SHONA MORPHOPHONEMICS: REPAIR STRATEGIES IN KARANGA AND ZEZURU

by

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Abstract

This thesis investigates how Shona, an African language spoken in Zimbabwe deals with potentially onsetless syllables (heterosyllabic VV sequences & initial onsetless syllables) and subminimal words. The thesis focuses on the morphophonemics of Karanga and Zezuru—the two principal dialects of Shona. Karanga and Zezuru morphophonemic processes observed in this thesis have only *one* primary goal; to achieve the typical or preferred Shona phonological structures—the consonant-vowel (CV) syllable and the disyllabic Prosodic Word. Often, when morphemes are concatenated, the resultant phonological structures do not conform to these typical structures. The study examines the repair strategies that Karanga and Zezuru employ to achieve the CV syllable and the disyllabic Prosodic Word. The overall analysis is couched in Optimality Theory (Prince and Smolensky (2004 [1993].

Hiatus resolution strategies are conditioned by prosodic domains/boundaries, and a detailed prosodic parsing is required to account for this phenomenon. The Prosodic Stem, Prosodic Word and the Clitic Group are the prosodic domains relevant for this study. Owing to the impossibility of unifying the cliticization and coalescence facts with the other strategies in a single constraint ranking, two strata are posited—the Word (lexical) and the Phrasal (Postlexical) using the Lexical Phonology and Morphology-Optimality Theory (Kiparsky 2000, 2003). At the Word level, Glide formation is the default strategy, and at the Phrasal level, it is coalescence. Employing the Clements and Hume (1995) Unified Feature Geometry model, with the addition of the feature [pharyngeal], all the hiatus-breakers [j w ʔ ɦ] are analyzed as products of spreading.

Karanga and Zezuru display greater variation with respect to prosodic minimality and initial onsetless syllables than in hiatus resolution. It is argued that Zezuru enforces WORD MINIMALITY at the expense of ONSET, and Karanga enforces ONSET at the expense of WORD MINIMALITY. Karanga displays internal variation; it allows initial onsetless syllables in function words but not in lexical ones. Based on tone, reduplication, minimality and cliticization, initial onsetless syllables are argued to be morified, syllabified and not extra-prosodic and therefore do not warrant any special representation.

Table of Contents

Abstract ii

Table of Contents iii

List of Tables viii

List of Figures ix

List of Abbreviations xi

Acknowledgements xiii

Dedication xv

PART I BACKGROUND 1

CHAPTER 1 INTRODUCTION 2

1.1 OVERVIEW 2
1.2 PROSODIC DOMAINS AND LEVELS 9
  1.2.1 The Motivation for Domains 9
  1.2.2 The Levels, Prosodic Domains and Hiatus Resolution Strategies 11
1.3 PROSODIC MINIMALITY AND INITIAL ONSETLESS SYLLABLES 12
1.4 THEORETICAL APPROACHES 15
  1.4.1 Optimality Theory 15
  1.4.2 Feature Geometry 16
  1.4.3. Morphological and Metrical Prosodic Hierarchies 19
1.5 EMPIRICAL AND THEORETICAL CONTRIBUTIONS 22
1.6 ORGANIZATION OF THESIS 23

CHAPTER 2 LITERATURE REVIEW 25

2.1 INTRODUCTION 25
2.2. PREVIOUS WORK ON SHONA PHONOLOGY 25
2.3 MECHANISMS FOR RESOLVING VOWEL HIATUS 27
  2.3.1 Previous Studies of Coalescence 27
  2.3.2 Previous Studies of Glide Formation 27
  2.3.3 Previous Studies of Vowel Elision 28
  2.3.4 Previous Studies of Epenthesis 29
2.4 INITIAL ONSETLESS SYLLABLES 32
  2.4.1 Onsetless Syllables do not Bear Tone 32
  2.4.2 Onsetless Syllables do not Bear Stress 33
  2.4.3 Onsetless Syllables in Reduplication 35
  2.4.4 Onsetless Syllables are at the Left Edge 35
2.5 PROSODIC MINIMALITY 36
2.6 SUMMARY 37

CHAPTER 3 AN OVERVIEW OF SHONA PHONOLOGY 38

3.1. INTRODUCTION 38
3.2 A SOCIOLINGUISTIC NOTE 38
3.3 SHONA PHONEMES 39
3.3.1 The Vowels 39
3.3.2 Consonant Inventory 40
3.3.2.1 Simple Segments 40
3.3.2.2 Complex Segments 42
3.4 TONE 44
3.4.1 Lexical Tone 44
3.4.2 Grammatical Tone 46
3.5 THE SHONA SYLLABLE 46
3.6 SUMMARY 48

PART II MORPHOPHONOLOGY AND MORPHOSYNTAX OF VERBS AND NOMINALS 49

CHAPTER 4 VERBAL MORPHOPHONOLOGY AND MORPHOSYNTAX 50

4.1 INTRODUCTION 50
4.2 THE PROSODIC DOMAINS: AN INTRODUCTION 50
4.2.1 Prosodic Word 50
4.2.1.1 Disyllabic Minimality 51
4.2.1.2 Meeussen's Rule 52
4.2.2 Prosodic Stem 54
4.2.3 The Clitic Group 55
4.3 VERBAL STRUCTURES, DOMAINS AND HIATUS RESOLUTION STRATEGIES 58
4.3.1 Verb Root 60
4.3.1.1 Underived Verb Roots 61
4.3.1.2 Derived Verb Roots: Roots Derived from Ideophones 61
4.3.1.3 Roots Derived from Adjectives 63
4.3.2 The Prosodic Stem 63
4.3.2.1 Derivational Stem 63
4.3.2.2 Inflected Verb Stem 66
4.3.2.3 Macro Stem 69
4.3.2.4 PreStem 70
4.3.3 The Prosodic Word: Verb Word 70
4.3.4 Hiatus Resolution Across the PStem Edge: Recursive PStem and PrWd 71
4.3.5 Clitic Group 72
4.3.5.1 VCV Pronominal Clitics 73
4.3.5.2 Monosegmental Clitics (V Clitics) 76
4.3.6 Hiatus Resolution in the Clitic Group: Across the PrWd Edge (Postlexical Level) 77
4.4 SUMMARY 77

CHAPTER 5 NOMINAL MORPHOPHONOLOGY AND MORPHOSYNTAX 78

5.1 INTRODUCTION 78
5.2. THE DOMAINS AND THE HIATUS RESOLUTION STRATEGIES 78

5.3 The Minimal Nominal Stem 79
5.3.1 Minimal Noun Stem 80
5.3.2 Minimal Adjective Stems 81
5.3.3 Minimal Quantitative Stem........ 81
5.3.4 Minimal Selector Stem 82
5.3.5 Minimal Enumerative Stem........ 82
5.3.6 Minimal Possessive Stem 82
5.3.7 Compound Nominal Stem 82
5.4. The Non-Recursive Prosodic Stem: (Inflected Nominal Stems)........ 84
5.4.1. Inflected Noun Stem........ 84
5.4.1.1 The Ghost Augment........ 89
5.4.1.2 Diminutive Noun Classes 92
5.4.2 Inflected Adjective Stem 93
5.4.3 Inflected Quantitative Stem 95
5.4.4 Inflected Selector Stem........ 97
5.4.5 Inflected Enumerative Stem 98
5.4.6 Inflected Possessive Stem........ 98
5.4.7 Inflectional Nominal Stem ≠ PrWd 100
5.5 Hiatus Resolution in Non-Recursive Prosodic Stem: Minimal NStem Edge 101
5.6 Recursive Prosodic Stem: Extended Inflectional Noun Stems 103
5.6.1 Pre-Prefixed Inflected Noun Stems 104
5.6.2. Inflected Deverbal Stem 110
5.7 The Nominal Word: The Infinitive........ 113
5.8 Hiatus Resolution in the Recursive Prosodic Stem & Prosodic Word: Across a PStem Edge:(Word Level)........ 114
5.9 The Clitic Group Domain: Clitic Word........ 115
5.9.1 Pronouns: 1st and 2nd Person Singular/Plural Pronoun 116
5.9.2 Pronouns: 3rd Person Pronoun 116
5.9.3 Shona Demonstratives 117
5.9.4 Proclitics: Associatives and Copula........ 119
5.9.4.1 CV Associatives........ 119
5.9.4.2 Copula as Proclitic H-tone........ 120
5.9.4.4 CV Copula as Proclitic 121
5.10 Hiatus Resolution in the Clitic Group: Across a Prososdic Word Edge (Postlexical Level)........ 122
5.11 Summary........ 123

SUMMARY OF PART II 124

PART III: HIATUS RESOLUTION 125

CHAPTER 6 GLIDE FORMATION, SECONDARY ARTICULATION AND ELISION 126

6.1 Introduction 126
6.2 Glide formation, Secondary Articulation, Elision, Spreading and Coalescence: An Introduction 126
6.3. Hiatus Within a Single Prosodic Stem (Word Level): Glide Formation, Secondary Articulation and Elision........ 141
6.3.1 Glide Formation—The Default Strategy at the Word Level 142

6.3.2 Secondary Articulation 144
6.3.3 Elision 147
6.3.3.1 Coronal Vowel Elision 147
6.3.3.2 Pharyngeal Vowel Elision 150
6.3.3.4 Inter-dialectal Variation: Labial Vowel Elision 151
6. 4 SUMMARY 154

CHAPTER 7 SPREADING 155

7. 1 INTRODUCTION 155
7.2. DOMAIN FOR SPREADING: THE PROSODIC STEM BOUNDARY 155
7.3 SPREADING AND OTHER HIATUS RESOLUTION STRATEGIES 156
7.4 EPENTHESIS: SPREADING AND DEFAULT SEGMENTISM 160
7.5 SPREADING IN KARANGA AND ZEZURU 161
7.5.1 Spreading Resulting in Oral Glides: [j w] 162
7.5.1.1 Spreading From a Coronal Vowel: [j] 162
7.5.1.2 Spreading From a Labial Vowel: [w] 163
7.5.2 Spreading From a Pharyngeal Vowel: [ʔ] and [ɦ] 166
7.5.2.1 Spreading From a Pharyngeal Vowel Resulting in [ʔ] 167
7.5.2.2 Spreading From a Pharyngeal Vowel Resulting in [ɦ] 169
7.6 SUMMARY 177

CHAPTER 8 COALESCENCE 179

8.1 INTRODUCTION 179
8.2 TYPES OF COALESCENCE: ASYMMETRICAL AND SYMMETRICAL 179
8.2.1. Asymmetrical Coalescence 179
8.2.2 Symmetrical Coalescence 183
8.3 DOMAIN FOR COALESCENCE: CLITIC GROUP 183
8.4 COALESCENCE: VCV CLITICS 184
8.4.1 CV Proclitics 184
8.4.2 Enclitics 190
8.4.2.1 VCV Enclitics 190
8.5. SPREADING: MONOSEGMENTAL (V) CLITICS 190
8.6 THE GHOST AUGMENT 192
8.7 3RD PERSON PRONOUN AS ENCLITIC 196
8.8 DEMONSTRATIVES AS ENCLITICS 197
8.9 SUMMARY 199

CHAPTER 9 PROSODIC MINIMALITY AND INITIAL ONSETLESS SYLLABLES .. 200

9.1 INTRODUCTION 200
9.2 PROSODIC MINIMALITY 201
9.2.1. Imperatives 201
9.2.2 Monosyllabic Nominal Words 206
9.3 INITIAL ONSETLESS SYLLABLES 210
9.3.1 Lexical Words 210
9.3.2 Function Words 215
9.4 THE NEED FOR BOTH ONSET AND NO HIATUS 220

9.5 Moraic Structure of Initial Onsetless Syllables ... 223
9.5.1 Initial Onsetless Syllables Bear Tone ... 223
9.5.2 Initial Onsetless Syllables Count for Syllables ... 224
9.5.2.1 Minimality ... 224
9.5.2.2 Cliticization ... 225
9.5.2.3 Reduplication ... 226
9.6 Summary ... 227

CHAPTER 10 CONCLUSION ... 229

REFERENCES ... 234

List of Tables

Table 3.1 Shona Vowel Features (Clements and Hume 1995)……………………………………..40
Table 3.2 Shona Simple Consonants……………………………………………………………41
Table 3.3 Shona Complex Consonants…………………………………………………………..43
Table 4.1 Enclitics…………………………………………………………………………………73
Table 5.1 Shona Noun Class Prefixes……………………………………………………………87
Table 5.2 Shona Noun Class Prefixes Showing 'Ghost' Augment……………………………...92
Table 5.3 Quantitative Class Prefixes……………………………………………………………98
Table 5.4 Suppletion: Quantitative Class Prefixes………………………………………………99
Table 5.5 Shona 3rd Person Pronouns…………………………………………………………..119
Table 5.6 Shona Demonstratives ……………………………………… …………………...120
Table 6.1 Non-Recursive PStem (Word Level): Domain for Glide Formation, Secondary articulation, and Elision……………………………………………………………………...144
Table 7.1 Spreading: Prosodic Stem Boundary………………………….............................159
Table 7.2 Hiatus Resolution Strategies and Domains…………………………………………163
Table 8.1 Clitic Group Domain: Coalescence…………………………………………………187

List of Figures

Figure 1.1 Hiatus (heterosyllabic VV sequences)……………………………………………...3
Figure 1.2 Glide formation……………………………………………………………………..6
Figure 1.3 Secondary Articulation……………………………………………………………...6
Figure 1.4 Elision………………………………………………………………………………6
Figure 1.5 Spreading……………………………………………………………………………7
Figure 1.6 Coalescence…………………………………………………………………………9
Figure 1.7 Levels, Morphosyntactic Constituents and Prosodic Domains………………………12
Figure 1.8 Unified Feature Geometry of Clements and Hume (1995)…………………………..17
Figure 1.9 Feature Structure of [ɦ], [ʔ] and [a]………………………………………………..18
Figure 1.10 Feature Structure of [e], [i] and [j]…………………………………………………19
Figure 1.11 Feature Structure of [o], [u] and [w]……………………………………………….19
Figure 1.12 Prosodic Hierarchy …………………………………………………………………20
Figure 1.13 Morphological and Metrical Prosodic Hierarchies (Downing 2006)……………....22
Figure 2.1 Unsyllabified Vowels in Aranda…………………………………………………….35
Figure 3.1 Representation of t^w ……………………………………………….....................44
Figure 3.2 Typical Shona Syllable ……………………………………………………………...47
Figure 4.1 Recursive Prosodic Word……………………………………………………………56
Figure 4.2 Clitic Group ………………………………………………………………………....56
Figure 4.3 Verbal Morphosyntactic Constituents, Levels, Prosodic Domains and Hiatus
Resolution Strategies……………………………………………………………………………59
Figure 4.4 The Verb Structure…………………………………………………………………..60
Figure 4.5 Roots Derived from Ideophone……………………………………………………...62
Figure 4.6 Derivational Stem…………………………………………………………………....64
Figure 4.7 Inflected Verb Stem…………………………………………………………………66
Figure 4.8 MacroStem…………………………………………………………………………..69
Figure 4.9 PreStem……………………………………………………………………………....70
Figure 4.10 Verb Word…………………………………………………………………………..71
Figure 4.11 Pronominal Enclitic………………………………………………………………...74
Figure 4.12 Enclitics and Minimality……………………………………………………………75
Figure 5.1 Levels, Nominal Morphosyntactic Constituents, Prosodic Domains and Hiatus
Resolution Strategies……………………………………………………………………………80
Figure 5.2 Compound Nominal Stem…………………………………………………….......85
Figure 5.3 Inflected Nominal Stem with Compound Nominal Stem …………………………...88
Figure 5.4 Inflected Noun Stem ……………………………………………………………......95
Figure 5.5 Inflected Adjective Stem ……………………………………………………………97
Figure 5.6 Inflected Quantitative Stem …………………………………………………………99
Figure 5.7 Inflected Possessive Stem …………………………………………………………101
Figure 5.8 Inflectional Nominal Stem ≠ PrWd…………………………………………………103
Figure 5.9 Pre-Prefixed Inflected Noun Stem…………………………………………………109
Figure 5.10 Pre-Prefixed Inflected Noun Stem: Three Class Prefixes…………………………111
Figure 5.11 Inflected Deverbal Stem…………………………………………………………...113
Figure 5.12 Pre-Prefixed Inflected Deverbal Stem……………………………………………..114
Figure 5.13 The Infinitive is a Nominal Word…………………………………………………116
Figure 5.14 Proclitic ……………………………………………………………………………..121
Figure 5.15 Levels, Morphosyntactic Constituents, Prosodic Domains and Hiatus Resolution
Strategies………………………………………………………………………………………..127

Figure 6.1 Glide Formation ……………………………………………………………………132
Figure 6.2 Secondary Articulation…………………………………………………………...133
Figure 6.3 Elision………………………………………………………………………………135
Figure 6.4 Spreading……………………………………………………………………………137
Figure 6.5 Coalescence: Elision of V_1 with Preservation of [open]…………………………....139
Figure 7.1 Spreading……………………………………………………………………………164
Figure 7.2 Default Insertion……………………………………………………………………164
Figure 7.3 V-Place Spreading…………………………………………………………………..167
Figure 7.4 Root Node Spreading………………………………………………………………168
Figure 9.1 Infinitive……………………………………………………………………………205
Figure 9.2 Initial Onsetless Syllables in Karanga and Zezuru…………………………………229
Figure 10.1 Levels, Morphosyntactic Constituents, Prosodic Domains and Hiatus Resolution Strategies……………………………………………………………………………………..232

List of Abbreviations

VV	vowel-vowel sequence
CV	consonant-vowel sequence (syllable)
C	consonant
V	vowel
PStem	Prosodic Stem
PrWd	Prosodic Word
GF	glide formation
OT	Optimality Theory
Cw	consonant-[w] sequence (cluster)
C^w	labialization
[s.g.]	[spread glottis]
[c.g.]	[constricted glottis]
FV	final-vowel morpheme
INFIN	infinitive
PRoot	Prosodic Root
H	high
L	low
CL	class
CL	plural
HON.	honorific
PL	plural
OBJ	object
SUBJCT	subjective
SUBJ	subject
HAB	habitual
FUT	future
CAUS	causative
NEG	negation
SM	subject marker
TNS	tense marker
OM	object marker
DStem	Derived Stem
IVStem	Inflected Verb Stem
3SG	3rd person singular
3PL	3rd person plural
1SG	1st person singular
1PL	1st person plural
2SG	2nd person singular
2PL	2nd person plural
[phar]	[pharyngeal]
[lab]	[labial]
VC	vowel-consonant sequence
INTEROG	interrogative
REC	reciprocal
PRON	pronoun
DEM	demonstrative
RP	remote past

QP	question particle
DIMIN	diminutive
STAB	stabilizer
Ø	zero
DEROG	derogatory
QStem	Quantitative Stem
SELEC	selector
STAB	stabilizer
COP	copula
DEM.AFX	demonstrative affix
VStem	Verb Stem
Aug	augment
N	Noun
Adj	Adjective
POSS	possessive
CAUS	causative
NOM	nominalizer
POTENT	potential
*COMP	*COMPLEX
Min	minimal
NStem	Noun Stem
NRoot	Noun Root
Prfx	prefix
UNIQ	UNIQUE
ASSOC	associative
LOC	locative
LPM-OT	Lexical Phonology and Morphology-Optimality Theory (Kiparsky 2000)

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Mazvijita

Dedication

In loving memory of my mother, Ruvira Komboni.

PART I

BACKGROUND

Part 1 consists of chapters 1, 2 and 3. Chapter 1 introduces the whole thesis, laying out the issues that this thesis investigates, viz., Shona hiatus, prosodic minimality and initial onsetless syllables. The chapter introduces the formal theories employed, viz., Stratal Optimality Theory (Kiparsky 2000, 2003), see also (Orgun 1994) — a modified version of the traditional Optimality Theory framework (Prince and Smolensky (2004 [1993], McCarthy and Prince 1993), the Prosodic Hierarchy (Selkirk 1978, 1995), and Feature Geometry (Clements 1985, Clements and Hume 1995). Chapter 2 provides a brief overview of the pertinent literature. This is the literature on different aspects of Shona phonology; literature on hiatus resolution mechanisms; prosodic minimality and initial onsetless syllables. Chapter 3 is an overview of Shona phonology. It is intended to facilitate the reader's understanding of the subsequent chapters, particularly the analysis chapters. The overview provides the reader with the basic facts of Shona phonology.

CHAPTER 1

INTRODUCTION

1.1 Overview

Shona is a Central Bantu language, spoken in Zimbabwe by about 9 million people. It belongs to the Southern Bantu cluster, and is classified as S.10 in Guthrie's classification (Guthrie 1948). Shona comprises five dialects: Karanga, Zezuru, Manyika, Korekore, and Ndau. Karanga and Zezuru are the principal dialects: the orthography is based largely on the phonologies of these dialects; each of them has more speakers than the other dialects; each of them occupies a larger geographical area compared to the other dialects; both are considered more prestigious than the other dialects (Chimhundu 1983).

This thesis investigates how Karanga and Zezuru, the principal dialects of Shona, deal with onsetless syllables and subminimal words. Onsetless syllable is a cover term for hiatus (heterosyllabic VV sequences) and initial onsetless syllables. The focus is largely on the morphophonemics of Karanga and Zezuru with the overarching theme of illustrating that the Karanga and Zezuru morphophonemic processes observed in this study have only *one* goal: to achieve the typical or preferred Shona phonological structures—the consonant-vowel (CV) syllable and the disyllabic prosodic word. Often, when morphemes are concatenated, the resultant phonological structures do not conform to these typical structures. The primary research question addressed is:

(1) How do the Shona dialects of Karanga and Zezuru achieve the phonological structures that satisfy the following two requirements:

- (i) that all syllables be CV.
- (ii) that all prosodic words be a minimum of two syllables.

I assume that there are two constraints driving the repair of onsetless syllables NO HIATUS and ONSET. NO HIATUS drives the repair of two vocalic sequences, and ONSET drives the repair of initial onsetless syllables.

(2)

NO-HIATUS

```
* σ     σ
  |     |
  μ     μ
  |     |
  Rt    Rt
```

(Ola Orie and Pulleyblank 2002)

(3) ONSET

*[$_\sigma$ V (syllables must have onsets)

(Itô 1989, Prince and Smolensky 1993)

The need for both constraints NO HIATUS and ONSET is worth justifying. In principle, ONSET alone should be enough to drive the repair of vocalic sequences (hiatus) and initial onsetless syllables. Vocalic sequences involve a medial onsetless syllable. However, both Zezuru and Karanga data present challenges that can only be resolved by invoking both NO HIATUS and ONSET. The justification for the need of both constraints is presented in §9.4 which examines initial onsetless syllables.

I also assume that WORD MINIMALITY (WDMIN) is the driving constraint in the repair of monosyllabic Prosodic Words.

(4) WORD MINIMALITY

Words are minimally disyllabic (WD ≥ σ σ)

First, with respect to onsetless syllables, both dialects consistently eliminate hiatus thereby ensuring that heterosyllabic VV sequences illustrated in Figure 1.1 never surface.

Figure 1.1 Hiatus (Heterosyllabic VV sequences)

```
σ    σ
|    |
μ    μ
|    |
Rt   Rt
```

(adapted from Orie and Pulleyblank 2002)

Glide formation (GF), secondary articulation, elision, coalescence and spreading are the five hiatus resolution strategies in Karanga and Zezuru. In examples (5)-(10), I provide illustrative examples. Examples 5(b) and 6(b) illustrate glide formation. In 5(b), the coronal vowel /i/ is realized as the glide [j], and in 6(b) the labial vowel /ù/ is realized as [w]. In examples 7(b), the labial vowel /ù/ is deleted and its VPlace feature is passed on to the preceding consonant where it is realized as secondary articulation. In 8(b), V_1 is elided. In example 9(b), /à/ and /ì/ coalesce to produce [é]. Finally, in 10(a) and (b) the hiatus-breakers [w] and [j] are products of [labial] and [coronal] spreading from a [labial] and [coronal] V_2 respectively. In instances where an example has more than a single word, the word that contains hiatus is in boldface. Unless indicated otherwise, all the Karanga data used in this thesis is from the author, while the Zezuru data is from the author's wife, Shingirai Makaye.

- **Glide formation**

		Karanga/Zezuru
(5) a.	/Ø-mò^{m}bé ì-ʧá-fá^{m}b-a/ CL9.SG-cow CL9.SG-FUT-walk-FV 'the cow will walk'	[mò^{m}bé ìʧáfá^{m}bá]
b.	**/Ø-**mò^{m}bé **ì-á^{n}gù/** CL9.SG-cow CL9.SG-1SG.POSS 'my cow'	[mò^{m}bé **já^{n}gù**]
(6) a.	/mù-rúmé ù-ʧá-fá^{m}b-a/ CL1.SG-man CL1.SG-FUT-walk-FV 'the man will walk'	[mùrúmé ùʧáfá^{m}bá]
b.	/mù-rúmé **ù-áké**/ CL1.SG-man CL1.SG-3SG.POSS 'his man'	[mùrúmé **wáké**]

- **Secondary articulation**

(7) a.	/mù-ʃá/ CL3.SG-home 'home'	[mùʃá]
b.	/mù-ánà/ CL1.SG-child 'child'	[m^{w}ánà]

- **Elision**

(8) a.	/ʧì-kórò/ CL7.SG-school 'school'	[ʧìkórò]
b.	/ʧì-ánà/ CL7.SG.DIMIN-child	[ʧánà]

‘small child’

- **Coalescence**

(9) a /ɦá=ù-jù/ [ɦójù]
COP=STAB-CL1.SG.DEM.AFX
‘here s/he is’

b. /ɦá=ì-rì/ [ɦérì]
COP=STAB-CL5.SG.DEM.AFX
‘here it is’

- **Spreading (“epenthesis”)**

(10) a. /ʋà-úᵐb-í/ [ʋàwúᵐbí]
CL1.PL-mould-NOM
‘the moulders’

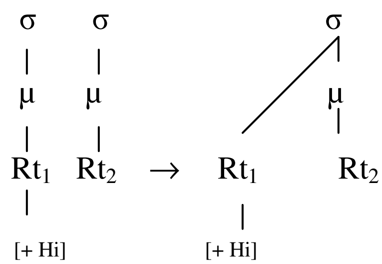
b. /ʋà-íᵐb-í/ [ʋàjíᵐbí]
CL1.PL-sing-NOM
‘the singers’

The five strategies glide formation, secondary articulation, elision, spreading and coalescence form a conspiracy: they are all mobilized to eliminate a single configuration—hiatus (Figure 1.1). Kisseberth (1970) originally identified a phonological ‘conspiracy’ as a set of rules (processes) that serve the same purpose: to rid the surface forms of the language of certain undesirable (marked) configurations. McCarthy (2002:93) calls this ‘homogeneity of target/heterogeneity of process’. This is where an output target is achieved in different ways across contexts in the same language or across languages. Hiatus resolution is considered *the* classical case of heterogeneity of process, both within the same language and across languages (dialects in this case). In Karanga and Zezuru, the five strategies are employed to eliminate a single configuration— hiatus. The strategies operate in different contexts. In addition, there is variation across the two dialects.

Glide formation occurs when a word-initial high V_1 is parsed in onset position where it is realized as a glide (5b & 6b)[1]. This observation follows from the representations of glides and high vowels where they share the same features save for the fact that the vowels have moras and the glides are in onset position (§1.4.2). Glide formation results in the loss of a mora. Figure 1.2 illustrates glide formation.

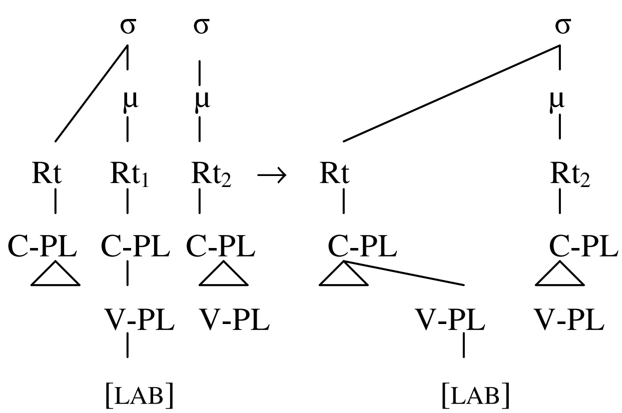
[1] Examples involving /e, o/ in the environment are not attested.

Figure 1. 2 Glide formation



Secondary articulation involves turning the back vowels [u] and [o] into a glide when it is immediately preceded by a consonant, and followed by a vowel. The glide is realized as secondary articulation on the preceding consonant (7b). This is analyzed as the deletion of V_1 with the preservation of the [labial] V-Place node, which docks onto the preceding consonant. Similar to glide formation, secondary articulation involves the loss of a mora.

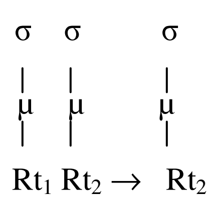
Figure 1. 3 Secondary Articulation



The difference between glide formation and secondary articulation is that glide formation involves turning a labial or coronal vowel into a glide whereas secondary articulation involves deleting the root node of a vowel and preserving its V-Place features.

Elision involves deleting the first vowel, without lengthening the following vowel (8b).

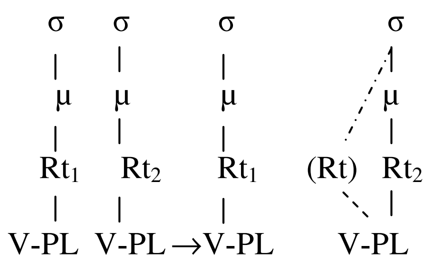
Figure 1. 4 Elision



Elision usually involves the loss of V_1. Cases involving the loss of V_2 are also discussed.

Next, spreading is where all the features of the hiatus-breaker are ‘borrowed’ from an input segment (10a & b). Intermediate cases where some features are spread from an input segment and others are inserted will be discussed as well. As an illustration, I show V-Place spreading in Figure 1.5.

Figure 1. 5 Spreading



With respect to spreading, the thesis argues that all the hiatus-breakers [j w ʔ ɦ] are products of spreading. In the literature, there are implicit and explicit assumptions that spreading is the preserve of oral glides [j w], and all other epenthetic segments are products of default insertion (Rosenthall 1994, Kawahara 2002, Lombardi 2002). While work such as Broadbent (1991), Ortmann (1999) and Gick (1999) have demonstrated that other epenthetic segments can be analyzed as products of spreading, the assumption that spreading is restricted to the glides [j w] is still robust. This thesis contributes to this debate by demonstrating that Karanga and Zezuru hiatus-breakers, [j w ʔ ɦ], are best analyzed as products of spreading. The hiatus-breakers occur in complementary distribution: each is used in a context in which it is as similar to one of its neighboring vowels or input segments as possible.

The glide [j] occurs in the context of [i] or [e] (11), and [w] in the context of [u] or [o] (12). Both [ʔ] and [ɦ] are used in the context of a pharyngeal vowel [a] ((13) and (14)). In 13(a) and (b), [ʔ] is used in the context in which V_2 is [a]. Examples 14(a) and (b) demonstrate that [ɦ] is used in a very specific context: two pharyngeal vowels ([a]) have to be in sequence and the consonant immediately preceding V_1
must be [ɦ].

(11) a. /ʋà-ì-tór-e/ [ʋàjìtóré]
2L.PL.SUBJ-CL9.SG-take-SUBJCT
‘they should take it’

b. /mù-è^{n}d-ès-i/ [mùjè^{n}dèsì]
2SG.SUBJ-send-CAUS-SUBJCT
‘the sender’

(12) a. /ʋà-ù-tór-e/ [ʋàwùtóré]
2L.PL.SUBJ-CL3-take-SUBJCT
'they should take it'

b. /tì-ón-e/ [tìwóné]
1PL.SUBJ-see-SUBJCT
'may we see'

(13) a. /tí-á-rúm-e/ [tíʔárúmé]
1PL.SUBJ-cl6-SUBJCT
'we should bite them'

b. /pà-à-ri/ [pàʔàrí]
CL16.LOC-3SG.SUBJ-AUX
'where s/he is'

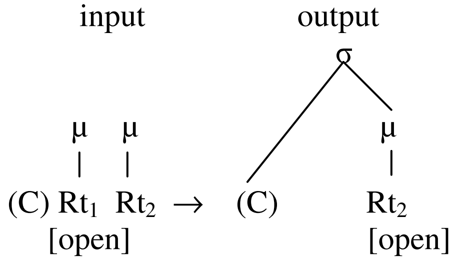
(14) a. /ɦá-à-táᵐb-i/ [ɦá̤ɦàtáᵐbí]
NEG-3SG.SUBJ-play-SUBJCT
's/he does not play'

b. /ɦá-à-tór-i/ [ɦá̤ɦà̤tórí]
NEG-3SG.SUBJ-take-SUBJCT
's/he does not take'

I argue that all the hiatus-breakers [j w ʔ ɦ] are products of V-Place spreading from V_2. The glide [j] is a product of [coronal] spreading from [i] or [e], and [w] a result of [labial] spreading from [o] and [u]. In the case of the glottal stop and the glottal fricative, however, more is involved. The glottal stop [ʔ] is a result of spreading [pharyngeal] from [a] with the insertion of the feature [constricted glottis]. [ɦ] involves spreading of the feature [pharyngeal] from V_2 [a] and the spreading of the feature [spread glottis] from [ɦ] 'via' V_1 [a̤].

Finally, coalescence involves the 'movement' of features. V_1 is elided and its [open] feature is passed on to the following vowel, causing /a+i/ to be realized as [e], and /a+u/ as [o]. Similar to GF and elision, coalescence involves the loss of a mora.

Figure 1.6 Coalescence: elision of V_1 with preservation of [open]



1.2 Prosodic Domains and Levels

First, this section presents the motivation for prosodic domains and the need for two strata, the Word Level and the Postlexical Level. Second, it presents the proposed levels and domains and the hiatus resolution strategies that operate at each of these levels and domains.

1.2.1 The Motivation for Prosodic Domains and Levels

The challenge in this thesis is to present a formal analysis, which accounts for *when* and *why* a particular hiatus resolution strategy (glide formation, secondary articulation, elision, coalescence or spreading) is chosen over the others, as well as why an expected strategy fails to operate. To illustrate the problem, let us consider words that have identical vowels in sequence; yet different hiatus resolution strategies are employed. In examples 15(b), and 16(b), the vowels in hiatus are the same; V_1 is /u/ and V_2 is /e/. In 15(b) hiatus is resolved through secondary articulation, and in 16(b), it is resolved through spreading.

		Karanga	**Zezuru**
(15) a.	/mù-tí/ CL3.SG-tree ‘tree’	[mùtí]	[mùtí]
b.	/mù-ènà/ CL3.SG-hole ‘hole’	[m^{w}ènà]	[m^{w}ènà]
(16) a.	/ér-a/ weigh-FV ‘weigh!’	[jérá]	[érá]

b. /mù-ér-í/ [mùjérí] [mùjérí]
CL1.SG-weigh-NOM
'the one who weighs'

By examining the phonological conditions (the quality of the vowels in hiatus), it is not possible to predict which strategy would apply. This problem is even more challenging for a language learner who has to deal with five hiatus resolution strategies and has to know when to apply the appropriate strategy.

In order to provide a systematic account of when and where each strategy applies, I appeal to the notions of prosodic domains/boundaries and strata or levels. First, on domains, I argue that the different prosodic domains/boundaries condition or trigger different strategies. Some strategies, however, operate in exactly the same domain, where they complement each other in a unique way. This is true of glide formation, secondary articulation and elision, which all operate in the same domain, with secondary articulation kicking in when glide formation is blocked, and in turn elision applying when secondary articulation is banned.

The difference between 15(b) on one hand, and 16(b) on the other, is that hiatus in 15(b), occurs in a single (non-recursive) Prosodic Stem (PStem), and in 16(b), it occurs in a Recursive Prosodic Stem, specifically at a Prosodic Stem boundary. This means that Prosodic Stem internal contexts (single PStem) and the Prosodic Stem boundary trigger different hiatus strategies. Examples 15(b) and 16(b) are repeated below as 17(a) and (b) respectively, showing the prosodic constituents. The far right column shows the prosodic domains. The curly brackets mark the Prosodic Stem and the square brackets the Prosodic Word (PrWd).

(17) a. /mù-ènà/ [m^{w}ènà] [{m^{w}ènà}]
CL3.SG-hole
'hole'

b. /mù-ér-í/ [mùjérí] [{mù{jérí}}]
CL1.SG-weigh-NOM
'the one who weighs'

Armed with the knowledge that secondary articulation occurs in the single Prosodic Stem, and spreading across the PStem edge, all things being equal, we can predict what strategy would operate across the PStem or within the PStem. Due to the intricate relationship between hiatus resolution strategies and the prosodic structures, this thesis argues that there is need for a refined prosodic parsing in order to account for hiatus resolution strategies in Karanga and Zezuru.

Second, owing to the impossibility of integrating the description and analysis of coalescence which occurs across a host-clitic boundary with the other strategies (glide formation, secondary articulation, elision and spreading), I employ Stratal Optimality Theory which will be discussed shortly. In the spirit of LPM-OT, I posit two strata (Levels), the Word level (stratum) and the Postlexical Level (stratum). At the Word level, hiatus resolution is resolved through glide-formation, secondary articulation and spreading, and at the Postlexical Level it is resolved through coalescence and spreading. I assume that at the Word level, glide formation is the default strategy, and at the Postlexical Level, it is coalescence. Within the Word (Lexical) stratum, there is a manifestation of the interaction between the hiatus resolution strategies and the prosodic constituent structure. Within the Word (Lexical) stratum, for example, the Prosodic Stem edges play a crucial role in determining the choice of the hiatus repair strategy. Therefore, there is need to lay out the different morphological constituents and the prosodic domains they correspond to, e.g., the Prosodic Stem and the Prosodic Word.

1.2.2 The Levels, Prosodic Domains and Hiatus Resolution Strategies

I illustrate that the rich and complex verbal nominal morphosyntactic constituents and the nominal morphosyntactic constituents observed for this thesis are reducible to only three prosodic domains, viz., the Prosodic Stem, Prosodic Word and Clitic Group. I argue that the PStem may be recursive. Figure 1.7 shows the verbal and nominal (nouns, adjectives, quantitatives,enumeratives, selectors and possessive words) morphosyntactic constituents, and the levels to which the different constituents belong to, as well as the prosodic domains that they map onto. Figure 1.7 also shows the hiatus resolution strategies that operate at each of the levels as well as in each of the domains.

Figure 1.7 Levels, Morphosyntactic Constituents and Prosodic Domains

Prosodic Domains	**Morphosyntactic Constituents**		**Hiatus Resolution**
POSTLEXICAL LEVEL			
	Verbs	**Nominal**	
Clitic Group	Clitic Word	Clitic Word	coalescence or spreading
WORD LEVEL			
Prosodic Word	Verbal Word	Nominal Word	spreading (N/A in verbs)
Prosodic Stem (recursive)	Inflectional Stem	N/A	spreading
Prosodic Stem (recursive)	Macro Stem	Extended Inflected NStem	spreading
Prosodic Stem (recursive)	Inflected VStem	Inflected NStem	N/A
Prosodic Stem (non-recursive)	DStem	Minimal NStem	GF/sec art/elision/(N/A in verbs)
-------------	VRoot	N/A	N/A

Examining Figure 1.7, from bottom up, it shows that glide formation, secondary articulation and elision operate at the Word stratum, specifically in the non-recursive Prosodic Stem. Spreading also operates at the Word stratum but in a recursive PStem or in a PrWd where a PStem is a constituent. Specifically, spreading occurs across a PStem edge. Finally, in the Postlexical stratum, coalescence is the preferred strategy and when it fails to operate spreading kicks in.

1.3 Prosodic Minimality and Initial Onsetless Syllables

In addition to hiatus, this thesis examines prosodic minimality and initial onsetless syllables. A consequence of examining initial onsetless syllables in Karanga and Zezuru is that exploring minimality becomes inevitable. Minimality and onsetless syllables have such an intricate relationship that in order to understand one, it is imperative to investigate the other. This thesis, for example, argues that Karanga strictly enforces a requirement that all initial syllables in lexical words have onsetful syllables at the expense of the minimal word requirement. In contrast, Zezuru enforces a strict minimal word requirement at the expense of onsets in initial syllables. This falls out from the formal analysis provided: the two dialects rank differently the constraints relevant for enforcing the minimal size of the word and onsets.

With respect to prosodic minimality, the thesis examines the different strategies employed to ensure that the prosodic word is minimally disyllabic. [ì] epenthesis is the strategy employed to augment subminimal words.

In the examples in 18, there is variation between Karanga and Zezuru. Karanga has [ì], which is missing in the Zezuru forms. It is argued that the [ì] is epenthesized to satisfy minimality.

		Karanga	Zezuru
(18) a.	/Ø-gò/ CL5.SG-wasp 'wasp'	[gò]	[ì.gò]
b.	/Ø-^{m}bá/ CL9.SG-house 'house'	[^{m}bá]	[ì.^{m}bá]
c.	/p´-a/ give-FV 'give!'	[pá]	[ì.pá]
d.	/g^{w}`-a/ fight-FV 'fight!'	[g^{w}à]	[ì.g^{w}à]

In addition to differences in the resolution of monosyllabic words, Karanga and Zezuru also differ in how they treat initial onsetless syllables. Karanga shows 'category-specific' effects such that initial onsetless syllables are banned in lexical words or content words (i.e. nouns, verbs, adjectives, adverbs), but allowed in function words (i.e. determiners, tense markers, clitics, pronouns, demonstratives). In contrast, Zezuru shows no domain effects and freely allows initial onsetless syllables in both lexical and function words. This is summarized in (19), and the sample comparative data is given in (20) and (21).

(19) Distribution of Initial Onsetless Syllables

	Lexical Words	Function Words
Karanga	banned	allowed
Zezuru	allowed	allowed

In 20(a)-(e), in lexical words Karanga provides an onset for the initial vowel through spreading. In contrast, Zezuru does not. In the function words in 21(a)-(e) both dialects allow initial onsetless syllables: 21(a) and (b) are pronouns; (c) and (d) are demonstratives; (e) is an interjective.

		Karanga	Zezuru
(20) a.	/Ø-ò^{n}dé/ CL5.SG-fig 'fig'	[wò.^{n}dé]	[ò.^{n}dé]
b.	/ù-wà^{n}dú/ CL14-abundance 'abundance'	[wù.wà.^{n}dú]	[ù.wà.^{n}dú]
c.	/í^{m}b-a/ sing-FV 'sing!'	[jí.^{m}bá]	[í.^{m}bá]
d.	/è^{n}d-a/ go-FV 'go!'	[jè^{n}dà]	[è^{n}dà]
e.	/à^{m}bùr-a/ ignite-FV 'ignite!'	[ʔà.^{m}bù.rà]	[à.^{m}bù.rà]

		Karanga/Zezuru		
(21) a.	/íjé/	[íjé]	*[jíjé]	'he/she'
b.	/íʋò/	[íʋò]	*[íʋò]	'them'
c.	/ùjò/	[ùjò]	*[wùjò]	'this one'
d.	/àʋà/	[àʋà]	*[ʔàʋà]	'those ones'
e.	/èɦé/	[èɦé]	*[jèɦé]	'That's right' (interj.)

Zezuru grammar allows initial onsetless syllables whilst Karanga grammar partly allows them. Karanga has an absolute ban on initial onsetless syllables in lexical words, yet allows them in function words. In order to account for the strict requirement that Karanga lexical words must have onsets, but function words are exempted, I follow Cahill (2007) in relativizing the constraint ONSET, so that it may only apply to lexical words: ONSET-lex.

(22) ONSET-lex
A lexical item must have an onset
(Cahill 2007: 165)

This thesis demonstrates that in both Karanga and Zezuru, the initial onsetless syllables are no more defective than their apparent lack of onsets and their confinement to word initial position (Itô 1986, 1989). Evidence to this effect is adduced from the syllables' ability to bear a high tone; visibility to processes that count syllables, such as prosodic minimality, reduplication and cliticization. The conclusion is that these initial onsetless syllables are morified, syllabified, and not extraprosodic and therefore do not warrant any special representation (cf. Downing 1993, 1998; Piggott 1995).

1.4 Theoretical Approaches

This section looks at the theoretical approaches used in this thesis. The thesis employs three major theories, Optimality Theory (Prince & Smolensky 2004 [1993]), Feature Geometry (Clements 1985, Clements and Hume 1995), and the Prosodic Hierarchy (Selkirk 1978, 1995; Inkelas 1989; McCarthy and Prince 1986).

1.4.1 Optimality Theory

The overall analysis in this thesis is couched in Optimality Theory (OT), which states that phonological constraints are hierarchically ranked and violable (Prince & Smolensky 1993). The mapping from underlying to surface forms is a matter of negotiating the demands of the language-specific constraint hierarchy. OT is best suited to handle the phonological conspiracies of the different repair strategies as well as the variation displayed across the dialects including within the dialects. One of the merits of employing OT in this thesis is that OT recognizes the role of the marked configuration (hiatus), and OT captures the central aspect of the conspiracy: to repair hiatus. OT captures the generalization that the goal of each of the strategies is ONSET and NO HIATUS satisfaction. An OT analysis of Karanga and Zezuru shows how a complex system of processes (hiatus resolution strategies), all mobilized in the service of the same target, can be analyzed through the ranking of faithfulness and markedness constraints. This is captured by the observation that in an OT grammar, phonological processes are manifest when some markedness constraint dominates a faithfulness constraint, thereby forcing an alternation.

OT elegantly accounts for the inter-dialectal variation found in Karanga and Zezuru. The differences are accounted for by the differences in ranking of constraints between the two grammars. A constraint that may be highly ranked in one dialect may be lowly ranked in the other. However, due to the impossibility of unifying the coalescence (cliticization) facts with the other strategies (glide formation, secondary articulation, elision and spreading) in a single constraint ranking, I adopt Stratal Stratal Optimality Kiparsky (2000, 2003). Stratal Optimality Theory was pioneered by Kiparsky (2000, 2003). There is literature on Stratal Optimality Theory showing how it better accounts for issues that cannot be adequately handled through the original version of Optimality Theory (McCarthy & Prince 1993; Kiparsky 2000, 2003; Bermúdez-Otero 1999, 2007; Ito & Mester 2003; Rubach 2000). The complete parallelism of Optimality Theory is modified to allow for Levels/ Strata of constraint interaction. The theory distinguishes three Levels/Strata: Stem, Word (Lexical) and Phrase (Postlexical). Stratal Optimality Theory posits different constraint rankings not only between Stem and Word but also between Word (lexical) Level and Postlexical. Kiparsky (2000) highlights the benefits of the Stratal Optimality Theory. Kiparsky (2000:1) points out that despite having stratified constraint ranking, the Stratal Optimality Theory has the "advantage of maintaining a restrictive and well-defined constraint inventory, as originally envisaged in OT."

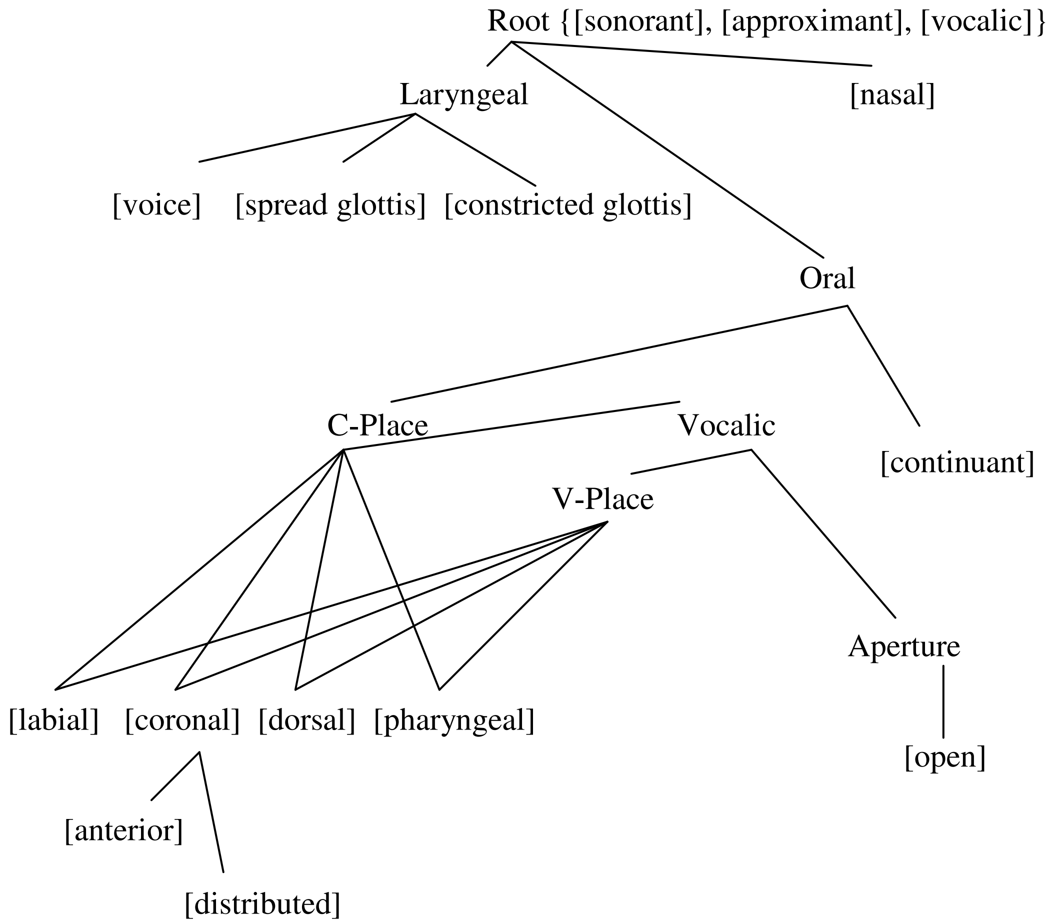
For the purposes of this thesis, I identify two Levels, the Word (lexical) stratum and the Phrasal (Postlexical) stratum. Within the Word (Lexical) stratum, there is evidence of the interplay between the hiatus resolution strategies and the prosodic constituent structure (phonology-morphology interface).

1.4.2 Feature Geometry

There are different models of Feature Geometry advanced (e.g., Sagey 1986, McCarthy 1988, Halle 2005). In this study, I assume the Feature Geometry model advanced by Clements and Hume (1995) with minor modifications. I add the place node [pharyngeal] (see McCarthy 1994, 1989, Hayward and Hayward 1989, Rose 1996, Lombardi 2002). This is a crucial feature for my analysis, particularly in cases involving [a], [ɦ] and [ʔ] (§ 7.5.2.)

In Feature Geometry, all phonological features are viewed as autosegments, and their behavior and possible interactions are explained and constrained in the model. Features are hierarchically grouped. Class nodes group features that function and behave together as natural classes. Class nodes are also autosegments and act as single units in phonological constraints.

Figure 1.8 Unified Feature Geometry of Clements and Hume (1995)

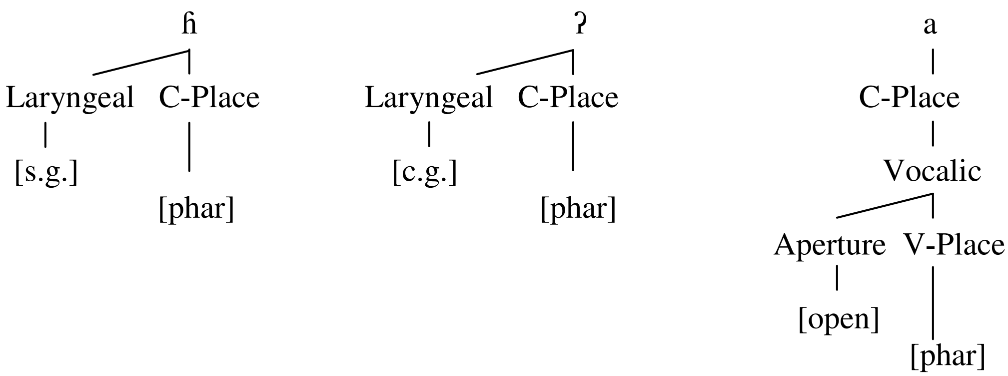


One of the major strengths of Clements and Hume's (1995) model, and a point that is critical in this thesis, is that it presents a unified account of Place in consonants and vowels. The feature [-back] is replaced with [coronal], while [+back] is replaced with [dorsal] and [+round] with [labial]. The mother node to which their features attach distinguishes consonants and vowels. Consonantal places of articulation attach to a C-Place node while vocalic articulations attach to a V-Place node. For consonants the place features [labial], [coronal], [dorsal] and [pharyngeal] are dependent on the C-place node, whereas vocalic place features are dependent on the V-Place node. The V-Place node is attached to the C-Place node via a Vocalic node. Laryngeal features, [voice] [spread glottis] and [constricted glottis] are under the Laryngeal node.

Clements and Hume's (1995) model does not have the feature [pharyngeal], though they comment on it. I have incorporated this feature taking into consideration the evidence in the literature that the feature is needed to cater for the class of uvulars, pharyngeals and laryngeals (gutturals), and the low vowel [a] (see e.g., McCarthy 1994, 1988; Hayward and Hayward 1989;

E.G Pulleyblank 1989). In short, the gutturals and the low vowel share the feature [pharyngeal]. The feature [pharyngeal] is useful in explaining the consistent and largely predictable use of the laryngeals ([ʔ ɦ]) in the environment of the low vowel [a]. I assume the following feature structure for [ɦ], [ʔ] and the vowel [a].

Figure 1.9. Feature structure of [ɦ], [ʔ] and [a]



The model predicts that consonants and vowels that share particular place features form natural classes. For example, coronal consonants and front vowels form a natural class and the low vowels and pharyngeal consonants form a natural class. This aspect of the model explains the largely predictable vowel-consonant interactions in a straightforward way.

