

MIDLANDS STATE UNIVERSITY



FACULTY OF ARTS

DEPARTMENT OF ENGLISH AND COMMUNICATION

**Comparing vowel hiatus resolution strategies in ChiHwesa and
ChiManyika. An optimality theoretic account.**

By

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A thesis submitted to the Department of English and Communication, Midlands State University, in partial fulfillment of the requirements for the Master of Arts in Applied English Linguistics Degree.

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NOVEMBER 2015

DECLARATION BY STUDENT

I, **MVUNDURA EMACULATE (R147164J)**, sincerely declare that this dissertation is my original work and where other people's ideas were mentioned due acknowledgement was made. I also declare that this work has not been previously submitted in any other university for the award of any degree.

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A special word of thanks goes to the Hwesa and Manyika communities for making this research a success. Our dialects continues to be our salvation as minority groups.

Last but by far not least, I thank the almighty God for life and good health, without which none of this would have been produced at least by me.

DEDICATION

I dedicate this dissertation to my husband, to whom I can never be able to repay all good things he did for me during my studies. For his prayers and advice, I thank him dearly, and shall forever be grateful.

I also dedicate this work to my three beloved sons, Trevor, Jason and Yemurai for their encouragement throughout the study.

ABSTRACT

The study makes a comparative analysis of how ChiHwesa and ChiManyika resolve vowel hiatus configurations. The dialects are against the VV sequence in structures and this triggers the application of the resolution strategies to break the vowel sequences. The comparative analysis was examined in the theoretical framework of optimality theory proposed by Prince and Smolensky (1993), McCarthy and Prince (1999) and Kager (1999) which argues that constraints are universal and they belong to the grammar of every language. Its focus is centered on the ranking of constraints which are markedness constraints and faithfulness constraints. Data was analyzed to establish the phonological and morphophonological process which militates against hiatus configurations in both dialects. The key findings of the study revealed that the two dialects resolve hiatus configurations through coalescence, glide insertion/formation, vowel deletion or elision and epenthesis. The study recommends that the phonological and morphological systems of ChiHwesa and ChiManyika in the theoretical framework of the Optimality theory is necessary as means to understand the interaction of constraints.

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CHAPTER ONE: GENERAL INTRODUCTION

1.1.Introduction

This chapter forms the background and a general introduction to the study including the statement of the problem. The other sections of this chapter outline objectives, research questions, significance of the study, empirical and theoretical justification of the study and research methodology. This chapter brings out the area of investigation to establish the worthiness of this study.

1.2.Statement of the problem

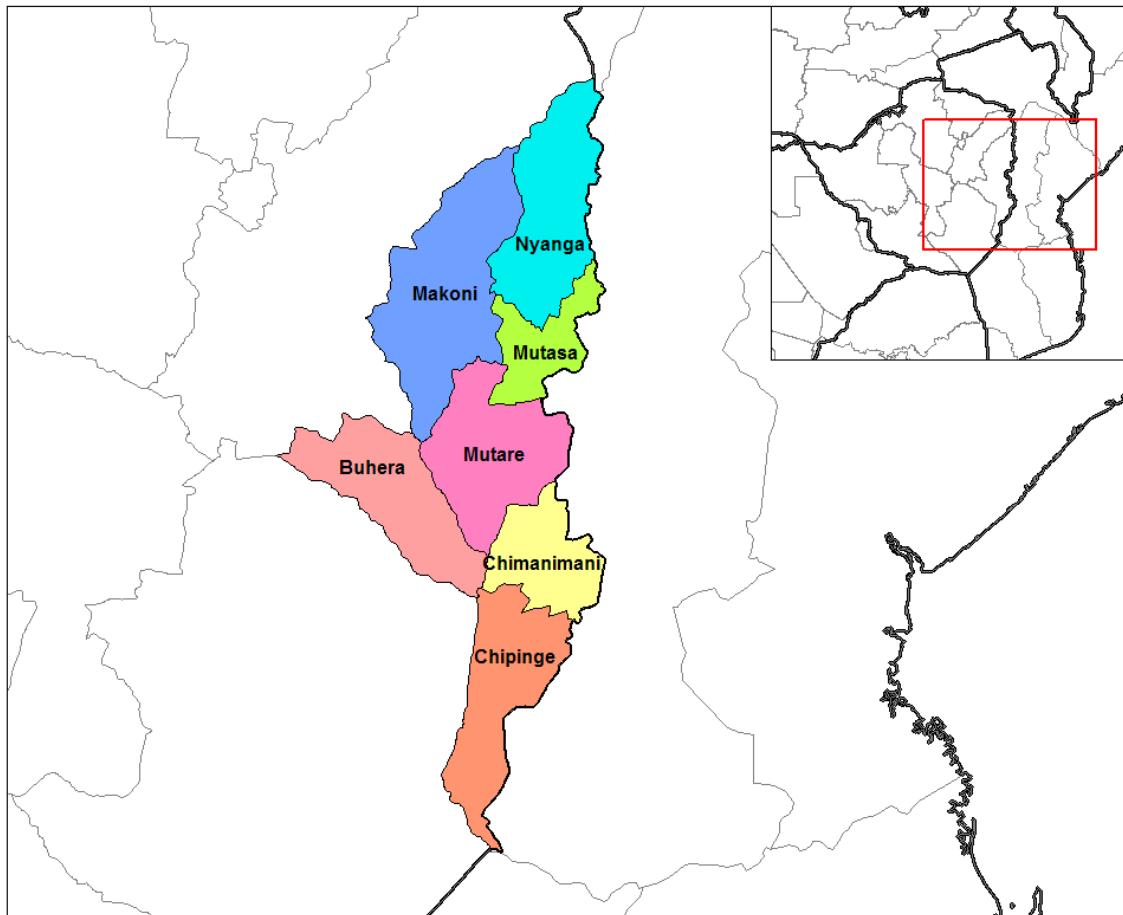
A considerable amount of work on the phonology of Bantu languages has been done. However, not much theoretical and practical research has focused on minority languages such as ChiHwesa and ChiManyika which is a dialect of Shona language. Other studies have been carried out but the majority of the studies in Zimbabwe are on Karanga (Mudzingwa, 2012), Ndebele, (Sabao, 2009, 2012, 2015), Chichewa (Sabao, 2013), Nambya (Kadenge, 2010) and Shangani (Mabaso, 2009). This research will be one of the emerging studies in Zimbabwe using recent models such as Optimality Theory as the Theoretical framework. The focus of this study is to examine the phonological processes that resolve vowel hiatus configurations in ChiHwesa and ChiManyika which are dialects of Bantu languages spoken in Zimbabwe and Mozambique. The study will make a comparative analysis of the phonological processes of the two languages.

1.3.Background of the study

In Zimbabwe many languages are spoken in different provinces and they are identified with particular geographical boundaries. These dialects remain confined in certain geographical boundaries of Zimbabwe without being used at national level hence they remain a symbol of

identity, (Mazuruse, 2015). Chiome (1993) argues that minority groups of Zimbabwe and Africa in general cannot get full access to modernity without their languages and cultures because any development programs that are mediated through other languages can only worsen the plight of uneven development. ChiShona is classified by Guthrie (1948) in Zone 10 (South Eastern Bantu) and it is widely spoken in Botswana, Mozambique and Zimbabwe. Furthermore, the language has ten distinct dialects namely ChiKalanga, ChiKaranga, Chikorekore, ChiNambya, ChiBarwe, ChiHwesa, ChiTeve, Chimanyika, ChiZezuru and ChiNdau (Magwa, 1999). Magwa (1999) states that these dialects are mutually intelligible thus they can be linguistically considered as dialects of the same language. Despite this high level of intelligibility in its spoken form, the written forms of these dialects is very problematic in a number of ways. It has been observed that marginalized dialects like ChiNdau, ChiBarwe, ChiTeve ChiHwesa and Chikorekore are being used and it is difficult to establish their lexical forms since their documentation needs to be improved. Hence the need to compare the phonological processes of ChiHwesa and ChiManyika as means of establishing how they resolve phonological conflicts which arise from vowel hiatus configurations through the use of Optimality Theory.

The study compares the phonological processes that take place in the languages under study and the repair strategies that apply to these languages when resolving hiatus conflicts. The study employs the optimality theory to investigate how these languages resolve vowel hiatus conflicts or vowel sequences. In optimality theory terms, the language specific ranking of the same set of constraints will be compared in this study.



The Manyika and Hwesa dialects are spoken in the districts found in the Manicaland province of Zimbabwe (in the Eastern Highlands Region of the country). The Manyika dialect is largely spoken in Nyanga, Mutare, Marange and Mutasa districts whereas Hwesa is also largely spoken in the Northern part of Nyanga. The Hwesaland is made up of Munzara, Ruwangwe, Chapatarongo, Kazozo and Fombe villages

Magwa (1999) argues that some of the Shona dialects have been presented as languages and others such as ChiBarwe, ChiNambya, ChiTeve, and ChiHwesa were left without so much a mention of whether they could be harmonized with central Shona or left to develop their own, (Doke (1931) in Magwa (1999). However, in the new constitution of Zimbabwe ChiBarwe is given the status of a

language. ChiKalanga, ChiBarwe, ChiKaranga, ChiNdau, ChiHwesa and Chikorekore have several other sound realizations and combinations that are not found on the current spelling system; e.g.,

ChiNdau<kudhla> (to eat)

<kuthwa> (pound)

ChiHwesa<muphare> (boy)

<Nkuni> (firewood)

<Kwunguwo> (crow)

ChiBarwe<zentse> (ant)

<Psvaira> (sweep)

<Mpfuti> (gun) (Magwa 1999:35).

1.4. Historical Background of ChiManyika

The Ethnologue (2014) considers Chimanyika to be a dialect of the Shona language. It is spoken in the eastern parts of Zimbabwe, particularly in Manicaland province. ChiManyika has a total population of speakers which reaches to about 1,025,000 and In Zimbabwe, the speaker population reaches 861 000 people. It has been classified separately from Shona as S13 (Ethnologue 2014). Furthermore, it states that ChiManyika has partial intelligibility with Shona and that speakers consider ChiManyika to be a Shona dialect. It is spoken by people in the northern parts of Manicaland which are the Nyanga, Honde Valley, and Mutasa areas whereas ChiBocha is spoken by people in the Southern part of Manicaland. It includes dialects such as ChiBocha, ChiUngwe ChiNdau and ChiManyika from which the broad Manyika gets its name.

1.4.1. ChiManyika orthographic alphabet

The ChiManyika orthographic alphabet is constituted of the following symbols;

<a, b, c, d, e, f, g, h, I, j, k, l, m, n, n', o, p, q, r, s, t, u, u, v, w, y, z> (Siteo and Ngunga (2000) in Mazuruse, 2015).

Consonant clusters of ChiManyika variety

<bh, bv, dz, dzv, mh, nh, ny, pf, sh, sv, ts, tsv, vh, zh, zv>

1.5. Historical Background of ChiHwesa

Ranger (1989) describes that Hwesa are a special case in Zimbabwean history, inhabiting a semi-arid region that was not subject to the massive land alienation that affected most of the country during the colonial era. It was an inaccessible area which was rarely visited by local administrators or missionaries until after the Second World War. Furthermore, he states that the Hwesa people relied more heavily on local cults during the colonial era and less on worship of Karuva, the High God, to support the local elites and to explain the ecological disruptions that were increasingly frequent. Hwesa minority language is spoken by people found in the northern part of Nyanga district in the Manicaland province.

Hwesa is mostly spoken in both private and public places such as beerhall, schools church gatherings and trading areas. However most of the people who speak Hwesa are also fluent in other languages such as Manyika, Zezuru and Budyá. People surrounding the Hwesaland look down upon Hwesa speakers because the language is spoken by a minority group. As a result the Hwesa people feel humiliated when they speak ChiHwesa in public places because of the derogatory names such as *muserede* or *borwa* (both meaning a backward and homeless person), (Chirimaunga 2013).

1.5.1. ChiHwesa orthographic alphabet

The ChiHwesa orthographic alphabet is constituted of the following symbols;

<a, b, c, d, e, f, g, h, l, j, k, l, m, n, n', o, p, r, s, t, u, v, w, y, z> (Chirimaunga 2013)

The consonant cluster of ChiHwesa;

<bh, bhw, bv, bw, ch, chw, dh, dhw, dw, dy, dyw, dz, dzv, dzw, gw, hw, kh, kw, mb, mb, mbw, mh, mp, mph, mv, mh, nd, ndw, ng, ngw, nh, nk, nj, njw, nt, nts, nw, ny, nz, nzw, nzv, nzvw, ph, pf, psv, psv, pw, rh, rw, sh, shw, sw, sv, svw, th, ts, tsw, tsv, tsvw, ty, tw, vh, zh, zv (Chirimaunga 2013).

