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Minimality in siSwati

by

Vusi Musa Magongo

A dissertation submitted to the University of the Witwatersrand in fulfilment of the requirements of the degree of Master of Arts in Linguistics

Supervisor:

Professor Maxwell Kadenge

13 March 2024

PLAGIARISM DECLARATION

I hereby declare that this dissertation is my original work. All outside sources have been acknowledged. It has not been previously submitted, in part or entirety, to any institution of higher learning.



13 March 2024

Signature Date

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ABSTRACT

Many languages have minimal prosodic restrictions on the size of well-formed words. This study explores word minimality restrictions on the siSwati Prosodic Word, with emphasis on how the grammar of the language repairs submininal constructions. It provides evidence for word minimality in different forms of the Verb and the Noun within the siSwati grammar. It further illustrates that siSwati grammar triggers different augmentation strategies across various morphosyntactic domains. The dissertation provides a formal Optimality Theory analysis of the minimality restrictions on the PWord, highlighting how minimality effects in siSwati pattern with other Bantu in general and Nguni languages in particular. This work demonstrates that the Prosodic Hierarchy and its domains determine whether the siSwati grammar triggers or blocks augmentation to satisfy minimality constraints. The aim of this study is to present the first comprehensive account of repair strategies used in siSwati to maintain preferred phonological structures, highlighting the importance of the syllable and word as essential levels of phonological analysis in this language and others like it. Findings reveal that the language selects phonological or morphological augmentation to parse grammatical constructions that are minimally well-formed in all surface representations in the siSwati grammar. The requirements for minimality evident from this study are the same crosslinguistically, with siSwati and Xitsonga employing a suffixal morpheme as opposed to the prefixal morpheme employed by all the other Nguni languages in the imperative. In Nguni languages prefixing augmentation is unmarked while suffixing augmentation is marked. Additionally, the results of this analysis are compared to those of other Southern Bantu languages in an effort to situate siSwati within its language family, thereby contributing, in a small but significant way, to linguistic typology.

Key words: minimality, Optimality Theory; subminimal constructions; Prosodic Stem: Prosodic Word; phonological augmentation; morphological repair, constraints, Nguni languages.

DEFINITIONS OF KEY TERMS

Repair strategies Strategies that conspire to ensure that the phonological rules of a language is maintained.

Loan words Words adopted from one language and adapted to suit another.

Prosodic word minimality The minimum number of syllables required by a language to form an acceptable word.

Optimality Theory A constraint-based theory of generative grammar developed by Prince and Smolensky in 1991 (Archangeli, 1997).

Constraints The requirements governing grammatical structure, based on language universals. Markedness constraints prohibit marked surface structures and faithfulness constraints aim to preserve the input form as much as possible.

Candidates The possible output forms based on the input.

Input The original form of a word before it is repaired or rephonologised.

Output The realisation of the input once the optimal form has been determined based on the constraints.

LISTS OF SYMBOLS, ABBREVIATIONS AND CONSTRAINTS

LIST OF SYMBOLS

/ /	Underlying representation (base form)
→	Is realised as/becomes
>	Stronger than
[ ]	Phonetic/narrow transcription (Optimality Theory Output)
.	Syllable boundary.
-	Morpheme boundary.
☞	Winning candidate.

LIST OF ABBREVIATIONS

AUG	Augment
C	Consonant
CL	Class
CV	Consonant Vowel
DIM	Dimunitive
FV	Final Vowel
IDENT	Identity
IMP	Imperative
INFL Stem	Inflectional Stem

IO	Input/Output
IVS	Inflected Verb Stem
LOC	Locative
MAX	Maximum
N	Nasal consonant
Ṇ	Syllabic nasal consonant
OT	Optimality Theory
PH	Prosodic Hierarchy
PWord	Prosodic Word
PStem	Prosiodic Stem
PWord	Prosodic Word
QUAL	Qualificative
RED	Reduplicant
SM	Subject Marker
TAM	Tense, Aspect, Mood
V	Vowel

LIST OF CONSTRAINTS

DEP-IO	An output segment must have input correspondent. (No epenthesis) (Kager,1999, p. 101)
HIGH VOWEL ELISION	Parsing of high rounded vowel is prohibited (Harford & Malambe, 2011, p. 7; Kadenge, 2015, p. 96)
IDENT-Morph	The features of an input segment must remain in the output; no segment substitution (Kadenge and Mudzingwa, 2012).
MAX-IO	Elision of segments is prohibited. (Kager, 1999, p. 67)
MIN-WD	Prosodic words must be minimally disyllabic (Park, 1997, p. 251)
RED [σσ]	the reduplicant must be minimally disyllabic. (Hyman, Inkelas & Sibanda, 1999, p. 280)

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CHAPTER 1: INTRODUCTION AND BACKGROUND TO STUDY

1.1 Introduction

In the world, there are languages with disyllabic or bimoraic minimum size requirements. Among these languages, there are diverse strategies to keep words over the minimum size. Some of the examples found in these languages, as explored and demonstrated extensively in Park (1997) include blocked apocope in Estonian (see Prince 1980), blocked truncation in Lardil (see Wilkinson, 1988), vowel lengthening in Bengali (see Cole 1990), prothesis in Choctaw (see Lombardi & McCarthy, 1991), Iraqi (see Broselow, 1982) and Mohawk (see Broselow, 1982), appendices in Axininca Campa (see Spring, 1988; McCarthy & Prince, 1993), epenthesis, cliticization and consonant gemination in Mayo (see Hagberg, 1992), and glide deformation in Mexican Spanish (see Crowhurst, 1992).

Prosodic minimality and its related effects has been demonstrated to operate productively in numerous Bantu languages, such as Luganda (see Hyman & Katamba, 1990), Kihehe (see Odden, 1985, Odden 1996a), Shona (see Myers, 1987), Chichewa (see Kanerva, 1990), Siswati (see Kiyomi & Davis, 1992, Herman ,1996, Malambe, 2006, Mkoko, 2021), Kikerewe (see Odden ,1996b), and Swahili (see Park, 1997), to name but a few.

There is a general observation that has been made by numerous scholars that many languages have minimal prosodic restrictions on the size of well-formed words (see Park, 1997; Harford, 1999; Downing 1999, 2005 & 2006; Zerbian, 2002; Rose & Demuth, 2006; Mkochi 2009; Mudzingwa, 2010; Selkirk & Lee 2015; Downing & Kadenge 2015; Kadenge & Mathangwane, 2017). Selkirk and Lee (2015), for example, observe a minimally disyllabic PWord, proposing that markedness

constraints in Optimality Theory (OT) require that a prosodic constituent of type ω be prosodically binary.

Like most Bantu languages, siSwati has strict rules governing its phonology including requirements regarding Word Minimality. The study identifies and describes a number of the repair strategies employed in siSwati to maintain disyllabicity as part of its preferred phonological structure. It also discusses related morpho-phonological asymmetries within siSwati and other Bantu languages' nominal and verbal constructions and lastly, identifies the direction of change among Nguni languages.

1.2. Background to Study: Evidence for Minimality Constraint in siSwati

Most previous studies such as Herman (1996), Downing (1997, 1998); Kockaert (1999); Lee (1999); Malambe (2006); Harford and Malambe (2015, 2017); Kadenge (2015) and recently; Mkoko, (2021), focused on selected parts of the phonology of the siSwati language. Each of these studies provide an independent inquiry of individual phonological structures. Downing (1997) solely focuses on reduplication, Kockaert (1999) on vowel harmony, Malambe (2006) on palatalisation and other non-local effects, Harford and Malambe (2015) on high vowel elision and perfect imbrication (2017), and Mkoko (2021) on the siSwati syllable structure and its impact on [mu-] reduction and loan word phonology.

This study builds on the findings of these previous studies by comprehensively focusing on various phonological processes, and then demonstrating how the language optimally accomplishes Prosodic Word well-formedness. In most Bantu languages, for example, monosyllabic stems are augmented in order to fulfil a minimality requirement of the language (Park 1995). Preliminary findings on siSwati minimality indicate that among the strategies to deal with minimality across the grammar of the language are the augmentation of subminimal forms and rule blocking in well-

formed PWord (see Downing, 1997; Malambe, 2006; Mkoko,2021), among others, and this is discussed in detail in Chapter 5. However, there is no substantial research that has been undertaked specifically focussing on Minimality in siSwati, hence this study is designed to fill this gap.

Herman (1996) observes that siSwati has word-and stem-minimality. In the language, there is no phonological word shorter than two syllables. Imperatives consist of bare (unprefixed) verb stems in siSwati, as shown in the example (1) below.

1. / hamb-a/ → [hamb-a] 'go'

On the contrary, monosyllabic stems only become well-formed imperatives when combined with the morpheme /-ni/ to make them bisyllabic. Subminimal forms are avoided by suffixing an extra syllable /-ni/ which Park (1997) refers to it as the 'default syllable' that is normally used as a plural imperative marker. The syllable is affixed to the end of the verb stem to augment the verb size to two syllable long (Park 1997:30). The example in (2) below demonstrates this.

2. / p^h-a/ → [p^h-a-ni] 'Give!'