The assumed feature geometry model also makes the prediction that the Aperture features and the V-Place features can function together as a single unit in phonological rules (Clements and Hume 1995:277). Conversely, the V-Place features can function as a unit independent of the Aperture features and vice versa. This element of the model is crucial in explaining instances where vowels with different Aperture features but with the same place features spread different nodes resulting in the same corresponding glide. This is straightforwardly explained as the spreading of the V-Place node.

Another advantage of the model is that it captures the fact that vowels and glides (vocoids) are phonetically similar. They share exactly the same structure and feature organization as illustrated in the figures below:

Figure 1. 10 Feature structure of [e] and [i]/[j]

```
(a)   Feature structure of [e]              (b) Feature structure of [i]/[j]
                 e                                        i/j
                 |                                         |
              C-Place                                   C-Place
                 |                                         |
              Vocalic                                   Vocalic
          _______|                                         |
 Aperture   V-Place                                     V-Place
    |          |                                           |
  [open]     [cor]                                       [cor]
```

Figure 1. 11 Feature structure of [o] and [u]/[w]

```
(a) Feature structure of [o]              (b) Feature structure of [u]/[w]
                 o                                        u/w
                 |                                         |
              C-Place                                   C-Place
                 |                                         |
              Vocalic                                   Vocalic
          _______|                                         |
 Aperture   V-Place                                    V-Place
    |          |                                           |
  [open]     [labial]                                  [labial]
```

The insertion of a glide in the context of a corresponding vowel is explained easily; except for the differences in moraic structure, the two have the same feature content— vowels are moraic and the glides are not moraic.

1.4.3. Morphological and Metrical Prosodic Hierarchies

Cross-linguistically, the constraints on minimum word size rely on prosodic units such as morae, syllables, and feet, and these units are organized according to the Prosodic Hierarchy provided in Figure 1.12.

Figure 1. 12 Prosodic Hierarchy (Selkirk 1978, 1995; Inkelas 1989; McCarthy and Prince 1986)

Prosodic Word
|
Foot
|
σ
|
μ

Every prosodic category in the hierarchy has as its head an element of the next lower level category: Every PrWd contains a foot; every foot contains a syllable; every syllable contains a mora. The principle that each constituent must contain at least one of the units at the next level is the HEADEDNESS PRINCIPLE (Ọla 1995, 1997, Selkirk 1995, Downing 2006).

(23) HEADEDNESS PRINCIPLE:

Every prosodic word must contain a foot (and every foot a syllable and every syllable a mora)

The LOCALITY PRINCIPLE ensures that each constituent contains at most two of the units at the next level due to the locality principle.

(24) LOCALITY PRINCIPLE.
A constraint may fix on one specified element and examine a structurally adjacent element and no other.

(25) BINARITY:
A prosodic constituent contains minimally two of the units dominated by the constituent (i.e., a Prosodic Word contains minimally 2 feet; foot contains minimally two syllables or moras ; syllable contains minimally two moras.

Given that any morpheme parsed as a distinct prosodic word must minimally have one bimoraic/disyllabic stress foot, many studies show that minimality effects fall out from the Prosodic Hierarchy: (Selkirk 1985, McCarthy and Prince 1986; Prince and Smolensky (2004 [1993]).

Downing (2006) raises concerns with the assumption that every Prosodic Word must dominate at least one bimoraic/disyllabic stress foot (cf. Ọla 1995, 1997). Downing contends, for example, that if this were the case, languages that do not have word stress, such as Kikuyu and

Bukusu would not have minimality requirements. However, such languages have been shown to impose a minimal word size requirement.

In addition, independent studies have repeatedly demonstrated that there is no strong correlation between minimal stress foot and minimal word requirements (Hayes 1999, Garrett 1999, Gordon 1999). In Gordon's comprehensive cross-linguistic survey, the languages that require words to be bimoraic or disyllabic often do not provide evidence from the stress system that this is also the minimum stress Foot size.

Further, not all morphological constituents that are subject to a disyllabic minimality condition are prosodic words. In other words, not only words are subject to minimality. In Bantu, for example, morphological constituents not parsed out as prosodic words are required to be minimally disyllabic. For example, a study by Marlo (2006) illustrates that roots that are not co-extensive with prosodic words are subject to a bimoraic minimality requirement.

In the examples, the Lubukusu CV-roots contrast with the CVC –roots in that the CV roots are obligatorily augmented by the sequence -iʃ- between the root and the reciprocal suffix, without a change in meaning.

	reciprocal	gloss
(26)	xúu-ri-iʃ-án-á	'to fear each other'
	xúu-xw-eeʃ-án-á	'to pay each other'
	xúu-sy-eeʃ-an-a	'to grind each other'
	xúu-sy-kw-iiʃ-án-á	'to fall on each other'
	xuu-kan-an-a	'to want each other'
	xuu-laaŋg-an-a	'to call each other'
	xuu-teex-án-á	'to cook each other'

(Marlo 2006, citing Mutonyi 2000)

Downing (2005) concludes that there is no necessary correlation between word stress and minimality requirements. For further arguments, see Downing (2006) and references cited therein.

Another contentious issue raised concerning the prosodic hierarchy theory is that the category PrWd is different from the category it dominates viz., the stress foot (Inkelas 1989, McCarthy and Prince 1986, Downing 2000, 2006 *inter alia*). In an attempt to resolve these problems, following Inkelas (1993) and Downing (1998, 1999), Downing (2006) proposes a major modification on the prosodic hierarchy under a new theory she calls Morpheme-Based

Templates (MBT). One of the novel things about the MBT is the separation of the PrWd from the Prosodic Hierarchy. Following Inkelas (1989:46), she proposes the Morphological and Metrical hierarchies illustrated in Figure 1.13(a) and 1.13(b).

Figure 1.13 "Morphological" and Metrical Hierarchies (Downing 2006:115)

(a) Prosodic Hierarchy	(b) Metrical Hierarchy
Utterance	Foot
|	|
Intonational Phrase	σ
|	|
Phonological Phrase	μ
|	
Prosodic Word	
|	
Prosodic Stem	
|	
Prosodic Root	

I follow Downing (2006) in having a Prosodic Hierarchy and a Metrical Hierarchy. In my analysis, there are some morphological domains that map onto the prosodic domains, such as the Prosodic Stem and the Prosodic Word. I observe that for such domains, the mapping of the morphological category onto the prosodic category determines which hiatus resolution strategy operates. This means that a PStem or PrWd can perfectly well begin and/or end in the middle of a syllable (or foot).

1.5 Empirical and Theoretical Contributions

The major empirical contribution of this thesis is that it provides the first comprehensive description and analysis of hiatus resolution in Shona, with specific reference to Karanga and Zezuru. Scattered works on Shona hiatus resolution strategies are available. They vary from studies that either mention hiatus in passing or describe a single strategy without providing an analysis (Doke 1931 Marconnes 1931, Fortune 1955, Myers 1990, Harford 1997, Mkanganwi 1995). This study investigates all the hiatus resolution strategies employed in Shona. It examines the different morphological and phonological contexts in which they occur, and provides a formal analysis. By analyzing all these strategies at the same time, the thesis provides a deeper understanding of how the strategies work. This helps bring together not only the Shona hiatus resolution strategies but also the phonology, morphology and morphosyntax, that in Shona and other Bantu languages are inextricably linked (cf. Myers 1990). This study contributes to a deeper understanding of the verbal and nominal structures in Shona and Bantu by examining the verbal and nominals in parallel.

Another contribution of the thesis is that in my analysis none of the hiatus resolution strategies rely exclusively on epenthesis—the insertion of features. Instead, there is optimal use of the features that are already present in the representation.

This study also contributes by providing a parallel examination of the verbal and nominal structures, showing how they are similar and different. Most studies on Bantu examine either the verbs at the exclusion of the nouns or vice versa.

With regard to the Shona dialects, the thesis contributes on two fronts: the inter-dialectal and intra-dialectal variations. Scholars have often highlighted the differences across the dialects without getting into the internal variations of each dialect. The results of this study indicate that Karanga shows more intra-dialectal variation than Zezuru. For example, in a domain established for glide formation, phonotactic constraints unique to Karanga block GF and elision comes in.

Karanga does not enforce minimality on monosyllabic words. When a monosyllabic word is a host, it is required to be disyllabic. Second, Karanga displays domain-sensitivity by allowing initial onsetless syllables in lexical words but not in function words.

The thesis contributes by extending the spreading analysis of the oral glides [j w], to the hiatus breakers [ɦ] and [ʔ]. The thesis argues that just like their counterparts [j] and [w], the hiatus-breakers [ɦ] and [ʔ] are also products of spreading. The glottal stop and the glottal fricative involve V-Place spreading. In addition, for the glottal stop there is insertion of [c.g.] and [ɦ] involves spreading of [s.g.] from a nearby [ɦ] via [a̤].

1.6 Organization of Thesis

Chapters 1, 2 and 3 form Part I and constitute the background to the thesis. Chapter 2 provides an overview of Shona phonology. It describes the vowel and consonant inventories; Shona syllable structure; features for vowels [i e a o u], the glides [j w], the glottal fricative [ɦ] and the glottal stop [ʔ]. Chapter 3 presents a review of the literature on different aspects of Shona phonology; mechanisms for resolving vowel hiatus; prosodic minimality; initial onsetless syllables. Chapters 4 and 5 constitute Part II. The two chapters provide the morphophonology and morphosyntax of verbs and nominals. The chapters present evidence for the proposed model of hiatus resolution. Chapter 4 focuses on the verbal morphophonology and morphosyntax. The chapter follows the canonical structure of the verb proposed by scholars such as (Barrett-Keach 1986; Myers 1990; Hyman 1993, 2005; Downing 1999, 2005; Ngunga 2000). Chapter 5 presents the second and final installment of the evidence for the proposed analysis. The chapter examines nominal morphology demonstrating that the morphosyntactic constituents map onto the Prosodic Stem and the Prosodic Word. Chapters 6, 7 and 8 constitute Part III. This section examines the hiatus strategies in detail. Chapters 6 and 7, examine hiatus resolution strategies that operate in the Prosodic Word, and, chapter 7 the strategies that operate at the Clitic Group level, that is outside the PrWd. Chapters 9 and 10 constitute part IV. Chapter 9 examines minimality and initial onsetless syllables, and chapter 10 provides the conclusion to the thesis.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter makes a review of the literature on Shona phonology, mechanisms for resolving hiatus, initial onsetless syllables and prosodic minimality. The literature review helps to put the research in context, illuminating the gap that this study fills in Shona and Bantu.

2.2. Previous Work on Shona Phonology

The literature on Shona is rich, particularly on Shona phonology; the current study draws directly or indirectly from these earlier works, Doke (1931), Marconnes (1931), Fortune (1955, 1984), Chimhundu (1983), Odden (1981), Myers (990) and Mkanganwi (1995) *inter alia,* as well as from the literature on other Bantu languages.

Doke (1929) pioneered the work on Shona. Doke (1931) provides a comprehensive account of Shona, illustrating the linguistic affinity amongst the five dialects that make up Shona: Karanga, Zezuru, Manyika, Ndau and Korekore. Doke (1931) resulted in the creation of the Shona orthography. Fortune's (1955) grammar of Shona builds on Doke's work and provides an overview of Shona phonology and a comprehensive description of the morphology and morphosyntax. Fortune (1984) examines Shona morphology and morphosyntax in greater depth.

Many studies on Shona focus on a single theme, e.g., tone, syntax, phonology or loanwords. Tone is an area that has attracted the attention of numerous scholars; see for example, Fivaz (1970), Carter and Kahari (1979), Jefferies (1990), Odden (1981), Myers (1990) among others. Myers (1990), for example, argues that tone and morphology are intricately linked and one cannot examine one without the other. Myers (1990: 7) says, "I have chosen to treat the two domains [tone and morphology] together because I believe that they are inextricably linked". He shows that an analysis of tone makes constant reference to morphosyntactic constituents such as the verb stem. Myers' insight into the relationship between tone and morphology is a source of inspiration for the current study. The current study examines how the (five) hiatus resolution strategies (glide formation, secondary articulation, elision, coalescence and spreading) are constrained by the morphology and morphosyntax. Myers' work also discusses hiatus resolution in Shona, although his focus was on tone. He examined what happens to the tonal pattern when hiatus is resolved through either glide formation or elision. Myers (1990: 254) observes, “The syllable created by resyllabification inherits the tone of the first syllable, which in the sequence class marker plus noun [for example] is always the class marker” (cf. Odden 1981).

Pongweni (1990) investigates Shona phonetics and phonology based on the Karanga dialect. He provides a comprehensive acoustic analysis of Shona consonants. Pongweni (1990) is one of the few instrumental studies on Shona phonetics. Harford (1997) examines vowel coalescence in Shona. She argues that coalescence occurs across a syntactic boundary. This study goes beyond hers in three respects. First, the current study examines all the potential hiatus resolution strategies in Shona. Second, I analyze coalescence differently from Harford (1997). She analyzes coalescence as the fusion of two vowels (root nodes) into one. I analyze coalescence as deletion of V_1 with the preservation of the feature [open] on the following vowel (chapter 9). Third, this study is comparative in nature—comparing Karanga and Zezuru repair strategies.

Beckman (1998) examines Shona height harmony. She shows that in verb stems, there is a restriction on the distribution of mid vowels: the mid vowels can only occur when the vowel in the root initial syllable is also mid and where no low vowel intervenes.

There are numerous studies focusing on single dialects, including some of those mentioned above. Marconnes, (1931), Odden (1981), Myers (1990) among others studied Karanga while Zezuru received the attention of O’Neil et.al. (1948), Fivaz (1970), *inter alia*. Dembetembe (1969, 1987) has done much research on the Korekore verb. Mkanganwi (1973) investigated Ndau verbal morphology, with an overview of Ndau phonology.

Chimhundu (1983) and Uffmann (2005) examined English loanwords in Shona. Chimhundu (1983) investigates how English words are nativized into Shona, looking at the syllable structure. He also includes a sociolinguistic analysis showing the ‘triglossic’ nature of Zimbabwean society: English sits at the apex of the prestige triangle while Karanga and Zezuru are more prestigious than Ndau, Korekore, and Manyika dialects. Uffman (2005) focuses on uncovering the epenthetic vowels in Shona. Based on statistical analysis, he concludes that the idea of a default epenthetic vowel is not tenable in Shona loanwords, but that the preceding consonant influences which type of vowel is epenthesized.

A discussion of any linguistic work on Shona would not be complete without acknowledging the outstanding lexicographic work done by Hannan (1987) in producing the *Standard Shona-English Dictionary*. Chimhundu (1996) contributed to Shona lexicography by producing the first ever Shona-Shona dictionary: *Duramazwi ReShona*.

It is against such a rich background of scholarship on Shona phonology that this current study addresses the issue of onsetless syllables and minimality in Karanga and Zezuru. The thesis draws on the findings and insights of these earlier studies.

2.3 Mechanisms for Resolving Vowel Hiatus

The section reviews the different mechanisms for resolving vowel hiatus; elision, coalescence, glide formation and epenthesis.

2.3.1 Previous Studies of Coalescence

Haas (1988) investigates coalescence from a cross-linguistic perspective. First, he wants to account for the basic characteristics of vowel coalescence within the Autosegmental framework of Goldsmith (1979). His other goal is to restrain the phonological theory of coalescence to exclude unattested processes of vowel coalescence but at the same time making the theory sufficiently powerful to account for those that are attested (Haas 1988:10). Haas analyzes vowel coalescence as a process where two vowels in hiatus merge into a single vowel. He considers this an articulatory compromise of the input segment. He points out that the output vowel is generally a long vowel unless language-specific constraints rule this out.

Snider (1985) examines coalescence in Chumburung as assimilation followed by elision. He considers that the retained vowel assimilates features from the other vowel in hiatus before it is deleted. Using a rule-based approach, Snider accounts for the vowel coalescence process using two ordered rules, assimilation and then deletion. Snider's approach to coalescence is similar to the one used in this thesis, where coalescence is considered as elision of V_1 with preservation of the feature [open], which is passed on to V_2.

2.3.2 Previous Studies of Glide Formation

Numerous language-specific studies have focused on glide formation, for example: Luganda (Clements 1986); Korean (Y-S Lee 1996); German (Hall 1992); Japanese (Kawahara 2002) among others. Y-S Lee (1996) investigates glide formation in Korean from an optimality perspective. He considers glide formation as moraic underparsing and claims that there are two types of glide formation in Korean: one is optional and the other is obligatory. The optional process triggers compensatory lengthening and the obligatory one fails to do so. Y-S Lee claims that glide formation is obligatory when the vowels are in hiatus and optional elsewhere. He proposes ONSET and PARSE μ in his account of Korean glide formation: or moraic underparsing violates PARSE μ to satisfy ONSET. In hiatus, the non-application of moraic underparsing results in two cases of ONSET violation, with both syllables being without onsets. The evaluation procedure selects the form with glide formation as the optimal form, hence the obligatory nature of providing an onset in hiatus contexts.

Rosenthall (1994) investigates the distribution of high vowels and glides using Optimality Theory, focusing on three main phenomena associated with the distribution of high vowels and glides. First, he explores the syllabification of vowels in hiatus in a number of languages, which only allow surface monophthongal vowels. In Etsako, Luganda, Kimatuumbi, and Ilokano, high vocoids are syllabified as vowels when followed by a consonant, but they are syllabified as their nonmoraic counterparts (glides) when followed by another vowel. The syllabification of vowel sequences is shown to follow from the interaction of syllable structure constraints that ensure the surface vowel is a monophthong.

2.3.3 Previous Studies of Vowel Elision

Casali (1997) conducts a comprehensive cross-linguistic examination of hiatus resolution through vowel elision, focusing on the factors that determine which of two vowels in a potential hiatus sequence is deleted. In his analysis, Casali assumes that features are preserved in certain phonetically or semantically prominent positions (e.g. in roots). The cross-linguistic tendencies found in his work are that there is a preference for deleting V_1 rather than V_2. In addition, there is a preference to retain vowels in lexical words/morphemes and monosegmental morphemes. Accordingly, he proposes a series of position-sensitive Faithfulness constraints requiring preservation of features in appropriate positions. The rankings of these constraints yield an elision typology that is in agreement with attested patterns. The behavior of Karanga and Zezuru is in harmony with these observations. Both dialects consistently elide V_1, which in most cases occurs in a prefix. In instances where both V_1 and V_2 occur in roots, it is V_1 that is elided.

Many language-specific studies investigate elision (Igede, Bergman, 1971; Emai; Yoruba, Akinlabi and Oyebade 1987, Obolo, Faraclas 1982; Yoruba, Pulleyblank 1988 *inter alia)*. Egbokhare (1990) investigates vowel elision in Emai and observes that certain lexical sequences and not others condition elision. Egbokhare (1990) points out that vowel elision may only apply within primary constituents such as Noun Phrase (NP), Aux, Verb Phrase (VP) and Adverbial Phrase (AP). He mentions that elision never occurs across phrasal boundaries. Egbokhare also shows that elision may be blocked by phonological constraints within the lexical sequences where it would otherwise be expected.

Pulleyblank (1988) investigates vowel elision in Yoruba, and observes that elision occurs in certain lexical items but not others (cf. Akinlabi and Oyebade (1987). Elision is triggered by affixation, and occurs at the phrase level, (between a verb and its object, between a preposition and its object, between the focus marker *ni* and a following subject clitic and between the conjunction *àti* and the following conjunct). What is common amongst these independent studies (Egbokhare 1990, Pulleyblank 1988 and others) is that they identify a specific class of constituents or morphemes where elision occurs. These are insights that this thesis exploits; it shows that the hiatus resolution strategies are conditioned by the prosodic domains/boundaries, which in turn reflect morphosyntactic constituent structure.

2.3.4 Previous Studies of Epenthesis

Several studies have investigated consonant epenthesis with the goal of establishing how the quality of the epenthetic consonant is determined. The epenthetic consonant is employed to:

(i) provide an onset for word-initial onsetless syllables, (Kučera 1961; Spencer 1996; Christensen & Christensen 1992)
(ii) fill a C-slot in a morphological template where no lexically sponsored consonant is available (Broselow 1984, 1995).
(iii) break hiatus (Mithun and Basri 1986; Durand 1986; Hayes and Abad 1989)
(iv) ensure that a particular sequence of consonantal segments disallowed in a language does not surface (Broselow 1995).
(v) make a syllable heavy so that it is stressable (Parker 1994).
(vi) satisfy minimum word requirements (Crowhurst 1994; Odden 1999; Downing 2001).

Due to the heterogeneity of the morphological and phonological environments in which consonants are epenthesized cross-linguistically and language-internally, and the various segmental shapes of the epenthetic segments, Ortmann (1999:52) concludes that consonant epenthesis is a heterogeneous process[2]. Scholars have focused on explaining the quality of the epenthetic consonant, particularly from a typological perspective. One typological approach considers the epenthetic consonant to be minimally specified within its phonemic system (Paradis & Prunet 1989; Ortmann 1999).

Another approach considers the epenthetic segment(s) as the least marked segment(s). Lombardi (2002) provides the following Markedness Hierarchy to account for the cross-linguistic patterns of consonant epenthesis in general (hiatus contexts included):

(1). *DORSAL >> *LABIAL >> *CORONAL >> *PHARYNGEAL
(Lombardi 2002:221)

Pharyngeals, which include glottals (e.g., [ʔ]), are considered the least marked, and the prediction is that cross-linguistically they should be the most common epenthetic segments, followed by coronals. Despite coronals being the second least marked segments they are not amongst the commonly used epenthetic consonants (Ortmann 1999). Further, the universality of the Markedness Hierarchy has been questioned (see, e.g., Hume & Tserdanelis 2002). Lombardi's approach has direct relevance for this study: the glottal stop [ʔ] and fricative [ɦ] are used as epenthetic segments in both Karanga and Zezuru. Whilst this thesis follows Lombardi (cf. McCarthy 1994, 1989; Hayward and Hayward 1989; Rose 1996), in assuming that the glottal stop is [pharyngeal], it goes further and analyzes the glottal stop as a product of spreading. I argue that its place features are spread from the pharyngeal [a], and the laryngeal feature [c.g.] is inserted (§7.5.2.1) Lastly, the thesis shows that the glottal stop is no more preferred as a hiatus breaker than the other hiatus-breakers since the hiatus breakers are in complementary distribution. Each hiatus-breaker operates in the context of a homorganic V_2. In addition to a homorganic V_2, [ɦ] also occurs in the context of a nearby /ɦ/.

A different approach to consonant epenthesis is to establish the mechanism in determining the quality of the epenthetic segment. Kitto and de Lacy (1999) observe that the quality of the epenthetic segment can be accounted for through copy epenthesis (spreading), default segmentism, and a mixture of spreading and default insertion. Copy epenthesis or spreading is where all the features of the epenthetic segment are spread or copied from a nearby segment, and default segmentism is where all the features are inserted. Kitto and de Lacy (1999:

[2] Although consonant epenthesis seems heterogeneous, it has a homogenous goal of improving the prosodic structure in language: metrical (stress), syllable, and prosodic word. A unified theory of consonant epenthesis is possible if the phenomenon is approached from this perspective.

1) say: “Copy epenthesis [or spreading] and default segmentism are the two endpoints of a continuum: intermediate cases also exist, where the epenthetic element copies some features and defaults to others.”

Instances where an epenthetic consonant or segment, borrows features from a neighboring segment have been analyzed as spreading, using the autosegmental approach (Clements 1986, Clements and Keyser 1983). Kitto and de Lacy (1999) offer a different analysis, arguing that this can be analyzed as copying, similar to reduplication. They propose that correspondence can hold between an epenthetic element and another output segment, paralleling the situation in reduplication. This, they propose, can be achieved through correspondence theory (McCarthy & Prince 1995) and they claim that this approach accounts for both cross-linguistic and language-internal variation in epenthetic quality. Kawahara (2007) argues against extending correspondence-based copying to the non-reduplicative domain of epenthesis, particularly to epenthetic segments. Based on a cross-linguistic typological study of reduplication and echo epenthesis (also known as copy-vowel epenthesis), which can be applied *mutatis mutandis* to consonant epenthesis, Kawahara argues that echo epenthesis is invariably achieved by spreading, and never by correspondence-based copying. Kawahara says spreading is a necessary part of phonological theory distinct from correspondence-based copying.

Kawahara argues that the problem with extending correspondence copying to a purely phonological phenomenon such as echo epenthesis is that it predicts unattested patterns. He points out that although echo epenthesis is superficially similar to reduplication in that one underlying segment is pronounced twice in the output, echo epenthesis displays different typological properties from reduplication. One of Kawahara’s central points is that spreading is subject to a locality requirement, and that it affects intervening segments. He identifies four characteristics that distinguish echo epenthesis from reduplication. The first difference between echo epenthesis and reduplication is that consonants are freely copied across vowels in reduplication (Marantz 1982: 447), on the other hand, long-distance consonantal echo epenthesis is never found. Second, reduplication can skip the closest available segment to satisfy other phonological requirements, but such a pattern is unattested for echo epenthesis, since spreading is local. Skipping would result in a prohibited gapped construction where spreading skips a potential anchor (Archangeli and Pulleyblank 1994; Gafos and Lombardi 1999; McCarthy 1994). Third, in reduplication, it is common for length to be copied; a long vowel is copied as long, and a short vowel as short. Kawahara argues that in echo epenthesis length is never copied. His fourth point is that some echo epenthesis cases fail when certain types of segments intervene: “I argue that echo epenthesis is always achieved by autosegmental spreading and never by correspondence-based copying, despite Kitto and de Lacy's claim (1999) to the contrary" Kawahara (2007: 3). This debate is of direct relevance to this thesis since it could be argued that the use of [ɦ] as a hiatus-breaker is a matter of copying. [ɦ] is used as a hiatus-breaker only when in the input there is an [ɦ] as well. Consider the following illustrative examples.

(2) a. /ɦá-à-ná/ [ɦá̤ɦá̤ná]
NEG-3SG.SUBJ-AUX
's/he does not have'

b. /ɦá-à-p-i/ [ɦá̤ɦà̤pí]
NEG-3SG.SUBJ-give-SUBJCT
's/he does not give'

The epenthetic [ɦ] can be analyzed as a copy of the underlying /ɦ/ since it is only used in the context of an input /ɦ/. In section 5.3.2.1 it is demonstrated that this position is untenable as there is empirical evidence that [ɦ] is not a copy of the input /ɦ/ but a product of spreading.

2.4 Initial Onsetless Syllables

Owing to their unusual phonological behavior, skewed distributional pattern and 'prosodically defective' structure, onsetless syllables have been the subject of numerous studies (Itô 1986, 1989; Downing 1998, Ọla 1995, Odden 1995, Piggott 1995 *inter alia*). Cross-linguistically, onsetless syllables are dispreferred, and phonological processes such as elison and epenthesis repair them. Several studies highlight the exceptional properties of onsetless syllables, such as their inability to bear tone or stress, and the fact that processes that refer to syllables often ignore them (Downing 1993, 1998, Odden 1995, Ọla 1995). In addition, onsetless syllables are often restricted to word-initial or phrase-initial position (Itô 1986).

2.4.1 Onsetless Syllables do not Bear Tone

Language-specific studies arrive at different conclusions concerning onsetless syllables. Ọla (1995) for example, investigates the installation of prosodic constituents, from the level of the prosodic word to the mora, in several Benue-Congo languages spoken in Nigeria, Togo, and the Republic of Benin. One of her findings was that vowels differ in their syllabicity capabilities depending on whether they are preceded by onsets (onsetful) or not (onsetless). In Standard Yoruba, Owon-Afa, and Gokana, vowels are syllabified if onsets precede them; onsetless vowels are not syllabified. In Ondo Yoruba and Emai, vowels are syllabified whether they have onsets or not.

On Kikerewe, Odden (1995) observes a number of irregularities involving these syllables, one of which is their lack of ability to bear a high tone. Odden (1995) observes that in Kikerewe, in the conditional, if the subject prefix is one of the onsetless prefixes /o-/ ‘2sg’, /a/ ‘3sg.human’, or /e-/, cl9, the subject prefix which is supposed to bear a high tone, does not do so, and the second onsetful syllable bears the H tone which spreads one syllable to the right (Odden 1995:97). Consider the following Kikerewe examples adopted from Odden (1995:97). In (3), the H tone on the second syllable is a result of tone spread from the initial syllable. In (4), the H tone originates from the second syllable and spreads to the third syllable. Finally, in (5), the subject prefix is a vowel that does not bear an H tone, instead the syllable following the subject prefix bears the H tone.

(3)	bá-ká-luunduma	‘they who are growl’
	tú-ká-luunduma	‘if we growl’
	bí-ká-luunduma	‘if they growl’

(4)	a-ká-lúúnduma	‘he who is growling’
	e-ká-lúúnduma	‘it cl.9) which is growling’
	a- lúúndúma	‘he who growls’
	e-lúúndúma	‘it (cl.9) which growled (yesterday)’

(5)	a-lúúndúmile	‘he who growled (yesterday)
	e-lúúndúmile	‘in (cl.9) which growled (yesterday)’
	o-ká-lúúnduma	‘if you sg. growl’
	a-ká-lúúnduma	‘if he growls’

2.4.2 Onsetless Syllables do not Bear Stress

In some languages, onsetless syllables are ignored for stress. In Aranda, for example, Davis (1985, 1988) and Downing (1993), show that onsetless syllables may not participate in stress assignment. Consider the following examples drawn from Aranda (Downing 1993: 171). In the examples in (6), in consonant-initial words of three or more syllables, stress is assigned on the initial syllable. Examples in (7) show that in vowel-initial words of three or more syllables, stress is assigned on the leftmost consonant-initial syllable. Finally, (8) illustrates that in disyllabic V-initial and C-initial words, stress is assigned to the initial syllable.

(6)	rá:tama	‘to emerge’
	kútungùla	‘ceremonial assistant’
	wóratàra	‘place name’

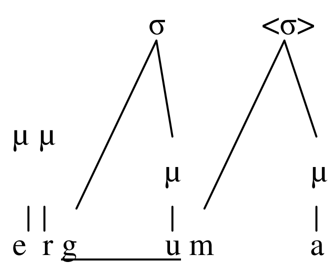
túkura ‘ulcer’
pítjima ‘to come’

(7) ergúma ‘to seize’
arálkama ‘to yawn’
ulúrba ‘cold wind’
artjánama ‘to run’

(8) á:twa ‘man’
ílba ‘ear’
úrba backbone’
dé:ba ‘bird’
párpa ‘quickly’
kála ‘already’
(Aranda, Downing 1993)

Downing (1993) proposes that in words with more than two syllables (6)-(7), the initial vowels are morified but not syllabified. Since Aranda is a syllable counting language, onsetless syllables are ignored for stress. (Downing 1993: 177) argues that the unsyllabified vowels are retained in the representation because they have a licensor, namely, the moras which dominate them. She proposes the representation given in Figure 2.1. The stressed syllable is underlined and the final syllable is extrametrical.

Figure 2. 1 Unsyllabified vowels in Aranda



‘to seize’

(adapted from Downing (1993)

In the light of the analysis in Figure 2.1, where word initial syllables are analyzed as morified but not syllabified and do not participate in stress assignment, the initial vowels in disyllabic words in (8), are interesting. These vowels participate in stress assignment. Downing argues that the initial vowels in the disyllabic words are exceptional in that they are syllabified. The reason is that Aranda has a disyllabic minimal word requirement, and this minimality forces syllabification of the initial vowels because not doing so would otherwise result in forms with fewer than two syllables (Downing 1993:182).

2.4.3 Onsetless Syllables in Reduplication

Reduplication is one of the often-cited processes that make a distinction between onsetless and onsetful syllables (Axininca Campa, McCarthy and Prince 1993; Kinande, Mutaka and Hyman 1990). In Kinande, for example, Mutaka and Hyman (1990), illustrate that verbal reduplication is sensitive to the distinction between vowel-initial and consonant-initial syllables. Consider the examples below drawn from Mutaka and Hyman (1990). Examples in 9(a) demonstrate that in consonant initial verb stems, the target for reduplication is a disyllabic Foot. Examples in 9(b) illustrate that in monosyllabic verb stems, the stem reduplicates twice. Examples in 9(c) demonstrate that disyllabic vowel-initial stems reduplicate twice in order to satisfy the disyllabic template.

(9) a.	e-ri-hum-a	‘to beat’	e-ri-hum-a. hum-a
	e-ri-lim-a	‘to cultivate’	e-ri-lim-a.-lima
b.	e-ri-sw-a	‘to grind’	e-ri.sw-a.sw-a.sw-a.
	e-rí-ta	‘to bury’	e-rí.-ta.ta.ta
c.	e-rí-oh-aa	‘to pick’	e-rí.oh-a.oh-a.oh-a
	e-ri-es-aa	‘to play’	e-ri.es-a.es-a.es-a.

2.4.4 Onsetless Syllables are at the Left Edge

Another exceptional property of onsetless syllables is that they are largely confined to word or phrase initial position (Itô 1986). In fact, in all the cited examples above, it is clear that in Kikerewe, Aranda and Kinande, the onsetless syllables are restricted to word-initial position. Similar circumstances hold in Shona: onsetless syllables are only tolerated in initial position and nowhere else.

In sum, besides just the lack of onsets, different studies have demonstrated other exceptional properties of onsetless syllables. In some cases, these word-initial vowels are analyzed as unsyllabified. It is against this background that this study approaches the study of initial onsetless syllables in Karanga and Zezuru with one of the objectives being to observe what exceptional properties they exhibit—if any. The findings indicate that they have no exceptional properties save for their lack of onsets and confinement to initial position. Onsetless syllables participate in other syllable-sensitive phonological processes in a regular fashion, e.g. tone assignment, reduplication, etc. (see chapter 9).

2.5 Prosodic Minimality

Wilkinson (1986) observes that the Minimal Word requirement is like other phonological constraints such as the Obligatory Contour Principle (OCP), which trigger and block processes (McCarthy 1986, Suzuki 1998). Numerous scholars have studied minimality, demonstrating these aspects either explicitly or implicitly (Bengali, Fitzpatrick-Cole 1990; Kikerewe, Odden 1999; Ndebele, Downing 2001; Yoruba, Orie and Pulleyblank 2002 among others)

Orie and Pulleyblank (2002) examined vowel elision and minimality effects in Yoruba, showing that elision in the language is driven by prosodic requirements. They propose that foot binarity and prosodic word minimality protect vowels in minimally sized words from deletion. In contrast, they argue that when a subminimal word is joined to a form that obeys minimality, the prosodic goodness is improved through deletion. Failure of deletion results in violation of the highly ranked foot binarity and minimality.

Odden (2006) investigates the interaction between minimality and the structure of onsetless syllables in Zinza, a Bantu language. Odden observes that in Zinza, word-initial vowels of disyllables are lengthened 10(a). However, initial vowels of disyllabic and longer words are not lengthened 10(b).

(10)	óó-lja	'you (SG) eat'
	áá-lja	's/he (CL1) eats'
b	a-líma	's/he (CL1) cultivates'
	a-libáta	's/he (CL1) walks'

Odden (2006) proposes a constraint which bans word-initial short onsetless syllables, namely, $*_{PW}$[V. This constraint interacts, with his proposed constraint MINIMALITY which requires words to be minimally bimoraic. Lengthening the vowel of the disyllabic words (10a) satisfies both constraints. In disyllabic and longer words (10b), the initial vowel is analyzed as being outside the prosodic word, so that both $*_{PW}[V$ and minimality are also satisfied.

Ọla (1995) investigates prosodic minimality effects in Benue-Congo languages spoken in Nigeria, Togo, and the Republic of Benin. Her findings were that in languages like Idoma, Gokana, the minimal Prosodic Word is a binary foot, while in languages like Yoruba, and Ebira, the minimal condition requires the presence of a syllable in every word. Foot binarity effects are only required of specific lexical classes, like nouns, in both languages.

2.6 Summary

This chapter provided an overview of works on Shona phonology, hiatus resolution strategies and initial onsetless syllables. The chapter reviewed literature on some of the commonly used mechanisms employed to resolve vowel hiatus. These are glide formation, elision, coalescence, epenthesis and spreading. The chapter reviewed works that illustrate and argue for different representations of initial onsetless vowels based on the behavior of such vowels.

CHAPTER 3

AN OVERVIEW OF SHONA PHONOLOGY

3.1. Introduction

This chapter provides an overview of Shona phonology, focusing on the vowel and consonant inventories, and the features assumed for the vowels, the glides, the glottal fricative and the glottal stop. The chapter discusses consonant-labial glide combinations (Cw combinations), as well as the syllabic and moraic structure of Shona.

3.2 A Sociolinguistic Note

Shona includes five dialects: Karanga, Zezuru, Manyika, Korekore, and Ndau. Karanga and Zezuru are the principal dialects: the orthography is based largely on the phonologies of these dialects; each of them has more speakers than the other dialects; each of them occupies a larger geographical area compared to the other dialects; both are considered more prestigious than the other dialects (Chimhundu 1983, Mkanganwi 1995).

Shona as a label and as a language came into 'existence' in 1931, through Clement Doke's report on the unification of the Shona dialects, which was tabled and adopted by the Rhodesian parliament. Doke (1931:1) based his unification of the dialects on the following shared linguistic features among others:

(1) (i) Common phonological features:
- (a) five-vowel system.
- (b) two-tone system.
- (c) employment of whistling fricatives.
- (d) phenomenon of velarization.

(ii) Common morphological and morpho-syntacic features:
- (a) monosyllabic noun class prefixes.
- (b) ability to stack noun class prefixes.
- (c) significant super-addition of prefixes to nouns.
- (d) locative formation.

These features in 1(i.a-d) and 1(ii.a-d) among others, sets Shona apart from other Bantu languages. The characteristics in 1(i.a-d) are illustrated in this chapter whilst those in 1(iia-d) are discussed in depth in chapters 4 and 5 which focus on the morphophonology and morphosyntax of verbs and nominals, respectively.

Doke's unification of Shona culminated in what Myers-Scotton (1993) calls a 'constructed language' with a single orthography. Doke's unification has its own merits and demerits, the details of which I cannot go into in this study (cf. Doke 1931). One of the major merits was recognizing the linguistic affinity among the dialects and accordingly forming a single orthography. A major demerit is that the orthography is largely based on Karanga and Zezuru phonology, ignoring phonemes that are unique to the 'minor' dialects. Doke (1931:2) himself acknowledges this problem: "…as regarding orthography it was very soon found that Ndau and several cognate dialects presented real difficulties. There were found to be in these dialects phonetic phenomena very distinct from those occurring in Karanga and Zezuru, for instance." Mkanganwi (1995) says, "The actual situation is a complex 'mess' of dialects and dialect clusters. Linguistically this means that there are a number of Shona phonologies."

Considering these inter-dialectal differences, studies on Shona, particularly on phonology, have focused on a particular dialect: Karanga (Marconnes 1931, Odden 1991, Myers 1990, Pongweni 1990); Zezuru (Fortune 1955); Ndau (Mkanganwi 1973); Korekore (Dembetembe 1987). In a similar vein, this study focuses on the comparison of Karanga and Zezuru. Although the differences between the two dialects may seem small and/or insignificant it is, however, imperative to study each dialect carefully. First, no matter how small the differences may seem, they help contribute towards a deeper understanding of Shona, Bantu languages and other languages in general, thereby contributing insights into linguistic theory, diversity and typology. Second, since Doke's (1931) recommendations, there has been increased horizontal mobility amongst the Shona-speaking people with the effect of blurring distinctions amongst the dialects, particularly among the young (Mkanganwi 1995). A careful documentation and analysis of the differences amongst the Shona dialects is important for posterity.

3.3 Shona Phonemes

This section examines the vowel and consonant inventory in Shona. It provides the features assumed for the different vowels as well as for the crucial consonants in this thesis.

3.3.1 The Vowels

Shona has a simple vowel system comprising five short oral vowels, /i, e, a, u, o/. All Shona vowels are produced with modal voice. However, in §7.5.2.2, I argue that vowels that are immediately preceded by breathy voiced consonants assimilate the breathiness. In Shona, there are no diphthongs, and no long vowels (Fortune 1955, 1984, Chimhundu 1983, Mkanganwi

1995). In Table 3.1, I provide the Shona vowels and the features I assume for each of the vowels.

Table 3.1 Shona Vowel features (Clements and Hume (1995)

	/i/	/e/	/u/	/o/	/a/
[coronal]	✓	✓			
[labial]			✓	✓	
[pharyngeal]					✓
[dorsal]	✓	✓	✓	✓	✓
[open]		✓		✓	✓

I adopt Clements and Hume's (1995) Unified Feature Geometry (see §1.5.2 for relevant feature tree and relevant diagrams). In this feature system, front vowels [i] and [e] are [coronal]; back rounded vowels [o] and [u] are [labial]; the low vowel [a] is [pharyngeal]. Following scholars such as E.G Pulleyblank, (1998), I assume that all vowels involve a dorsal articulation. Following Hayward and Hayward (1989), McCarthy (1988), Lombardi (2002) among others, I use the feature [pharyngeal] for the low vowel [a], and this is crucial for my analysis. I employ Clements' (1989, 1991) privative feature [open], for the aperture. The high vowels [i] and [u] lack the feature [open] and the vowels traditionally considered [-high], namely, [a, e, o], are [open].

3.3.2 Consonant Inventory

Based on their articulation, Shona consonants are divided into simple and complex (Fortune 1984, Mkanganwi 1995, Pongweni 1990): simple consonants are articulated with a constriction at one point in the oral cavity, complex consonants are produced with more than one constriction in the oral cavity. First, I discuss simple segments.

3.3.2.1 Simple Segments

Table 3.2 below contains the simple segments in Shona.

Table 3.2 Shona Simple Consonants

	Labial	Alveolar	Palatal	Velar	Glottal
voiceless stops	p	t		k g	
breathy voiced stops	b̤	d̤			
implosives	ɓ	ɗ			
nasals	m	n	ɲ	ŋ	
breathy voiced nasals	m̤	n̤			
voiceless fricatives	f	s	ʃ		
voiced fricatives		z	ʒ		
breathy voiced fricatives	v̤				ɦ
labialized ‘whistling’ fricatives		ʂ ʐ			
approximants	ʋ		j	w	
trill		r			

Adapted from (Fortune 1984:128b)

Shona makes use of a three-way laryngeal distinction amongst obstruents: modal voice, voicelessness and breathy voice. Among nasals it employs a two-way distinction: modal voice versus breathy voice. Phonologically, all the simply articulated segments are realized as single consonant onsets, giving rise to the CV syllable type. Amongst the hiatus-breakers, the glide /j/, /w/ and the glottal fricative /ɦ/ are phonemic. The glottal stop [ʔ] is not phonemic.

The glottal stop fricative /ɦ/ is phonemic. As an illustration, consider the following minimal pairs
involving /ɦ/.

(2) a. /ɦák-a/ [ɦák-á]
hook-FV
‘hook’

b. /pák-a/ [pák-á]
load-FV
‘load

c. /Ø-ɦúkú/ [ɦúkú]
CL9.SG-chicken
‘chicken’

d /Ø-ʃúkú/ [ʃúkú]
CL9.SG-dire necessity
‘dire necessity’

The glottal fricative can also occur in non-initial position:

(3) a /ʧà-ɦúvé/ [ʧàɦúv̤é]
CL7-SG-mould
'mould'

b. /kàɦàdᶻìk-a/ [kàɦàdᶻìkà]
surprise-FV
'surprise, astonishment'

The glottal stop on the other hand only appears in contexts where it functions as a hiatus-breaker. In examples (4) and (5), I illustrate that the glottal stop only occurs as a hiatus breaker.

(4) a /á-rí mù-ᵐbá/ [árí mùᵐbá]
3SG-aux CL16.LOC-house
's/he is in the house'

b. /pà-á-rí/ [pàʔárí]
LOC-3SG-AUX
'where he is'

(5) a. /tá-ɓát-a/ [táɓátá]
1PL.SUBJ-touch-FV
'we are touched them'

b. /ʋá-à-ɓát-a/ [ʋáʔàɓátá]
3PL.SUBJ-CL6.PL.OBJ-touch-FV
'those who touched them'

Recall that I consider the glottal fricative [ɦ] and the glottal stop [ʔ] to be [pharyngeal] (McCarthy 1994, 1989, Hayward and Hayward 1989, Rose 1996, Lombardi 2002).

3.3.2.2 Complex Segments

I adopt Sommerstein's (1977: 104) definition of complexity, which says: "A complex segment is a segment which, for at least one feature [type], has two or more specifications."

Table 3.3 below provides complex segments in Shona.

Table 3.3 Shona Complex Consonants

	Labial	Alveolar	Palatal	Velar
voiceless affricates	pf	ts	ʧ	
voiced affricates	bv	dz	ʤ	
labialized affricates		tʂ dʐ		
prenasalised stops	^{m}b	^{n}d		^{ŋ}g
prenasalized fricatives	m^{v}	n^{z}		
labialized prenasalized fricatives	^{n}ʐ			
Cw combinations with voiceless plosives	p^{w} b^{w}	t^{w}	k^{w}	g^{w}
Cw combinations with nasals	m^{w}	n^{w}		
Cw with prenasalized fricatives	^{m}b^{w}	^{n}z^{w}		^{n}g^{w}

(Adapted from Mkanganwi, 1995: 28)

Fortune (1955, 1984) and Mkanganwi (1995) refer to complex segments as clusters, but I prefer the term 'combinations'. Fortune (1955, 1984) and Mkanganwi (1995) identify the following five types of consonant combinations:

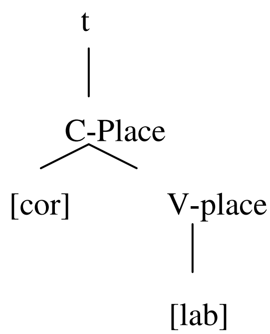
(6)
(i) Affricates (e.g., /t^{s}, d^{z}, tʂ, ʧ, b^{v}, d^{z}, d^{ʐ}, ʤ/)
(ii) Nasal-Oral stop combinations (e.g. /^{m}b, ^{ŋ}g, ^{n}d /)
(iii) Nasal-fricative combinations (e.g /^{m}v ^{n}z/)
(iv) Consonant and /w/ can form C^{w} combinations with all simple and complex segments except with the following / ʧ/, /j/ or complex segments and the labials /f/, /ʋ/; labialized fricatives / ʂ/, / ʐ/; implosives /ɓ, ɗ/ .

I also include the labialized fricatives /ʂ/ and /ʐ/, and the labial glide /w/ in the group of complex segments because their production involves more than a single point of constriction in the oral cavity. In Shona, affricates, nasal-oral stop combinations (which are realized as prenasalized stops), and nasal-fricative combinations (prenasalized fricatives) are considered unitary segments (Mkanganwi 1995). These segments are complex at the phonetic level but not at the phonological level, where they are treated as single segments or simple onsets, namely, C.

Cw combinations are of direct relevance to this study, particularly regarding glide formation (Chapter 5). I follow Doke (1931), Mkanganwi (1995), Downing (2002), Rogers *et.al.* (2008), in proposing that the Cw combinations are complex segments, that is, the /w/ in the Cw combinations is not an independent segment but is realized as secondary articulation on the preceding consonant. Phonologically, the Cw combinations are simple onsets. /w/ can combine with almost all simple and complex segments to form Cw combinations.

I follow Clements and Hume (1995) in assuming that secondary place on consonants is dependent on V-Place (Vowel Place) node, which in turn is dependent on a C-Place (Consonant Place) node.

Figure 3.1 Representation of [t^{w}]



3.4 Tone

Shona has two basic tones: High [´] and Low [`]. Low tone is often phonologically analyzed as the absence of tone (Odden 1981, Myers 1990, 1994). In Shona, the only segment that can bear tone is the vowel. I assume that the vowel can bear tone because it has a tone-bearing unit, viz., the mora (Hayes 1989, Hubbard 1995, Pulleyblank 1994, Hyman 1992). Tone in Shona is carried by the vowel or it can float. The tones are used to index lexical as well as grammatical meaning.

3.4.1 Lexical Tone

Lexical tone distinguishes one word from the other. Lexical functions of tone are shown in (7) and (8) illustrates the floating lexical tones.

(7) a.	[guru]	HH	‘ big’
	[guru]	LH	‘human stomach’
	[guru]	LL	‘burrow’
b.	[ʋàná]	LH	‘children’
	[ʋànà]	LL	‘four’
(8) a.	/p´-/		‘give’
b.	/n^{w}´-/		‘drink’
c.	/f`-/		‘die’
d	/g^{w}`-/		‘fight’

Evidence that the tones in (8) are floating comes from disyllabic and longer roots. In Shona, like in most other Bantu languages, verb suffixes do not have their own underlying tones. They assume the tones of the Verb Root. In 9(a) and (b), and 10(a) the final vowel takes the L tone of the preceding root vowel(s), and in 10(b), it takes the H tone of the root vowels.

(9) a. /pùtìr-a/ [pùtìrà]
wrap-FV
'wrap!'

b. /fùr-a/ [fùrà]
graze-FV
'graze!'

(10) a. /kòdzò^{n}g-a/ [kòdzò^{n}gá]
str-FV
'stir!'

b. /pér-a/ [pérá]
come to end-FV
'come to an end!'

A final vowel that is added to the Verb Roots that consist of a single consonant (8), surfaces with an H tone as in 11(a) and (b), and L tone in 11(c) and (d). Considering that consonants do not bear tone in Shona, it is safe to conclude that the tone that docks onto the final vowel was floating.

(11) a. /p´-a/ [pá]
give-FV
'give!'

b. /n^{w}´-a/ [n^{w}á]
drink-FV
'drink!'

c. /f`-a/ [fà]
die-FV
'die!'

d. /g^{w}`-a/ 'fight'
fight-FV
'fight!'

3.4.2 Grammatical Tone

Tone is used to mark different grammatical structures. In 12(a) is a declarative statement and (b) is a relative clause. The difference between the two is on the tone pattern.

	L H H H **H H** H L L H L	
(12) a.	mùkómáná ákáşíkà nèzúrò	(remote past)
	'The boys arrived yesterday'	
	L H H H **L L** H L L H L	
b.	mùkómáná àkàşíkà nèzúrò	(relative clause)
	'the boy who arrived yesterday'	

3.5 The Shona Syllable

Syllables in Shona are very simple. They are CV and V. They are all open and have simple onsets. Myers (1990: 220) observes that Shona syllables "are all open, there are no long vowels or diphthongs, and the onset consists either of a single consonant, or a consonant followed by a glide". In a similar vein, Mkanganwi (1995: 25) observes that, "…if we treat postvelarization [Cw combinations] as being no more than a distinctive feature [secondary articulation] of Shona phonemes, then the phenomenon of clustering is eliminated from our account of the organization of Shona speech." Since I analyze Cw segments as complex segments that have secondary articulation, this means that Shona has only simple onsets. Considering this observation, we can claim that the typical or maximal Shona syllable is CV.

Evidence that CV is the typical Shona syllable comes from loanword phonology. English loanwords with complex onsets (clusters) are simplified to CV syllable structure when words containing such onsets are borrowed into Shona (cf. Chimhundu 1983, Uffman 2005). As an illustration, consider the examples in (13).

(13) a.	/grin/	[gì.rí.nì]	'green'
b.	/trʌk/	[tì.rá.kì]	'truck'
c.	/graʊnd/	[gì.rá.wù.^{n}dì][3]	'sports ground'
d.	/spun/	[sì.pú.nù]	'spoon'

Additional evidence that CV is the typical syllable in Shona is adduced from frequency of occurrence. CV syllable is the most frequently occurring syllable structure in Shona. It occurs

[3] The fact that a diphthong /aʊ/ is split through spreading illustrates two things. First, it confirms that in Shona there are no diphthongs. Second, it shows that diphthongization can never be a hiatus resolution strategy in Shona, since diphthongs are banned in the language.

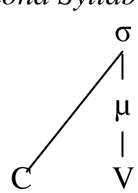
word-initially and medially. In contrast, V syllables are confined to word-initial position. This is described and analyzed here in (§9.3). The two dialects under investigation behave differently with respect to V initial syllables: Karanga allows V-initial syllables in function words only whilst Zezuru allows them in both lexical and function words (§9.3). The examples in (14) illustrate that both dialects allow V-syllables in function words. Examples in (15) show that in lexical
words, Zezuru allows initial onsetless syllables.

		Karanga/Zezuru
(14) a.	/ìní/ 1SG 'me'	[ì**.**ní]
b.	/ùjú/ 'this one'	[ù**.**jú]

		Karanga	**Zezuru**
(15) a.	/Ø-ò^{n}dé/ CL5.SG-fig 'fig'	[wò**.** ^{n}dé]	[ò**.** ^{n}dé]
b.	/ù-t^{s}ì/ CL14-smoke 'smoke'	[wù**.**t^{s}ì]	[ù**.**t^{s}ì]

Taking a moraic approach to Shona syllable structure (Hayes 1989), one can see that every Shona syllable must have a mora. This also means that by definition every vowel is moraic. A re-presentation of the typical Shona syllable is given below.

Figure 3.2. Typical Shona Syllable



3.6 Summary

The chapter has given the Shona vowel inventory and the relevant features for each of the vowels. It was proposed that the glottal stop [ʔ], the glottal fricative [ɦ] and the vowel [a] are [pharyngeal] segments. The chapter also presented the Shona consonant inventory, proposing that complex segments at the articulatory level are unitary segments functioning as simple onsets. Cw combinations have a direct relevance to this thesis particularly on glide formation and elision (chapter 6). On tone, the chapter showed that Shona has two tones, H and L, realized on the vowel. The chapter demonstrated that CV is the typical Shona syllable. The assumptions spelt out in this chapter as well as the phonological aspects discussed are crucial to an understanding of the description and analysis presented in the analysis chapters (6, 7, 8 and 9).

