<td>E</td>
<td>b</td>
<td>betinarĩ</td>
<td>vetinarĩ</td>
</tr>
<tr>
<td>pawpaws</td>
<td>E</td>
<td>b</td>
<td>mabañaĩ</td>
<td>maafaĩ</td>
</tr>
<tr>
<td>detention</td>
<td>E</td>
<td>nd</td>
<td>nditianĩ</td>
<td>ditĩni</td>
</tr>
<tr>
<td>location</td>
<td>E</td>
<td>r/c</td>
<td>rokĩconi</td>
<td>rokĩshoni</td>
</tr>
<tr>
<td>demon</td>
<td>E</td>
<td>nd</td>
<td>ndaimono</td>
<td>daimono</td>
</tr>
<tr>
<td>licence</td>
<td>E</td>
<td>r/c</td>
<td>raiceniçi</td>
<td>laicensi</td>
</tr>
<tr>
<td>council</td>
<td>E</td>
<td>nj</td>
<td>kanjũ</td>
<td>kajũ</td>
</tr>
<tr>
<td>family</td>
<td>E</td>
<td>b/r</td>
<td>bamĩřĩ</td>
<td>famĩřĩ</td>
</tr>
<tr>
<td>budget</td>
<td>E</td>
<td>mb/nj</td>
<td>mbanjetĩ</td>
<td>banjetĩ</td>
</tr>
<tr>
<td>spinach</td>
<td>E</td>
<td>b/nj</td>
<td>thibinanji</td>
<td>thivinanji</td>
</tr>
<tr>
<td>glass</td>
<td>E</td>
<td>ng</td>
<td>ngirathi</td>
<td>girathi</td>
</tr>
<tr>
<td>shilling</td>
<td>E</td>
<td>c/ng/ñ</td>
<td>ciringi</td>
<td>cirigi</td>
</tr>
<tr>
<td>rail</td>
<td>E</td>
<td>r</td>
<td>reri</td>
<td>reli</td>
</tr>
<tr>
<td>line</td>
<td>E</td>
<td>r</td>
<td>rainĩ</td>
<td>lainĩ</td>
</tr>
<tr>
<td>rubber</td>
<td>E</td>
<td>r/b</td>
<td>raba</td>
<td>rafa</td>
</tr>
<tr>
<td>doctor</td>
<td>K</td>
<td>nd</td>
<td>ndagĩtarĩ</td>
<td>dagĩtarĩ</td>
</tr>
<tr>
<td>pepper</td>
<td>K</td>
<td>b/r</td>
<td>biribiri</td>
<td>firiiri</td>
</tr>
<tr>
<td>vehicle</td>
<td>K</td>
<td>ng</td>
<td>ngari</td>
<td>gari</td>
</tr>
<tr>
<td>a minute</td>
<td>K</td>
<td>nd/g</td>
<td>ndagĩka</td>
<td>dagĩka</td>
</tr>
<tr>
<td>tribe</td>
<td>K</td>
<td>r</td>
<td>kabira</td>
<td>kabila</td>
</tr>
<tr>
<td>money</td>
<td>K</td>
<td>mb/c</td>
<td>mbeca</td>
<td>mbecha</td>
</tr>
<tr>
<td>tea</td>
<td>K</td>
<td>c</td>
<td>cai</td>
<td>shai</td>
</tr>
<tr>
<td>window</td>
<td>K</td>
<td>c</td>
<td>ndirica</td>
<td>ndirisha</td>
</tr>
<tr>
<td>newspaper</td>
<td>K</td>
<td>ng</td>
<td>ngathĩti</td>
<td>gathĩti</td>
</tr>
<tr>
<td>shirt</td>
<td>E</td>
<td>c</td>
<td>catĩ</td>
<td>shatĩ</td>
</tr>
<tr>
<td>coloniser</td>
<td>K</td>
<td>r</td>
<td>mukoroni</td>
<td>mukoloni</td>
</tr>
</tbody>
</table>

Key: E: English  K: Kiswahili
The words that were borrowed contained phonemes that are not found in the Gĩkũyu phonemic inventory. From English, phonemes were /p/, /b/, /d/, /dz/, /l/, /v/, /v/ and /g/. From Kiswahili they were /p/, /b/, /d/, /l/, /v/, /v/ and /g/.