The study analyses how siSwati grammar blocks augmentation in minimally well-formed constructions such as in example (2) above, using analytic insights from Optimality Theory. It further explores how siSwati grammar ranks minimality to achieve minimally well-formed surface representations as this suffices for all Nguni languages and other Bantu languages that enforce binarity on all surface forms as seen in Park (1997).

Malambe (2006) briefly discusses the different grammatical categories under which minimality effects are evident in siSwati. She presents imperatives, pronouns, reduplication and monosyllabic stems as some of the morphosyntactic categories that have to conform to disyllabic minimality. Inspired by her brief discussion, this study advances this argument comprehensively by exploring each of the morphosyntactic domains in detail. Amongst the grammatical categories that Malambe

(2006) briefly highlights as evidence for minimality in siSwati are Pronouns. The absolute Pronoun is monosyllabic and to make it pronounceable, an additional syllable /-na/ is suffixed. This caters for the required syllable size permissible in the siSwati language as demonstrated in (3) below.

3. [ye-na] 'him/her'

This raises the question: is the /-na/ not part of the pronoun in siSwati or it is there to add size? This study further draws more evidence that the /-na/ is not part of the pronoun by looking at derivation of other grammatical categories from this pronoun. Malambe (2006) and Herman (1996) observe that both adverbs and possessives fail to insert the /-na/ after prefixing their different formatives to the absolute pronoun, as shown in (4) below Malambe 2006:56).

4. Absolute pronoun	**Adverb**	**Possessive**
[t'o-na] 'them 10pl.'	[ku-t'o] 'at/on them 10pl.'	[ya-t'o] 'theirs 10pl.'
*ku-t'o-na	* ya-t'o-na	
[ɓo-na] 'them 2pl.'	[ku-ɓo] 'at/to them 2pl.'	[ya-ɓo] 'theirs 2pl.'
* ku-ɓo-na	* ya-ɓo-na	

The demonstrative pronoun further provides evidence for a bisyllabic minimality constraint in siSwati. An optional /-na / is suffixed to monosyllabic pronouns, as shown in (5) through (7) below.

5. / lo / → [lo-na] 'this one 1sg.'

6. /le/ → [le-na] 'this one 9sg.' (Malambe 2006:57)

7. /le-/ → [lesi] 'this one 8sg' *lesi-na

On the contrary, bisyllabic pronouns suffixation results in ill-formedness, e.g. /lesi/ ‘this one 8sg.’ becoming *lesi-na as demonstrated in 7 above.

Siswati also exhibit evidence for minimality constraint through monosyllabic loan words. Malambe (2006) and Mkoko (2021), among others hint on this constraint which this study comprehensively analyses with insights from Optimality theory. A CVC loan word is expanded to two syllables when borrowed into siSwati. This is demonstrated in the following example in (8), while more examples are discussed in detail in this dissertation.

8. English SiSwati

/pɑmp/ → [po.^{m}pa] ‘to pump’ (Malambe, 2006:57)

Examples from nouns confirm the binarity requirement of words in the siSwati language as shown below in (9) through (11) in the formation of loan words from English. This is further discussed in detail with more examples in chapter 5. The examples are adapted from (Mkoko, 2021:172).

9. [plæŋk] → [lí.p´u.là.ŋò] ‘plank’

10. [tæŋk] → [lí.t^{h}à.ŋé] ‘tank’

11. [bæŋk] → [lí.bà.ŋé] ‘bank’

The disyllabic size of the reduplicant is subject to minimality requirements in siSwati. The reduplicant in siSwati is realized as a two-syllable prefix (Downing, 1994). In the following examples the reduplicant is underlined as illustrated in 12 and 13.

12. [ɬeɠa] → [ɬeɠa-ɬeɠa] ‘laugh a little‘

13. [seŋa] → [seŋa-seŋa] 'milk a little'

Monosyllabic stems are augmented by infixing an extra syllable [ji] between the stems, so that the prefix is now two syllables, a permissible size in siSwati as shown in 14 and 15 below.

14. [va] → [va-ji-v-a] 'hear a little'

15. [ma] → [ma-ji-m-a] 'wait a little'

Downing, drawing, on her extensive work on Bantu reduplication including on siSwati (See Downing, 1994, 1997, 1998, 2003, 2005), affirms that reduplication in Bantu languages is subject to prosodic constraints on the size of the Reduplicant. This study provides a a comprehensive analysis of the permissible size of the siSwati Verb Reduplicant.

Hypocoristic names provide additional evidence for the validity of the two-syllable minimal size restriction as outlined by Malambe (2006: 58). The names are never shortened to one syllable or to three as the examples in (16) through (18) demonstrate. They are almost always disyllabic.

16. Nhlanhla → Nhlanhla *Nhla

17. Sandile → Sandi *Sa

18. Thembisile → Thembi *Thembisi

Moreover, the size of the Prosodic Word determines the form that the passive takes in siSwati. Malambe (2006), Kiyomi and Davis (1992) and Herman (1996) among others, note that if the root is monosyllabic, the siSwati language inserts the epenthetic [i] to augment the subminimal root. Malambe (2006) further posits that siSwati requires two or more syllables for minimally well-

formed roots. Consider the following examples given (19) through (22) below as displayed by Malambe (2006: 7-8);

19. /hámbà/ → [handʒ**w**a] "go"

20. /sèɓéntà/ → [sètʃ'ént**w**à] "work"

21. /pʰá/ → [pʰ**íw**á] "give"

22. /ɮá/ → [ɮ**íw**à] "eat"

The above examples present the variation of the passive marker in siSwati. In (19 and 20) where the verb root is two syllables or more, the marker is realised as [w], but as augmented [iw] in (21 and 22) where the monosyllabic verbs are subminimal and therefore ill-formed. This is discussed in detail in Chapter 5.

Moreover, the dissertation shows that different aspects within the Verb are domains for various phonological and morphological processes such as reduplication among others (Downing & Mtenje, 2017). The siSwati verb follows a similar representation with that of the Bantu verbal structure. More so, typical of the Bantu verb, the siSwati verb consists of the verb stem to which various prefixal and suffixal morphemes are added hence the different phonological processes in the siSwati verbal constructions are analysed in Chapter 5 to answer the second research question of this dissertation.

1.3. Problem Statement

There are strategies in place in every language that ensure that the preferred phonological structures of a language are maintained and that dispreferred structures are eliminated. The repair strategies differ from language to language but seek to achieve the same goal cross-linguistically; that of

ensuring that stems (and/words) are minimally disyllabic. Previous research has already shown that siSwati prefers a disyllabic minimal word and employs various strategies to maintain this (see, for example, Herman, 1996, Malambe, 2006 and Mkoko, 2021) and dispreferred structures are eliminated.

Herman's (1996) descriptive analysis of the prosodic structure of siSwati has greatly inspired this study. She postulates that the shortest word in siSwati is two syllables long. Words which might otherwise be monosyllabic, because they consist of a single C root with a single vowel suffix, have an additional syllable added on which does not appear in words formed from longer roots. This current study builds on Herman's (1996) Metrical Phonology (MP)-based descriptive study by presenting new data and an original OT analysis of the specific repair strategies used in siSwati to curb subminimality. It further compares and contrast these repair strategies with those of other Bantu languages with specific reference to nominal and verbal constructions. It has been observed by numerous scholars who conducted research on Minimality; such as Park (1997); that in some instances where other languages augmented their subminimal forms through prefixing an epenthetic syllable in the same linguistic domain, siSwati would opt for suffixing.

The study further analyses such asymmetries through the use of Optimality theory (OT) (Prince and Smolensky, 2004). The results of the study are compared to those of other Bantu languages in an effort to situate siSwati within the Bantu family, thus contributing in a small but significant manner, to Bantu linguistic typology.

Malambe (2006) briefly discusses the different grammatical categories under which minimality effects are evident in siSwati. This current study builds on these findings by exploring each of these domains in detail. New data and theoretical analysis are presented in this study. It is demonstrated in this investigation that the formation of imperatives in siSwati behaves phonologically differently from the other Bantu languages. While most Bantu languages opt for an

epenthetic syllable that is prefixed, siSwati suffixes an additional syllable. This raises question about the direction of change in siSwati phonology. We seek to explore the origins and suistainability of this markeness. Consider the following examples (23) through (24) on the construction of siSwati imperatives.

23. /bon-a/ → [bon.a]

'see' 'see IMP'

24. /lim.a/ → [lim.a]

'cultivate' 'cultivate IMP'

Examples (23) and (24) above illustrate that no changes occur to the stem to form the imperative in siSwati in cases where the stem is polysyllabic. However, if the stem is monosyllabic, an additional syllable [-ni] is added as shown in (25) and (26) below.

25. /y-a/ → [ya.**ni**]

'go' 'go IMP'

26. /f-a/ → [fa.**ni**]

'die' 'die IMP'

In each case presented in (25) and (26) above, the words are minimally disyllabic in the imperative. The monosyllabic verb stems are subminimal and to augment them an extra [-ni] is suffixed.

