

Adjustment of Syllabic Structure in Citshwa

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Abstract. This article discusses the process documented in many languages concerning the elimination of V-V vowel sequences as part of a general strategy for readjustment of the syllabic structure. This study examines the particular case of resolution of hiatus in Cidzive, variant of Citshwa spoken in the districts of Homoine and Morrumbene in Inhambane-Mozambique. The study describes the contexts in which V-V sequences are subjected to the most common processes of gap resolution as a form of readjustment of the syllabic structure and indicates the restrictions that occur in the language. Knowing that the resolution of hiatus is a universal process that occurs in all languages of the world, the analysis seeks to understand the strategies adopted by Citshwa speakers to eliminate contiguous vowel sequences.

Keywords: Vowel Hiatus, Hiatus Resolution, Syllable Structure, Syllabification, Phonology

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1.0 Introduction

This article discusses the process documented in various languages concerning the elimination of V-V vowel sequences as part of a general strategy for readjustment of the syllabic structure. This study examines the particular case of resolution of hiatus in Cidzive, variant of Citshwa spoken in the districts of Homoíne and Morrumbene in Inhambane. The study describes the contexts in which V-V sequences are subjected to the most common processes of gap resolution as a form of readjustment of the syllabic structure and indicates the restrictions that occur in the language. Knowing that the resolution of hiatus is a universal process that occurs in all languages of the world, the analysis seeks to understand the strategies adopted by Citshwa speakers to eliminate contiguous vowels sequences. As Casali (1997) states, different languages adopt various strategies to get out of undesirable vowels sequences. In Citshwa, not all V-V sequences are eliminated, and some are preserved.

The central point of this research is to demonstrate that some restrictions of elimination of vowels sequences in Citshwa take place precisely in the contexts in which all theories of readjustment of the syllabic structure predict that one of the vowels in the sequence should be eliminated. The study seeks, in the light of Noske's Theory of Syllabification and Segmental Alteration (1992), Selkirk (1982). To analyze the processes of syllable readjustment in Citshwa, assuming the basic principles of the Autosegmental model proposed by Goldsmith (1976), Goldsmith (1990) with a parametric approach. In essence, these models defend the existence and representation of multiple levels or layers in linguistic structure. The relationship between the different layers involves the creation of an element or sequence of elements at a given level, in this case the syllable node (σ) or syllable sequence and the application of bonding processes between that level and the group of segments or skeletal element of lower level. In this study, the processes involving the resolution of hiatus in Citshwa are explained as the propagation of traces of certain skeletal level elements to the syllable constituents located in the upper layer that comprise attack (A) and rhyme (R). Alternatively, other processes of

resolving hiatus in Citshwa, such as semivocalization, are analyzed such as untying or blocking of association lines between a given element and consequent new association or binding to the different layer nodule. The parameterized approach ultimately explains the differences in the mechanisms adopted by the different languages to avoid vowels sequences. The work follows the structure that includes, in addition to the introduction, a section that provides brief information about the language; objective of the study; problem; hypotheses; theoretical framework; data collection methodology; literature review; data analysis; conclusion and bibliographic references.

1.1 Background on Citshwa

The Citshwa language, the subject of this study, belongs to the S51 Tswa-Ronga group according to the Guthrie classification (1967-71), which includes Xirhonga, Citshwa and Xichangana, mutually intelligible languages. Motivated by the Eurocentric historical vision and encouraged by the exercise developed in the 1980s by some currents that launched themselves in the search for "majority languages vs Minowill languages" in Mozambique, as attested by the works of the time of Babalola (1983), Katupha (1988) among others, NELIMO (1989) assumes that there is "the Xitsonga language covering three languages: Xirhonga, Citshwa and Xitsonga (Xichangana). According to the same source, these languages (mutually intelligible) are spoken in Maputo, Gaza and Inhambane provinces and in the southern part of Manica and Sofala provinces." NELIMO (1989) further states that "the three languages are fairies in the southern part of the Republic of Zimbabwe and in South Africa in the province of Transvaal". A careful observation of the quote made above shows that NELIMO (1989) contradicts itself in its analysis. As it can be seen, there cannot be a language covering three languages. It is clear that NELIMO avoided, at the time, designating Xirhonga and Citshwa from Xitsonga variants, probably by intuitively recognizing that they were distinct languages.

Debates developed later in the last three decades in the country's academic circles, as it can be seen in Siteo and Ngunga (2000) and Ngunga

(2014), Citshwa has been treated as an independent language of Xichangana and Xirhonga. According to data from INE (2017), in Mozambique, this language is spoken by 697,533 people from the age of five or older, mostly in Inhambane province. All researchers agree that in addition to Inhambane, Citshwa is also spoken in the Provinces of Manica, Sofala, Gaza, Maputo, as well as in the Republics of Zimbabwe, South Africa, and the Kingdom of Eswathini, formerly Swaziland. The exact numbers of speakers of the language outside Mozambique are unknown, but in view of the geographical dispersion of their speakers, it is to be assumed that the total number of Citshwa speakers is to surpass the number known in the official statistics in Mozambique.

According to the Report of the II Seminar on the Standardization of The Spelling of Mozambican Languages, NELIMO (2000) and according to Ngunga (2014), in Mozambique, Citshwa has the following variants: (i) Xikhambane, spoken in Panda district; (ii) Xirhonga, spoken in the western districts of Massinga and Funhalouro; (iii) Xihlengwe, spoken of the districts of Morrumbene and Massinga; (iv) Ximhandla, spoken in Vilankulo district; (v) Xidzonge or Xidonge, spoken in the meridional part of Inharime district and (vi) Xidzivi or Cidzive spoken in the districts of Morrumbene and Homoine. The latter variant is the subject of this research. All the variants mentioned above present small lexical, phonetic, and phonological differences between them, maintaining, however, mutual intelligibility. The choice of Cidzivi for this study was motivated by two factors. First, one of the co-authors of this paper is a native speaker of the language and, therefore, can better judge the data based on linguistic intuition. Second, as with most Bantu languages spoken in Mozambique, Citshwa has not yet benefited from detailed linguistic description of important aspects of the functioning of its grammar. This study is therefore a contribution to the extension of knowledge of the language.

1.2 Study Objective

The aim of this work is to identify and describe the different strategies that the language adopts to get out of contiguous vowels sequences. It is also the

objective of the research to analyze the specific contexts in which the rules for resolving hiatus occur and the restrictions that the language imposes in favor of maintaining certain vowel sequences.

1.3 Research Problem

Citshwa, like other Bantu languages spoken in Mozambique, has few described morphological studies. Preliminary factual observations show that in all Bantu languages there are common and recurrent processes related to the elimination of unwanted vowels sequences, although certain vowel sequences are allowed. Previous studies, including Clements (1986), Clements and Hume (1995), Clements and Keiser (1983), Odden (1996), and Ngunga (1997), among others, correctly show that certain vowels sequences are dispreferred. The same authors make the correct prediction according to which high vowels are subject to semivocalization before another vowel. In this study we show that, in general, Citshwa follows the same pattern of elimination of vowel sequences found in other Bantu languages. However, what is specific in Citshwa is the fact that only the rounded vowels /u, o/ are subject to semivocalization before the vowels /a/ and /i/ of the diminutive and locative morphemes *-ana* and *-ini*. Prefixal high vowels never semi-vocalize. All linguistic theories dealing with vowels sequences predict that the high vowels in the initial position become semi-vowels before another vowel. In view of these facts, the study raises the following questions, from the outset, which constitute the research problem:

- (i) What factors determine the elimination of vowels sequences in Citshwa?
- (ii) What is the most appropriate explanation to account for the restrictions that prevent the transformation of the high vowel into a semi-vowel position in Citshwa?

1.4 Hypothesis

In this research project, we put forward three competitive hypotheses: (1) some vowels in the initial position are semi-vocalizing, when followed by certain vowels; (2) not high starting position semi-vocalizing, when followed by another vowel; and (3) high vowels in initial semi-vocalizing, when followed by another vowel (current language theories).

This research work particularly aims to test the first two hypotheses, since preliminary observations of Citshwa data suggest that semivocalization as a strategy for eliminating V-V vowel sequences is not only determined by the morphological information of the prefixes or by the quality (height) of the vowel, but also by morpho-syntactic information involving the last vowel of the word and the initial vowel of the following word.