Chirimaunga (2013) in Mazuruse (2015) believes that the ChiHwesa variety was influenced very much by the Zimbabwean ChiManyika variety which is part of the 'standard' Shona. There is little literature in ChiHwesa variety. Furthermore, the harmonized Shona-Nyai alphabet show few differences from ChiHwesa alphabet except for the harmonized /ch/ where the harmonized orthography has a /c/ and /x/ not found in ChiHwesa. It has been observed that the cluster combinations of the harmonized alphabet and that of ChiHwesa have several similarities and it can be noted that the harmonized cluster combinations have excluded the following consonant clusters found in ChiHwesa variety.

<tk, nkh, mk, nch, mpf, nkh, mps, nth, mbv, bsv>

Chirimaunga (2013) show peculiar differences of ChiHwesa and 'standard shona.

English	ChiHwesa	Standard Shona

Brain	Nzero	Pfungwa
Hair	Ntsese	Bvudzi
Eyes	Mantso	Maziso
Chin	Ndigwi	Chirebvu
Cheek	Phutu	Dama
Stomach	Nhenga	Dumbu
Leg	Phondo	Gumbo

According to Chirimaunga, the above examples show that there are low levels of mutual intelligibility between ChiHwesa and ‘standard Shona.

1.6. Research Objectives

The study seeks to investigate the following;

- To examine comparatively the phonological and morphophonological processes which result from hiatus resolution in ChiHwesa and ChiManyika?
- To present an Optimality Theoretic account of the established processes in the study.

1.7. Research questions

The study seeks to answer the following;

1. What are the phonological processes found in ChiHwesa and ChiManyika dialects?
2. How does the languages understudy resolve vowel hiatus conflicts?
3. How optimality theory be applied to the phonological processes?

1.8. Aim of the study

The aim of the study is to compare the phonological processes that resolve the conflicts found in ChiHwesa and ChiManyika dialects which are spoken in the eastern part of Zimbabwe. The current study is also interested in shedding more light on the repair strategies that apply to these languages in a bid to bring out the phonological system differences. The main focus of the study is to apply the optimality theory in order to investigate how the vowel sequences are treated and to establish the peculiar similarities and differences.

1.9. Empirical justification of the study

This study is a comparative analysis of ChiHwesa and ChiManyika phonological processes. The researcher chose this area of study because it has emerged as an important area that reveals how languages deal with the phonological occurrence of vowel hiatus and to establish the resolution strategies. There is dire need for linguistic research in these dialects so as to fill the gap in our knowledge of ChiHwesa and ChiManyika phonological processes and to establish whether they employ the same strategies when resolving the hiatus conflict. Furthermore, this research will promote ChiHwesa and ChiManyika as dialects which are to be preserved and guarded from being extinct and that will enable the speakers of two dialects to maintain their heritage and identity. This research is a starting point in the development of languages that are not documented and this paves way for languages under study not become extinct. This brings us to main reason for discussing the phonological processes such as epenthesis, coalescence and vowel deletion. This study will pave way for other studies on ChiHwesa and ChiManyika phonology and morphology. The study will be of much help to language policy makers if these languages might be considered as medium of instruction by the ministry of primary and secondary education in Zimbabwe.

1.10. Theoretical justification of the study

There are a number of theories that could have been considered in this study such as Distinctive Features, Lexical Phonology and Feature Geometry. However the researcher employed the Optimality Theory because of its explanatory potential as it considers that a language consists of a ranked set of universal constraints. The Theoretical framework to be used in the analysis of the data is the Optimality Theory (Prince and Smolensky, 1993), which was developed as a response to linear phonology which was perceived as not an adequate model in explaining all phonological processes (Cahill, 2007). In the application of the theory to the data, language inputs for the structures will be constructed and candidates will be evaluated on constraint hierarchies in order to determine the optimal candidates. Downing (2009) explains that OT shift focus from rule based theories to a constraint based theory of phonological processes and their interactions whereas the basic principle of violable constraints is a powerful tool for analyzing different elements of the languages under study. She asserts that it is a theory of how well-formedness conditions on representations interact to account for phonological processes. Sabao (2009) agrees that this enables an analysis of trends and patterns of the languages restrictions and constraints. Data presentation will also be easy to present when using tableaus.

In Optimality Theory a grammar is made up of well-formedness constraints and its central idea is a technique that determines the exact analysis of an input that best satisfies a set of conflicting conditions. In other words, an output is the optimal candidate and thus grammatically well formed, if it violates least the constraints. Kager (1999) alludes that OT predicts that a markedness constraint may trigger various types of structural changes depending on its interaction with faithfulness constraints.

Markedness constraints are constraints on output forms hence they are similar to the surface-structure constraints of filters in earlier theories.(McCarthy, 2002). Languages resolve conflicts

among universal constraints in different ways thus if one constraint dominates another, it means that these constraints disagree on the status of a pair of candidates and therefore the dominating or better ranked constraint makes the decision about the optimal output, (Prince and Smolensky 2002).

1.11. ResearchMethodology

The qualitative approach is going to be used because of its descriptive nature. Gilham (2000) states that qualitative research allows the researcher to investigate situations where little is known about what is going on and explore the complexities that are beyond the scope of the controlled approaches. Data will be elicited from the native speakers of ChiHwesa and ChiManyika dialects. This will be done through structured interviews. Purposive sampling will be employed since it is used to select representatives of a population basing on the participant's knowledge of the language under study. These methods will assist the researcher to compare the phonological processes in ChiHwesa and ChiManyika.

1.11.1. Research instruments

1.11.1.1. Tape recordings

Tape recording was a means which was used to collect data from the interviews. The most notable advantage of capturing data through tape-recording is that it provides a linguistically accurate corpus of data since every sound will be recorded, (Mabaso, 2009). Crystal (1987) also adds that tape-recording enables the linguist's claims about the language to be verified. The ethical aspects of recording the interviews were put into consideration since it is not ethical to record and use pieces of information without the consent of the people. Having this in mind, the researcher informed the interviewees beforehand since this will enable the researcher to remember all the information discussed during interviews. For the sake of better acoustic quality, the researcher avoided noisy environments.

1.11.1.2. Data analysis

Optimality theory will provide guidelines which will help the researcher to account for the phonological processes in the languages under study.

1.11.1.3. Data presentation

Data presentation will be mainly influenced by the theoretical framework. The data will be presented in the form of input given by various candidates and the GEN, EVAL and the Constraints will determine the optimal candidate through the ranking system.

1.12. Organization of the study

Chapter 1 will introduce and includes objectives of the study, background of the Bantu languages under study and the methods that will be used to elicit data. Chapter 2 will review the literature while chapter 3 will give an overview and discussion of the optimality theory including the theoretical tenets that are relevant to the study. Chapter 4 deals with the presentation of the findings thus the vowel hiatus resolution strategies while Chapter 5 will present the conclusion of the study.

1.13. Conclusion

The chapter discussed the statement of the problem as well as the background of the study. The study established that ChiHwesa and ChiManyika are dialects of Shona language. They share some features in their respective orthographic alphabets although some sounds found in ChiHwesa are only peculiar to that dialect. The empirical and theoretical justification of the study was also discussed to establish the theory which informs the study. The comparative analysis will be done in the theoretical framework of the optimality theory thus will influence the data presentation and

analysis. The aim of the study is to compare the phonological processes that resolve or break the vowel hiatus configurations present in ChiHwesa and ChiManyika dialects.

CHAPTER 2:LITERATURE REVIEW

2.1. Introduction

The chapter reviews literature that is relevant to the study and it draws examples from other Bantu languages in connection with the strategies they use to resolve hiatal configurations. The major repair strategies to be discussed in this chapter include glide formation/insertion/epenthesis, vowel coalescence and vowel deletion. Furthermore, the literature to be review will be of much help when presenting and analyzing data whereas the similarities and differences found in the Bantu languages will be established. The chapter examines the phonological processes that break away the vowel sequences and the reasons for doing that.

2.2. On Vowels and vowel hiatus

Mabaso (2009) states that vowels can be defined as a voiced sound in which the air issues in a continuous stream through the pharynx and mouth, there being no obstruction and no narrowing such as would cause audible friction. Vowels are the continuing or sustaining or sounding elements of speech since they make speech audible. Trask (1996) describes hiatus as the occurrence of two consecutive vowels forming separable syllables. In situations where they happen to co-occur, usually as a result of the catenation of morphological units, the language uses different phonological processes in order to remove the less preferred sequences. Mangoya (2012) refers to vowel hiatus as the occurrence of adjacent phonologically independent vowels within a word within a word or morpheme, but more precisely at a morphological boundary. Orié and Pulleybank (2002) in Sabao (2009) define vowel hiatus as the arrangement of vowels across a syllable boundary or it can be referred to a sequencing of vowels without placing a consonant between them. Sabao (2005) in Sabao (2009) refers to vowel hiatus as the occurrence of two or more vowels which stand as

individual syllables adjacently. When the syntax or morphology of a language causes such vowel sequences to arise, hiatus may be resolved in various ways. For example, one of the vowels may be deleted, one of the vowels may be changed into a glide, a consonant may be epenthesized to break up the vowel sequence, and the vowels may coalesce and the vowels may coalesce to eliminate the change in the quality, (Orie and Pulleybank in Sabao, 2009)). Casali (1996) explains that vocalic or hiatal configurations are fixed by the eliding the first vowel or second vowel, moreover, coalescing of two vowels to come up with a third vowel or inserting a glide or the formation of a semi-glide also militates against vowel hiatus. Languages apply various strategies as means to deal with juxtaposed vowels or to break the sequencing of vowel in a structure since most of the languages do not prefer hiatal configurations. These are the phonological processes which prohibit the occurrence of vowel hiatus. In order to resolve hiatus, Bantu languages like many other languages of the world use phonological processes such as vowel coalescence, epenthesis, and vowel deletion/elision, glide formation and glide insertion. These processes are discussed and exemplified in detail in 2.3 below. Spanish favours a regular vowel-consonant vowel alteration and thus hiatus is commonly resolved in some way in speech. Furthermore, deletion of the two vowels (e.g., /a/ +/e/ > [e]), creation of a diphthong (e.g., /a/ +/e/ > [ai]), coalescence of two vowels into a different one (e.g., /a+/e/[e]). In Spanish hiatus at the word boundary is very common. Deletion is a widely attested strategy for hiatus resolution in Yoruba. Standard cases of vowel deletion in Yoruba;

a. Owó Ki' owó → owókówó [any money at all/money any money.

Omo Ki' omo → omkómo [any child at all/bad child/child any child.

Hiatus may be resolved, however, by an assimilatory strategy. Examples of standard cases of vowel assimilation:

- a. omo eran omeeran *[omeran] goat kid; son of a bitch
- b. ěro owě ěro owó *[ěrowó] machine of money; money making machine.(Bakovic, 2003).

2.3. Hiatus resolution strategies

2.3.1. Vowel coalescence

Mudzingwa (2010) asserts that when two vowels are clashed at a morphological boundary, one of the commonest ways of resolving the hiatal configuration is that they are merged together into one neutral vowel incorporating the features of the two original vowels. The phonological process is called vowel coalescence or vowel fusion. Coalescence is a procedure employed by different languages to break hiatal configurations and the process happens when two vowels next to each other are joined to form a new segment which is not identical to the original segment but carries the same features. As a result the violation of the featural identity is triggered although features found in the input are maintained in the joined product which is the output. Sabao (2009) asserts that coalescence refers to the merging of two adjacent vowels in a *VV context (a phonological vowel sequence context), into a third vowel that derives its phonological qualities from those of both the two coalescing vowels. Harford (1997) in Sabao (2009) contends that vowel coalescence is a phonological phenomenon in which adjacent vowels cause each other to change and sometimes shorten. In the same vein, Casali (1996) agrees that it is a replacement of a vowel sequence by a third and neutral vowel which shares the qualities of both the original vowels. Mabaso (2009) asserts that when two segments are joined to create a third single segment which is different from the initial vowels is known as vowel coalescence, a strategy used to break vowel hiatus. Doke (1943) in Sibanda (2009) illustrates that in Nguni, coalescence happens when the vowel /a/ is preceded by /a, i, or u/ as illustrated below.

1. a+a →a

a+i → e

a+u → o (Doke, 1943 in Sibanda, 2009)

Harford (1997) is of the opinion the coalescing of two segments or vowels into a merger is referred to as vowel coalescence in Shona which is a Bantu language whereas, Mudzingwa (2010) views the coalescing of vowels in Shona as the deletion of the first vowel whilst the preserving of the feature on the next vowel should be considered.