From the table above, it is observed that some speakers/writers, using their linguistic structure of Gĩkũyu, mapped the phonemes in English and Kiswahili to their corresponding graphemes. In other cases, the phonemes were not mapped as is the case in the analysis repeated here:

a) Initial position

ngari (vehicle)

Conventional orthography

\[
\begin{array}{c|c|c|c}
\text{ngARI} & \text{graphemic tier} \\
\text{n} & \text{g} & \text{a} & \text{r} & \text{i} \\
\end{array}
\]

Unconventional orthography

\[
\begin{array}{c|c|c|c}
\text{ngARI} & \text{phonematic tier} \\
\text{g} & \text{a} & \text{r} & \text{i} \\
\end{array}
\]
This results in ill-formed sequences that violate the restriction of sound occurrences in Gĩkũyũ such as ‘siligi’ which would be vocalized as /siligi/ or /silisĩ/.

This is because /s/, /l/ and /g/ are not found in the phonetic inventory of Gĩkũyũ. The phoneme /g/ in Gĩkũyũ is homorganic and is always accompanied by an initial nasal segment.

Words adapted into Gĩkũyũ language were expected to have a CVCCV structure. This is the sequential structure of Gĩkũyũ and many other Bantu languages. Many of the respondents present words with this structure. In all responses, the final V-sound was produced. This was an indication that the speakers/writers were conversant with the final V-sound in Gĩkũyũ language. In several cases, the CV sequence was violated in the initial and medial word positions. Two consonantal sounds followed each other giving CCV for example ‘spinaji’ (spinach) or CVVCVCCV for example ‘laicensi’ (license) sequences. It was noted that such violations mostly occurred in words borrowed from English, a language that allows consonantal clusters (Laver, 1994:33). It would appear that some of the borrowed words are first adapted as accidental gap fillers which violate sequential constraints but which, nevertheless, fill a gap in the Gĩkũyũ lexicon. With more adaptation into the language through the process of naturalization, they are modified to fit the lexicon. This possibly explains why some writers use the conventional graphemes with the expected CV structure for a given word while others use different graphemes and structures for the same word. It also partly
explains why some Gĩkũyũ language authors write some words with such spellings since they are creating gap-fillers for words that are recently borrowed from other languages, words such as ‘kampeini’ (campaign). With naturalization, the consonantal sequence /mp/ is transformed into the Gĩkũyũ phoneme /mĩb/.

4.4 Conclusion

In the preceding sections of this chapter, eight phonemes and their respective graphemes have been analysed using the Autosegmental Phonology construct, Phonological Recodability and Linguistic Mental Representation. In the chart given below, the phonemes and graphemes generated in the primary data are shown against the phoneme presented in the secondary data.
### Chart III: Phonemes and Graphemes generated in the study

<table>
<thead>
<tr>
<th>Phoneme under study</th>
<th>Phonemes generated in the study</th>
<th>Corresponding grapheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>mb</td>
<td>/b/</td>
<td>b.</td>
</tr>
<tr>
<td></td>
<td>/Φ/</td>
<td>b</td>
</tr>
<tr>
<td></td>
<td>/p/</td>
<td>p</td>
</tr>
<tr>
<td>ŋg</td>
<td>/g/</td>
<td>g</td>
</tr>
<tr>
<td>ŋj</td>
<td>/dʒ/</td>
<td>j</td>
</tr>
<tr>
<td></td>
<td>/dʒ/</td>
<td>g</td>
</tr>
<tr>
<td></td>
<td>/tʃ/</td>
<td>ch</td>
</tr>
<tr>
<td></td>
<td>/tʃ/</td>
<td>c</td>
</tr>
<tr>
<td>ríd</td>
<td>/d/</td>
<td>d</td>
</tr>
<tr>
<td>r</td>
<td>/l/</td>
<td>l</td>
</tr>
<tr>
<td>Φ</td>
<td>/f/</td>
<td>f</td>
</tr>
<tr>
<td></td>
<td>/v/</td>
<td>v</td>
</tr>
<tr>
<td></td>
<td>/p/</td>
<td>p</td>
</tr>
<tr>
<td>ʂ</td>
<td>/ŋb/</td>
<td>ng</td>
</tr>
<tr>
<td></td>
<td>/k/</td>
<td>k</td>
</tr>
<tr>
<td>tʃ</td>
<td>/s/</td>
<td>s</td>
</tr>
<tr>
<td></td>
<td>/tʃ/</td>
<td>ch</td>
</tr>
<tr>
<td></td>
<td>/ʃ/</td>
<td>sh</td>
</tr>
<tr>
<td></td>
<td>/θ/</td>
<td>th</td>
</tr>
</tbody>
</table>