While siSwati augments subminimal forms through suffixing an epenthetic syllable, other Bantu languages opt for an epenthetic prefix. This is illustrated below with examples from different Bantu languages in the formation of the imperative. Downing and Kadenge (2015) illustrate how

chiZezuru, a dialect of chiShona, requires words to be minimally disyllabic and uses an epenthetic vowel [i] to curb subminimality. This process of augmentation occurs in both nouns and verbs. The epenthetic vowel is prefixed to monosyllabic verbs in the formation of the imperative. Consider the following examples in (27) and (28) from chiZezuru below.

27. /ɓ-á/ → [**i**-ɓá]

'steal' 'steal IMP'

28. /p-á/ → [**i**-pá]

'give' 'give IMP'

In chiZezuru monosyllabic verbs of the imperative are augmented by means of an epenthetic syllable [i] to create two syllables. This is an inverse of what is obtained where the epenthentic material is suffixed.

Just like in chiZezuru, iKalanga one of the dialects of chiShona, adopts prefixing other than suffixing in the formation of imperatives. In this language, the type of word determines the minimum number of syllables required (Kadenge & Mathangwane, 2017). Imperative need to be minimally disyllabic and the epenthetic syllable [i] is prefixed to augment monosyllabic verb stems as shown in (29) through (30) below.

29. /já/ → [**i**.já]

'eat' 'eat IMP'

30. /dá/ → [**i**.dá]

'love' 'love IMP'

In (29) and (30) above, an epenthetic vowel is used to augment the monosyllabic verb root to become disyllabic in iKalanga (Kadenge & Mathangwane, 2017). This is contrary to siSwati which suffixes the epenthetic syllable as compared to prefixing.

Sesotho is one of the languages that select prefixing in the formation of the imperative. Sesotho, a Bantu language spoken in Lesotho, South Africa and some parts of Zimbabwe, exhibits special behaviour in monosyllabic verbs (McNally, 1990). In the imperative formation, monosyllabic verbs as shown in (31) and (32) require a prothetic vowel /e/ in fulfilment of bimoraicity.

31. /ja/ → [**e**.ja]

'eat' 'eat IMP'

32. /nwa/ → [**e.**nwa]

'drink' 'drink IMP'

The above examples (31) and (32) show that in the formation of the imperative in seSotho monosyllabic verbs, the syllable /e-/ is prefixed to augment that verb in order to make it bimoraic as per the requirements of the language.

Knerva (1990) observes that Chichewa also requires a word-final bisyllabic foot. Undersized forms acquire an additional syllable or mora so that they can satisfy the minimal foot requirement, as shown in (45) and (46) below.

33. /ka/ → [**ii**.ka]

'put' 'put IMP'

34. /^{m}ba/ → [**ii**.^{m}ba]

‘sing’ ‘sing IMP’

Chichewa prefixes a prothetic syllable to make the monosyllabic verbs bisyllabic as shown in (45) and (46), which is also different from siSwati in the formation of the imperative.

Ndau follows this general pattern in the formation of the imperative. The imperative form of most verbs consists of the bare verb stem and the monosyllabic stems are augmented by epenthesizing (semantically empty) a syllable (Mutonga, Mabugu, Mukaro & Mugari, 2018), as shown in (47) through (49) below.

35. /rʲá/ → [**i**.rʲá]

‘eat’ ‘eat IMP’

36. /dá/ → [**i**.dá]

‘love’ ‘love IMP’

37. /tá/ → [á.tá]

‘sleep’ ‘sleep IMP’

Vowel epenthesis in the imperative shows that Ndau has a minimality restriction on the Verb

word. Hence, the epenthesis of the vowel /i/ and /a/ in imperatives shows that Ndau imposes a disyllabic minimality requirement, as shown in (47) through (49) above.

SiSwati is no different from many other Southern Bantu languages like Ndebele, Sesotho, Xitsonga, isiZulu, chiShona, to mention a few, in that it also has minimality requirements, for

which it employs a few strategies. It is believed that this study is the first to do a comprehensive analysis of minimality requirements in this language.

1.4. Objectives of the study

The objectives of this study are threefold:

- To explore the different repair strategies employed in siSwati to curb Prosodic Word subminimality.
- To discuss the morpho-phonological asymmetries in siSwati and other Bantu languages' nominal and verbal constructions in relation to minimality effects.
- To use evidence in siSwati to identify the direction of change in this language and the Nguni group in general.

The Study seeks to answer the following questions:

- What are the different repair strategies that are employed in siSwati to curb Prosodic Word subminimality?
- What are the morpho-phonological asymmetries in siSwati and other Bantu languages' nominal and verbal constructions in relation to minimality effects?
- Which direction of change in terms of markedness is siSwati taking?

1.5. Justification for the Study

The study aims to provide a comprehensive descriptive and theoretical analysis of siSwati minimality effects. Numerous theoretical and descriptive studies focused on various aspects of siSwati grammar. Zievorgel and Mabuza (1952), Dlamini (1979), Taljaard, Khumalo and Bosch (1991) as well as Sibanda and Mthembu (1996), describe siSwati grammar. Other scholars dealt with various morphophonemic aspect of the language, for example, Downing (1997, 1999) focused

on verbal reduplication, Herman (1996) on siSwati prosodic structure. Herman (1996) utilises Metrical Phonological to explain the metrical structure of siSwati and minimality is one of the prosodic structures that are partially accounted for in his brief investigation.

Lee (1999) describes vowel hiatus, Kockaert (1997) looks atvowel harmony, Malambe (2006) focuses on palatalisation and its effects, Harford and Malambe (2015) analyse high vowel elision as well as perfect imbrication; and Mkoko (2021) looks how various phonological processes eliminate dispreferred phonological structures, as conditioned by the morphological domains in which they occur. Mkoko (2021) uses hiatus resolution patterns, loanword adaptation, /mu/ reduction, and word minimality to present evidence for the siSwati syllable structure and permissible minimal word size. Each of these studies focuses on the phonology of the language as presented within specific domains.

There is as yet no comprehensive analysis of minimality requirements in this language. Thus, the current study aims to fill a gap in research on siSwati phonology, and Southern Bantu languages more generally, by presenting a comprehensive, updated account of the minimality effects in this language. Also, there is no study that has presented a comparative description on the different minimality constraints amongst different Bantu languages, with the aim of identifying and accounting for the direction of change that these Bantu languages are taking. By linking the main analysis to those of similar phenomena in other Bantu languages, this study seeks to paint a picture of general tendencies of these languages, thus contributing to Southern Bantu linguistics typology. The results of the study are compared to those of other Bantu languages in an effort to situate siSwati within the Bantu family, thus contributing to Bantu linguistic typology and further speculate the direction of change that exists among these Nguni languages. The question that the study seeks to answer is: are these Nguni languages moving from suffixing to prefixing or the reverse?

The study is also theoretically significant as the analysis is couched within the OT framework. The use of OT not only modernises the approach taken, but also allows for a unified description of data that has otherwise been dealt with fragmentally or peripherally in other studies.

1.6. Structure of Dissertation

The rest of this dissertation is structured as follows:

CHAPTER 2 provides a literature review, which surveys descriptive and theoretical studies and situates the current research within a larger body of work.

CHAPTER 3 provides background information on siSwati a general overview of siSwati phonology and morphosyntax. This is essential in the discussion of the morpho-phonological asymmetries in siSwati and other Bantu languages' nominal and verbal constructions in relation to minimality effects in Chapter 5.

CHAPTER 4 discusses the methodological approaches employed in this study.

CHAPTER 5 presents and analyses the repair strategies used by siSwati to maintain PWord minimality requirements. This is followed by a discussion on how these repair strategies compare to those used by other Bantu languages, in order to situate siSwati within its language family and thus contribute, in a small but significant way, to linguistic typology.

CHAPTER 6, the final chapter of the dissertation. It provides concluding remarks and some suggestions for further studies.

1.7. Envisioned empirical and theoretical contributions

The empirical value of this study lies in the fact that no work has been done on specific word minimality requirements in siSwati. As mentioned earlier, scant descriptions exist upon which this

study builds on. This is the first comprehensive and extensive study to describe and theorise the minimality effects of siSwati.

Secondly, this dissertation underscores the centrality of the syllable in siSwati phonology and that of much other related Bantu languages. It demonstrates that the prosody of siSwati wordhood is defined by the number of syllables in the word.

Thirdly, also in terms of empirical scope, this study compares siSwati to numerous other Bantu languages in specific domains in terms of dealing with subminimal formations. By linking the main analysis to those of similar phenomena in other Bantu languages, this study paints a picture of general tendencies of these languages, thus contributing to Southern Bantu linguistics typology. The results of the study are compared to those of other Bantu languages in an effort to situate siSwati within the Bantu family thus contributing, in a small but significant manner, to Bantu linguistic typology and further speculate the direction of change that exists among these Nguni languages in terms of markedness.

Lastly, in terms of theoretical framework, this study is embedded within Optimality Theory (OT) as compared to previous descriptive studies. The use of OT not only modernises the approach taken, but also allows for a unified description of data that has otherwise been dealt with fragmentally and peripherally in other previous studies.