Kadenge (2013) asserts that coalescence operate in the cliticisation domain which is between the host and clitic (encliticisation) and between a clitic and host (procliticisation). He further explains that the left and the right edges of the host are crucial because when the same clitics occurs in other contexts hiatus is resolved differently. The two input vowels V_1 and V_2 are fused together to have a single vowel on the surface whereas the fused vowel $V_{1,2}$ bears the same features of V_1 and some of V_2 .

Examples of Vowel coalescence in Kinyarwanda (Lee, 2015)

/ka-iiza/ [keeza] “good, nice beautiful”

/ak-iibi/ [akeeβo] “little basket”

/βa=iinshi/ [βeenshi] “many”

/ama-iino/ [ameeno] “teeth”

/ku-ta-iis-a/ [guteesha] “to cause, to lose, to waste”

Lee (2015) accounts that the merger of the low vowel /a/ and the high vowel /i/ into the mid-front vowel [e] is only surface attested in this language. Interestingly, the fusion of /a+u/ into [o] is not witnessed in Kinyarwanda. Kimenyi (1979) in Lee (2015) argues that vowel fusion applies only in two cases.

- a. If the root is a noun or an adjective or
- b. If the structural description is fully satisfied in the suffix after the verbal root.

2.3.1.1. Types of coalescence

Casali (1996) describes the two types of height coalescence which are asymmetric and symmetric. Symmetric coalescence is a process of hiatus resolution which neutralizes certain vowel features in preference for other features. The serial ordering of the two dissimilar vowels is irrelevant; high ranking feature sensitive constraints determine the output segment, as in the language Afar, where sequences of /e+u/ and /u+e/ are both realized as [o]. In this case, the features of [high] and [front] are lost in preference to [round] and [back]. The ordering of vowels in these V_1 to V_2 sequences has no bearing on the outcome in symmetric coalescence. Asymmetric coalescence does not rely on the serial ordering of $V_1 + V_2$. This asymmetric can be shown in the following example from Xhosa:

Height coalescence in low + high sequences (from Casali (1996))

- a. /a+i/ → [e]

Wa-inkosi → **wenkosi** “of the chiefs”

Na-impendulo → **nempendulo** “with the answer”

- b. /a+u/ → [o]

Wa-umfazi → **womfazi** “of the woman”

Na-umntu → **nomntu** “with the person.”

We can see that sequences of low+high vowels that occur at word-internal morpheme boundaries are realized as mid-vowels with the backness and rounding of the resulting vowel corresponding to the rounding of the second vowel.

According to Mutaka and Tamanja (2000) in Mangoya (2012) vowel coalescence refers to the process where two vowels of different qualities merge into one. In the Barwe case, vowel sequencing that leads to coalescence can be noticed in a possessive construction.

/a+i/ → [e] [+syl, +low]+[syl, +high] – [+low, -high]

Possessive prefix+ pronoun

/wa+ iko/ → [weko] those of that place (cls 1,3)

/la+ iko/ → [leko] that belongs there (cl 11)

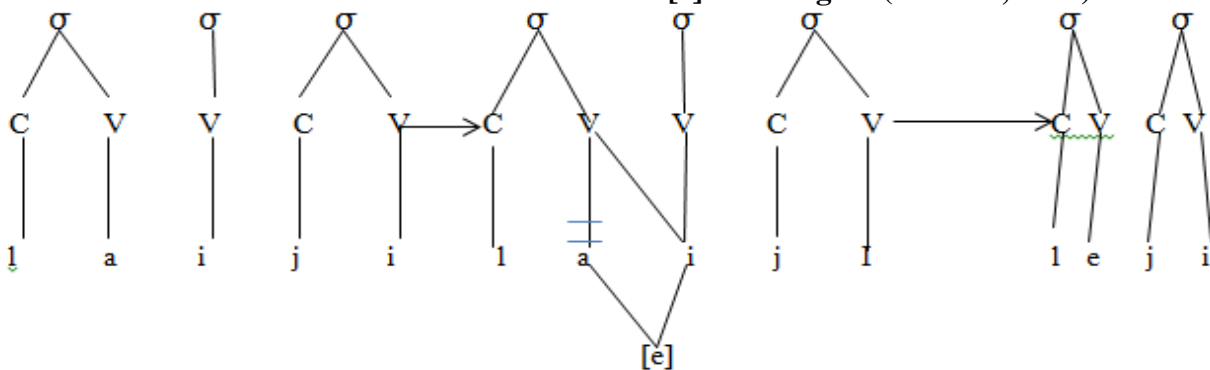
/ca+ iko] → [ceko] “that belongs there (cl7)

/za +ipo/ → [zepo] those that belong (cl 8)

It shows that /a/ and /i/ combine to form [e] and the possessive prefix is CV shaped. The construction pattern of a pronoun is initial vowel /i-/ + pronominal stem. Mangoya (2012) demonstrates that in a possessive prefix + pronoun construction, the [+low] vowel prefix comes into succession with the [+front, +high] initial vowel. These coalesce with the front;[-high, -low] vowel in the process. Mabaso (2009) purports that vowel coalescence in Shangani is attested in /a+i/, /a+u/ and /o+i/ combinations as illustrated by the examples above. The sequence /o+i/ is obtained in locative formation only if the consonant of the last syllable of the noun to be locativized is a labial consonant. This is because in Shangani, there is an incompatibility between the round vowel and

C^w combinations. It is important to note that vowel coalescence in Shangani occurs only if /i/ or /u/ are the second vowels of the sequence. She argues that Just like in other Bantu languages such as the Nguni group of languages (Sibanda 2009) and Ciyao (Ngunga 2000) in Shangani, reordering of the segments produces a completely different phonological process. Vowel coalescence only occurs when the vowel /a/ or /o/ are the first vowels in the sequence as with the case of /a+i/ and /o+i/ coalescing to a mid-front vowel /e/. Reversal of vowel sequences leads to V₁ deletion. The sequence /i+o/ leads to V₁ deletion as in /ti--ona/ to give [tona]‘them’, /i+a/ also leads to V₁ deletion as in /fi+mbuti+ana/to give us [fimbutana] ‘goat (*dim*)’, /a+u/ leading to V₁ deletion as in /fi+nhopfu+ana/ to get [finhopfana].

Coalescence of Vowels /a/ and /i/ to [e] in Shangani (Mabaso, 2009)



Mabaso (2009) argues that coalescence of unlike vowels takes place when the first vowels in sequence are /a/ or /o/ and the second is either /i/ or /u/. The feature [+round] plays a significant role in the coalescence of unlike vowels. It is only when one or both of the underlying vowels are round that the coalesced vowel is also rounded as in /a/ a mid-front vowel and /u/ a high back rounded vowel that gives us [o] a mid-back round vowel. Any two distinct unrounded vowels will coalesce to the mid non round vowel [e] as in /a/ + /i/. She presents that in Shangani, the general pattern that obtains in respect to vowel coalescence is as follows:

/a+i/ → [e]

/o+i/ → [e]

/a+u/ → [o]

She concurs with Doke (1943) in Kadenge (2008; 2012) that the patterns /a+i/ to [e] and /a+u/ to [o] are the commonest vowel coalescence patterns obtained in Southern Bantu languages including Shangani.

2.4. Glide insertion/ epenthesis

Mangoya (2012) defines glide epenthesis/deletion as a process whereby both vowels that precede each other are retained but a semivowel is inserted between them to resolve the hiatus. In Bantu languages such as Shona vowels next to each other broken by the insertion of glides or semi-vowels which are [w] and [j], (Mudzingwa, 2001). The process is influenced by the phonological environment. This is evident in Shona where the glide /j/ is normally inserted in the environment of the coronal vowels /e/ and /i/ while /w/ is inserted in the environment of the round vowel /o/ and /u/. Mudzingwa (2010) in Mabaso (2009) further observes that in Shona the palatal approximant [j] acts as a syllable onset in palatal vowels, /e/ or/i/. The glide [j] is epenthesized where there is a V element that has the same feature configurations with it. The V element which shares the same feature matrices with [j] should either precede or follow it. For example, the loaning of the English word boil to Tonga [bojila] displays that the vowel sequence [oi] which is prone to the epenthesis of [j] placed between [o] and [i] since the vowel [i] and glide [j] both have [-round] and [+sonorant] feature values.

Mangoya (2012) pinpoints that in environments where vowels are juxtaposed to resolve hiatus, the best way to avoid hiatus is the insertion of a semi-vowel. The ideal semi-vowels are [j] and [w]

which are functional in this phonological process which militates against vowel hiatus as exemplified below.

Θ → [syl, +son, -back, +pal] – [+syl, +ant]

a. Insertion of the semi-vowel [j] between /a+i/

/ka + ita/ → [kajita]	it had gone/worked out
/ma + isa/ → [majisa]	‘you have put/placed
/za + itika/ → [zajitika]	‘it has happened

b. Insertion of the semi-vowel [j] between /a+e/

/ma + ema/ → [majema]	‘you have stopped/stood up’
/wa + enda/ → [wajenda]	they have gone
/ta + erenga/ → [tajerenga]	we have read
/wa + enzana/ → [wajenzana]	‘they all did the same

c. Insertion of the semi-vowel [y] between /i+e/

/i + enda/ - → [yenda]	as she was going
/ci + enda/ - → [cijenda]	go now

d. Insertion of the semi-vowel [j] between the combinations of /o+e/ and /u+i/

/to + enda/ → [tojenda]	we are going
/mo + isa/ → [majisa]	you are putting

/ku + ita/ → [kujita] to do something

e. Verb +interrogative -i

/marimire + i/ → [marimireji] what kind of farming

/cece + i/ → [ceceji] what kind of church

/mabero + i/ → [maberoji] what kind of thighs

Mangoya's study demonstrates that Barwe breaks vowel sequencing through the placing of a glide [j] between the vowel sequences. The insertion of the glide is influenced by the position of the vowels present in the vowel sequence. The examples above demonstrate that the glide [j] is inserted between the vowel sequence of /e/ and /i/ that carries the feature [-back]. It is the features of the second vowel which is [-back] that determines the nature of the glide [j] which is also [-back] to be inserted.

He further illustrates that [w] can also be inserted before particular vowels.

Ø → [syl, +son, +lab, +velar] [+syl, +back]

Subject prefix+verb

a. /ta + otsira/ → [tawotsira] we have sneezed

b. /za + ona/ → [zawona] they have seen them

c. /ca + otsila/ → [cawotsila] it has sneezed

d. /to + ulaja/ → [towulaja] we are killing

e. /ku + otsila/ → [kuwotsila] to sneeze

f. /ca + ulaya/ → [cawulaya] it has killed

g. /a + ume/ → [aweme] to dry them

The above examples demonstrate that instead of preferring the vowels [o] and [u], Barwe prefers the glide [w] first as a strategy to facilitate the passing of the features [+back] to the glide [w] since it also carries the lip rounding and raising of the back tongue. In other words, glide epenthesis is a phonological process responsible for breaking hiatal configurations present in Barwe by simply inserting the glides [j] and [w] between the vowel sequence. The inserted semivowel provide the C component to the onsetless initial syllable of the verb stem as the glide now function as a consonant in syllable formation. This study claims that Barwe prefers to preserve the initial features present in the input and above all it favours the insertion of a glide.

2.5. Vowel deletion

When a vowel is left out, the process is regarded as vowel deletion and happens when the features of the vowels are in disagreement, (Sibanda, 2009). The study carried out by Sibanda on Nguni languages claims that /a/ is usually dropped prior to mid vowels /e/ and /o/. Trask (1996) explains that what triggers deletion is when a structure fails to preserve or maintain a segment. This kind of process is given different terms such as elision (Mudzingwa and Kadenge, 2010) whereas others term it deletion, (Ngunga, 2000).Casali (1996) is of the opinion that the elision of a vowel is influenced by the demands of a particular language and in some circumstances, other languages prefer to elide the first vowel whilst the deletion of the second vowel is common in other languages. A formula for vowel deletion was coined as means of avoiding hiatus. The formula reads (consonant+first vowel) + (consonant +second vowel) - (consonant+second vowel) or (consonant+first vowel) or $CV_1 + CV_2 - CV_2$ or CV_1 .