PART II

MORPHOPHONOLOGY AND MORPHOSYNTAX OF VERBS AND NOMINALS

Part II, which comprises chapters 4 and 5 demonstrates that the rich morphology and morphosyntax of the Shona verbs and nominals examined in this thesis reduce to three prosodic domains, namely, Prosodic Stem, Prosodic Word and Clitic Group. The defining characteristics of each domain are the yardstick for determining whether a particular morphosyntactic structure qualifies to be in that domain or not. The goal is to present domains which are crucial to my analysis. Chapter 4 introduces the diagnostics employed and examines verbal morphophonology and morphosyntax. Chapter 5 examines nominal morphophonology and morphosyntax. Part II makes no pretensions of completeness: each chapter only covers those aspects that are relevant for this thesis.

In examining the morphosyntax and the prosody of the verbs and the nominals, the central question addressed is about the correspondence relations between prosodic structure (Prosodic Stem, Prosodic Word, Clitic Group) and morphosyntactic structure. In presenting the correspondence relation, I employ parallel structures (Williams 2003). These are structures presented in parallel, with the morphosyntax and the prosodic structures mirroring each other.

CHAPTER 4

VERBAL MORPHOPHONOLOGY AND MORPHOSYNTAX

4.1 Introduction

This chapter examines verbal morphophonology and morphosyntax and demonstrates that the complex verbal morphosyntax reduces to three prosodic domains: Prosodic Stem (PStem), Prosodic Word (PrWd) and the Clitic Group (CG).

I adopt the canonical structure of the Bantu verb proposed by scholars such as Barrett-Keach (1986), Mutaka and Hyman (1990), Myers (1990), Hyman (1993, 2005), Downing (1999, 2005), and Ngunga (2000), among others. The canonical structure of the Bantu verb consists of the following morphosyntactic constituents:

i) Derivational Stem[4] (DStem).
ii) Inflected Stem (IVStem).
iii) Macro Stem.
iv) PreStem or Inflectional Stem.

The chapter discusses and exemplifies how these morphosyntactic constituents correspond to different prosodic domains, that is how the edges of some morphosyntactic constituent aligns with those of some prosodic domain.

4.2 The Prosodic Domains: An Introduction

4.2.1 Prosodic Word

Dixon and Aikhenvald (2002) point out that there is no single criterion that can serve to define a unit 'phonological word' in every language, rather there is a range of types of criteria such that every language utilizes a selection from these. These features could be segmental, prosodic or phonological. Myers (1990:65), building on Doke (1929), identifies disyllabic minimality and Meeussen's rule as the defining characteristics of the Prosodic Word in Shona.

[4] I make no distinctions between the Minimal Stem and the Extended Derived Stems since such distinctions are not crucial in this thesis (cf. Downing 1999, 2005, Ngunga 2000).

4.2.1.1 Disyllabic Minimality

Disyllabic minimality is the requirement that every Prosodic Word must be at least two syllables long. This means that every Prosodic Word must consist of at least a foot (Myers 1995). Karanga, which allows monosyllabic Prosodic Words, is the exception. In all the other dialects, potentially monosyllabic Prosodic Words are augmented by an epenthetic [ì] to ensure that they are at least two syllables long (Myers 1990). The issue of disyllabic minimality is explored in §9.2.

In Shona, like in other Bantu languages, a noun class prefix and a noun stem join to form a word (Fortune 1984, Mkanganwi 1990). In my analysis, I consider the class prefix and the morphological stem an Inflected Nominal Stem which maps on to a Prosodic Stem (§5.4). In examples 1(a) and (b), the Inflected Nominal Stem is co-extensive with a Prosodic Word, and it triggers augmentation with [ì]. The vertical line marks the edge of a morphological stem while the curly brackets enclose a Prosodic Stem, and the square brackets a Prosodic Word.

		Zezuru	
(1) a.	/Ø-gò/ CL5.SG-wasp 'wasp'	[ìgò]	[{ì|gò}]
b.	/Ø-g^{w}à/ CL5.SG-canoe 'canoe'	[ìg^{w}à]	[{ì|g^{w}à}]

The Inflected Noun Stems in 1(a) and (b) are realized with an [ì] when in isolation, but simply as /-gò/ and /-g^{w}à/ when they have a class prefix that has phonological material, as shown in 2(a) and (b) below. In 2(a) and (b), where the class prefix and the stem are two syllables long, epenthesizing the vowel [ì] is unacceptable. The glide in the ungrammatical form is a hiatus breaker.

		Karanga/Zezuru	
(2) a.	/mà-gò/ CL6.PL-wasp 'wasps'	[màgò]	*[{màjì|gò}]
b.	/mà-g^{w}à/ CL6.PL-canoe 'canoes'	[màg^{w}à]	*[{màjì|g^{w}à}]

The class prefix /mà-/ and the stem are in the same Prosodic Word and together they satisfy disyllabic minimality requirement. In the last column, where the epenthetic vowel is parsed inside or outside the Inflected Noun Stem, these forms are unacceptable.

In verbs, a similar pattern exists: monosyllabic Prosodic Words are augmented with an [ì]. In 3(a) and (b), a Verb Root, which is here coextensive with a Derived Verb Stem (§ 4.3.1.2 and §4.3.1.3), comprising a single consonant, together with a final vowel form a monosyllabic Inflected Verb Stem that is co-extensive with the Prosodic Word. However, when an infinitive marker, /kù-/, which is a class prefix, is added the epenthetic [ì] is made redundant as shown in 4(a) and (b).

(3) a.	/p´-a/ give-FV 'give!'	[ìpá]	[{ì|pá}]	
b.	/ɓ´-a/ steal-fv 'steal!'	[ìɓá]	[{ì|ɓá}]	
(4) a.	/kù-p´-a/ CL15.INFIN-give-FV 'to give'	[kùpá]	[{kù|pá}]	*[{kùjì|pá}]
b.	/kù-ɓ´-a/ CL15.INFIN-steal-fv 'to steal'	[kùɓá]	[{kù|ɓá}]	*[{kùjì|ɓá}]

The data suggests that the infinitive class marker /kù-/ and the monosyllabic stem together constitute a well-formed Prosodic Word.

4.2.1.2 Meeussen's Rule

Meeussen's rule is the lowering of a high tone when preceded by another high tone. A different way of interpreting Meeussen's rule is to say that a high tone is deleted and replaced with a low tone, since low tone in Shona is considered the default (Odden 1981, Myers 1990).

(5) H → Ø / H___

Myers (1990) considers the phonological word to be the domain for Meeussen's rule, but I wish to argue that it occurs in the Clitic Group. Myers (1990:46), reports that the PreStem is not a domain for Meeussen's Rule. The following examples are adopted from Myers (1990:45). In 5(a) and (b), the two highlighted high tones are in the PreStem, and the third one, which is not highlighted, is a result of tone spreading. The subject prefix and the tense/mood prefix are both in the PreStem.

(6) a. /*và-ká*-ʋèrè^{ŋ}g-a/   H H   [*vàká*ʋérè^{ŋ}gà]
1SG.PAST-RP-read-FV
'to read randomly'

b. /*và-^{n}gá*-ʋèrè^{ŋ}g-e/   H H   [*và^{n}gá*ʋérè^{ŋ}gè]
1SG.PAST-POTEN-read-FV
'they could read'

In order to account for the lack of Meeussen's rule in the above examples, Myers (1990:46) says: "Assuming an INFL [PreStem] stem constituent, we can account for these facts simply by not including the stem level in the domain for Meeussen's rule. The rule will not apply … because the tones are not in the appropriate domain" The PreStem is part of the Verbal Word (Figure 4.4), and I assume the Verbal Word is a Prosodic Word, and if Meeussen's rule applies in the Prosodic Word, it is logical to expect to occur in the PreStem.

The Macro Stem is not a domain for Meeussen's rule (Myers 1990). The vertical line ǀ marks the left edge of a Macro Stem and the curly brackets { } a Prosodic Stem and italics the Inflected Stem. In the examples below, two high tones in separate morphemes are allowed to be juxtaposed—one high is the object marker and the other is in the PreStem.

(7) a. /téng-a/   H   [téngá]
buy-FV
'buy!"

b. /kù-rí-téng-a/   H H   [kù{ǀrí{*téngá*}]   H L   *[kù{ǀrí{*tèngà*}]
CL15.INFIN-CL5.OBJ-buy-FV
'to buy it'

Applying Meeussen's rule in the Macro Stem produces unacceptable results (cf. Myers 1990). Similar to the PreStem, the Macro Stem is inside the Prosodic Word, and if Meeussen's rule applies in the Prosodic Word, then it should also apply in the Macro Stem.

The diagnostic for the Prosodic Word is disyllabic minimality; every Prosodic Word must be minimally disyllabic, with Karanga being the exception.

4.2.2 Prosodic Stem

There are no 'canonical' diagnostics for the Prosodic Stem. The diagnostics seem to vary from context to context and include, for example, vowel harmony, reduplication and tone spread.

The Prosodic Stem, however, is not a domain for (i) minimality and (ii) Meuussen's rule. It is however, a domain for other phonological processes.

As an illustration, consider the examples in which the stems are not a domain for disyllabic minimality.

(8) a.	/p´-a/ give-FV 'give!'	[ìpá]	[{ì|pá}]
b.	/ɓ´-a/ steal-FV 'steal!'	[ìɓá]	[{ì|ɓá}]

Evidence in support of the [ì] epenthesis hypothesis comes from Infinitives. When the infinitive morpheme /kù-/ is prefixed to a monosyllabic imperative verb, there is no [ì] epenthesis:

(9) a.	/kù-p´-a/ CL15.INFIN-give-FV 'to give'	[|pá]	*[{kùjì|pá}]

b. /kù-ɓ´-a/ [kùɓá] *[{kùjì|ɓá}] *[{kù|jìɓá}]
CL15.INFIN-steal-fv
'steal'

The explanation for the lack of [ì] epenthesis in Zezuru could be that the infinitive /kù-/ (CV) and the monosyllabic Minimal Inflected Stem (CV) constitute a well-formed prosodic word (CV**.**CV). This means that /ku/ + stem is a PrWd, but the stem alone is not a PrWd and consequently not subjected to disyllabic minimality. It means that the form is not:

(10) *[$_{PrWd}$ kù-[$_{PSTEM}$ jìpá]]

4.2.3 The Clitic Group

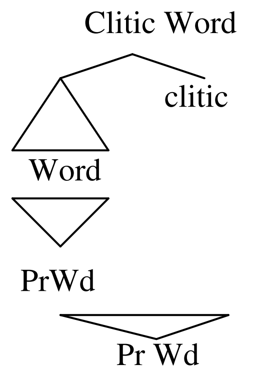
The notion of cliticization has generated a lot of debate, which I cannot go over in this thesis. Hayes (1989) and Nespor & Vogel (1986) have made two major contributions in the area of the phonological aspects of cliticization, particularly on the prosodic representation of clitics and their hosts. Hayes (1989) and Nespor & Vogel (1986) independently argue that the prosodic hierarchy should contain a constituent that groups together clitics and their hosts, called the Clitic Group. They argue that the Clitic Group should be placed between the Prosodic Word and the Prosodic Phrase. Ever since Hayes (1989) and Nespor & Vogel (1986) independently introduced the Clitic Group, the need for this constituent has been questioned (see, e.g., Booij 1995, Inkelas 1989; Zec & Inkelas 1991).

Nespor & Vogel (1986) have demonstrated that the major motivation for the various prosodic categories lies with the fact that they serve as the domain of application of phonological processes. Peperkamp (1997:158), commenting on the need or lack of the Clitic Group, says "…the clitic group can be shown to be a necessary constituent if, in the same language clitics are treated as word-internal by some rules and as word-external by others, or if clitics and their hosts undergo juncture rules that apply neither within nor across non-clitic words." Though this may sound circular, in Shona, the phonological processes under observation in this study illustrate the latter point: hiatus resolution strategies that apply within and across non-clitic words are different from those that apply across clitic-words. Illustrating and accounting for this observation is one of the major tasks of this thesis.

There are two hypotheses that can account for the prosodization of clitics in Shona. First, using Meussen's rule as a diagnostic, Myers (1990, 1995) argues that a clitic attaches to a

Prosodic Word to form another Prosodic Word. In other words, cliticization results in recursive Prosodic Word. Figure 4.1 illustrates the Recursive Prosodic Word.

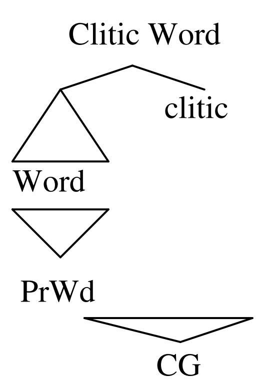
Figure 4.1 Recursive Prosodic Word



In the representation, the Word and the clitic are joined together to form a Clitic Word[5]. The Word corresponds to the PrWd and the Clitic-Word corresponds to another Prosodic Word.. The recursion in the syntax is mirrored in the morphophonology. The demerit of this structure is that it violates, the strict layer hypothesis, PROPERHEADEDNESS in particular.

A second hypothesis is that the clitic attaches to a Word to form a Clitic Word. The Word corresponds to a Prosodic Word and the Clitic Word to the Clitic Group (CG). This means that Meeussen's rule applies to the Clitic Group and not to the Prosodic Word (cf. Myers 1990). Figure 4.2 illustrates the structure of the Clitic Group.

Figure 4.2 Clitic Group



[5] I make a distinction between a Nominal Word and a Verbal Word which I also refer to as just Word, and a Clitic Word. The Clitic Word and the Word (Nominal or Verbal) behave differently both in the morphosyntax and the phonology, hence the need to capture that distinction.

In this thesis, I adopt the Clitic Group hypothesis. The merit of this analysis is that it respects, PROPERHEADEDNESS. Furthermore, I argue that Meeussen's rule is a diagnostic for the clitic Group.

The characteristic of the Clitic Group in Shona, are that, (i) it is a domain for Meeussen's rule and (ii) it comprises a clitic and a host; clitic plus PrWd

The examples in (11) illustrate Meeussen's rule, which requires the lowering of a high tone when it immediately follows another high tone. This occurs across the clitic-word boundary. A vertical line marks the boundary.

(11) a. /Ø-ɓángá/   H
[ɓángá]
CL5.SG-knife
'knife'

b. /sá=ɓángá/   H L
[sé |[ɓàngà]   H H
*[sé|ɓángá]
CL5.SG-knife
'like a knife'

c. /ná=ɓángá/   H L
[né |ɓàngà]]   H H
*[né|ɓángá]
CL5.SG-knife
'with a knife'

The clitic /né=/ and /sé=/ have an underlying H tone. When they are attached to a high-toned word, the tone of the high-toned word is turned into an L. In instances where the clitic is attached to a noun with an initial low tone, the initial tone of the word does not change.

(12) a. /Ø-ràngà/   L
[ràngà]
CL5.SG-eye discharge
'eye discharge'

b. /sé=ràngà/   H L
[sé |[ràngà]
CL5.SG-eye discharge
'like eye discharge'

H L

c. /né=ràngá/ [né |ràngà]]
CL5.SG-knife
'with eye discharge'

4.3 Verbal Structures, Domains and Hiatus Resolution Strategies

Shona verb morphology as in other Bantu languages is complex and markedly different from nominal morphology (Mutaka and Hyman 1990; Hyman 2005; Myers 1990). The most dominant feature of the Shona verb, like other Bantu languages, is the capacity of the Verb Root to take on enough affixes on either side such that the verb alone can function as a complete sentence, as illustrated in (13). When the data is not specified for any dialect(s), it means that all the Shona dialects behave in the same way.

(13) a. [tì-tʃá-mù-tór-ér-á]
3PL.SUBJ-FUT-3SG.OBJ-take-APPL-FV
'we will take away from him/her'

b. [ʋà-jí-á-bát-ír-án-á]
2PL.SUBJ-HAB-PAST-3SG.OBJ-hold-APPL-REC-FV
'they held them for each other'

The complex verbal morphosyntactic constituents observed in this thesis are reduceable to the PStem, PrWd and Clitic Group. Figure 4.3 provides a summary of the verbal morphosyntactic constituents, the corresponding prosodic domains and the hiatus resolution strategies that operate in each domain.

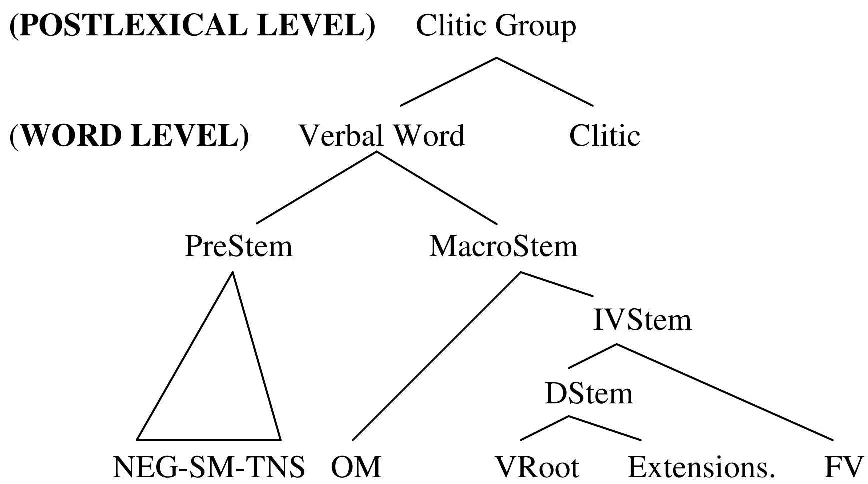
Figure 4.3 Verbal Morphosyntactic Constituents, Levels, Prosodic Domains and Hiatus Resolution Strategies

Prosodic Domains	**Morphosyntactic constituents**	**Hiatus Resolution**
	POSTLEXICAL LEVEL	
Clitic Group	Clitic Word	coalescence or spreading
	WORD LEVEL	
Prosodic Word	Verb Word	spreading
|	|	|
Prosodic Stem (recursive)	PreStem	spreading
|	|	|
Prosodic Stem (recursive)	Macro Stem	spreading
|		|
Prosodic Stem (recursive)	Inflected Verb Stem	N/A
|	|	|
Prosodic Stem (non recursive)	Derivational Stem	N/A
|	|	|
-----------------	Verb Root	N/A

First, the figure shows two levels (or strata), the Postlexical Level and the Word Level. Second, reading the figure from bottom up, the dotted lines indicate that there is no evidence in support of or against the mapping of the Verb Root onto a prosodic domain. Each of the stems, namely, the Derivational Stem, Inflected Verb Stem, Macro Stem and PreStem, corresponds to a Prosodic Stem. Except for the Derived Stem, the other stems, namely the Inflected Verb Stem, Macro Stem and PreStem are recursive, corresponding to recursive PStems. Hiatus that occurs in the Prosodic Stem is resolved through spreading. The Verbal Word maps onto a Prosodic Word. Hiatus, which arises at a Prosodic Stem boundary is resolved through spreading. At the Postlexical Level the Clitic Word maps on to the Clitic Group. Hiatus in the Clitic Group domain, precisely at the PrWd boundary, is resolved through coalescence. In instances when coalescence is blocked, spreading kicks in.

The representation of the structure given in Figure 4.4 is adapted from Ngunga (2000), (cf. Myers 1990, Downing 1997).

Figure 4.4 The Verb Structure



Bantu scholars such as Barrett-Keach (1986), Hyman (1993), Myers (1990), Hyman and Mutaka (1994), Downing (1994, 2006) *inter alia* have provided both phonological and morphological evidence for the various constituents of the verb illustrated in Figure 4.4.

The rest of this chapter discusses the representation in Figure 4.3 and the tree structure in Figure 4.4, beginning from bottom up. The Verb Root, Derivational Stem, Inflected Verb Stem, Macro Stem, PreStem and the Verbal Word are at the Word level. The Postlexical level comprises the Clitic Word.

4.3.1 Verb Root

The Verb Root may be derived or underived. I have no evidence in support of or against the Verb Root mapping onto a Prosodic Root (PRoot). The Verb Root is:

(i) syllabically incomplete and always ends in a consonant (C-final).
(ii) a bound morpheme, which accepts morphemes before and after it.
(ii) monotonic—it carries a single tone, H or L.

Shona has both underived Verb Roots and Verb Roots derived from other word classes such as ideophones and adjectives. First, I look at the underived Verb Roots.

4.3.1.1 Underived Verb Roots

Underived Verb Roots have the following characteristics, they:

(i) are monomorphemic.
(ii) are consonant-final (C-final).
(iii) have a minimum size of a single consonant.
(iv) have a maximum size of three syllables.

Underived Verb Roots have the following prosodic shapes:

(14)

Prosodic Shape	Example	Gloss
C	/p´-/	‘give’
VC	/ón-/	‘see’
CVC	/gár-/	‘sit’
VC	/éd^{z}-/	‘try’
CVVC	/téúk-/	‘spill’
CVCVC	/tón̤ór-/	‘be cold’
CVCVCVC	/tón̤ó^{n}gór-/	‘shell’

4.3.1.2 Derived Verb Roots: Roots derived from Ideophones

In Shona, Verb Roots are derived from ideophones and adjectives. The derived Verb Roots are:

(i) morphologically complex.
(ii) made of an ideophone or adjective and a verbalizer suffix.
(iii) C-final.
(iv) monotonic.

Roots are derived from ideophones by attaching a verbalizer to the ideophone to produce a Verb Root.

Figure 4.5 Verb Root Derived From Ideophone

VRoot

Ideo verbalizer

First, I briefly look at the structure of the ideophone. The ideophone is used to mark vivid or dramatic speech. The ideophone is:

(i) monomorphemic.
(ii) V-final.
(iii) not necessarily monotonic; a single ideophone can carry varied tones, e.g. LH, HL, HHL
(iv) a free form.
(v) not inflected when used in speech.

Examples in (15) illustrate that the ideophone is; monomorphemic, V-final, not necessarily monotonic, and a free form.

(15) a.	/pù/	L	'ideo of falling gently'
b.	/ɗùkù/	LL	'ideo of cowering'
c.	/pàrú/	LH	'ideo of tearing'
d.	/b̤ùrùrù/	LLL	'ideo of flying'
e.	/b̤ùrùkùtù/	LLLL	'ideo of slumping to the ground'
f	/gó/	H	'ideo of cutting'
g	/b̤áɗù/	HL	'ideo of splitting'
h.	/b̤úgúgù/	HHL	'ideo of knocking container over'
i.	/súrùɗùɗù/	HLLLL	'ideo of hanging head to express sadness'

The addition of a verbalizer to an ideophone turns it into a Verb Root. The canonical shape of the verbalizers is a consonant (C) (Fortune 1955, 1984).

Although ideophones are not monotonic, the Verb Roots derived from ideophones conform to the monotonic pattern of the Shona Verb Root. The derived Verb Roots take the initial tone of the ideophone: If the ideophone is HL, HHL or H, for example, the derived root will be H. In cases where the ideophone is L, LH, LLH or LHL, the derived root will be L. Note that a root H is realized throughout the root.

(16)

	Verbalizer	Ideophone		Derived Verb Root	
	-r- (C)	d^{z}ímù	'ideo of extinguishing'	dzímú-**r-**	'extinguish'
	m- (C)	kó^{m}bá	'ideo of bending'	kómbá-**m-**	'bend'
	-t- (C)	fú^{m}bá	'ideo of hiding in palm'	fú^{m}bá-**t-**	'hide in palm'
	-n- (C)	góɲá	'ideo of curling'	góɲá-**n-**	'curl'

4.3.1.3 Roots Derived from Adjectives

The adjective is V-final, and not monotonic. Examples in (17) are illustrative examples of Shona adjectives. (A full discussion of adjectives is given in § 5.4.2.

(17) a. /Ø-tá^{m}bò Ø-rèfú/ [tá^{m}bò rèfú]
CL9.SG-rope CL9.SG-long
'long rope'

b. /Ø-ɓótá Ø-ɗètè/ [ɓótá ɗètè]
CL5.SG-porridge CL5.SG-thin
'thin porridge'

The verbalizer is a consonant. Similar to Verb Roots derived from ideophone, a Verb Root derived from an adjective assumes the tone of the initial syllable:

(18)

	Adjective	Tone	Derived Verb Root	Tone
	kóbvù 'thick'	HL	kóbvú-**k-** 'become thick'	H
	pfúpì 'short'	HL	pfúpí-**k-**'become short'	H

Across the adjective-verbalizer or ideophone-verbalizer boundary, hiatus does not arise, as the adjectives are V-final and the verbalizer is a consonant (C).

4.3.2 The Prosodic Stem

The Derivational Stem, Inflected Verb Stem, Macro Stem, Inflectional Stem each corresponds to a Prosodic Stem. This section examines each one of these morphosyntactic structures in detail, beginning with the Derivational Stem.

4.3.2.1 Derivational Stem

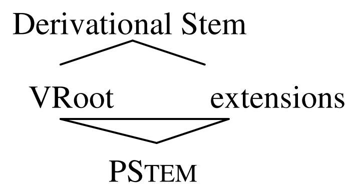
The Derivational Stem has the following properties, it is:

(i) monotonic.

(ii) C-final.
(iii) is a domain for vowel harmony.
(iv)

The structure of the DStem is illustrated in Figure 4.6 (cf. Myers 1990, Downing 2000)[6]

Figure 4.6 Derivational Stem



Reading the figure from top to bottom, the Derivational Stem comprises a Verb Root and verb extensions. The Derivational Stem corresponds to the Prosodic Stem.

The verbal extensional suffixes come immediately after the Verb Root. They do not have an inherent tone, and always assume the tone pattern of the Verb Root. The verbal extensions have
different prosodic shapes: VC, C, VCVC.

(19)

Extension	**Prosodic shape**		**Example**	**Gloss**
intensive	VC	/-is-~-es-/	ɓát-ís-	‘hold tightly’
potential	VC	/-ik-~ek-/	ɓát-ík-	‘be able to be held’
reciprocal	VC	/-an-/	ɓát-án-	‘hold each other’
contactive	VC	/-at-/	nàm-àt-	‘adhere to’
associative	VC	/-an-/	góɲ-án-	‘curl’
applied	VC	/-ir-~-er/	ɓát-ír-	‘hold for’
causative	VC	/-is-~-es-/	rúm-ís-	‘cause to bite’
repetitive	VCVC	/-urur ~oror-/	kàr-urùr-	‘resow’
perfective	VCVC	/-irir~-erer-/	sèk-èrèr-	‘laugh on and on’
passive	C	/-w-/	tèm-w-	‘be stoned’

In Shona, VC is the most prevalent prosodic shape amongst the extensions. Hyman (2005:17) observes that the canonical shape of the verbal extension in Bantu is VC. In fact, the VCVC verbal extensions seem to have undergone reduplication with the VC extension repeated to give VCVC. Similar to the Verb Root, the verbal extensions are C-final.

[6] Myers (1990 and Downing (2000) argue that the verb root is the Minimal Stem, and the verb root plus the extensional suffixes comprises the Extended Derived Stem.

The alternation between [e] and [i] in the verbal extensions is due to vowel harmony. In (20) and (21), the initial syllable has a high vowel /i/ and /u/ respectively and the extensional suffix has an /i/. In (22), the initial syllable has the low vowel /a/ and the extensional suffix has the vowel /i/. In (23) and (24), the initial syllables have the mid vowels /e/ and /o/ respectively and the extensional suffix has the vowel /e/. The final vowel-/a/ is not part of the DStem.

		Karanga/Zezuru	
(20) a.	/tíz-a/ run away-FV 'run away!'	[tízá]	
b.	/tíz-ir-a/ run away-APPL-FV 'run away to'	[tízírá]	*[tízérá]
(21) a.	/súk-a/ wash/clean-FV 'wash!'	[súká]	
b.	/súk-ir-a/ wash-APPL-FV 'wash for'	[súkírá]	*[súkérá]
(22) a.	/tár-a/ draw a line-FV 'draw a line!'	[tárá]	
b.	/tár-ir-a/ draw a line-APPL-FV 'draw a line for'	[tárírá]	*[tárérá]
(23) a.	/réʋa/ tell-FV 'tell!'	[réʋá]	
b.	/réʋ-ir-a/ tell on-APPL-FV 'tell on someone'	[réʋérá]	*[réʋírá]
(24) a.	/tór-a/ take-FV 'take!'	[tórá]	
b.	/tór-ir-a/	[tórérá]	*[tórírá]

take-APPL-FV
'take from/for'

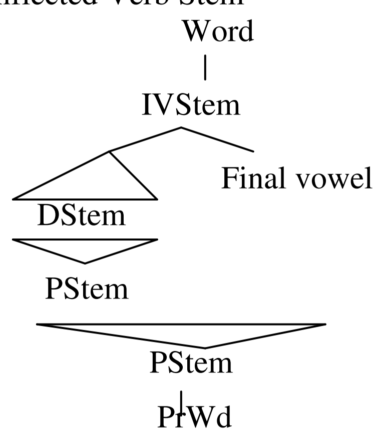
The alternation between the high and mid vowels is due to vowel harmony. A mid vowel in the extensions only occurs when there is a mid-vowel in the Verb Root (Fortune 1955, Beckman 2004). The final vowel does not participate in vowel harmony. Considering that the DStem is a domain for vowel harmony, I assume that it maps onto a prosodic domain, namely a Prosodic Stem.

The nature of the morphemes involved in the DStem do not create hiatus. The Verb Root is C-final and the extensions are VC.

4.3.2.2 Inflected Verb Stem

The Inflected Verb Stem (IVStem) comprises the DStem and the final vowel, also called the Inflectional Final suffix (IFS) (cf. Downing 1999). Figure 4.7 shows the correspondence relations between the Inflected Verb Stem and the prosodic constituent.

Figure 4.7 Inflected Verb Stem



The Inflected Verb Stem can be co-extensive with the Word, only in imperatives. The Inflected Verb Word comprises the Derivational Stem (Verb Root plus extensions Figure 4.6), and the Final Vowel. The Inflected Verb Stem corresponds to a Prosodic Stem which can be co-extensive with a Prosodic Word.

The generalizations about the final vowel are as follows:

(25)

(i) When the final vowel is /a/, it satisfies the prosodic constraint that all Shona syllables must be open.

(ii) When the final vowel is /e/ or /i/, in addition to satisfying the prosodic constraint, it also provides morphological information.
(iii) The final vowel assumes the tone of the root.

The final vowel has received very little attention, and when it does, it is often explained away as a default final vowel. There is little attempt to address its status—whether it is phonological, syntactic or a combination of these. Following Mkanganwi (2002), I consider the FV, to serve a dual purpose. It has phonological and morphosyntactic functions. Mkanganwi (2002:184) observes that:

> The final vowel seems to have a dual morphological and phonological function. On the one hand, it is analyzable as distinct morphological element quite separate from the verb … On the other hand; it does not seem to have an evident meaning or grammatical function. Its apparently purely mechanical role seems to be purely phonological. However, it seems to perform a distinct derivational role [too!].

In its phonological role, the final vowel is needed so that the final consonant of the stem is properly syllabified. The DStem is C-final, yet Shona only allows open syllables. Joining the DStem and the final vowel provides the final consonant of the DStem with a nucleus. This is syllabified as CV. In Shona, like in most other Bantu languages, the FV is the vowel /a/. Like other verbal suffixes, it does not have an inherent tone, and it assumes the tone of the root to which it is attached. This translates into the Inflected Verb Stem having a single tone pattern. In instances where the root comprises a consonant, there is a floating tone, which docks onto the final vowel. In 26(a), there is a floating H tone and in 27(a) L tone.

		Zezuru	**Karanga**
(26) a.	/p´-a/ give-FV ‘give!’	[ìpá]	[pá]
		Karanga/Zezuru	
b.	/gár-a/ sit-FV ‘sit!’	[gárá]	
c.	/tónór-a/ cold-FV ‘cold!’	[tónórá]	
(27) a.	/g^{w}`-a/ fight-FV ‘fight!’	[g^{w}à]	
b.	/ɓùr-a/	[ɓùrà]	

remove (object) from fire-FV
'remove (object) from fire!'

c. /ɗùrùr-a/ [ɗùrùrà]
pour out liquid or grain-FV
'pour out liquid or grain!'

In this context, the Final Vowel does not play any morphological or morphosyntactic role, other than ensuring that the phonotactics of the language are satisfied.

In its morpho-syntactic role, the FV plays a dual role. The final vowel continues to satisfy the phonotactics of the language as well as play a grammatical function. Consider the following examples, where in 28(a) the FV marks negation and in 28(b) marks the subjunctive.

(28) a. /mù-kómáná ɦà-á-fá^{m}b-i/ [mùkómáná ɦàɦáfá^{m}bí]
CL1.SG-boy NEG-3SG.SUBJ-walk-FV
'The boy does not walk'

b. /^{n}dí-tór-e ɦèrè/ [^{n}dítóré ɦèrè]
1SG.SUBJ-take-FV INTERROG.
'should I take it?'

Tone provides further evidence of the Inflected Verb Stem. In the Mhari dialect of Karanga, tone that originates in the Inflected Verb Stem spreads right to the end of the stem/word (cf. Myers 1990). However, a tone that originates outside the Inflected Verb Stem spreads one syllable into the Inflected Verb Stem (Myers 1990:46). The examples in 29(a) and (b) show the spreading of tone that originates in the Inflected Verb Stem. Example (c) illustrates tone that originates outside the stem and spreads one syllable to the right.

(29) a. /ɲór-ir-a/ [ɲóréré]
write-APPL-FV
'write for'

b. /ɓát-an-a/ [ɓátáná]
hold-REC-FV
'hold each other'

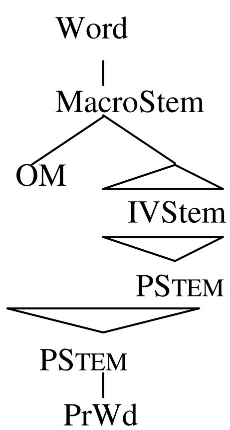
c. /kù-mú-*vèrèng-ir-a*/ [kùmú*vérèngèrà*]
INF-CL1.OBJ-read-APPL-FV
'to read to him'

In view of the evidence that the morphology and phonology make a distinction of the Inflected Verb Stem, I assume that it is a Prosodic Stem.

4.3.2.3 Macro Stem

The DStem can have morphemes preceding it. Very generally, all morphemes which occur before the Verb Root are ‘grammatical’ in the sense that they perform the usual subject and object agreement, tense and aspect functions. These morphemes are either CV or V in shape. The object marker is the morpheme that comes immediately before the Inflected Verb Stem, and together they constitute the Macro Stem *(*Hyman and Ngunga 1994, Myers 1998, Ngunga 2000, Downing
2006). Figure 4.8 provides the structure of the Macro Stem and the prosodic domain it maps on to.

Figure 4.8 MacroStem



Reading Figure 4.8, from top down, the Macro Stem can be co-extensive with the Word. The Macro Stem comprises the object prefix and the Inflected Verb Stem. The Inflected Verb Stem corresponds to another Prosodic Stem. The Macro Stem in turn corresponds another Prosodic Stem which is co-extensive with the PrWd. This is an instance of Prosodic Stem recursion, where one Prosodic Stem is inside another. The phonology mirrors the recursion found in the morphosyntax where the IVStem is inside another stem, the Macro Stem.

In (30) are examples of the Macro Stem.

(30) a. /rí-tór-e/ [rítóré]
CL5.SG.OBJ.-take-FV
‘take it’

b. /mà-ʧék-e/ [màʧéké]
CL6.PL.OBJ-cut-FV

‘cut them’

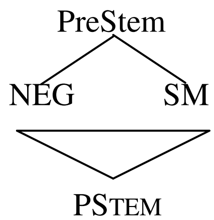
c. /tù-súk-e/ [tùsúké]
CL13.PL.OBJ-wash-FV
‘wash them’

Evidence for the Macro Stem is also adduced from tone. Myers (1990) showed that two high tones are allowed to be juxtaposed and Meeussen’s rule does not apply as shown in 30(a).

4.3.2.4 PreStem

Preceding the Macro Stem there are morphemes that carry grammatical information. These are negation markers (NEG), subject markers (SM) and tense markers (TNS). These morphemes constitute the PreStem (Ngunga 2000) or the Inflectional Stem (INFL) (Myers 1990, Downing 1997). Figure 4.9 shows the morphosyntactic structure of the Inflectional Stem and the corresponding prosodic constituent.

Figure 4.9 PreStem



In Figure 4.9, the PreStem is made up of the negation marker and the subject marker. The PreStem corresponds to the Prosodic Stem.

The examples in (31) show the PreStem: 31(a) shows the negative marker and the subject markers; 31 (b), the subject marker and the tense marker; preceding the PreStem.

(31) a. /*ɦà-ʋá*-fàr-i/ [*ɦàʋá*fàrì]
NEG-3PL.SUBJ-happy-FV
‘they are not happy’

b. /*á-ʧá*-pèr-a/ [*áʧá*pèrà]
3SG-FUT-finish-FV
‘they will be finished’

4.3.3 The Prosodic Word: Verb Word

The Verb Word comprises the PreStem and the Macro Stem. I assume that the Verb Word maps onto a Prosodic Word.

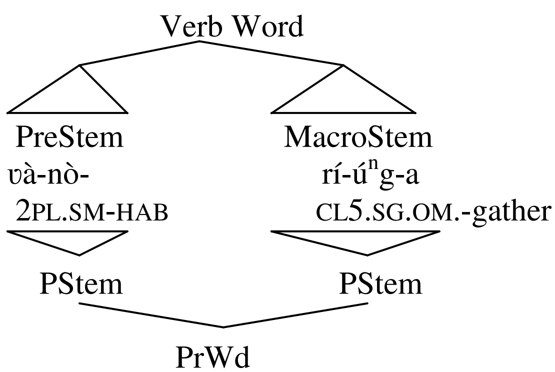
The examples in (32) illustrate the Verb Word. The italicized part is the Macro Stem, and the non-italicized part the PreStem.

(32) a. /ʋà-nò-*rí-ú^{n}g-a*/ [ʋànò*ríwú^{n}gá*]
2PL.SM-HAB-CL5.SG.OM.-gather-FV
'they gathered it'

b. /ɦà-kà-ʧá-*ù-ɗ-i*/ [ɦàkàʧá*wùɗí*]
NEG-CL13.SM-FUT-CL3.OM-like-FV
'it no longer likes it'

Figure 4.10 provides the morphosyntactic structure of the Verb Word and the prosodic domain it maps on to.

Figure 4. 10 Verb Word



In Figure 4.10, The Verb Word comprises the PreStem /ʋà-nò-/ and the Macro Stem /rí-ú^{n}g-a/. Each of the stems corresponds to a Prosodic Stem. The Verb Word corresponds to the PrWd.

4.3.4 Hiatus Resolution Across the PStem Edge: Recursive PStem and PrWd (Word Level)

Six things are common to the Macro Stem, Compound Stem and PreStem. First, they map onto a Prosodic Stem. Second, they are recursive. Third, they are within the Word level. Fourth, hiatus that occurs in each of these constituents occurs across a PStem boundary. Fifth, in each of the cases, hiatus is resolved through spreading. Sixth, hiatus that occurs within the Verbal Word that is across the PreStem and the Macro Stem for example, occurs at a PStem edge as well. It is also resolved through spreading.

Examples in 33(a) and (b), demonstrate hiatus in the Macro Stem, across the Object marker and the IStem. The Macro Stem is in italics, the Inflected Verb Stem boundary is marked by the | and curly brackets mark the PStem. Examples 34(a) and (b) demonstrates hiatus occurs across the PreStem and the Macro Stem boundary. The MacroStem is in italics.

(33) a. /ku-*rì-éd͡ʑ-a*/ [ku{*rì*{|*jéd͡ʑá*}}]
CL15.INFIN-CL5.SG.OBJ-try-FV
'to try it on'

b. /mù-*mà-út-é*/ [{mù{*mà*{|*wúté*}}]
CL1.PL.SUBJ- CL6.PL.OBJ-gather-SUBJCT
'gather them'

(34) a. /ʋà-*ì-ʧék-a*/ [ʋà{*jì*{|*ʧéká*}]
CL2.PL.SUBJ-CL9.SG.OBJ-cut-FV
'they cut it'

b. /rà-kà-*ù-ɓát-a*/ [ràkà{*wù*{|*ɓátá*}]
CL5.SG.SUBJ-NS-CL3.SG.OBJ-touch-FV
'it caught it'

Considering the data presented, it is safe to conclude that at the PStem edge hiatus is resolved through spreading. This is a PStem edge in a Recursive PStem or where a PStem is a constituent of the Prosodic Word as in the Verb Word.

4.3.5 Clitic Group (Postlexical)

The task of this section is to illustrate the prosodization of verbal enclitics in Shona. Table 4.1 provides the verbal enclitics discussed in this section. These are: (a) the pronominal clitics and (b)
the question particle /i/.

Table 4.1 Enclitics

Verbal Enclitics	**Prosodic Shape**
(a) pronominals (b) question particle /i/	(a) VCV (b) V

Shona clitics have the following properties, they:

(i) are appended to fully formed Prosodic words.
(ii) are monosyllabic.
(iii) do not satisfy or count for minimality.
(iv) are mobile: enjoy greater freedom than affixes.
(v) can be stacked.

4.3.5.1 VCV Pronominal Clitics

The pronominals (demonstratives and pronouns) can function either as free forms or as enclitics.

In 35(a) and (b), the pronominals function as free forms and in 36(a) and (b) they are cliticized.

Karanga/Zezuru

(35) a. /tʂóɗ-a ìní/ [tʂóɗă ìní]
kiss-FV 1SG.PRON
'kiss me!'

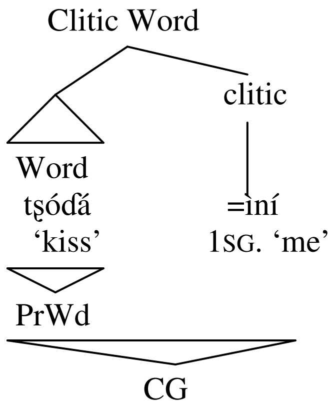
b. /tór-a ìsú/ [tórá ìsú]
take-FV 1PL.PRON
'take us!'

(36) a. /tʂóɗ-a=ìní/ [tʂòɗȅní]
kiss-FV=1SG.PRON
'kiss me!'

b. /tór-a=ìsú/ [tòrèsú]
take-FV=1PL.PRON
'take us'

The clitics attach to a well-formed Prosodic Word to create the Clitic Group. Figure 4.11 provides the structure of enclitics.

Figure 4. 11 Pronominal Enclitic



In Figure 4.11, the Clitic Word comprises a Word [tʂóɗá] and a enclitic /=ìní/. The word corresponds to the PrWd. The Clitic Word corresponds to the Clitic Group.

The Clitic Group and the Prosodic Word (Figure 4.11) differ in that the Clitic Group has an internal Prosodic Word boundary whereas the Prosodic Word does not. These differences in the internal structure of the Clitic Group and the Prosodic Word are reflected in the hiatus resolution strategies under observation. In the Clitic Group, that is across the clitic-Prosodic Word boundary, hiatus is resolved through coalescence, and in the Prosodic Word, across a Prosodic Stem boundary hiatus is resolved through spreading, and inside a single PStem, it is resolved through glide-formation, secondary articulation or elision.

The first piece of evidence that the clitic attaches to the PrWd comes from disyllabic minimality. In the examples in (37), the host, which is an imperative verb stem, is monosyllabic in Karanga and in Zezuru an [ì] is epenthesized. In Zezuru, adding a pronominal clitic without epenthesizing [ì] produces an unacceptable form. In Karanga, which allows monosyllabic forms, when a clitic is added, there is need to epenthesize [ì].

		Karanga	**Zezuru**	
(37) a.	/p´-a/ give-FV ‘give!’	[pá]	[ìpá]	
b.	/p´-a=ìní/ give-FV=me ‘give me’	[ípénì]	[ípénì]	*[pénì]
c.	/ɗ̋-a/ love-FV	[ɗá]	[ìɗá]	

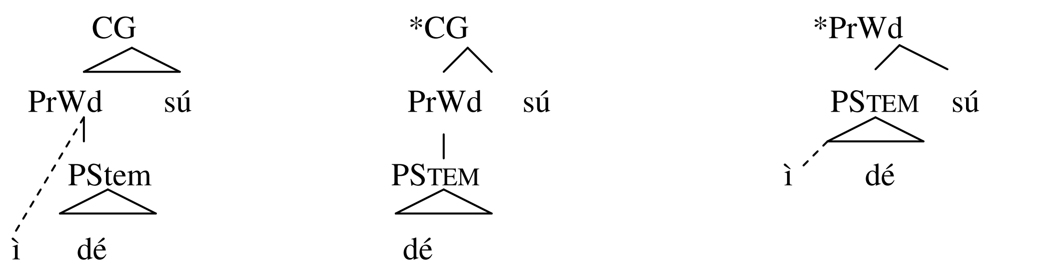
'love!'

d. /ɗ̌-a=ìsú/ [ìɗésù] [ìɗésù] *[désù]
love-FV=us
'love us'

What is interesting is that when monosyllabic Prosodic Words function as hosts, Karanga that allows monosyllabic Prosodic Words requires the hosts to be disyllabic (37b & d). In other words, Karanga requires the attachment site for the clitic to be minimally disyllabic. Zezuru as expected, shows that the clitic requires its attachment site (host) to be minimally disyllabic. If this were not the case, the clitic and the host make up two syllables and would satisfy minimality. Figures 4.12 (a), presents the acceptable structure whilst (b) and (c) provide the unacceptable forms.

Figure 4. 12 Enclitics and Minimality

(a) PrWd disyllabic (b) monosyllabic PrWd (c) Clitic attaches to PStem



The unacceptability of 4.12(b), demonstrates that the host, must be disyllabic. Though (12)c would correctly derive this case, it wrongly requires disyllabicity of stems. Mindful of the fact that PStems are not subject to minimality, it means that the host is a PrWd. Minimality is discussed in greater detail in (§9.2).

The clitics can be stacked as shown below.

(38) a. /tʂóɗ-a=ìní=ʐè/ [tʂóɗéníʐè]
kiss-FV=1SG=again
'kiss me again'

b. /tór-a=ìsú=ʐè/ [tórésúʐè]
take-FV=1PL=again
'take us again'

c. /ɓát-a=kò=ʐè/ [ɓátákòʐè]
hold-FV=FAR DEM=again
'hold over there again'

4.3.5.2 Monosegmental Clitics (V Clitics)

This section examines the monosegmental clitic, namely, the question particle /=ì/.
The question particle /=ì/ is roughly equivalent to the English question word 'what'. The question particle attaches to the Macro Stem (PStem) or the Verbal Word (PrWd). This is presumably because it questions the action of someone, and we know that the Macro Stem has the Object Marker and the Verbal Word has both the Object Marker and the Subject Markers.

(39) a. /á-gúr-e=ì/ [ágúréjì]
3.SG.SUBJ-cut-SUBJCT-QP
'what did s/he cut'

b. /á-kà-gúr-e=ì/ [ákàgúréjì]
3.SG.SUBJ-RP-cut-SUBJCT-QP
'what did he cut'

c. /mù-ʧá-gúr-e=ì/ [mùʧágúréjì]
2.PL.SUBJ-FUT-cut-SUBJCT-QP
'what will you cut'

The clitics can be stacked. As an illustration, the question particle and the adverbial clitic can be stacked as shown in (40).

(40) a. /á-gúr-e=ì=ʐé/ [ágúréjìʐé]
2.SG.SUBJ-cut-FV-SUBJCT=QP=again
'what did he cut again?'

b. /ʋá-gúr-ír-án-e=ì=ʐé/ [ʋágúríránéjìʐé]
CL2.PL-cut-APPL-REC-SUBJCT=QP=again
'what did they cut for each other again?'

c. /mù-ʧá-gúr-ír-án-e=ì=ʐé/ [mùʧágúríránéjìʐé]
2PL.SUBJ-FUT-cut-APPL-REC-FV=QP=again
'what will you cut for each other again?'

In conclusion, the clitic does not count for minimality and it attaches to a Prosodic Word. I consider this as evidence that the clitic is at the Postlexical level and is not within the Word Level.

4.3.6 Hiatus Resolution in the Clitic Group (Postlexical): Across the PrWd Edge

Hiatus, which occurs at the Postlexical level, that is across the PrWd edge, is resolved through coalescence and spreading. I argue that coalescence is the preferred strategy, and spreading only kicks in when coalescence is blocked. In chapter 9, I argue that coalescence is blocked when the clitic is monosegmental, and spreading operates.

The examples in 41(a)-(c) illustrate coalescence, and 42(a) and (b) spreading.

(41) a. /sèk-a=ìsú/ [sèkèsú]
laugh-FV=1PL.PRON
'laugh at me

b. /sèk-a=ìní/ [sèkèní]
laugh-FV=1SG.PRON
'laugh at me'

c. /ɓát-a=ìwé/ [ɓètèwé]
touch-FV=2SG.PRON
'touch you'

(42) a. /ri-ʧá-ɓát-e=í/ [riʧáɓátéjí]
CL5.SUBJ-hold-FUT-SUBJCT=QP
'what will it catch?'

b. /tá-kà-gúr-e=ì/ [tákàgúréjì]
1PL.SUBJ-RP-cut-SUBJCT-QP
'what did we cut'

4.4 Summary

The chapter examined verb morphophonology and morphosyntax. It demonstrated that the rich verbal morphology and morphosyntax map onto three domains—Prosodic Stem, Prosodic Word and Clitic Group. The Derivational Stem, Inflected Verb Stem, MacroStem and PreStem are all within the Word Level. Each corresponds to a Prosodic Stem. The Inflected Verb Stem, MacroStem and PreStem correspond to recursive Prosodic Stem. The Verb Word that comprises the PreStem and Macro Stem corresponds to a PrWd. Hiatus that occurs in the recursive PStem and PrWd, effectively occurs across a PStem edge and is resolved through spreading. The Clitic Word is at the Postlexical Level, and hiatus is resolved through coalescence or spreading.

CHAPTER 5

NOMINAL MORPHOPHONOLOGY AND MORPHOSYNTAX

5.1 Introduction

This chapter complements the previous chapter on verbal morphophonology and morphosyntax by presenting the second and final installment of the proposed domains. Similar to the verbs, the nominals reduce to the Prosodic Stem, Prosodic Word and Clitic Group. The term nominal here refers to the lexical class of nouns, adjectives, quantitatives, enumeratives, selectors and possessive words, (Fortune 1955, 1984; Mkanganwi 1995). I call these Inflectional Nominal Stems. These are formed by joining a class prefix and a stem, here called a Minimal Nominal Stem. Inflected Noun Stems allow for a stacking of the class prefixes, to have Extended Inflected Nominal Stems. I argue that these are recursive Prosodic Stems. Second, the chapter examines the Nominal Word. It comprises the Infinitives. Finally, the chapter examines the different types of clitics that attach to the nominals to have the Clitic Word, which maps onto the Clitic Group.

5.2. The Domains and the Hiatus Resolution Strategies

Figure 5.1 shows the different domains and the hiatus resolution strategies that operate in each domain.

Figure 5.1 Levels, Nominal Morphosyntactic Constituents, Prosodic Domains and Hiatus Resolution Strategies

Prosodic Domains	**Morphosyntactic Constituents**	**Hiatus Resolution**
	POSTLEXICAL LEVEL	
Clitic Group	Clitic Word	coalescence or spreading
	WORD LEVEL	
Prosodic Word	Nominal Word	spreading
Prosodic Stem (recursive)	Extended Inflected NStem	spreading
Prosodic Stem (non recursive)	Inflected NStem	GF (default), or sec art, or elision
……..	Min NStem	N/A
N/A	NRoot	N/A

First, there are two Levels, (Strata), the Postlexical Level and the Word Level. The Postlexical Level contains the Clitic Word, and the Word Level has the following morphosyntactic constituents; the Nominal Root (NRoot), Minimal Noun Stem (Min NStem), Infected Noun Stem (Inflected NStem), Extended Inflected Noun Stem (Extended Inflected NStem) and Nominal Word.

Second, reading the figure from bottom up, there is no evidence for or against the claim that the Minimal Nominal Stem corresponds to any prosodic domain. The Inflected NStem maps on to a PStem. The PStem is non-recursive. Hiatus that occurs inside the non-recursive PStem is resolved through glide formation, secondary articulation or elision. This is hiatus which occurs across a Minimal NStem boundary. The Nominal Word maps onto the Prosodic Word. Hiatus that arises in the Prosodic Word, in fact occurs across the Prosodic Stem edge and is resolved through spreading. Finally, the Clitic Group corresponds to the Clitic Word. Hiatus that occurs in the Clitic Group, occurs outside the Prosodic Word, specifically, across the PrWd boundary and is resolved through spreading.

5.3 The Minimal Nominal Stem

The Minimal Nominal Stem comprises a Nominal Root, which is co-extensive with the Minimal Nominal Stem.

The Minimal Nominal Stem has the following properties:

(i) simplex; monomorphemic.
(ii) not necessarily monotonic.
(iii) bound.
(iv) C-initial or V-initial.
(v) not an agreement trigger.

The class of Minimal Nominal Stem (Min NStem) comprises nouns, adjectives, quantitatives, enumeratives, selectors and the pronominal possessive stems. These are bare uninflected Stems.

5.3.1 Minimal Noun Stem

The Minimal Noun Stems have a varied and complex tone pattern. All tonal combinations are possible without any obvious restriction. This is in contrast with the DStem, which is monotonic (§4.3.2.1). All Shona Min NStems are bound morphemes. They always require a class prefix in order to function as free forms. The class prefix may have phonological content (overt class prefix) or may not have phonological content (zero class prefix). Examples in (1) illustrative the different types of Minimal Stems, namely, stems that require an overt class prefix, and stems that belong to noun classes whose class prefix morphemes are phonologically null. Under each category, there are V-initial and C-initial stems.