1.8. Summary of Chapter

This chapter presented important background information relevant to understanding the origins, objectives and importance of this dissertation. The following chapter presents a review of existing literature relevant to the current research.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

Many languages have minimal prosodic restrictions on the size of well-formed words. Bloom (1933:244) posits that content words or phonological words such as nouns, verbs, adjectives, etc. are often subject to such restriction in the world's languages, while non-content words, also called function words or grammatical words, such as prepositions, articles, conjunctions, complementizers, etc., are not easily subject to the restrictions. This chapter presents a survey of pre-existing literature on prosodic word minimality. It starts by presenting existing literature on minimality effects in general to existing work on minimality in Bantu languages and lasty it looks at the local context which is the existing grammatical work on siSwati.

2.2. Minimal Word Effects in General

McCarthy and Prince (1986) have noted that many languages place a two-mora bound on the minimum size of major- category words. They have based their observation on the hypothesis that a prosodic word must contain a foot, and that the foot is normally two moras. According to the theory of moraic phonology, a short vowel is considered to be monomoraic, a long vowel is bimoraic, and a coda consonant is moraic or not, depending on the language. In this essence, the two moras of minimally bimoraic monosyllables can come from a long vowel, a bimoraic diphthongal vowel, or a monomoraic vowel plus a coda consonant which is moraic (Park, 1997). Thus, the minimal size of a word is determined not by the number of segments of a form, but by the number of moras or syllables.

English has one of the mostly known minimal size restriction on its content words. Golston (1991), for example, notes that, as a consequence of this requirement, English does not allow content words with fewer than two moras. The bimoraic minimal size requirement does not apply, however, to

function words like the articles *a* and *the*. Engish content words cannot be monomoraic as shown below in in (50 through 55), (Park 1997).

38. [ɪ] 'eye'

39. [kə] 'cat'

40. [strɪ] 'steady'

41. [bə] 'but'

42. [dʊ] 'do'

43. [strə] 'star'

Likewise, Diyari, an Austrian language exhibite a similar phenomenon. In this language, however, bisyllabicity instead of bimoraicity is operative for minimal words. Austin (1981) and McCarthy and Prince (1986) posit that all phonological and grammatical words in this language are bisyllabic, except for the particle *ya* which transcribes to 'all'. This is a similar phenomenon in siSwati as the language exhibits bisyllabicity as opposed to bimoraicity, which is discussed in chapter 5 of this dissertation.

In the world's languages, there numerous diverse strategies that prevent words from being less than the minimum size. The role of these strategies is to keep a form at least the same as or longer than bimoraic or bisyllabic. It has also been established that the minimal word requirement may cause augmentation, block size-reduction rules, and trigger exceptional phonological change (Downing and Kadenge, 2015).

Minimal word effects are a real and widespread phenomenon cross-linguistically. The two common ways of keeping words minimally bisyllabic or bimoraic are rule blocking and augmentation (Park 1997).

Cross-linguistically, it is not uncommon for rules of vowel deletion to be blocked if the output would be monomoraic or monosyllabic (Park, 1997: 11). Such cases provide evidence for the role of the minimal word. In other words, the potential vowel loss (aphesis, syncope, apocope) or the truncation of moraic or syllabic elements can be blocked if the result would be a monosyllabic (or monomoraic) word, that is, less than a bisyllabic or bimoraic minimum (Park, 1997:12). The two cases of deletion rules from Estonian and Lardil, illustrate blockage due to minimal word effects. Consider the following examples below in (56) through (61).

44.	[tænav_]	[tænava]	'street'
45.	[kon:n_]	[konna]	'frog'
46.	[mat:s_]	[matsi]	'lout'
47.	[kana] *kan_	[kana]	'hen'
48.	koi: *ko_	[koi]	'clothes-mouth'
49.	maa: *ma_	[maa]	'country'

According to Prince (1980), this apocope does not affect forms with two moras, either one syllable or two syllables, as shown in (59) through (61). The blockage of apocope in the forms with two light syllables or one heavy syllable should be understood as observing a bimoraic minimality condition for Estonian words, (Prince, 1980).

Wilkinson (1988) also mentions Lardil, the Australian language, which actively enforces a minimal word size requirement of two moras. Final vowels of Lardil words are normally truncated unless the word contains two moras, in which case truncation fails to apply. The lack of truncation in such words is comprehensible if a bimoraic word minimum is operative.

The truncation rule in Lardil, an Australian language, applies to words of three or more moras as shown in (50 through 54 below.

50. [mayara-n] [mayar_] 'rainbow'

51. [karikari-n] [karikar_] 'butter-fish'

52. [murkunima-n] [murkuni_] 'fighting stick'

53. [mela-n] [mela] 'sea'

54. [ŋawu-n] [ŋawa] 'wife'

The non-application of truncation to the uninflected forms in (53) is an indication of minimality word effect since truncation would result in the word that ius less than two moras. The example in (54) shows that the root-final underlying vowel /u/ undergoes the truncation, but by the repair strategy of augmentation, which is discussed more in the next subsection, /a/ is inserted in order not to yield an undersized form.

Another technique used to meet the minimum size requirement that a language may impose on its phonological words is to make a form the same as or longer than the required size by adding moraic or syllabic elements. Epenthesis is one of the common methods to expand a form. According to Park (1997:12), the term 'augmentation' is used in a broad sense which includes vowel lengthening, prothesis, epenthesis, and paragoge. Consonant gemination and glide vocalization also can contribute to the augmentation of the moraic or syllabic size of a form by reassociating moraic or syllabic elements.

According to Ito (1986, 1989, 1990) and Broselow (1982), the epenthesis of a vowel often means the insertion of a mora to the right or left of an unsyllabifiable consonant. Broselow (1982) further proposes three types of epenthesis: segmentally-conditioned, syllabically-conditioned, and

metrically-conditioned. Segmentally- conditioned epenthesis is motivated by the need to break up a disallowable juxtaposition of segments; syllabically-conditioned epenthesis syllabifies syllable onsets and codas in such a way as to be acceptable in the language; metrically-conditioned epenthesis takes place when the epenthesis adds a mora or a syllable, yielding a foot to carry a stress or a tone, or to undergo other morphological processes. The epenthesis which is to be discussed in this section is this last type of epenthesis. It is this type of epenthesis which we see in Lardil.

In Lardil, words containing one underlying mora must be augmented by epenthesis so that they surface with two moras. Augmentation consists of vowel epenthesis at the end of monomoraic nominal and verbal bases. Consider the following examples from (66) through (68) below adapted from Park (1997:15).

55.	[peer]	[peer]	[peer-in]	'tree species'
56.	[wik]	[wik<u>a</u>]	[wik-in]	'shade'
57.	[pet]	[pet<u>a</u>]	[pet-uɽ]	'to bite'

While bimoraic base (left hand side above), of either one or two syllables, remain unchanged in nominative formation (middle) in (55), the monomoraic nominal base in (56) and monomoraic verbal base in (57) are augmented to two moras in order to guarantee well-formed bimoraic minimal words.

Prothesis is used to produce prosodically bisyllabic or bimoraic minimal words is evident in Choctaw, Iraqi Arabic, and Mohawk. According to (Lombardi & McCarthy 1991), Choctaw has two types of VCV verb stems. Normal stems in the forms of 'for infinitive' retain the initial vowel

found in the infinitive forms, as shown in (58 through 60), whereas abnormal forms lose the vowel in the same structure, as shown in (61) through (64) below.

	Infinitive	**For-Infinitive**	
58.	[ani]	[ish-ani]	'for you to fill'
59.	[ona]	[ish-ona]	'for you to arrive there'
60.	[ishi]	[ish-ishi]	'for you to fill'
61.	[abi]	[ish-bi]	'for you to kill'
62.	[ala]	[ish-la]	'for you to arrive here'
63.	[amo]	[ish-mo]	'for you to gather a crop'
64.	[apa]	[ish-pa]	'for you to eat'

The best way to explain this vowel elision is that the data in (58) to (60) have underlying initial vowels, but those in (61) to (64) do not have initial vowels underlyingly. The question then arises on the motivation for the common initial vowel /a/ of the infinitive in (58) to (60). The answer is that the underlying stems are monomoraic CV, but the minimal word of Choctaw should have at least two moras. The forms in the second column meet the requirement because of the prefix

[ish-], but those in the first column need a moraic element. The vowel /a/ is provided in order that the word does not surface as an undersized monomoraic form.

According to Broselow (1982), Iraqi Arabic initial epenthesis (prothesis) is optional for bimoraic or longer words but is obligatory when the underlying form is monomoraic with a non-moraic word-final consonant. This is demonstrated in the examples below in (65) through (66).

Base Prothesis

65.	[druus]	[?idruus]	‘lessons’
66.	*drus	[?idrus]	‘study’

Moreover, Mohawk depicts an epenthesis phenomenon similar to the two languages above (Michelson 1981, Broselow 1982). Consider the following examples in (67) through (71) below adapted from Park (1997:17).