The phonemes in the chart above are presented below in a consonantal chart that shows their place and manner of articulation.
Chart IV: Consonantal chart: Phonemes generated in the study

<table>
<thead>
<tr>
<th>Plosives</th>
<th>Bilabial</th>
<th>Labiodental</th>
<th>Dental</th>
<th>Alveolar</th>
<th>Palatal alveolar</th>
<th>velar</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>p</td>
<td>b</td>
<td></td>
<td></td>
<td></td>
<td>k</td>
</tr>
<tr>
<td>Fricative</td>
<td>f</td>
<td>v</td>
<td></td>
<td>s</td>
<td>f</td>
<td>g</td>
</tr>
<tr>
<td>Affricate</td>
<td>l</td>
<td></td>
<td>l</td>
<td>d</td>
<td>tf</td>
<td></td>
</tr>
<tr>
<td>lateral</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>dz</td>
<td></td>
</tr>
</tbody>
</table>

From the chart above, it can be observed that phonemes not found in the phonemic inventory of Gĩkũyũ (apart from /k/) have been generated by the respondents. Graphemes that are not conventionally assigned to the phonemes of Gĩkũyũ have also been used. The phonemes and graphemes have been analysed under the variables of sex, dialect and instruction. In the following section, we present a conclusion of that analysis.

4.4.1 The Sex Variable

In identifying discrepancies between some Gĩkũyũ phonemes and their orthography, sex as a variable was expected to play a major role. Trudgill (1974) has claimed that ‘female linguistic forms are considered to be “better” than male forms’. Our findings are that responses for the conventional graphemes from female subjects is 78.3% as compared to 77% for male responses from Kiambu, 90.8% against 89.7% for Muranga and 86% against 82.3% for Nyeri. This is a very small difference between the two sexes. Female responses for the
conventional graphemes were marginally higher than the male responses. These figures validate Trudgill’s claim to a small extent, but as a variable, sex was insignificant in our research.

4.4.2 Dialect as a Factor

All phonemes are represented with unconventional graphemes by subjects from all dialects. The representation of phonemes with unconventional graphemes differs from dialect to dialect. Kabete has the highest responses with unconventional graphemes for the homorganic phonemes /mb/, /nd/, /ng/ and /ň/. The subjects with those responses mostly dropped the nasal segment from the phoneme. Respondents from Kabete may have had more contact with other languages due to their proximity to Nairobi with its cosmopolitan linguistic features. This could have interfered with their mental representations of the Gĩkũyũ phonemes (Mattingly 1992).

The alveolar palatal affricate /tʃ/ is represented with <ch>, <sh> and <s>. Most responses with <ch> are from Gaki dialect. In this dialect, /tʃ/ is realized as in the English word ‘church’ and the respondents presented it as they perceived it. This differs from Kabete where the same phoneme is realized as /s/ and represented as <s>. In all the dialects, there were instances in which the same phoneme was realized as /ʃ/ as in ‘shot’. Thus, in all dialects, the phoneme is realized differently but is conventionally represented with <ʃ>. But the analysis and conclusion above do not explain the usage of one grapheme in one word and
another in a different word by the same respondent. For example, in one case, a subject writes ‘ndirisa’ (window) thereby using <s> for /ʃ/ and then writes ‘cucu’ (grandmother) and so uses <c> for the same phoneme. Here, there is no “regularity of symbol-to-sound correspondents” (Koda, 1997). This is probably because such a subject has encountered the word ‘cucu’ in written form more often than the word ‘ndirica’ and so readily produces the conventional orthography in the former but not in the latter. The subject has learnt the orthographical form of the word ‘cucu’ and so is able to produce it in a form that others can recognize. Another explanation could be that the subject is using the mental representation of English which lacks isomorphism with the phoneme /s/ where <c> in ‘cease’ and <s> in ‘seas’ represent one phoneme (Koda, 1997). It could also be that the subject writes one thing <s> then corrects himself and writes <c> after realizing that one is wrong.