- Stems that require an overt noun class prefix
    - C-initial stems

	Prosodic shape	Stem	Inflected form	Gloss
(1) a.	CV	-ʃá	[mùʃá]	'home'
	CV.CV	-rúmé	[mùrúmé]	'man'
	CV.CV.CV	-kómáná	[mùkómáná]	'boy'

-
    - V-initial stems

b.	V.CV	-ánà	[m^{w}ánà]	'child'
	V.CV	-èné	[m^{w}èné]	'owner'

- Stems that take either an overt or phonologically null class prefix
    - C-initial stems

	Prosodic shape	Stem	Gloss
(2) a.	CV.CV	mówù	'cow'
	CV.CV	ɓàd^{z}á	'hoe'
	CV.CV.CV	ɗàwúnà	'blanket'
	CV.CV.CV	ɓá^{n}dá^{m}bá	'big head'
	CV.CV.CV.CV	ɗàkàtàkà	'type of dish'
	CV.CV.CV.CV	ɓàkàjáwà	'dried fish'
	o V-initial stems		
	V.CV.CV	ájìnì	'iron'
	V.CV.V	àmájì	'mother'

5.3.2 Minimal Adjective Stems

The Minimal Adjective Stems are C-initial, and have no vowel sequences (cf. Fortune 1955, Mkanganwi 1995). They are predominantly disyllabic.
Consider the following illustrative examples:

(3)	Prosodic Shape	Adjectival Stem	Gloss
	CV.CV	/-kúrú/	'big'
	CV.CV	/-kòb^{v}ú/	'thick'
	CV.CV	/-tèmà/	'black'

5.3.3 Minimal Quantitative Stem

The Minimal Quantitative Stems are a closed class, which comprises three V-initial stems.

(4)	Quantitative Stem	Prosodic Shape	Gloss
a.	/-ósè/	V.CV	'all'
b.	/-ógà/	V.CV	'each, alone'
c.	/-óméné/	V.CV.CV	'him/herself'

Fortune (1984: 3.104) says that the quantitatives are constructed as follows:

(5) quantitative prefix (qp) + o + quantitative stem (qs)

Fortune (1970:66) considers the initial vowel /ó/ as a stem-formative vowel. The motivation for analyzing the vowel /ó-/ as a stem formative vowel is because all quantitative stems begin with the vowel /ó-/. However, there is no evidence to warrant the separation of the vowel /ó-/ from the stem. There are no cases in the language where we find /-sè/, /-gà/ or /-méné/ functioning as separate morphemes without the vowel /ó-/. The opposite is also true; there are no instances in the language where /ó-/ functions separately from /-sè/, /-gà/ or /-méné/. The vowel /ó-/ always occurs together with /-sè/, /-gà/ or /-méné/. For that reason, I will consider the vowel /ó-/ to be part of the stem.

5.3.4 Minimal Selector Stem

The Minimal Selector Stems are a closed class with only three monosyllabic C-initial stems.

(i) /-nò/ 'this one'; 'this very one'
(ii) /-jè/ 'that one', or 'that very one'
(iii) /-pì/ 'which' or 'which one'

5.3.5 Minimal Enumerative Stem

The Minimal Enumerative Stems are a closed class. They comprise two monosyllabic C-initial stems.

(i) /-m^{w}è/ a certain, some, others, more
(ii) /-m^{w}é/ one, the same

5.3.6 Minimal Possessive Stem

The Minimal (Primitive) Possessive Stems are a closed class. The class comprises four pronominal V-initial stems.

(i)	/-à^{n}gù/	1st person singular
(ii)	/-èɗù/	1st person plural
(iii)	/-àkò/	2nd person singular
(iv)	/-èɲù/	2nd person plural

5.3.7 Compound Nominal Stem

Out of the class of nominals, only nouns have compound stems. They are formed by joining two Minimal NStems to form another Minimal Nominal Stem.

The examples in (6) and (7) are examples of stems in different words. In 6(c) and 7(c), are examples of these stems joined to form a complex stem. The stems are in italics.

(6) a. /Ø-*ɦúkú*/ [ɦúkú]
CL9.SG-chicken
'chicken'

b. /mú-*àná*/ [m^wàná]
CL1.SG-child
'child'

c. /Ø-*ɦúkú-àná*/ [ɦúk^wáná]
CL9.SG-chicken-DIMIN.
'chick'

(7) a. /mù-*rá^{n}dá*/ [mùrá^{n}dá]
CL1.SG-servant
'servant'

b. /mù-*kómáná*/ [mùkómáná]
CL1.SG-boy
'boy'

c. /mù-*rà^{n}dà- kómáná*/ [mùrà^{n}dàkòmànà]
CL1.SG-servant-boy
'boy servant'

Evidence that the second italicized member of (6c) and of (7c) forms are morphological stems comes from the morpho-syntax. These forms cannot trigger agreement. Only nominals can trigger agreement in Shona (Mkanganwi 1995, Fortune 1955, 1984). In fact, the noun class prefix triggers agreement. The forms below lack a noun class prefix, which is needed for them to be nominals.

(8) a. /-ɦúkú ɦúrú ká-ʂík-á/ *[ɦúkú ɦúrú káʂíká]
chick-tall-RP arrive-FV

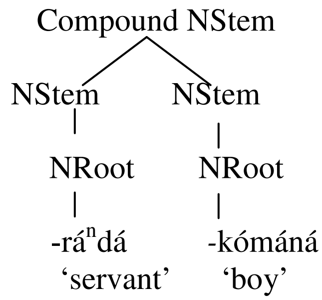
b. /-àná réfú ká-ʂík-á/ *[áná réfú káʂíká]
child tall RP-arrive-FV

c. /-rá^{n}dá réfú ká-ʂík-á/ *[rá^{n}dá réfú káʂíká]
servant tall RP-arrive-FV

d. /-kómáná rèfú ká-ʂík-á/ *[kòmànà rèfú káʂíká]
boy tall RP-arrive-FV

Using the stem, /-rà^{n}dàkòmànà/, 'boy servant', Figure 5.2 provides the structure of a Compound Nominal Stem, which is a Minimal Nominal Stem.

Figure 5.2 Compound Nominal Stem



The Minimal Nominal Stems /-rá^{n}dá/’servant’ and /-kómáná/ ‘boy’ are joined to form a Derived Nominal Stem, /-rà^{n}dà-kòmànà / ‘boy servant’.

5.4. The Non-Recursive Prosodic Stem: (Inflected Nominal Stems)

The goal of this section is to illustrate that the Inflected Nominal Stems have the same structure, and map onto a Prosodic Stem that is, the left and right edges of the Inflected Nominal Stem coincide with those of the PStem.

The Inflected Nominal Stem comprises the Inflected Noun Stem, Inflected Adjective Stem, Inflected Quantitative Stem, Inflected Enumerative Stem, Inflected Selector Stem and Inflected Pronominal Possessive Stem. This section illustrates that the Minimal Nominal Stem and the class prefix, or the Compound Nominal Stem and the class prefix, make up the Inflected Nominal Stem (Inflect NStem). Second, the section illustrates that these map onto the Prosodic Stem.

5.4.1. Inflected Noun Stem

Shona, like other Bantu languages has class prefixes determined by the class into which a particular noun belongs (Bleek 1862, Meinhof 1932, Guthrie 1948). Noun class prefixes come in three prosodic shapes: CV; V; /Ø/ (zero) (see Table 5.1). The typical prosodic shape is CV. Hyman (2005) observes that CV is the canonical prosodic shape for Bantu noun class prefixes. In Shona, all noun class prefixes that have phonological content are CV, except for class 14, which has a V noun class prefix.

All the noun class prefixes encode gender, number and semantic information. The prefixes of class 1a and 5 are listed as /Ø/ (zero prefix). Fortune (1955, 1984) lists the prefix in class 9 and 10 as /N-/: a non-syllabic nasal consonant. Since these noun class prefixes lack phonological content just like those of classes 1a and 5, for example, I will consider these as /Ø/

(zero prefix). The members of classes 1a, 5, 9 and 10 are marked by the significant absence of a syllabic prefix. In spite of the absence of a syllabic prefix, the morpheme fulfils the same classifying function syntactically as the presence of an overt prefix.

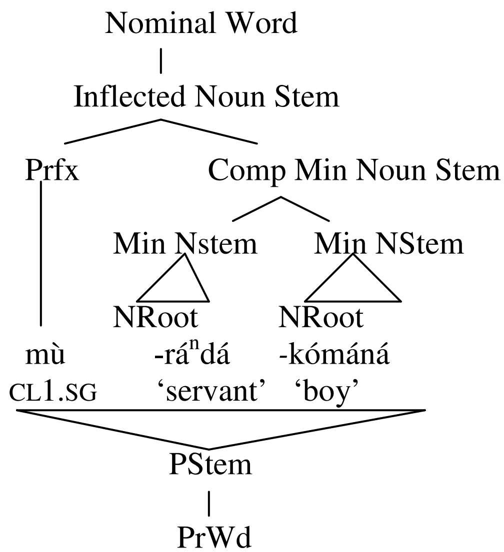
Table.5.1 Shona Noun Class Prefixes

CLASS	NOUN PREFIX (NP)	EXAMPLE	GLOSS
Class 1 SG	mù-	mù-kómáná	'boy'
Class 1a SG	Ø-	Ø-ɓàɓá	'father'
Class 2 PL	*ʋá-*	ʋá-kómáná	'boys'
Class 3 SG	mù-	mù-sáná	'back'
Class 4 PL	mì-	mì-sáná	'backs'
Class 5 SG	Ø-	Ø-ɓàd^{z}á	'hoe'
Class 6 PL	mà-	mà-pàd^{z}á	'hoes'
Class 7 SG.DIMIN	ʧì-	ʧì-ʂ̬ó	'razor'
Class 8 PL.DIMIN	ʐ̬ì-	ʐ̬ì-ʂ̬ó	'razors'
Class 9 SG	Ø-	Ø-ɲóká	'snake'
Class 10 PL	Ø-	Ø-ɲóká	'snakes'
Class 11 SG.DIMIN	rù-	rù-kómáná	'sickly boy'
Class 12 SG.DIMIN	kà-	kà-mù-sáná	'small back'
Class 13 PL.DIMIN	tù-	tù-kómáná	'small boys'
Class 14	ù-	ù-ʧí	'honey'
Class 15	kù-	kù-tárá	'to underline'
Class 16 LOC	pù-	pà-mù-sáná	'on the back'
Class 17 LOC	kù-	kù-mù-sáná	'at the back'
Class 18 LOC	mù-	mù-mù-sáná	'in the back'
Class 19 DIMIN.	ʂ̬ì-	ʂ̬ì-mù-kómáná	'boy'
Class 21 AUG.	zì-	zì-mùʃá	'big home'

Shona noun class prefixes often enter into pairwise contrasts. The most common pairing is where the first number indicates the singular and the latter the plural: 1 and 2; 3 and 4; 5 and 6; 7 and 8; 9 and 10. Nouns in class 14 are abstract nouns. When they are in the plural, they generally fall into class 6. Class 15 is unique. It comprises the infinitives, also called 'verbal nouns', (§5.7). Classes 7, 8, 13 and 12 are diminutives. Class 21 is augmentative. Classes 16, 17, 18 are locatives. With the exception of the infinitives, diminutives, augmentatives and the locatives, all the other noun classes are simple nouns, which conform to the structure of Inflected Nominal Stems. Noun classes 7, 8, 11, 12, 13, 16, 17, 18, 19, and 21 are special in that they allow for more than a single prefix. The forms with more than a single prefix will be discussed below.

Figure 5.3 illustrates an Inflected Noun Stem (Inflect NStem) with a Compound Noun Stem and its corresponding prosodic constituent.

Figure 5. 3 Inflected Noun Stem with Compound Noun Stem



Reading Figure 5.3 from top down, the Nominal Word is co-extensive with the Inflected Noun Stem [mùrá^{n}dákómáná] 'boy servant'. The Inflected Noun Stem comprises a class prefix / mù-/ and a Compound Minimal Noun Stem that comprises two Minimal Noun Stems Noun /rá^{n}dá/ and /kómáná/. The Inflected Noun Stem corresponds to Prosodic Stem which is co-extensive with a Prosodic Word.

In Shona, like in any other Bantu language, every Inflected Noun Stem triggers concordial agreement for class, number, and person. Inflected Noun Stems in the same class trigger the same concordial agreement. Inflected Noun Stems that lack an overt class prefix trigger agreement, just like those with an overt noun class prefix.

The examples in (9) illustrate agreement involving an Inflected Noun Stem with an overt noun class marker and (10) an Inflected Noun Stem with a zero noun class prefix. Examples in 9(a) and 10(a) show agreement between an Inflected Noun Stem and a modifier; 9(a) and 10(b) in the genitive construction; 9(c) and 10(c) between the verb and its subject.

(9) a. /mù-kómáná mù-kúrú/ [mùkómáná mùkúrú]
CL1.SG-boy CL1.SG-big
'big boy'

b. /ʧì-^{n}g^{w}á ʧì-à^{n}gú/ [ʧì ^{n}g^{w}á ʧà^{n}gú]
CL7.SG-bread CL7.SG-mine
'my bread'

c. /ʋà-kómáná ʋà-ʧà-ɓát-á/ [ʋàkómáná ʋàʧàɓátá]
CL2.PL-boys CL2.PL-FUT-hold-FV
'The boys will catch'

(10) a. /Ø-gùɗő Ø-gúrú/ [gùɗő gúrú]
CL5.SG-baboon CL5.SG-big
'big baboon'

b. /Ø-gùɗő rì-à^{n}gú/ [gùɗő rà^{n}gú]
CL5.SG-baboon CL5.SG-mine
'big baboon'

c. /Ø-gùɗő rì-ʧà-ɓát-á/ [gùɗő rìʧàɓátá]
CL5.SG-baboon CL5.SG-FUT-hold-FV
'the baboon will catch'

Evidence that the Inflected Noun Stems are not Prosodic Words but are Prosodic Stems is presented in §5.4.7 which examines Pre-Prefixed Inflected Noun Stems, where there is recursion. However, in cases where the Inflected Noun Stem is co-extensive with the Nominal Word, then minimality is imposed on the Nominal Word.

In these cases, monosyllabic Inflected Noun Stems which are co-extensive with the Nominal Word are augmented through [ì] epenthesis. In 11(a) and (b), in Zezuru, monosyllabic Minimal Noun Stems that are joined with a zero noun class prefix have an [ì], which is missing in the disyllabic forms (12a & b).

	Karanga	**Zezuru**
(11) a. /Ø-gò/ CL5.SG-wasp 'wasp'	[gò]	[ìgò]
b. /Ø-gà/ CL5.SG-scar 'scar'	[gà]	[ìgà]
(12) a. /Ø-gùɗò/ CL5.SG-baboon 'baboon'	[gùɗò]	[gùɗò]

b.	/Ø-gàkà/ CL5.SG-cucumber 'cucumber'	[gàkà]	[gàkà]

The [ì] found in the Inflected Noun Stems made up of a zero noun class prefix and a monosyllabic minimal stem is epenthetic. When the minimal monosyllabic stems are joined with an overt CV noun class /mà-/, they do not surface with the vowel [ì] anymore.

Karanga/Zezuru

(13) a.	/mà-gò/ CL6.PL-wasp 'wasps'	[màgò]	*[màɉìgò]
b.	/mà-gà/ CL6.PL-scar 'scar'	[màgà]	*[màɉìgà]
c	/mà-kùɗɔ̀/ CL6.PL-baboon 'baboon'	[màkùɗɔ̀]	
d.	/mà-gàkà/ CL6.PL-cucumber 'cucumber'	[màgàkà]	

In the Inflected Noun Stem with a monosyllabic Minimal Stem, when it is joined with a class prefix that has a prefix with phonological content, the [i] is missing because the Inflected Nominal Stem which is co-extensive with the Nominal Word is longer than a single syllable. The CV class prefix and the monosyllabic Minimal Noun Stem satisfy the disyllabic minimality requirement imposed on the Nominal Word which is a Prosodic Word. A different explanation might be that in the examples in 11 (a) and (b), [ì] is deleted to avoid hiatus. This analysis, however, does not go through. Hiatus, which arises across the class prefix and the Minimal Nominal Stem boundary, is consistently resolved through glide formation or elision. When elision occurs, V_1 is the target. §6.3.3 illustrates that the constraint that prohibits elision at the left edge of a morpheme is highly ranked. Considering this observation, the hypothesis that [ì] is deleted, is implausible. The issue of whether [i] is epenthetic or elided is discussed in depth in §9.2 which examines prosodic minimality.

5.4.1.1 The Ghost Augment

The Shona noun class system is different from most other Bantu languages in that it lacks an overt augment. An augment, which is also called, ‘pre-prefix’ or ‘initial vowel’, is a vowel that precedes the noun class prefix, (Zulu, Doke 1931, 1954; Kinande, Mutaka and Hyman 1990; Kinyambo, Bickmore 1989). The prosodic significance of the absence of the augment in Shona is that except for class 14, all nouns that have overt noun class prefixes are C-initial. However, nouns that have a zero noun class marker may be C-initial or V-initial depending on the prosodic shape of the stem.

There are two perspectives about the augment in Shona. There are scholars who explicitly argue that there is a ghost augment and others who are silent about the existence of the augment, and by implication do not acknowledge its existence. I shall call the former position the ‘augment hypothesis’ and the latter the ‘no augment hypothesis’. Doke (1931), Marconnes (1931), Fortune (1955) and Harford (1997) are amongst the proponents of the ‘augment hypothesis’. They point out, for example, that the ‘augment’ conditions the alternation in the associative and possessive morphemes.

As illustration, I use the associative morpheme /sá-/. Examples in (14) show that the associative morpheme is /sá-/, in both input and output; (15), shows that in underlying form it is /sá-/ and in surface form it is [sé-]; in (16) /sá-/ is realized as [só-].

(14) a. /sá=ʋà-kómáná/ [sáʋàkómáná]
ASSOC-CL2.SG-boy
‘like boys’

b. /sá=kà-ᵐbá/ [sákàᵐbá]
ASSOC-CL12.SG-house
‘like a small house’

(15) a. /sá=mù-tí/ [sómùtí]
ASSOC-CL3.SG-tree
‘like a tree’

b. /sá=mù-kómáná/ [sómùkómáná]
ASSOC-CL1.SG-boy
‘like a boy’

(16) a. /sá=ʧì-tótà/ [séʧìtótà]
ASSOC-CL7.SG-locust
‘like a locust’

b. /sá=ʂì-kómáná/ [séʂìkómáná]
ASSOC-CL2.DIMIN-boy
'like a boy'

Marconnes (1931:70) claims that the augment is similar to the first vowel of the demonstrative of each of the noun classes. Table 5.2 below illustrates this aspect. The merit of Marconnes' observation is that it helps us see the quality of the ghost augment even for those noun classes that have a zero noun class prefix. In independent studies, Doke (1931) and Marconnes (1931) captured the notion of the ghost augment vowel in their representation of the Shona noun class system by placing the augment in parentheses—indicating that it is a ghost vowel.

Table 5.2. Shona Noun Classes Showing Ghost Augment

CLASS	NOUN PREFIX (NP)	DEMONSTRATIVE	AUGMENT
Class 1 SG	mù-	ùjù	(ù-)
Class 1a SG	Ø-	àvà	(à-)
Class 2 PL	ʋà-	àʋà	(à-)
Class 3 SG	mù-	ùjù	(ù-)
Class 4 PL	mì-	ìjì	(ì-)
Class 5 SG	Ø-	ìrì	(ì-)
Class 6 PL	mà-	àjà	(à-)
Class 7 SG.DIM	ʧì-	ìʧì	(ì-)
Class 8 PL.DIM	zì̥-	ìzì̥	(ì-)
Class 9 SG	Ø-	ìd^{z}ì	(ì-)
Class 10 PL	Ø-	ìjì	(ì-)
Class 11 SG.DEROG	rù-	ùrù	(ù-)
Class 12 SG.DEROG	kà-	àkà	(à-)
Class 13 SG.DEROG	tù-	ùtù-	(ù-)
Class 14	ù-	ùwù	(ù-)
Class 15	kù-	ùkù	(ù-)
Class 16 LOC	pà-	àpà	(à-)
Class 17 LOC	kù-	ùkù	(ù-)
Class 18 LOC	mù-	ùmù	(ù-)
Class 19 DIMIN.	ʂì-	ìʂì	(ì-)
Class 21 AUG.	zì-	zì-mṳ̀ɳú	(ì-)

Scholars who do not acknowledge the existence of the augment have a different explanation for the vowel alternation found in the associative and the possessive in examples 15(a) and 16(b) respectively. Odden (1981) and Myers (1990), for example, argue that the vowel of the associative assimilates to the backness or frontness of the vowel of the noun class prefix. This position, however, fails to account for the alternations found in nouns that have a zero noun class prefix.

As shown in (17)-(18) below, when the associative is used before nouns that lack an overt noun class prefix, no matter what vowel enters into the noun's first syllable, the vowel of the associative may change. In 17(a) and (b), the associative surfaces as [sá] but the vowels of the first syllables are /u/ and /e/, respectively. In 18(a) and (b), the associative surfaces as [sé] but the vowels in the first syllables are /o/ and /a/, respectively.

(17) a. /sá=Ø-ᵐbújà/ [sáᵐbújà]
ASSOC-CL1a.SG –grand mother
'like a grand mother'

b. /sá=Ø-sèkúrú/ [sásèkúrú]
ASSOC-CL1a.SG-uncle
'like uncle'

(18) a. /sá=Ø-gòɗò/ [ségòɗò]
ASSOC-CL5.SG-bone
'like a bone'

b. /sá=Ø-gáʋá/ [ségáʋá]
ASSOC-CL5.SG-fox
'like a fox'

The pattern is as follows: The variation in the quality of the vowel of the associative is consistent in nouns that belong to a particular noun class, regardless of the quality of the vowel of the first syllable in that noun. In the face of such data, the 'assimilation hypothesis' fails. For example, in (17a & b) both nouns belong to class 1a, and the associative consistently surfaces as [sá]. In (18 a & b), both nouns belong to class 5, and the associative consistently surfaces as [sé].

Although these nouns do not have overt noun class prefixes, using their respective demonstratives (Table 5.3), it is possible to tell the shape of the augment; for class 1a, it is /a/ and for class 5, it is /i/. If we assume that there is 'coalescence' between the vowel of the associative and the augment, then the variation that is observed in (17) and (18) can be easily accounted for. The 'augment hypothesis' not only accounts for the alternation of the associative morphemes when attached to nouns that belong to the same noun class but also for nouns that lack an overt noun class prefix. In this regard, following proponents of the 'augment hypothesis', I consider that there is a 'ghost' augment vowel. I assume that this ghost augment vowel comprises floating V-Place features [coronal] for /i/; [labial] for /u/; [pharyngeal] for /a/.

5.4.1.2 Diminutive Noun Classes

In the diminutive noun classes (7, 8, 11, 12 & 13) there are forms that are made up of a class prefix and a stem (Inflected Noun Stems) as well as forms that have stacked prefixes (pre-prefixation); a prefix joined to an Inflected Noun Stem (Nominal Words). I will deal with pre-prefixation in §5.6.1. The Inflected Noun Stems in the diminutive noun class pattern with other Inflected Noun Stems in that they share the same structure.

The Inflected Noun Stems with this structure do not have a diminutive reading. The examples in 19(a)-(e) provide examples of Inflected Noun Stems for the following classes: 7, 8, 11, 12 & 13.

(19) a. /ʧì-kòjò/ [ʧìkòjò]
CL7.SG-large female baboon
'large female baboon'

b. /zì̥-kòjò/ [zì̥kòjò]
CL8.PL-large female baboon
'large female baboons'

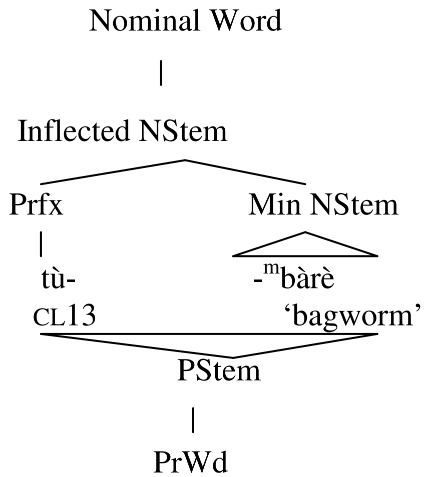
c. /rù-^{m}bó/ [rù^{m}bó]
CL11.SG-song
'song'

d. /kà-^{n}ʤèké/ [kà^{n}ʤèké]
CL12.SG-type of maize
'quick maturing variety of maize'.

e. /tù-^{m}bàrè/ [tù^{m}bàrè]
CL13.SG-bagworm
'bagworm'

Using the example /tù^{m}bàrè/ 'bagworm' (19e), Figure 5.4 illustrates the structure of Inflected Noun Stems that do not have a diminutive reading.

Figure 5.4 Inflected Noun Stem



In Figure 5.4, a Nominal word is co-extensive with an Inflected Noun Stem. The Inflected Noun Stem is formed by joining together a Nominal Root /-^{m}báré/, which is co-extensive with the Minimal Nominal Stem with a noun class prefix /tù-/. These form /tù^{m}báré/ 'bagworm'. The Inflected Nominal Stem corresponds to a PStem which is co-extensive with a PrWd.

5.4.2 Inflected Adjective Stem

Inflected Nominal Adjectives have the following properties, they:

(i) have C-initial stems.
(iii) are not necessarily monotonic. They allow varied tone patterns.
(iv) have the same class prefixes as Inflected Noun stems.

In (20), are illustrative examples of Minimal Adjective Stems:

(20)	**Prosodic Shape**	**adjectival stem**	**gloss**
	CV**.**CV	/-kúrú/	'big'
	CV**.**CV	/-kòb^{v}ú/	'thick'
	CV**.**CV	/tʂ̤ùkú/	'red'

The adjectival prefixes are the same in form as the corresponding base forms of the noun class prefixes after which they are numbered (Table 5.3). Adjectival prefixes have no allomorphs. The reason is that there are no vowel-initial stems, and no morphophonological changes occur across the prefix-Minimal Adjective Stem boundary. The following are examples of Shona adjectives.

(21) a. /mù-kúrú/ [mùkúrú]
CL1.SG-big
'the big one'

b. /ʧì-kòbᵛú/ [ʧìkòbᵛú]
CL7.SG-thick
'the thick one'

c. /kà-tʂúkú/ [kàtʂúkú]
CL12.SG -red
'the red one'

Evidence that the adjectival prefixes are the same as those of the noun class prefixes comes from the associative. The use of the associative with the adjective has the same effect on the vowel of the associative morpheme as that displayed across the associative-Minimal Noun Stem boundary: In 22(a), the associative surfaces as [sá]; in (23) as [só]; in (24) as [sé].

(22) a. /sá=ʋà-kúrú/ [sáʋàkúrú]
ASSOC-CL2.PL-big
'like the big one'

b. /sá=kà-kúrú/ [sákàkúrú]
ASSOC-CL12.SG.DEROG.-big
'like the tbig one'

(23) a. /sá=mù-réfú/ [sómùréfú]
ASSOC-CL3.SG -tall
'like the tall one'

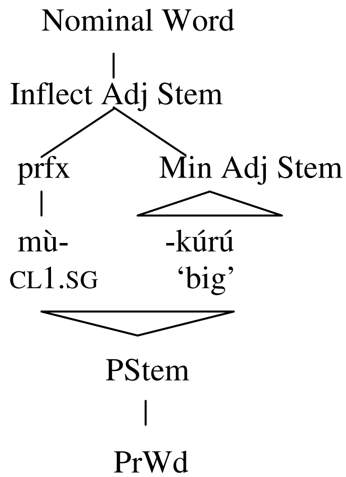
b. /sá=mù-kòbᵛú/ [sómùkòbᵛú]
ASS-CL1.SG-stout
'like the stout one'

(24) a. /sá=ʧì-tʂúkú/ [séʧìtʂúkú]
ASSOC-CL7.SG-red
'like the red one'

b. /sá=ʂì-tètè/ [séʂìtètè] '
ASSOC-CL19.SG.DEROG-thin
'like the thin (one)'

Using the Inflected Adjective Stem /mù-kúrú/ 'big', Figure 5.5, provides the structure of Inflected Adjective Stem.

Figure 5.5 Inflected Adjective Stem



In Figure 5.5, the Nominal Word and the Inflected Adjectival Stem are co-extensive. The Inflected Adjective Stem is made up of the prefix /mù-/ and the Minimal Adjectival Stem /-kúrú/ 'big'. The Minimal Adjectival Stem corresponds to a Prosodic Stem which is coextensive with the PrWd..

5.4.3 Inflected Quantitative Stem

In (25), are examples of Inflected Quantitative Stems.

(25) a. /ʋà-kómáná ʋà-ósé/ [ʋàkómáná ʋósé]
CL2.PL-boys CL2.PL-all
'all the boys'

b. /Ø-ɓàɓá ʋà-óméné/ [ɓàɓá ʋóméné]
CL1a.SG-father CL1a.SG-himself
'father himself'

c. /mù-rúmé ù-ógá/ [mùrúmé wógá]
CL1.SG-man CL1.SG-alone
'the man alone'

Table 5.3 provides the list of quantitative class prefixes. Although CV prefixes are the more prevalent, V prefixes are well represented as well.

Table 5.3 Quantitative Class Prefixes

CLASS	NOUN CLASS PREFIX (NP)	QUANTITATIVE PREFIX
Class 1 SG	mù-	ù-
Class 1a SG	Ø-	ʋà-
Class 2 PL	ʋà-	ʋà-
Class 3 SG	mù-	ù-
Class 4 PL	mì-	ì-
Class 5 SG	Ø-	rì-
Class 6 PL	mà-	à-
Class 7 SG.DIMIN	ʧì-	ʧì-
Class 8 PL.DIMIN	zʅ̀-	zʅ̀-
Class 9 SG	Ø-	d^zì-
Class 10 PL	Ø-	ì-
Class 11 SG.DEROG	rù-	rù-
Class 12 SG.DEROG	kà-	kà-
Class 13 SG.DEROG	tù-	tù-
Class 14	ù-	ù
Class 15	kù-	kù-
Class 16 LOC	pà-	pà-
Class 17 LOC	kù-	kù
Class 18 LOC	mù-	mù-
Class 19 DIMIN.	ʂ̬ì-	ʂ̬ì-
Class 21 AUG.	zì-	rì-

The quantitative prefixes for classes, 1a, 3, 4, 5, 6, 9 and 10 are different from the noun class prefixes. These are presented in Table 5.4. The prosodic basis of the relation between the two classes of prefixes seems to fall into two sets: The first is where the quantitative prefix is a suppletive form of the noun class prefix. These are for the noun classes that have a zero noun class marker (class 1a zero/a-, class 5 zero/rì-, class 9 zero/ì-, class 10 zero/d^zì). The second set is for those where the quantitative prefix is a truncated form of the corresponding noun class prefix (class mù-/ù-, class 3 mù-/ù-, class 4 mì/-ì, class 6 mà-/à-). The latter seem to involve an alternation

between mV- and V-.

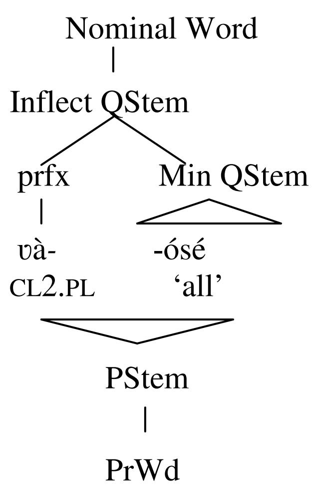
Table 5.4. Suppletion: Quantitative Class Prefixes

CLASS	NOUN CLASS PREFIX (NP)	QUANTITATIVE PREFIX
Class 1 SG	mù-	ù-
Class 1a SG	Ø-	ʊà-
Class 3 SG	mù-	ù-
Class 5 SG	Ø-	rì-
Class 6 PL	mà-	à-
Class 9 SG	Ø-	d^zì-
Class 10 PL	Ø-	ì-
Class 21 AUG.	zì-	rì-

Considering that the prefixes are CV or V and the stems are vowel initial, morphophonemic changes occur across the class prefix and Minimal Quantitative Stem.

Figure 5.6 illustrates the structure of Inflected Quantitative Stems, using the form [ʊósé] 'all'.

Figure 5.6 Inflected Quantitative Stem



The Inflected Quantitative Stem which is coextensive with the Nominal Word is made up of the class prefix /ʊà-/, and the Minimal Quantitative Stem /-ósé/. The Inflected Quantitative Stem maps on to a Prosodic Stem which is co-extensive with a PrWd.

5.4.4 Inflected Selector Stem

The set of selector prefixes are similar to those of the quantitatives given in Tables 5.3 and 5.4. The examples of Inflected Selector Stems are given in (26).

(26) a. /ʋà-kómáná *ʋà-nó* ʋà-ʧá-súk-a/ [ʋàkómáná *ʋànó* ʋàʧásúka]
CL2.PL-boys CL2.PL-SELEC. CL2.PL-wash-FV
'these boys/these very boys will wash'

b. /ʋà-kómáná *ʋà-jé* ʋà-ʧá-ɓát-a/ [ʋàkómáná *ʋàjé* ʋàʧáɓáta]
CL2.PL-boys CL2.PL-SELEC. CL2.PL-FUT-catch-FV
'those boys/Those very boys will catch'

c. /ʋà-kómáná *ʋá-pí* ʋà-nònòk-a/ [ʋàkómáná *ʋápí* ʋànònòka]
CL2.PL-boys CL2.PL-SELEC. CL2.PL-late-FV
'which boys were late?'

I skip representing the structure of the selector; it is the same as that of the Inflected Noun Stem, Inflected Adjective Stem, and the Inflected Quantitative Stem.

5.4.5 Inflected Enumerative Stem

The following are examples of Inflected Enumerative Stems.

(27) a /mù-m^{w}é mù-rúmé/ [mùm^{w}é mùrúmé]
CL1.SG-certain CL1.SG-man
'A certain man'

b. mù-àná mù-m^{w}é/ [m^{w}àná mùm^{w}é]
CL1.SG-child CL1.SG-one
'One child'

The structure of the enumerative is the same as that of the Inflected Noun Stem, Inflected Adjective Stem, and the Inflected Quantitative Stem, Inflected Selector Stem, consequently I skip showing it.

5.4.6 Inflected Possessive Stem

The Inflected Possessive Stem comprises a possessive prefix and a primitive possessive stem. The Primitive Possessive Stems have the following properties. They:

(i) are a closed class.
(ii) are V-initial stems.
(iii) have bound stems

(iv) have class prefixes that are similar to those of the nouns.
(v) display a suppletion pattern of the class prefixes.

The possessive prefixes are the same as those of the quantitatives, enumeratives, and selectors, given in Tables 5.3 and 5.4. The following are examples of Inflected Possessive Stems.

(28) a. /ʧì-à^{n}gù/ [ʧà^{n}gù]
CL7.SG-1SG. mine
'mine'

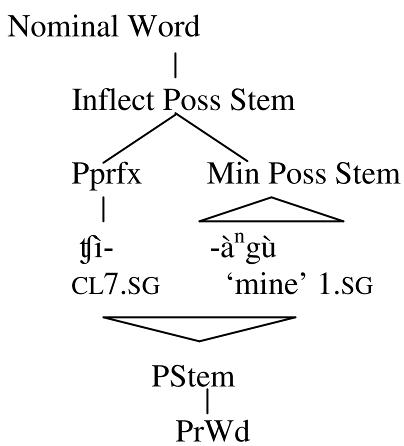
b. /ù-èʤù/ [wèʤù]
CL1.SG-1PL.ours
'ours'

c. /ì-àkò/ [jàkò]
CL9.SG-2SG.yours
'yours' (sg)

d. /kà-èɲù/ [kèɲù]
CL12.-2PL.yours
'yours' (pl)

Figure 5.7 illustrates the structure of the Inflected Possessive Stem.

Figure 5.7 Inflected Possessive Stem



In Figure 5.7, the Inflected Possessive Stem which is co-extensive with the Nominal Word is formed by joining the class prefix /ʧì-/, and the Minimal Possessive Stem /-à^{n}gù/. The Inflected Possessive Stem corresponds to a Prosodic Stem which is co-extensive with a PrWd.

5.4.7 Inflectional Nominal Stem ≠ PrWd

I provide evidence in support of the observation that the Inflectional Noun Stem is a PStem and not a PrWd. The crucial difference between a PStem and PrWd is that the latter is subjected to a disyllabic minimality requirement and the former is not. Consider the following Inflectional Noun Stems, which comprise a zero class prefix and a Minimal Noun Stem. In Karanga, they are monosyllabic but in Zezuru, they are augmented with an [ì].

		Karanga	**Zezuru**
(29) a.	/Ø-^{m}bà/ CL5.SG-house 'house'	[^{m}bà]	[ì^{m}bà]
b.	/Ø-^{n}dá/ CL9.SG-louse 'louse'	[^{n}dá]	[ì^{n}dá]
c.	/Ø-gò/ CL5.SG-wasp 'wasp'	[gò]	[ìgò]
d.	/Ø-gà/ CL5.SG-spot 'spot'	[gà]	[ìgà]

In isolation, these forms require /i/ epenthesis in Zezuru, which requires all Prosodic Words to be minimally disyllabic. This means that PStem in isolation is also the PrWd, hence its subjection to minimality. This suggests the structure given in Figure 5.5 for Zezuru.

When the monosyllabic Minimal Nominal Stems are inflected with an overt noun class prefix, they do not require an /ì/, particularly in Zezuru. I will illustrate this point using two examples /Ø-gò/ 'wasp' and /Ø-gà/ 'spot' , which take the plural morpheme /mà-/ when they are plural. In the examples in 30(a) and (b), the nouns take /mà-/. In the last to colums, the curly brackets indicate a Prosodic Stem and square brackets a Prosodic Word.

		Karanga/Zezuru	
(30) a.	/kà-Ø-^{m}bá/ cl5.sg-house 'house'	[kà^{m}bá]	*[{kàjì{^{m}bá}}]

b.	/tù-Ø-^{n}dà/ cl9.sg-louse ‘louse’	[tù^{n}dà]	*[{tùjì{^{n}dà}}]
c.	/rù-Ø-gò/ cl5.sg-wasp ‘wasp’	[rùgò]	*[{rùjì{gò}}]
d.	/zì-Ø-gà/ cl5.sg-spot ‘spot’	[zìgà]	*[{zìjì{gà}}]

In the last column, the epenthetic vowel is parsed inside the inner Inflected Noun Stem, which in this instance is being treated as a subminimal PrWd that needs augmentation. This is unacceptable. If the Inflected Noun Stem were a Prosodic Word, it would be subjected to minimality and would have to be augmented with [ì]. However, forms that are augmented with [ì] are unacceptable. I consider the unacceptability of such forms as evidence that the Inflected Noun Stem does not correspond to a Prosodic Word, but to a Prosodic Stem, and is therefore not subject to the disyllabic minimlity requirement.

Figure 5.8 Inflectional Nominal Stem ≠ PrWd

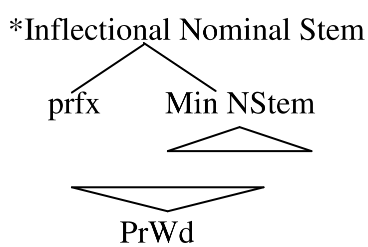


Figure 5.8, illustrates that it is not the case that a class prefix and a Minimal Nominal Stem join together to form a Nominal Word. The Nominal Word corresponds to the PrWd. Further evidence for positing that the Nominal Stems are not Prosodic Words is given in §5.6.1.

5.5 Hiatus Resolution in Non-Recursive Prosodic Stem: Minimal NStem Edge

So far, I have indicated that the Inflectional Nominal Stem maps onto the Prosodic Stem. Hiatus that occurs within the PStem, that is across the Minimal Nominal Stem edge is resolved through glide formation, secondary articulation or elision. In Chapter 6, I argue that glide formation is the preferred strategy, and when it is blocked, secondary articulation is employed, and in turn when secondary articulation is blocked, elision kicks in. The examples in (31) and (32) illustrate glide formation. 31(b) illustrates glide formation across a Minimal Quantitative Stem boundary, and 32(b) across a Minimal Possessive Stem boundary.

(31) a. /mù-kómáná ù-jó/ [mùkómáná ùjó]
CL1.SG-boy CL1.STAB-FAR DEM.
'that boy'

b. /mù-kómáná ù-ógá/ [mùkómáná wógá]
CL1.SG-boy CL1.SG-alone
'the boy alone'

(32) a. /Ø-ɦúkú ì-jò/ [ɦúkú ìjò]
CL9.SG-chicken CL9.SG.DEM.AFX-FAR DEM
'that chicken'

b. /Ø-ɦúkú ì-àkò/ [ɦúkú jàkò]
CL9.SG-chicken CL9.SG-2SG.yours
'your chicken'

The examples in (33) and (34) illustrate secondary articulation. In 33(b), hiatus occurs across the Minimal Noun Stem boundary, and in 34(b) across compounded Minimal Noun Stems.

(33) a. /mù-tí / [mùtí]
CL3.SG-tree
'tree'

b. /mù-énà/ [m^{w}énà]
CL3.SG-burrow
'burrow'

(34) a. /Ø-ɗé^{n}gú-ánà/ [ɗè^{n}g^{w}áná]
CL5.SG-basket-DIMIN.
'basket'

b. /Ø-ɗé^{ŋ}gú-ánà/ [ɗè^{ŋ}g^{w}áná]
CL5.SG-harvesting basket-DIMIN.
'small harvesting basket'.

The examples in (35)-(37) illustrate elision. In 35(b), elision occurs across a Minimal Noun Stem boundary; in 36(b) across a Minimal Possessive Stem boundary; in 37(b) across a derived Minimal NStem boundary that is in the middle of a Compound NStem.

(35) a.	/ʧì-tóró/ CL7.SG-store 'store'		[ʧìtóró]
a.	/ʧì-àná/ CL7.SG-child 'child'		[ʧàná]
(36) a.	/ʋà-rúmé/ CL2.PL-man 'men'		[ʋàrúmé]
b.	/ʋà-èɗù/ CL2.PL-1PL.ours 'ours'		[ʋèɗù]
(37) a.	/Ø-g^{w}àjì/ CL5.SG-sheep 'sheep'		[g^{w}àjì]
b.	/Ø-g^{w}àjì-ánà/ CL5.SG-sheep-DIMIN. 'lamb'		[g^{w}àjánà]

Given that glide formation, secondary articulation and elision occur in exactly the same domain, that is, in the non-recursive Prosodic Stem; it is imperative to account for when one is chosen over the other. I assume that glide formation is the default or preferred strategy. Secondary articulation only operates when glide-formation is blocked, and in turn elision occurs when secondary articulation is blocked. Building on this assumption, Chapter 6 provides a detailed description and analysis of glide formation, secondary articulation and elision.

5.6 Recursive Prosodic Stem: Extended Inflectional Noun Stems

The recursive Prosodic Stem comprises the Pre-Prefixed Inflected Noun Stems and the Inflected Deverbal Stem.

5.6.1 Pre-Prefixed Inflected Noun Stems

Pre-prefixation is where a class prefix is added to an Inflected Nominal Stem (PStem) (Figure 5.5) that has a class prefix, yielding a sequence of class prefixes. As mentioned in Chapter 2, the prevalence of this phenomenon was one of the criteria Doke (1954) used for ‘Shona-hood’. Pre-prefixation holds of diminutives and augmentatives. The diminutive noun class prefixes are: class 7 (singular diminutive/ ʧì-/); class 8 (plural diminutive /ʐ̤ì-/); class 11 (singular diminutive /rù-/); class 12 (singular diminutive /kà-/); class 13 (plural diminutive /tù-/).

In 38(b)-(f) are examples of Pre-Prefixed Inflected Noun Stems. In the examples, the Inflectional Noun Stem to which the diminutive prefix attaches has an overt noun class prefix.

(38) a. /mù-rúmé/ [mùrúmé]
cl1.SG-man
‘man’

b. /ʧí-mù-rúmé/ [ʧímùrúmé]
CL7.SG.DIMIN.-CL1.SG-man
'short stocky man'

c. /ʐ̤ì-ʋà-rúmé / [ʐ̤ìvàrúmé]
CL8.PL.DIMIN-CL2PL-man
'short stocky men '

d. /rù-mù-rúmé/ [rùmùrúmé]
CL11.DIMIN.-CL1.SG-man
'thin and sickly looking man'

e. /kà-mù-rúmé/ [kàmùrúmé]
CL12.DIMIN.SG-CL1.SG-man
'short thin, and ugly man'

f. /tù-ʋà-rúmé/ [tùʋàrúmé]
CL13.DIMIN.PL-CL2.PL- man
'short, thin, and ugly men'

In 39(b)-(e) are examples of Pre-Prefixed Inflected Noun Stems where the Inflected Noun Stem has a zero noun class prefix.

(39) a. /Ø-zò^{n}góròrò/ [zò^{n}góròrò]
CL5.SG.-millipede
‘millipede’

b. /ʧí-Ø-zò^{n}góròrò/ [ʧízò^{n}góròrò]
CL7.SG.DIMIN.-CL5.SG-millipede
'millipede'

c. /zʅ̀-mà-zò^{n}góròrò/ [zʅ̀màzò^{n}góròrò]
CL8.PL.DIMIN.-CL6.PL-millipede
'millipedes'

d. /rù-Ø-zò^{n}góròrò/ [rùzò^{n}góròrò]
CL11.SG.DIMIN.-CL5.SG-millipede
'millipede'

d. /kà-Ø-zò^{n}góròrò/ [kàzò^{n}góròrò]
CL12.SG.DIMIN.-CL5.SG-millipede
'millipedes'

e. /tù-mà-zò^{n}góròrò/ [tùmàzò^{n}góròrò]
CL13.PL.DIMIN.-CL6.PL-millipede
'millipedes'

The pre-prefix acts as a morphosyntactic head in that it controls agreement. This illustrates two things. First, the pre-prefixed unit is functioning as a single entity. Only one prefix triggers agreement. In examples (40)-(45), in the (a) examples the outer class prefix triggers agreement, and in the (b) examples, which are unacceptable, the inner class prefix triggers agreement.

(40) a. /ʧì-mù-rúmé ʧì-tema ʧì-ʧa-fá^{m}ba/ [ʧìmùrúmé ʧìtema ʧìʧafá^{m}bá]
CL7.SG.DIMIN-CL1.SG.DIMIN-man CL7.SG-black CL7.SG-FUT-walk-FV
'the short black stocky man will walk'

b /ʧì-mù-rúmé mù-témà ù-ʧá-fá^{m}ba/ *[ʧìmùrúmé mùtémà ùʧáfá^{m}bá]
CL7.SG. DIMIN -CL1.SG- man CL1.SG-black CL1.SM-FUT-walk

(41) a. /zʅ̀-ʋà-rúmé zʅ̀-tʂúkú zʅ̀-ʧá-fá-^{m}ba/ [zʅ̀ʋàrúmé zʅ̀tʂúkú zʅ̀ʧáfá^{m}bá]
CL8.PL.DIMIN -CL2.PL- man CL7.PL-light CL7.PL-FUT-walk
"short stocky men, light in complexion will walk'.

b. /zʅ̀-ʋà-rúmé ʋà-tʂúkú ʋà-ʧá-fá-m^{b}a/ *[zʅ̀ʋàrúmé ʋàtʂúkú ʋàʧáfám^{b}á]
CL8.PL.DIMIN -CL2.PL-man CL2.PL-light CL2.PL-fut-walk

(42) a. /rù-mù-rúmé rù-rèfù rù-ʧá-fá^{m}ba/ [rùmùrúmé rùrèfù rùʧáfá^{m}bá]
CL11.DIMIN-CL1.SG-man CL11.DIMIN-tall CL11.DIMIN-FUT-walk
'thin and sickly looking man will walk'.

b. /rù-mù-rúmé mù-refu á-ʧá-fá^{m}bá/ *[rùmùrúmé mùrefu áʧáfá^{m}bá]
CL11.DIMIN-CL1.SG-man CL1.SG-tall CL1.SG.SM-FUT-walk

(43) a. /kà-mù-rúmé ka-pfupi ka-ʧá-fá^{m}ba/ [kàmùrúmé kapfupi kaʧáfá^{m}bá]
CL12.DIMIN-CL1-man CL12.DIMIN-short CL12.S.G.DIM.-FUT-walk
'the short, thin and ugly man will walk'.

b. /kà-mù-rúmé mù-pfúpí u-ʧá-fám^{b}a/ *[kàmùrúmé mùpfúpí uʧáfám^{b}á]
CL12.DIM-CL1.SG-man CL1.SG-short CL1.SG-fut-walk

(44) a. /tù-ʋà-rúmé tù-refu tu-ʧá-fá^{m}ba/ [tùʋàrúmé turefu tuʧáfá^{m}bá]
CL13.PL.DIMIN.-CL2.SG-man-CL13.PL-.DIMIN.-tall CL13.PL.DIM.-FUT-walk
'thin, and tall men will walk.'

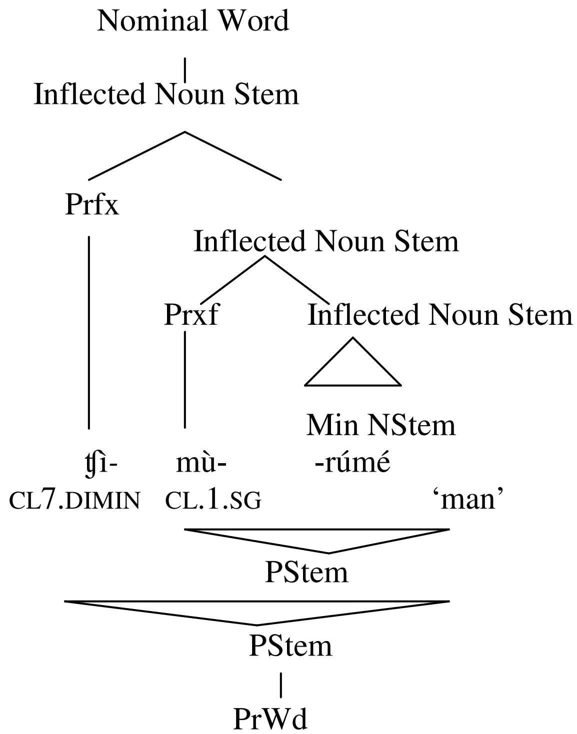
b. /tù-ʋà-rúmé ʋa-refu ʋa-ʧá-fá^{m}ba/ *[tùʋàrúmé ʋarefu ʋaʧáfá^{m}bá]
CL13.DIMIN-CL2.PL-man CL2.PL-tall CL2.PL-FUT-walk

(45) a. /kà-Ø-kùɗő ka-tema ka-ʧá-fá^{m}bá/ [kàkùɗó katema kaʧáfá^{m}bá]
CL12.DIMIN-CL5.SG-millipede CL12.DIMIN.-black CL12.DIMIN-FUT-walk
'small black millipede will walk.'

b. /kà-Ø-kùɗő Ø-ɗema ri-ʧá-fá^{m}ba/ *[kàkùɗó ɗema riʧáfá^{m}bá]
CL12.DIMIN-CL5.SG-millipede CL5.SG-black CL5.SG-FUT-walk

Using the example /ʧí-mù-rúmé/ 'short stocky person', Figure 5.9 exemplifies the structure of Pre-Prefixed Inflected Noun Stems formed through pre-prefixation. The Inflectional Noun Stem has an overt noun class prefix.

Figure 5.9 Pre-Prefixed Inflected Noun Stem



In Figure 5.9, the Pre-Prefixed Inflected Noun Stem, which is co-extensive with the Nominal Word is made up of the prefix /ʧì-/ and an Inflected Noun Stem /mùrúmé/ 'person'. The Inflected Noun Stem /mùrúmé/ is made up of a class prefix and a Minimal Nominal Stem /-rúmé/. The Inflected Noun Stem corresponds to a PStem, and the Pre-Prefixed Inflected Stem corresponds to a PStem which is co-extensive with a PrWd. The recursion in the morphosyntax is captured in the phonology.

All the nominals that fall into class 21, which is the augmentative class, are Pre-Prefixed Inflected Noun Stems. The examples in (46)-(48), show the augmentatives in class 21. The (b) examples show the plural forms. The plural forms demonstrate that it is possible to stack up to three class prefixes.

(46) a. /zì-mù-rùme/ [zìmùrùme]
CL21.AUG-CL1.SG-man
' a huge man'

b. /mà-zì-rúmé/ [màzìrúmé]
CL6.PL-CL21.AUG.PL-man
'huge men'

(47) a. /zì-mù-tí/ [zìmùtí]
CL21.AUG.-CL3.SG-tree
'big tree'

b. /mà-zì-mì-tí/ [màzìmìtí]
CL6.PL-CL21.AUG.-CL4.PL-tree
'big trees'

(48) a. /zì-Ø-zò^{n}góròrò/ [zìzò^{n}góròrò]
CL21.AUG.-CL5.SG-millipede
'big millipede'

b. /mà-zì-Ø-zò^{n}góròrò/ [màzìzò^{n}góròrò]
CL6.PL-CL21.AUG.-CL5.SG-millipede
'big millipedes'

The plural forms of the nouns from class 21 fall into class 6, /mà-/. These forms show that Shona allows up to a sequence of three noun class prefixes.

Similar to the diminutives, the outer prefix triggers agreement.