	Underlying Form	**Derived Form**	
67.	/k-ek-s/	[í:keks]	‘I eat’
68.	/k-tat-s/	[í:ktats]	‘I offer’
69.	/hs-ya:?k-s/	[í:hs-ya:?ks]	‘you are cutting’
70.	/k-ohkwat-s/	[kóhkwats]	‘I am digging’
71.	/te-k-ashvtho-s/	[tekashvthos]	‘I am crying’

The words in (70) through (71), however, do not require epenthetic material because they already have two or more syllables underlyingly. The augmentation in the examples in (67) through (69) show that Mohawk verbal structure is enforced by the bisyllabic minimal word requirement.

Another type of augmentation used to meet a minimal word requirement is vowel lengthening. In Bengali, an Indo-Aryan language, words should be minimally bimoraic, either bisyllabic with two light syllables or monosyllabic with one heavy syllable. Coda consonants are not moraic, but diphthongs (spelled with a vowel plus /w/ or /y/) are bimoraic. In fulfillment of this requirement,

the language adopts vowel lengthening and the blocking of vowel elision. According to Cole (1990), Bengali does not have phonemic vowel length, but there are some cases where vowels phonetically lengthen. One of the cases is in monomoraic words. When these words occur independently, the vowels always lengthen phonetically as shown in (72) through (75) below.

72. /ca/ → [ca:] 'tea'

73. /nɔt/ → [nɔ:t] 'dancer'

74. /rag/ → [ra:g] 'anger'

75. /din/ → [di:n] 'day'

Vowel lengthening in these words adds one mora to the monomoraic syllables in order to make them bimoraic syllables respectively. Vowel lengthening is not triggered where words have two moras to meet the minimal size requirement of bimoraicity. On the same principle, monomorphemic monomoraic words with diphthongs do not require vowel lengthening, as shown in (76), (Cole, 1990).

76. boy [*bo:y] 'book'

Example (76) shows that since diphthongs carry two moras and words with a diphthong already satisfy the minimal word requirement, they do not need to lengthen their vowels to obtain an additional mora.

According to Davis and Torretta (1997), the nouns of Trukese, a Micronesian language are minimally bimoraic. Trukese, though, has a rule of final mora deletion. In nouns that are underlyingly bimoraic, there are at least two ways to prevent them from surfacing under the minimum size. One of them is to block the application of the final mora deletion rule, and the other is to augment undersized forms by compensatory lengthening. In addition, the typologically

unusual characteristic of initial geminates that Trukese displays are also viewed as contributing a mora to the minimal word (Davis and Torretta, 1997).

Hagberg (1992) who conducted a study on Mayo, an Uto-Aztecan language of northwestern Mexico, suggests that the language exhibits a combination of strategies so that outputs meet a bimoraic minimal word requirement. This language has a phonemic contrast between short and long vowels. Additionally, it can have a sequence of two identical short vowels in a word. This is illustrated in the following examples in (77) through (79);

77. [nátemae] 'ask'

78. [w áate] 'others'

79. [náate] 'begin'

Moraic theory postulates that a short vowel has one mora and a long vowel has two moras in a syllable, and both have only one root node (i.e., one set of features). Double vowels, on the contrary, have two root nodes (i.e., two sets of features) each of which contains one mora. The phenomena of vowel length alternation in independent words and cliticization, and of consonant gemination phrase-finally, are motivated for the bimoraic minimal size requirement in the language (Hagberg, 1992). This study is so essential since such occurrence pattern with some of the repair strategies employed in Bantu languages, hence informing the current study on minimality requirements in siSwati.

Another language that exhibits restrictions on minimal prosodic size in words is Mexican Spanish. Crowhurst (1992) shows that while the Mexican Spanish minimal word is a bimoraic foot consisting of a heavy syllable or two light syllables, the template in the diminutive and augmentative forms is a minimally bisyllabic foot. This shows that a morphological template can be dependent on the minimal word size in a language. According to Crowhurst, the stem preceding

diminutive and augmentative suffixes in Mexican Spanish must contain a form with minimally two syllables. This is illustrated below in (80) through (84).

	Dimunitive	**Augmentative**	**Nominal Base**	
80.	[dinosawr-ito]	[dinosawry-ote]	[dinosawryo]	‘dinosaur’
81.	[koron-ita]	[koron-ota]	[korona]	‘crown’
82.	[tapyes-ita]	[tapyes-ota]	[tapya]	‘mud wall’
83.	[menus-ito]	[menus-ote]	[menu]	‘menu’
84.	[panes-ito]	[panes-ote]	[pan]	‘bread’

In the above examples, when the nominal bases have three or more syllables as in (80) and (81), they drop their final vowel when the diminutive and augmentative suffixes are added. If the base forms are exactly two syllables as in (82) and (83), then they fit the target template with minor change in vowel quality when needed. However, if the base is smaller than the minimal size of two syllables, it must be augmented by mora epenthesis to the end of the base, as shown in (84). Additionally, the minimum forms in (82 to 84) require the default consonant /s/ to be inserted to block vowel hiatus.

The literature above shows that among these languages, there are diverse strategies to keep words over the minimum size. Some of the examples found in these languages, include blocked apocope in Estonian, appendices and blocked truncation in Lardil, vowel lengthening in Bengali, prothesis in Choctaw, Iraqi and Mohawk, epenthesis, cliticization and consonant gemination in Mayo and glide deformation in Mexican Spanish.

The truncation of moraic or syllabic elements is blocked in these languages if the result would be a monosyllabic/monomoraic word; wich is considered subminimal. These studies have informed the research on siSwati minimality requirements, as we have seen that siSwati minimality requirements are placed on the syllable and not the mora. Also, siswati grammar augments subminimal words while augmentation is blocked on well formed disyllabic words. Below I discuss existing literature on minimality effects in different Bantu languages.

2.3. Prosodic word Minimality in Bantu languages

A significant body of word has been developed on minimality effects in different Bantu languages. One of the contentious issues has been the distinction between the PStem and PWord in determining whether various grammars enforce minimality restrictions or not in Bantu languages. Downing (1999, 2001) observes that PStems and PWords are distinct phonological domains, each subject to different constraint application and blocking. Downing distinguishes minimality constraints enforced on the PWord from those used on the PStem, noting the predictability of constraint application if the PWord and PStem are defined as distinct phonological domains, with the PWord immediately dominating the PStem in the Prosodic Hierarchy (PH).

Downing and Kadenge (2015) propose that the stem level, which is phonologically represented as the PStem, is distinguishable from the word level, phonologically represented as the PWord. They present evidence for the asymmetrical relationship between the two phonological domains, noting that vowel harmony, tonal processes, reduplication, vowel hiatus, and word minimality provide evidence for the distinct roles that the two domains play in phonological analysis. Building on their argument on the role of the PH in Bantu, Downing and Kadenge (2020) use word minimality to establish the distinction between the PWord and PStem in phonological analysis, pointing out that the two domains do not trigger the same constraint application.

Firstly, they argue that subminimal PWords are augmented through epenthesising 'morphologically empty material' (p.13). Secondly, they posit that minimality restrictions are enforced on the PWord and not the PStem. They use Zezuru, a ChiShona dialect, to support the argument on the asymmetry between the PWord and PStem in phonological analysis (Downing & Kadenge, 2015).

In this section, the special behavior of several Bantu languages is introduced, as they display both similarities and differences with siSwati, which is the main focus of this dissertation.

Studies into the word minimality requirements of Bantu languages show that these languages tend to prefer minimally disyllabic words (Park, 1997; Downing & Kadenge, 2015). Park (1997) looks at the disyllabic requirements of Swahili, a Bantu language, which employs reduplication in verbs and nouns, and cliticization in verbs in order to augment words to have a minimum of two syllables. When verbs are reduplicated, monosyllabic stems are reduplicated along with an epenthetic [ku], showing a disyllabic minimality requirement as shown in examples (85) through (86) below;

85. inuka → inuka-inuka 'rise up'

86. ku-ja → ku-ja-kuja 'come'

Cliticisation of the emphatic copula /ndi- /occurs to make words minimally disyllabic, as shown in (87) through (88) below.

87. ndi-mi 'it is I'

88. ndi-ye 'it is he/she'

Park (1997) gives a full account of this by means of an Optimality Theory analysis.

Downing and Kadenge (2015) further illustrate how chiZezuru, a dialect of ChiShona, requires words to be minimally disyllabic. This is achieved by means of augmentation and this process of

augmentation is evident in both nouns and verbs. It involves the epenthesis of [i] to add an additional syllable to monosyllabic words. Monosyllabic verbs, for example, when forming the imperative, must be augmented by means of this [i] so as to be minimally disyllabic (Downing and Kadenge, 2015). Consider the following exampples in (89) through (90) below;

89. / –pá / → [i-pá]

‘give IMP’

90. /–dyá/ → [i-dyá]

‘eat IMP’

Futhermore, a similar occurrence is seen with monosyllabic nouns that have a null class prefix (Downing and Kadenge, 2015). This is shown in the following examples in (91) through (92) below;

91. go → i-go ‘wasp’

92. mbwa → i-mbwa ‘dog’

Sesotho, a Bantu language spoken in Lesotho, South Africa and some parts of Zimbabwe, exhibits special behaviour in monosyllabic verbs (McNally, 1990). In the imperative formation, monosyllabic verbs as shown in (93) and (94) require a prothetic vowel /e/ in fulfilment of bimoraicity.