The placement of vowels plays a very important because vowel deletion is place sensitive and languages such as Shona and Chichewa the elision of the first vowel or second vowel depends on the where the vowels are placed. Languages like Swahili and Tonga proved to be inclined to V₁ deletion despite the fact that it has been proved that some languages favour the deletion of the second vowel whilst the deletion of the first vowel is peculiar to most languages. In some instances there are languages which favour the elision of both the first vowel and the second vowel and this was attested in Shona and Etsako. Consider the following examples of V₁ and V₂ deletion:

V₁ Deletion/d_a akpa/ - [dakpa] buy a cup

V₂ Deletion/baba + awo/ - [babawo] that father

/mⁿana + ujo/ - [mⁿanajo] that child

Mabaso (2009) accounts that the above examples from Chichewa and Etsako that Casali (1996) used show that V₂ deletion is attested in the languages are problematic because they show that V₂ deletion occurs when demonstratives are cliticized to nouns. Sabao (2009) accounts that Chichewa presents evidence of both V₁ and V₂ elision which is a result of phonological rules in Chichewa that stipulate that a vowel deletes when followed by another vowel at a morphological boundary. He pinpoints that the most common mode of deletion is V₁ elision and in most instances, the vowel that elides through V₁ deletion is a prefix vowel, which is a negation prefix as presented below:

a. si-u-pita [supita] /i₁#u₂/ - [u₂] “you will not go”

Neg-you-go

b. si-u-funa [sufuna] /i₁#u₂/ - [u₂] “you don’t want”

Neg-you-want

c. si-u-dya [sudya] /i₁#u₂/ - [u₂] “you will not eat”

Neg-you-eat

d. si-u-lira [sulira] /i₁#u₂/ [u₂] “you will not cry”

Sabao explains that in the given data, we can argue that the rule is to delete the vowel in the negative prefix vowel when it is followed by a subject marker which commences in/with a vowel. This form of vowel elision, which results in the high front prefix vowel [i] eliding because it deletes the final vowel of the first prefix morpheme.

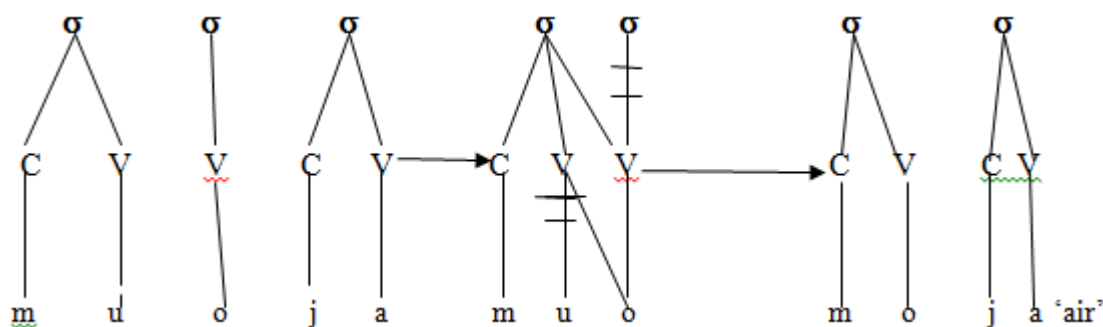
Orie and Pulleybank (2002) observe that in Yoruba, V₁ deletes when contained in a word of two or more syllables. Whereas, Ngunga (2000) argues that in Ciyao deletion occurs in /e + i/ - [e] cases only. This shows that Ciyao also deletes the second vowel when vowels are juxtaposed. Sabao (2005) in Sabao (2009) argues that although both V₁ and V₂ elision is attested in many Bantu languages, the choice of the vowel to be elided can also be argued to owe much to languages making great effort to preserving material that is auditorily salient. It can also be argued that the choice of the vowel that elides is governed by phonological and morphological restrictions within a language.

Vowel deletion in Shangani

$V_1 \rightarrow \emptyset - V$

The above rule shows that V₁ is deleted when it is followed by another vowel.

Vowel deletion (Shangani)



Mabaso (2009) indicates that V_1 is dissociated from its relationship with its V slot hence the connection of the first and second vowel to the V slot. The vowel /o/ transforms to the core of the first syllable of the word after the deletion of the vowel /u/. This is illustrated in the word /mu+oja/ which becomes a disyllabic word [moja]. The table below illustrates elision of V_1 .

/va+ona/	vona	them	V_1 deletion
/ʃi+ne ⁿ ge+ana/	ʃine ⁿ gana	Small leg	V_1 deletion
/ti+ona/	tona	they	V_1 deletion
/ʃi+doki+ana/	ʃidokana	little donkey	V_1 deletion

V_1 Deletion in Shangani

She argues Shangani deletes V_1 and the elision of the following vowels /a/, /i/, /e/ and /u/ and this type of activity is experienced at different areas. The deletion of /o/ is not peculiar to Shangani whereas the point where the vowel is placed in the VV sequence is of great importance in the language. The point to note is that Shangani favours the deletion of the first vowel in the vowel sequence and this resolves hiatal configurations. This kind of elision happens in the process of suffixation hence the deletion of the second vowel is not evident in shangani.

Vowel deletion in Kinyarwanda

Kimenyi (1979) in Lee (2015) argues that the data below belong to regressive vowel deletion in the sense that the back vowel /u/ or /o/ preceded by a consonant like a labiodental or a velar is deleted.

Vowel deletion with labiodentals in Kinyarwanda

/ku – vu a/ → [kuva] “to fall, to sleep”

/ku – pfu – a/ → [gupfa] “to die”

The data above describes that a high back vowel /u/ is eliminated when it is preceded by a labiodental fricatives /f, v/ and affricate /pf/. Therefore, gliding vowel is rejected but deleting a vowel is adopted instead. The same vowel is also elided, this time, if it is preceded by a velar/k, g, h/ as shown below;

Vowel deletion with velars in Kinyarwanda

/ku-uumv-a/ → [kuumva] “to hear, listen, feel, understand, smell”

/ku-oog-a/ → [kooga] “to swim”

/hiraho#umu-uunu/ → [hiahumuunu] “to put salt on it”

Mangoya observes that the combination of a noun prefix+ a vowel commencing stem attracts vowel elision as a way of avoiding or breaking the vowel sequencing and he argues that the CV pattern is a result of the deletion of one of the vowels found in the vowel sequence as illustrated in the examples below.

Noun prefix + noun stem

/mu+oŋko/ → [moŋko] hand

/mu+oto/ → [moto] fire cl 3

/mu + ojo/ → [mojo] heart cl3

/co +oto/ → [coto] fire place cl7

Quantitative prefix + quantitative stem

/va + entsene/ → [ventsene] all of them cl 2

/ci + entsene/ → [centsene] all of it cl 7

/ji + entsene/ → [jentsene] all of it cl 9

/dza + entsene/ → [dzentsene] all of them cl 10

Taking the above examples into consideration, hiatus is resolved by the elision of one of the two vowels present in the vowel sequence. In most instances, the vowel present in the noun prefix is elided whereas there is the preservation of stem vowels as in /mu+oŋko/, the vowel /u/ of the noun prefix is elided and the /m/ becomes the syllable onset with onsetless vowel of the stem becoming the nucleus. As a result the word [moŋko] after resyllabification. The deletion is realized as means to prohibit (CCVCCV) to make room for (CVCCV) which is the surface structure. Mangoya pinpoints that the prefix vowel becomes prey to deletion as shown in the quantitative prefix + quantitative stem example. The consonants of the prefix become onsets as the onsetless commencing vowel of the quantitative stem becomes the vowel nucleus to construct the CV preferred syllable in the surface structure. Barwe breaks hiatus configurations by not favoring onsetless syllables.

2.6. Glide formation

According to Mabaso (2009) glide formation is a process whereby a vowel is realized as glide. In the similar vein, Kadenge (2010) observes that glide formation is referred to as a process where a

high vowel that belongs to a class affix transforms into a glide when preceded by a vowel commencing stem. Sabao (2009) accounts that glide formation refers to the change of phonological qualities of a vowel and its assumption of ‘consonancy’ [consonant features] in order to break up a hiatus complex. Thus when words are uttered in isolation, the close vowels in the opening sequences undergo glide formation process. The structural condition under which a glide formation will apply for a close vowel is that it occurs between a consonant and an open vowel. Fromkin and Rodman (1991) describe glide as sounds that are produced with little obstruction of the pulmonic air stream as the tongue moves rapidly in a gliding fashion either toward or away from a neighbouring vowel. The glides that are commonly talked about in Bantu languages are the palatal [j] and the labiovelar [w] thus glide formation involves the replacement of [u] by [w] and of [i] by [j]. Mangoya accounts that these sounds are also referred to as semivowels due to articulation that allows freer passage of the airstream that is almost similar to the way vowels are produced. Glide formation is influenced and conditioned by a host of conditions most of which are featural ones. Baković (2003) in Sabao (2009) presents that in vowel sequence in Chicano Spanish, if the initial vowel is high [+high], it becomes a glide of the vowel that it precedes. The basic rule in this kind of hiatus context in languages is: /i/ > [j] and /u/ → [w]. The result is the elimination of vocalic hiatus and the replacement of the sequence with a rising-sonority diphthong.

Kadenge (2010) is of the opinion that high glide formation occurs when the higher of the two vowels of the hiatus is raised to the point where it becomes a glide /w/ or /j/. The vowels that can undergo high glide formation are /i, u, e/ and /o/. Because /a/ is the lowest vowel it cannot physically be raised to a high glide. V₁ normally undergoes glide formation in rising sonority /e+a > [ja] and V₂ in falling sonority /a+e/ > [aj].

Mtenje (1986) and Mkochi (2004) argue that there is evidence that in Chichewa there is a rule of glide formation. In glide formation, a high vowel is changed into a glide when it is followed by another vowel. The second vowel in turn is compensatorily lengthened. Glide formation in Chichewa occurs when the V₁ has the features [+high] and/or [+round] and/or [+back]. The first vowel in the sequence with the required features surfaces as a glide in a bid to preserve the original vowel features as well as maximize segmental identity between the input and the output.

Glide formation in many bantu languages typically takes place as the high front vowel /i/ is followed by a vowel initial stem, producing the glide /j/ (written y), and the back high rounded vowel /u/ is followed by a vowel initial stem, results in the glide /w/, (Hyman, 2003).

Glide formation in Kwere

Underlying form	Surface form	English word
i+e-ye mi-ele	Myele	Knives
i+a-ya mi-anza	Myanza	Journey
u+e-we mu-ele	Mwele	Knife
u+a-wa mu-anza	Mwanza	Journey
u+i-wi li-ivi	Lwivi	Door

Lee (2015) refers to glide formation as a process whereby high vowels become corresponding glides before another vowel. He further argued that glide formation is conversion of an unstressed /i/ or u/ to the corresponding glide before another vowel. This is one of the rules often observed in languages when vowels occur in hiatus. In Luganda, for example, the noun class prefix mu- as occurring in muganda “brother/sister” has an allomorph mw- before stems beginning with a vowel.

Mwami < *mu-ami 'chief'

Mwana < *mu-ana 'child'

In Korean, glide formation not only applies to high vowels [i] and [u] but also to o as in

Glide formation before i: kye < *ki-ə 'crawl'

Glide formation before u: kke w ə < kke-ə 'wake up'

Glide formation before o: po+ta.pwa < *po-a 'see'

We can deduce that glide formation is most likely to occur to high vowels such as [i] and [u] as in Luganda and then generalize to include mid-vowels such as [o], as in Korea. This observation implies that if in a language a mid-vowel such as [o] undergoes glide formation to [w] before another vowel, then a high vowel such as [u] must also undergo glide formation.

Lee (2015) accounts that in Kinyarwanda, vowel clash is entirely prohibited, and thus glide formation is invoked as shown below;

/ku-gu-a/	[kugwa]	To fall
/ku-ku-a/	[gukwa]	To give bride wealth
/ku-aak-a/	[kawaka]	To ask
/ku-ne-a/	[kunya]	To defecate
/ku-ri-a/	[kurya]	To eat
Ibi-aatsi/	[Ibyaatsi]	Grass

(Kimenyi, 1979)

Glide formation in Kinyarwanda requires one of the vowels to become a semi-vowel or glide, that is /y/ or /w/ the vowel gliding arises when one of the non-low vowels / i, e, o, u/ is followed by another vowel across a morpheme boundary. As a result the vowel becomes /y/ if it is a front vowel while /w/ if it is a back vowel.