(49) a. /zì-mù-rúmé zì-réfú/ [zìmùrúmé zìréfú]
CL21.SG-CL1.SG-person CL21.SG-tall
'a big scary person'

b. /zì-Ø-zò^{n}góròrò zì-ɗèmà/ [zìzò^{n}góròrò zìɗèmà]
CL21.SG-CL5.SG-millipede CL21.SG-black
'a big black scary millipede'

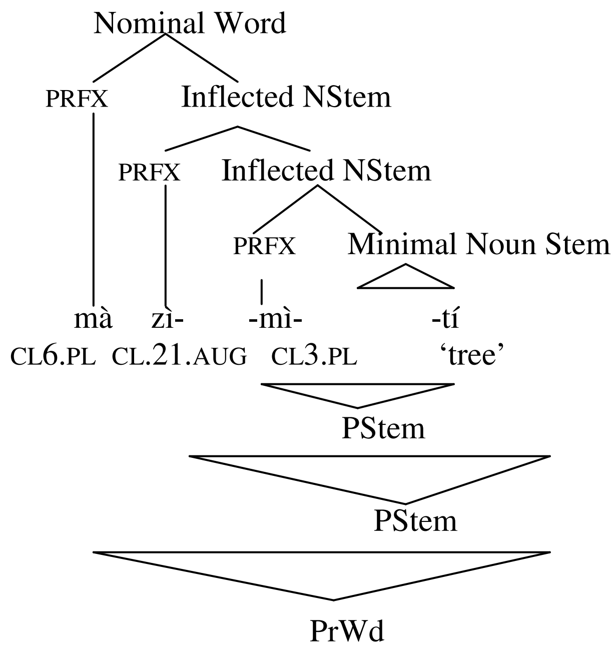
Trying to have the inner prefix control agreement creates unacceptable forms:

(50) a. /zì-mù-rúmé mù-réfú/ *[zìmùrúmé mùréfú]
CL21.SG.AUG.-CL1.SG-person CL1.SG-tall

b. /zì-Ø-zongororo Ø-ɗèmà/ *[zìzongororo ɗèmà]
CL21.SG.AUG.-CL5.SG-millipede CL5.SG-black
'a big black scary millipede'

The structure of the augmentatives with two prefixes is the same as for the diminutives, and I therefore do not give the structure of the augmentatives. In Figure 5.10, is the structure of the Pre-Prefixed Inflected Noun Stems with three class prefixes, and this is the maximum allowed.

Figure 5.10 Pre-Prefixed Inflected Noun Stems: Three Class Prefixes



In Figure 5.10, the Nominal Word is [màzìmìtí] /mà-/, which is made up of the class prefix /mà-/and the Pre-Prefixed Inflected Noun Stem, /-zìmìtí /. In turn, the Pre-Prefixed Inflected Noun Stem, /zìmìtí / is made up of the class prefix /zì-/ and an Inflected Noun Stem /mìtí/. The Inflected Noun Stem /mìtí/ is made up of the class prefix /mì-/ and the Minimal Nominal Stem /-tí/. The Nominal Word corresponds to a Prosodic Word, the Inflected Stem corresponds to a PStem, the Inflected Noun Stem to a PStem. The reason for suggesting that [màzìmìtí], corresponds to a Prosodic Word is because it carries the maximal number of prefixes. This means [màzìmìtí] cannot be an attachment site for any more prefixes, but for clitics, which I argue attach to Prosodic Words (Figure 5.14).

According to my analysis, the prediction is that the hiatus resolution strategy employed within a Non-Recursive PStem, for example, and the one in a Recursive PStem (but outside the inner PStem) must be different. These predictions are borne out by the data: Within the Non-Recursive PStem, hiatus is resolved through glide formation, secondary articulation, or elision (chapter 6), and within the Recursive PStem, where hiatus occurs across a PStem edge spreading occurs (chapter 7). The boundaries that condition hiatus are different within the non-recursive PStem and in the Recursive PStem.

5.6.2. Inflected Deverbal Stem

The Inflected Deverbal Stem comprises a Derivational Stem (Figure 4.6). To the right of the Derivational Stem is a nominalizing final vowel, and to the left is a class prefix. Although the Inflected Verb Stem which is part of the Inflected Deverbal Stem does not conform to the 'canonical' Inflected Verb Stem, I still consider it an 'Inflected Verb Stem' for reasons that will be given shortly.

In 51(c), (d), and (e) I provide examples of Inflected Deverbal Stems, which are derived from the DStem. The DStem is in italics.

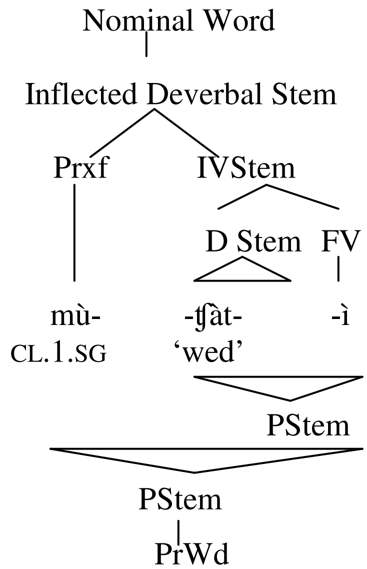
(51) a. /*tʃàt*-à/ [*tʃàt*à]
wed-FV
'wed!'

b. /mù-*tʃàt*-ì/ [mù*tʃàt*ì]
CL1.SG-work-FV
'bride/bridegroom'

c. /mù-*tʃàt-ìs*-ì/ [mù*tʃàtìs*ì]
CL1.SG-wed-CAUS-FV
'the one who weds people'

There are three reasons for considering the Inflected Deverbal Stem is a nominal. First, only nominals have a class prefix—verbs do not. Second, the quality of the final vowel is different from that found in the citation forms of the verbs. Third, the tone of the Final Vowel can be different from that of the DStem. This is unlike in verbs where the FV assumes the tone of the DStem. In the examples above, the final vowel may have a tone that is different from that of the Verb Root. Based on the class prefix, the quality of the Final Vowel and tone, I therefore conclude that the Inflected Deverbal Stem is a nominal with the structure given in Figure 5.11.

Figure 5.11 Inflected Deverbal Stem



In Figure 5.11, the Nominal Word is coextensive with the Inflected Deverbal Stem which is made up of prefix, /mù-/, and an Inflected Verb Stem. The Inflected Verb Stem is made up of a Derivational Stem and a Final Vowel. The Inflected Verb Stem corresponds to a PStem, and the Inflected Deverbal Stem corresponds to a PStem which is co-extensive with a Prosodic Word.

I now provide reasons for calling the DStem and the FV in the Inflected Deverbal Stem an 'Inflected Verb Stem'. I acknowledge that the final vowel is no longer the default vowel /a/, and that the tone pattern is not consistent with that of the canonical Inflected Verb Stem. The tone on the final vowel is unpredictable. Calling a final vowel a nominalizing suffix is lack of a better term. When the 'nominalizer' [i] is added to the Verb Root, the nominalization only becomes complete with the addition of the noun class prefix. For this reason, I consider that the final vowel and the Verb Root still constitute an Inflected Verb Stem, and only become nominal when the class prefix is added.

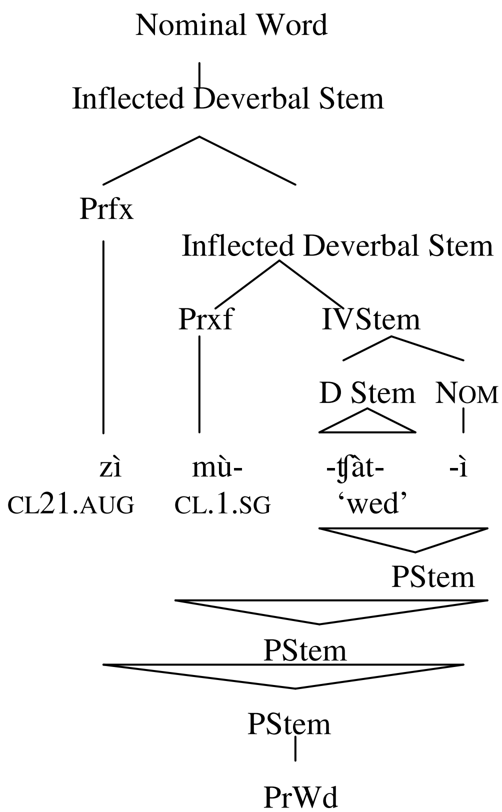
The reason for suggesting that the Inflected Deverbal Stem is a stem is that it is an attachment site for a class prefix, similar to the inflected Nominal Stems. In other words, it allows for pre-prefixation (§5.6.1).

(52) a /zì-mù-*ʧàt*-ì/ [zìmù*ʧàt*ì]
CL21.AUG-CL1.SG-work-FV
'the huge bride/bridegroom'

c. /ʧì-mù-*ʧàt-ìs*-ì/ [kàmù*ʧàtìs*ì]
CL8-CL1.SG-wed-CAUS-FV
'the small one who weds people'

The fact that the Inflected Deverbal Stem can take class prefix, to become an Pre-Prefixed Inflected Deverbal Noun Stem implies that the Inflected Deverbal Stems is a PStem and not a PrWd. Figure 5.12, illustrates that the Inflected Deverbal Stem (Figure 5.11), allows for pre-prefixation—the stacking of prefixes.

Figure 5.12 Pre-Prefixed Inflected Deverbal Stem



The Pre-Prefixed Inflected Deverbal Stem is co-extensive with a Nominal Word. The Pre-Prefixed Inflected Deverbal Noun comprises the clas prefix /zì-/ and the Inflected Deverbal Stem /mù-ʧàt-ì/. The Inflected Deverbal Stem /mù-ʧàt-ì/ is in turn made up of the Inflected Verb Stem /-ʧàt-ì/. The Inflected Verb stem comprises the Derivational Stem /-ʧàt-/ and the Nominalizer /-ì/. The Pre-Prefixed Inflected Deverbal Stem is a PStem which is co-extensive with a PrWd. The

Inflected deverbal Stem corresponds to a PStem. The Infected verbal Stem corresponds to a PStem as well.

The ability of the Inflected Deverbal Noun Stem to stack prefixes is similar to that of the Pre-Prefixed Inflected Noun Stems which was illustrated to be a PStem.

5.7 The Nominal Word: The Infinitive

The Infinitive is formed by inflecting the Inflected Verb Stem (Figure 4.7) with a noun class prefix. The core morpheme of the Infinitive is an Inflected Verb Stem. What makes the infinitive a nominal is that it has a class prefix. Similar to other nominals, the class prefix triggers concordial agreement and is the basis for the classification of the Infinitive. The examples in (53) are of Infinitives.

(53) a. /kù-ʧ͡àt-à/ [kùʧ͡àtà]
CL15.INFIN-wed-FV
'to wed'

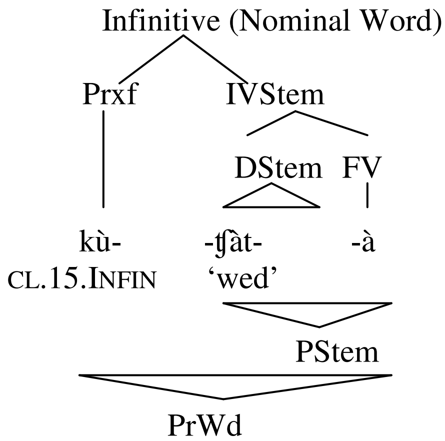
b. /kù-ʧ͡àt-ìs-à/ [kùʧ͡àtìsà]
CL15.INFIN-wed-INTENS-FV
'to cause to wed'

(54) a. /kù-fár-á/ [kùfárá]
CL15.INFIN-happy- FV
'to be happy'

b. /kù-fár-ír-án-á/ [kùfáríráná]
CL15.INFIN-happy-APPL-REC-FV
'to be like each other'

The Infinitive has the structure given in Figure 5.13.

Figure 5.13 The Infinitive is a Nominal Word



In Figure 5.13, the Infinitive is a Nominal Word which is made up of a class prefix, the infinitive /kù-/ and an Inflected Verb Stem /ʧ͡àtà/. The inflected Verb Stem is in turn made up of a Derivational Stem /-ʧ͡àt-/, and a FV, /-à/. The Infinitive corresponds to a Prosodic Word and the The Inflected Verb Stem to a Prosodic Stem.

The Infinitive is similar and different from the Inflected Deverbal Stem. It is similar to the Inflected Deverbal Stem, in that its core morpheme is verbal, the Inflected Verb Stem. However, it is unlike the Inflected Deverbal Stem in that it cannot be the attachment site for any other class prefix. In other words, the Infinitive does not allow for pre-prefixation. The examples in (55) show that the Infinitive does not allow for the stacking of class prefixes.

(55) a. /zì-kù-ʧ͡àt-à/ *[zìkùʧ͡àtà]
CL21.AUG-CL15.INFIN-wed-FV

b. /ʧ͡ì-kù-fár-á/ *[ʧ͡ìkùfárá]
CL15.INFIN-happy- FV

I take the lack of stacking in the Infinitive as evidence that the Infinitive is not a PStem but a PrWd.

5.8 Hiatus Resolution in the Recursive Prosodic Stem & Prosodic Word: Across a PStem Edge (Word Level)

The Recursive Prosodic Stem comprised the Extended Inflected Noun Stems, which in turn comprise the Pre-Prefixed Inflected Noun Stem and the Inflected Deverbal Nouns. The Prosodic

Word comprises the Infinitive. All these morphosyntactic constituents and their corresponding prosodic domains are at the Word level. Hiatus that occurs in the recursive PStem and the PrWd occurs across the same boundary, the Prosodic Stem Boundary. It is resolved through spreading

The examples in (56) show hiatus in the Recursive PStem (Pre-Prefixed Inflected Noun Stems) and (57) (Inflected Deverbal Noun) and (58) in the PrWd (Infinitive). Curly brackets indicate a PStem and square brackets a PrWd.

(56) a. /má-zì-ú-mé/ [mázìwúmé] [{má{zì{wúmé}}}]
CL6.PL-CL21.SG.AUG.-CL14-fruit
'big *ume* fruits'

b. /tù-mà-Ø-ò^{n}dé/ [tùmàwò^{n}dé] [{tù{mà{wò^{n}dé}]]
CL13.SG.DIMIN.-CL6.SG-CL5.SG-fig
'small figs'

(57) a. /mù-í^{m}b-í/ [mùjí^{m}bí] [mù{jí^{m}bí}]
CL1.SG-sing-NOM
'singer'

b. /ʋà-ó^{n}górór-í/ [ʋàwó^{n}górórí] [ʋà{wó^{n}górórí}]
CL2.PL-spy-NOM
'spies'

(58) a. /kù-à^{m}bùr-à/ [kùʔà^{m}bùrà] [kù{ʔà^{m}bùrà}]
CL15.INFIN.-ignite-FV
'to ignite'

b. /kù-ón-á/ [kùwóná] [kù{wóná}]
CL15.INFIN.-see-FV
'to see'

c. /kù-ìt-à/ [kùjìtà] [kù{jìtà}]
CL15.INFIN.-do-FV
'to do'

What is common between the Recursive Prosodic Stem and the Prosodic Word is that both have an inner PStem as a constituent, and spreading resolves hiatus at the boundary of this inner PStem.

5.9 The Clitic Group Domain: Clitic Word (Postlexical Level)

The Clitic Word is at the Postlexical level. The Clitic Word is made up of a clitic and a Nominal Word. This is unlike all the other morphosyntactic constituents discussed above which are at the

Word Level. I consider that the Clitic Word corresponds to the Clitic Group. First, I examine the structure of the pronouns, which can function as clitics and or as hosts.

5.9.1 Pronouns: 1st and 2nd Person Singular/Plural Pronoun

The 1st and 2nd person/singular pronoun are monomorphemic, whilst the 3rd person/singular plural is bimorphemic.

The examples in 59 (a) and (b) are of the 1st person and plural respectively, and in (c) and (d) are of the 2nd person singular and plural respectively.

(59) a. ìní 1SG
b. ìsú 1PL

c. ìwé 2SG
d. ìmí 2PL

5.9.2 Pronouns: 3rd Person Pronoun

3rd person singular and plural has the following structure:

(60) stabilizer + pronominal affix

Mkanganwi (1995: 72) points out that the stabilizer cannot be called a morpheme: It has no meaning or grammatical function. Its function is purely phonological: it is needed so that the pronoun can stand as a free form.

Table 5.5 gives the list of Shona 3rd person pronouns and the corresponding noun class.

Table 5.5 Shona 3rd Person Pronouns

Class	Pronominal Affix	Example
Class 1 SG	-jé	ì-jé
Class 1a SG	-ʋó	ì-ʋó
Class 2 PL	-ʋó	ì-ʋó
Class 2a HON	-ʋó (hon)	ì-ʋó
Class 3 SG	-wó	ì-wó
Class 4 PL	-jó	ì-jó
Class 5 SG	-ró	ì-ró
Class 6 PL	-jó	ì-jó
Class 7 SG.DIMIN	-ʧó	ì-ʧó
Class 8 PL.DIMIN	-ʐó	ì-ʐó
Class 9 SG	-jó	ì-jó
Class 10 PL	-d^{z}ó	ì-d^{z}ó
Class 11 SG.DEROG	-rù	ì-ró
Class 12 SG.DEROG	-kà	ì-kó
Class 13 SG.DEROG	-kó	ì-tó
Class 14	-h^{w}ó	ì-h^{w}ó
Class 15	-kó	ì-kó
Class 16 LOC	-mó	ì-mó
Class 17 LOC	-kó	ì-kó
Class 18 LOC	-mó	ì-mó
Class 19 DIMIN.	-ʂó	ì-ʂó
Class 21 AUG.	-ró	ì-ró

The significance of the observation that the [ì] in the 3rd person pronouns is purely epenthetic; it is only needed when the pronoun stands as a free form. When the pronoun is cliticized for example, the epenthetic vowel is not needed, and it does not trigger coalescence. This contrasts with the 1st and 2nd person pronoun in which the /i/ is underlying. The issue about the clitics and the structure of the 3rd person is discussed again in §8.5.

5.9.3 Shona Demonstratives

In Shona, there are two types of demonstratives, the near demonstratives and the far. The construction patterns of the near and far demonstratives are provided below:

(61) NEAR DEMONSTRATIVE: Stabilizer + demonstrative affix

(62) FAR DEMONSTRATIVE: Stabilizer + demonstrative affix + o

Table 5.6 gives a list of the demonstratives in Shona.

Table 5.6 Shona Demonstratives

Class	Near Demonstrative Affix	Example	Far Demonstrative
Class 1 SG	-jù	ù-jù	ù-j-ò
Class 1a SG	-ʋà	à-ʋà	à-ʋ-ò
Class 2 PL	-ʋà	à-ʋà	à-ʋ-ò
Class 3 SG	-jù	ù-jù	ù-j-ò
Class 4 PL	-jì	ì-jì	ì-j-ò
Class 5 SG	-rì	ì-rì	ì-r-ò
Class 6 PL	-jà	à-jà	à-jò
Class 7 SG.DIMIN.	-ʧì	ì-ʧì	ì-ʧ-ò
Class 8 PL.DIMIN.	-ʐ̭ì	ì-ʐ̭ì	i-ʐ̭-ò
Class 9 SG	-jì	ì-jì	ì-j-ò
Class 10 PL	-d^zì	ì-d^zì	ì-d^z-ò
Class 11 SG.DIMIN.	-rù	ù-rù	ù-r-ò
Class 12 SG.DIMIN	-kà	à-kà	à-k-ò
Class 13 SG.DIMIN	-tù	ù-tù	ù-t-ò
Class 14	-h^wù	ù-h^wù	ù-h^w-ò
Class 15	-kù	ù-kù	ù-k-ò
Class 16 LOC	-pà	à-pà	à-p-ò
Class 17 LOC	-kù	ù-kù	ù-k-ò
Class 18 LOC	-mù	ù-mù	ù-m-ò
Class 19 DIMIN.	-ʂ̭ì	ì-ʂ̭ì	ì-ʂ̭-ò
Class 21 AUG.	-rì	ì-rì	ì-r-ò

Fortune (1955) mentions that the stabilizer is a variable vowel, /i/ /u/ or /a/ depending on the characteristic vowel of the demonstrative affix and its class. By characteristic vowel of a class is meant the vowel found in the noun prefix and the other prefixes of that class. Fortune (1984: 3.110) says about the stabilizer, “The stabilizer is not an essential part of the demonstrative but is required in order that this construction may be a phonological word. Its presence allows it to function as a free form.”

The quality of the stabilizer found in the demonstrative is different from the one found anywhere else in the language. The stabilizers are /a/, /u/ and /i/. These stabilizers vary according to the noun class. It appears that the ‘stabilizer’ plays a dual role; when the demonstrative is in isolation, it is a Prosodic Word, and the stabilizer is needed to satisfy prosodic minimality. In addition to serving a phonological role, the stabilizer also carries some information about the class.

5.9.4 Proclitics: Associatives and Copula

This section examines the associative and copula as proclitics. It demonstrates the prosodization of these clitics in Shona.

5.9.4.1 CV Associatives

In Shona, possessive affixes and associatives are called prepositions, (Myers 1990:81). These prepositions function as proclitics. Mkanganwi (1995:68) observes that " all Shona proclitics… are appended to the substantive phrases [noun phrases] to form what in traditional Shona terminology are called …, adverbial [associative] and possessive forms…".

In examples 63(a)-(d) are examples of the associative. 63(a) and (b) show the associative /ná/ 'with', and (c) and (d) /sá/ 'like'.

(63) a. /ná=ìní mù-rèfú/ [néní mùrèfú]
ASSOC-1SG- CL1.SG-all
'with me the tall one'

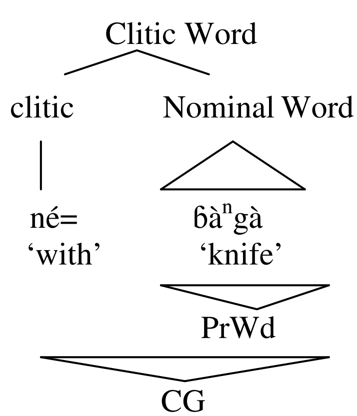
b. /ná=mù-réfú ù-jù/ [nómùréfú ù-jù]
ASSOC-CL1.SG-tall STAB-DEM.AFFIX
'with this tall one'

c. /sá=ù-jù / [sójú]
ASSOC-STAB.-DEM.AFFIX
'like this one'

d. /sá=Ø-ɓá^{n}gá/ [séɓà^{n}gà]
ASSOC-CL5.SG-knife
'like a knife'

Figure 5.14, shows the structure of the Clitic Group, involving the proclitic.

Figure 5.14 Proclitic



In Figure 5.14, The Clitic Word is formed by joining the clitic [né] and the Nominal Word, /ɓà^{n}gà/ 'knife' to form a Clitic Word. The Nominal Word corresponds to the PrWd and the clitic word to the Clitic Group.

In examples, 64(a) and (b), the Inflected Noun Stems, when they are in isolation and are co-extensive with a PrWd, have a high tone, but in (b) and (d) when a high toned associative is attached they surface with low tone. Meeussen's rule applies within the Clitic Group.

(64) a. /Ø-ɓá^{n}gá/ [ɓá^{n}gá]
CL5.SG-knife
'knife'

b. /sá-Ø-ɓá^{n}gà/ [séɓà^{n}gà]
ASSOC-CL5.SG-knife
'like a knife'

c. /Ø-ɓútì/ [ɓútì]
CL5.SG-popcorn
'popcorn'

d. /ná-Ø-ɓútì/ [néɓùtì]
CL5.SG-popcorn
'with a popcorn'

5.9.4.2 Copula as Proclitic H-tone

H tone and /ɦá-/ are the two copula morphemes in Shona, (Fortune 1955, 1984).

Copula proclitic H-tone attaches to nouns of all classes except class 1a. It is manifested in two ways: it can be superimposed on low toned class prefixes, or it can dock onto an epenthetic [ì]. The epenthetic [í]'s goal is to host the 'floating' copula H tone /´/.

Disyllabic and longer nouns of classes, 9, 10, 5, show free variation. If the initial syllable is L tone, they can take the H tone copula morpheme directly onto the L toned initial syllable or an epenthetic [ì] anchors the tone.

Karanga/Zezuru

(65) a /Ø-gà^{m}bà/ [gà^{m}bà]
CL5.SG-hero
'hero'

b. /´=Ø-gà^{m}bà/ [ígà^{m}bà]~[gá^{m}bà]
COP-CL5.SG-hero
'it's a hero'

(66) a. /Ø-ɓùd^{z}í/ [ɓùd^{z}í]
CL9.SG-squash
'squash'

b. /´=Ø-ɓùd^{z}í/ [ɓúd^{z}í]~[íɓùd^{z}í]
COP.CL9.SG-squash
'it is a squash'

(67) a. /mù-kómáná/ [mùkómáná]
CL1.SG-boy
'boy'

b. /´=mù-kómáná/ [mùkómáná]
COP-CL1.SG-boy
'it is a boy'

		Karanga	**Zezuru**
(68) a.	/Ø-ɓù/ CL5.SG-immature groundnut 'immature groundnut'	[ɓú]	[ìɓù]
b.	/´=Ø-ɓù/ COP-CL5.SG-immature groundnut 'it is an immature groundnut'	[íɓù]	[íɓù]
(69) a.	/Ø-gò/ CL5.SG-wasp 'wasp'	[gò]	[ígò]
b.	/´=Ø-gò/ COP-CL5.SG-wasp 'it is a wasp'	[gó]~[ígò]	[ígò] *[gó]

In Karanga, there is free variation between imposing the H tone on the monosyllabic Inflected Noun Stem if it is low toned, or inserting an epenthetic [ì] to function as a tone anchor. Zezuru does not show such free variation.

5.9.4.4 CV Copula as Proclitic

/ɦá-/ is used to inflect the 3rd person singular and plural, as well as the demonstratives. The forms inflected with /ɦá-/ are what Fivaz (1970) calls presentative phrases.

(70) a. /ɦá=ì-rì / [ɦérì]
COP=STAB-CL5.SG.DEM.AFX
'here it is'

b. /ɦá=ìjò/ [ɦéjò]
COP=STAB-CL9.SG.DEM.AFX
'There it is'

c. /ɦá=ù-jù/ [ɦójù]
COP.=STAB-CL3.SG.DEM.AFX
'here it is'

d. /ɦá=ù-mù/ [ɦómù]
COP.=STAB-CL18.LOC.DEM. AFX
'there it is '

e. /ɦá=à-ʋà / [ɦáʋà]
COP.=STAB-CL2.PL.DEM.AFX
'Here they are'

f. /ɦá=à-kà / [ɦákà]
COP.-STAB-CL12.S.G.DIMIN.DEM. AFX
'Here it is'

The demonstratives are the hosts and they are 'stabilized' so that they satisfy the disyllabic minimality requirement imposed on Prosodic Words. These are the attachment sites for clitics. The augmentation of attachment site for clitics, demonstrate that clitics do not attach to Prosodic Stems but to Prosodic Words. If clitics attached to Prosodic Stems, augmentation would not be necessary since Prosodic Stems are not subjected to minimality requirements.

5.10 Hiatus Resolution in the Clitic Group: Across a PrWd Edge (Postlexical Level)

This section provides illustrative examples showing that in the Clitic Word, which is at the Postlexical level, hiatus is resolved through coalescence, and when coalescence is blocked, spreading occurs. Examples in (71)-(73), illustrate that hiatus is resolved through coalescence. In examples (71)-(73) in which the clitic is
CVC, hiatus is resolved through coalescence.

(71) a. /ìnì/ [ìnì]
1SG

'me/I'

b. /sá=ìnì/ [sénì]
ASSOC=1SG
'like me'

(72) a. /ù-jù/ [ùjù]
STAB-CL1.LOC.DEM. AFX
'this one'

b. /ná=ù-jù/ [nójù]
ASSOC-STAB-CL1.LOC.DEM. AFX
'with this one'

(73) a. /ɦá=ì-rì/ [ɦérì]
COP=STAB-CL5.SG.DEM. AFX
'here it is'

b. /ɦá=ì-ʂì/ [ɦéʂì]
COP=STAB-CL21.SG.DEM. AFX
'here it is'

Chapter 8 provides a detailed analysis of coalescence. It argues that at the Postlexical level, that is in the Clitic Group, coalescence is the preferred strategy.

5.11 Summary

This chapter examined the nominal morphosyntactic constituents at the Word Level and Postlexical Level. The Inflected Nominal Stems, The Extended inflected Nominal Stems, Pre-Prefixed Inflected Nominal Stems, the Inflected Deverbal Stems and the Infinitive are at the Word level. The Clitic Word is at the Postlexical. The Inflected Nominal Stems, correspond to the non-recursive PStem. The Extended inflected Nominal Stems which comprises the Pre-Prefixed Inflected Nominal Stems and the Inflected Deverbal Stems map onto a recursive Prosodic Stem. The Inifinitve corresponds to the Nominal Word. Finally, the clitic and word form a Clitic Word, which corresponds to the Clitic Group.

Hiatus that occurs in the non-recursive PStem is resolved through glide formation, secondary articulation or elision. Hiatus that occurs in the recursive PStem, that is outside the inner PStem but across a PStem edge is resolved through spreading. Similarly, hiatus that occurs at a PStem edge, where the PStem is a constituent of a PrWd is resolved through spreading as well. Hiatus that occurs in the Clitic Group at the Prosodic Word edge is resolved through coalescence.

SUMMARY OF PART II

Part II, which comprises chapters 4 and 5 examined verbal and nominal morphophonology and morphosyntax, respectively at the Word and Postlexical level showing that the different morphosyntactic constituents correspond to the Prosodic Stem, Prosodic Word and the Clitic Group.

Figure 5. 15 Levels, Morphosyntactic Constituents, Prosodic Domains and Hiatus Resolution Strategies

Prosodic Domains	**Morphosyntactic Constituents**		**Hiatus Resolution**
POSTLEXICAL LEVEL			
	Verbs	**Nominal**	
Clitic Group	Clitic Word	Clitic Word	coalescence or spreading
WORD LEVEL			
Prosodic Word	Verbal Word	Nominal Word	spreading (N/A in verbs)
Prosodic Stem (recursive)	Pre Stem	N/A	spreading
Prosodic Stem (recursive)	Macro Stem	Extended Inflected NStem	spreading
Prosodic Stem (recursive)	Inflected VStem	Inflected NStem	N/A
Prosodic Stem (non-recursive)	DStem	Minimal NStem	GF/sec art/elision/(N/A in verbs)
-------------	VRoot	N/A	N/A

The task of the next three chapters, 6, 7 and 8 is to present a formal analysis of hiatus resolution strategies. Chapters 6 and 7 examine hiatus that occurs at the Word (Lexical) Level and chapter 8 explores strategies that operate at the Postlexical Level.

PART III: HIATUS RESOLUTION

Part III consists of chapters 6, 7 and 8. The main goal of part III is to describe and provide a formal analysis of the hiatus resolution strategies that operate at the edges of or within each of the domains proposed in chapters 4 and 5. Chapter 6 serves two purposes. First, it introduces the five hiatus resolution strategies, glide formation, secondary articulation, coalescence, elision and spreading and the relevant constraints. Second, it examines glide formation, secondary articulation and elision in detail. Chapter 7 examines spreading, which occurs at the Prosodic Stem edge. The chapter establishes when each of [j w ʔ ɦ], is the optimal hiatus-breaker. Chapters 6 and 7 examine hiatus resolution strategies at the Word Level. The strategies that operate at this level are glide-formation, secondary articulation, elision and spreading. Chapter 8 examines hiatus resolution strategies which operate at the Postlexical level. These are coalescence and spreading, with spreading only operating when coalescence is blocked.

CHAPTER 6

GLIDE FORMATION, SECONDARY ARTICULATION AND ELISION

6.1 Introduction

The goals of this chapter are two-fold: First, the chapter introduces the five hiatus resolution strategies, glide formation, secondary articulation, elision, spreading and coalescence by providing a basic description and analysis of each strategy in relation to the others. Second, the chapter provides a detailed description and analysis of glide formation, secondary articulation and elision, which operate at the Word Level. The chapter argues that glide formation, secondary articulation and elision have a unique relationship; they operate in the same domain, that is within a Non-Recursive Prosodic Stem. The chapter assumes that glide formation is the default strategy at the Word Level, and that when it is blocked by higher ranked phonotactic constraints, secondary articulation operates. In turn, when secondary articulation is blocked, elision is then employed. In cases where the phonotactic constraints are unique to one dialect, this is manifested as inter-dialectal variation—the two dialects resolve hiatus differently in exactly the same contexts.

6.2 Glide formation, Secondary Articulation, Elision, Spreading & Coalescence: An Introduction

This section has three goals. First, it introduces spreading, glide formation, elision and coalescence by means of providing illustrative examples of each strategy. Second, it provides the representations assumed for each of these strategies. Third, it introduces the relevant constraints.

The examples in (1)-(10) illustrate each of the hiatus resolution strategies. Examples 1(b) and 2(b) illustrate glide formation; 3(b) and 4(b) secondary articulation; 5(b) and 6(b) coalescence; 7(b) and 8(b) elision; 9(b) and 10(b) spreading.

- **Glide formation**

(1) a. /mù-tí ù-ʧá-kúr-á/ [mùtí ùʧákúrá]
CL3.SG-tree CL3.SG-FUT-grow-FV
'the tree will grow'.

b. /mù-tí ù-ósé ú-ʧá-kúr-á/ [mùtí wósé úʧákúrá]
CL3.SG-tree CL3.SG-all CL3.SG-FUT-grow-FV
'the whole tree will grow'.

(2) a. /mì-tí ì-ʧá-kúr-á/ [mìtí ìʧákúrá]
CL4.PL-trees CL4.PL-FUT-grow-FV
'the trees will grow'.

b. /mì-tí ì-ósé ì-ʧá-kúr-á/ [mìtí jósé ìʧákúrá]
CL4.PL-tree CL4.PL-all CL4.SG-FUT-grow-FV
'all trees will grow'.

- **Secondary articulation**

(3) a. /Ø-ɦúkú/ [ɦúkú]
CL9.SG-chicken.
'chicken'

b. /Ø-ɦúkú-ánà/ [ɦúkʷàná]
CL9.SG-chicken-child
'chick'

(4) a. /mù-rúmé/ [mùrúmé]
CL1.SG-man
'man'

b. /mù-ánà/ [mʷánà]
CL1.SG.-child.
'child'

- **Coalescence**

(5) a. /wà-kà-tór-a Ø-ɦúkú/ [wàkàtórá ɦúkú]
2.SG.SUBJ-RP-take-FV CL9.SG-chicken
'you took a chicken'

b. /wà-kà-tór-a=ìní/ [wàkàtóréní]
2.S.G.SUBJ-RP-eat-FV=me
'you took me'

(6) a. /ù-jù/ [ùjù]
STAB-CL5.SG.DEM.AFX
'this one'

b. /ɦá=ù-jù/ [ɦójù]
COP.=STAB-CL5.SG.DEM.AFX
'here it is'

- **Elision**

(7) a. /ʋà-rúmé/ [ʋàrúmé]
CL2.PL-man
'men'

b. /ʋà-énì/ [ʋénì]
CL2.PL-visitor
'visitors'

(8) a. /ʧì-ᵑgʷá/ [ʧìᵑgʷá]
CL7.SG-bread
'bread'

b. /ʧì-ùrù/ [ʧùrù]
CL7.SG.DIMIN.-ant-heap
'ant-heap'

- **Spreading**

(9) a. /ù-sʷá/ [ùsʷá]
cl14-grass
'grass'

b. /kà-ù-sʷá/ [kàwùsʷá]
CL12.DIMIN.SG.CL14-grass
'small grass'

(10) a. /ìt-a/ [ìtà]
do- FV
'do!'

b. /mù-ìt-ì/ [mùjìtì]
2PL-do- NOM
'doers'

Glide formation, secondary articulation, elision, coalescence and spreading conspire to ensure that hiatus (heterosyllabic VV sequences), never surfaces. Kisseberth (1970) originally identified a phonological 'conspiracy' as a set of rules that serve the same purpose: to rid the surface forms of the language of certain undesirable (marked) configurations. McCarthy (2002) refers to this phenomenon as homogeneity of target and heterogeneity of process. In a hiatus context, the undesirable element or configuration, if unaltered, is that the second vowel would be onsetless. In this case, the same target is achieved in different outputs in the two different dialects and in different contexts in each of the dialects. Both Karanga and Zezuru enforce an undominated markedness constraint that prohibits two vocalic segments in sequence:

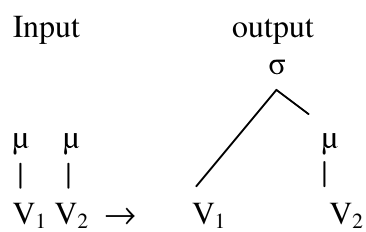
(11) NO-HIATUS

$$
* \begin{array}{cc} \sigma & \sigma \\ | & | \\ \mu & \mu \\ | & | \\ \mathrm{Rt} & \mathrm{Rt} \end{array}
$$

(Ola Orie and Pulleyblank 2002)

Glide formation in which a labial or coronal vowel is turned into a glide occurs when there is no consonant immediately preceding V_1 as in 1(b) and 2(b). I assume that at the Word or Lexical Level, glide-formation is the preferred or default strategy in both Karanga and Zezuru. Glide formation is illustrated in Figure 6.1.

Figure 6.1 Glide Formation



Turning V_1 into a glide, that is, syllabifying V_1 in onset position, results in the loss of a mora. A constraint that militates against mora loss is MAX μ and is ranked below NO HIATUS since glide formation repairs hiatus in both dialects.

(12) MAX μ
A mora in the input must have a correspondent in the output.

In GF, the loss of a mora does not trigger compensatory lengthening. This is because the Shona segment inventory does not have long vowels (§3.3.1). The constraint that militates against long vowels is highly ranked together with NO HIATUS. The constraint *V: is defined as:

(13) *V:
No long vowels
(McCarthy and Prince 1995, Rosenthall 1994: 23)

Tableau (14) illustrates glide formation in both Karanga and Zezuru, and shows that a candidate that has a long vowel does not win. The period indicates syllable boundary.

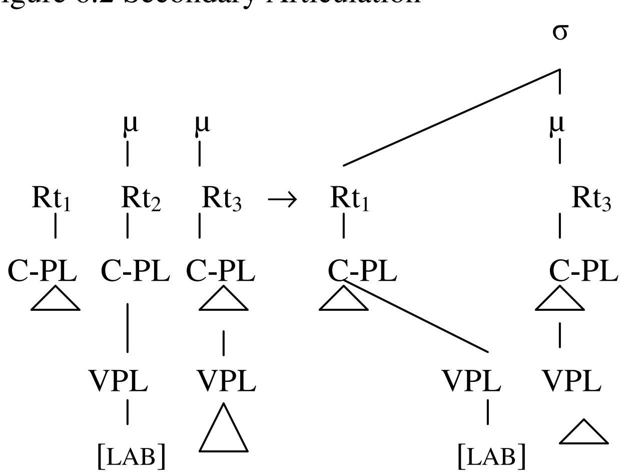
(14) Karanga/Zezuru: Glide Formation

/ ù-ósé /	NO HIATUS	*V:	MAX μ
a. ù.ó.sé	!*		
b. ☞wó.sé			*
c. wó:.sé		*!	

Candidate (a) which does not resolve hiatus violates the undominated constraint, NO HIATUS. Candidate (b) which forms a glide and elides the mora violates the lowly ranked MAX μ, and is therefore the optimal candidate. Candidate (c) which resolves hiatus through glide formation and lengthens the following vowel is disqualified for violating *V:. Henceforth, candidates that violate *V: will not be considered. Such candidates will never win and do not add new information.

When glide formation fails, secondary articulation is one of the alternative strategies employed to resolve hiatus. Secondary articulation involves eliding V_1 and passing the whole V-Place node to the preceding consonant, where it is realized as secondary articulation (3b and 4b). Secondary articulation occurs when V_1 is a labial vowel /u/ or /o/, and is immediately preceded by a consonant that can be labialized. Recall that in §3.3.2.2, it was indicated that some consonants cannot undergo labialization. If a consonant that cannot be labialized precedes a labial V_1, then secondary articulation is blocked and elision (of V_1) applies. Secondary articulation is described and analyzed in depth in §6.3.2. Figure 6.2 illustrates secondary articulation.

Figure 6.2 Secondary Articulation



First, secondary articulation involves the loss of a root node for V_1. This means that NO HIATUS must outrank a constraint that penalizes the loss of a root node, MAX Rt, defined as:

(15) MAX Rt:
Every root node of the input has a correspondent root node in the output.

Second, although in secondary articulation there is loss of a root node, the [labial] V-Place node is preserved by being passed onto the preceding consonant. A constraint that prohibits the loss of any labial features is MAX [labial]:

(16) MAX [labial]
Any [labial] feature in the input must have a correspondent in the output.

Fourth, similar to GF, secondary articulation involves the loss of a mora. The constraints that penalize the loss of a mora and the one that prohibits long vowels were given as (12) and (13) respectively.

Based on the assumption that glide formation is the default strategy at the Word Level, this means that all things being equal, secondary articulation never wins over GF. However, when there is a consonant immediately preceding a labial or coronal V_1, forming a glide is blocked as it would create illicit Cw or Cj clusters, respectively (§3.3.2.2). As an illustration, consider example 4(b) /mù-ánà/ 'child' realized as [m^{w}ánà]. If glide formation (GF) were to apply, the output would be *[mwánà]. This has an illicit Cw, viz., (*[mw]). In the Shona syllable inventory, there are no such clusters (see, §3.3.2.2).

(17) *COMPLEX
Complex onsets are prohibited.

With glide formation blocked, by *COMPLEX, secondary articulation kicks in. Tableau (18) provides a formal analysis in which a candidate that employs secondary articulation is optimal.

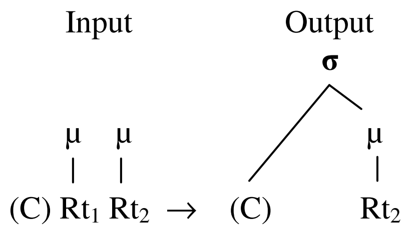
(18) Karanga/Zezuru: Secondary Articulation

/mù$_1$-á$_2$nà/	NO HIATUS	*COMP	MAX [labial]	MAX RT
a. mù$_1$.á$_2$.nà	*!			
b. ☞ m^{w}á$_2$.nà				*
c. mwá$_2$.nà		*!		
d. má$_2$. nà			*!	*

Candidate (c) which forms a glide violates the highly ranked *COMPLEX. This effectively blocks glide formation, and candidate (b) which employs secondary articulation wins.

Elision only becomes the optimal hiatus resolution strategy when GF and secondary articulation are both blocked. Elision involves deleting a vowel without the preservation of any of its features. It also deletes a mora as well. In Shona, it is V$_1$ that is consistently eliminated—evidence to this effect is presented in §6.3.3. Figure 6.3 illustrates elision.

Figure 6.3 Elision



MAX Rt which was given in (15), penalizes the elision of a root node. All things being equal, a candidate that elides will never win over a candidate that employs either glide formation or secondary articulation. In both GF and secondary articulation, some features of V$_1$ are preserved. More importantly, the constraints form a subset relationship such that a candidate that elides will also violate the constraints that penalize secondary articulation and elision—excluding those that block these strategies.

The illustration provided below involves glide formation being blocked by the constraint *COMPLEX. Secondary articulation is blocked by a constraint that prohibits palatalized consonants given that Shona does not have palatalized consonants (§3.3.2.2). The constraint *C^j which penalizes the palatalization of consonants is undominated.

(19) *C^j
No palatalized segments

Tableau (20) provides a formal analysis in which a candidate that elides is optimal.

(20) Karanga/Zezuru: Elision (Tie Between Candidates that Elide (d) and (e)

/ ʧì$_1$-á$_2$nà /	NO HIATUS	*COMP	*C^j	MAX RT
a. ʧì$_1$.á$_2$.nà	*!			
b. ʧ^{j}á$_2$.nà			*!	
c. ʧjá$_2$.nà		*!		
d. ☞ʧá$_2$.nà				*
e. ☞ʧì$_1$.nà				*

Candidate (a) is ruled out for violating the undominated constraint NO HIATUS. Candidate (b) employs secondary articulation, that is, it deletes V$_1$ and passes on the pharyngeal feature onto the preceding consonant. The candidate fatally violates the highly ranked *C^j. Candidate (c) which parses the vowel /a/ in onset position violates *COMPLEX. There is a tie between candidates (d) and (e) which resolve hiatus through elision. Both candidates violate MAX Rt. In all instances where elision is the optimal hiatus resolution strategy, V$_1$ is consistently elided. In order to break the tie in Tableau (20), I invoke a constraint that takes into account this detail, namely, ANCHORL, which I define as follows:

(21) ANCHOR L
Any root node at the left edge of a morpheme in the input has a correspondent root node in the output.

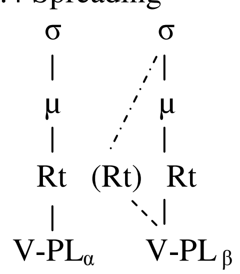
ANCHOR L must be ranked below NO HIATUS, but above MAXRT, in order to allow elision, but at the same time, disqualify any candidate that elides V$_2$. The inclusion of this constraint breaks the tie as illustrated in Tableau (22). Candidate (e) which elides V$_2$ loses to candidate (d) which elides V$_1$. Candidate (e) is ruled out by the constraint ANCHOR L.

(22) Karanga/Zezuru: Elision (Candidate that Elides V_1 Wins)

/ ʧì$_1$-á$_2$nà /	NO HIATUS	*COMP	*C^j	ANCHORL	MAXRT
a. ʧì$_1$.á$_2$.nà	*!				
b. ʧ^{j}á$_2$. nà			*!		*
c. ʧjá$_2$.nà		*!			
d. ☞ʧá$_2$.nà					*
e. ʧì$_1$.nà				*!	*

Spreading is another strategy employed to resolve hiatus. Without going into details of whether spreading is of the root node or the V-Place, or from V_1 or V_2, Figure 6.4 illustrates spreading. Chapter 7 provides a detailed description and analysis of spreading.

Figure 6.4 Spreading



Spreading is economical; all that the speaker does is spread features from a neighboring segment. The major disadvantage of any form of spreading is the loss of bijectivity. The unique one-to-one relationship between segment and feature is disrupted, as there is multi-linking: one feature is linked to more than one segment (consonant or vowel). A constraint that bans such linkages is UNIQUE, which must be ranked below NO HIATUS, in order to allow for spreading to repair hiatus.

(23) UNIQUE

$\forall x$, where x is a feature or class node, x must have a unique segmental anchor y.

(Benua 1997)

The example in Tableau (24) is an Inflected Deverbal Stem (Figure 1.10). It is a Recursive PStem. A candidate that spread should be optimal, but because of the current constraint ranking, candidate (c) which employs secondary articulation is the optimal. Candidate (c) and (d) spread, and one of them should be the optimal candidate.

(24) Karanga/Zezuru: Spreading loses to Secondary Articulation

/mù$_1$-ì$_2$t-ì/	NO HIATUS	MAX [lab]	UNIQUE	MAX RT
a.[mù$_1$.{ì$_2$.tì}]	*!			
b. ☞ [m^w{ì$_2$.tì}]				*
c. ☹ [mù$_1$.{j ì$_2$.tì}]			*!	
d. ☹ [mù$_1$.j{ì$_2$.tì}]			*!	
e. [m{ì$_2$.tì}]		*!		

In order to solve the problems in Tableau (24), I invoke an alignment constraint ALIGN L-PSTEM:

(25) ALIGN L-PSTEM
The left edge of a Prosodic Stem must coincide with the left edge of a syllable.

The constraint ALIGN L-PSTEM, which forces the alignment of a PStem and a syllable, is never violated in optimal hiatus resolution, and is therefore ranked together with NO HIATUS. ALIGN L-PSTEM disqualifies candidate (c) that employs secondary articulation. The candidate misaligns the left edges of the PStem and the syllable. ALIGN L-PSTEM also disqualifies candidate (e) which spreads and misaligns the PStem and syllable edges.

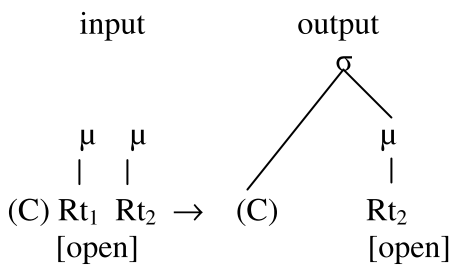
Tableau (26) provides the analysis in which candidate (d) that spreads and aligns the left edge of the PStem and of the syllable is the winner. Candidate (c) that employs secondary articulation is disqualified for violating ALIGN L-PSTEM. Candidate (e) which tied spread is ruled out by the constraint that requires the alignment of the PSTEM and syllable edges.

(26) Karanga/Zezuru: A Candidate that Spreads loses to a Candidate that Employs Secondary Articulation

/mù$_1$-ì$_2$t-ì/	NO HIATUS	ALIGNL-PSTEM	MAX [lab]	UNIQUE
a.[mù$_1$.{ì$_2$.tì}]	*!			
b. [m^w{ì$_2$.tì}]		*!		
c. ☞ [mù$_1$.{j ì$_2$.tì}]				*
d. [mù$_1$.j{ì$_2$.tì}]		*!		*
e. [m{ì$_2$.tì}]		*!	*	

Coalescence is the fifth strategy that operates to resolve hiatus. In this study, coalescence is analyzed as the elision of V$_1$ with preservation or 'flopping' of the feature [open] onto the following vowel. In all the cases involving coalescence, V$_1$ is consistently /a/ and V$_2$ is either /i/ or /u/.

Figure 6.5 Coalescence: Elision of V$_1$ with Preservation of [open]



Coalescence involves the 'movement' of features. In elision, when a root node is deleted its V-Place node is preserved by docking it onto the following root node. In order to account for the prohibition of such 'movement' of features, I adapt Alderete's (1999) accentual faithfulness constraint, NO-FLOP:

(27) NO-FLOP
Let [F] be a feature (autosegment) in the output representation, and let [F´] be the input correspondent of that feature. If the output feature [F] is dominated by a Root node (segment) X, then the input feature [F´] must likewise be dominated by a Root node (segment) X´, where X´ is the input correspondent of X.

In the coalescence cases, the correspondence relation of V$_2$ is not deleted between the input and output, and in the output V$_2$ must maintain its identity with its correspondent in the input by being fully faithful. Flopping of some of the elided V_1 onto V_2 however, results in an inevitable featural mismatch between the input and output. The VPlace of the output vowel on which the feature doscks is different from that of the input. Thus in addition to violating NO FLOP, coalescence candidates violates IDENT(VPlace).

(28) IDENT(VPlace)
The specification for VPlace of an input segment must be preserved in its output correspondent.

Crucially, IDENT(VPlace) breaks a tie between secondary articulation and coalescence which both violate NOFLOP and MAX μ. This will be illustrates shortly after defining MAX [open]. In all cases involving coalescence, the feature [open] from V_1 is preserved by passing it on to V_2. A constraint MAX [open], which protects the [open] feature must be higher ranked than NOFLOP to allow for coalescence.

(29) MAX [open]
Any [open] feature in the input must have a correspondent in the output.

I now illustrate that IDENT (VPlace) crucially makes the distinction between secondary articulation and coalescence. I repeat Tableau (18), in which a candidate that employed secondary articulation was optimal. In Tableau (29), a candidate that coalesces is added.

(30) Karanga/Zezuru: Secondary Articulation

/mù$_1$-á$_2$nà/	NO HIATUS	MAX [labial]	NO FLOP	UNIQUE	MAX RT	IDENT (VPlace)
a. mù$_1$.á$_2$.nà	*!					
b. ☞ m^{w}á$_2$.nà			*		*	
c. mó$_2$.nà			*		*	*!
e. má$_2$. nà		*!			*	
f. mù$_1$.ʔ á$_2$.nà				*!		

A comparison of candidate (b) which employs secondary articulation, and candidate (c) which coalesces shows that without IDENT (VPlace), which rules out the candidate that coalesces, there would be a tie. Crucially, IDENT (VPlace), avoids that problem by ruling out the candidate that spreads.

The dilemma that we face is of how to rank NO FLOP and UNIQUE. In order to illustrate this problem, for now, I rank NO FLOP above UNIQUE. This allows a candidate that spreads to win over a candidate that employs coalescence. With this ranking, a candidate that spreads never wins over a candidate that spreads. In Tableau (31), candidate (b), which coalesces, loses out to candidate (b) which spreads.

(31) Karanga/Zezuru: Spreading Wins Over Coalescence (incorrect result)

/ɦá$_1$=ì$_2$-jì/	NO HIATUS	*COMP	ANCHORL	MAX [open]	NO FLOP	UNIQUE
a. ɦá$_1$.ì$_2$jì	*!					
b. ☹ɦé$_2$.jì					*!	
c. ☞ɦá$_1$. j ì$_2$.jì						*
d. ɦì$_2$.jì				*!		

Candidate (b) is supposed to be the optimal candidate but owing to the ranking of NOFLOP over UNIQUE it loses to candidate (d). With this ranking, a candidate that coalesces can never win over a candidate that spreads. In order for the candidate that coalesces to win, there is need to re-rank these two constraints. This creates a ranking paradox. This is because we need to maintain this ranking as in (31) in order to get spreading when it happens.

One strategy that could be employed to resolve the problem is to co-index either UNIQUE or NO FLOP, to a particular domain. As an illustration let us co-index UNIQUE, to have the constraint [UNIQUE]$_{CG}$ so that spreading is absolutely banned in the Clitic Group. The problem with this approach is that it also inadvertently bans spreading where it should occur—either in the recursive PStem or PrWd, that is, across the PStem edge. Banning spreading in a higher domain Clitic-Group, also effectively bans it in the lower domain PrWd or PStem. Similarly, the co-indexation of NO FLOP would have similar problems.

In order to solve the problem, I consider that coalescence and spreading operate in different strata, spreading occurs at the Word Level, together with glide formation, secondary articulation and elision, whereas coalescence at the Postlexical Level. I propose that at the Word level, glide formation is the default strategy, as illustrated so far, and at the Postlexical Level coalescence is the default hiatus resolution strategy. This means that at the Postlexical Level the strategy that prohibits coalescence, namely NO FLOP is at the bottom of the constraint hierarchy.

(32) **Level** **Ranking**

Word Level	NOFLOP >> UNIQUE
Postlexical Level	UNIQUE >> NOFLOP

This approach gives the correct result, such that in the Postlexical Level, coalescence is the optimal hiatus resolution strategy. This is shown in Tableau (33).