1.5 Theoretical Framework

For the performance of this study we supported two theories of phonological analysis, namely the model of Syllabification and Segmental Alteration in the way in which this is discussed by Noske (1992), considering the proposal of Selkirk (1982) based on the theory of Autosegmental or Nonlinear Phonology proposed by Goldsmith (1976; 1990), assuming the parametric approach. Let's then summarize the basic concepts of syllabification that explore the principles of self-segmental phonology.

The central idea of nonlinear phonology is the representation of multiple layers. Based on this assumption, a way to explain the deletion (disconnection) and propagation (connection) of the tone from the tonal layer to the segmental layer is to assume that one tone-carrying unit (UPT) is deleted, but the stroke remains floating, and that stroke is connected to the other (UPT). Based on this argument the ascending or descending tones that appear on the surface are derived by independent processes of shutdown and trace connection to a particular unit belonging to the specific layer. The second argument constructed by nonlinear phonology is that in many tone languages there are morphemes that consist exclusively in tone and there are morphemes that although having (UPT) have no tone. Finally, the last argument of nonlinear phonology, directly related to this research, is that

there are words containing different numbers of syllables and exhibit a behavior that suggests that such words have the same tonal melody. Although alternative analyses argue that the connection of a stroke to a unit belonging to the given layer (propagation) is not universal, the central point is that vowels deletion is an operative process affecting the initial vowel in the contiguous vowel sequence of two vowels. Thus, the principles of mapping, linking, propagation, and assigning or maintaining standard value can be motivated independently. In cases where two types of superimposed elements must be connected, it is not always the elements of both layers that cause the connection process. Processes involving snare and spread can be morphologically conditioned. Thus, the elimination of a vowel following two vowels can be fully conditioned by morphological principles. Only elements preceding the higher layers need to be connected to the lower layer, while elements of the lower layer can remain unbound. In essence, nonlinear phonology models defend the existence and representation of multiple levels or layers in linguistic structure. The relationship between the different layers involves the creation of elements at a given level, in this case the syllable nodule (') or syllable sequence and the application of bonding processes between that level and the group of segments or skeletal element of lower level. In this study, the processes involving the resolution of hiatus in Citshwa are explained as the propagation of traces of certain elements from a certain level to the syllable constituents located in the lower layer that comprise attack (A) and rhyme (R). Alternatively, other hiatus resolution processes in Citshwa, such as semivocalization, are analyzed such as disliking or blocking of connection between a given lower layer element with top layer units. The parameterized approach ultimately explains the differences in the mechanisms adopted by the different languages to avoid vowel sequences.

The theory of syllabification and segmental change can be summarized in the following terms. The segment sequence, in the segmental layer, is skewed (scanned) to identify non-syllabicated segments, respecting a certain directionality, from left to right (LR) or from right to left (RL). If a syllabified segment is found, the canonical size syllable is superimposed on the sequence of segments. Then, optional connections are

made between segments and segment carrier units, according to auto-segmental phonology conventions. Then the scanning process restarts and continues continuously (Noske, 1992). Based on this model, processes such as the insertion of semi-vowels in intervocalic position can be explained as filling empty positions in the syllabic structure. The process of filling empty positions in the syllable template can be analyzed as the result of applying general principles of nonlinear phonology, more specifically the principles of propagation and attribution of the standard value of the language-specific grammar. It is precisely this last aspect that justifies the relationship between the syllable model and segmental alteration and the theory of self-segmental phonology.

1.6 Research Methodology

Three methodological techniques were observed in this research, namely, literature review, interview use and introspection. The revision of the literature consisted in the consultation of sources indicated throughout this work that are occupying the subject in discussion. This method allowed, on the one hand, to identify the weakness presented by models based on the stipulation of rules of morph-phonological processes without presenting independent linguistic evidence and, on the other hand, it allowed to understand that the elimination of vocalic sequences can be motivated by phonological principles and can also be determined by the morphological structure. The method of interviews consisted of collecting additional data, based on a previously elaborate list containing words and phrases involving vocalic sequences. The purpose of this methodological technique was to check in the limited and controllable universe of native speakers, as these pronounced words and phrases containing vocalic sequences. Finally, the introspective method was applied to control the data given that one of the co-authors of the work is a native speaker of Citshwa.

2.0 Literature Review

The pioneering work on the elimination of vocalic sequences in Bantu is Clements (1986) in the Luganda study in which postulates the obligatory

semivocalization of high vowels in the initial position accompanied by compensatory stretching. Examining the sequence of vowels in the internal structure of the word, the author states that the high vowels in pre-vocalic position semi-vocalize when they are followed by another vowel. Later works, Bickmore (1989), Downing (1990), Odden (1996), Ngunga (1997), Ngunga (2000), Liphola (2001), among others, showed that the semivocalization of high vowels is recurring in other languages. Odden (1996) and Liphola (2001) go further when in Kimatuumbi and Shimakonde, respectively, semivocalization also affects the sequence of vowels in the context of the phrase. The work of Clements (1986) does not include sequences of vowels in the context of phrases nor are incorporated vocalic sequences involving average vowels in the initial position, because usually these vowels do not appear in the prefixes of nominal classes. Contrary to what happens in Luganda in terms of obligatory semi-vocalization, Liphola (2001) shows that in Shimakonde where the elimination of vocation sequences is optional, causing processes that eliminate vocalic sequences are determined by particular language grammars. Casali (1996), Ngunga (1997), Sibanda (2009), Overton (2018), Maho (2008), Kandege (2011), Vratsanos and Kandege (2017), Simango (2014), Mutonga (2017), among others, recognise different strategies for solving hiatus including syllabification, diphthong formation, epenthesis, deletion, semi-vocalization, and coalescence. However, we did not find in these studies adequate explanation why semivocalization is allowed in some cases involving the sequence of degeminated vowels but blocked in other contexts in which the same vowel sequences are involved, as happens in Citshwa. Sabão (2013) shows that in Cicewa, as it also happens in Cindau (Mutonga, 2017). However, the authors admit that some vowel sequences are allowed in these languages due to the need to maintain the canonical structure of the CV syllable. The central question that is not answered in these studies is whether the canonical structure of the CV syllable is responsible for triggering morphophonetic processes.

In conclusion, we can claim that the elimination of unwanted vowels sequences is a process observed in different languages, the strategies adopted by the different languages are better understood based on nonlinear

phonology models that allows interaction between different layers of representation in the linguistic structure.

3.0 Strategies for Vowel Sequence Elimination

Several studies including Clements (1986), Bickmore (1989), Downing (1990), Odden (1996), Ngunga (1997), among others, show that one of the perverse rules in Bantu languages is semi-vocalization, which affects high vowels in pre-vocalic position. More specifically, semivocalization transforms /i/ into [y] and /u/ into [w] respectively, as a way to avoid undesirable V+V sequences. In this section, we examine the V+V sequences, taking into account combinations of certain morphemes. We show that in Citshwa the elimination of V+V sequences by semivocalization is restricted, even in the context in which nominal prefixes are involved within the word containing high vowels in the initial position. In fact, in this language, semivocalization occurs only in the limited context involving exclusively backing and rounded vowels simultaneously.

3.1 Semi-Vocalization

According to Mtenje (2018), semivocalization is the phonological process in which a vowel becomes a semi-vowel in front of another vowel. In Citshwa, the vowels that are prone to the semivocalization process are the backing and rounded vowels /u, o/, when they are in the final position of the word, before the vowels /a, i/ of the diminutive morphemes –ana and locative –ini respectively, as shown in the following examples.

Table 1: *Semivocalization of /u+a/ in Word-Final Position*

cibuuku		‘mirror’
cituulu		‘chair’
cilaatu		‘shoe’
cifuulu		‘coconut pit’
cibaamu		‘weapon’
cibukwaana	/cibuku-ana/	‘small mirror’
citulwaana	/citulu-ana/	‘small chair’
cilatwaana	/cilatu-ana/	‘small shoe’
cifulwaana	/cifulu-ana/	‘small coconut pit’
cibamwaana	/cibamu-ana/	‘small weapon’

An observation to the examples in Table 1 shows three results. First, the vowel of the penultimate position is lengthened due to an independent phonological rule. Second, the high and rounded vowel in the final position of the word appears as such, when not followed by another vowel, but that same vowel becomes semi-vowel before the vowel /a/ of the diminutive morpheme –ana. Third, the stretching is kept in the penultimate syllable after the locative morpheme suffixation

Additional data in Table 2 show that the high vowel rounded /u/ in the final position of the word is performed as semi-vowel before the anterior high vowel /i/ of the locative morpheme -ini.