93. ja → [**e**.ja]

‘eat’ ‘eat IMP’

94. nwa → [**e.**nwa] ‘drink IMP’

‘drink’ ‘drink IMP’

The above examples (93) and (94) show that in the formation of the imperative in seSotho monosyllabic verbs, the syllable /e-/ is prefixed to augment that verb in order to make it bimoraic as per the requirements of the language.

Another study that contributes to literature on word minimality comes from Tswana. Zerbian (2002) looks at word minimality in Tswana, a member of the Sotho-Tswana languages spoken in Lesotho, Botswana, South Africa and Zimbabwe. Tswana, like other Bantu languages, shows a limited number of monosyllabic stems. These stems trigger particular segmental rules if they occur in imperative, positive participial tense, reduplication, passive, nouns in class 9 and adjectives in class 9. What is interesting in Tswana is that the segmental material is inserted or retained in connection with monosyllabic stems in a number of unrelated morphological contexts. In the nominal domain, noun class prefixes are retained whereas in the verbal domain, additional vowels are inserted thereby often doubling the quality of the respective subject concord. This is evidence that some Bantu languages put forth various repair strategies for the binary requirement of a Prosodic Word and siSwati is no exception.

Mutonga, Mabugu, Mukaro and Mugari (2018) examined minimality effects in Ndau, a dialect of ChiShona. They demonstrate repair strategies that Ndau uses to avoid subminimality. The data for this study were collected through intuition and verified by other Ndau speakers in Chipinge and Chimanimani districts of Manicaland Province in Zimbabwe. The research situates Morpheme Based Theory within Optimality Theory to examine the different strategies employed in Ndau to ensure that the prosodic word is minimally disyllabic. They established that Ndau speakers use vowel epenthesis in both verbal and nominal constructions as well as cliticisation to ensure that

Ndau words meet the required size of Ndau words, which is basically disyllabic. Their claim is recast within Optimality Theory (OT), which shows that the minimal word condition in Ndau straightforwardly stems from the ranking of relevant constraints in the language. The major contribution of this study is typological as it adds empirical insights on how languages repair strategies to deal with words that are potentially sub-minimal forms. The current study follows the same methodology with that used in Ndau. I also rely on native speaker intuition in formulating data as well as use insights from OT.

Ndau augments monosyllabic nominal words through the [i] epenthesis. In Ndau, disyllabic nouns have the same form with or without the prefix, but monosyllabic words have different forms when they are bare and when they have a prefix. Consider the following examples:

95. / fé / → [ìfé] [ʧìfé]

CL.5- sugarcane

'Sugarcane'

96. / mbwà/ → [ìmbwà] [ʧìmbwà]

CL.9-dog

'dog'

97. /dědě/ → [dědě] [ʧì dědě]

CL.5-baboon

'Baboon'

In a similar way chiZezuru monosyllabic verbs are augmented by means of lengthened [i] in the imperative as dispayed by example (98) through (99) below:

98. ii-ba ‘steal IMP’

99. ii-dya ‘eat IMP’

IKalanga, a dialect of ChiShona spoken mainly in Zimbabwe and Botswana, differs greatly from chiZezuru in terms of minimality requirements, having different requirements for different word categories (Kadenge & Mathangwane, 2017). It therefore presents a very different case. What we oberve here is thatimperative verbs must be minimally disyllabic, and so monosyllabic words in these cases are augmented, much like in chiZezuru, by means of an epenthetic vowel [i] (Kadenge & Mathangwane, 2017). This is demonstrated in the following examples in (100) through (102) below;

100. ijá ‘eat IMP’

101. idwa ‘go out IMP’

102. idá ‘love IMP’

Kadenge and Mathangwane, (2017) establish that pronouns in iKalanga are augmented using a stabilizing (STAB) vowel as shown below in (103) through (104);

103. i-mí

STAB-I

‘I’

104. i-wé

STAB-you

‘you’

On the other hand, unlike chiZezuru but similar to chiKaranga, iKalanga nouns and adjectives can be monosyllabic, and so no augmentation is required (Kadenge and Mathangwane, 2017). Consider the following examples (105) through (106).

105. iKalanga: [go] 'wasp' cf. chiZezuru: [igo] 'wasp' chiKaranga: [go] 'wasp'

106. iKalanga: [psá] 'new' cf. chiZezuru: [itʂá] 'new' chiKaranga: [tʂá] 'new'

Kadenge and Mathangwane (2017) account for this inter-linguistic variation using the co-phonologies theory. That is, the differences between these three dialects arise out of differences in constraint ranking determined by the type of word or morpheme in question.

Mkochi (2017) argues, using Malawian Tonga that analyses of prosodic stems in this language need to occur at the level of the syllable. Malawian Tonga illustrates generational discrepancies with regards to the use of the [i] augment before monomoraic verb stems (Mkochi, 2017). Elderly people tend not to use this augment, instead ensuring that the stem is bimoraic (but monosyllabic) (Mkochi, 2017):

107. –swa → ii-swa 'break IMP' cf. elderly people's speech: [swaa]

108. –ija → ii-ja 'eat IMP' cf. elderly people's speech: [ijaa]

Acording to Mkochi (2017), the minimality requirement of Malawian Tonga is that words are minimally disyllabic, and that monosyllabic stems are sub-minimal, but attain bimoraicity through phonological phrasing. This analysis is empirical, couched in OT, and this phenomenon is accounted for by means of constraint interaction. Downing (2005) takes a more theoretical approach to prosodic minimality.

Downing acknowledges that certain languages require lexical words impose minimality restructions, but not phonologically bound, as previously assumed. The Prosodic Word hierarchy

assumes that each word contains at least one stress Foot, which is made up of either two syllables or two morae (Downing, 2005). However, this works on the assumption that stress is assigned to every PWord, when many Bantu languages that have minimality requirements do not have stress patterns. She points out that minimality is frequently fulfilled morphologically, as opposed to phonologically (Downing, 2005).

Downing (2005) uses a wide variety of Bantu languages to demonstrate her point, showing that there are several strategies in place to fulfil the CANONICAL STEM constraint by augmenting stems to be minimally disyllabic. These strategies include: Phonological epenthesis, as in isiZulu, in which a segment that is phonologically and semantically void is epenthesised as shown below;

109. dla → [ji-ɮa] 'eat IMP'

110. pha → [ji-p^ha] 'give IMP'

Morphological epenthesis, as in siSwati, in which a phonologically-viable morpheme is epenthesised. This morpheme is a type of 'dummy' morpheme (Downing, 2005);

111. pha → [p^ha-ni] 'give IMP'

Existing literature shows that different Bantu languages impose different minimality restrictions. For example, chiZezuru (Doke 1931; Fortune 1980, 1955; Myers 1987; Mudzingwa 2010; Downing and Kadenge 2015) requires minimally disyllabic PWords in all of its word categories while chiKaranga accepts monosyllabic, monomoraic PWords in verbs, nouns and adjectives (Doke 1931; Mudzingwa 2010; Mudzingwa and Kadenge, 2013). SiSwati minimality requirements have not yet been comprehensively examined. This study is useful as it provides a starting point which states that there are some minimality requirements evident in siSwati. Thus, the present study examines how these parameters function in the language, in order to fill the aforementioned

gap. Existing literature that has dealt with minimality reqirements in siSwati in scattered generaliztions is discussed next.

2.4 Previous research on siSwati word minimality

As alluded earlier, this is the first study to comprehensively focus on siSwati word minimality as compared to other studies which made scattered generalization on the existence of minimality in the language.

Herman's (1996) descriptive analysis of the prosodic structure of siSwati formed the main basis of this study. She claims that there are several phonological patterns in SiSwati, a member of the Nguni sub-family of the Bantu family of languages, which point to the existence of some sort of prosodic structure. She describes the phonological patterns and compared them to the prosodic structure of SiSwati with the types of prosodic structures which occur cross-linguistically. She usesmetrical phonology (MP) to analyse the siSwati data.

She observes that the first piece of evidence about prosodic structure in SiSwati comes from word minimality and the shortest word in SiSwati is two syllables long. Moreover, words which might otherwise be monosyllabic, because they consist of a single C-root with a single vowel suffix, have an additional syllable added on which does not appear in words formed from longer roots. The presence of the augmentative syllable in shorter forms indicates that in order to be pronounceable as a word in SiSwati, there must be at least two syllables.

This current study builds on Herman's (1996) Metrical Phonology (MP)-based descriptive study by presenting new data and an original OT analysis of the specific repair strategies used in siSwati to curb subminimality.