In his study, Mangoya (2012) observes that Barwe also employs the glide formation which takes place when the vowel nucleus of the prefix precede an onsetless initial syllable of the suffixed stem thereby juxtaposing the two vowels, for example, u+a

/mu+ana/	[mwana]	Child/kid (cl 1
/mu+ando/	[mwando]	Cold/moisture cl 3
/mu+aka/	[mwaka]	Season cl 3
/tu+ana/	[twana]	Small children
u+e		
/mu+ene/	[mwene]	Owner cl 1
/ku+enda/	[kwenda]	To go
/mu+endo/	[mwendo]	Leg
/mu+eya/	[mweya]	Spirit/smell
u+i		
/mu+iri/	[mwiri]	Body
u+o		
/mu+ongo/	[mwongo]	Marrow
/mu+oyo/	[mwoyo]	Heart

The above examples demonstrate that /u/ undergoes gliding /w/ whenever it precedes the vowels /a, e, i, o/. Mangonya observes that there was less evidence of the glide formation [j] and it was only observed in the quantative stem and quantitative prefix as in

/i+entsene/ → [je-nstene] all of it

He argues that the generalization in Barwe is that the high vowels undergo glide formation. For example,

u+a =wa	i+a =ja
u+e =we	i+e =je
u+i =wi	i+i =ji
u+o =wo	i+o =jo
	i+u =ju

The above examples demonstrate that the semivowel formation that targets the left side vowel. It can be noted that the front unrounded /i/ becomes [j] while the back rounded vowel /u/ becomes the glide [w].

Mabaso (2009) accounts for labial and palatal glide formation in Shangani. Furthermore, she contrasted glide formation in Shangani and glide formation in Duruma from Schroeder (2010) study.

/u+a ⁿ ga/	[wa ⁿ ga	mine
/u+otʃe	[wotʃe	alone
/u+upfa/	[wupfa]	roast
//u+otʃa/	[wotʃa]	Be ripe

Glide formation in shangani

Underlying Representation	Surface Representation	Gloss
---------------------------	------------------------	-------

/i-+-a ⁿ ga/	[ja ⁿ ga]	mine, my own (cl 9)
/i-+-otʃe/	[jotʃe]	alone (cl 9)
/i-+-ak ^w e/	[jak ^w e]	his/ hers (cl 1)

Glide formation in shangani

Noun Prefix + Noun Stem	Noun	Gloss
/u-+-ira/	[wira]	song
/u-+-e ^m be/	[we ^m be]	razor blade
/u-+-ari/	[wari]	food from maize meal
/u-+-o ⁿ go/	[wo ⁿ go]	brain

Glide formation in Duruma (From Schroeder, 2010)

Mabaso (2009) study demonstrates that the examples above in Duruma demonstrates that formation of a glide comes about when the high vowel /u/ is the first vowel of the two adjacent vowels and is followed by any other vowel besides itself. Turning of the vowel /u/ into a glide requires stripping it off the (+syllabic) feature. However, Vowel deletion is brought about as a result of a vowel sequence as in /u+unga/ to [uⁿga] → (flour) and this results from the elision of the first vowel /u/. On the other hand, shangani realizes glide formation when there are identical vowel sequences as in /u+upfa/ → [wupfa] which is (be ripe).

2.7. Conclusion

In this chapter, the main strategies have been discussed. In each of the strategies discussed examples were drawn from previous studies to describe the phonological processes and their contribution in Bantu languages. The chapter established that the way languages resolve hiatus configuration is different and it is influenced by the lexical system of that language. In some instances, similarities and differences in the way languages resolve hiatus were highlighted and examined what triggers the hiatus. It was established that VV sequences are not allowed in most bantu languages and this

results in coalescing of two initial vowels to form a third neutral vowel that preserves the features present in the input. Some languages resolve hiatus through inserting a glide thus breaking the unwanted vowel sequence whereas elision of a vowel is another way of dealing with hiatal configuration. This is where the first or the second vowel is elided to break the sequences. In other words, some languages prefer the deletion of a vowel. The next chapter presents the theoretical framework and gives an analysis of the strategies within the framework of Optimality theory.

CHAPTER 3: THEORETICAL FRAMEWORK: OPTIMALITY THEORY

3.1. Introduction

This chapter examines the theoretical framework that guides the researcher in the discussion and presentation of findings. The Optimality theory informs the decisions during the interrogation of data and describes the presentation of data using tableaux. This chapter discusses the generation of output forms for every input encountered. The markedness constraints and faithfulness constraints will be examined in a bid to establish the ranking of the constraints and how they break vowel hiatus configurations as well as designing the tableaux to show the violation and ranking of constraints.

3.2. Background of OT

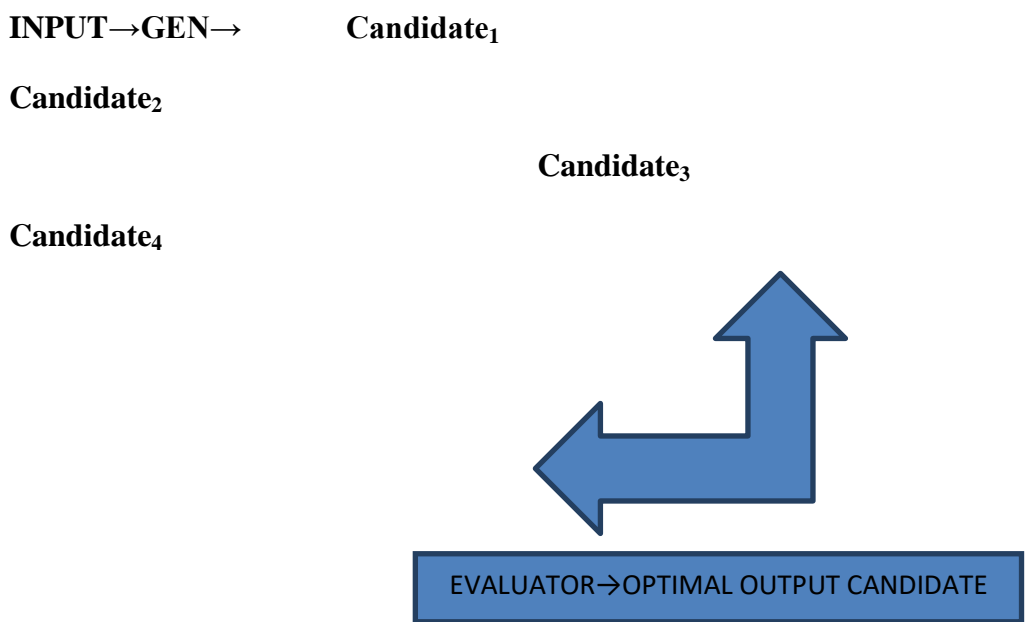
Optimality theory (OT) is a non-derivational approach to phonology and does not favour a series of levels from underlying representations to surface form. It is argued that in OT a single set of constraints can account for varied input having similar outputs as compared to rule based theories where several rules are supposed to work together to give the same result in grammar, (Cahill, 2007). Cahill (2007) further asserts that OT that defines well-formedness in terms of constraint interaction. For a given input to the grammar, the output is the form that best satisfies a set of constraints. Moreover, these constraints are considered to be universal and are inherently conflicting. In other words, the theory is a constraint based one which is a means to explain the differences that occur between languages. Within the framework of OT, the role of a language is to select the output form from among a very wide range of candidates. Downing (2009) argues that OT and its developments give a fresh perspective to complex phenomena that are found in African phonologies.

Grammars of a language regulate the ranking of constraint and it is the different ranking of constraints that accounts for variations in languages. For a given linguistic input, the grammar of a language will generate an infinite number of candidates which are then evaluated over a hierarchy of constraints of that particular language until an optimal candidate is selected, (Mtenje, 1980). Prince and Smolensky (2002) attest that in OT terms, a grammar consists of well-formedness constraints and of possible ways to resolve conflicts that arise between the contradictory demands of different constraints; the conflict resolution is achieved by means of constraint hierarchy. In other words, the only specifications of the input dwells on well-formedness that is it does not contain variables that are not grammatical. Moreover, the theory requires establishment of a constraint ranking and it can account for the reasons why a given phonological process applies or fails to apply in a given environment or context. Furthermore, the phonological occurrences are a result of the language's adherence to faithfulness of input form hence it must be in agreement with its avoidance of certain output forms. Kager (1999) pinpoints that optimality is the status of being most harmonic with respect to a set of conflicting constraints hence the optimal candidate is the one which incurs the least violations of constraints, especially the highly ranked ones. In the same vein, Optimality theory is not accountable for the differences between the input and output in terms of rules or processes but in terms of constraints.

Kager (1999) is of the opinion that the higher-ranked of a pair of conflicting constraints takes precedence over the lower ranked one. In other words, in Optimality theory, the lower ranked constraints are violated only if they are meant to satisfy a higher ranking constraint. This reflects that languages avoid violations of constraints but, the avoidance of a violation of a higher ranked constraint is preferred to that of a lower one, (Mtenje, 2011). This shows that OT proposes that conflicts between constraints are resolved by strict domination. In support, Ferry notes that one set

of constraints can account for such typological differences. Thus all languages have markedness constraints which requires an onset that is responsible for the prohibition of codas and complex margins. All languages have different kinds of faithfulness constraints, such as MAX and DEP that militates against deletion and insertion of a segment. The typological differences emanate from the differences in the ranking of these segments. The typology which is produced by different rankings of constraints will predict specific patterns across languages depending on the ranking under examination.

3.2.1. System of optimality theory: mapping of input to output



The diagram above illustrates that the structure of grammar in Optimality theory demonstrates that for a given input, the Generator (GEN) is responsible for generating the candidate set which consists of the output forms. The Evaluator (EVAL) is responsible for selecting the corresponding output form of the candidate set that ends up as the definite output. The selection of the EVAL is determined by the constraint hierarchy of a given language. Sabao (2009) highlights the three

major components that bring out the relationship between the output and the input in grammar; GEN which produces a list of all possible candidates (suboptimals) relying on the available input form, CON (for constraints) which provides the criteria (violable constraints/hierarchical constraint ranking schema) used to make decisions between candidates and EVAL (for Evaluator) which is the selectional mechanism used by languages to arrive at an optimal output form from the candidate set generated by GEN.

Sabao (2009) suggests that the evidence from the above diagram enable us to argue that elision, coalescence, glide formation/dissimilation and any other form of hiatus resolution processes used to eliminate hiatus configurations in languages, arise out of the ultimate need to honour high ranked constraints in a language, in other words, the high ranking of vowel hiatus (*VV) as a constraint, over and above other constraints that the other losing suboptimal candidates represent. Based on this, it becomes possible to assume that grammars are essentially language specific hierarchies of constraints (Kager, 1999). This thus underlies the key assumption of OT that constraints are violated in any given output form because they are dominated by some constraint(s). Sabao (2009) summarizes that EVAL has a regulatory role in language creation while GEN has the creative role (Zuraw, 2000). For the given input, /na-+-[*u]munhu/, GEN creates a candidate set of potential outputs (A, B, C, D, E, F...), EVAL selects, from the candidate set, the best/optimal candidate and in doing this, EVAL makes use of the language's hierarchy of ranking of constraints from the universal set, CON. To this end, differences between constraint rankings by different languages result in different patterns, thus giving rise to systematic variations between languages.

3.3. Two views of optimality theory

There are two views of optimality theory which are the Containment theory and the Correspondence theory. McCarthy and Prince (1993) are of the opinion that every output contains input and the table below illustrates how every segment in the input is contained in the candidates. The constraint NOHIATUS prohibits hiatus, the constraint FILL which was replaced by DEP says that each segment of the output must correspond to a segment in the input. In other

words, it militates against epenthesis. MAX replaced PARSE and MAX says that all segments of the input must correspond to a segment of the output.

/le/ + /ami/	NOHIATUS	DEP(FILL	MAX(PARSE)
a. ke>ami			*
b. le ami	*!		
c. le °ami		*!	

According to McCarthy and Prince (1995) Gen is completely free and this freedom enables it to generate any kind of change called candidates. They allude that this is known as Freedom of analysis and it explains that you may add as much structure as you want to input. The relationship between the input and candidates is expressed with the help of subscripts added to individual segments. Constraints like DEP or MAX check the correspondence between individual and segments, and militate against epenthesis and deletion.

/l ₁ e ₂ / + a ₃ m ₄ i ₅	NOHIATUS	DEP	MAX
l ₁ a ₃ m ₄ i ₅			*
l ₁ e ₂ a ₃ m ₄ i ₅	*!		
L ₁ e ₂ t ₆ a ₃ m ₄ i ₅		*!	

3.4. Relationship between output and input

3.4.1. Constraints

Constraints are universal since they are viewed as an outcome of universal grammar. All constraints are violable and they easily have contradictory requirements about well-formedness of analyses. This means that when there is no agreement, a conflicting environment is triggered and as a result a constraint is violated whilst the other one becomes the winning candidate. Prince and Smolensky (2002) argues that different rankings of constraints is influenced by the differences which are found in various languages because the GEN and CON are universal. The differences in phonologies of various languages are attributed to the difference in rankings of constraints. Archangeli and Langendoen (1997) postulate that constraints are a way of characterizing universal patterns that happen across the language. Furthermore, constraints are a mechanism of demonstrating different styles that occur between languages as well as determining markedness indicated by constraint violation. In support, McCarthy (2002) accounts that optimality theory predicts that all constraints are violable. The conflict between faithfulness and markedness leads to violation of constraints which is known as constraint violability. In other words, every utterance violates some constraints, if faithfulness is maintained then markedness is violated. An absolutely ill-formed structure is such that when it is analyzed by the grammar, it occurs in no input which will lead to the output form including the structure (Prince and Smolensky, 2002). A constraint always determines its choice for the best output, even if it is low-ranked in the system. Every constraint evaluates all the candidates, but all the constraints are not visibly active. Constraints consists two types of constraints which are faithfulness constraint and markedness constraint (Prince and McCarthy, 1995).