The bilabial fricative /ʃ/ is closely aligned to the labiodentals /f/ and /v/ in terms of manner of articulation. It could be that /ʃ/ is more prevalent in Metumi than in the other two dialects or that respondents easily identify /ʃ/ with <f> and not with <b> which may appear to them as the grapheme for /b/.

Most respondents from all the dialects have given the conventional grapheme <g> for the velar fricative /x/. The phoneme is not subject to dialectal variations. It appears as if most of the subjects are aware that the grapheme <ng> represents
another phoneme apart from /ṣ/. Those who misrepresent the phoneme may simply have made errors in given instances since they also represent the phoneme with the conventional grapheme in other instances.

Grapheme <l> representing the alveolar trill /r/ is mostly used by respondents from Kiambu. Since /l/ is not a Gikũyũ phoneme, its usage by some speakers is possibly because the subjects are unable to differentiate the alveolar trill /r/ from the alveolar tap /ɛ/. They therefore present what they perceive.

4.4.3 The role of Formal Instruction

From the data that was collected, it is observed that formal instruction plays a major role in the mapping of graphemes onto their phonemes. Respondents who are formally instructed in reading and writing Gikũyũ produce more responses where the conventional grapheme is mapped onto the corresponding phoneme. In the case where <ch> is mapped onto /tʃ/ by more males with formal instruction than those without it from Nyeri, dialect as a factor is seen to play a bigger role. Among the non-native Gikũyũ speakers, the same is observed. Male respondents who were uninstructed tend to use the unconventional grapheme especially <f> for /Ø/ and <r> for /l/. This can be attributed to the presence of phonemes <f> and <l> in their L₁.
Our findings agree with Mattingly (1992:13) who says that literacy is the largest stimulus for the acquisition of the mental representation of a language. Instruction helps one to master the mapping between graphemes and phonemes.

4.4.4 Adaptation of Borrowed Words

Borrowed words are adapted into the phonological structure of Gĩkũyũ. Where a word is borrowed from a language that allows consonantal clusters, vocalic sounds are inserted between the consonantal strings so as to break the clusters. Consonantal sounds that are not part of Gĩkũyũ phonology are naturalized into Gĩkũyũ phonemes so as to fit the Gĩkũyũ lexicon.

4.5 Conclusion

In this chapter, data from the respondents was analysed. Discrepancies between the graphemic and the phonological structure of Gĩkũyũ are identified and accounted for using the theoretical constructs of Autosegmental Phonology, Phonological Recodability and Linguistic Mental Representation.

Lastly, the variables of sex, dialect and the role of instruction are discussed as they affect the analysed data. In the next chapter we present a summary of our findings, conclusion and recommendations.
SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This research aimed at identifying and describing some of the discrepancies found between Gikuyu phonology and orthography, and accounting for the discrepancies using the Autosegmental Phonology Theory, Phonological Recodability and Linguistic Mental Representation. It also aimed at describing the extent to which borrowed words are adapted to Gikuyu orthography. Such discrepancies have been identified, described and accounted for in Chapter 4. The extent to which borrowed words are adapted to Gikuyu orthography is also discussed in Chapter 4.

5.1 Summary of Findings

In this research, eight phonemes and their respective graphemes were under study. These were the homorganic phonemes /mb/, /nd/, /ng/, /nj/, the alveolar palatal affricate /tl/, the bilabial fricative /f/, the velar fricative /s/ and the alveolar trill /r/. Their respective conventional graphemes are <mb>, <nd>, <ng>, <nj>, <c>, <b>, <g> and <r>. Unconventional graphemes were generated in the research. These have been discussed under the variables of sex, dialect and instruction. The
extent to which borrowed words were adapted into Gĩkũyũ orthography has also been discussed. Following is a summary of the findings from our research.

5.1.1 Sex

Female responses for the conventional grapheme were slightly more than male responses. Nevertheless, this difference was too small to make us claim that one sex was definitely better in generating more responses for the conventional graphemes. Our conclusion, therefore, is that sex as a variable in this study was insignificant.