Malambe (2006), in her study on palatalization in siSwati, postulates that prosodic minimality conditions application of the passive marker in siSwati. She notes that the size of the prosodic word determines the form that the passive takes. She observes that if the root is monosyllabic, the grammar of the language inserts epenthetic [i] to augment the subminimal root. For minimally well-formed roots, which she postulates that at two or more syllables, augmentation is blocked. Consider the following examples in (112) through (115) sourced from (Malambe, 2006: 7-8):

112. /hámbà/ → [handʒwa] 'go'

113. /sèɓéntà/ → [sètʃʼéntwà] 'work'

114. /ph á/ → [pʰíwá] 'give'

115. /ɮá/ → [ɮíwà] 'eat'

The above examples present the variation of the passive marker in siSwati. In (112) and (113) where the verb root is two syllables or more, the marker is realised as [w], but as [iw] in (114) and (115) where the verbs are subminimal and therefore ill-formed.

Malambe (2006) further argues that subminimality of the verb root triggers augmentation while prosodic well-formedness blocks it. In addition, Downing (1997) adds onto the debate on minimality in siSwati. In her extensive work on Bantu reduplication (See Downing, 1994, 1997, 1998, 2003, 2005) among others, she argues that reduplication in Bantu languages is subject to prosodic constraints on the size of the reduplicant. Downing presents that the reduplicant (RED) only copies only part of the first two syllables, a phonological process that is guided by foot binarity. She proposes a "fixed bisyllabic length" in siSwati guided by foot binarity, a Correspondence Optimality theoretic constraint that forces reduplicants to be minimally and maximally disyllabic (Downing, 2003:3).

Moreover, Downing, (1999) establishes the relationship between the size of the prosodic word (PWord) and augmentation of monosyllabic and onsetless verb stems in siSwati imperatives. She strongly notes that in submininal verbs stems, the siSwati language inserts/-ni/after the verb, while it epenthesises [j] before onsetless verbs to provide an onset for the onsetless syllable. Another observation made is that siSwati is no exception to binarity in that it also enforces disyllabic minimality on its reduplicants.

Downing (1997) demonstrates how morphosyntax conditions the output of a reduplicant in siSwati. She notes that in certain morphological contexts, the RED copies the same second vowel (V2) of the verb stem while in others, it duplicates the default Final Vowel (FV), even when it is absent in the input. She proposes that Inflectional Stems copy the FV, whereas derivational stems duplicate the input vowel and not the default. Consider the following examples from Downing (1997: 27) in (116) and (117).

116. /u-ya-phuphutsa/ → [u-ya-phuphu-phuphutsa]

CL1.2nd. TAM-blow

'you are blowing'

117. /u-ya-lindz-el-a/ → [u-ya-lindza-lindz-el-a]

CL1.OM.2nd Pers.TAM.wait.

'You are waiting for'.

In (116) above, the polysyllabic stems duplicate the input vowel of the inflectional stem by copying the first two syllables as they are, as expected in minimally well-formed verbs. The derivational examples with verbal extension /-el/ in (117), however, copy the default FV [a], even though the input vowels are [e] and [i] respectively. The current study expands this discussion on minimality

by discussing the close link between morphology and phonological analysis. I focus on how different morphosyntactic environments deal with augmentation and rule blocking as governed by the PWord binarity enforced by siSwati. It demonstrates how siSwati selects different augmentation strategies depending on the morphosyntax involved, with nominals using phonological epenthesis while verbs select morphological epenthesis to augment subminimal constructions as depicted by studies conducted by Ziervogel and Mabuza, (1976); Sibanda and Mthembu, (1996). In this regard, the study encompasses a broader context for analysis that these studies did not capture.

Peng (1991) and Kiyomi and Davis (1992) further reveal that there is an interesting affixation of a bisyllabic foot in verb reduplication in siSwati. They suggest that the affix is normally a prefix, but appears as an infix where the base begins with a vowel and is longer than two syllables. Monosyllablic verbs also behave characteristically. According to Kiyomi and Davis (1992), the word initial vowel in a base stem of three or more syllables is extraprosodic, which means that it is invisible and does not undergo reduplication. While vowel-initial verbs take /y/ for an onset, monosyllabic verbs take a whole syllable, /yi/. The monosyllabic word takes a whole syllable because the reduplicative template should be a bisyllabic minimal word. Such observation will be of great importance in this current study on siSwati minimality as we seek to analysethe morphophonological strategies involved in avoiding subminimality in the language.

Most recently, Mkoko (2021) looks at some aspects of siSwati phonology. Her study set out to investigate the language'segmental phonology. The focus was on examining various phonological processes that create contexts that give rise to dispreferred syllable structures in siSwati grammar. The discussion also highlighted how the V-Slot in siSwati can be optimally occupied by a moraic nasal [ṃ] through ranking PEAK as a low-ranking constraint to allow the surface representation of a syllabic nasal. Seeing that siSwati is an agglutinative language, like most Bantu languages,

her study demonstrated how morpheme sequences give rise to a series of dispreferred configurations that potentially violate the siSwati syllable template. Her study informs this dissertation since a similar theoretical approach will be adopted by this study in analysing minimality in siSwati also alluded that there are numerous processes that siSwati employs in avoiding subminimality. She used vowel hiatus, mu-reduction as well as loan word rephonologization as examples.

2.5 The gap

Numerous theoretical and descriptive studies focused on various aspects of siSwati grammar. Zievorgel and Mabuza (1952), Dlamini (1979), Taljaard, Khumalo and Bosch (1991) as well as Sibanda and Mthembu (1996), describe siSwati grammar. Other scholars dealt with various morphophonemic aspect of the language, for example, Downing (1997, 1999) focused on verbal reduplication, Herman (1996) on siSwati prosodic structure. Herman (1996) utilises Metrical Phonological to explain the metrical structure of siSwati and minimality is one of the prosodic structures that are partially accounted for in his brief investigation.

Lee (1999) describes vowel hiatus, Kockaert (1997) looks at vowel harmony, Malambe (2006) focuses on palatalisation and its effects, Harford and Malambe (2015) analyse high vowel elision as well as perfect imbrication Mkoko (2021) looks how various phonological processes eliminate dispreferred phonological structures, as conditioned by the morphological domains in which they occur. Mkoko (2021) uses hiatus resolution patterns, loanword adaptation, /mu/ reduction, and word minimality to present evidence for the siSwati syllable structure and permissible minimal word size. Each of these studies focuses on the phonology of the language as presented within specific domains.

To the best of the current researcher's knowledge, there is as yet no comprehensive analysis of minimality requirements in this language. Thus, the current study aims to fill a gap in research on siSwati phonology, and Southern Bantu languages more generally, by presenting a comprehensive, updated account of the minimality effects in this language. Also, there is no study that has presented a comparative description on the different minimality constraints amongst different Bantu languages, with the aim of identifying and accounting for the direction of change that these Bantu languages are taking. By linking the main analysis to those of similar phenomena in other Bantu languages, this study seeks to paint a picture of general tendencies of these languages, thus contributing to Southern Bantu linguistics typology.

2.6 Summary of Chapter

This chapter presented a review of existing literature, examining theoretical and descriptive studies relevant to Bantu languages more generally, as well as Prosodic word minimality. It started by presenting existing literature Minimal Word Effects in the world's languages to existing work done on Minimality in Bantu languages and lasty it looked at the local context which is grammatical work on siSwati.The following chapter presents background information to siSwati; it details the sociolinguistic classification, consonant and vowel inventories, morphosyntax and syllable structure of the language.

CHAPTER 3: BACKGROUND TO SISWATI

3.1 Introduction

The chapter discusses the morphosyntactic structure of nominals and verbs. The morphosyntax of the language provides the context, which conditions most phonological processes in Bantu. Since siSwati is an agglutinative language (Doke, 1950; Katamba, 1978; Mchombo, 2001), morpheme concatenation yields potential illicit sequences emanating from the combination of morphemes and it creates a fertile context for phonological analysis. This morphosyntactic structure provides a platform to analyse the likelihood of how various dispreferred constructions are repaired within the confines of siSwati grammar restrictions.

3.2 The siSwati sociolinguistic classification

The Constitution of ESwatini proclaims siSwati as one of ESwatini's two official languages, alongside English, and is spoken in ESwatini and some parts of South Africa, specifically the Mpumalanga province. The siSwati spoken in ESwatini has two dialects emanating from the influence of other languages spoken in neighbouring countries, one known as kuyeyeza, largely spoken in the southern part of ESwatini, and another spoken on the Mozambican border, informally known as siShewula, (Malambe, 2006). These two dialects have, to some extent, linguistic influences of the languages spoken in these neighbouring countries. This study focuses on the siSwati spoken in the central part of ESwatini, which is believed to be devoid of major linguistic influences of either Mozambique or South Africa (Ziervogel & Mabuza, 1976; Malambe, 2006).

The classification of Bantu languages, especially within the Niger-Congo language group, has been the focus of diverse research (Guthrie, 1948, 1967; Doke, 1954; Cope, 1971). Tucker-Childs (2003,

p. 32) advocates for grouping African languages based on whether they "share linguistic properties and items which cannot have been borrowed, thereby demonstrating that they have a common 'parent'". SiSwati (S43) is a Nguni language alongside three other mutually intelligible languages, namely: isiXhosa (S41), isiZulu (S42) and isiNdebele (S44) (Guthrie, 1967; Poulos & Msimang, 1998; Creissels, 1999). Typologically, these languages are characterised by, amongst other linguistic features, a system of nominal classes denoting singular and plural nouns marked through affixes (Greenberg, 1963). These noted similarities that siSwati shares with other Nguni languages transcend beyond this language family. Typological similarities exhibited across Bantu languages point to their propensity to select similar phonological repair strategies in phonological analysis, as is discussed in following chapters.