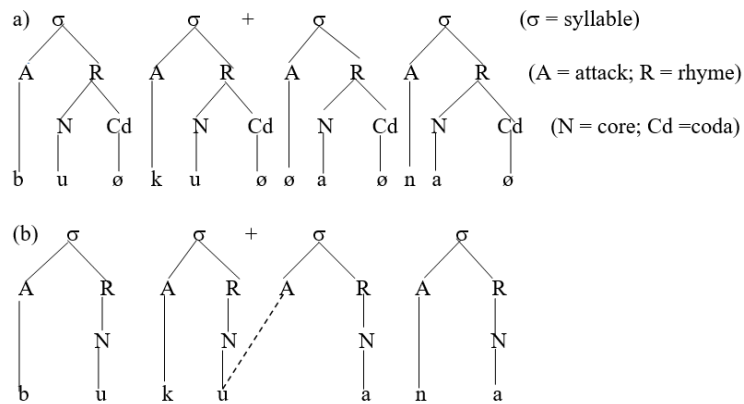
Table 2: Semivocalization of /u+i/

cibuuku		‘mirror’
cituulu		‘chair’
cilaatu		‘shoe’
cifuulu		‘coconut pit’
cibaamu		‘weapon’
cibukwiini	/cibuku-ini/	‘in the mirror’
citulwiini	/citulu-ini/	‘in the chair’
cilatwiini	/cilatu-ini/	‘in the shoe’
cifulwiini	/cifulu-ini/	‘in the coconut pit’
cibamwiini	/cibamu-ini/	‘in the weapon’

The data in Table 1 and Table 2 show the semivocalization of the rounded high vowel /u/ in the final position of the word before another vowel. This is the context in which all theories that address the elimination of vowels sequences make the correct prediction according to which, the high vowel in the initial position semi-vocalizes before another vowel.

Assuming the syllabification model and making use of the principles of nonlinear phonology, the semivocalization in the aforementioned examples can be explained based on the derivations indicated in Figure 1.

Figure 1: Syllable and Segment Change



The observation made to the representations in Figure 3 shows that, first, the classical structure of the syllable is predictable in each language. Second, the process of assigning the syllabic structure consists of postulating a specific structure such as that indicated in Figure 3A associating it with a chain of segments. Third, the syllabic nodes of the syllabic structure, such as attack (A) and rhyme (R) are always represented in the structure, when there are segments in the chain that require syllabification. Fourth, the binary structure from R (rhyme) to the immediately dependent nodes is never fully filled by potential constituents, except the N(nucleus), which is occupied by the V(vowel) or syllabic nasal. It follows from this fact that in Citshwa the Syllabic node Cd(Coda) is always empty as shown by the structure in (3a) in which the empty categories (\emptyset) appear for lack of segmental material.

In the structure given in Figure 3A we see that the third syllable is composed only of a vowel that has been syllabicated. Therefore, node A is present in the structure, but empty segmentally. Fourth, since the canonical structure of the syllable in Bantu is CV, this fact makes the Cd node always empty. Fifth, the representation in Figure 3B shows that N of the second syllable is associated with the position left empty by A of the next syllable. This is precisely the process that causes a segment to be superimposed on two syllabic structures, requiring that, in this case, the high rounded vowel be altered, becoming semi-vowel, because of its binding to the syllabic node of (A) attack.

The following examples in Table 3 show that in Citshwa the rounded middle vowel /o/ in the final position of the word passes to semi-vowel before /a/ of the diminutive morpheme *-ana*.

Table 3: *Semivocalization of /o+a/*

dzoolo		'knee'
minkoolo		'necks'
minkoondzo		'feet'
mawooko		'arms'
zvimoombo		'foreheads'
dzolwaana	/dzolo-ana/	'small knee'
minkolwaana	/minkolo-ana/	'small necks'
minkondzwaana	/minkondzo-ana/	'small feet'
mawokwaana	/mawoko-ana/	'small arms'
zvimombwaana	/zvimombo-ana/	'small foreheads'

This is the context in which previous studies on the resolution of hiatus, including Clements (1986), did not foresee that the average vowel would pass into semi-vowel before another vowel. Observations of Luganda data analyzed at the time show that Clements (1986) includes in his analysis only high vowel sequences, because it did not take into account vowel sequences in the phrasal context, and it is also rare to find nominal prefixes containing medium vowels.

Additional data of semivocalization of the rounded middle vowel /o/ in the final position of the word before the upper anterior vowel /i/ of the locative morpheme, are presented in Table 4.

Table 4: *Semivocalization of /o+i/*

dzoolo		'knee'
minkoolo		'necks'
minkoondzo		'feet'
mawooko		'arms'
zvimoombo		'foreheads'
dzolweeni	/dzolo-ini/	'in the knees'
minkolweeni	/minkolo-ini/	'in the necks'
minkondzweeni	/minkondzo-ini/	'on the feet'
mawokweeni	/mawoko-ini/	'in the arms'
zvimombweeni	/zvimombo-ini/	'on the foreheads'

Data in Table 4 show that /o/ passes to semi-vowel [w] before /i/. In the examples, we also see that the sequence /o+i/ derives the vowel [e] on the surface, due to harmony in height. It follows that phonetic forms *[minkolw-ini] or *[mawokw-ini] are prohibited. The question that needs to be

answered is why do we have [dzolw-eni] or [mawokw-eni] instead of *[dzolw-ini] or *[mawokw-ini]?

To explain the presence of the middle vowel [e] on the surface in Table 4, two alternative analyses are assumed. One approach is to postulate that the high vowel of the locative morpheme /i/ is subject to harmony in height with the middle vowel /o/ that appears in the final position of the word. Later, an independent rule transforms /o/ into semi-vowel. The derivations in Table 5 illustrate the order of the strategies involved in the elimination of the V-V sequences.

Table 4: *Assimilation of the Height Trait by Vowel /i:/*

/woko-ini/	phonological structure
/woko-ini/	assimilation in height
/wokw-eni/	semi-vocalization
[wokweni]	surface structure

According to the derivations in Table 5, the assimilation of height by the high vowel is applied before semi-vocalization, in order to derive the appropriate phonetic structure. The approach taken above would have to explain the fact that assimilation at height does not affect the leftmost root vowels. However, the data considered above in Table 4 do not provide linguistic evidence to defend order in the application of the proceedings in Table 5. In addition, we did not find V+V sequences involving the middle rounded vowel followed by the middle vowel /e/ in the underlying structure. Thus, although the analysis presented here correctly predicts that the vowel [e] on the surface comes from the sequence /o+e/, this vowel sequence has not been tested on the tongue. The fact that the sequence /o+e/ has not been tested in our data may be due to a phonological gap in the language or insufficient data.

The second alternative approach is to assume that the assimilation of height of the middle vowel by the high vowel /i/ of the locative morpheme can be triggered by the vowels more to the left of the root, which would make the consonants transparent for this process. The derivations in Table 6 illustrate the correlation between semivocalization and the assimilation of the trace in height in Citshwa.

Table 6: *Semivocalization Before Harmony in Height*

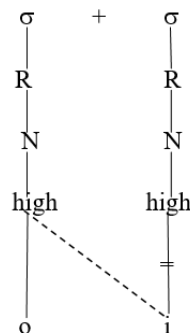
/woko-ini/	underlying representation
/wokw-ini/	semi-vocalization
/wokw-eni/	vowel harmony
[wokweni]	phonetic representation

The derivations in Table 6 show that the assimilation in height occurs involving the high vowel of the suffix and the first vowel of the root, making fully transparent the consonant between the two vowels. As we see in derivations in Tables 5 and 6, the two approaches are similar. Both assume that the middle vowel appears on the surface by applying an independent rule of vowel assimilation. However, the two approaches differ only in the ordering of rules between the assimilation of the trait in height and semivocalization. By applying semivocalization before assimilation of the trace in height, we obtain the same correct shape in the surface structure.