5.1.2 Dialect

Responses from subjects from each dialect were analysed. We observed that there were differences in the responses by subjects from different dialects. The dialect of the speakers influence what respondents wrote. Subjects from Kiambu dialect had more responses where the nasal segment was dropped from the homorganic phonemes. There were more responses from Nyeri that represented /tʃ/ with <ch> and more responses from Kiambu where /tʃ/ was represented with <s> but the same phoneme was represented with <sh> by respondents from all the dialects. From Murang'a there was a larger number of responses that used <ʃ> for /ʃ/. Phonoeme /ʃ/ did not show dialectal influences. Lastly, the alveolar trill was mostly represented with <l> by respondents from Kiambu.
5.1.3 Formal Instruction

We observed that the subjects who had received formal instruction in writing and reading Gikũyũ generally produced more responses for the conventional grapheme. We also observed that subjects who were uninstructed and were non-native speakers of Gikũyũ produced graphemes that were used to represent phonemes that are possibly found in their L1, or other languages such as English and Kiswahili.

Our conclusion, then, is that formal instruction plays a major role in enabling respondents to map graphemes onto their phonemes.

5.1.4 Borrowed words

Words that are borrowed from other languages are adapted into the phonological structure of Gikũyũ. Phonemes from loaner languages are naturalized into Gikũyũ phonemes. These are then presented using the appropriate graphemes in Gikũyũ. Where graphemes that are unconventional are used, we have endeavored to show that the phonemes are still undergoing the naturalization process.
5.2 Conclusion

Discrepancies occur between Gĩkũyũ orthography and Gĩkũyũ phonology. The discrepancies have been identified and described in this study. An account for these discrepancies using the Autosegmental Phonology Theory, Phonological Recodability and Linguistic Mental Representation has been given.

The AP tenets of tiers and association lines have been used to account for the discrepancies. A psycholinguistic approach based on phonological recodability and linguistic mental representations has been used in explaining the association between the phonological and the graphemic tiers.

The extent to which borrowed words are adapted into Gĩkũyũ has also been discussed. Words are seen to first be adapted phonologically and then graphemically.
5.3 Recommendations

Only eight consonantal phonemes and their corresponding graphemes were studied in this research. No vocalic phonemes were studied. Though some discrepancies were resolved with the vocalic phonemes (Wanjau, 1989), there is need to study the vocalic phonemes that were not studied. This should be done with a view of assigning to Gĩkũyũ an orthography that will cut across dialectal divides.

We did observe that some subjects did not represent the nasal element found in the homorganic phonemes. This was possibly because of the non-perception of the segment, or because the subjects lack its mental representation. We recommend that further research be carried out in the area of the pronunciation of these phonemes. The findings would establish whether the nasal element is actually perceived and determine the need or otherwise of maintaining the graphemic representation of the segment.

We did note the close alignment between /Ø/, /f/ and /v/ and that there are many instances where both the instructed and uninstructed respondents used <f> to represent /Ø/. We would recommend that the orthography be reviewed to include <f> which would represent /Ø/ and <v> for /v/ which comes in with borrowed words such as ‘vetinari’ (vetinary), ‘vidio’ (vedio). The grapheme <p> should
also be included in the orthography to represent /p/ from borrowed words such as 'purovenici' (province) and 'purocekiuta' (prosecutor).

Instruction in reading and writing Gikuyu has been observed to be of major importance in the mapping of graphemes onto their respective phonemes. We did observe that most subjects who had received formal instruction in reading and writing in Gikuyu produced more responses for the conventional graphemes. However, we also observed that this group of respondents also used the unconventional graphemes. In view of this, we recommend that the Ministry of Education should re-examine the evaluation of the teaching and learning of Gikuyu in schools so that the objectives that are set out in the syllabus are achieved.
BIBLIOGRAPHY


Guthrie, M (1967) *Classification of Bantu Languages.* London: Dawsons of Pall Mall


Appendix I

Questionnaire

To be answered by respondents who can read and write in Gikuyu.

BACKGROUND INFORMATION

NAME:

AGE: MALE/FEMALE

LEVEL OF EDUCATION:

SECTION A: Answer all the questions in this section

1. Have you ever had any formal instruction in Gikuyu writing? YES □ NO □

2. Have you ever written, a letter, a story, passage, etc in Gikuyu? Yes/No
   If Yes No, Why:

3. Writing in Gikuyu is
   Very easy
   Easy
   Difficult
   Very difficult

4. How often do you read in Gikuyu
   Daily
   Regularly for example, once a week
   Occasionally for example, once a month
   Rarely
   Hardly ever

5. Reading Gikuyu is
   Very easy
   Easy
   Difficult
   Very difficult
6. If your answer for question 3 is easy or very easy, briefly explain why

7. If your answer for question 5 is difficult or very difficult, briefly explain why

SECTION B: Rewrite the following passage in Gikũyũ

I heard the voice of the preacher as he was coming. He was asking me, “There are many types of plants in the garden. There are fruits like pawpaws, pineapples, mangoes and oranges. There are other plants like beans, spinach, pepper and cassava. Who is the planter? Who will harvest? Once sold, who will the money belong to?”
SECTION C: Translate the following words into Gikuyu and indicate your ease of translation by ticking in the appropriate column.