(33) Karanga/Zezuru: Coalescence (Postlexical Level)

/ɦá$_{1}$=ì$_{2}$-jì/	NO HIATUS	*COMP	*C^{ʕ}	ANCHOR L	MAX [open]	UNIQUE	NO FLOP
a. ɦá$_{1}$.ì$_{2}$jì	*!						
b.☞ ɦé$_{2}$.jì							*
c.ɦá$_{1}$.jì$_{2}$.jì						*!	
d. ɦì$_{2}$.jì					*!		

Candidate (c) which spreads fatally violates UNIQUE, and candidate (b) which coalesces is optimal. It violates the lowest ranked constraint NO FLOP. With this ranking, unless coalescence is blocked, it will be the optimal hiatus resolution strategy.

The constraint ranking for the Word and the Postlexical Levels are given in (34) and (35) respectively.

(34) Word Level

{NO HIATUS, MAXμ, *COMP, *C^{j},*C^{ʕ}, ALIGNL-PSTEM} >> ANCHOR L >> MAX[lab], MAX [open]>> UNIQUE >> NO FLOP >> MAXRT

(35) Postlexical Level

{NO HIATUS, MAXμ, *COMP, $*C^j$,$*C^ʕ$, ALIGNL-PSTEM} >> ANCHOR L >> MAX[lab], MAX [open]>> UNIQUE >> MAXRT >> NO FLOP

To sum up this section, I provide a list of the constraints that have been motivated so far. I divide the constraints into two categories, constraints that are never violated in hiatus resolution and the rest of the constraints.

(36) Constraints never violated in hiatus contexts:

NO-HIATUS
$$
\begin{array}{cc}
*\mu & \mu \\
| & | \\
\text{Rt} & \text{Rt}
\end{array}
$$
(Ola Orie and Pulleyblank 2002)

*COMPLEX
Complex onsets are prohibited.

$*C^j$
No palatalized consonants.

ANCHOR L
Any root node at the left edge of a morpheme in the input has a correspondent root node in the output.

(37) All the other constraints:

MAX Rt:
Every root node of the input has a correspondent root node in the output.

MAX [open]
Any [open] feature in the input must have a correspondent in the output.

MAX[LAB]
Any [labial] feature in the input must have a correspondent in the output.

MAX μ
A mora in the input must have a correspondent in the output.

NO-FLOP
Let [F] be a feature (autosegment) in the output representation, and let [F´] be the input correspondent of that feature. If the output feature [F] is dominated by a Root node

(segment) X, then the input feature [F´] must likewise be dominated by a Root node (segment) X´, where X´ is the input correspondent of X.

UNIQUE
$\forall x$, where x is a feature or class node, x must have a unique segmental anchor y.
(Benua 1997)

IDENT(VPlace)
The specification for VPlace of an input segment must be preserved in its output correspondent.

6.3. Hiatus at Within a Single Prosodic Stem (Word Level): Glide Formation, Secondary Articulation & Elision

This section describes and analyzes glide formation, secondary articulation, and elision in detail. The three strategies have a unique relationship. They operate at the Word Level, in exactly the same domain, and are banned at the Postlexical Level. At the Word Level, glide-formation, secondary articulation and elision operate inside a single Prosodic Stem. Table 6.1 provides the morphosyntactic constituents which map onto a single Prosodic Stem, where glide-formation, secondary articulation and elision.

Table 6.1 Non-Recursive PStem (Word Level): Domain for Glide Formation, Secondary articulation, & Elision

WORD LEVEL	HIATUS RESOLUTION STRATEGY
PROSODIC DOMAIN **PROSODIC STEM** (1) Inflected Quantitative Stem (2) Inflected Noun Stem (3) Inflected Possessive Stem	Glide-formation (GF), secondary articulation & elision

6.3.1 Glide Formation—The Default Strategy at the Word Level

Glide formation is assumed to be the default strategy at the Word Level and coalescence at the Postlexical Level, (Chapter 8). The assumption is that secondary articulation, elision and secondary articulation only do so when glide formation is blocked.

Glide formation is 'restricted' to the high vowels /u/ and /i/. There are no right contexts to test whether /e/ and /o/ would participate in glide formation. Examples 38(c) and (b) illustrate glide formation, involving /u/, 39(b) and 40(b) involving a high coronal vowel /i/. The far right column shows the different domains, the curly { } brackets show the PStem and the square brackets the Prosodic Word. In cases, where a given example contains more than a single word, the word in which hiatus occurs is in bold.

/u+V/→[wV]

Karanga/Zezuru

(38) a. /mù-tí ù-ʧá-kúr-a/ [mùtí ùʧákúrá] .
CL3.SG-tree CL3.SG-FUT-grow-FV
'the tree will grow'

b. /mù-tí **ù-ósé** ú-ʧá-kúr-a/ [mùtí **wósé** úʧákúrá] [{**wósé**}]
CL3.SG-tree CL3.SG-all CL3.SG-FUT-grow-FV
'the whole tree will grow'.

c. /mù-tí **ù-éɗú** ù-ʧá-kúr-a/ [mùtí **wéɗú** ùʧákúrá] [{**wéɗú**}]
CL3.SG-tree CL3.SG-1PL-POSS CL3.SG-FUT-grow-FV
'our tree will grow'

/i+V/→[jV]

Karanga/Zezuru

(39) a. /mì-tí ì-ʧá-kúr-a/ [mìtí ìʧákúrá]
CL4.PL-tree CL4.PL-FUT-grow-FV
'the trees will grow.'

b. /mì-tí **ì-ósé** í-ʧá-kúr-a/ [mìtí **jòsé** ìʧákúrá] [{**jòsé**}]
CL4.PL-tree CL4.PL-all CL4.PL-FUT -grow-FV
'all the trees will grow.'

(40) a. /Ø-ɦúkú ì-ʧá-f´-a/ [ɦúkú ìʧáfá]
CL9.SG-chicken CL9.SG-FUT-die-FV
'the chicken will die.'

b. /Ø-ɦúkú **ì-á^{n}gú** ì-ʧá-f´-a/ [ɦúkú **jà^{n}gú** ìʧáfá] [{**jà^{n}gú**}]
CL9.SG-chicken CL9.SG-mine CL9.SG-FUT-die-FV
'my chicken will die.'

The following generalizations can be drawn from the data:

(i) The high vowels [u] and [i] are glided when there is no consonant immediately preceding either vowel.
(ii) The opportunity for us to see whether [e] or [o] are glided never arises because these vowels do not occur in prefixes where there is no consonant immediately preceding them.
(iv) GF does not result in compensatory lengthening of the following vowel.

The behaviour of Karanga and Zezuru of not lengthening V_2 when V_1 is glided is in harmony with observations in the literature: It is argued that only languages with pre-existing weight or length distinctions trigger compensatory lengthening. Compensatory lengthening may, however, be blocked by some higher ranked constraints in such languages (Dechaine and Anderson 1979, Rosenthall 1994, Hubbard 1995, Hayes 1989). Luganda, for instance, a Bantu language spoken in Uganda, has a phonemic vowel length distinction, and exhibits compensatory lengthening when V_1 is turned into a glide.

Luganda

(41)	/li-ato/	[lja:to]	'boat'
	/ki-uma/	[kju:ma]	'metal object'
	/mu-iko/	[mwi:ko]	'trowel'
	/mu-ojo/	[mwo:jo]	'soul'

Adapted from Clements (1986:47)

Recall that the ranking that obtains in the at the Word Level is:

(42) Word Level
{NO HIATUS, MAXμ, *COMP, *C^{j},*$C^{ʕ}$, ALIGNL-PSTEM} >> ANCHOR L >> MAX[lab], MAX [open]>> UNIQUE >> NO FLOP >> MAXRT

Using this ranking, and only the crucial constraints, Tableau (43) provides a formal analysis of glide formation using the example, /ì-á^{n}gú/ realized as [jà^{n}gú] 'mine' (40b).

(43) Karanga/Zezuru: Glide formation

/ɦì$_1$-á$_2$^{n}gú/	NO HIATUS	ANCHOR L	UNIQUE	NO FLOP	MAX RT	MAX μ
a.[{ì$_1$.á$_2$. ^{n}gú}]	*!					
b.☞[{jà$_2$.^{n}gú]						*
c. [{à$_2$. ^{n}gú}]					*!	*
d. [{ì$_1$. ^{n}gú}]		*!			*	*
e. [{è$_2$. ^{n}gú}]				*!	*	*
f.[{ì$_1$.ʔ á$_2$^{n}gú}]			*!			

Candidate (a) is ruled out by NO HIATUS; it does not resolve hiatus. Candidate (b), which forms a glide is the winner. It violates the lowest ranked constraint MAX μ. Candidate (c) which elides V_1 fatally violates MAXRT and MAX μ. Candidate (d) which elides V_2 fatally violates ANCHORL. In addition, it violates MAX RT and MAX μ. Candidate (e) which coalesces by deleting V_1 and passing on the place feature to the following vowel fatally violates NOFLOP. In addition, it violates MAX RT and MAX μ. Candidate (f) which spreads is ruled out the by the constraint UNIQUE.

Glide-formation is the preferred strategy; it violates the least number of constraints, only one, and lowest ranked constraint. With the ranking presented, unless glide-formation is blocked, no other candidate can win over a candidate that forms a glide.

6.3.2 Secondary Articulation

When glide-formation is blocked, secondary articulation operates. GF is blocked by syllable structure constraints. Glide formation is blocked when V_1 is immediately preceded by a consonant. Secondary articulation occurs when a labial vowel /u/ or /o/ is V_1 and it is immediately preceded by a consonant that can be labialized.

In 44(a)-47(b), secondary articulation occurs when V_1 is /u/. In instances in which there is more than one word, the word in bold contains hiatus.

/Cu+V/→[C^{w}V]

Karanga/Zezuru

(44) a. /Ø-ɦúkú-rúmé/ [ɦúkúrùmè]

CL9.SG-chicken-male
'rooster'

b. /Ø-ɦúkú-àná/ [ɦúk^{w}áná] *[ɦúkwáná] [{ɦúk^{w}}{áná}]
CL9.SG-chicken-child
'chick'

(45) a. /mù-tí / [mùtí]
CL3.SG-tree
'tree'

b. /mù-àná/ [m^{w}àná] *[mwàná] [{m^{w}àná}]
CL1.SG-child
'child'

(46) a. /kù-^{m}bá kù-ja / [kù^{m}bá kùja]
CL17.LOC-hut CL17.LOC-DEM.
'that hut'
b. /kù-^{m}bá **kù-éɗú** / [kù^{m}bá **k^{w}éɗú**] *[kù^{m}bá **kwéɗú**] [{k^{w}éɗú}]
CL17.LOC-hut CL17.LOC-ours
'at our home'

(47) a. /rù-^{m}bó rù-nó/ [rù ^{m}bó rùnó]
CL12.SG-song CL12.SG-SELECT
'this very song'

b. /rù-^{m}bó **rù-ósé/** [rù ^{m}bó r^{w}ósé] *[rù ^{m}bó rwósé] [{r^{w}ósé}]
CL12.SG-song CL12.SG-all
'the whole song'

In example 48(b), secondary articulation occurs when V_2 is /o/.

/Co + V/→[C^{w}V/

Karanga/Zezuru

(48) a. /Ø-^{n}díró/ [^{n}díró]
CL9.SG-plate
'plate'

b. /Ø-^{n}díró-àná / [^{n}dír^{w}áná] *[^{n}dírwáná]
CL9.SG.-plate- DIMIN.
'small plate'

The generalizations drawn from the data are as follows:

(i) secondary articulation occurs when a V_1 labial vowel is immediately preceded by a consonant.
(ii) GF is banned when the labial vowel is immediately preceded by a consonant.
(iii) Similar to GF, secondary articulation does not result in the lengthening of the following vowel.

When there is a consonant immediately preceding V_1, GF is blocked. Shona does not allow clusters, and forming a glide would create a cluster. Recall that the constraint that bans complex onsets is *COMPLEX. In order to respect the constraints NO HIATUS, and *COMPLEX, and at the same time not lose the [labial] feature of V_1, secondary articulation is employed. A constraint that protects the [labial] feature is the constraint MAX[lab].

Using the example /mù-àná / realized as [m^{w}àná] 'child' (45b), Tableau (49) illustrates the proposed analysis of secondary articulation.

Tableau (49) Karanga/Zezuru: Secondary Articulation

/mù$_1$-à$_2$ná/	NO HIATUS	*COMP	ANCHORL	MAX [LAB]	UNIQ	NO FLOP	IDENT (VPlace)
a. [{mù$_1$.à$_2$.ná}]	*!						
b.☞[{m^{w}à$_2$.ná}]						*	
c. [{mwà$_2$.ná}]		*!					
d.[{mù$_1$.ʔ à$_2$.ná}]					*!		
e. [{mà$_2$.ná}]				*!			
f. [{mó$_2$.ná}]						*	*!
g. [{mù$_1$.ná}]			*!				

Candidate (a) is disqualified for not resolving hiatus. Candidate (b) which employs secondary articulation violates NO FLOP, and is the optimal candidate. Candidate (c) which forms a glide is ruled out for violating the undominated *COMPLEX. Candidate (d) which spreads is disqualified for violating UNIQUE, the constraint that bans spreading. Candidate (e) which elides, V_1 fatally violates MAX [LAB]. In all instances where secondary articulation occurs, the feature [labial] is preserved. Candidate (f) which coalesces violates NOFLOP, similar to the candidate that employs secondary articulation. However, candidate (f) is disqualified for violating IDENT (VPlace)— the constraint that prohibits a mismatch of the place features between an input segment and its correspondent output. Finally, candidate (g) that elides V_2 fatally violates ANCHORL.

The analysis demonstrates that when glide formation is blocked, the next best strategy is secondary articulation. It is better to preserve the VPlace features of the vowel than to elide them.

6.3.3 Elision

Elision only becomes applicable when both secondary articulation and glide formation are blocked. Depending on whether the higher ranked constraints that block secondary articulation are unique to one dialect or are common to both dialects, the blocking effects are manifested as intra-or inter-dialectal variation, respectively.

6.3.3.1 Coronal Vowel Elision

In both Karanga and Zezuru, glide formation is blocked when V_1 is /i/, or /e/ and is preceded by any consonant.

The examples in (50) and (51) illustrate that when V_1 is a coronal vowel /i/, secondary articulation is blocked and elision kicks in. In 54(b) V_1 is /e/. In instances where an example has more than one word, the word in bold contains hiatus.

- **/i/ elision**

		Karanga/Zezuru		
(50) a.	/ʧì-kómáná/ CL7.SG.DIMIN-boy ‘small boy’	[ʧìkómáná]		
b.	/ʧì-àná / CL7.SG-DIMIN.-child ‘small child’	[ʧàná]	[{ʧàná}]	*[{ʧ^{j}àná}]
(51) a.	/Ø-^{m}búd^{z}í/ CL9.SG-goat ‘goats’	[^{m}búd^{z}í]		
b.	/Ø-^{m}búd^{z}í-àná/ CL9.SG-goat-DIMIN. ‘kid’	[^{m}búd^{z}áná]	[{^{m}búd^{z}áná}]	*[{^{m}búd^{zj}áná}]

(52) /Ø-gùɗő **rì-àn^{g}ú** rì-ʧá-f´-a/ [gùɗ ó **ràn^{g}ú** rìʧáfá] *[gùɗő **r^{j}àn^{g}ú** rìʧáfá]
CL5.SG-baboon CL5.SG-mine CL5.SG-FUT-die-FV
'my baboon will die'

(53) /ʧì-nú **ʧì-òsé/** [ʧìnú **ʧòsé**] [{ʧòsé}] *[{ʧ^{j}òsé}]
CL7.SG-thing CL7.SG-all
'the whole'

- **/e/ elision**

(54) a. /Ø-gúb^{w}è Ø-ɗèmà/ [gúb^{w}è ɗèmà] [ɗèmà]
CL5.SG-wild animal CL5.SG-black
'young one of a *gubwe*'

b. /Ø-gúb^{w}è-àná/ [gúb^{w}ànà] [{gúb^{w}ànà}] *[{gúb^{wj}ànà}]
CL5.SG-wild animal-DIMIN.
'young one of a *gubwe'*.

When V_1 is a coronal vowel, (/i/ or /e/), both GF and secondary articulation are not possible. Forming a glide would create a cluster. Secondary articulation would create palatalized consonants (C^j). These segments are not part of the Shona phonemic inventory (§3.3).

I provide further motivation for the observation that it is V_1 that is consistently deleted. Consider the following examples (repeated from above), in which V_1 is elided. In the examples, V_1 is deleted regardless of its quality, and the nature of the morpheme in which it is found. In 55(a) & (b), the deleted V_1 belongs to the prefix, and it is /u/ and /i/ respectively. In 56(a) and (b) it belongs to the stem, and it is /i/ and /e/ respectively.

Karanga

(55) a. /mù-òjò/ [mòjò]
CL3.SG-heart
'heart'

b. /ʧì-àná/ [ʧàná]
CL7.SG-child
'child'

(56) a. /Ø-^{m}búd^{z}í-àná/ [^{m}búd^{z}áná]
CL9.SG-goat-DIMIN.
'kid'

b. /Ø-gúb^{w}è-àná/ [gúb^{w}ànà]
CL5.SG-type of animal-DIMIN.
'young one of a *gub^{w}e*'.

Based on the above evidence, it is safe to conclude that neither the quality of the vowel nor the nature of the morpheme in which the vowel is found matters: What matters is the position of the vowel in the hiatus context—whether it is V_1 or V_2. This observation is in harmony with the findings of Casali (1997). Casali carried out a comprehensive cross-linguistic investigation in order to establish the factors that determine which of two vowels in a potential hiatus sequence is deleted. His findings were that there is a strong cross-linguistic preference for deleting V_1 rather than V_2.

Using the example /ʧìàná / realized as [ʧà:nà] 'kid', Tableau (57), provides an analysis of elision in both Karanga and Zezuru.

Tableau (57) Karanga/Zezuru: Coronal Vowel Elision

/ʧì$_1$-à$_2$ná/:	NO HIATUS	*C^j	*COMP	ANCHORL	UNIQUE	NO FLOP	MAX RT
a. [{ʧì$_1$à$_2$nà}]	*!						
b.☞[{ʧà$_2$.nà}]							*
c. [{ʧì$_1$.nà}]				*!			*
d [{ʧ^{j}à$_2$.nà}]		*!					*
e.[{ ʧì$_1$ á$_2$nà}]					*!		
f. [{ʧé$_2$.nà }]						*!	*
g. [{ʧjà$_2$.nà }]			*!				

Candidates (a), (d), (f) and (g) are disqualified for violating the undominated constraints, NO HIATUS, *C^j , NO FLOP and *COMPLEX respectively. Candidate (b) and (c) both elide and consequently violate MAXRT. However, candidate (c) elides V_2, thereby fatally violating the highly ranked ANCHOR L. ANCHOR L protects segments that are at the left edges of morphemes. Candidate (b) which elides V_1 is optimal. Candidate (e) spreads and fatally violates UNIQUE. Candidate (f) which coalesces is disqualified for violating NO FLOP. Finally, candidate (g) which forms a glide, is disqualified for violating the constraint which prohibits complex onsets, namely *COMPLEX.

6.3.3.2 Pharyngeal Vowel Elision

This section examines the elision of a pharyngeal vowel. Similar to elision of a coronal vowel, elision of a pharyngeal vowel occurs when a pharyngeal vowel is V_1, and is immediately preceded by a consonant.

In examples 58(b) and 59(b), V_1 which is /a/ is elided.

$$/(C)\ a_1 + V_2\,/ \rightarrow [(C)\ V_2]$$

Karanga/Zezuru

(58) a. /ʋà-kómáná/ [ʋàkómáná]
CL2.PL-boy
'boys'

b. /ʋà-énì/ [ʋénì] [{ʋénì}]
CL2.PL-visitor
'visitor'

(59) a. /Ø-ᵐbùfùrá/ [ᵐbùfùrá]
Cl9.sg-young child
'young child'

b. /Ø-ᵐbùfùrá-àná/ [ᵐbùfùràná] [{ᵐbùfùràná}]
CL9.SG-young-DIMIN.
'very young child'

When a pharyngeal vowel is immediately followed by a consonant, both glide formation and secondary articulation are blocked. First, trying to turn /a/ into a glottal stop [ʔ] would create illicit clusters and the constraint *COMPLEX blocks glide formation. Second, secondary articulation, in which the vowel /a/ would be deleted and its pharyngeal feature passed onto the preceding consonant would also result in illicit segments. I propose an undominated constraint *Cˁ which bans pharyngealization.

(60) *Cˁ
No pharyngealized segments.

Using the example,where /ʋà-énì/ realized as [ʋènì] (58b), I provide a formal analysis of elision of the pharyngeal vowel /a/, highlighting the blocking of glide formation and secondary articulation.

Tableau (61) Karanga/Zezuru: Pharyngeal Vowel Elision

/ʋà$_1$-é$_2$nì/	NO HIATUS	*COMP	*Cˤ	ANCHORL	UNIQ	MAX [open]	MAX RT
a. [{ʋà$_1$.è$_2$.nì}]	*!						
b.☞ [{ʋè$_2$.nì}]						*	*
c. [{ʋà$_1$.nì}]				*!			*
d. [{ʋà$_1$.jé$_2$.nì}]					*!		
e. [{ʋá̯$_1$é$_2$.nì}]		*!					
f. [{ʋˤà$_1$.è$_2$.nì}]			*!				

Candidates (a), (c), (e) and (f), fatally violate the inviolable constraints NO HIATUS, ANCHORL, *COMPLEX and *Cˤ respectively. Candidate (d) is dismissed for violating UNIQUE. Finally, candidate (b), which elides V$_1$ is the optimal candidate, though it violates MAX[open] and MAX Rt

6.3.3.4 Inter-dialectal Variation: Labial Vowel Elision

In Karanga, when the consonant preceding a labial V$_1$ is a labial consonant, and V$_2$ is a labial vowel, secondary articulation is blocked and elision kicks in. In contrast, Zezuru allows secondary articulation to operate. In (62) and (63), GF is blocked.

/C*lab* u +o / → [C*lab* o]

			Karanga		Zezuru
(62) a.	/mù-tí/ CL3.SG-tree 'tree'		[mùtí]		[mùtí]
b.	/mù-òjò/ CL3.SG-heart 'heart'		[mòjò]	[m^{w}òjò]	[{mòjò}]/[{m^{w}òjò}]
c.	/mù-òtó/		[mòtó]	[m^{w}òtó]	[{mòtó}]/[{m^{w}òtó}]

CL3.SG-fire
'fire'

(63) a. /mù-Ø-m^{b}á mù-nó/ [mùm^{b}á mùnó] [mùm^{b}á mùnó]
CL18.LOC-9.SG-home CL18.LOC-SELECT
'in this very house'

b. /mù-ósé/ [mósé] [m^{w}ósé][{mósé}]/[{m^{w}ósé}]
CL18.LOC-QUANT
'in the whole'

The observations from the data are as follows:

(i) In Karanga, within a single PStem internally, secondary articulation is blocked in instances where doing so would violate the phonotactics of the dialect: where it would create a labial consonant (secondary articulation) followed by a labial vowel. In contrast, Zezuru, which does not impose such a restriction, employs secondary articulation.
(ii) V_1 is elided.
(iii) Similar to GF and secondary articulation, elision of V_1 does not trigger lengthening of the following vowel.

First, in both Karanga and Zezuru, C^{w} combinations are allowed in the language, and precisely, [m^{w}] (§3.3.2.2). [m^{w}] is a phoneme in both dialects. It occurs with all other vowels except the labial vowels. This means that in Karanga, what is banned must not be the segments [m^{w}] but the sequence [m^{w} V_{lab}], that is m^{w} must not be immediately followed by a labial vowel.

In both Karanga and Zezuru it is permissible to have the phoneme [m^{w}], being followed by a non-labial vowel. The following examples illustrate the occurrence of [m^{w}] with a pharyngeal or coronal vowel.

Karanga/Zezuru

(64) a. /mù-àná/ [m^{w}àná]
CL1.SG-child
'child'

b. /mù-èné/ [m^{w}èné]
CL1.SG-owner
'owner'

c. /mù-ìsé/ [m^{w}ìsé]
CL3.SG-tail
'tails'

In Karanga, there are no occurrences of /m^w/ and a labial vowel /o/. In Hannan's *Standard Shona Dictionary,* there are no lexical entries with /m^wo/ sequences for Karanga. In the dictionary, the lexical entries listed as having /m^wo/ sequences in Zezuru, are entered as /mo/ in Karanga. Consider the following examples adapted from Hannan (1987); I have included morpheme boundaries. In example 65(c), Karanga uses a different lexical item, hence the dash.

		Karanga	**Zezuru**
(65) a.	/mù-tí/ CL3.SG-tree 'a tree'	[mùtí]	[mùtí]
b.	/mù-ò^{n}dò/ CL3.SG-shaft of spear 'shaft of spear'	[mò^{n}dò]	[m^wò^{n}dò]
c.	/mù-òní/ CL3.SG-malice 'malice'	[mòní]	[m^wòní]
d.	/mù-òkò/ CL3.SG-hand 'basketful measure of millet'	--------	[m^wòkò]
e.	/ mù-òtò/ CL3.SG-fire 'fire'	[mòtò]	[m^wòtò]

In Karanga a constraint that bans [m^wo] and [m^wu] sequences is*[$C_{Lab}{}^wV_{Lab}$]. This constraint is inviolable in Karanga grammar, yet in Zezuru it is lowly ranked.

(66)

*[$C_{Lab}{}^wV_{Lab}$]
The sequence labialized labial consonant and a labial vowel are prohibited.

Second, when elision operates, V_1 is consistently eliminated. V_2 is 'protected'. The situation as illustrated above is different in the dialect of Karanga where in a comparable case elision and not secondary articulation operates. Tableau (67) exemplifies the analysis of elision in Karanga in the word /mù-òjò/ realized as [mòjò] 'heart.

Tableau (67) Karanga: Labial Vowel Elision

/[{mù$_1$-ò$_2$jò}]/	NO HIATUS	*COMP	*[$C_{Lab}{}^{w}V_{Lab}$]	ANCHORL	UNIQUE	MAX RT
a.[{mù$_1$.ò$_2$.jò}]	*!					
b.☞ [{mò$_2$.jò}]						*
c. [{mù$_1$.jò}]				*!		*
d. [{m^{w}ò$_2$.jò}]			*!			*
e.[{mù$_1$.wò$_2$.jò}]					*!	
f. [{mwò$_2$.jò}]		*!				

Candidates (a) and (f) are disqualified for violating the highly ranked constraints, NO HIATUS, and *COMPLEX respectively. Candidate (d), which employs secondary articulation is disqualified for violating *[$C_{Lab}{}^{w}V_{Lab}$] the constraint that bans the sequence of a labialized labial consonant and a labial vowel. This constraint effectively blocks secondary articulation. Candidate (c) which elides V_2 is disqualified for violating the highly ranked ANCHOR L. Candidate (c) also violates MAX RT. Candidate (b) is the optimal candidate; it elides V_2, and violates the lowly ranked MAX RT. Candidate (e) is dismissed for violating UNIQUE.

This section illustrated that when glide-formation and secondary articulation are blocked, elision kicks in.

6. 4 Summary

This chapter introduced the five hiatus resolution strategies employed in Karanga and Zezuru, namely glide formation, secondary articulation, spreading and coalescence. The chapter demonstrated the need to assume a Stratal approach, where at the Word Level, glide formation is the default strategy and at the Postlexical Level, it is coalescence. The chapter provided a detailed analysis of glide formation, secondary articulation and elision. Glide formation, secondary articulation and elision have a unique relationship, they not only occur at the Word Level, but at in the same domain, that is, inside a single PStem. When glide-formation, the default strategy is blocked, secondary articulation kicks in, and in turn, when secondary articulation is blocked, elision kicks in. Further evidence of the unique relationship between glide formation, secondary articulation and elision is that where one is inapplicable the other two are also inapplicable. This fact is demonstrated in the next chapter that examines spreading.

CHAPTER 7

SPREADING

7. 1 Introduction

This chapter describes and examines spreading. Similar to glide-formation, secondary articulation and elision, spreading operates at the Word Level. Spreading is where all or some of the features of the epenthetic segment are supplied by one of the input segments. Default segmentism is the opposite: it is where all the features of the epenthetic segment are inserted. The chapter argues that spreading is the preferred strategy at the Prosodic Stem edge. The default strategy, glide formation is blocked by an alignment constraint that requires the left edges of the Prosodic Stem and the syllable to be aligned. This same constraint disqualifies secondary articulation, elision and coalescence—they have the same misalignment effect.

This chapter argues that all the Karanga and Zezuru hiatus-breakers, viz., [j w ʔ ɦ], are best analyzed as products of spreading. The hiatus-breakers occur in complementary distribution. Each occurs in the context of a homorganic vowel. The intricate spreading pattern that this chapter argues for is as follows: [j] is a product of [coronal] spreading from [i] or [e], and [w] is a product of [labial] spreading from [o] or [u]. The glottal stop [ʔ] is a product of [pharyngeal] spreading from [a] with concomitant insertion of the feature [constricted glottis]. The glottal fricative [ɦ] is a product of [pharyngeal] spreading from [a] and spreading of the feature [spread glottis] from [ɦ], 'via' [a̤]. Lastly, the chapter provides some cross-linguistic data, showing how the spreading analyses can be applied to other languages and in other epenthetic contexts.

7.2. Domain for Spreading: The Prosodic Stem Boundary

Table 7.1 illustrates the different morphosyntactic constituents that map onto the Prosodic Stem.

Table 7.1 Spreading: Prosodic Stem Boundary (Word Level)

MORPHOSYNTACTIC CONSTITUENT	**WORD LEVEL**	**HIATUS RESOLUTION STRATEGY**
	PROSODIC DOMAIN	
1. STEMS	**(RECURSIVE PSTEM)**	
Macro Stem	PSTEM BOUNDARY	spreading
Inflectional VStem	PSTEM BOUNDARY	spreading
Reduplicated Verb Stems	PSTEM BOUNDARY	spreading
2 NOMINAL WORD	**(PROSODIC WORD)**	
A. Pre-prefixed Inflectional NStem	PSTEM BOUNDARY	spreading
B. Inflected Deverbal Stems • Deverbal Noun • Infinitives	PSTEM BOUNDARY PSTEM BOUNDARY	spreading spreading

7.3 Spreading and other Hiatus Resolution Strategies

Recall that in Karanga and Zezuru, at the Word Level, the preferred hiatus resolution strategy is glide formation, and when it fails secondary articulation or elision apply. At the PStem edge, in examples (1)-(6), spreading is employed to resolve hiatus. The the far right column illustrates the prosodic constituents; the Pstem is in curly brackets and the PrWd in square brackets.

		Karanga	**Zezuru**	
(1) a.	/ù^{n}g-a/ CL6.PL.OM-gather-FV 'gather !'	[wù^{n}gà]	[ù^{n}gà]	
b.	/rí-ù^{n}g-e/ CL5.SG.OM-gather-SUBJCT 'gather it'	[ríwù^{n}gè]	[ríwù^{n}gè]	[{rí{wù^{n}gè}}]

(2)	/ɦà-ì-kùm-i/ NEG-CL6.SG.OM-roar-SUBJCT. ‘it does not roar’	[ɦàjìkùmì]	[ɦàjìkùmì]	[{{ɦà}{jì{kùmì}}}]
(3) a.	/í^{m}b-a/ sing-FV ‘sing’	[jí^{m}bá]	[í^{m}bá]	
b.	/kù-í^{m}b-a/ sing-FV ‘sing!’	[jí^{m}bá]	[í^{m}bá]	[{kù{jí^{m}bá}}]
(4) a.	/ù-sáʋí/ CL14-gravy ‘gravy’	[wùsáʋí]	[ùsáʋí]	
b.	/mà-zì̯-ù-sáʋí/ CL6.PL-CL21.DEROG.-CL14-gravy ‘gravies’ derog.	[màzì̯wùsáʋí]	[màzì̯wùsáʋí]	[{mà{zì̯{wùsáʋí}}}]
(5) a.	/è^{n}d-a/ go-FV ‘go’	[jè^{n}dà]	[è^{n}dà]	
b.	/ʋà-è^{n}d-í/ CL2.PL-go-NOM ‘the goers’ (travelers)	[ʋàjè^{n}dí]	[ʋàjè^{n}dí]	[{{ʋà}{jè^{n}dí}}]]
(6) a.	/ór-a/ rot-FV ‘rot’	[wórá]	[órá]	
b.	/mù-ù-ór-ì/ CL18.LOC-CL14.-rot-NOM ‘in the corruption’	[mùwùwórì]	[mùwùwórì]	[{mù{wù{wórì}}}]

Spreading is the optimal hiatus resolution strategy. The crucial difference between the above contexts, and where glide formation, secondary articulation and elision were employed is that in the above examples hiatus occurs across a PStem edge, in a recursive PStem or inside a Prosodic Word in which a PStem is a constituent (§5.8). Armed with this crucial piece of information, I can explain why not only glide formation is banned but also secondary articulation and elision. The constraint that blocks glide formation, secondary articulation and elision from resolving hiatus across a PStem edge is ALIGNL-PSTEM, repeated here for convenience.

(7) ALIGN L-PSTEM
The left edge of a Prosodic Stem must coincide with the left edge of a syllable.

Glide formation, secondary articulation and elision would misalign the PStem and the syllable edges. In the above examples, coalescence is ruled out for the same reasons; it would misalign the left edge of the PStem and that of the syllable. I repeat the ranking established for the Word Level.

(8) Word Level

{NO HIATUS, MAXµ, *COMP, *C^j,*C^ʕ, ALIGNL-PSTEM} >> ANCHOR L >> MAX[lab], MAX [open]>> UNIQUE >> NO FLOP >> MAXRT

Using this ranking, I formalize the analysis of spreading in Tableau (9), highlighting that glide formation, secondary articulation and elision are ruled out by the alignment constraint.

(9) Karanga/Zezuru: Spreading as the Optimal Hiatus Resolution Strategy

/mù$_1$-à$_2$^{m}bùr-ì/	NO HIATUS	*COMP	ANCHORL	ALIGNL -PSTEM	NO FLOP	UNIQUE
a. [mù$_1${à$_2$.^{m}bù.rì}]	*!					
b. [mw{à$_2$.^{m}bù.rì}]		*!		*		
c. [m^w$_1${à$_2$.^{m}bù.rì}]				*!	*	
d. [mù$_1$.ʔ{à$_2$.^{m}bù.rì}]				*!		*
e.☞[mù$_1${ ʔ à$_2$.^{m}bù.rì}]						*
f. [m{à$_2$.^{m}bù.rì}]				*!		
g. [mù$_1$.{ ^{m}bù.rì}]			*!			
h. [m{ó$_2$.^{m}bù.rì}]				*!	*	

Candidate (a) and (b) fatally violate NO HIATUS and *COMPLEX respectively. Candidate (c) which employs secondary articulation is disqualified for misaligning the left edge of the PStem and syllable. It fatally violates ALIGNL-PSTEM. Candidate (d) which spreads and parses the product of spreading outside the PStem violates ALIGNL-PSTEM ,which requires the alignment of a PStem and a syllable. The candidate also violates UNIQUE. Candidate (e) which spreads and parses the glide inside the PStem is the optimal candidate. It violates UNIQUE. Candidate (f) deletes V_1 and fatally violates ALIGNL-PSTEM. Candidate (g) which elides V_2 is disqualified for violating ANCHOR L. Finally, candidate (h) which coalesces is ruled out by the constraint ALIGNL-PSTEM. The candidate also violates NO FLOP.

The analysis demonstrates that at the PStem edge, glide formation, secondary articulation and elision are banned and spreading operates. A deeper reading of the domains in which the strategies operate reveals that the trio of glide formation, secondary articulation, and elision, operate inside the single PStem, and at the PStem edge spreading occurs. Although all these strategies operate at the Word Stratum, the choice of which strategy operates where, displays an interaction between the hiatus resolution strategies and the prosodic constituents. Coalescence operates at the Postlexical Level, that is, across the PrWd boundary (chapter 8).

Owing to its alignment of the prosodic constituents (PStem and syllable), spreading is better than any of the strategies, secondary articulation, elision and coalescence which will always cause misalignment. Glide formation is always blocked when there is a consonant immediately preceding V_1.

Table 7.2 Hiatus Resolution Strategies and Levels and Domains

Hiatus Resolution Strategy	**Level & Prosodic Domain**
The 'trio': (i) glide formation (ii) secondary articulation (iii) elision	**WORD LEVEL** inside Non-Recursive PStem
spreading	Recursive PStem & PrWd (PStem edge)
coalescence	**POSTLEXICAL LEVEL** Clitic Group (PrWd edge)

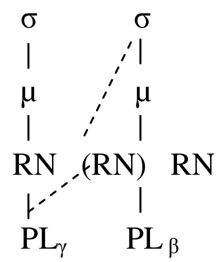
Having illustrated that spreading operates in the recursive PStem, and that the other strategies are barred from operating in this domain, the rest of the chapter examines spreading in depth.

7.4 Epenthesis: Spreading and Default Segmentism

Epenthesis is often used as a cover term for spreading and default segmentism. In spreading, all features are supplied by an input segment, and in default segmentism, all features of the epenthetic segment are inserted.

Without going into details of whether spreading is of the root node or V-Place, and whether it is spreading from V_1 or V_2, I illustrate the concept of spreading. For convenience, Figure 6.4 is repeated as 7.1.

Figure 7.1 Spreading

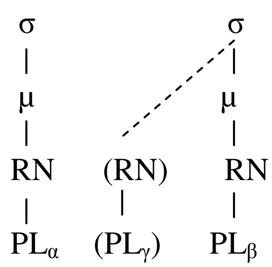


As pointed out earlier, the major demerit of spreading is that bijectivity is lost. A single feature is linked to more than one segment. This is penalized by the constraint, UNIQUE.

(10) UNIQUE
$\forall x$, where x is a feature or class node, x must have a unique segmental anchor y.

Figure 7.2 illustrates default segmentism.

Figure 7.2 Default Insertion



The major advantage of default insertion is that bijectivity is maintained. However, the major demerit is that all the features of the epenthetic segment are inserted: An input segment does not sponsor them. Karanga and Zezuru do not employ default segmentism, but intermediate cases exist. These are cases where some features are spread and others are inserted.

7.5 Spreading in Karanga and Zezuru

This section is organized based on the quality of V_2. The first subsection examines spreading from [coronal] and [labial] vowels, resulting in the oral glides, [j] and [w], respectively. The second section examines spreading from a [pharyngeal] vowel [a], resulting in either [ʔ], or [ɦ]. I make the following generalizations about Karanga and Zezuru spreading:

(i) All the hiatus breakers [j w ʔ ɦ], are products of spreading.
(ii) The hiatus breakers [j w ʔ ɦ] occur in complementary distribution: each occurs in the context of a homorganic V_2.
(iii) Karanga and Zezuru spread V-Place features from V_2 (tautosyllabic spreading).
(iv) The glottal stop [ʔ] is the only segment that involves spreading with insertion: V-Place features are spread from V_2 [a], and the laryngeal feature [c.g.] is inserted.
(v) [ɦ] is the only hiatus-breaker that involves spreading features from two different input segments: pharyngeal V-Place features are spread from V_2 [a], and the laryngeal feature [s.g.] is spread from a nearby [ɦ] 'via' a (pharyngeal) V_1 [a̤].

7.5.1 Spreading Resulting in Oral Glides: [j w]

[j] is used in the context of a coronal V_2 [i] or [e], and [w] in the context of a labial V_2 [u] or [o]. These glides are analyzed as products of V-Place spreading.

7.5.1.1 Spreading from a Coronal Vowel: [j]

Regardless of the quality of V_1, when V_2 is a coronal vowel, [i] or [e], the homorganic glide [j] functions as a hiatus-breaker.

In 11(a)-(d), V_2 is the coronal vowel [i], and in 12(a)-(e), V_2 is [e].

		Karanga /Zezuru	
(11) a.	/tà-ì-tòr-a/ 1PL.SM.PAST-OM-take-FV 'we took it.'	[tàjìtòrà]	[{{tà}{jì{tòrà}}
b.	/ʧì-ít-ó/ CL7.SG-do-NOM 'an activity'	[ʧìjító]	[{ʧì{ító}}
c.	/mù-ít-í/ CL1.SG-do-NOM 'a doer'	[mùjítí]	[{mù{ítí}}}]
(12) a.	/kà-én^d-a/ CL13.DIMIN.SUBJ.PAST-go-FV 'it went'	[kàjén^{d}á]	[{{kà}{jén^{d}á}}]

b.	/tì-éd^{z}e/ 1PL.SUBJ-try-SUBJCT ‘we (should) try’	[tìjéd^{z}é]	[{{tì}{jéd^{z}é}}]
c.	/mù-èd^{z}-e/ CL2.SG.SUBJ-try-SUBJCT ‘you should try’	[mùjèd^{z}è]	* [{mù{wèd^{z}è}}]

First, in all the above examples, V_2 is a coronal vowel [i] or [e]. Second, a homorganic glide, [j], is used as the hiatus-breaker. I analyze the glide as a product of spreading from V_2. The issue of what exactly is spread from V_2 will be addresses after showing the pattern involving the glide [w].

7.5.1.2 Spreading From a Labial Vowel: [w]

In the context of a labial V_2 [u] or [o], the homorganic glide [w] is used as a hiatus-breaker.

In examples in (13) and (14) below in which [w] is used as a hiatus-breaker; in examples 13(a)-(d), the labial vowel is [u], and in 14(a)-(c) the labial vowel is [o].

		Karanga /Zezuru	
(13) a.	/ʋà-út-í/ CL2.PL.-gather ‘the gatherers’	[ʋàwútí]	[{ʋà{wútí}}]
b.	/mì-ùrùr-ò/ CL4.PL-drill-NOM ‘drills’	[mìwùrùrò]	[{mì{wùrùrò}}]
c.	/kù-ù^{n}dùr-a/ CL15.INFV-pluck feathers-FV ‘to pluck feathers’	[kùwù^{n}dùrà]	[{kù{wù^{n}dùrà}}]
(14) a.	/pà-òr-a/ CL16.LOC.OM-rot-FV ‘it’s rotten’	[pàwòrà]	[{pà{wòrà}}]
b.	/tì-ón-e/ 1PL.SM.-see-SUBJCT ‘let us see’	[tìwóné]	[{tì{wóné}}]
c.	/kú-ó^{n}d-a/ CL15.INFV-thin-FV ‘to be thin’	[kúwó^{n}dá]	[{kú{wó^{n}dá}}]

In the above data, V_2 is a labial vowel [u] or [o]. The hiatus breaker employed is [w]. I analyze the glide [w] as a product of spreading from V_2. This is similar to the pattern observed for [j]. In both cases, the hiatus breaker and V_2 are homorganic. The claim that [j] and [w] are products of V_2 spreading naturally leads to the questions: What is spread? Is spreading from a mid vowel the same or different from spreading from a high vowel?

Although all the Karanga and Zezuru examples given above involve spreading from V_2, it is possible to spread from V_1. Cognizant of this fact, I illustrate both V_1 and V_2 spreading. In fact, illustrating V_1 spreading helps highlight its demerits. I exemplify spreading from the mid vowels [o] and [e], and from the high vowels [u] and [i].

Figure 7.3, represents spreading from the mid vowels. Spreading from the mid-vowels involves the insertion of a root node and spreading V-Place features. Figure 7.3(a) illustrates heterosyllabic V-Place spreading, and (b) tautosyllabic spreading.

Figure 7.3 V-Place Spreading

a. Heterosyllabic (V_1) b. Tautosyllabic (V_2)

The root node in parentheses is the inserted one. A constraint that militates against insertion of a root node is DEP RT.

(15) DEP RT
Every root node of the output has a correspondent root node in the input.

Notwithstanding bijectivity, $V_{2,}$ has the advantage of spreading within the same syllable—tautosyllabic spreading. In contrast, V_1 spreading (heterosyllabic spreading), has the demerit of linking features across a syllable boundary. A constraint that militates against spreading across a syllable boundary is CRISP EDGE σ:

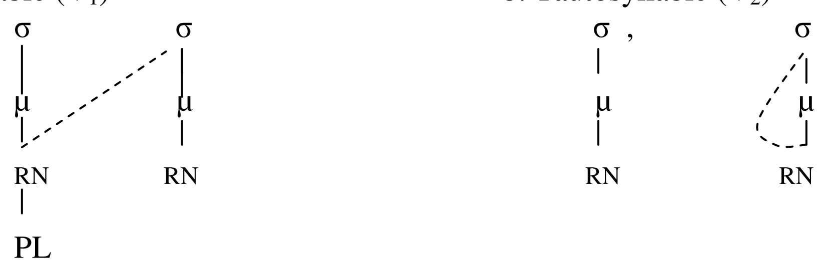
(16)

Crisp Edge σ
A syllable has fine edges (feature should not be shared across a syllable boundary)
Itô and Mester (1999:208).

In cases involving the high vowels [i] and [u], all the features are spread from the vowel. In Figure 7.4, I illustrate spreading from a high vowel, which is root node spreading. Figure 7.4(a), illustrates spreading from V_1 or heterosyllabic root node spreading, and Figure 7.3(b) demonstrates V_2, tautosyllabic root node spreading. Such an analysis is in agreement with the assumption that glides and high vowels have the same structure (§1.4.2).

Figure 7.4 Root Node Spreading

a. Heterosyllabic (V_1) b. Tautosyllabic (V_2)



In order to provide a unified analysis of spreading from the vowels, I analyze all spreading from the vowels, including the high vowels as involving spreading of place features, namely V-Place spreading. This means that I consider all such cases as involving root node insertion—similar to spreading from the mid-vowels (Figure 7.4). This approach calls for relativization of the constraint Dep to place features, viz., [coronal], [labial], [pharyngeal], in order to ban the insertion of place features. This is common practice in the literature, (see e.g., McCarthy & Prince 1995; Pulleyblank 1998). The constraint Dep (Place) is used as a cover constraint for (Dep [labial]; Dep [coronal]; Dep [pharyngeal]).

(17) Dep (Place)
A place feature in the output must have a correspondent (feature) in the input.

Tableau (18) provides a formal analysis of spreading from a high coronal vowel. This is representative of spreading from the coronal and the labial vowels.

(18) Karanga/Zezuru: Spreading From a Coronal Vowel: [j]

/mù-í^{m}bí/	NO HIATUS	DEP (Place)	CRISP EDGE σ	UNIQUE
a. mù**.**í**.**^{m}bí	*!			
b. mù**.** ʔí**.**^{m}bí		*!		
c. mù**.** w í**.**^{m}bí			*!	*
d. ☞ mù**.**j í**.**^{m}bí				*

Candidate (a) violates the undominated constraint NO HIATUS. Candidates (b) violates DEP(Place). Recall that I assume that the glottal stop is pharyngeal. Candidate (e) is the most harmonic candidate and violates the least ranked constraint UNIQUE. Candidate (d) violates CRISP EDGE σ and UNIQUE.

This section demonstrated that the oral glides [j] and [w] occur in complementary distribution. Each is used in the context of a homorganic V_2. [j] is used in the context of the coronal vowels [i] and [e], and [w] in the context of [u] and [o]. The hiatus breakers [j] and [w] are products of tautosyllabic spreading; V-Place spreading from V_2.

7.5.2 Spreading From a Pharyngeal Vowel: [ʔ] and [ɦ]

When V_2 is pharyngeal, either [ʔ] or [ɦ] is used as a hiatus breaker. I extend the V-Place spreading analysis of the oral glides to the glottal stop ([ʔ]) and the glottal fricative ([ɦ]). Consequently, I argue that they are products of V-Place spreading from V_2. However, in the case of the glottal stop and the glottal fricative more is involved: The glottal stop additionally involves the insertion of the laryngeal feature [constricted glottis] ([c.g]), and for the glottal fricative, the feature [spread. glottis] ([spr. gl.]) is spread from /ɦ/ via and intervening [a̤].

7.5.2.1 Spreading from a Pharyngeal Vowel Resulting in [ʔ]

The glottal stop is used as a hiatus-breaker in two contexts: first, when V_2 is pharyngeal (/a/) and V_1 is not /a/. Second, if both vowels in hiatus are pharyngeal and the consonant immediately preceding V_1 is not [ɦ].

Consider the examples in (19) in which the glottal stop is used as the hiatus-breaker.

		Karanga /Zezuru	
(19) a.	/pà-à-rí/ CL16.LOC-3SG.SUBJ-AUX 'where S/he is'	[pà.ʔà.rí]	*[pà.ɦà̤.rí]
b.	/tà-à-gón-a/ 1.PL.SUBJ-CL6.OBJ-manage-FV We managed them	[tà.ʔà.góná]	*[tà.ɦà̤.gó.ná]
c.	/tì-à-tór-e/ 1SG.SUBJ-CL6.PL.OBJ-take-FV 'we should take them'	[tì.ʔá.tó.ré[	*[tì.jà.tó.ré]
d.	/mù-à-ɓát-e/ 2PL.SUBJ-CL6.PL.OBJ-hold-SUBJCT 'you should hold them'	[mù.ʔà.ɓá.té]	*[mù.wà.ɓá.té]
e.	/tì-nò-à-ɗ-a/ 1PL.SUBJ-HAB-CL6.OBJ-want-FV 'we want them'	[tì.nò.ʔà.ɗà]	*[tì.nò wà.ɗà]

First, in the above data, V_2 is /a/. Second, the hiatus breaker employed is the glottal stop. The use of the glottal stop in the context of a homorganic V_2 is parallel to the use of the glides [j] and [w]. These were restricted to context were V_2 was homorganic. Consistent with my analysis of the oral glides, I consider that the pharyngeal place feature of the glottal stop is spread from V_2. Although in the literature the glottal stop is not analyzed as a product of spreading, Lombardi (2002:225) mentions that such an analysis is a possibility:

> … my analysis assumes that [ʔ] is Pharyngeal, following McCarthy (1989), and it seems likely that the vowel [a] is Pharyngeal as well. So in cases where a glottal stop only occurs with [a] it is possible that this is a case of inserting an agreeing segment as well, rather than emergence of the unmarked consonant.

The analysis of the glottal stop as a product of spreading raises the question of how the choice between [ʔ] and [ɦ] is made. Both are pharyngeal segments (§1.4.2). In addition, the claim that the pharyngeal place spreads from V_2, leads to the question of the source of the feature [c.g.]. Mindful of our representation of the glottal stop as having the feature [c.g], (§1.4.2), this is a legitimate question. I address the latter issue first.

In the examples in 19(a)-(e), in the input, there is no segment with the feature [c.g]. It is therefore inevitable to conclude that this feature is inserted. A constraint that militates against the insertion of the feature [c.g.] is DEP [c.g.].

(20) DEP [c.g.]
Any value of [c.g.] in the output must have a correspondent in the input.

I now turn to the issue of how the glottal stop [ʔ] is chosen over [ɦ]. Similar to our analysis of the glottal stop, the use of [ɦ] would involve spreading with insertion—spreading the [pharyngeal] feature from V_2, and the insertion of the laryngeal feature [s.g.]. A constraint that militates against inserting the feature [s.g.] is DEP [s.g.]:

(21) DEP [s.g.]
Any value of [s.g.] in the output must have a correspondent in the input.

Recall that in Shona, the glottal stop is not phonemic, but [ɦ] is (Table 3.2). In addition to [ɦ], there are breathy voiced consonants with the feature [s.g.]. The fact that the glottal stop is not phonemic means that the only way to get the feature [c.g.] onto a hiatus breaker with a pharyngeal place is through insertion. In contrast, in the right phonological environment, the feature [s.g.] can be spread (§7.5.2.2). The penalty for inserting [s.g.], which has a realistic chance of being spread, is greater than the penalty for inserting [c.g.] which has no chance of ever being spread. This gives the ranking:

(22) DEP[s.g] >> DEP[c.g.].

For this reason, it is better to insert [c.g.] than [s.g.]. Put differently, it is better to use the glottal stop as a hiatus-breaker than the glottal fricative.

Tableau (23) provides an analysis of cases involving the use of the glottal stop. The analysis underscores the choice of inserting [c.g.] ([ʔ]) over [s.g.] ([ɦ]). The candidate that inserts [s.g.] is less harmonic compared to the candidate that inserts [c.g.].

(23) Karanga/Zezuru: Spreading From a Pharyngeal Vowel: [ʔ]

/tì-à-tór-e/	NO HIATUS	DEP (Place)	DEP [s.g.]	CRISP EDGE σ	DEP[c.g.]	UNIQUE
a. tì.à.tó.ré	*!					
b. t ì. j à.tó.ré				*!		*
c. ☞tì. ʔ á. tó.r é					*	*
d. tì. ɦ ạ̤.tó.r é			*!			*
e. tì ɦạ̤.tó.ré		*!	*			
f. tì. ʔ à.t ó.r é		*!			*	
g. t ì.w à.tó.r é		*!				

Candidate (a) violates NO HIATUS. Candidate (b) fatally violates CRISP EDGE σ, which bans the spreading of features across a syllable boundary. It also violates UNIQUE. Candidate (c), is the optimal candidate and it violates DEP [c.g.] and UNIQUE. Candidate (d) violates DEP[s.g.], which prohibits the insertion of the feature constricted glottis. In addition it violates UNIQUE. Candidates (e), (f), and (g) violate the undominated constraint, DEP (Place) and are duly disqualified. Candidate (e) which employs the glottal fricative [ɦ] as the hiatus-breaker and (f) which involves insertion of the glottal stop [ʔ] have the place features inserted. Candidate (g) which employs [w] as the hiatus-breaker involves insertion of the [labial] feature.