As the additional data show that the sequence /o+i/ transforms the first vowel of the sequence into a semi-vowel, but the sequence /o+e / was not tested in the phonological structure, we assumed the ordering of the rules in Table 6 as the most appropriate approach, if we had to explain the adjustment of the structure of the syllable through semivocalization in Citshwa, on the basis of analysis of the segmental phonology model.

Assuming the syllable model and making use of the principles of self-segmental phonology we do not need to make use of alternative analyses, nor do we need to resort to the ordering of phonological processes, since we can explain the assimilation of height as indicated below.

Figure 2: *Assimilation of the High Vowel /i/*



The representation made in Figure 2 shows that when the sequence /o+i/ co-occurs as in *woko-ini* [*wokweni*] ('in the arm'), the high vowel disassociates from its initial height and through the propagation principle, that vowel segment is associated with the height of the middle vowel.

We have just demonstrated the contexts where semivocalization is obligatory involving rounded pre-vocalic vowels /u/ and /o/ before /a/ and /i/ in Citshwa. It should be noted that previous studies, including Clements (1986), argue that semivocalization is an obligatory rule in Luganda. Odden (1996) shows that in Kimatuumbi the rule is optional. The optionality of semivocalization is also defended in Shimakonde, by Liphola (2001).

Citshwa data analysis shows that process that eliminates vowels sequences through semivocalization is obligatory only when it involves rounded vowels /u, o/ in the final position of the word and before vowels /a, i/ of diminutive and locative morphemes respectively. The rule does not apply to high vowels in the pre-vocalic position, except for the vowel /u/ in the final position of the word. What is even more intriguing is the fact that in Citshwa semivocalization is not applicable to the high vowels of prefixes of nominal classes within the word, as happens in most Bantu languages. This will be examined further.

3.2 Vowel Elision

Elision or deletion is a process by which one of the vowels in the sequence is deleted. Trask (1996) quoted by Mangoya (2013:82) on the elision or deletion of vowels says that "it is the loss of a follow-up of a word or other phonological form". In Citswa, elision affects the vowels /i, o, e/ in the final position of the word, before the low vowel /a/ of morpheme –ana, as shown in the examples in Table 7.

Table 7: *Elision of Vowel /i/ before /a/*

lidaavi		'branch'
liriimi		'tongue'
lingooti		'rope'
muuti		'home'
kwaati		'jungle'
gwaanyi		'grass'
lidavaana	/lidavi-ana/	'small branch'

lirimaana	/lirimi-ana/	‘small tongue’
lingotaana	/lingoti-ana/	‘small rope’
mutaana	/muti-ana/	‘small house’
kwataana	/kwati-ana/	‘small jungle’
bzwanyaana	/bzwanyi-ana/	‘small grass’

The examples in Table 7 show that the previous high vowel is pronounced as such in the final position of the word. However, it does not appear on the surface when it follows a low vowel of the diminutive morpheme. This is the context in which all previous studies predict that an anterior high vowel semi-vocalizes before another vowel, giving rise to [y] on the surface. In Citshwa, the vowel /i/ does not pass to [y] before another vowel, because it is simply deleted.

Additional data in Table 8 show that the previous high vowel's check in the final position of the word also applies to the middle anterior vowel when followed by the diminutive vowel /a/ morpheme.

Table 8: Elision of /e/ before /a/

veele		‘breast’
ndleeve		‘ear’
neenge		‘leg’
mpeepe		‘diaper’
kheele		‘grave’
velaana	/vele-ana/	‘small breast’
ndlewaana	/ndleve-ana/	‘small ear’
nengaana	/nenge-ana/	‘small leg’
mpelaana	/mpele-ana/	‘small diaper’
khelaana	/khele-ana/	‘small grave’

In the approach of the model of segmental phonology based on rules one would have to assume that the previous vowels in Tables 7 and 8 are deleted by the rule presented below:

Prevocalic Front Vowel Elision Rule in Citshwa:

- (a) /i, e/ → ∅ / + — a (segmental theory)
- (b) [+syll; -back] → ∅ / — [+syll; +low] (feature theory)

The rule formalized above says that the previous vowel in the final position of the word is deleted before the low vowel.

The problem posed by analysis based on rules is why the same vowel, in this case the low vowel, causes semivocalization in Tables 1 and 3, but does not trigger semivocalization in Tables 7 and 8. Note that in Table 7 the first vowel in the sequence is high followed by a vowel /a/. This is a context in which all previous works provide for the first vowel in the sequence to be transformed into semi-vowel. The fact that the sequence /i+a/ is not subject to semivocalization poses a problem to the theory of segmental phonology based on rules, because it is unable to explain the process in a simple way. The unanswered question is exactly what the determining factor is for a phonological rule to be triggered. It is worth mentioning that in Citshwa, semivocalization is obligatory in the phrasal context. Therefore, the optionality in the application of a phonological rules does not account for the blockade of semivocalization.

Let's consider the additional data where the sequence of contiguous previous vowels is unwanted in Citshwa. When an anterior vowel is followed by another previous vowel, one of the vowels in the sequence is deleted, as the following examples attest.

Table 9: *Elision of /i/ before /e/*

veele		'breast'
ndleeve		'ear'
neenge		'leg'
mpeepe		'diaper'
kheele		'grave'
veleeni	/vele-ini/	'in the breast'
ndleveeni	/ndleve-ini/	'in the ear'
nengeeni	/nenge-ini/	'on the leg'
mpeleeni	/mpele-ini/	'in the diaper'
kheleeni	/khele-ini/	'in the grave'

These examples show that the high vowel of the suffix is deleted after the middle vowel at the end position of the word. The data in Table 9 differ from those previously seen in Tables 7 and 8. More specifically, in Tables 7

and 8 the vowels /i, e/ or in the final position of the word are deleted before /a/. It is therefore the vowel on the left in the sequence that is affected before another vowel. In Table 9, on the contrary, the second vowel is deleted in the sequence. More specifically, the locative morpheme vowel /i/ is deleted after the previous middle vowel /e/.

One observation that needs to be made is that both the approach based on linear phonology of segmental model and the feature theory would have to assume the rules formalized below as a way of explaining the deletion of front vowels in Table 8 and Table 9.

Height Front Vowel Elision Rule in Citshwa:

- (a) /i/ → [∅] / e + — a (segmental theory)
- (b) [+syll; +hi; -back] → ∅ / — [-back] (feature theory)

The rules formalized above say that a sequence of two previous vowels is unpreferred. Due to the rule that eliminates /i/ after /e/, we end up having two different rules that affect the previous vowels in the Citshwa language. First, there is a rule that delete all the previous vowel before the low vowel /a/. Second, there is another independent rule that eliminates the previous high vowel /i/ after the previous middle vowel /e/. These facts show that the rules of deletion of vowels are asymmetrical in Citshwa. This reveals that the approach of linear phonology based on rules has to arbitrarily stipulate, by means of rules, which of the segments should be eliminated. The asymmetric nature of these rules is demonstrated below, where we repeat the rules formalized earlier.

Asymmetrical Vowel Deletion in Citshwa:

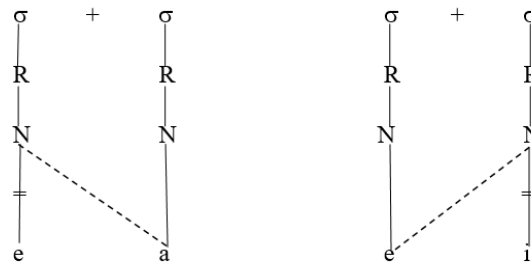
- (a) [+syll; -back] → ∅ / — [+syll; +low] (feature theory)
- (b) [+syll; +hi; -back] → ∅ / [-back] — (feature theory)

We see above that the rules affect the previous vowel. In one case, the entire anterior vowel is dispreferred before the low vowel; on the other, only the previous high vowel is unpreferred after the previous vowel. These rules suggest that the previous trait is at the same time the cause of the outage, and also the target of an elision. Kisseberth (1969, 1970b) had already noticed the existence of conspiratorial rules in Yawelmani where the vowel

is inserted to break the trilateral sequences of consonants and the consonant is deleted after clustering two consonants.

Assuming the syllable model along with the principles of nonlinear phonology, the deletion of vowels in Tables 8 and 9 can be explained based on untying and association as shown by the representations in Figure 3.