<table>
<thead>
<tr>
<th>Word</th>
<th>Translation</th>
<th>Very Easy</th>
<th>Easy</th>
<th>No Comment</th>
<th>Difficult</th>
<th>Very Difficult</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. a minute</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. paint</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. line</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. vehicle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. budget</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. a water glass</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. campaign</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. shilling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. factory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. onion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. rubber</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. headscarf</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. location</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. haircomb</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. head turban</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. trading licence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. tea</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. shirt</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SECTION D: For the words given below, choose the most correct translation from the choice

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. need</td>
<td>(a) fata</td>
<td>(b) bata</td>
<td>(c) vata</td>
<td>(d) pata</td>
</tr>
<tr>
<td>2. spider</td>
<td>(a) būbūţi</td>
<td>(b) būmbūţi</td>
<td>(c) mbūbūţi</td>
<td>(d) mbūmbūţi</td>
</tr>
<tr>
<td>3. detain</td>
<td>(a) ditīini</td>
<td>(b) nditīini</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. council</td>
<td>(a) kanjū</td>
<td>(b) kajū</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. doubts</td>
<td>(a) ganja</td>
<td>(b) nganja</td>
<td>(c) ngaja</td>
<td>(d) gaja</td>
</tr>
<tr>
<td>6. badge (of rank)</td>
<td>(a) ndebe</td>
<td>(b) debe</td>
<td>(c) ndeve</td>
<td>(d) ndefe</td>
</tr>
<tr>
<td>7. rail</td>
<td>(a) reri</td>
<td>(b) reli</td>
<td>(c) leri</td>
<td>(d) leli</td>
</tr>
<tr>
<td>8. maize</td>
<td>(a) bembe</td>
<td>(b) mbebe</td>
<td>(c) mbembe</td>
<td>(d) bebe</td>
</tr>
<tr>
<td>9. cowpeas</td>
<td>(a) njūgū</td>
<td>(b) jūgū</td>
<td>(c) jūngū</td>
<td></td>
</tr>
<tr>
<td>10. doctor</td>
<td>(a) dagītarī</td>
<td>(b) ndangītarī</td>
<td>(c) ngāgītarī</td>
<td>(d) dangītarī</td>
</tr>
<tr>
<td>11. veterinary</td>
<td>(a) betinari</td>
<td>(b) vetinari</td>
<td>(c) fetinari</td>
<td>(d) mbetinari</td>
</tr>
<tr>
<td>12. newspaper</td>
<td>(a) ngaceti</td>
<td>(b) ngazeti</td>
<td>(c) gathiti</td>
<td>(d) ngathiti</td>
</tr>
<tr>
<td>13. tribe</td>
<td>(b) kafira</td>
<td>(b) kabira</td>
<td>(c) kavila</td>
<td>(d) kabila</td>
</tr>
<tr>
<td>14. demon</td>
<td>(a) daimono</td>
<td>(b) ndaimono</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. duck</td>
<td>(a) bata</td>
<td>(b) mbata</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. harvest</td>
<td>(a) ngetha</td>
<td>(b) getha</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. completely</td>
<td>(a) fiū</td>
<td>(b) viū</td>
<td>(c) biū</td>
<td>(d) piū</td>
</tr>
<tr>
<td>18. cock</td>
<td>(a) njogoo</td>
<td>(b) jogoo</td>
<td>(c) njongoo</td>
<td>(d) jongo</td>
</tr>
<tr>
<td>19. colonizer</td>
<td>(a) mūkoloni</td>
<td>(b) mūkoroni</td>
<td>(c) mūcoroni</td>
<td>(d) mūcolon</td>
</tr>
<tr>
<td>20. family</td>
<td>(a) famirī</td>
<td>(b) bamirī</td>
<td>(c) famili</td>
<td>(d) bamilī</td>
</tr>
<tr>
<td>21. owl</td>
<td>(a) ndudu</td>
<td>(b) ndundu</td>
<td>(c) dundu</td>
<td>(d) dudu</td>
</tr>
<tr>
<td>22. wet</td>
<td>(a) njigū</td>
<td>(b) jīgū</td>
<td>(c) njingū</td>
<td>(d) jingū</td>
</tr>
<tr>
<td>23. loaf of bread</td>
<td>(a) boburū</td>
<td>(b) mbofurū</td>
<td>(c) mboburū</td>
<td>(d) bofurū</td>
</tr>
<tr>
<td>24. grandmother</td>
<td>(a) cūcū</td>
<td>(b) chuchū</td>
<td>(c) sūsū</td>
<td>(d) shūshū</td>
</tr>
<tr>
<td>25. window</td>
<td>(a) ndirisa</td>
<td>(b) ndiricha</td>
<td>(c) ndirica</td>
<td>(d) ndirisha</td>
</tr>
</tbody>
</table>
### Appendix II