This section has analyzed the glottal stop [ʔ] as a product of [pharyngeal] V-Place spreading from V_2 with insertion of [c.g.]. The analysis of the glottal stop as a product of [pharyngeal] V-Place spreading from V_2 highlights the complementary distribution of the hiatus breakers: each occurs in the context of a homorganic V_2. In addition, it provides a simple and unified analysis of the hiatus breakers [j], [w] and [ʔ].

7.5.2.2 Spreading from a Pharyngeal Vowel Resulting in [ɦ]

The use of [ɦ] as a hiatus-breaker occurs in a very restricted phonological environment. [ɦ] is used as a hiatus-breaker when the pharyngeal vowels are in sequence, and when the consonant immediately preceding V_1 is [ɦ].

Consider examples 24 (a) and (b) below in which [ɦ] is used as a hiatus-breaker.

		Karanga /Zezuru
(24) a.	/ɦà-à-gòn-i/	[ɦà̤.ɦà̤.gò.nì]
	NEG-3SG.SUBJ-manage-SUBJCT	
	's/he cannot manage'	
b.	/ɦà-á-fár-i/	[ɦà̤.ɦá̤.fá.rí]
	NEG-3SG.SUBJ-happy-SUBJCT	
	's/he is not happy'	

I advance four hypotheses about the source of the epenthetic [ɦ]:

(25)

(i) Hypothesis 1 (H1): [ɦ] is a product of spreading of ([phar]) VPlace and of [s.g].
(ii) Hypothesis 2 (H2): [ɦ] is a product of VPlace spreading and insertion of [s.g].
(iii) Hypothesis 3 (H3): [ɦ] is a copy of the input /ɦ/.
(iv) Hypothesis 4 (H4): [ɦ] is a product of default segmentism.

If H1, H2 or H3 is true, then the question about the sources of the [pharyngeal] and [s.g.] features become pertinent. If H1, H2 or H3 is true then the source of the feature [pharyngeal] could be:

(i) $V_{1.}$
(ii) $V_{2.}$
(iii) /ɦ/.

If H1 or H2 is true, then the source of the feature [s.g.] could be:

(i) default insertion.
(ii) spread from [ɦ] 'via'[a̤] in [ɦa̤] sequence.

The analysis presented so far is consistent with H1: The source of the feature [pharyngeal] is $V_{2.}$ In addition, I propose that the feature [s.g.] is spread from [ɦ] 'via' [a̤]. Before I give evidence in support of H1, and the source of the feature [s.g.], I address H4 first. With respect to H2 and H3, I address these as I present evidence in support of H1.

Similar to the other hiatus breakers, [j], [w] and [ʔ], the glottal fricative [ɦ] only occurs in the context of a homorganic V_2, viz., /a/. In addition, [ɦ] is only used in a context where there is an /ɦ/ (nearby) in the input. If [ɦ] were a product of default segmentism (H4), we would expect it to function as a hiatus breaker in contexts where there are no pharyngeal segments in the input: pharyngeal V_2 and input /ɦ/. Put differently, we would expect [ɦ] to occur in phonological environments where the input segments are non-homorganic. This however, is not the case. I, therefore, dismiss H4, which says that [ɦ] is a product of default segmentism.

The first evidence in support of H1, and that the feature [pharyngeal] is spread from V_2, comes from data in which there is at least one pharyngeal segment in the input but not V_2. In these examples, neither [ɦ] nor [ʔ] is used as a hiatus breaker.

In 26(a) and (b), V_1 is a pharyngeal vowel, and the consonant immediately preceding V_1 is [ɦ]. In 26(a), V_2 is a labial vowel, and in (b) it is coronal vowel. In 26(a) [w] is used as a hiatus breaker and in (b), it is [j].

Karanga /Zezuru

(26) a.	/ɦà-ú-gón-i/ NEG-2SG.SUBJ-manage-SUBJCT 'you cannot manage'	[ɦạ̀.wú.gó.ní]	[*ɦạ̀.ɦṳ́.gó.ní]	[*ɦạ̀.ʔú.gó.ní]
b.	/ɦà-í-f-i/ NEG -CL9-die-SUBJCT 'it will not die'	[ɦạ̀.jí.fí]	[*ɦạ̀.ɦḭ́.fí]	[*ɦạ̀.ʔí.fí]

Despite the presence of two pharyngeal segments in the input—/ɦ/ and V_1 ([a]), the hiatus-breaker is not a pharyngeal segment. Instead, a glide homorganic to V_2 is used. First, consistent with my analysis, I analyze this as V-Place spreading from V_2. This suggests that in examples 24(a) and (b), where there are three pharyngeal segments in the input, ([ɦ], V_1 and V_2), the source of the pharyngeal feature is V_2 just as V_2 is the source of [coronal] and [labial] V-Place features. If the source of the feature [pharyngeal] is [ɦ] or V_1, we would expect the feature to spread to the epenthetic slot in the above examples as well. This, however, is not the case.

Second, examples 26(a) and (b) demonstrate that in examples 24(a) and (b), the hiatus breaker [ɦ] was not a copy of the input /ɦ/. If copying did take place, it is reasonable to expect copying to take place in the above examples as well. Since this is not the case, the conclusion is that in 24(a) and (b), the epenthetic [ɦ] was not a copy. Accordingly, H3, which says the hiatus breaker [ɦ] is a copy, falls away.

Evidence that the feature [s.g.] is spread from [ɦ] via [a̤] comes from examples in which the glottal stop is used as the hiatus-breaker. In order to illustrate this point, I repeat examples 19(a)-(e) as 27(a)-(e) in which the hiatus breaker is the glottal stop. In these examples, V_2 is pharyngeal.

		Karanga /Zezuru	
(27) a.	/pà-à-rí/ CL16.LOC-3SG.SUBJ-AUX ‘where S/he is’	[pà.ʔà.rí]	*[pà.ɦà̤.rí]
b.	/tà-à-gón-a/ 1.PL.SUBJ-CL6.OBJ-manage-FV We managed them	[tà.ʔà.góná]	*[tà.ɦà̤.gó.ná]
c.	/tì-à-tór-e/ 1SG.SUBJ-CL6.PL.OBJ-take-FV ‘we should take them’	[tì.ʔá.tó.ré[	*[tì.jà.tó.ré]
d.	/mù-à-ɓát-e/ 2PL.SUBJ-CL6.PL.OBJ-hold-SUBJCT ‘you should hold them’	[mù.ʔà.ɓá.té]	*[mù.wà.ɓá.té]
e.	/tì-nò-à-ɗ-a/ 1PL.SUBJ-HAB-CL6.OBJ-want-FV ‘we want them’	[tì.nò.ʔà.ɗà]	*[tò.wà.ɗà]

I analyzed these examples as involving spreading with insertion. The feature [pharyngeal] is spread from V_2 and [c.g] is inserted. If the feature [s.g.] was inserted, this would be the perfect opportunity; no segment in the input bears this feature. Instead, [c.g.] was inserted. On the contrary, in the examples, /ɦà-à-gòn-ì/ and /ɦà-á-fár-í/, [ɦ] was used and not [ʔ]. The use of [ʔ] in these examples would have involved insertion of [c.g]. Since [s.g.] was available from the neighboring [a̤], which got it from [ɦ], it was cheaper to spread [s.g] than insert [c.g]. Based on the above reasons, I therefore propose that in the examples in (24), the source of the feature [s.g] was the input /ɦ/ and [a̤] ‘helped’ in the transmission of the feature.

The suggestion that the feature [s.g.], spreads to the epenthetic [ɦ] ‘via’ [a̤] finds support in the literature. Blankenship (2002), for example, did a phonetic study with the goal of addressing the following research questions:

(1) Is nonmodal phonation of *longer duration* in languages with contrastive phonation types?

(2) Is nonmodal phonation *more different* from modal phonation in languages with contrastive vowel phonation types?

In order to answer these questions, Blankenship compared nonmodal vowels in Mazatec and Tagalog. In Mazatec, breathy voice is distinctive for vowels, whereas in Tagalog it is not. For breathy voice, which is of direct interest to us, Blankenship used /h/ as the conditioning consonant. Blankenship’s findings were that in Tagalog, the vowels immediately following /h/

were breathy. However, in Mazatec, where breathiness is contrastive, it was ‘stronger’ than in Tagalog vowels. Blankenship (2002:1) says: ‘ In a language where breathiness … is a contrastive property of vowels, such nonmodal phonation lasts longer and is more differentiated from modal phonation than in a language where nonmodal phonation results from the influence of preceding consonants.” What is of interest is that the earlier suggestion that the breathiness of breathy consonants spreads onto the following vowel is not without merit.

Borrowings provide additional evidence that [s.g.] spreads from /ɦ/ onto the following vowel. When Shona borrows words that have a /b/, that /b/ is realized as a breathy voiced consonant, (Chimhundu 1983). The examples in 28(a) and (b) are borrowed from English, and in 28(c) and (d) from Afrikaans. In each of these examples, in Shona, the /b/ is breathy voiced [b̤].

	English	Shona	
(28) a.	/bætərɪ/	[b̤á̤tìrì]	‘battery’
b.	/bɛl/	[b̤é̤rà]	‘bell’
	Afrikaans	**Shona**	
c.	/baadje/	[b̤á̤ʧì]	‘coat/jacket’
d.	/betaal/	[b̤à̤d̤à̤rà]	‘pay’

(adopted from Hannan (1987)

Example (29) provides an illustration of a borrowing from Hebrew. The word contains a /b/ and displays hiatus. [ɦ] is employed to break hiatus. (Periods indicates syllable boundary).

	Hebrew	Karanga /Zezuru		
(29)	/baal/	[b̤á̤.ɦá̤.rì]	*[b̤a̤.ʔa̤.ri]	‘baal’ (a god)

The use of [ɦ] as a hiatus-breaker is consistent with my analysis: The pharyngeal feature spreads from V_2 and the feature [s.g] spreads from [b̤] via [a̤]. The use of [s.g] is cheap; all that the speaker does is spread the feature from the neighboring vowel.

In light of the above evidence, I conclude that in examples 24(a) and (b), repeated here as 30(a) and (b), the feature [pharyngeal] spread from V_2, and [s.g.] spreads from [ɦ] via [a̤].

		Karanga /Zezuru
(30) a.	/ɦà-á-gòn-i/	[ɦà̤.ɦá̤.gò.nì]
	NEG-3SG.SUBJ-manage-SUBJCT	
	's/he cannot manage'	
b.	/ɦá-á -fár-i/	[ɦá̤.ɦá̤.fá.rí]
	NEG-3SG.SUBJ-happy-FV	
	's/he is not happy.'	

Based on the evidence presented I draw the following conclusions:

(i) [ɦ] is a product of spreading (H1).
(ii) The pharyngeal feature spreads from V_2.
(iii) The laryngeal feature [s.g.] spreads from /ɦ/ via [a̤].

Using the example /ɦà-á-gòn-ì/, realized as [ɦà̤ɦá̤gònì] 's/he cannot manage' I provide a formal analysis of [ɦ] as a hiatus-breaker. Tableau (31) makes use of the proposed constraints so far. This analysis highlights some problems with the constraint CRISP EDGE σ. The constraint unfairly disqualifies candidate (c) which spreads the laryngeal feature [s.g.] across a syllable boundary. Accordingly, I propose to modify this constraint.

(31) Karanga/Zezuru: Spreading from a Pharyngeal Vowel: [ʔ]

/ɦà-á-gon-i/	NO HIATUS	DEP (Place)	DEP [s.g]	CRISP EDGEσ	DEP [c.g]	UNIQUE
a. ɦ à̤. á. g ò. n ì	*!					*
b. ☞ ɦ à̤. ʔ à. gò. n ì					*	*
[s.g.] c. ☹ ɦ á̤. ɦ á. g ò. n ì				*!		**

Candidate (a) violates NO HIATUS. Candidate (b) which inserts the feature constricted glottis violates DEP [c.g] and UNIQUE is the optimal candidate. Candidate (c) which is the expected winner is disqualified because it violates the highly ranked constraint CRISP EDGE σ. The feature [s.g.] is spread across a syllable boundary. The disqualification of candidate (c) goes against the prediction that if there is a chance to spread it is better to do so than insert.

Candidate (c), however, is unfairly ruled out by CRISP EDGE σ. The features barred from spreading across the syllable boundary are place features, and not laryngeal features. Any candidate that spreads place features across a syllable boundary, as illustrated below, never wins but spreading laryngeal features across a syllable boundary is acceptable. This calls for the relativization of the constraint CRISP EDGE σ to CRISP EDGE σ (Place). Place here is an abbreviation for the different place nodes [coronal], [labial] and [pharyngeal].

(32) CRISP EDGE σ (Place)
Place features should not be shared across a syllable boundary.

Tableau (33) provides an analysis in which a candidate that spreads the feature [s.g.] resulting in [ɦ] is optimal. The analysis helps underline the preference to spread [s.g.] rather than to insert [c.g.]. It shows that it is more costly to insert [c.g.] than spread [s.g.].

(33) Karanga/Zezuru: Spreading From a Pharyngeal Vowel and From [ɦ] via [a̤]

/ɦa-a-gòn-i/	NO HIATUS	DEP (Place)	CRISP EDGEσ(Place)	DEP [s.g]	DEP [c.g]	UNIQUE
[s.g] a. ɦ a̤. à. g ò. n ì	*!					**
[s.g.] b. ɦ a̤ ʔ à gò n ì					*!	**
[s.g.] c. ☞ ɦ a̤. ɦ a̤. gò.nì						****
[s.g] [s.g.] d. ɦ a̤. ɦ a̤. g ò. n ì				*!		***
[s.g.] e. ɦ a̤. ɦ a̤ gònì			*!			****
[s.g.] [s.g.] f. ɦ a̤. ɦ a̤ gòni		*!		*		
[s.g.] g. ɦ a̤. ʔ à.g ò.n ì		*!			*	
[s.g.] h. ɦ a̤.wà.gò.n ì		*!				

Candidate (a) violates NO HIATUS. Candidate (b) violates DEP [c.g] and UNIQUE. The optimal candidate (c), violates the constraint CRISP EDGEσ (Place) and UNIQUE. Candidate (d) violates DEP [s.g] and UNIQUE. Candidate (e) violates the highly ranked CRISP EDGE σ (Place), DEP [s.g] and UNIQUE. Candidates (f), (g) and (h) violate DEP (Place).

Candidates (b) and (c) are interesting. These candidates provide a flipside of the analysis in which insertion of [c.g.] was preferred over insertion of [s.g.] (Tableau 23). In Tableau (33), candidates (b) and (c) have their pharyngeal features spread from V_2—they only differ on the source of the laryngeal feature. Candidate (b) inserts [c.g.] while candidate (c) spreads [s.g.]. In this context, insertion of [c.g.] is less economical than spreading [s.g.], even if spreading involves crossing a syllable boundary. Put differently, spreading of anything (even [s.g.]) is better than insertion of any (laryngeal) feature, but insertion of [c.g.] is better than insertion of [s.g.]. These candidates underscore the preference for Karanga and Zezuru to spread whenever that is possible.

In Shona, there are no contexts in which a coronal or labial V_1 is immediately preceded by [ɦ], and V_2 is pharyngeal:

(34) ɦ $\left\{\begin{array}{l} \mathrm{i} \\ \mathrm{e} \\ \mathrm{u} \\ \mathrm{o} \end{array}\right\}$ + a

The context in (29) would have allowed us to see whether [ɦ] or [ʔ] would be used. Despite the lack of such an opportunity, my analysis predicts that the glottal fricative [ɦ] would be used: The feature [pharyngeal] would spread from V_2, and the feature [s.g.] from /ɦ/ 'via' V_1. I would go further and say that in ɦV sequences the V is breathy voiced [V̤].

7.6 Summary

The chapter demonstrated that the trio of glide formation, secondary articulation and elision are banned from operating across the Prosodic Stem edge. This is achieved by an alignment constraint that requires the left edge of the PStem and syllable to be aligned. This constraint effectively bans the other hiatus resolution strategies, secondary articulation, elision and coalescence.

The chapter analyzed all the hiatus-breakers [j w ʔ ɦ] as products of spreading. These hiatus-breakers are in complementary distribution. The palatal glide [j] occurs in the context of [i] and [e]; [w] in the context of [u] and [e]; [ʔ] and [ɦ] in the context of the pharyngeal vowel [a]. In addition, [ɦ] only occurs in the context of another [ɦ]. I analyzed this as V-Place spreading from V_2. Assuming that the glottal stop, the glottal fricative, and the vowel [a] are pharyngeal has helped to systematically account for the consistent use of [ɦ] or [ʔ] in the context of the vowel [a]. In the analysis, spreading from [a] results in either [ɦ] or [ʔ] albeit with laryngeal adjustments; spreading of [s.g.] for [ɦ] and insertion of [c.g.] for [ʔ]. Insertion of [c.g.]

is a consequence of lack of a segment with the feature [c.g.]. On the other hand, [ɦ] is restricted to contexts where all its features can be spread: [pharyngeal] spread from a pharyngeal V_2 and [s.g.] spread from [ɦ] via [a]. In conclusion, analyzing all the hiatus-breakers [j w ʔ ɦ] as spreading gives a unified and elegant account of the distribution of these hiatus-breakers in Karanga and Zezuru.

In sum, the broad cross-linguistic implication of my analysis is that many instances of hiatus-breakers and epenthetic segments that are traditionally analyzed as default insertion could be re-analyzed as products of spreading.

CHAPTER 8

COALESCENCE

8.1 Introduction

This chapter examines coalescence and assumes that at the Postlexical Level, coalescence is the preferred/default strategy. This is in contrast to the Word Level (chapters 6, 7, & 8), where the default strategy was assumed to be glide formation. This chapter argues that in instances where a clitic is monosegmental, coalescence is blocked and spreading kicks in. In addition, the chapter provides an analysis of 'coalescence' involving the floating features of the ghost augment. The floating place features of the augment and of the immediately preceding vowel 'coalesce' at the Postlexical Level but not at the Word Level. The cases involving the augment buttresses the the need of a stratal model such as LPM-OT. Finally, the chapter examines contexts where coalescence is expected to occur but fails—when the 3rd person pronoun and demonstratives function as enclitics.

8.2 Types of Coalescence: Asymmetric and Symmetrical

This section examines asymmetrical and symmetrical coalescence. The section illustrates that Karanga and Zezuru coalescence is not sensitive to the ordering of the vowels or the position of the vowels, such as being in a root or affix, but to both the Level and the domain in which hiatus occurs.

8.2.1. Asymmetrical Coalescence

Casali (1996) argues that asymmetrical coalescence is sensitive to the ordering of the vowels in hiatus. For example, cases where sequences of /V_1 + V_2/ in which V_1 has to be a low vowel and V_2 a high vowel coalesce to a mid vowel. In cases where the order of the vowels is reversed a different strategy applies. Examples (1) and (2) of Xhosa are from (Casali (1996). In 1(a) and (b), the vowels in sequence are /a/ and /i/ which coalesce to [e], and in 2(b), /a/ and /u/ coalesce to [o]. The root is in bold.

- **coalescence**

a+ i →[e]

(1) a. wa-**inkosi** [wenkosi]
‘of the chiefs’

b. na-**impendulo** [nempendulo]
‘with the answer’

- **coalescence**

a+ u →[o]

(2) a /wa-**umafazi/** [womufazi]
‘of the woman’

b. /na-**umuntu/** [womuntu]
‘with the person’

In (3) and (4), the order of the vowels found in (1) and (2) is reversed; V_1 is a high vowel and V_2 is a non-high vowel. In 3(a) and (b), V_1 is /u/ and V_2 is /a/ and hiatus is resolved through glide-formation. In 4(a) and (b), V_1 is /i/ and V_2 is /a/.

- **glide-formation**

u + a → [wa]

(3) a. /uku-**amkela/** [ukwamkela]
‘to receive’

b. uku-**ahlula/** [ukwahlula]
‘to divide’

- **elision**

(4) a. /ndi-**akha/** [ndakha]
“I build’

b. /ni-**enza/** [nenza]
‘you make’

In his analysis of coalescence, Casali explains the Xhosa data as exhibiting asymmetrical coalescence. The asymmetry is that when the low vowel is V_1 and the high vowel V_2, coalescence occurs as in (I) and (2). However, when the order of the vowels is reversed coalescence does not occur; in 3(a) and (b) glide-formation occurs, and in 4(a) and (b) elision takes place. It is crucial in Casali's analysis, that the morphological contexts in which the vowel sequences occur are the same[7]. Casali (1996) says that asymmetrical coalescence arises when both feature-sensitive and position-sensitive constraints are active in the evaluation of output candidates. He argues that the feature specification [-high] must be preserved in preference to [+high], otherwise all features of V_2 are to be preserved. The reason is that V_2 is always part of the root when a prefix and a root/stem are joined. Casali (1996) accounts for the Xhosa data, for example, by arguing that the asymmetrical coalescence shown is sensitive to both articulatory and contextual position. He does this by proposing both high-ranking context sensitive faithfulness constraints, which require faithfulness to feature specifications in a root, over general faithfulness to preserve features.

Casali's analysis of positional-faithfulness cannot account for the Karanga and Zezuru data. First, in Karanga and Zezuru, stem vowels do not have a privileged status. In §6.3.3, it was illustrated that in instances where elision is the optimal hiatus resolution strategy, stem-vowels are elided. Second, in Karanga and Zezuru, the quality of the vowel and the order of the vowels is not important in determining which strategy would apply. What is important is *where* hiatus occurs, in other words both the Level and the prosodic constituent in which the V-V sequence is found.

As illustration, in the Karanga and Zezuru (5) the vowels in sequence are /a/ and /i/, and in (6) they are /a/ and /u/, but different strategies are employed to resolve hiatus in the cases in 5(a) and (b), and in 6(a) and (b). In 5(a) spreading occurs and in 6(a), hiatus is resolved through spreading, and in 5(b) coalescence occurs and in 6(b) coalescence.

[7] In 3(a) and (b) where coalescence occurs, the forms are postlexical, they comprise of a clitic and a noun Umfazi. In 5(a), these look like infinitives, with /uku-/, having the characteristics of a noun class. It appears that the morphological contexts are not exactly the same. Where glide-formation occurs, this is word internal and where coalescence occurs this is postlexical.

/a + i/

- **spreading**

Karanga/Zezuru

(5) a. /ʋà-í^{m}b-í/ [ʋàjí ^{m}bí]
CL2.PL-sing-FV
'the singers!

- **coalescence**

b. /sá=ìní/ [séní]
ASSOC=ISG PRON
'like the me'

/a + u/

- **spreading**

(6) a /ʋà-új-í/ [ʋàwújí]
cl2.pl-come-nom
'sojourners'

- **coalescence**

b. /sá=ù-jú/ [sójú]
ASSOC=STAB.CL1.SG-PRON.AFX
'like the him/her'

The nature of the morphemes in which hiatus arises are different. In 5(a) and 6(a), hiatus occurs occurs at the Word Level, in an Inflectional Deverbal Stem which is a Recursive Prosodic Stem. Specifically, hiatus occurs at the PStem boundary. In 5(b) and 6(b), hiatus occurs at the Postlexical Level, across a clitic and a word, specifically across a clitic-Prosodic Word boundary.

Casali (1996) was at liberty to appeal to positional faithfulness constraints because in his analysis the V-V sequences appeared in the same morphosyntactic constituent, that is, across a prefix + root/stem boundary. In the Karanga and Zezuru data, appealing to positional faithfulness constraints is not feasible, and the best alternative is to identify the Levels or Stratum at which each strategy operates as well as the prosodic constituents. In 5(a) and (b) hiatus occurs at the Word Level, and it is resolved through glide-formation, secondary articulation, elision or spreading. At the Word Level, the prosodic constituents also determine which strategy operates. In the above examples, spreading is chosen because it is the strategy that resolves hiatus across a PStem boundary (Chapter 7). In 5(b) and 6(b), coalescence is chosen because this is a Postlexical domain. These facts cannot be reduced to positional faithfulness.

The behaviour of Karanga and Zezuru is akin to what is observed for Ciyao, (Ngunga 2000). Ngunga observed that across morphemes (within words), fusion (coalescence), glide-formation and elision apply without exception whenever each of the processes' structural description is met. However, across words (Postlexical) the situation is different. Ngunga (2003:33) observes that, "There are many cases in which the rules that apply across morphemes do not apply across words even when all conditions are met".

8.2.2 Symmetrical Coalescence

Casali (1996) describes symmetrical coalescence as a hiatus resolution process which neutralizes certain features in preference for other features. In symmetrical coalescence, the order in which the vowels in hiatus occur is irrelevant. The high-ranking constraints are feature sensitive constraints. In 7(a) and (b), V_1 is a non-high vowel, and the vowels coalesce to a mid vowel; [o] in 7(a) and [e] in 7(b). In 8(a) and (b), the order of the vowels is reversed and still the vowels coalesce.

(7) a. a + u →o

b. a + i→e

(8) a. u + a →o

b. i + a →e

8. 3 Domain for Coalescence: Clitic Group

Table 8.1 provides the constituents of the Clitic Group and the hiatus resolution strategies that operate in the domain.

Table 8.1 Clitic Group Domain: Coalescence

Clitic Group DOMAIN	HIATUS RESOLUTION STRATEGY
1. CV Proclitics Prepositions	coalescence
2. ENCLITICS A. VCV pronouns	coalescence
B. V CLITICS enclitic honorific/plural enclitic	spreading

8.4 Coalescence: VCV Clitics

This section examines coalescence that occurs across a host and a clitic where the latter is CV or VCV.

8.4.1 CV Proclitics

In (9)-(11), coalescence occurs across a CV prepositional enclitic and its host, which is a Prosodic Word. In all these cases, V_1 is consistently /á/ and V_2 is /ù/ or /ì/. In 9(a)-(c), V_2 is /ù/, and the coalesced vowel is [ó]. In 10(a)-(d), V_2 is /ì/, and the coalesced vowel is [é] and in 11(a)-(c), V_2 is /à/ and the coalesced vowel is [á]

Karanga/Zezuru

$/a_1 + u_2/ \rightarrow [o_2]$

(9) a. /ná=ù-j-ù/ [nójù]
ASSOC=STAB-CL1.DEM.AFX -V
'with this one'

b. /sá=ù-m-ù/ [sómù]
ASSOC-STAB-CL16.DEM.AFX-V
'like inside there'

c. /ɦá=ù-j-ù/ [ɦójù]
COP-STAB-CL1.DEM.AFX-V
'here he is!'

/a_1 + i_2/ → [e_2]

(10) a. /ná=ì-d^{z}ó/ [nèd^{z}ó]
ASSOC=STAB-CL10.PRON.AFX-V
'with it'

b. /sá=ì-kó/ [sékò]
ASSOC=STAB-CL13.PRON.AFX-V
'like the one'

e. /ɦá=ì-r-ì/ [ɦérì]
HORTATIVE-STAB-CL5.PRON.AFX-V
'here he is!'

/a_1 + a_2/ → [a_2]

(11) a. /ná=à-ʋò/ [náʋò]
ASSOC=STAB-CL2.DEMON.AFX-V
'with these ones'

b. /sá=à-kà/ [sákò]
ASSOC=STAB-CL13.DEM.AFX-V
'like the one'

e. /ɦá=à-w-à/ [ɦáwà]
HORTATIVE-STAB-CL5.DEM.AFX-V
'here they are!'

The general pattern that obtains with respect to coalescence is as follows:

(12) a + u > o
a + i > e
a + a >a

Recall that I analyze coalescence as the elision of V_1 with the preservation of the feature [open]. I list down the relevant proposed constraints:

(13) Constraints never violated in hiatus contexts:

NO-HIATUS

$$*\begin{array}{cc}\mu & \mu \\ | & | \\ \text{Rt} & \text{Rt}\end{array}$$

(Ola Orie and Pulleyblank 2002)

*COMPLEX
Complex onsets are prohibited.

ANCHOR L
Any root node at the left edge of a morpheme in the input has a correspondent root node in the output.

NO-FLOP
Let [F] be a feature (autosegment) in the output representation, and let [F´] be the input correspondent of that feature. If the output feature [F] is dominated by a Root node (segment) X, then the input feature [F´] must likewise be dominated by a Root node (segment) X´, where X´ is the input correspondent of X.

MAX [open]
Any [open] feature in the input must have a correspondent in the output.

MAX[LAB]
Any [labial] feature in the input must have a correspondent in the output.

UNIQUE
$\forall x$, where x is a feature or class node, x must have a unique segmental anchor y.
ALIGN L-PSTEM

The left edge of a Prosodic Stem must coincide with the left edge of a syllable.

I introduce an undominated 'anti-metathesis' constraint LINEARITY:

(14) LINEARITY
S_1 is consistent with the precedence structure of S_2, and vice versa.

Using these constraints, I provide a formal analysis of coalescence, in Tableau (15). The curly brackets { } indicate a PStem, the square brackets [ ] a PrWd and the angled brackets < > a Clitic Group. I have skipped including the constraint NO FLOP which is at the bottom of the constraint hierarchy at the Postlexical Level as well as at the Word Level.

(15) a + u > o

/sá$_1$=ù$_2$-m-ù/	NO HIATUS	*COMP	LINEARITY	ANCHOR L	ALIGNL -PSTEM	UNIQUE
a. <sá$_1$.[{ù$_2$.mù}]>	*!					
b. ☹<s[{ó$_2$.mù}]>					*!	
c. <sá$_1$.[{mù}]>				*!		
d. <s.[{ú$_2$mù}]					*!	
e. ☞<sá$_1$.[{wú$_2$.mù}]>						*
f. <sá̯$_1$[{ù$_2$mù}]>		*!			*	
g. <sá$_1$.[{m^w ù}]>			*!	*		

Candidate (a), which does not resolve hiatus violates the undominated NO HIATUS. Candidate (b), which coalescence V_1 and V_2, is disqualified for violating ANCHOR L. Candidate (c) which elides V_1 fatally violates ANCHOR L. Candidate (d) which elides V_1 misaligns the PStem and the syllable and is ruled out by the alignment constraint ALIGNL-PSTEM. Candidate (e), which spreads is the optimal candidate; it violates the lowly ranked UNIQUE. Candidate (f), which parses /a/ as part of the onset fatally violates *COMPLEX. Finally, candidate (g) which employs secondary articulation by passing on the feature of V_2, onto the following consonant, violates the undominated LINEARITY. The optimal candidate should be candidate (b) that coalesces.

With this ranking, coalescence, secondary articulation, and V_1 elision never wins over spreading. Spreading will always be better because it aligns the PStem and the syllable. Coalescence on the other hand, will always be less optimal because it will consistently violate this constraint. In order to resolve this problem, I appeal to Lexical Phonology and Morphology Optimality Theory (McCarthy & Prince 1993; Kiparsky 2000, 2003; Bermúdez-Otero 1999, 2007; Ito & Mester 2003; Rubach 2000). Spreading, glide formation, secondary articulation, and elision operate at the Word level and coalescence at the Postlexical. By positing these strata, it can be argued that at the Postlexical stratum misalignment is not an issue. Thus, ALIGNPSTEM, which rules out coalescence can be relegated to the bottom of the constraint hierarchy, and NO FLOP, which bans coalescence below yielding the correct result. In Tableau 16, candidate (b), which coalesces, is the optimal candidate, and (e) which spreads is ruled out by UNIQUE. Without the alignment constraint highly ranked, any candidate that elides V_1, which is always /a/, is ruled out by MAX [open], thus will never be optimal.

(16) a + u > o

/sá$_1$=ù$_2$-m-ù/	NO HIATUS	*COMP	LINEAR	ANCHL	MAX [open]	UNIQ	NO FLOP	ALIGN LPSTEM
a. <sá$_{1.}$[{ù$_{2.}$mù}]>	*!							
b. ☞<s[{ó$_2$.mù}]>							*	*
c. <sá$_1$.[{mù}]>				*!				
d. <s.[{ú$_2$mù}]					*!			*
e. <sá$_1$.[{wú$_2$.mù}]>						*!		
f. <sá̯$_1$[{ù$_2$mù}]>		*!						
g. <sá$_{1.}$[{m^w ù}]>			*!					

Candidate (a) which does not resolve hiatus is ruled out by NO HIATUS. Candidate (b), which coalesces is the optimal strategy, it violates the lowly ranked NO FLOP and ALIGNL-PSTEM. Candidate (c) which elides V2 is ruled out for violating ANCHOR L. Candidate (d) which elides V_1 fatally violates MAX[open]. Candidate (e) which spreads is disqualified for violating UNIQUE. Candidate (f) which parses /a/ as part of the ONSET violates *COMPLEX. Finally, Candidate (g), which passes on the [labial] feature of V_2 onto the following consonant fatally, violates LINEARITY—the candidate reverses the order of the input features.

The constraint ALIGNL-PSTEM, turns out to be also crucial in whether coalescence occurs or not. This observation calls for a revision of my earlier position that the impossibility of ranking coalescence with the other constraints in a single constraint system had to do with NOFLOP and UNIQUE. By ranking the constraint ALIGNL PSTEM highly in the Word Level, it prevents, coalescence at PStem edges, and by lowly ranking it at the Postlexical Level, it allows coalescence. At the Word Level, NO FLOP is ranked above UNIQUE and at the Postlexical level UNIQUE is above NO FLOP. The ranking is as follows:

(17) Word Level ALIGNL-PSTEM >>NO FLOP >> UNIQUE
Postlexical Level UNIQUE >>NO FLOP >> ALIGNL-PSTEM

Tableau (18) provides an analysis of cases in which /a + i/ coalescences to [e].

(18) a + i > e

/ɦá$_1$=ì$_2$-rì/	NO HIATUS	*COMPL	*C^j	ANCHORL	MAX [open]	UNIQ	NO FLOP	ALIGNL-PSTEM
a. <ɦá$_1$.[{ì$_2$rì}]>	*!							
b. ☞<h[{é$_2$.rì}]>							*	*
c. <ɦá$_1$.[{rì}]>				*!				
d. <ɦ[{ì$_2$.rì}]>					*!			*
e. <ɦá$_1$[{j ì$_2$rì}]>						*!		
f. <ɦá̯$_1$[{ì..rì}]>		*!						*
g. <ɦá$_1$.[{r^{j}ì}]>			*!	*			*	

Candidate (a) fatally violates NO HIATUS. Candidate (b), is the optimal candidate, it violates the lowly ranked NO FLOP and ALIGNL-PSTEM. Candidate (c) which elides V_2 is disqualified by the constraint ANCHORL. Candidate (d), which elides V_1, which is /a/, fatally violates MAX [open]. Candidate (e) which spreads is disqualified for violating UNIQUE. Candidate (f) which parses /a/ as part of the onset violates *COMPLEX. Candidate (g), which passes the features of the V_2 on to the following consonant fatally violates *C^j ; LINEARITY could have done the job as well.

Finally, Tableau (19) provides a formal analysis involving pharyngeal vowels.

(19) a + a > a

/ɦá$_1$=à$_2$-w-à/	NO HIATUS	*COMP	ANCHL	MAX [open]	UNIQ	NO FLOP	ALIGNL -PSTEM
a. <ɦá$_1$.[{à$_2$.wà}]>	*!						
b. ☞<ɦá$_1$.[{wà}]>						*	
c. <ɦ[{à$_2$.wà}]>				*!			*
d. <ɦà$_1$[{wà}]>			*!	*			
e. <ɦá$_1$[{ʔ à$_2$wà}]					*!		
f. <ɦá̯$_1$[{à$_2$wà}]		*!					

Candidate (a) fatally violates NO HIATUS . Candidate (b) which coalesces is the optimal candidate; it violates the lowly ranked constraints NO FLOP and ALIGNL-PSTEM. Candidate (c) which elides V_1 fatally violates MAX [open] and the lowly ranked ALIGNL-PSTEM. Candidate (d), which elides V_2, fatally violates ANCHORL, and MAX [open]. Candidate (e) which spreads is disqualified for violating UNIQUE. Finally Candidate (f) which parses V_1 as part of the onset violates *COMPLEX.

8.4.2 Enclitics

The enclitics are divided into two sections based on their prosodic shapes; the VCV and the monosegmental (V) clitics.

8.4.2.1 VCV Enclitics

The VCV clitics described in this section are first and second person pronouns that cliticize to a verb. Example 20(b) shows the 1st person plural as the clitic, and in 21(b), the clitic is the 1st person singular. In both examples, V_1 is /a/ and V_2 is /ì/.

Karanga/Zezuru

(20) a. /wà-ká-tór-a Ø-màrí / [wàkátórá màrí]
2SG.SUB-RP-eat-FV CL9-money
'you took money'

b. /wà-ká-tór-a=ìsú/ [wàkátòrèsú]
2SG.SUBJ-RP-eat-FV=1PL
'you took us'

(21) a. /ɓát-a Ø-màrí/ [ɓátá màrí]
touch-FV CL9.SG-money
'touch the meat'

b. /ɓát-a=ìní/ [ɓáténí]
touch-FV 1SG
'hold me'

The vowels /a/ and /ì/ coalesce to form [e]. This is similar to the coalescence pattern observed for the proclitics. The analysis for the enclitics is similar to that provided for the proclitics. I skip presenting a formal tableau; this does not add any new information.

8.5. Spreading: Monosegmental (V) Clitics

Coalescence fails to operate where we expect it to—that is at the Postlexical Level—between a V-final host and a V clitic.

In 22(a)-(c), the clitic is monosegmental. It is the question particle /i/. Spreading is employed to resolve hiatus.

(22) a. /wà-tór-e=ì/ [wàtóréjì] *[wàtóré]
3SG.SUBJ-take-FV=QP
'what did you take?'

b /ɓát-a=ì/ [ɓátájí] *[ɓáté]
touch-FV=PL/HON
'touch!

c. /gàr-a=ì/ [gàràjì] *[gàrè]
sit-FV=PL/HON
'sit!' (plural/honorific)

Examples 22(a) and (b) are instructive. The phonological conditions for coalescence are met—V_1 is /a/ and V_2 is /i/. However, instead of coalescence, spreading is the optimal hiatus resolution strategy. The difference between the examples in 22(a)-(c), and cases where coalescence was employed §8.3.1 and §8.3.2 is the prosodic shape of the clitics involved. In §8.3.1 and §8.3.2 the clitic is larger than a single syllable; it is VCV and in the examples in 22(a)-(c), it is monosegmental. Considering this observation, it seems plausible to conclude that coalescence is blocked when the clitic is monosegmental (V).

(23) IDENT (VClitic)

The featural specification of an input V-Clitic must be preserved in its output correspondent.

Tableau (24) provides a formal analysis of spreading when coalescence is blocked. I use the example /ɓát-á=ì / realized as [ɓátájí] 'touch!'(pl).

(24) Coalescence blocked: Spreading

/ɓát-á$_1$=ì$_2$/	NO HIATUS	*COMP	IDENT (V CLITIC)	ANCHORL	MAX [open]	UNIQ	NO FLOP
a ɓá.tá$_1$.ì	*!						
b. ɓá.té$_2$			*!		*		*
c. ɓá.tí$_2$					*!		
d ɓá.tá$_1$.				*!			
e. ☞ɓá.tá$_1$. [j ì$_2$.						*	
f. ɓá.tá̯$_1$.ì		*!					

Candidate (c) which coalesces is blocked by the inviolable IDENT (V CLITIC). With coalescence blocked, spreading kicks in. Candidate (f) which spreads is the optimal candidate.
When coalescence is blocked the other three strategies elision, glide-formation, and secondary articulation fail to apply for various reasons. First, the phonotactics of the language rule out glide-formation (*COMPLEX). Second, secondary articulation is ruled out by phonotactic constraints as well. (This confirms the point raised earlier about the unique relationship between glide-formation, secondary articulation and elision: where one operates, the others do, and where one is inapplicable, all of them are inapplicable. Finally, elision, which could possibly be of V_1 is ruled out by MAX[open].

8.6 The Ghost Augment

In §5.4.1.1, I argued that in Shona, there is a ghost augment with floating V-Place features. This section examines how the ghost augment participates in 'coalescence'. I argue that at the Postlexical Level the floating features of the ghost augment dock onto the preceding vowel. This is akin to coalescence.

In (25)-(27) are examples of the associative morpheme cliticizing to a noun. In (25a) and (b), the vowel of the associative is /a/; in 26(a) and (b), there is a mismatch—the underlying vowel is /á/ and the surface vowel is [ó]. In (27a) and (b), the underlying vowel of the associative is /á/ and the surface vowel is [é].

Karanga/Zezuru

(25) a.	/sá=ʋà-rúmé/		[sáʋàrúmé]
	ASSOC-CL2.PL-man		
	'like men'		
b.	/sá=kà-ᵐbá/		[sákàᵐbá]
	ASSOC-CL12.SG-house		
	'like a small house'		
(26) a.	/sá=mù-ʃá/		[sómùʃá]
	ASSOC-CL3.SG-home		
	'like a home'		
b.	/sá=mù-síkáná /		[sómùsíkáná]
	ASSOC-CL1.SG-girl		
	'like a girl'		
(27) a.	/sá=ʧì-kórò/		[séʧìkórò]
	ASSOC-CL7.SG-school		
	'like a school'		
b.	/sá=ʂ̫ì-kómáná/		[séʂ̫ìkómáná]
	ASSOC-CL2.DIMUN-boy		
	'like a boy'		

The alternations in the vowel of the associative vary according to the class of the noun to which the associative attaches. Recall that Marconnes (1931) pointed out that the quality of the augment vowel is similar to the initial vowel of the demonstrative (§5.4.1.1). In 25(a) and (b), the initial vowel of the demonstrative is /á/; in 26(a) and (b) it is /ú/; in 27(a) and (b) it is /í/ (see Table 5.6. The surface vowels are as follows: where the floating features of the augment are of the vowel /a/, the surface vowel is [á]; where it is /ú/, the surface vowel is [ó]; where it is [í], the surface vowel is [é]. This pattern is similar to coalescence, and it is summarized in (28):

(28) a. a + a > a
b. a + u > o
c. a + i > e

The 'coalescence' involving the floating features of the augment, and coalescence (proper) involving vowels in sequence are different. First, coalescence proper involves the elision of V_1 with the [open] feature being passed on to the following vowel. Second, the type of ‘coalescence’ involving the floating features of the ghost augment is different in that there is only one root node involved—the root node of V_1.

Additional constraints that are needed to provide an analysis of the floating features are:

(29) *FLOAT
Floating features are prohibited.

(30) DEP RT
Every root node of the output has a correspondent root node in the input.

(31) a + i > e

/sá$_1$=^{lab}mù$_2$-ʃá/	*FLOAT	NO HIATUS	*COMPL	LINEARITY	MAX [LAB]	DEP RT	NO FLOP
a.<sá$_1$.[{^{lab}mù$_2$.ʃá}]>	*!						
b. ☞<s[{ó$_2$.mù.ʃá}]>							*
c. <sá$_1$.[{mù.ʃá}]>					*!		
d. .<sá$_1$[{ù.mù$_2$.ʃá}]>		*!				*	
e. <sá$_1$.[{wù.mù.ʃá}]>						**!	

Candidate (a) which allows floating features fatally violates *FLOAT. Candidate (b) which ‘coalesces’ the floating features with the preceding vowel is the optimal candidate. It violates the lowly ranked NO FLOP. Candidate (c), which elides the floating features, fatally violates MAX [lab]. Candidate (d) which inserts a root node to be an anchor for the floating features fatally violates NO HIATUS. It also violates DEPRT. Candidate (e) which inserts a root node and resolves the resultant hiatus through spreading violates DEPRT.

An interesting aspect about the ‘coalescence’ involving the floating features of the ghost augment is that it is restricted to the Postlexical Level. At the Word Level, in Pre-Prefixed Inflectional Noun Stems (§5.6.1), the ghost augment does not coalesce with the root node of the preceding prefix. This is illustrated in 329(a)-(d). In parentheses is the ghost augment.

Karanga/Zezuru

(32) a. /kà-(u)mù-rúmé/ [kàmùrúmé] *[kómùrúmé]
CL13.SG.DIMIN-(AUG).CL1.SG-man
‘small man’

b.	/kà-(u)mù-tí/ CL13.SG.DIMIN-(AUG).CL3tree ‘small tree’	[kàmùtí]	*[kómùtí]
c.	/mà-zì-(a)và-ná/ CL6.PL-CL21.DEROG.-(AUG).CL2.PL-child ‘children’ derog.	[màzìvàná]	*[màzèvàná]
d.	/ʂì-(a)ʋà-ná/ CL19.DEROG.-AUG.CL2.PL-child ‘children’ derog	[ʂìʋàná]	*[ʂèʋàná]

There are three hypotheses that can be advanced about the lack of ‘coalescence’ between the class prefix and the floating features of the ghost augment. The first hypothesis is that there are no floating features of the ghost augment in pre-prefixation. In other words, the inner Inflectional Noun Stem lacks an augment. There is only one augment, which occurs on the outermost class prefix. This would suggest that the augment is a separate morpheme, yet in languages that have the augment it is part of the noun class prefix.

The second hypothesis is that the floating features of the ghost augment are there, but this is not a domain for coalescence, so a different strategy is employed to deal with the floating features. The second hypothesis is more plausible. So far, I have demonstrated that coalescence operates at the Postlexical and is banned at the Word Level. Cognizant of this fact, we can account for the lack of coalescence between the floating features of the augment and the preceding root node; this is at the Word Level where coalescence is banned. Specifically, the examples are of Pre-Prefixed Inflected Noun Stems, which are at the Word Stratum. Glide-formation, secondary articulation, elision and spreading should operate at this stratum. Since the above prosodic constituent, is a recursive PStem, spreading is optimal (Chapter 7). Given that spreading would involve the insertion of two root nodes, one for the floating features and the other for the product of spreading in order to resolve hiatus, this is uneconomical and there is no motivation for going this route. It appears the most economical thing to do is to elide the features.

The third hypothesis is that the features are allowed to float at the Word Stratum, but not at the Postlexical stratum. The second hypothesis that the features are deleted and the third which says that the features are allowed to float, have the same output form. In other words, on the surface, if the floating features do not coalesce there is no way of telling whether they have been deleted or they are still floating. However, without appealing to LPM-OT, it would be almost impossible to account for the behaviour of the floating features of the augment—crucially at the Word stratum, 'coalescence' is banned.

8.7 3rd Person Pronoun as Enclitic

Recall that in §5.9.1.2, the structure of the 3rd person pronoun was given as follows:

(33) Stabilizer + pronominal affix

When the 3rd person pronoun is a free form, the stabilizer is needed since the pronoun will be a Prosodic Word and must satisfy minimality. What is interesting is that Karanga, which tolerates monosyllabic words, also makes use of the stabilizer. When the pronoun is cliticized, the initial vowel (stabilizer) is not needed anymore.

In 34(a) and 35(a), when the 3rd person pronoun functions as a free form there is a [ì] (stabilizer). In 34(b) and 35(b), when the 3rd person pronoun functions as a clitic, the stabilizer [ì], is missing.

(34) a. /ɓát-a í-ʋò/ [ɓátá íʋò]
touch-FV STAB-3PL.PRON.AFX
'touch it'

b. /ɓát-a=ʋò/ [ɓátáʋò]
touch-FV STAB-CL2.PL.PRON. AFX
'touch them'

(35) a /rùm-a í-rò/ [rùmà írò]
bite-FV STAB-CL.5SG.-PRON. AFX
'bite that it'

b. /rùm-a=rò/ [rùmàró]
bite-FV STAB-CL.5SG.-PRON. AFX
'bite that it'

In 34 (b) and 35(b), where [ì] is missing, there are three hypotheses that can be advanced to account for this phenomenon. The first hypothesis is that the [ì] is epenthetic. Evidence in support of this hypothesis is adduced from three sources. First, the vowel stabilizer is [ì]; the general vowel used to augment sub-minimal Prosodic Words. In additin, the vowel carries a low tone pattern—the default tone in the language. Furthermore, the vowel does not participate in coalescence. If the vowel [ì] were underlying, we would expect it to participate in coalescence, similar to the initial vowels of the 1st and 2nd person pronoun.

The second hypothesis is that the vowel is underlying and it is deleted when the pronoun functions as a clitic. This is untenable. In instances where elision is used to resolve hiatus, it is V_1 that is deleted.

The third hypothesis is that the full form with an initial vowel and the form without the vowel are listed as allomorphs.

(36)	**Allomorph**	**Example**	**Gloss**
a.	STAB + PRONOUN AFFIX	í-rò	'it'
b.	PRONOUN AFFIX	=rò	'it'

The speakers use the appropriate allomorph in the right context. When the pronoun is in isolation, the speakers choose the full form that satisfies minimality. This is economical; there is no subminimality to repair. In instances when the pronoun functions as a clitic, the speakers choose the allomorph that contains just the pronoun affix 36(b). Choosing the allomorph without the vowel in cliticization is also economical—there is no hiatus to resolve.

The hypothesis that the forms are listed as allomorphs gives a better account of why Karanga uses the form that satisfies minimality. Although Karanga allows monosyllabic words, it is undeniable that a disyllabic Prosodic Word is better than a monosyllabic one particularly if it is gotten for free.

8.8 Demonstratives as Enclitics

In instances where demonstratives are enclitics, in both dialects coalescence does not occur. Considering that this is the domain for coalescence, this is surprising. In 37(b) and 38(b) the demonstratives function as free forms, and in 37(c) and 38(c) they are clitics.

(37) a. /wà-ká-tór-a Ø-màrí / [wàkátórá màrí]
2SG.SUB-RP-take-FV CL9-money
'you took money'

b. /wà-ká-tór-a ù-jù/ [wàkátòrá ùjù]
2SG.SUBJ-RP-take-FV=STAB.CL1-DEM.AFX
'you took him/her'

c. /wà-ká-tór-a=jù/ [wàkátòrájù]
2SG.SUBJ-RP-take-FV=DEM.AFX
'you took him/her'

(38) a. /ɓát-a Ø-màrí/ [ɓátá màrí]
touch-FV CL9.SG-money
'touch the money'

b. /ɓát-a ù-kò/ [ɓátá ùkò]
touch-FV STAB.CL15-FAR DEM.AFX
'hold there'

c. /ɓát-a=kò/ [ɓátákò]
touch-FV FAR DEM.AFX
'hold there'

Similar to the 3rd person pronoun, I wish to argue that the two forms are listed as two different allomorphs, the full form and the form without an initial vowel as given in (39).

(39)	**Allomorph**	**Example**	**Gloss**
a.	STAB + DEMONSTRATIVE AFFIX	ù-kò	'there
b.	DEMONSTRATIVE AFFIX	=kò	'there'

In contexts where minimality is an issue, the speakers chose the full form, and in contexts where it is not an issue, for example, where the form is a clitic the full form is used.

An examination of the behavior of the 1st and 2nd person pronouns on one hand and that of the 3rd person and the demonstratives on the other contributes to a deeper understanding of their structures. There is justification for considering that the initial vowel of the 1st and 2nd person pronouns are underlying. The vowel participates in coalescence when the pronoun is cliticized. In contrast, the 3rd person pronouns and the demonstratives have been argued to have two listed allomorphs; the full form and the pronominal affix.

8.9 Summary

This chapter examined coalescence, which operates at the Postlexical Level. Coalescence occurs across a clitic-host boundary in which the host is a Prosodic Word. In instances where the clitic is larger than a single segment, that is, CV or VCV, coalescence operates. However, in instances where the clitic is monosegmental (V), spreading occurs. The chapter argued that at the Postlexical Level, the floating features of the augment 'coalesces' by docking on to the preceding vowel. In contrast, at the Word Level, the floating features do not dock on to a preceding root node even if one is available. Finally, the 3rd person pronoun and the demonstratives do not participate in coalescence. The plausible hypothesis is to consider the 3rd person pronoun and the demonstratives as having two listed allomorphs, the full form and the form without the initial vowel—the stabilizer. The full form is used in contexts where minimality is an issue, and the form without the stabilizer where minimality is not an issue.

CHAPTER 9

PROSODIC MINIMALITY AND INITIAL ONSETLESS SYLLABLES

9.1 Introduction

This chapter examines prosodic minimality in Karanga and Zezuru, showing that Zezuru enforces a disyllabic minimal word requirement yet Karanga does not (Doke 1931, Marconnes 1931, Fortune 1955, Myers 1990, Mkanganwi 1995). The chapter, however, goes beyond earlier studies in several respects. First, the chapter makes a comparison between the two principal dialects of Shona—Karanga and Zezuru. Second, the chapter examines the connection between initial onsetless syllables and heterosyllabic VV sequences (hiatus). Both dialects have an absolute ban on heterosyllabic VV sequences (chapters 6, 7, 8), but the two dialects show variation with respect to initial onsetless syllables. Third, the chapter argues that Karanga shows 'domain-specific' effects such that initial onsetless syllables are banned in lexical or content words (i.e. nouns, verbs, adjectives, adverbs), but allowed in function words (i.e. determiners, demonstratives, pronominals). In contrast, Zezuru shows no domain effects and allows initial onsetles syllables in both lexical words and function words. This variation is summarized in Table 9.1 below.

Table 9.1. Distribution of Initial Onsetless Syllables

	Lexical Words	Function Words
Karanga	banned	allowed
Zezuru	allowed	allowed

This chapter goes further to argue that initial onsetless syllables in both Karanga and Zezuru do not display any other exceptional properties besides their apparent lack of onsets, and their confinement to initial position. These syllables, for example, can bear tone; they are visible to processes that count syllables, such as minimality and reduplication. Consequently, they are not extra-prosodic nor do they warrant some special prosodic status.

9.2 Prosodic Minimality

This section examines prosodic minimality, by looking at imperatives and monosyllabic Inflectional Nominal Stems, specifically Inflected Noun Stems (§5.4.1). The section illustrates that the two dialects display inter-dialectal variation: Karanga allows monosyllabic forms yet Zezuru augments these forms with an epenthetic [ì].

9.2.1. Imperatives

In Karanga and Zezuru, disyllabic imperatives and longer forms have the same form, yet in Zezuru, imperatives that are made up of a consonant (C) root and final vowel (CV) have an initial [ì] that is missing in the Karanga forms.