Figure 3: Elision of /e/ before /a/ and /i/ after /e/



This representation shows that disassociation of the /e/ segment of its node results in the elision of this vowel before /a/ in the surface structure keeping the node associated with the vowel /a/. The disassociation of /i/ of its original N syllable node results in the deletion of /i/ after /e/ on the surface, keeping its syllable node associated with the vowel /e/ as a consequence of syllabification. Based on this analysis, it is relatively simpler to show that the conditioning factor that determines the deletion of a given segment is the syllabic structure and not the intrinsic properties of the segment.

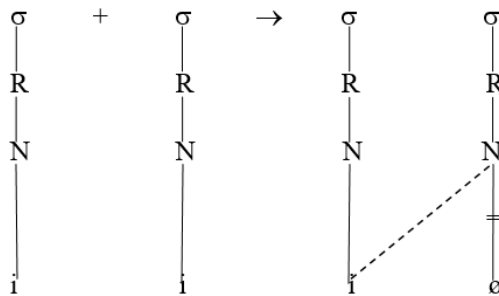
The next examples in Table 10 include names ending in a high anterior vowel followed by an identical vowel. These names show that the vowel is held as such in the absolute final position of the word. However, when the vowel is followed by an identical vowel, the resulting vowel shall be [i].

Table 10: Fusion of /i+i/

muuti		‘home’
viimbi		‘wave’
ruumbi		‘ruin’
khuumbi		‘wall’
mutiini	/muti-ini/	‘in the house’
vimbiini	/vimbi-ini/	‘on the wave’
rumbiini	/rumbi-ini/	‘in ruin’
khumbiini	/khumbi-ini/	‘on the wall’

As the data in Table 10 illustrate, the sequence of identical previous high vowels does not trigger semivocalization. These examples suggest that /i+i/ gives [i] on the surface as a result of merging the two vowels. In the model in which we have been assuming, the fusion of /i+i/ is interpreted as a deletion resulting from the encounter of two segments that are in adjacent distinct syllabic nodes as shown by the representation in Figure 4.

Figure 4: *Payment of Identical High Vowels*



Thus, when two vowels of identical height come together in a sequence, the resulting segment is phonetically [i] due to the delinking process. The association of the syllabic node of the deleted segment with the phonetically performed vowel lengthens the vowel to maintain the structure of the word. Because phonetically [i] is similar to /i/ of the underlying structure, we have no evidence to say which of the vowels in the sequence is deleted. However, considering the rules formulated earlier, it could be assumed that the first vowel of the locative suffix *-ini* is deleted after /i/ that occurs in the final position of the word.

An alternative analysis would be to assume that /i+i/ gives rise to two contiguous syllables of identical vowels [i.i], allowing the existence of two identical syllables on the surface. This approach would, however, have to account for the vowel lengthening of the penultimate syllable by postulating the insertion of the third mora, a fact not tested based on the available data. On the other hand, this analysis would have to assume, arbitrarily, that when two identical vowels belonging to distinct syllables are kept on the surface the insertion of additional mora is blocked. In view of, again, the syllable model and its corresponding representations, we argue that the encounter of two identical vowels results in fusion, the phonetic

effect of which is equivalent to the deletion of one of the segments in the sequence.

After presenting the data on vowel-elision strategies in Citshwa, in the following subsection we present another strategy involved in the resolution of hiatus in Citshwa, specifically coalescence or fusion.

3.3 Coalescence

Coalescence or fusion is a process by which two vowels of different qualities then merge to give origin to a third vowel of different quality from the first two. Mutaka and Tamanje (2000), quoted by Mangoya (2013:90) says that coalescence is the process in which two vowels of different qualities appear fused into a single vowel. In Citshwa the curdling of vowels takes place between the low vowel /a/ and the high vowel /i/ which results in a middle vowel [e], as shown in the examples in Table 11.

Table 11: *Fusion of /a+i/*

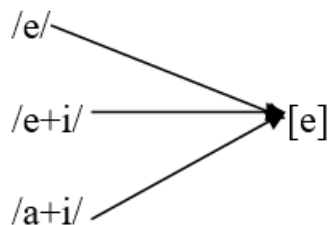
raama		‘cheek’
raanga		‘corral’
cikamba		‘nail’
mungaana		‘friend’
phakaama		‘parasitic plant’
khalavatla		‘watermelon’
rameeni	/rama-ini/	‘on the cheek’
rangeeni	/ranga-ini/	‘in the corral’
cikambeeni	/cikamba-ini/	‘on the nail’
munganeeni	/mungana-ini/	‘in a friend’
phakameeni	/phakama-ini/	‘in the parasitic plant’
khalavatleeni	/khalavatla-ini/	‘on the watermelon’

We see in these data that the sequence /a+i/ derives [e] on the surface due to fusion. This is the classic pattern of vowel fusion, which demands that a low vowel followed by the previous high vowel should give rise to a third vowel that contains the properties of the first two underlying vowels. We have seen before in the examples in Table 9 that the sequence /e+i/ also gives rise to the vowel [e] due to the elision of the second vowel in the sequence. Thus, in Citshwa, the vowel [e] appearing on the surface may be derived from

/a+i/, but [e] also results from the deletion of one of the vowels in the sequence as in the examples illustrated in Table 9.

Thus, the difference between the data in Tables 12 and 11 are as follows: While in Table 12 the vowel [e] appearing on the surface results from the deletion of the second vowel, in Table 11, the vowel [e] that appears on the surface is the result of fusion. Schematically, in Citshwa, the vowel [e] can come from different sources, as illustrated by the representation in Figure 5 below.

Figure 5: *Different Sources of Surface-Level [e]*



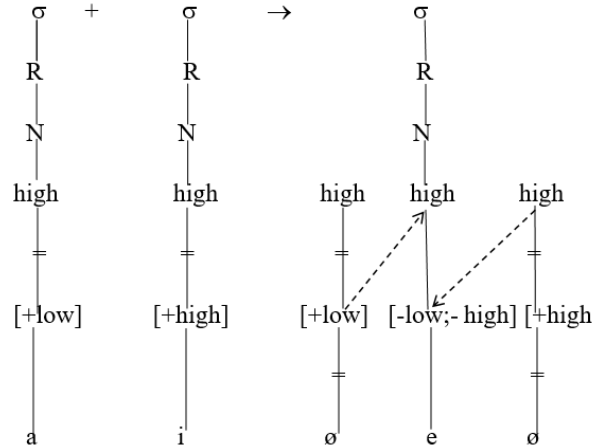
In the linear phonology model, the vowel fusion in Table 11 is explained based on the rule formulated as the following: /a+i/ → [e]. However, this rule does not inform or explain why X+Y=p, since there is not, in fact, a relationship between the morphophonological process involved with the simple mathematical operation involving two plots.

In fact, segmental fusion in Table 11 involves, on the one hand, the manipulation of height of the high vowel that tends to lower its height and, on the other hand, the manipulation of the height of the low vowel that tends to be raised to be produced in a vowel space different from that of the first two vowels.

In the self-segmental model, fusion in Table 11 is seen as the physiological need for production and compatibilization of organs involved in the production of sound, requiring that both the height of the vowels and the voice space have to make a commitment to generate a vowel with characteristics resulting from the encounter of the affected two vowels. This fact follows an important preliminary conclusion that says that it is not the segments or their intrinsic traces that determine in isolation the morphophonological processes, but the combination between these elements and the

corresponding prosodic structure. In view of this approach, the fusion process in Table 11 can be symbolically presented as follows in Figure 6.

Figure 6: Fusion of /a+i/



This representation simply shows that the encounter of /a+i/ causes the first vowel in the sequence to gain height, going from [+low] to [-low] and the second vowel in the sequence to pass from [+high] to [-high], because both are disassociated from their height and their initial syllabic nodes. Consequently, the segment characterized as [-low; -high] is the vowel [e] resulting from segmental syllabification and alternation.

The next examples involve the V+V sequence of identical low vowels, in which one of them is pre-vocalic followed by the low vowel of the diminutive morpheme.