3.4.1.1. Faithfulness constraints

McCarthy (2008) posits that faithfulness constraints are a very knowledgeable idea in OT that no other theory has used constraints before. Faithfulness constraints require that input and output

forms should be identical to one another and if the segments between the input and output are deleted, inserted or re-arranged, the faithfulness constraint is violated. The anti-deletion constraint called the MAX belongs to the family and it requires that all the segments of the input must be present in the output. Another example is DEP, requires that all the segments of output must have correspondence in the input. Therefore, MAX prohibits deletion whereas DEP militates against insertion.

McCarthy and Prince (1995) restructured or revised Prince and Smolensky's idea of PARSE/FILL constraints and introduced the MAX and DEP families in their correspondence theory. A Max-10 constraint says that every segment of the input has a correspondent in the output thus the input must be well represented in the output. MAX is a revised version of the PARSE constraint. They demonstrate that the MAX constraint family frees PARSE constraint from its connection with syllabification and phonetic interpretation. DEP requires that every segment of the output has a segment that corresponds with it in the input. Therefore, the output depends upon the input hence 'DEP'.

ONSET >> DEP (ONSET dominates or outranks DEP).

Input: /pai/	ONSET	DEP
a. [pa.wi]		*
b. [pa.i]	*!	

NoCODA >> DEP (it is better to insert something than to have a coda)

Input: /pakti/	NoCODA	DEP

a. [pa.kə.ti]		*
b. [pak.ti]	*!	

The overall ranking is ONSET, NoCODA, PARSE>>DEP. This shown in the summary table below;

Input:/pai/	ONSET	NoCODA	PARSE	DEP
a. [pa.wi]				*
b. [pa.i]	*!			
c. [paw.ti]		*!		**
d. [pa]			*!	

3.4.1.2. Markedness constraint

Markedness constraints attempt to enforce well-formedness of the output itself thereby prohibiting structures that are difficult to pronounce, produce and comprehend such as complex consonant structures including complex vowel strings, (Sabao, 2009). Markedness constraints require outputs to be unmarked or simplified in structure. Unmarked features are those that are easier to perceive or produce or those that occur frequently across languages. Markedness constraints are constraints on output forms, and they can be compared to the surface-structure constraints filters which belongs to the previous theories. Markedness constraints favour some linguistic structures over other and because of this reason they are often conflicting with faithfulness constraints. Some typical markedness constraints deal with syllable structures, for example, the ONSET requires a syllable to have an onset and NOCODA inhibits syllables from ending with a coda consonant. A markedness constraint assigns a violation mark to a candidate if

the candidate's output structure is in violation of the constraint. Markedness in OT is multidimensional because different constraints like or dislike different characteristics (McCarthy 2002). A concrete example is rules of deletion and insertion. Cahill (1998) uses the example of two hypothetical languages, considering that we are given a root ending with a consonant and a suffix beginning with a consonant, language A places a vowel between the root and the suffix, while language B deletes the final stem.

Language A /bak +to/ → [bakito]

Language B /bak +to/ → [bato]

The concept of unification process is triggered by the push for CV syllable pattern and avoidance of a closed CVC syllable. The NoCODA is responsible for the prohibition of closed syllables, which out ranks any other relevant constraint and as a result it is undominated. The two languages satisfy NoCODA in two different ways, using the same constraints but with different rankings. The relevant constraints are;

NoCODA: Codas are not allowed.

MAX (C): any consonant in the input is present in the output (prohibits deletion of consonants)

DEP (V) any vowel in the output is present in the input (prohibits insertion of vowels). Cahill (1998) postulates that markedness constraints evaluate output representations.

3.4.2. Generator

According to Boersma, et al (2000) the GEN takes the input and generate the list of possible candidates and the candidate set contains output structures which are possible analysis of the input. In the same vein, McCarthy (2002) states that GEN applies all linguistic operations freely, optionally and sometimes relatedly and this property of GEN is known as freedom of analysis. Gen is one of the main components in optimality theory and it is regarded as the operational component. Prince and Smolensky (2002) presents that since GEN is permanent component of universal grammar therefore the aspect of universality is shared in all candidates generated by the constraint GEN in all languages. In other words, GEN produces a candidate set of possible output forms for every input and its main purpose is to specify the association between the output forms and the input. The component of universality makes the GEN to carry the responsibility of making available candidates varied enough in order to anticipate all the differences found between languages. Even if the GEN is over generating, the grammar is because the output of GEN is evaluated and filtered by the evaluator component. Ferry observes some limits to the generative power of the GEN, that is it cannot generate structures which are impossible in all languages like the prosodic structures do not respect the prosodic hierarchy, and impossible feature configuration, like laryngeal feature (voiced, aspirated) associated with the place of articulation node.

Gen (in ;) = {cand₁, cand₂-----}

3.4.3. Evaluator

The EVAL judges candidates using a particular ranking system of constraints and it chooses a member of the set of candidate output forms to be the definite output of the grammar. Chomsky and Halle (1968) assert that the EVAL is responsible for choosing the winning candidate but

warns that overlooking a candidate that ties with the intended winner causes problems. In support, McCarthy (2008) explains that the evaluator gets the candidate set from the generator and then judges it using some constraint hierarchy and as a result the optimal candidate is chosen and it becomes the winning candidate. In OT, the application of a process relies on Evaluator which is instantiated as the language-specific interaction of a markedness constraint and a faithfulness constraint, (Cahill, 1998). The EVAL is responsible for the evaluation of different outputs and choosing of the output that is the optimal candidate. These output forms are evaluated through constraints and their ranking within that language, (Barlow, 2001).

Eval {cand₁, cand₂-----cand_n} =output

The EVAL judges the outputs to determine which one is the optimal output. For any given output such as [p[□]], which is the mental representation of the word [pig]. The GEN can generate the infinite number of possible outputs for that form. All these output forms compete with one another, but one output must be chosen as the optimal candidate.

3.5. Constraint ranking and tableaux

Within the framework of OT, the tableau is the device that is used to represent the hierarchical constraint interaction and ranking process and it demonstrate the rank order of constraints. The theory postulates that the rank ordering of constraints is the deciding factor hence lower-ranked constraints can be violated to satisfy higher-ranking constraints. Constraints are indicated at the top line of the tableau in domination order from left to right. Candidates are in the leftmost column, with the original input at the top. The pointing hand symbol helps to locate or denotes the winning candidate which is usually found in the first row of the candidates hence it is called the optimal candidate. The number of generated candidates is considered to be infinite though the

relevant ones are listed in the tableau and the judgement of these candidates is based on how well they conform to the set of constraints. An asterisk (*) is a sign which signals that a candidate has violated a constraint and the purpose of a blank cell is to signal the violation of a constraint by a candidate in that column. Exclamation mark (!) signal a fatal failure of a candidate. The cells that do not take part in the decision are illustrated by shaded cells and the judgement of a candidate at hand is influenced by another higher-ranked constraint that the candidate violates.

[buk + z] ‘books’, with CC(voice), INDENT(voice)_{ROOT} >> INDENT (voice)

/buk + z/	CC(voice)	INDENT(voice) _{ROOT}	INDENT(voice)
a. b bʊks			*
b. bʊgs		*!	*
c. bukz	*!		

In the tableau above, candidate (a) besides violating the constraint INDENT (voice), it becomes the winning or optimal candidate. The reason for the violation being that the suffix [s] in the output is [-voice] whilst the [z] in the input is [+voice]. Candidate (b) also violates INDENT (voice) but more importantly, also violates INDENT (voice)_{ROOT}. It is more important to preserve voicing in a root consonant than in other consonants, so INDENT (voice)_{ROOT} outranks INDENT(voice). A violation of INDENT (voice)_{ROOT} is enough to make candidate (b) lose. Candidate (c) loses because it violates CC(voice).

3.6. Optimality theory and the phonological processes

In OT, hiatus avoidance is expressed differently thus only one markedness constraint is needed (ONSET or NOHIATUS). How languages achieve resolution of hiatus depends on the ordering of several faithfulness constraints and just one markedness constraint. Prince and Smolensky (2002) pinpoint that the way languages resolve conflicts among universal constraints is different. If one constraint dominates another, it means that these constraints disagree on the status of a pair of candidates and therefore dominating or better ranked constraint makes decision about optimal output. The fact that many languages disprefer hiatus or ban it altogether is interpreted as reflecting a universal markedness constraint against onsetless syllables (McCarthy and Prince, 1993). Mudzingwa and Kadenge (2011) argue that the driving constraint that bans hiatus is the requirement that all syllables begin with a consonant, namely onset.

*[\emptyset V (syllables must have onsets) (Prince and Smolensky 2004).

Mudzingwa and Kadenge (2011) pinpoint that in Karanga and Nambya if a consonant preceding a labial V₁ is a labial consonant and V₂ is a labial vowel, secondary articulation is blocked and elision operates. The example below illustrates the elision of a labial V₁ in Karanga and Nambya.

Labial vowel elision: Karanga /C_{lab} u +O/ → [C_{lab} O]

a. /mú-ti/ → [múti] [múti]

CL3.SG-tree

‘tree’

b. /mú-ójó/ → [mójó] *[m^wójó]

CL3.SG-heart

‘heart’

From the above example, Mudzingwa and Kadenge demonstrate that secondary articulation is blocked in instances where doing so would violate the phonotactic constraints of the language: where it would create a labialized labial consonant followed by labial vowel. They argue that V_1 is consistently deleted and the elision of V_1 does not trigger the lengthening of the following vowel.

Pharyngeal vowel elision in Karanga and Nambya.

Mudzingwa and Kadenge (2011) assert that Karanga and Nambya use the same hiatus resolution strategy when V_1 is a pharyngeal vowel thus they both elide the pharyngeal vowel. They present that Karanga V_1 which is /a/ is elided.

/a/ elision in Karanga; / (C) a₁ + V₂ / → [(C) V₂]

/vâ-éni/ [véni]

CL2.PL-visitor

/a/ elision in Nambya: / (C) a₁ + V₂ / → (C) V₂]

/Bâ-àⁿgú/ [Bâⁿgú

CL2.SG-mine

‘mine’

An analysis of the pharyngeal vowel /a/ in tableau.

Pharyngeal vowel elision in Karanga.

/vâ ₁ -é ₂ .ni	ONSET	*C ^ɣ	ANCHOR L	MAX Rt	MAX _μ
a.vâ ₁ .è ₂ .ni	*!				
b.vâ ₁ .ni			*!	*	*
c.v ^ɣ è ₂ .ni		*!		*	*
d.∅vè ₂ .ni				*	*

Mudzingwa and Kadenge observe that candidate (a), (b) and (c) fatally violate the inviolable constraints Onset, Anchor L and *C^ɣ. Candidate (d), which elides V₁, is the optimal candidate because it violates the lowly ranked MAX Rt and MAX_μ.

Pharyngeal vowel elision in Nambya

/βâ ₁ -â ₂ . ⁿ gú/	ONSET	*C ^ɣ	ANCHOR L	MAX Rt	MAX _μ
a.βâ ₁ .â ₂ . ⁿ gú	*!				
b.βâ ₁ . ⁿ gú			*!	*	*
c.β ^ɣ a ₂ . ⁿ gú		*!		*	*
d.∅βâ ₂ . ⁿ gú				*	*

Mudzingwa and Kadenge (2011) account that candidates (a), (b) and (c) fatally violate the inviolable constraints Onset, Anchor L and *C^ɣ whereas candidate (d) which elides V₁ is the optimal candidate because it violates the low ranked MAX Rt and MAX_μ.

3.7. CONCLUSION

In conclusion, this chapter briefly discussed the framework being used for the analysis of data. The optimality theory relies more on the ranking of constraints to establish the optimal candidate. The GEN is responsible for generating input and the evaluator evaluates all the different outputs and it is responsible for choosing the output that is the optimal response for a particular language under study. The chapter also examined the two types of constraints namely faithfulness constraints which requires that input and output forms should be identical to one another hence it is violated if the segments between the input and output are elided or inserted. Whereas the markedness constraints requires outputs to be unmarked or simplified in structure. The next chapter analyzes the data guided by the optimality theory.