**List of Sampled Words from Gikuyū Literature that Contain the Phonemes Under Study.**

<table>
<thead>
<tr>
<th>Phoneme</th>
<th>Grapheme</th>
<th>Word</th>
<th>Gloss</th>
<th>Phoneme</th>
<th>Grapheme</th>
<th>Word</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>/mb/</td>
<td>mb</td>
<td>mbëmbëi</td>
<td>spider</td>
<td>/mb/</td>
<td>mb</td>
<td>mbëmbëi</td>
<td>spider</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mbembe</td>
<td>maize</td>
<td></td>
<td></td>
<td>mbembe</td>
<td>maize</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mbata</td>
<td>duck</td>
<td></td>
<td></td>
<td>mbata</td>
<td>duck</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mûgamo</td>
<td>sound</td>
<td></td>
<td></td>
<td>mûgamo</td>
<td>sound</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mbëmbëi</td>
<td>spider</td>
<td>mbëmbëi</td>
<td>spider</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>bata</td>
<td>need</td>
<td></td>
<td></td>
<td>bata</td>
<td>need</td>
</tr>
<tr>
<td></td>
<td></td>
<td>betinarî</td>
<td>veterinary</td>
<td></td>
<td></td>
<td>betinarî</td>
<td>veterinary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>bûû</td>
<td>completely</td>
<td></td>
<td></td>
<td>bûû</td>
<td>completely</td>
</tr>
<tr>
<td></td>
<td></td>
<td>biribiri</td>
<td>pepper</td>
<td></td>
<td></td>
<td>biribiri</td>
<td>pepper</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mbembe</td>
<td>maize</td>
<td></td>
<td></td>
<td>mbembe</td>
<td>maize</td>
</tr>
<tr>
<td></td>
<td></td>
<td>maembe</td>
<td>mangoes</td>
<td></td>
<td></td>
<td>maembe</td>
<td>mangoes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kambîînî</td>
<td>campaign</td>
<td></td>
<td></td>
<td>kambîînî</td>
<td>campaign</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kiremba</td>
<td>headturban</td>
<td></td>
<td></td>
<td>kiremba</td>
<td>headturban</td>
</tr>
<tr>
<td>/b/</td>
<td>b</td>
<td>bata</td>
<td>need</td>
<td></td>
<td></td>
<td>bata</td>
<td>need</td>
</tr>
<tr>
<td></td>
<td></td>
<td>betinarî</td>
<td>veterinary</td>
<td></td>
<td></td>
<td>betinarî</td>
<td>veterinary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>bûû</td>
<td>completely</td>
<td></td>
<td></td>
<td>bûû</td>
<td>completely</td>
</tr>
<tr>
<td></td>
<td></td>
<td>biribiri</td>
<td>pepper</td>
<td></td>
<td></td>
<td>biribiri</td>
<td>pepper</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mbembe</td>
<td>maize</td>
<td></td>
<td></td>
<td>mbembe</td>
<td>maize</td>
</tr>
<tr>
<td></td>
<td></td>
<td>maembe</td>
<td>mangoes</td>
<td></td>
<td></td>
<td>maembe</td>
<td>mangoes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kambîînî</td>
<td>campaign</td>
<td></td>
<td></td>
<td>kambîînî</td>
<td>campaign</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kiremba</td>
<td>headturban</td>
<td></td>
<td></td>
<td>kiremba</td>
<td>headturban</td>
</tr>
<tr>
<td>/nd/</td>
<td>nd</td>
<td>ndîînî</td>
<td>detention</td>
<td></td>
<td></td>
<td>ndûûda</td>
<td>garden</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ndagîînî</td>