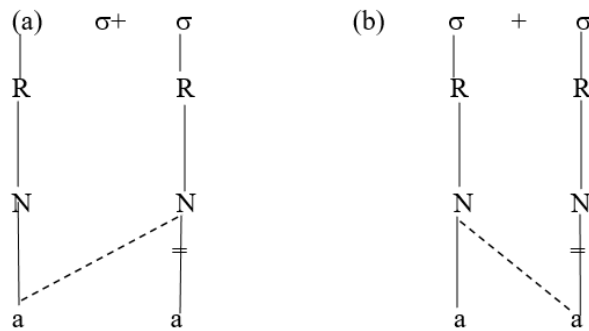
Table 12: Fusion of /a+a/

raama		‘check’
raanga		‘corral’
cikamba		‘nail’
mungaana		‘friend’
phakaama		‘parasitic plant’
khalavatla		‘watermelon’
ramaana	/rama-ana/	‘small cheek’
rangaana	/ranga-ana/	‘small corral’
cikambaana	/cikamba-ana/	‘small nail’
munganaana	/mungana-ana/	‘small friend’

phakamaana	/phakama-ana/	‘small parasitic plant’
khalavatlaana	/khalavatla-ana/	‘small watermelon’

In Citshwa, the encounter of two identical low vowels results in a fusion of both, giving rise to a low and brief vowel on the surface, as was demonstrated in Table 10. As the low vowel has no height, the encounter of /a+a/ causes one of the segments to de-bind from the nuclear node in the syllabic structure. Since it is not possible to say which of the vowels is detached from its nuclear node, let us assume two alternative possibilities as indicated by the representation in Figure 7.

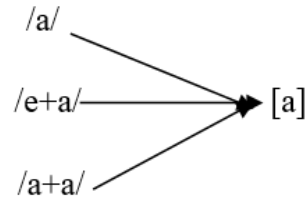
Figure 7: Fusion of Low Vowels



This representation shows that a sequence of identical low vowels results in a brief low vowel. This representation also shows that when /a+a/ or the segment on the left disassociates from its syllabic node or the vowel on the right does the same.

The data we have just examined shows that, like the vowel [e] appearing on the surface coming from different underlying structures, in Citshwa the vowel low [a] appearing in the language may come from different sources, namely from the deletion of the underlying vowel /a/ or from the vowel sequence /e+a/ or from the fusion of /a+a/, as can be seen in the diagram given in Figure 8.

Figure 8: Different Sources of Surface-Level [a]



Finally, what is surprising in the Citshwa data we have just examined is the fact that previous vowels in pre-vocalic position are completely excluded from semivocalization. The fact that these vowels are not subject to semivocalization means that we advance two preliminary conclusions, taking into account the data we have been analyzed. The first conclusion is that the semivowel palatal [y] derived from vocalic encounters of /i+V/ and /e+V/ found in several Bantu languages is not tested in Citshwa. The second conclusion about Citshwa is that only the retreated and rounded vowels semi-vocalize in the phrase domain. Semivocalization is blocked in sequences involving the high vowels of nominal prefixes in pre-vowel position.

4.0 Semi-Vowels in the Underlying Structure

The embarrassment about the occurrence of semivocalization in Citshwa does not prevent the existence of semi-vowels in the underlying structure of the language. The Principle of Inalterability of the syllable structure (PIES), Hayes (1986), only prevents the language from deriving semivowels in unwanted contexts involving certain V+V sequences. The data provided in Table 13 show that Citshwa has the semi-vowel /y/ in the underlying structure that does not result from the semivocalization process.

Table 13: Occurrence of /y/

kuya	*kuia ~	*kwia	/ku-ya/	‘go’
kuyila	*kuila ~	*kwila	/ku-yila/	‘bad omen’
kuyisa	*kuisa ~	*kwisa	/ku-yisa/	‘follow up’
kuyimba	*kuimba ~	*kwimba	/ku-yimba/	‘sing’
kuyeyisa	*kueisa ~	*kweisa	/ku-yeyisa/	‘disrespect’
kuyuyutela	*kuiuitela ~	*kwiwitela	/ku-yuyutela/	‘cast pests’
kuya	*kuia ~	*kwia	/ku-ya/	‘go’

As we see in the examples in Table 13, there is no evidence that the semi-vowel /y/ that appears on the surface results from the application of a phonological rule. We see that the semi-vowel does not come from semivocalization or insertion in an intervocalic position.

We have noticed before that in Citshwa the anterior high vowel does not semi-vocalize. Then we show that V+V sequences like in *kuimba* ('sing'), *kuoka* ('collect embers'), and *kuokola* ('take something from the coals') are permitted. We see in these examples that semivocalization is not allowed, but also does not occur the insertion of semi-vowel. One way to explain the presence of semivowels in Table 13 would be to propose an arbitrary insertion rule of y between vowels. However, the biggest problem resulting from this assumption is that there are no clear bases to motivate the rule of insertion of the semi-vowel in Table 13, nor does it occur in similar situations as shown in the additional data in Table 14, which illustrate the occurrence of w in the underlying structure in Citshwa.

Table 14: Occurrence of /w/

kuwa	*kua	/ku-wa/	'to fall'
kuwela	*kuela	/ku-wela/	'to fall on'
kuwoca	*kuoca	/ku-woca/	'to bake'
kuwoma	*kuoma	/ku-woma/	'to dry'
kuwola	*kuola	/ku-wola/	'to collect'
kuwula	*kuula	/ku-wula/	'to say'
kuwuya	*kuuya	/ku-wuya/	'to return'

The insertion rule could not explain in which context /y/ and /w/ are inserted. We also see that the semi-vowel insertion rule would be clearly arbitrary and incapable of explaining the data in Tables 13 and 14. Note that words such as *kuya* ('go') and *kuwa* ('fall') exist in the language. This reveals that the semi-vowel insertion would have to be random for sometimes to select /y/ or to prefer the insertion of /w/, but without a clear reason for that selection. In Citshwa, the semi-vowel labial /w/ also occurs in verbs of the passive form involving the morpheme *-iw-*. The relevant examples are given in Table 15.

Table 15: Morpheme -iw- in Underlying Structure

kutsala	'write'	kutsal-iw-a	'to be written by'
kupeta	'introduce'	kupet-iw-a	'to be introduced by'
kupima	'measure'	kupim-iw-a	'to be measured by'
kuruma	'send'	kurum-iw-a	'to be sent by'
kuwona	'see'	kuwon-iw-a	'to be seen by'
kurandza	'love'	kurandz-iw-a	'to be loved by'
kufemba	'sniff'	kufemb-iwa	'to be sniffed by'

The difference between the data in Tables 14 and 15 is as follows: While in Table 14 the semi-labial vowel /w/ appears in the initial position of the root at Table 15, the same segment appears in the attack position of the last syllable corresponding to the extended verbal theme. Again, the insertion rule would not be able to explain in what context the labial segment w is inserted, since we do not see the phonological factor that causes the insertion. In Citshwa, the semi-vowel also occurs in labialized consonants whose examples are presented in Table 16.

Table 16: Labialized Consonants

kugwandza	*kuguandza	/ku-gwandza/	'break in'
kurwala	*kuruwala	/ku-rwala/	'load'
kucwanyela	*kucwanyela	/ku-cwanyela/	'varer'
kucwongola	*kucuwongola	/ku-cwongola/	'march'
kucwokola	*kucuwokola	/ku-cwokola/	'give up'
kupukwa	*kupukwa	/ku-pukwa/	'fail'

These examples provide evidence that modified consonants containing the second articulation [gw], [rw], [cw], [kw] occur in the language. Finally, we found very few examples in the language involving the labialized nasal consonant [N^w].

In Citshwa, there is a class of names with the prefix /ø-/. Some of them use the class 2 prefix to make the plural corresponding. The examples in Table 17 illustrate this category of names.

Table 17 : Underlying Semi-Vowel

mwani /ø-mwani/ ('son-in-law')	va-mwani ('sons-in-law')
n'wana /ø-n'wana/ ('son/daughter')	va-na ('sons/daughters')
mun'wani /mu-n'wani/ ('others')	va-n'wani ('others')

The first two of these examples apparently suggest semivocalization involving the structure /mu-ani/ and /n'u-ana/. We found no reasons to

explain why only these names would be subject to semivocalization within the word. If this is the case, let's assume that this is lexical idiosyncratic. We therefore suggest that further studies be conducted.