		Karanga	**Zezuru**
(1) a.	/p´-a/ give-FV 'give!'	[pá]	[ì.pá]
b.	/g^{w}\`-a/ fight-FV 'fight!'	[g^{w}à]	[ì.g^{w}à]
c.	/tór-a/ take-FV 'take!'	[tó.rá]	[tó.rá]
d.	/gúr-a/ cut-FV 'cut!'	[gú.rá]	[gú.rá]
e.	/ɲèm^{w}èrèr-a/ smile-FV 'smile!'	[ɲè.m^{w}è.rè.rà]	[ɲè.m^{w}è.rè.rà]
f.	/jèmùr-a/ admire-FV 'admire!'	[jè.mù.rà]	[jè.mù.rà]

I advance two hypotheses to account for the differences between the forms that have an [ì] initial; 1(a) and (b): the [ì] epenthesis hypothesis and the [ì] elision hypothesis. First, Zezuru imposes a disyllabic minimality requirement and it epenthesizes [ì] so that the imperative meets this requirement. The second hypothesis could be that Karanga elides the vowel [ì], to ensure that the imperative begins with an onset. This as will be shortly illustrated is not sustainable. In this context, it is important to note that the imperative stem is co-extensive with the Prosodic Word.

Evidence in support of the [ì] epenthesis hypothesis comes from infinitives. When the infinitive morpheme /kù-/ is prefixed to a monosyllabic imperative verb, there is no [ì] epenthesis:

Karanga/Zezuru

(2) a. /kù-p´-a/ [kù**.**pà] *[kùj**ì**pà]
CL15.INFIN-give-FV
'to give'

b. /kù- g^{w}\`-a/ [kù**.**g^{w}à] *[kùj**ì**g^{w}à]
CL15.INFIN-fight-FV
'to fight'

c. /kù-tór-a/ [kù**.**tó**.**rá]
CL15.INFIN-take-FV
'to take'

d. /kù-gúr-a/ [ku**.**gú**.**rá]
CL15.INFIN-cut-FV
'to cut'

e. /kù-ɓát-is-a/ [kù**.**ɓá**.**tí**.**sá]
CL15.INFIN-hold-CAUS-FV
'to cause (someone) to hold'

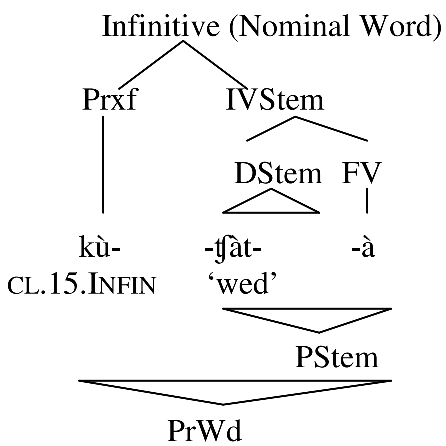
f. /kù-tór-ir-an-a/ [kù**.**tó**.**ré**.**rá**.**ná]
CL15.INFIN-take-APPL-REC-FV
'to take for each other'

The explanation for the lack of [ì] epenthesis in Zezuru could be that the infinitive /kù-/ (CV) and the monosyllabic Minimal Inflected Stem (CV) constitute a well-formed Prosodic Word (CV**.**CV). These examples involving a monosyllabic Inflected Verb Stem plus /kù-/ illustrate that the /kù/ + stem is a PrWd, but that the stem portion of the infinitive form is not a PrWd. It means that the form is not as shown in (3):

(3) *[$_{\mathrm{PRWd}}$ kù-[$_{\mathrm{PrWd}}$ pá]]

In other words, there is no nested Prosodic Word at least in such forms. If the inner word were a Prosodic Word, this would be subjected to the disyllabic minimality requirement, particularly for Zezuru speakers: In §5.4.1, it was shown that the class prefix /kù-/ attaches to a PStem to form a PrWd. For convenience, Figure 5.13, showing the structure of the infinitive, is repeated here as Figure 9.1.

Figure 9.1 Infinitive



Crucially, the attachment site for the infinitive /kù-/, (like any other class prefix) is the PStem (Figure 9.1b). The infinitive /kù-/ and the PStem form a PrWd.

Further evidence in support of the claim that [ì] is epenthesized comes from /i/ initial verb stems, that is verbs that have an underlying /i/. In these verb stems, the vowel /i/ is present even after the addition of the infinitive /kù-/, and hiatus is consistently resolved through spreading.

		Karanga	Zezuru	
(4) a.	/íᵐb-a/ sing-FV 'sing'	[jí. ᵐbá]	[í. ᵐbá]	*[ᵐbá]
b.	/kù-íᵐb-a/ cl15.INFIN-sing-FV 'to sing'	[kù.jí. ᵐbá]	[kù.jí. ᵐbá]	*[kù.ᵐbá]
(5) a.	/ít-a/ do-FV 'do'	[jí.tá]	[í.tá]	

b.	/kù-ít-a/ cl15.INFIN-do-FV 'to do'	[kù.jí.tá]	[kù.jí.tá]	*[kù.tá]
(6) a.	/ìr-a/ weigh-FV 'weigh'	[jì.rà]	[ì.rà]	
b.	/kù-ìr-a/ cl15.INFIN-weigh-FV 'to weigh'	[kù.jì.rà]	[kù.jì.rà]	*[kù.rà]

The presence of the vowel [i] even when the infinitive is added, and the unacceptability of forms in which it is deleted, demonstrate that the vowel /i/ is part of the stem: it is underlying. In addition, the [i]'s in the above data have different tone patterns. The examples in (4) and (5), have a high-toned [í]. In (6), the examples have a low-toned [ì]. This is in contrast to the epenthetic vowel which, barring other tonal processes, consistently carries a low tone.

I now address the issue of the constraints that are relevant for the analysis of minimality. Every Prosodic Word in Shona must be at least two syllables long. The requirement for the PrWd to be minimally binary is driven by the constraint WORD MINIMALITY (WDMIN).

(7) WORD MINIMALITY
Words are minimally disyllabic (WD $\geq \sigma\ \sigma$)

In Zezuru, in order to satisfy WDMIN, phonological material that is not found in the input is inserted, viz., the epenthetic vowel [ì]. This means that WDMIN must dominate an 'anti-epenthesis' constraint like DEP (Place).

(8) DEP (Place)
A Place feature in the output must have a correspondent (feature) in the input.

Although in hiatus contexts, DEP (Place) was never violated, since place features where spread from a neighboring vowel, in prosodic minimality contexts, particularly in Zezuru the constraint DEP (Place) is always violated. There is no way Zezuru can supply the much-needed second syllable without the insertion of a vowel.

In (9) and (10), I provide additional constraints relevant for the analysis of minimality.

(9) ONSET
*[$_\sigma$ V (syllables must have onsets)
(Itô 1989, Prince and Smolensky 1993)

(10) DEP RT
Every root node of the output has a correspondent root node in the input.

Considering that the optimal forms in Zezuru have epenthetic material and misalign the PStem and syllable edges, this means that DEP and ALIGN L must be ranked below WDMIN. Using the example /p´-a/, 'give', I formalize my analysis for Zezuru. I will skip DEP PLACE and will only include it where it is crucial to do so.

(11) Zezuru: Monosyllabic Imperatives

/ p´-a/	NO HIATUS	WDMIN	UNIQUE	ONSET
a. [pá]		*!		
b. ☞ [ì.pá]				*
c. [pá.j ì]			*!	
d. [pì. ʔ á]			*!	
e. [j ì.pá]			*!	
f. [(pá.j ì)]			*!	
g. [(pá.ì)]	*!			

Candidate (a) which is fully faithful, is monosyllabic and fatally violates WDMIN. Candidate (b) is the optimal candidate; it violates ONSET. Candidates (c), (d) and (e), which epenthesize [ì], and then spread to respect the inviolable NO HIATUS, fatally violate UNIQUE; initial onsetless syllables are not repaired in Zezuru. Candidate (g) which epenthesizes to satisfy WDMIN, and in the process creates hiatus which is not resolved, is ruled out by the constraint NO HIATUS.

In Karanga, it is more important for words to have an onset for the initial syllable than have a minimum of two syllables. In Karanga, ONSET is ranked above WDMIN. The analysis for Karanga is provided in Tableau (12).

(12) Karanga: Monosyllabic Imperatives

/pá/	No Hiatus	Onset	Unique	WdMin
a. ☞ [pá]				*
b. [ì.pá]		*!		
c. [pá.j ì]			*!	
d. [pì. ʔ á]			*!	
e. [j ì.pá]			*!	
f. [pá. j ì]			*!	
g. [pá.ì]	*!			

Candidate (a), which is the fully faithful candidate is the optimal candidate. It violates the lowly ranked WdMin. Candidate (b) which epenthesizes [ì] violates the highly ranked Onset. Candidates (c), (d), (e) and (f) fatally violate Unique; each of them involves the insertion of [ì] and spreading in order to resolve hiatus. Candidate (g) which epenthesizes and does not resolve hiatus violates the undominated No Hiatus. Comparing candidates (a) the winner, and candidate (b), (the winner in Zezuru), it is safe to conclude that in Karanga, it is more important to have onsets in initial syllables that have a Prosodic Word that is minimally two syllables long.

The variation between Karanga and Zezuru is achieved by re-ranking WdMin and Onset as shown in (13).

(13) WdMin >> Onset   Zezuru
Onset >> WdMin   Karanga

The variation exhibits the differences between the two dialects, Karanga enforces Onset at the expense of minimality and Zezuru enforces minimality at the expense of Onset. If the dialects were examined in isolation, this crucial information about both dialects was likely to be missed.

9.2.2 Monosyllabic Nominal Words

In Karanga, monosyllabic Nominal Words are not repaired, but Zezuru augments them through initial [ì] epenthesis.

In 14(a)-(f), Karanga and Zezuru disyllabic Nominal Words and those that are longer have the same form. However, monosyllabic ones in 14(a) and (b) display differences: in

Zezuru, they have an [ì], which is missing in Karanga forms.

(14) a.		**Karanga**	**Zezuru**
	/Ø-gò/ CL5.SG-wasp ‘wasp’	[gò]	[**ì**gò]
b.	/Ø-g^{w}à/ CL5.SG-canoe ‘canoe’	[g^{w}à]	[**ì**g^{w}à]
		Karanga/Zezuru	
c.	/Ø-gùɗò/ CL5.SG-baboon ‘baboon’	[gùɗò]	
d.	/Ø-sékúrú/ CL1a.SG-uncle ‘uncle’	[sékúrú]	
e.	/Ø-gùrùrù^{m}bá/ CL5.SG-larva ‘larvae’	[gùrùrù^{m}bá]	
f.	/Ø-ʃà^{m}bàkód^{z}ì/ CL5.SG-clay pot ‘clay pot’	[ʃà^{m}bàkód^{z}ì]	

In 14(a) and (b), the Minimal Nominal Stem (CV) and a zero noun class prefix are joined to form an Inflected Nominal Stem, which is a PStem that is co-extensive with the PrWd (§5.4.1). In Karanga, these forms surface as monosyllabic PrWd (CV), whereas in Zezuru they surface as VCV, with an initial [ì]. The disyllabic and longer forms do not show this variation between the dialects; the underlying form is the same as the surface form in both dialects.

Examples 14(a) and (b) can be analyzed in one of two ways. First, the [ì] found in Zezuru forms and missing in Karanga could be argued to be epenthetic. The prosodic motivation for [ì] epenthesis is to ensure that the Prosodic Word is disyllabic. Considering that in Zezuru words are minimally disyllabic, it is reasonable to assume that Zezuru augments the Prosodic Word with [ì]. In contrast, Karanga does not augment monosyllabic PrWds in order to obey the constraint ONSET.

A different explanation is that Karanga elides a stem-initial [ì] and Zezuru does not. It is plausible to argue that maybe in Karanga the requirement that words begin with onsets is highly ranked and the strategy employed to achieve that prosodic goal is elision. This, I shall call the [ì] elision hypothesis. This, as will be shortly illustrated, is not sustainable.

The first piece of evidence in support of the [ì] epenthesis hypothesis comes from plural formation. When the Nominal Words in 14(a)-(f) are made plural, as shown in 15(a)-f), they fall into class 6, which has a CV noun class prefix, viz., /mà-/. In both Karanga and Zezuru, when the CV prefix is attached to the monosyllabic stems, the surface forms do not have the vowel [ì].

Karanga/Zezuru

(15) a. /mà-gò/ [màgò] *[màj**ì**gò]
CL6.PL-wasp
'wasps'

b. /mà-g^{w}à/ [màg^{w}à] *[màj**ì**g^{w}à]
CL6.PL-canoe
'canoes'

c. /mà-kùɗɔ̀/ [màkùɗɔ̀]
CL6.PL-baboon
'baboons'

d. /mà-gùrùrù^{m}bá/ [màgùrùrù^{m}bá]
CL6.PL-larva
'larva'

It can be argued that the lack of [ì] epenthesis in the monosyllabic (15a & b) is because the CV noun class prefix and the CV stem constitute a well-formed PrWd, thereby making [ì] epenthesis redundant. However, in cases where the noun class prefix /mà-/ was added, it could be argued that the vowel [ì] was once again deleted: This time to avoid hiatus. This argument however, does not go through. In §6.3.3, it was illustrated that in the single PStem, when glide formation and secondary articulation were blocked, elision took over. However, due to the highly ranked constraint ANCHOR L, V_1 is consistently eliminated. The constraint is repeated below.

(16) ANCHOR L
Any root node at the left edge of a morpheme in the input has a correspondent root node at the left edge of the morpheme in the output.

Tone provides further evidence that the vowel [ì] in 14(a) and (b) is epenthetic. Barring any tonal processes, in Shona, epenthetic vowels consistently carry a low tone. This is the default tone in the language (Chimhundu 1983, Odden 1981, Myers 1990). As an illustration, the epenthetic vowels [ù] and [ì] (in bold) which are used in loanword adaptation to avoid a coda or to break-up an illicit cluster all carry low tones. Consider the examples in 17(a)-(d).

(17) a.	/tim/	[tím**ù**]	'team'
b.	/tub/	[ʧúb**ù**]	'tube'
c.	/grin/	[g**ì**rín**ì**]	'green'
d.	/treɪn/	[t**ì**rén**ì**]	'train'

In view of the evidence presented, it is reasonable to conclude that Zezuru augments monosyllabic words in order to satisfy WDMIN. Tableau (18), illustrates that the ranking that obtains for monosyllabic words is the same as the one that obtains for imperatives.

(18) Zezuru: Monosyllabic Nominal Words

/Ø-gò/	NO HIATUS	WDMIN	UNIQUE	ONSET
a. [gò]		*!		
b. ☞ [ì.gò]				*
c. [gò.ì]	*!			*
d. [j ì. gò]			*!	
e. [gò. j ì]			*!	

Candidate (a) fatally violates WDMIN. Candidate (b) which inserts [ì], to satisfy WDMIN is optimal; it violates the low ranked ONSET. Candidate (c) which inserts [ì] fatally violates NO HIATUS. Candidate (d) and (e) which insert [ì], and spread to resolve hiatus are ruled out by UNIQUE; Initial onsetless syllables go unrepaired in Zezuru.

In Karanga, ONSET is ranked high, together with NO HIATUS, and WDMIN is relegated to the bottom of the constraint hierarchy.

(19) Karanga: Monosyllabic Nominal Words

/Ø-gò/	NO HIATUS	ONSET	UNIQUE	WDMIN
a. ☞ [gò]				*!
b. [ì.gò]		*!		
c. [gò.ì]	*!			
d. [j ì. gò]			*!	
e. [gò. j ì]			*!	

Candidate (a) which is fully faithful is optimal; it violates the lowly ranked WDMIN. Candidate (b) which inserts [ì] word-initially fatally violates ONSET. Candidate (c) which inserts [ì] word-finally, creates hiatus, and it does not resolve it and consequently fatally violates NO HIATUS Candidate (d) and (e) fatally violate UNIQUE.

A comparison of the winning candidates in Karanga [(gò)], and Zezuru [(ì. gò)] shows that similar to the imperatives, it is more important for a Prosodic Word to have an initial onsetsetful syllable than to be minimally two syllables. In contrast, in Zezuru it is more important for a Prosodic Word to be minimally two syllables than have an initial onsetful syllable. This variation gives a different ranking for the constraint WDMIN and ONSET in the two dialects. This manifestation of inter-dialectal variation is captured by the re-ranking of ONSET and WDMIN given in (13).

9.3 Initial Onsetless Syllables

Karanga and Zezuru display inter-dialectal variation with respect to initial onsetless syllables. Zezuru allows initial onsetless syllables and Karanga bans them in lexical words but tolerates them in function words. I wish to extend the notion of domains to ONSET by arguing that in Karanga, ONSET takes the lexical words as its domain, and function words lack such a domain category. Consequently, the function words are exempted from this requirement.

9.3.1 Lexical Words

Karanga and Zezuru display variation with respect to lexical words. By lexical words, I refer to the content words whereas other words are classified as function words. In lexical words, Karanga strictly requires initial syllables to have onsets, whilst Zezuru allows initial onsetless syllables.

In the examples in 20(a)-(e), Karanga forms have a glide whereas in Zezuru such a glide or glottal stop is missing.

		Karanga	Zezuru
(20) a.	/Ø-ò^{n}dé/ CL5.SG-fig ‘fig’	[wò ^{n}dé]	[ò ^{n}dé]
b.	/ù-kúrú/ CL14-big ‘bigness’	[wùkúrú]	[ùkúrú]
c.	/í^{m}b-a/ sing-FV ‘sing!’	[jí ^{m}bá]	[í ^{m}bá]
d.	/é^{ŋ}gérér-a/ circle purposefully-FV ‘circle purposefully!’	[jé ^{ŋ}gérérá]	[é^{ŋ}gérérá]
e.	/à^{m}bùr-a/ ignite-FV ‘ignite!’	[ʔà. ^{m}bù.rà]	[à. ^{m}bù.rà]

The data can be explained as consonant epenthesis or deletion. First, it could be argued that Karanga epenthesizes a glide in order to provide an onset. Since the glide is homorganic to the neighboring vowel this can be analyzed as spreading. An analysis of spreading was presented in Chapter 7. In 20(a) and b, [w] is used in the context of [o] and [u] respectively. In 20(c) and (d), the glide [j] is used in the environment of the coronal vowels [i] and [e] respectively. Lastly, in 20(e) the glottal stop is used in the context of the pharyngeal [a]. In each of the examples, the features of the onset are supplied by the neighboring vowel. In §7.5.2.1, it was illustrated that the glottal stop was a product of spreading of the [pharyngeal] feature from [a] with concomitant insertion of the laryngeal feature [c.g.].

Second, it could be argued that in the forms in (20), Zezuru deletes an initial homorganic glide. The problem with this explanation is that there is no prosodic motivation for the deletion of the glide. Glide deletion would create word-initial onsetless syllables when in the world’s languages it is repeatedly shown that languages prefer syllables that have onsets. It could be argued, however, that the motivation for deletion is to avoid a homorganic glide and vowel being next to each other—a kind of obligatory contour principle (OCP) constraint. This position is untenable because Zezuru allows a homorganic glide and vowel to be next to each other. In (21) and (22) are examples of Zezuru words that contain glide-vowel sequences ([wo], [wu], [ji] & [je]). In these forms, deletion of the glides is not acceptable.

		Karanga/Zezuru	
(21) a.	/wòtá/ 'hopscotch'	[wòtá]	*[òtá]
b.	/wúrù/ 'wool'	[wúrù]	*[úrù]
(22) a.	/jìkì/ 'ideo of following in numbers'	[jìkì]	*[ìkì]
b.	/jèrèr-à/ 'inter of expressing suffering'	[jèrèrà]	*[èrèr-à]

The deletion of these glides is not acceptable in either dialect. The observation that these glides must surface in both dialects, particularly in Zezuru, demonstrate that they are underlying. Based on this evidence, in examples 20(a)-(e) where the homorganic initial glide was found in Karanga forms only, it is plausible to say that the glide was epenthesized to provide an onset to the initial onsetless syllable. There appears to be no apparent motivation for the deletion of the glide in Zezuru. Glides that are underlying, obligatorily surface since their deletion results in unacceptable words. In Chapter 7, it was illustrated that glides were inserted in hiatus contexts to resolve hiatus (provide an onset to the onsetless vowel). Consistent with these observations, it is plausible to assume that a glide is inserted.

In the light of the above observations, it is plausible to conclude that Karanga and Zezuru demonstrate inter-dialectal differences with respect to word-initial onsetless syllables. Karanga does not tolerate word-initial onsetless syllables in lexical words, and repairs this anomaly through spreading. Consistent with this observation, Karanga has no lexical words which are V-initial on the surface. Zezuru on the other hand, permits word-initial onsetless syllables, and as a result does not repair them, and allows V-initial lexical words on the surface.

In Zezuru, neither of these strategies applies to provide an onset for the initial onsetless syllable. A constraint that blocks any possible repair strategies, which may cause misalignment, is ALIGNL GrWd:

(23) ALIGN GrWd, L, PrWd, L
The left edge of the GrWd must coincide with the left edge of the PrWd.

The deletion of the initial segment is prohibited by the constraint ANCHOR L.

Using the example /ù-kúrú/ 'bigness', I formalize an analysis for Zezuru; the straight line indicates the grammatical word boundary.

(24) Zezuru: Initial Onsetless Syllables In Lexical Words

/ù-kúrú/	ALIGN GrWd	ANCHOR L	UNIQUE	ONSET
a.☞[|ù.kú.rú]				*
b. [w|ù.kú.rú]	*!		*	
c.[|wù.kú.rú]		*!	*	
d. [|jù.kú.rú]		*!		
e. [j|ù.kú.rú]	*!			
f. [|kú.rú]		*!		

Candidate (a) which is the fully faithful candidate is the winner. It violates the lowly ranked ONSET. Candidate (b) which spreads, misaligns the grammatical word and the Prosodic Word and it fatally violates ALIGN GrWd. In addition, it violates UNIQUE. Candidate (c) which spreads, with the product of spreading [w] being part of the grammatical word, is disqualified for violating ANCHOR L: it epenthesizes a segment at the left edge of a stem. In addition, it violates UNIQUE. Candidate (d) which inserts [j], and parses it as part of the grammatical word, suffers a similar fate to candidate (c); it fatally violates ANCHORL. Candidate (e) is ruled out by ALIGN GrWd. Finally, candidate (f) which elides /u/ fatally violates ANCHOR L.

In Karanga, which requires an onsetful initial syllable, the constraint ONSET is highly ranked and ALIGN GrWd is lowly ranked to allow initial onsetless syllables to be repaired through spreading. This is formalized in Tableau (25).

(25) Karanga: Initial Onsetless Syllables Banned in Lexical Words

/ù-kúrú/	ONSET	ANCHOR L	UNIQUE	ALIGN GrWd
a. [|ù.kú.rú]	*!			
b. ☹ [w|ù.kú.rú]			*	*
c. [|w ù.kú.rú]		*!	*	
d. [|jù.kú.rú]		*!		
e. ☞ [j|ù.kú.rú]				*
f. [|kú.rú]		*!		

The fully faithful candidate, which does not provide an onset for the initial syllable is ruled out by the undominated constraint ONSET. Candidate (b), which is supposed to be the optimal candidate violates the lowly ranked ALIGN GrWd. Candidate (c) which is optimal provides an onset but the onset is parsed as part of the grammatical word and fatally violates ANCHOR L. It also violates UNIQUE. Candidate (d) which inserts a palatal glide [j] and parses it as part of the grammatical word, fatally violates ANCHOR L. Candidate (e) is the optimal candidate, it inserts [j], parses it outside the grammatical word but inside the PrWd. It violates the lowly ranked ALIGN GrWd.

The problem in Tableau (25) is that candidate (b) which is supposed to be the winner loses out to candidate (e) because it is ruled out by UNIQUE.

In order to resolve this problem, there is need to appeal to DEP(Place). Ranking DEP (Place) below ONSET, but above UNIQUE rules out the default insertion of a segment but allows spreading in order to repair the initial onsetless syllable. This is formalized in Tableau (26).

(26) Karanga: Initial Onsetless Syllables Banned In Lexical Words

/ù-kúrú/	ONSET	ANCHOR L	DEP (Place)	UNIQUE	ALIGN GrWd
a. [|ù.kú.rú]	*!				
b. ☞ [w|ù.kú.rú]				*	*
c. [|w ù.kú.rú]		*!		*	
d. [|jù.kú.rú]		*!			
e. [j|ù.kú.rú]			*!		*
f. [|kú.rú]		*!			

Candidate (e) is now ruled out by the constraint DEP(Place), and candidate (b) which spreads and parses the glide [w] outside the grammatical word but inside the PrWd is the optimal candidate. It Violates the lowly ranked ALIGN GrWd. The inter-dialectal variation between Karanga and Zezuru is achieved by re-ranking the constraints ALIGN GrWd and ONSET.

(27) ALIGN GrWd >> ONSET — Zezuru
ONSET >> ALIGN GrWd, — Karanga

9.3.2 Function Words

Unlike in lexical words, Karanga allows initial onsetless syllables in function words. Zezuru, which was shown to allow initial onsetless syllables in lexical words, behaves consistently: it allows these initial onsetless syllables in function words as well.

In 28(a)-30(b), in both Karanga and Zezuru, in function words initial onsetless syllables are allowed: 28 (a)-(f) shows pronouns; 29(a)-(e) demonstratives; 30(a), conjunction; 30(b) number; 30(c) and (d) interjective.

Karanga/Zezuru

(28) a. /ìmí/ [ìmí] *[jìmí]
'you' 1PL

b.	/ìsú/ 'we/us'	[ìsú]	*[jìsú]
c.	/ìwé/ 'you' 1PL	[ìwé]	*[jìwé]
d.	/ìní/ 'I/me'	[ìní]	*[jìní]
e.	/íjé/ 'he/she'	[íjé]	*[jíjé]
f.	/íʋò/ 'them'	[íʋò]	*[íʋò]
(29) a.	/ùjù/ 'this one'	[ùjù]	*[wùjù]
b.	/àʋà/ 'those ones'	[àʋà]	*[ʔàʋà]
c.	/ìjì/ 'those ones'	[ìjì]	*[jìjì]
d.	/ù-j-ò/ 'this one'	[ùjò]	*[wùjò]
e.	/àʋò/ 'those ones'	[àʋò]	*[ʔàʋò]
(30) a.	/àsí/ 'conjunction: but'	[àsí]	*[ʔàsí]
b.	/ìnà/ 'four'	[ìnà]	*[jìnà]
c.	/èɦé/ 'That's right'	[èɦé]	*[jèɦé]
d.	/òɦó/ 'I see'	[òɦó]	*[wòɦó]

In Zezuru, the ranking that obtains for the lexical words applies to the function words.

(31) ALIGN GrWd >> {ANCHOR L, DEP(PLACE)} >> UNIQUE >> ONSET

Tableau (32) that shows that in Zezuru, function words are allowed to have initial onsetless syllables.

(32) Zezuru: Initial Onsetless Syllables In Function Words.

/ìmí/	ALIGN GrWd	ANCHORL	DEP (Place)	UNIQUE	ONSET
a.☞[|ìmí]					*
b. [j|ìmí]	*!			*	
c. [w|ìmí]	*!		*		
d. [|mí]		*!			

In Zezuru, the fully faithful candidate, which violates ONSET, is the winner. Candidates (b) and (c) are disqualified for misaligning the grammatical word and the Prosodic Word. They violate ALIGN GrWd. Candidate (d) is disqualified for violating ANCHORL.

Whilst Zezuru displays consistent behavior with respect to initial onsetless syllables, Karanga displays an asymmetry: initial onsetless syllables are banned in lexical words but allowed in function words. In Karanga, the ranking that obtains for the lexical words, cannot account for the function words. The ranking for the lexical words is as follows:

(33) ONSET >> {ANCHOR L, DEP(Place)} >> UNIQUE >> ALIGN GrWd

In Karanga, this ranking yields the wrong results. In Tableau (34), candidate (b) which provides an onset for the initial syllable through spreading is the optimal candidate. The winner should be candidate (a), which does not provide an onset for the initial syllable. This candidate is ruled out by the constraint ONSET.

(34) Karanga: Initial Onsetless Syllables In Function Words

.

/ìmí/	ONSET	ANCHORL	DEP (Place)	UNIQ	ALIGN GrWd
a. ☹ [|ìmí]	*!				
b. ☞ [j |ìmí]				*	*
c. [w|ìmí]			*!		*
d. [|mí]		*!			

The asymmetry displayed by Karanga, which bans initial onsetless syllables in lexical words and allows them in function words is reported in other studies. Cahill (2007:165), for example, observes that in Kɔnni "numbers, pronouns and conjunctions are not considered lexical items and may or may not have initial onsets."

The observation that in Karanga function words are exempted from obeying the constraint ONSET necessitates the revision of the constraint to cater for this detail. Following Cahill (2007), I revise the constraint ONSET to ONSET-lex so that the constraint specifically refers to initial syllables in lexical items. Cahill (2007: 165) says, "This general constraint ONS is familiar from many OT accounts; here we assume that it is, like many constraints, explodable into a family of constraints. This member of the family specifically refers to initial syllables in lexical items."

(35) ONSET-lex
Within lexical items, all syllables must have onsets.

With the constraint ONSET-lex highly ranked, and the constraint ONSET relegated to the bottom of the hierarchy we get the correct result for Karanga in function words. ONSET-lex, which is highly ranked does not rule out candidate (a), which is fully faithful. It is the winner. Candidate (b), the previous winner, is now ruled out by the constraint UNIQUE.

(36) Karanga: Initial Onsetless Syllables In Function Words

/ìmí/	ONSET-lex	ANCHORL	DEPPLACE	UNIQUE	ALIGN GrWd	ONSET
a.☞[[ìmí]						*
b. [j |ìmí]				*!	*	
c. [w|ìmí]			*!		*	
d. [|mí]		*!				

The analysis shows that in Karanga, initial onsetless syllables are tolerated in function words but not in lexical words. The conatraint ONSET, which would have forced the repair of such syllables in function words is relegated to the bottom of the constraint, and the constraint ONSET-lex is undominated in Karanga. The constraint has nothing to say about function words that have initial onsetless syllables and these syllables are not repaired. Zezuru does not display such an asymmetry, it allows initial onsetless in both lexical and function words. The inter-dialectal variation displayed by Karanga and Zezuru, is summed up as follows:

(37) ONSET-lex >> ALIGN GrWd   Karanga
ALIGN GrWd >> ONSET-lex   Zezuru

In Karanga, it is imperative to provide onsets to lexical words. This is achieved at the expense of ALIGN GrWd. In Zezuru, it is important to respect ALIGN GrWd, and this is done at the expense of having an onset, whether in the function word or in the lexical words.

It is important to revisit minimality. In accounting for the inter-dialectal variation displayed with respect to minimality, I demonstrated that it involved re-ranking of WDMIN and ONSET. The re-ranking of WDMIN and ONSET was given in (13) and is repeated here as (38):

(38) WDMIN >> ONSET   Zezuru
ONSET >> WDMIN   Karanga

The re-ranking variation that should include ONSET-lex is given below:

(39) WDMIN >> ONSET-lex, Zezuru
ONSET-lex >> WDMIN Karanga

9.4 The Need for both ONSET and NO HIATUS

The need for both constraints NO HIATUS and ONSET is worth justifying. On the surface, it appears ONSET alone could be enough to drive the repair of vocalic sequences (hiatus) and initial onsetless syllables. Vocalic sequences involve a medial onsetless syllable. However, both Zezuru and Karanga data present challenges that can only be resolved by invoking both NO HIATUS and ONSET. I will illustrate the problem with Zezuru.

Both Karanga and Zezuru have an absolute ban on hiatus, but Zezuru allows initial onsetless syllables in all contexts. Karanga bans onsetless syllables in lexical words and allows them in function words. In 40(a) and (b), in both dialects, hiatus is resolved through spreading.

Karanga/Zezuru

(40) a. /ʋà-út-í/ [ʋàwútí]
CL2.PL.-gather-NOM
'the gatherers'

b. /mà-zʅ̀-ù-sáʋí/ [màzʅ̀wùsáʋí]
CL6.PL-CL21.DEROG.-CL14-gravy
'gravies' (derog).

Similar to Karanga, in Zezuru spreading is allowed to resolve hiatus 40(a) and (b). This means that if the constraint ONSET were the only constraint forcing the repair of onsetless syllables, it would have to be ranked above UNIQUE. This would allow for the repair of hiatus using spreading as shown in Tableau (41). Candidate (b) which spreads is the optimal candidate.

Tableau (41) Zezuru: Spreading in hiatus

/ zʅ̀-ù-sáʋí /	ONSET	UNIQUE
a. zʅ̀.ù.sá.ʋí	*!	
b. ☞ zʅ̀.w ù.sá.ʋí		*

Zezuru allows initial onsetless syllables and with the ranking, of ONSET above UNIQUE, we get the wrong results in the context of initial onsetless syllables. In Tableau (42), a candidate which does not repair the initial onsetless syllable is disqualified for violating the higher ranked ONSET, yet this should be the optimal candidate. Candidate (b) which spreads and provides an onset for the initial onsetless syllable violates the lower ranked UNIQUE, and is the winner.

Tableau (42) Zezuru: Spreading in initial onsetless syllable

/ù-sáʊí /	ONSET	UNIQUE
a. ☹ ù.sá.ʊí	*!	
b. ☞ w ù.sá.ʊí		*

The problem in Zezuru where UNIQUE is violated in optimal hiatus resolution but not in the context of initial onsetless syllables produces a ranking paradox:

(43)	ONSET >> UNIQUE	optimal hiatus resolution
	UNIQUE >> ONSET	initial onsetless unrepaired

In order to resolve this paradox, there is need for the constraint NO HIATUS. In hiatus context, the constraint UNIQUE is ranked below NO HIATUS and spreading repairs hiatus. In Tableau (44), candidate (a) is ruled out for not resolving hiatus, and candidate (b) which spreads is the optimal candidate.

Tableau (44) Zezuru: Spreading to repair hiatus

/ zi̯-ù-sáʊí /	NO HIATUS	UNIQUE
a. zi̯.ù.sá.ʊí	*!	
b. ☞ zi̯.w ù.sá.ʊí		*

In word initial onsetless syllables, NO HIATUS is irrelevant, and ONSET, which drives the repair of onsets, is ranked below UNIQUE. This ranking makes UNIQUE unavailable for the repair of the initial onsetless syllable. In Tableau (45), candidate (a) which allows the initial onsetless syllable is optimal, and candidate (b) which spreads violates the higher ranked UNIQUE, and as a result is disqualified.

Tableau (45) Zezuru: Spreading to repair initial onsetless syllable

/ù-sáʊí /	UNIQUE	ONSET
a. ☞ù.sá.ʊí	*!	
b. w ù.sá.ʊí		*

In order to allow spreading to repair hiatus, UNIQUE is ranked below NO HIATUS, and in order to ban spreading from repairing initial onsetless syllables, UNIQUE is ranked above ONSET. The ranking that obtains is as follows:

(46) NO HIATUS >> UNIQUE >> ONSET

Using an example that has both hiatus and an initial onsetless syllable, I illustrate that These constraints and the above ranking gives us the correct result, as illustrated in Tableau (47).

Tableau (47) Zezuru: Spreading to repair hiatus

/ ù-ór-ì /	NO HIATUS	UNIQUE	ONSET
a. ù.ó.rì	*!		**
b. ☞ ù.w ó.rì		*	*
c. w ù.ó.rì	*!	*	*
d. w ù.wó.rì		*!*	

Candidate (a) is disqualified for not resolving hiatus. Candidate (b) is the optimal; it violates the lowest ranked constraint, ONSET. Candidate (c), which repairs the initial onsetless syllable, violates UNIQUE. Candidate (d) which repairs both hiatus, and the initial onsetless syllables through spreading, does well on NO HIATUS, but fatally violates UNIQUE.

This discussion illustrated the problem of having ONSET only. Although NO HIATUS and ONSET are in a subset relationship, such that a candidate that violates NO HIATUS also violates ONSET but not vice versa, both constraints are needed to account for the Karanga and Zezuru data.

9.5 Moraic Structure of Initial Onsetless Syllables

The goal of this section is to demonstrate that other than the lack of onsets, initial onsetless syllables in Karanga and Zezuru do not have any other exceptional properties. First, they can bear tone. Second, they count for syllables in processes, which count syllables. Finally, in view of such observations, we argue that onsetless syllables in both dialects do not need any special representation.

9.5.1 Initial Onsetless Syllables Bear Tone

One way of forming the copula is to impose the H tone on an initial syllable (§5.9.3.2). The copula H tone can be imposed on onsetless and onsetful syllables. With respect to onsetless syllables, the copula H tone can be imposed on syllables that are syllabified from either an epenthetic or underlying vowel. In examples 48(a) and (b), the copula H tone is imposed on the L toned onsetful initial syllable. In 49 (a) and (b), the H tone is imposed on the L-toned initial onsetless syllable, which is syllabified from an underlying vowel. In 50(a) and (b), the H tone is imposed on the L-toned initial onsetless syllable, which is syllabified from an epenthetic vowel.

		Karanga	**Zezuru**
(48) a.	/´-mù-kómáná/ COP-CL1.-boy ‘it’s the boy’	[múkòmànà]	[múkòmànà]
b.	/´-ʧì-túrà/ COP.-CL7.SG.DIMIN.-granary ‘it’s a small granary’	[ʧítùrà]	[ʧítùrà]
(49) a.	/´-ù-nàkì/ COP-CL14-atrractiveness ‘it’s attractiveness’	[wúnàkì]	[únàkì]
b.	/´-Ø-òn^{d}é/ COP-CL5.SG-fig ‘it’s a fig’	[wón^{d}é]	[ón^{d}é]
(50) a.	/´-Ø-gà/ COP-CL5.SG-wasp ‘it’s a wasp’	[jígà]	[ígà]

b. /´-Ø-gò/ [jígò] [ígò]
COP.-CL9.SG-grey hair
'it's grey hair'

In both dialects, the initial onsetless syllables pattern with onsetful syllables in their ability to bear a high tone. This suggests that the onsetless syllables are moraic. The mora is generally regarded as the tone anchor or tone-bearing unit (Hyman 1985, Pulleybank 1988, Hubbard 1995). Next, I illustrate that these morified onsetless vowels count as syllables and are therefore not extraprosodic.

9.5.2 Initial Onsetless Syllables Count for Syllables

This section explores evidence in support of the observation that initial onsetless syllables count for syllables. Evidence in support of the claim that initial onsetless syllables in Karanga and Zezuru count for syllables is adduced from minimality and reduplication.

9.5.2.1 Minimality

Karanga does not enforce minimality but Zezuru does. The examples in (51) (a) and (b) illustrate that a syllable that is syllabified from an epenthetic vowel counts for syllable. In the examples, Zezuru has an epenthetic [ì], which is missing in Karanga.

		Karanga	Zezuru
(51) a.	/Ø-gà/ CL5.SG-spot 'spot'	[gà]	[ìgà]
b.	/Ø-g^wà/ CL5.SG-boat 'boat'	[g^wà]	[ìg^wà]

The epenthetic [ì], which is driven by the constraint WORD MINIMALITY in Zezuru must count for a syllable as it helps satisfy the disyllabic minimality requirement in Zezuru.

9.5.2.2 Cliticization

Cliticization provides additional evidence that initial onsetless syllables count for syllables. Karanga tolerates monosyllabic nouns and imperatives (see §9.2). In both dialects, when a clitic is added to a monosyllabic word, the word is augmented with [ì]. This is illustrated in 52(a) and (b). In (53), which has disyllabic words and (54) in which the words are trisyllabic, an epenthetic [ì] is not inserted.

		Karanga/Zezuru	
(52) a.	/p´-a=wó/ give-FV=also 'give also!'	[ì.pá.wò]	*[pá.wò]
b.	/g^{w}`-a=wó/ fight-FV=also 'fight aslo!'	[ì.g^{w}à.wó]	*[g^{w}à.wó]
(53) a.	/tór-a=wó/ take-FV=also 'take also!'	[tó.rá.wó]	*[ì.tó.rá.wó]
b.	/gúr-a=wó/ cut-FV=also 'cut also!'	[gú.rá.wó]	*[ì.gú.rá.wó]
(54) a.	/ɲèm^{w}èrèr-à= wó/ smile-FV 'smile also!'	[ɲè.m^{w}è.rè.rà.wó]	*[ì.ɲè.m^{w}è.rè.rà.wó]
b.	/jèmùr-a=wó/ admire-FV 'admire also!'	[jè.mù.rà.wó]	*[ì.jè.mù.rà.wó]

The monosyllabic imperatives are enlightening. Karanga patterns with Zezuru in epenthesizing the vowel [ì] so that they surface as disyllabic. In disyllabic and longer forms epenthesizing the vowel results in unacceptable forms. This is in contrast to how Karanga behaves when these very same forms occur without a clitic: They are allowed to surface as monosyllabic forms (§9.2). The difference in the behavior of Karanga is that in the above examples the imperatives are functioning as hosts but in section §9.2, the imperatives where free forms. The difference in the behavior of the imperatives when they were in isolation, and when they are hosts strongly suggests that Karanga requires a host to be a FOOT. The monosyllabic hosts are augmented but the disyllabic and longer ones, which are prosodically well-formed to function as host, are not augmented. A constraint, which requires the host to be disyllabic, is:

(55) SUFFIXATION-TO-FOOT

Since in disyllabic words with initial onsetless syllables satisfy the above constraint, it means two things. First, the initial onsetless syllable counts for a syllable. Second, that syllable is visible to the clitic, which attaches to a well-formed foot. In Karanga, these facts cannot be attributed to a binarity requirement on Prosodic Words since, Karanga allows monosyllabic Prosodic Words (§9.2). Since Karanga allows monosyllabic words, but augments the attachment site for the clitic, this suggests that the attachment site for the clitic must be minimally two syllables long.

9.5.2.3 Reduplication

In Zezuru, the reduplicant has to be minimally disyllabic.

In example 56(a) & (b), the underlying initial vowel is syllabified as an initial onsetless syllable in Zezuru but Karanga supplies an onset. In Zezuru, an onsetless initial syllable is copied in the Inflected Verb Stem reduplication. In 57(a) & (b), the epenthetic vowel needed to make the base disyllabic is syllabified as an onsetless syllable. In 58(a) & (b), a disyllabic C-initial base takes a reduplicant. The dotted line indicates that Karanga does not reduplicate.

		Karanga	**Zezuru**
(56) a.	/út-a-RED/ gather-FV-RED ‘gather randomly’	[w**ú.**tá**.**<u>wù**.**tà</u>]	[**ú.**tá**.**<u>**w**ù**.**tà</u>]
b.	/ír-a-RED/ weigh-FV-RED ‘weigh continuously’	[j**í.**rá**.**<u>jì**.**rà</u>]	[**í.**rá**.**<u>jì**.**rà</u>]
(57) a.	/ɗ̆-a-RED/ like-FV-RED ‘give randomly’	-------------	[**ì.**ɗá**.**<u>**jì.**ɗá</u>]

b.	/f̀-a-RED/	---------------	[**ì.**fá**.**<u>**jì.**ɗá</u>]
die-FV-RED
'die easily'

Karanga/Zezuru

(58) a. /sék-a-RED/	[sé**.**ká**.**<u>sé**.**ká</u>]
laugh-FV-RED
'laugh aimlessly'

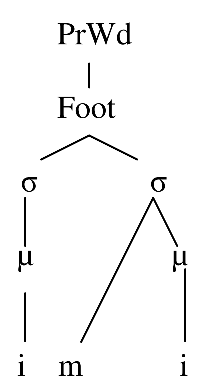
b.	/ɲór-a-RED/	[ɲó**.**rá**.**<u>ɲó**.**rá</u>]
write-FV-RED
'write aimlessly'

The initial onsetless syllables, whether containing an underlying (56) or epenthetic vowel (57), count for syllables. The epenthetic vowel is needed to ensure that the word is disyllabic. The reduplicant sees the initial onsetless syllables particularly in instances where it is copied in order to meet the disyllabic minimality requirement imposed on the Prosodic Word. There is total reduplication of the Inflected Verb Stem.

The observation that the word-initial onsetless syllables can bear high tone and count for syllables, in minimality and reduplication, demonstrates that besides the lack of onsets these syllables do not need any special representation. The onsetless syllables are morified, syllabified and are part of the Prosodic Word. Their only defects are the lack of onsets and the confinement to initial position. Accordingly, I represent the onsetless syllables in Karanga and Zezuru as follows:

Figure 9.2. Initial Onsetless Syllable in Karanga and Zezuru

(a)



9.6 Summary

This chapter has examined minimality and word initial onsetless. Zezuru and Karanga display variation; Zezuru requires Prosodic Words to be minimally two syllables, whilst Karanga does not. This variation is captured by the different ranking of the constraints WDMIN and ONSET; in Karanga ONSET is above WDMIN and in Zezuru it is the opposite. With respect to initial onsetless syllables, Karanga display internal variation. It bans initial onsetless syllables in lexical words, but tolerates them in function words. In contrast, Zezuru consistently allows initial onsetless syllables in both lexical and function words. The variation is accounted for by the re-ranking of the constraints ONSET-lex and ALIGNGrWd: In Zezuru, ONSET-lex is at the bottom of the constraint and ALIGN GrWd highly ranked, whereas in Karanga the opposite ranking prevails. The chapter further illustrated that other than lacking onsets, and their confinement to word initial position, the onsetless syllables in Karanga and Zezuru share other characteristics with the onsetful syllables. These syllables can bear a high tone; they are visible to processes that count syllables such as minimality, cliticization and reduplication. In sum, the onsetless syllables in Karanga and Zezuru therefore do not call for any special representations. They are syllabified, moraic and inside the Prosodic Word.

CHAPTER 10

CONCLUSION

This thesis set out to address the following research question:

(1) How do the Shona dialects of Karanga and Zezuru achieve the phonological structures that satisfy the following two requirements:

(i) all syllables be CV.
(ii) all prosodic words be a minimum of two syllables.

The study illustrates the need to posit both the Word (lexical) Level and the Postlexical Level as well as the prosodic constituents in order to comprehensively account for the hiatus resolution strategies exhibited by the two dialects. The three prosodic domains are the Prosodic Stem, Prosodic Word and the Clitic Group. Within the Word (Lexical) stratum, PStem edges play a crucial role in determining the choice of the hiatus resolution strategy, between glide formation, secondary articulation, elision and spreading. At the Word stratum, there is a manifestation of the interplay between the hiatus resolution strategies and the prosodic constituent structure (phonology-morphology interface). This is why it is crucial to lay out in detail which morphological constituents map onto the Prosodic Stem constituents and which ones do not.

At the Word (Lexical) Level, inside the Non-Recursive Prosodic Stem, hiatus is resolved through glide formation, secondary articulation and elision. In the Recursive Prosodic Stem and in the Prosodic Word where a Prosodic Stem is a constituent of the Prosodic Word, hiatus which occurs across the Prosodic Stem boundary is resolved through spreading. The constraint, ALIGN-L PSTEM blocked secondary articulation and elision.

(2) ALIGN-L (PStem, Right; syllable, Left)
"The left edge of every PStem coincides with the right edge of some syllable"

Finally, at the Postlexical Level hiatus is resolved within the Clitic Group through coalescence. When coalescence fails spreading kicks in. Coalescence is blocked when the clitic is monosegmental. Table 10.1 below presents the Word and Postlexical Levels, morphosyntactic domains, prosodic domains and the hiatus resolution strategies.

Figure 10.1 Levels, Morphosyntactic Constituents, Prosodic Domains and Hiatus Resolution Strategies

Prosodic Domains	**Morphosyntactic Constituents**		**Hiatus Resolution**
POSTLEXICAL LEVEL			
	Verbs	**Nominal**	
Clitic Group	Clitic Word	Clitic Word	coalescence or spreading
WORD LEVEL			
Prosodic Word	Verbal Word	Nominal Word	spreading (N/A in verbs)
|	|	|	|
Prosodic Stem (recursive)	Inflectional Stem	N/A	spreading
|	|	|	|
Prosodic Stem (recursive)	Macro Stem	Extended Inflected NStem	spreading
|	|	|	|
Prosodic Stem (recursive)	Inflected VStem	Inflected NStem	N/A
|	|	|	|
Prosodic Stem (non-recursive)	DStem	Minimal NStem	GF/sec art/elision/(N/A in verbs)
|	|	|	|
-------------	VRoot	N/A	N/A

On spreading, the thesis argued that all the hiatus breakers in Shona [j w ɦ ʔ] are products of spreading. These hiatus breakers occur in complementary distribution: [j] is the hiatus breaker in the context of coronal vowels; [w] in the context of labial vowels; [ɦ] and [ʔ] in the context of the low vowel /a/. Traditionally, only the oral glides [j] and [w] have been analyzed as products of spreading. What is novel is in this thesis is the extension of the spreading analysis to the glottal stop [ʔ], and the glottal fricative [ɦ]. In the case of [ɦ] and [ʔ] more was involved. In addition to V-Place spreading, for [ʔ] the feature [constricted glottis] was inserted, and for [ɦ], the feature [spread glottis] was spread from an input [ɦ] via [a̤]. The spreading analysis of all the hiatus breakers [j w ɦ ʔ] provided a simple and elegant account of the distribution of these hiatus breakers in both Karanga and Zezuru.

The examination of cliticization and coalescence contributes to a better understanding of the structure of the pronominals—demonstratives and pronouns. The 1st and 2nd person singular and plural participate in coalescence. This is taken as evidence for an underlying initial vowel. In contrast, the 3rd person pronoun and the demonstratives do not participate in coalescence. I account for the lack of participartion of the 3rd person pronoun and the demonstratives as the lack of an initial vowel when these forms are cliticized. I posited that the 3rd person pronoun and the demonstratives each has two listed allomorphs, the full form VCV and the 'short form CV. The full form is used where minimality matters, and the 'short' form where mimality is not an issue.

- **demonstratives**

(3)	**Allomorph**	**Example**	**Gloss**
a.	STAB + DEMONSTRATIVE AFFIX	ù-kò	'there
b.	DEMONSTRATIVE AFFIX	=kò	'there'

- **3rd person pronoun**

(4)	**Allomorph**	**Example**	**Gloss**
a.	STAB + PRONOUN AFFIX	í-rò	'it'
b.	PRONOUN AFFIX	=rò	'it'

Based on evidence from coalescence, I posit that there is a ghost augment in Shona. The ghost augment has floating features. At the Postlexical stratum, the floating features dock on to the preceding root node. In contrast, at the Word stratum, the floating features do not 'coalescence' with the preceding root node. This 'selective' docking of the floating features is best accounted for by positing two strata; the Word and the Postlexical. At the Postlexical stratum, the floating 'coalesce' by docking on to the preceding root node, but at the Word stratum, they do not 'coalesce'. This is similar to coalescence proper, where coalescence resolved hiatus at the Postlexical stratum, but not at the Word stratum.

Karanga and Zezuru display greater inter-dialectal variation in minimality and initial onsetless syllables than in hiatus resolution. The only variation identified in hiatus resolution is where in Karanga the constraint $*[C_{Lab}\ {}^{w}V_{Lab}]$, blocks secondary articulation and elision occurs. In Zezuru, in the very same context secondary articulation is employed.

In prosodic minimality, Zezuru enforces the constraint WORD MINIMALITY without exception—all prosodic words are required to be minimally two syllables long. In contrast, Karanga allows monosyllabic Prosodic Words. Karanga does violates WORD MINIMALITY in order to respect ONSET, and Zezuru does the opposite; it does violates ONSET in order to satisfy WORD MINIMALITY. The ranking of the constraints WORD MINIMALITY and ONSET, which accounts for the inter-dialectal variation, is illustrated in (5):

(5)	WDMIN >> ONSET-lex	Zezuru
	ONSET-lex >> WDMIN	Karanga

With regards to initial onsetless syllables, Karanga shows 'domain-specific' effects such that initial onsetless syllables are banned in lexical words or content words (i.e. nouns, verbs, adjectives, adverbs), but allowed in function words (i.e. determiners, tense markers, clitics, pronouns, demonstratives). In contrast, Zezuru grammar shows no domain effects, and initial onsetles syllables are consistently allowed in both lexical words and function words. This is summarized in the chart below:

(6) Distribution of Initial Onsetless Syllables

	Lexical Words	Function Words
Karanga	banned	allowed
Zezuru	allowed	allowed

In order to account for the intra-dialectal variation displayed by Karanga, the constraint ONSET is parametrized to ONSET-lex.

(7) ONSET-lex
A lexical item must have an onset
(Cahill 2007: 165

This thesis argues that the onsetless syllables are no more defective than their apparent lack of onsets. In both dialects, onsetless syllables participate in phonological processes that count or require syllables, namely, tone, minimality, cliticization and reduplication. The conclusion is that the initial onsetless syllables are morified, syllabified, count for syllables and therefore are not extra-prosodic, and consequently do not warrant any special representations. The thesis contributes to the study of Shona and Bantu by examining in parallel the structures of the verbs and the nominals, and thereby contributing insights on the differences and similarities between the two. Often in the literature there is an examination of the verbs alone or nominals alone.

Finally, the thesis identified the different properties of Shona clitics and affixes as the following:

(8) a. clitic

(i) attaches to PrWd
(ii) does not count for minimality
(iii) occur free form
(iv) hiatus resolution across host-clitic boundary resolved through coalescence
(v) mobile

b. affix

(i) attaches to a morphological stem
(ii) counts for minimality
(iii) can never be a free form
(iv) cannot freely move
(v) do not participate in Meeussen's rule (most of them are low-toned)

In conclusion, the thesis demonstrates that a refined prosodic parsing is required to account for hiatus in Shona. Furthermore, the thesis presents an analysis of hiatus resolution, in which none of the hiatus resolution strategies relies exclusively on default insertion of features, but where there is maximal use of the features in the representation.

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