CHAPTER FOUR: DATA PRESENTATION AND ANALYSIS

4.1 Introduction

The previous chapter described the Optimality theory. Constraints are identified and presented. The chapter also examines the phonological processes that are experienced in ChiManyika and ChiHwesa dialects. Mabaso (2009) pinpoints that the main purpose of the phonological processes is to make the pronunciation of words easier through deletion, addition and modifications of sounds when being articulated. Oyebade (2008) in Mabaso asserts that phonological processes are sound modifications motivated by the need to maintain ease of articulation in a language or to rectify violations of the well-formedness constraints in the production of an utterance. The chapter makes a comparative analysis on how these dialects resolve hiatus.

4.2. Glide insertion/ epenthesis in ChiManyika

Gliding only occurs when two vowels at the configuration boundary are different whereas similar vowels coalesce. The glide [y] [w] must agree in rounding with the second of the vowels in the vowel sequence. Glide formation is motivated by the need to eliminate the onset syllables hence the need to destroy the VV structures whereas epenthesis is triggered by the insertion of a sound that was not present. This is very common in ChiManyika. ChiManyika breaks the hiatus by inserting semi-vowels [j], [w] and [y]. In phonology a semi-vowel or a glide is a sound that is phonetically similar to a vowel. For example,

/wa + enda/ → [wayenda]

/taka+enda/→ [takayenda]

/ku-enda/→ [kwe: nda]

We can argue that instead of deleting a segment, ChiManyika prefers inserting the glide [y] between the vowels in the sequence thus the vowel sequence /a+e/ of the input is broken by a semi-vowel [y] insertion between the vowels. Sabao (2005) argues that the glide [w] formed agrees in rounding with its input segment. Furthermore, he is of the opinion that glide formation is elected because it maximizes featural as well as articulatory identity and this process eliminates the unwanted hiatal configurations. The changing of [u] to glide [w] automatically breaks the hiatus caused by vowel sequencing and the hiatus resolution brings about the presence of the glide [w] as exemplified in the diagram below. Mudzingwa (2001) observes that in Shona the palatal approximant [j] acts as a syllable onset in palatal vowels, /e/ or /i/. The epenthesis of the glide [j] is realized when there is a V-element that has the same configurations with it. The V-element which shares the same characteristics with the glide [j] should either precede or follow it, in the CV sequence.

FAITH-V: All vowels positions in the input should be preserved in the output (Mkochi, 2007)

NVL: All short vowels in the input should retain their features in the output

*COMPLEX: complex consonants are not allowed

PARSE:

Input:/mu-aki/	ONSE T	PARSE[F ']	*COMPLE X	DEP-10	IDENT(μ)
(a) /mu.a.ki/	*!				
(b) [☞] /mu.wa.ki/					*
(c) /mwa.ki/		*!	*(!)	*!	*

*TABLE
1:Glide
formatio*

n

Input:/mu-eni/	ONSE T	PARSE[F ']	*COMPLE X	DEP-10	IDENT(μ)
(a) /mu.e.ni/	*!				
(b) [☞] /mwe.ni/					*
(c) /me.ni/		*!		*!	*

*TABLE
2: glide*

formation

Input:/mu-ana/	ONSE T	PARSE[F ']	*COMPLE X	DEP-10	IDENT(μ)
(a) /mu.a.na/	*!				
(b) ^ɸ /mwa.na/					*
(c) /ma.na/		*!	*(!)	* (!)	*

TABLE
3: glide

formation

We can argue that VV sequence is not allowed in ChiManyika as exemplified in the tables above. Gliding takes place when two vowels at the configuration boundary are different and on the contrary similar vowels coalesce to produce a third vowel. There must be an agreement between glide [y] and glide [w] in terms of rounding with the second vowel present in the vowel sequence. Glide formation/epenthesis is influenced by the fact that it wants to get rid of the onset syllables hence the need to destroy VV structures as in /zve-anhu/- /zvewanhu/ summarized in the table below. This is in line with Mudzingwa's (2001) observation that glide [j] is normally inserted in the environment of the coronal vowels /e/ and /i/ while [w] is inserted in the environment of the round vowel /o/ and /u/.

Input:			MAX-10	IDENT	DEP-	UNIFORMI

/zve-anhu/	ONSE T	PARSE[F ']			IO	TY
(a) /zve.a.nhu/	*!					
(b) [☞] /zve.wa.nhu/					*	**
(c) /zve:.nhu/		*!	*(!)	*		**

TABLE 4: glide epenthesis

The above example demonstrates that epenthesis is the insertion of either a consonant or a glide (semi-vowel) between two vowels for example, na-anhu → /newanhu/ and /zva-imba/ → /zvemba/. The insertion of the glide /w/ in the output which is not present in the input is realized and as a result it militates against the segmental identity constraints such as DEP-10 (which says do not add/insert segments in the output that were not there in the input). Candidate (b) is the winning candidate because it violated DEP-10. It can be argued that from the above tables there is glide formation and glide insertion. Glide formation occurs when we apply a vowel between a consonant and an open vowel. Hyman (2003) concurs with Sabao (2013) when they describe that glide formation in many Bantu languages is realized when the high front vowel /i/ is followed by a vowel initial stem to produce the glide /j/ (which can be also written as y/, and the back high rounded vowel /u/ followed by a vowel initial stem resulting in the glide /w/. This is exemplified by examples from Chichewa (Sabao 2013) thus gliding of a high vowel Ku-ipa → /kwi:.pa/ - [kwipa] and epenthetic glide or dissimilation.

ku-danda-a /ku.dà.nda. ^wú.la/ /a₁#u₂/ → [a₁^wu₂] ‘to complain’

Inf-complain-FV

sauk-a /sa.^wu.ka/ /a₁#u₂/→[a₁^wu₂] ‘[to be] poor’

Chimanyika also experiences this kind of phonological dissimilation in form of glide insertion or dissimilation. Let's consider the following examples

wa-no-ita /wa.no^y-it-a/ /o₁#i₂/→ [o₁^yi₂]

mha-i /mha^yi/ /a₁#i₂/→ [a₁^yi₂]

In summary, Baumbach (1981) in Mabaso (2009) observes that glides are semi-vowels are created through a drastic narrowing of the passage through which the airstream from the lungs moves through the local oral tract. In support, Kadenge (2008) reiterates that at times glides function as because there is no radical obstruction of the airstream mechanism in their production but phonologically they function as consonants because they play the role of onsets in syllable structure. I can argue that glide formation or epenthesis occurs when the V1 is a high that is /u/ and /i/ whilst coalescence is not identical. We observe that ChiManyika apply both glide formation and glide epenthesis in cases demonstrated above where both glide [y] and [w] are used. In some cases the vowel changes into a consonant as in /ku-enda/-[kwenda] where the vowel [u] changes into a consonant or glide [w]. In some instances a glide is experienced in the pronunciation of word such as [mhai^yo] where glide [y] is applied. Mabaso is of the opinion that this is the reason why Sibanda (2009) and Kadenge (2008) argue that when a vowel transforms to a consonant, the process is now regarded as consonantalization instead of glide formation.

4.3. Vowel deletion in ChiManyika

Crystal (1997) in Mabaso (2009) explain that vowel elision is a phonological process that come as result of dropping one of the vowels found in the input. The dropping of a vowel is necessitated by the attachment of a vowel commencing stem to a prefix that ends with a vowel. The elision of the vowels is triggered when two vowels are sitting next to each other within or across a morpheme boundary and as a result there is a clash of adjacent vowels. Sabao (2009) argues that in vowel deletion the victims of elision come from just one of the input segment unlike in vowel coalescence where both input segments lose features and it results in the loss of the root node. This is exemplified by the following example,

mbudzi- ana [mbudzana]

The deletion of V₁ is determined by morphosyntactic domain and as a result we argue that this is not vowel coalescence because of the domains. Mabaso (2009) describes that the notion of domains is regarded as a diagnostic tool for identifying a process in situations where there are identical vowels as in /wa-ana/ → wana (for children). When there is a vowel sequence, the first vowel in the sequence is deleted leaving only one vowel. It is experienced in ChiManyika where elision takes place through the deletion of V₁.

Input:/wa-ana	ONSET	MAX-V	DEP-IO	IDENT-IO	IDENT-IO(F)	UNIFORMITY
(a) /wa.a.na/	*!					
(b) [☞] /wa:.na/				*		**
(c) /wa.na/		*!			*	**

(d)			*!	*		**
/wa.wa.na/						

TABLE 5: Vowel deletion

V₂ is also attested in Chimanyika when we encounter nouns with demonstrative affixes (suffixes) such as

baba + awo → babawo that father

mwana + uyu → mwanayu this child

imba + iyi → imbayi this house

From the above, we observe that elision affects the functional word vowels and in this case the demonstratives are the victims. In other words, this reveals that vowel deletion relies more on the feature quality of the vowels in hiatus. This is evident enough to prove that ChiManyika deletes both V₁ and V₂ in most instances. This is motivated by the rules which stipulate that a vowel deletes when followed by another vowel at a morphological boundary. V₂ deletion is evident at the lexical word-functional word boundary. Sabao (2013) demonstrates that one such boundary is the noun demonstrative boundary where the vowel that is deleted in such circumstances is the initial vowel of the demonstrative which is in the V₂ in the sequence. Mtenje (1980) in Sabao (2013) observes that this type of elision is known as demonstrative pronoun vowel elision and the following examples were cited

mwana + uyu /mwənəyu/ /a₁#u₂ → [a₁] ‘that/this child’

Child-this /that

nyumba + iyi /nyumbayi/ /a₁#i₂/ → [a₁] ‘this house’

house-this

Mabaso (2009) demonstrates that in Shangani, the high vowel which is V₁ in sequence below is deleted because if it turns into a glide it creates [C_j] clusters which are not permissible in Shangani thus glide formation and secondary articulation are blocked by these constraints. Consider the following examples of elision of the vowel /i/ in Shangani which are similar to ChiManyika and Chichewa.

/shi+ dhoki +ana/[ʃidokana] small donkey

/shi+ mbuti +ana/[ʃi^mbutana] small goat

/shi + hunyi + ana/ [ʃihujana] small firewood

We can argue that demonstrative pronoun vowel elision is also noticed in Chimanyika where we delete the vowel in the initial stem. I agree with Mabaso's view that if we do not delete the vowel /i/ it results in the creation of a glide/consonant [y] which is not allowed in Chimanyika.

4.4. Vowel deletion in Hwesa

Trask (1996) views deletion as the dropping of a segment from a structure. Scholars like Mudzingwa (2010) and Kadenge prefer using the term elision while Ngunga (2000) prefers to use deletion. Mangoya purports that the dropping of a vowel is realized when there is a combination of noun prefix + vowel commencing stem and this triggers the unwanted vowel sequences. Furthermore, he argues that the deletion or the dropping of one of the vowels sitting next to each other results in the favoured CV pattern which is wanted in most instances. This is exemplified in the examples below;

/za+entse/ - [zentse] all of them

/ma +ino/ - [mano] teeth

/va-entse/ - [ventse] all of them

/ra-entse/ - [rentse] all day

We noted that ChiHwesa removes the unwanted vowel sequences through V₁ or V₂ elision. It shows that one of the vowels in the vowel sequence is deleted to avoid hiatus. It can be argued that it is the vowel of the noun prefix that becomes the target of elision whereas the stem vowels are elided. The deletion is done to avoid the VV sequence occurrence.

Input:/za-entse/	ONSET	MAX Rt	*COMPLEX	MAX_μ	IDENT- IO(F)	UNIFORMITY
(a) /za.e.ntse/	*!					
(b) ^ɸ /ze:ntse/				*		**
(c) /zwe.ntse/		*!			*	**

TABLE 6

Candidate (a) violates the undominated constraint ONSET whereas candidate (c) is penalised for inserting a glide and it violates the *COMPLEX which does not allow consonant clusters in a structure. The optimal candidate or the winning candidate is candidate (b) which deletes V₁ to break the hiatus configuration by violating the lowly ranked MAX Rt and MAX_μ. We can argue

that V₁ elision takes place in ChiManyika and the inserting of a glide is not permissible in some structures.