5.0 Semi-Vocalization Restrictions Within the Word

In this section we examine the restrictions of semivocalization within the word. In Citshwa the high vowels of nominal prefixes do not semi-vocalize when followed by another vowel. Semivocalization occurs only at the end of the word, involving the rounded vowels /u, o/, before vowels /a, i/ of diminutive and locative morphemes respectively. Outside this context, there are other processes for resolving hiatus, namely elision and fusion.

Several scholars consider semivocalization as one of the most productive rules in almost all Bantu languages. This rule generally applies to any high vowel in the pre-vocalic position, turning /u/ into [w] and /i/ into [y] however, this process is completely blocked in Citshwa, when the vowels of nominal prefixes are involved. We will begin to demonstrate the restriction of semivocalization within the word considering the high vowel sequences in the pre-vocalic position of nominal prefixes.

Table 18: *Restriction of Semivocalization Within the Word*

a)	murimi	/mu-rimi/		'farmer'
	mugondzi	/mu-gondzi/		'student'
	muxavisi	/mu-xavisi/		'seller'
	muloyi	/mu-loyi/		'wizard'
	muyavi	/mu-yavi/		'distributor'
b)	muaki	/mu-aki/	*mwaki	'constructor'
	muendzi	/mu-endzi/	*mwendzi	'traveler'
	mumbe	/mu-imbe/	*mwimbe	'corner'
	muakelani	/mu-akelani/	*mwakelani	'neighbour'
	muavanyisi	/mu-avanyisi/	*mwavanyisi	'dispenser'
	muangameli	/mu-angameli/	*mwangameli	'pastor'

We see in the examples in Table 18a that the high pre-vocalic vowel of the class 1 nominal prefix (mu-) is pronounced as such before a consonant. In Table 18b, the same vowel presents itself as such, before the next vowel, because it does not semi-vocalize. This is the context in which all previous studies on V+V mentioned above predict that semivocalization should occur.

We assume that the reason why the high vowel in the pre-vocalic position is not subjected to semivocalization in Table 18b is because of the restriction of semivocalization within the word.

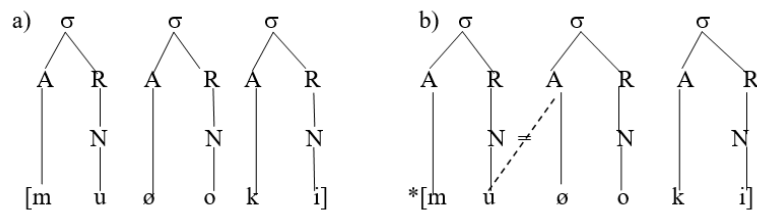
In the examples provided below, we examine all possible V+V sequences systematically to show that, in Citshwa, high vowels in the pre-vocalic position are immune to semivocalization within the word. The data in Table 19 provide additional evidence of intervocalization block of the high vowel of nominal prefix in the pre-vocalic position.

Table 19: *Semivocalization Restriction in /u+V/ Sequences*

/u+e/	muehleketi	/mu-ehleketi/	*mwehleketi	‘thinker’
	muetelisi	/mu-etelisi/	*mwetelisi	‘deepen’
	muendzi	/mu-endzi/	*mwendzi	‘traveler’
	muengiseti	/mu-engiseti/	*mwengiseti	‘listener’
	muengeteli	/mu-engeteli/	*mwengeteli	‘adder’
/u+i/	muise	/mu-ise/	*mwise	‘escort’
	muimbe	/mu-imbe/	*mwimbe	‘singer’
	muilise	/mu-ilise/	*mwilise	‘that does evil omen’
/u+o/	muoki	/mu-oki/	*mwoki	‘ember collector’
	muololi	/mu-ololi/	*mwololi	‘trainer’
	muokoli	/mu-okoli/	*mwokoli	‘taking something out of the ash’
	muongoli	/mu-ongoli/	*mwongoli	‘savior’

No examples involving the /u+u/ sequence within the word were found. All vowel sequences given in Table 19 show the blockade of semivocalization involving the high vowel inside the word in Citshwa, due to the principle of inalterability of the syllabic structure. In the view of that principle, the data in Table 19 may be represented as in Figure 9.

Figure 9: *Inalterability of the Syllabic Structure*



This representation shows that despite the canonical structure of the syllable in Bantu being CV, where C corresponds to the attack position A and V to the N core, Citshwa allows vowel sequences of contiguous syllables V.V.

These vowel sequences result from the existence of unfilled spaces in the Attack position, causing the syllable to be constituted only by the nucleus. We see that in Figure 9a the second syllable is devoid of attack, generating the structure CV.V.CV. In Figure 9b, we see that semivocalization is blocked, because the linguistic form *[mwoki] that would generate the CVCV syllabic structure is prohibited.

What is intriguing in the data analyzed so far is that the rounded high vowel in the pre-vocalic position turns into semi-vowel before the locative and diminutive suffixes, as in *cibukwini* of /cibuku-ini/ ('in the mirror'), as demonstrated earlier. However, the same vowel is not subject to semivocalization in Table 19. The question is why semivocalization is possible in the phrasal domain but blocked within the word.

In order to explain the difference in V+V patterns, our analysis assumes that the conditions governing the application of phonological processes within the word are different from those that govern the application of phonological processes at the sentence level. Nominal class prefixes are part of the internal structure of the word. In Citswani, locative suffixes function as independent words that match other independent words. Thus, we argue that in Citswani, the semivocalization of /u/ is allowed in "connected speech" through sandhi rules that result from syntax-phonology interaction, but semivocalization is blocked within the word in morpho-phonological interaction.

The additional data in Table 20 show that semivocalization is also not applicable to a high vowel in the pre-vocalic position of the prefixes of nominal classes 4, 7, 8 and 15, as the following examples attest.

Table 20: *Blocking of Semivocalization Inside the Word*

a)	kuala	/ku-ala/	*kwala	'refuse'
	kuava	/ku-ava/	*kwava	'separate'
	kuaneka	/ku-aneka/	*kwaneka	'extender'
	kuangula	/ku-angle/	*kwangula	'take care of the word'
	kualakanya	/ku-alakanya/	*kwalakanya	'remember'
b)	kueta	/ku-eta/	*kweta	'be deep'
	kuengeta	/ku-engeta/	*kwengeta	'repit'
	kuendza	/ku-endza/	*kwendza	'travel'
	kuetlela	/ku-etlela/	*kwetlela	'sleep'
	kuehleketeta	/ku-ehleketeta/	*'kwehleketeta	'reflect'

As we see in the examples in Table 20a and Table 20b, the vowel of the class 15 nominal prefix is maintained on the surface before /a/ and /e/.

Additional data involving /u+o/ follow the same pattern of semivocalization block as illustrated in Table 21.

Table 21: *Semivocalization Block in /u+o/ Sequence*

kuimba	/ku-imba/	*kwimba	‘to sing’
kuoka	/ku-oka/	*kwoka	‘to collect embers’
kuokola	/ku-okola/	*kwokola	‘to take something from the ashes’
kuololoxa	/ku-ololoxa/	*kwololoxa	‘to straighten’

No examples involving vowel sequence /u+u/ were found. However, the examples in Table 21 establish that a high vowel in the pre-vocalic position of the nominal class prefix is not affected by semivocalization.

The blockade of semivocalization also involves other vowels of prefixes of nominal classes, as illustrated in Table 22.

Table 22: *Semivocalization Restriction in /i+V/ Sequences*

/i+a/	ciavelo	/ci-avelo/	*cyavelo	‘premium’
	cialakanyisu	/ci-alakanyisu/	*cyalakanyisu	‘reminder’
/i+e/	cienge	/ci-enge/	*cyenge	‘fase’
	cienetelo	/ci-engetelo/	*cyenetelo	‘aumentative’
	miehleketo	/mi-ehleketo/	*myehleketo	‘reflections’
/i+o/	ciove	/ci-ove/	*cyove	‘gincho’
	ciololi	/ci-ololi/	*cyololi	‘straightening’
	ciolovisu	/ci-olovisu/	*cyolovisu	‘softener’

These data provide additional linguistic evidence showing that the previous high vowel /i/ does not turn into semi-vowel [y], as advocated in previous studies of the Bantu languages.

Similarly, the high vowel of the subject mark prefix in the pre-vocalic position does not turn into semi-vowel, as the examples indicate in Table 23.