<td>doctor</td>
<td></td>
<td></td>
<td>matunda</td>
<td>fruits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ndaimono</td>
<td>demon</td>
<td></td>
<td></td>
<td>mûûhûnûjia</td>
<td>planter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ndundu</td>
<td>owl</td>
<td></td>
<td></td>
<td>ciendio</td>
<td>will be sold</td>
</tr>
<tr>
<td>/nj/</td>
<td>nj</td>
<td>njûûgû</td>
<td>cowpeas</td>
<td></td>
<td></td>
<td>kanjûû</td>
<td>council</td>
</tr>
<tr>
<td></td>
<td></td>
<td>njogoo</td>
<td>cock</td>
<td></td>
<td></td>
<td>mbanjeti</td>
<td>budget</td>
</tr>
<tr>
<td></td>
<td></td>
<td>njûûgû</td>
<td>wet</td>
<td></td>
<td></td>
<td>mûûhûnûjia</td>
<td>preacher</td>
</tr>
<tr>
<td></td>
<td></td>
<td>thûûbininji</td>
<td>spinach</td>
<td></td>
<td></td>
<td>aranjûûri</td>
<td>he is asking me</td>
</tr>
<tr>
<td>/ng/</td>
<td>ng</td>
<td>nganja</td>
<td>doubts</td>
<td></td>
<td></td>
<td>rangi</td>
<td>paint</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ngathûûti</td>
<td>newspaper</td>
<td></td>
<td></td>
<td>miingi</td>
<td>many</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ngirathûû</td>
<td>glass</td>
<td></td>
<td></td>
<td>ciringi</td>
<td>shilling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ngaarûû</td>
<td>vehicle</td>
<td></td>
<td></td>
<td>mianga</td>
<td>cassava</td>
</tr>
<tr>
<td>/nl/</td>
<td>cûû</td>
<td>cûûcûû</td>
<td>grandmother</td>
<td></td>
<td></td>
<td>mbeça</td>
<td>money</td>
</tr>
<tr>
<td></td>
<td></td>
<td>çai</td>
<td>tea</td>
<td></td>
<td></td>
<td>ndirica</td>
<td>window</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ciringi</td>
<td>shilling</td>
<td></td>
<td></td>
<td>mboco</td>
<td>beans</td>
</tr>
<tr>
<td></td>
<td></td>
<td>çati</td>
<td>shirt</td>
<td></td>
<td></td>
<td>macungwa</td>
<td>oranges</td>
</tr>
<tr>
<td>/l/</td>
<td>gûû</td>
<td>getha</td>
<td>harvest</td>
<td></td>
<td></td>
<td>ndagûûka</td>
<td>a minute</td>
</tr>
<tr>
<td></td>
<td></td>
<td>gitûûngûû</td>
<td>onion</td>
<td></td>
<td></td>
<td>kûûganda</td>
<td>factory</td>
</tr>
<tr>
<td></td>
<td></td>
<td>gitûûnûri</td>
<td>haircomb</td>
<td></td>
<td></td>
<td>ookagûa</td>
<td>(he) was coming</td>
</tr>
<tr>
<td></td>
<td></td>
<td>gitûûmbûayêa</td>
<td>headscarf</td>
<td></td>
<td></td>
<td>ndûûràûgûaire</td>
<td>I heard</td>
</tr>
<tr>
<td>/r/</td>
<td>raini</td>
<td>line</td>
<td>reri</td>
<td>rail</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>-------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>raba</td>
<td>rubber</td>
<td>ūkabira</td>
<td>tribalism</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rokiconi</td>
<td>location</td>
<td>mūkooroni</td>
<td>colonialist</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>raicenici</td>
<td>licence</td>
<td>bamīrī</td>
<td>family</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix III

Excerpts from Waihonge agalciira

Kabiriri, muku T't
diirb a ribr:
cr to gerna guth ira . .mg'ethere

Manonca na mbere

Magazines

101