Input:/ma-ino/	ONSET	MAX-Rt	*COMPLEX	MAX_μ	IDENT-IO(F)	UNIFORMITY
(a) /ma.i.no/	*!					
(b) [☞] /ma:no/				*		**
(c) /ma.jo/			*!		*	**

TABLE 7: V₂ Deletion in ChiHwesa

This proves that phonological deletion is allowed in ChiHwesa and we can argue that glide formation is restricted when the high vowels /u and i/ are present and when each of them is V₁ is not followed by a consonant. Candidate (a) violates the onset and candidate (b) violated the uniformity constraint whereas candidate (c) is eliminated for violating MAX-10 which is do not insert anything. However, in ChiManyika, the data in the above table is considered as vowel coalescence because /a+i/ coalesce into /e/ as in

ChiManyika Coalescence

/ma+ino/ → [meno] ‘teeth’

/ma+iso/ → [meso] ‘eyes’

ChiHwesa Deletion

/ma+ino/ → [mano] ‘teeth’

/ma+iso/ → [maso] ‘eyes’

In ChiHwesa, we observe that V₂ deletion is permissible as compared to ChiManyika which coalesce /a+i/ to get /e/. We can argue that in ChiHwesa both V₁ and V₂ are allowed as shown in the above examples where /i/ in [ma-ino] and [ma-iso] is deleted whereas in ChiManyika they merge to form the third vowel /e/ as a result the vowel sequence is affected in the process and in most cases they follow the CVCV sequence. Consider the following example of vowel deletion in ChiHwesa where the V₂ is deleted unlike in the above example where the elision of V₂ is allowed.

Input:/va-entse/	ONSET	MAX-Rt	*COMPLEX	MAX _μ	IDENT-IO(F)	UNIFORMITY
(a) /va.e.ntse/	*!					
(b) [∅] /ve:ntse/		*		*		
(c) /va.ntse/	*!				*	**

TABLE 8: V₁ deletion in ChiHwesa

4.5. Glide epenthesis/formation in ChiHwesa

In instances where the subject prefix and vowel commencing verb roots are sitting next to each other, vowels get juxtaposed as means to avoid hiatus. A glide is formed and it is inserted between the two vowels to break the unwanted vowel hiatus. The semi-vowels [w] and [y] are also realised in ChiHwesa. This is shown in the examples below

/ku-enda/ - [kuyenda]

Input:/ku-enda/	ONSE T	PARSE[F ']	MAX-10	IDENT	DEP- IO	UNIFORMI TY
(a) /ku.e.nda/	*!					
(b) [☞] /ku.ye.nda/					*	**
(c) /ku:.nda/		*!	*	*		**

TABLE 9: Glide formation in ChiHwesa

Input:/ku-imba/	ONSE T	PARSE[F ']	MAX-10	IDENT	DEP- IO	UNIFORMI TY
(a) /ku.i.mba/	*!					
(b) [☞] /ku.yi.mba/					*	**

(c) /ku:.mba/		*!	*	*		**
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TABLE 10: Glide formation in ChiHwesa

We argue candidate (a) violates the onset constraint whereas candidate (c) is eliminated due to the elision of a segment in the output hence it failed to preserve all the features present in the input. Candidate (b) emerged as the winner because it violates the less ranked do not insert and do not delete constraints therefore it becomes the optimal candidate. This demonstrates that glide formation in ChiHwesa do not favour the deletion of segment thus features should be maintained in both the output and input. In other words, glide formation is a tool which is used to eliminate hiatal configuration ChiHwesa and ChiManyika by inserting a glide [y] or [j] and the glide agrees with its input segment. In most cases the glide is inserted between the two vowels to break the vowel sequence which is not allowed in the two dialects.

4.6. Coalescence in ChiManyika

Coalescence is when two distinct vowels in the input for example, /la+umunthu/ merge into one vowel in the output as in /lomunthu/. The /a+u/ sequence merges into a /o/. The /a/ and /u/ present in the input are no longer there in the output. Therefore, we now have a /o/ which is a coalesced result of /a+u/. Coalescence results in the loss of a V-slot/place as noticed in the above example where we had four vowels, the /a/ in /la/ and /u/ which comes after /la/ and is the initial vowel, the /u/ in /mu/ and the /u/ in /nthu/. This explains why the first two vowels are replaced by a /o/ and thereby reduces or destroys the vowel sequence.

Sometimes we prevent the loss of V-slots when coalescence results in long vowels this is usually the case when the coalescing vowels are identical for example ChiManyika coalescence /ro-ora/-

/ro:ra/. Thus we maintain the V-slots by lengthening the output vowel as exemplified in the table below.

Input:			DEP-IO	PARSE	IDENT-	UNIFORMITY
/ro-ora/	ONSET	MAX-V			(F)	
(a) /ro.o.ra/	*!					
(b) r^{h} /ro:.ra/				*		**
(c) /ro.ra/		*!			*	**

TABLE 11: Vowel coalescence in ChiManyika

Input:			DEP-IO	PARSE	IDENT-	UNIFORMITY
/mu-unga/	ONSET	MAX-10			(F)	
(a) /mu.u.nga/	*!					
(b) r^{h} /mu:.nga/				*		**
(c)/mu.wu.nga/		*!			*	**

Table 12: vowel coalescence (vowel lengthening)

This demonstrates that all segments in the input are preserved in the output (segmental identity) if there is no resultant long vowel then there is violation of segmental identity preserving

constraints especially MAX-10 and DEP-10. CANDIDATE (A) is eliminated because it violates the onset constraint and candidate (c) inserted a glide which results in a fatal violation of MAX-10 and IDENT[F]. Candidate (b) is the optimal candidate since it preserved the features in the input and this is done through vowel lengthening. Sabao (2013) purports that this is as a result of identical vowels coalescing into a long vowel identical to the two initial vowels, the lengthening of the resultant vowels ensures that vowel positions are preserved hence there must be some form of segmental identity between the input and the output.

Mabaso (2009) argues if two vowels sitting next to each other are clashed at a boundary, the result is that they are merged or coalesced into one as in /a+i/→[e] for example /**na-imbwa**/ →**nembwa**. The vowels /a/ and /i/ are the only one that coalesce when succeeded by similar vowels. In her study, she established that vowel coalescence is applied when two identical or non-similar vowels are coalesced into one. Shangani has come with a general trend in terms of vowel coalescence which is illustrated below.

/a+i/ → /wa+irhu/ [werhu] ‘ours’

/o+i/ → /sefo+ini/ [sefeni] ‘in the safe’

/a+u/ → /la+uyu/ [loyu] ‘this one’

/i+i/ → / mati+ini/ matini ‘in water’

This kind of coalescence is also permissible in ChiManyika where /a+e/ coalesce to /e/. I can argue that this is low +high coalescence as proposed by Casali (1962) where he gave the following examples

/a+i/ → [e]

Wa-inkosi → wenkosi ‘of the chiefs’

Na-impendulo → nempendulo ‘with the answer’

/a+u/ → [o]

Wa-umfazi → womfazi ‘of the woman’

Na-umntu → nomntu ‘with the person’

The argument presented is that the sequences of the low+ high vowels that occur at word internal morpheme boundaries are realized as mid vowels with backness and rounding of the resulting vowel corresponding to the rounding of the second vowel. This is exemplified in the examples below.

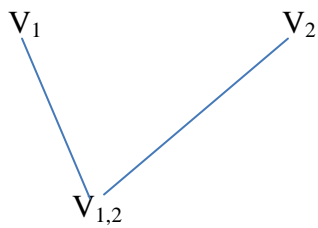
/ma+ino/ → [meno] teeth

/na+imbwa/ → [nembwa] with the dog

/ma+iso/ → [meso] eyes

In other words, we witness the merging or fusion of the two adjacent vowels sitting side by side within a boundary joining into a new third vowel that derives its phonological features from the two coalescing vowels present in the output. Casali (1996) in Sabao (2012) state that we see the merger of V₁ (for the first vowel in a vowel sequence) and V₂ (for the second vowel in the series) resulting in a neutral V₃ (for the third vowel which is the resultant merger vowel from the V₁-

V₂coalesce process. Harford (1997) states if the first vowel and second vowel are clashed across the morpheme boundary they are merged together into a third vowel which automatically shares the same features with the original vowels present in the input. Kadenge (2010) explain that coalescence is segment fusion and schematised it in the diagram below.



Kadenge (2010) correspondence diagram for coalescence

Kadenge illustrates that the two input vowels V₁ and V₂ are merged to produce a single vowel on the surface hence the merged vowel bears some features present in V₁ and V₂. He argued that deletion of a segment is prohibited because both input segment (V₁ and V₂) have output correspondence (V_{1,2}). He states that the difference lies in the output where a single segment corresponds to two segments in the output. This explains the kind of coalescence which takes place in ChiManyika and it can be argued that coalescence triggers violation of featural identity since two segments merge into one some initial features present in the input are present in the fused element.

Input:			DEP-IO	PARSE	IDENT-	UNIFORMITY
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/na-imbwa/	ONSET	MAX			(F)	
(a) /na.i.mbwa/	*!					
(b) ^ɸ /nembwa/					*	**
(c) /na.yi.mbwa/		*!			*	**

Table 13: Vowel coalesce in ChiManyika

The table above demonstrates that candidate (a) is eliminated because it violates the ONSET constraint and candidate (c) violates the constraint MAX which forbids insertion of segment in the structure and the UNIFORMITY constraint. It can be argued that candidate (c) did not satisfy the characteristic of coalescence instead it met the requirements of glide epenthesis/formation by inserting a glide between the two vowels instead of merging them to form a third neutral vowel which preserve both features present in the input. Candidate (b) is the optimal candidate since it manages to preserve the segment which are required to be featural identical to resolve the hiatus.

4.7. CONCLUSION

The chapter highlighted the similarities and difference between ChiHwesa and ChiManyika in terms of how they break hiatal configurations. The study reveals that both dialects do not favour hiatus thus the VV sequence is not allowed and type of hiatus is resolved by glide formation or vowel deletion. The most interesting thing is that vowel deletion in ChiHwesa is considered as

coalescence in ChiManyika thus the two vowels coalesce or merge to form a third vowel that is different from the ones in the input. In ChiHwesa vowel deletion is triggered by elision of the first vowel or the second vowel and the same goes in ChiManyika. Both resolve hiatus through glide formation and glide epenthesis thus the insertion of semi-vowels between vowels to break the VV sequence and these glides are in form of consonants.

Chapter 5: CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

The chapter presents the conclusion of the key findings as well as the presentation of recommendations for further studies.

5.2. Conclusions and Findings

The objective of the present study was to make a comparative analysis of phonological processes that resolve hiatus in ChiManyika and ChiHwesa dialects spoken in Zimbabwe. This has been achieved by examining the phonological processes that are present in two dialects. The data showed that vowel sequences are not favored hence the avoidance of hiatal configurations. The study revealed that high vowels undergo glide formation in ChiHwesa and ChiManyika and these glides are realized a semi-vowel is inserted between vowels to break the vowel sequence. It is evident that both vowels are retained and also the insertion of a sound that was not there is realized and the semi-vowels which are operative in both dialects are [j] and [w]. The analysis claim that both dialects bans hiatus through satisfying the requirement that all syllables must begin with a consonant and the constraint is known as ONSET, (prince and Smolensky, 2004). In

both ChiHwesa and ChiManyika the constraint ONSET makes sure that every syllable begins with an ONSET.

The analysis demonstrates that ChiHwesa and ChiManyika break vowel sequences through coalescence. The most interesting part is that what is regarded as vowel deletion in ChiHwesa is considered as coalescence in ChiManyika. This comes into play when /a/ and /i/ forms a third vowel which is a merger of the first vowel and second vowel. as a result the initial features found in the input are also present in the merged element. The analysis claims that ChiHwesa favours elision of the V_2 instead of coalescing the two vowel to form a merger. Both vowel deletion and coalescence break vowel sequences. The constraints PARSE and IDENT are always violated in because of failing to preserve the input feature in the output structure.

The deletion of either V_1 or V_2 is common in ChiHwesa and ChiManyika. The constraint MAX which prohibits deletion is violated. ChiHwesa favours the deletion of V_1 in most instances whilst ChiManyika elides vowels either at the beginning or at the end of the structure.

Hyman (2003) states that glide is realized when the high front vowel /i/ is followed by a vowel initial stem, producing the glide [j] and the back high rounded vowel /u/ followed by an initial stem and as a result the glide [w] if formed. Vowel gliding arises when one of the non-low vowels is preceded by another vowel across a morphological boundary. ChiHwesa favours the glide [j] which is pronounced as [y] as in /kuyenda] whereas ChiManyika inserts the glide [w] as in [kwenda]. The analysis claims that hiatal configurations in both dialects are prohibited through preserving the initial features in the input by inserting a glide or a semi vowel between the vowels.

5.3. Recommendations

The analysis of the phonological and morphological system of ChiHwesa in the theoretical framework of the optimality theory is necessary as means to further understand the interaction of constraints.

The investigation into the development of the phonological and morphological system of ChiHwesa and ChiManyika should be carried out to have a deeper understanding of the orthography.

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