Table 23: *Semi-Vocalization Restrictions*

ndziakile	/ndzi-akile/	*ndzyakile	'I built'
ndziavile	/ndzi-avile/	*ndzyavile	'I shared'
ndzianekile	/ndzi-anevole/	*ndzyanekile	'I extended'
ndziendzile	/ndzi-endzile	*ndzyendzile	'I traveled'
ndziengetelile	/ndzi-engetelile	*ndzyengetelile	'I added'
ndziokile	/ndzi-okile	*ndzyokile	'I took from the ashes'
ndziololoxile	/ndzi-ololoxile	*ndzyololoxile	'I straightened'

The data seen from Tables 19 to 23 meet the appropriate phonological conditions for semivocalization to take place. Citshwa's examples simply show that semivocalization is blocked not only in relation to potential vowels to semi-vocalize, but also in relation to the domain in which the process should be applied.

The examples we have just presented above show that in Citshwa the vowel /i/ does not turn into semi-vowel [y] before another vowel. This is the context in which all previous studies predict the obligatory semivocalization of the vowel /i/ before another vowel in the Bantu languages, due to the need for (de-)syllabification. It should be noted that even in languages where the resolution of hiatus is obligatory, there are vowel sequences not affected by gap resolution strategies. The difference between these cases and Citshwa data is that, in this specific language, the rule that transforms high vowels into semivowels is quite restrictive.

We explain the blockade of semivocalization in the data above based on the adjustment restrictions of the syllabic structure in Citshwa, assuming the Principle of inalterability of the syllabic structure (PIES), as proposed by Hayes (1986). This principle says that the structure of the underlying syllable cannot be changed. But as we see, (PIES) does not explain the semivocalization of /u; o/ in the final position of the word and its restriction within the word. A simple way to account for this apparent contradiction is to assume, once again, that in Citshwa the (PIES) is strictly applicable in the field of the word, but violable in the context of the sentence. In conclusion, there are phonological rules sensitive to interaction between syntax-phonology, but such rules are not sensitive to morphophonemic interaction.

6.0 Conclusion

The aim of this article was to show that in Citshwa, semivocalization as a gap resolution strategy is applicable only to certain vowels in the final position of the word, when followed by suffix vowels. More concretely, the rule that transforms high vowels into pre-vocalic position into semivowels affects only backing and rounded vowels, when followed by locative and diminutive morphemes. The process is prevented within the word. We explain that the main reason for the non-occurrence of semivocalization within the word is due to the fact that in this area the application of the principle of Inalterability of the syllabic structure (PIES) is obligatory being violable in the field of the phrase. We argue that in Citshwa, locative and diminutive morphemes are treated as phonologically independent words, while nominal class prefixes are an integral part of the internal structure of the word.

References

- Ayssa, Vratssanos and Maxwell Kandege. 2017. "Hiatus Resolution in Xitsonga." *Stellenbosch Papers in Linguistics Plus*, 52: 175-196.
- Bickmore, Stephen Lee. 1989. *Kinyambo Prosody*. Ph.D. Dissertation. University of California, Los Angeles.
- Casali, R. 1996. *Resolving Hiatus*. Ph.D. Dissertation, University of California, Los Angeles.
- Clements, G.N. 1986. "Compensatory Lengthening and Consonant Germination in LuGanda." In L. Wetzels and E. Sezar (eds), *Studies in Compensatory Lengthening*. Dordrecht: Foris, Netherlands.
- Clements, G. N. and Elizabeth Hume. 1995 "The Internal Structure of Speech Sounds." In John Goldsmith (ed.), *Handbook of Phonological Theory*, pp. 245-306. Oxford: Blackwell.
- . 1996. *The Internal Organization of Speech Sounds*.
- Clements G.N. and S.J. Keiser. 1983. *CV-Phonology: A Generative Theory of the Syllable*. Cambridge: MIT Press.
- Goldsmith, John. A. 1976. *Autosegmental Phonology*. Ph.D. Dissertation, Massachusetts Institute of Technology.
- . 1990. *Autosegmental and Metrical Phonology*. Oxford: Blackwell.
- Gurhrie, Malcolm. 1967. *The Classification of Bantu Languages*. London: Dawson of Pall Mall.

- Hayes, B. 1986. "Inalterability in CV Phonology." *Langue*, 62: 321-51.
- INE. 2017. www.ine.gov.mz
- Katupha, J.M.M. 1988. "The Linguistic Overview of Mozambique and the Contribution of Language in the Definition of an Appropriate Language Policy." *LUANOVA, Letters, Arts & Ideals*. Quengelequêze. Mozambican Writers' Association. Maputo, People's Republic of Mozambique.
- Kisseberth, Charles. 1969. "On the Abstractness of Phonology: The Evidence from Yawelmani." *Paper in Linguistics*, 1(2): 248-282.
- . 1970. "On the Functional Unity of Phonological Rules." *Linguistic Inquiry*, 1: 291-306.
- Liphola, M. 1988. "The Bantu Languages of Mozambique: A Small Point Approach Socio-Linguistic View." *LUANOVA. Letters, Arts & Ideals*. Quengelequêze. Mozambican Writers' Association. Maputo, People's Republic of Mozambique.
- . 2001. *Aspects of Phonology and Morphology of Shimakonde*. Ph.D. Dissertation, The Ohio State University.
- Mangoya, Esau. 2013. "Segmental Phonology of Barwe with Some Articulatory Phonetics." *Our Languages IX*. CEA-UEM.
- Maho, J. 2008 *A Comparative Study of Bantu Noun Classes*. Göteborg: *Acta Universitatis Gothoburgensis*.
- Mtenje, A. 2018. "'Repair' Strategies of Vowel Sequences in Cindali." *South African Journal of African Languages*, 327-335.
- Mutaka, Nguessimo and Pius Tamanje. 2000. *An Introduction to African Linguistics*. Lincom Europe: Muenchen.
- Mutonga, L. 2016. "Hiatus Resolution in Ndaui Cliticisation Domain." *Journal of Linguistics and Language in Education*, 10(1): X-X.
- NELIMO 1989. *Relatório do I Seminário sobre a Padronização da Ortografia das Línguas Moçambicanas*. Maputo.
- Noske, Roland Gabriel. 1992. *A Theory of Syllabification and Segmental Alternation with Studies on the Phonology of French, German, Tonkawa and Yawelmani*. Amsterdam.
- Ngunga, A.S.A. 1997. *Lexical Phonology and Morphology of the Ciyao Verb Stem*. University of California, Berkeley. PhD dissertation.
- . 2000. *Lexical Phonology and Morphology of the Ciyao Verb Stem*. Center for the Study of Language and Information.
- . 2014. *Intrusion to Bantu Linguistics (2nd ed)*. Maputo: University Press.
- Odden, D. 1996. *The Phonology and Morphology of Kimatumbi*. Oxford, UK: Clarendon Press.
- Overton, R. 2018. *Vowel Hiatus Resolution in Simbiti and the Orthographic Implication*. MA thesis, Centre for Linguistics, Translation and Literacy: Radcliffe College.
- Soap, C. 2013. "Feature Conditioned Resolution Hiatus in Chichewa." *Southern African Linguistics and Applied Languages Studies*.
- Selkirk, E. 1982. "The Syllable." In Hulst and Smith (ed), *The Structure of Phonological*

Adjustment of Syllabic Structure in Citshwa – Chivambo and Liphola

Representations, Part II, pp. 337-383. Dordrecht Foris.

Sibanda, G. 2018. *Vowel Processes in Nguni: Resolving the Problem of Unacceptable VV Sequences*. University of California, Berkeley and Stanford University.

Simango, S. R. 2014. “Comparing Hiatus Resolution in ciSenga and chiShona: An Optimality Theory Analysis.” *Stellenbosch Papers in Linguistics Plus*, 44: X-X.

Sitoe, B. and A. Ngunga (eds). 2000. *Relatório do II Seminário sobre a Padronização da Ortografia das Línguas Moçambicanas*. NELIMO-Centro de Estudos de Línguas Moçambicanas. Maputo: NELIMO, Universidade Eduardo Mondlane.

Yai, O. Babalola. 1983 *Elements of a Policy for Promotion of National Languages*. UNESCO.