3.2.1 The siSwati vowel system

SiSwati has the canonical five phonemic vowel system attested in many Bantu languages within and across the Nguni language family (See Lee, 1999; Hyman, 2003; Malambe, 2006; Sibanda, 2009; Kadenge, 2011; Simango & Kadenge, 2014). Table 1 below shows the distribution of the siSwati vowels.

Table 1: SiSwati phonemic vowels

	Labial	**Coronal**	**Pharyngeal**
High	[u]	[i]	
Mid	[o]	[e]	
Low			[a]

3.2.2 The siSwati consonant system

The siSwati consonant system comprises of aspirated and unaspirated plosives, implosives, ejectives, fricatives, affricates and clicks. The siSwati simple consonants according to Clements and Hume (1995), are produced with a single constriction in the vocal tract. Similar to vowels, siSwati consonants are categorised under the [LABIAL], [CORONAL], [DORSAL], and [PHARYNGEAL] features. Table 2 below presents the inventory of siSwati simple consonants, as adapted from works by Chen & Malambe (1998: 138) and (Malambe, 2006:37).

Table 2: SiSwati consonants

	Bilabial	Labio-dental	Alveolar	Palatal	Velar	Glottal
Plosives	pʰ b		tʰ d		kʰ g	
Implosives	ɓ				ɠ	
Ejectives	p′		t′	tʃ″	k′	
Nasals	m		n	ɲ	ŋ	
Fricatives		f v	s z	ʃ ʒ		h ɦ
Lateral Fricatives			ɬ ɮ			

Approximants	w		l	j		

3.2.2.1 Orthographic representations of consonant phonemes in siSwati

In this section, I present examples of the orthographic representations of all the simple consonants in siSwati. Orthographic representations are a guide on the letter-to-sound correspondence in the grammar. I group the sounds into natural classes (labials, coronals, dorsals, and pharyngeals) in line with the theoretical framework and analysis of the data presented in the study.

3.2.2.2 Labials

Labials are produced with one or both lips as active articulators. This category includes all bilabials and labiodental segments.

118. [p´] [p´áɠìʃà] pakisha ‘pack’

119. [ph] [pʰéɠà] pheka ‘cook’

120. [bh] [bʰémà] bhema ‘smoke’

121. [ɓ] [ɓuɠà] buka ‘look’

122. [f] [fùnà] funa ‘search’

123. [v] [vùlà] vula ‘open’

124. [m] [milà] mila ‘germinate’

125. [w] [wélà] wela ‘cross’

3.2.2.3 Coronals

Coronal sounds are produced with the front of the tongue as an active articulator. This category includes all alveolar and palatal sounds in siSwati.

126. [th] [tʰándàzà] thandaza ‘pray’

127. [t´] [t´álà] t´ala ‘give birth’

128. [d] [dálà] dala ‘create’

129. [l] [lálà] lala ‘sleep’

130. [ɬ] [ɬálà] hlala ‘sit’

131. [ɮ] [ɮálà] dlala ‘play’

132. [n] [nátsà] natsa ‘drink’

133. [ʃ] [ʃúɓà] shuba ‘take everything’

134. [j] [jálà] yala ‘refuse’

135. [ɲ] [ɲáɲà] nyanya ‘hate/dislike’

3.2.2.4 Dorsals

Dorsals are produced with the body of the tongue as an active articulator. All velar segments are classified as dorsal consonants.

136. [kh] [kh álà] khala ‘cry’

137. [k] [k´álà] kala ‘measure’

138. [g] [gálà] gala ‘prepare to sow’

139. [ŋ] [ŋgénà] ngena ‘enter’

3.2.2.5 Pharyngeals

These consonants are produced in the region of the pharynx and are usually referred to as "gutturals" (Hoberman, 1985; Goldstein, 1994; McCarthy, 1994). The only pharyngeal consonants in siSwati are the glottal fricatives.

140. [h] [húmà] huma 'drag'

141. [ɦ] [ɦúkà] hhuka 'hook up'

3.2.2.6 Dental clicks

The next set of segments we shall consider is that of the siSwati dental clicks.

142. [|] [|ínà] cina 'be strong'

143. [|h] [|hínà] china 'braid'

144. [|g] [|gìbà] gciba 'burry'

145. [ŋ|] [ŋ|òbà] ncoba 'conquer'

146. [ŋ|g] [ŋ|gòlà] ngcola 'get dirty'

Clements and Hume (1995, p. 253) note that simple consonants are characterised by a single root node as represented in the examples below.

147. [p] [t] [k] [h]

[labial] [coronal] [dorsal] [pharyngeal]

Notably, each of the above examples is a representation of the siSwati simple consonants as discussed above. Each illustration consists of a single, non-branching root node, respectively.

The next section discusses the preferred syllable structure in siSwati.

3.2.3 Syllable Structure

Clements and Keyser (1983) note that Type I and II languages consist of open syllables while enforcing a ban on marked structures such as complex clusters and coda specification. Type III and IV languages, on the other hand, allow the existence of closed syllables, with the possibility to contain a sequence of consonants and vowels, as guided by restrictions on the syllable template of individual languages. Based on this classification, Nguni languages fall under the Type II category that prefers open syllables (Khumalo, 1987).

Previous researchers such as Khumalo (1987) and Malambe (2006), amongst others posit that SiSwati favours open syllables, a system that is largely characteristic of most Southern Bantu languages. The representation of various syllable surface forms allowed by languages dictates the application of markedness constraints that conspire to eliminate input marked structures such as vowel sequences and consonant clusters. The phonological processes discussed in this study are therefore motivated by the need for siSwati grammar to enforce conformity to the Type II syllable surface form.

In their crosslinguistic investigation of syllable forms, Clements and Keyser (1983, p. 30) classified languages according to the following syllable types:

148. Type I: CV syllables.

149. Type II: CV, V.

150. Type III: CV, CVC

151. Type IV: CV, V, CVC, VC

Clements and Keyser (1983) posit that Type I and II languages consist of open syllables while enforcing a ban on marked structures such as complex clusters and coda specification. Type III and IV languages, on the other hand, allow the existence of closed syllables, with the possibility to contain a sequence of consonants and vowels, as guided by restrictions on the syllable template of individual languages. Based on this classification, Nguni languages fall under the Type 2 category that prefers open syllables (Khumalo, 1987). In the same vein, I concur with previous researchers such as Khumalo (1987) and Malambe (2006), amongst others, that SiSwati favours open syllables, a system that is largely characteristic of most Southern Bantu languages. The representation of various syllable surface forms allowed by languages dictates the application of markedness constraints that conspire to eliminate input marked structures such as vowel sequences, consonant clusters, and coda specification. The phonological processes discussed in this study are therefore motivated by the need for siSwati grammar to enforce conformity to the Type II syllable surface form.

3.2.3.1 Word initial V

Vowel initial syllables are common in the language. However, these are restricted to the word-initial position, an indication that the language favours onsetful syllables. A [.] between syllables indicates syllable breaks. Consider the examples below:

152. /ulele/ → [u.le.le] - V.CV.CV ‘s/he is sleeping

153. /ikhona/ → [i.k^{h}o.na] - V.CV.CV ‘it is here’

154. /u-ami/ → *[u.a.mi] - VV.CV ‘my’

The examples in (152) and (153) above are perfect examples of permissible V-initial syllables at the word-initial boundary of a siSwati phonological word. However, (154) presents a case where the initial object marker /u/ is followed by a vowel initial possessive marker /-ami/ ‘my’. This consequently yields an illicit VV sequence that falls outside the CV structure permissible in siSwati, therefore calling for the resyllabification of V1 as corresponding glide [w].

3.2.3.2 Basic CV

Most phonological words in siSwati typically consist of open CV syllables. This is the preferred syllable type attested in siSwati and other Bantu languages. Consider the examples in (155) through (157) below depicting CV syllables in nominals and verbals:

155. caphela [|à.phé.là] - CV.CV.CV ‘beware’

156. sihlahla [sí.ɬà.ɬà] - CV.CV.CV ‘tree’

157. lidladla [lí.ɮà.ɮà] - CV.CV.CV ‘traditional kitchen’

3.3 Some aspects of siSwati morphosyntax

This section presents the morphological structures of the siSwati noun and verb as background to the current study. It presents how the various morphosyntactic components of nouns and verbs combine to provide a fertile context for phonological analysis. I begin with the morphological structure of the siSwati noun.

3.3.1 The morphological structure of the siSwati Noun

One characteristic feature of Bantu languages is the classification of noun prefixes marked by singular and plural noun pairings, with odd numbers denoting singular and even numbers denoting plural (Odden, 1995). I adopt the system of siSwati noun classification used in previous siSwati

studies (Sibanda & Mthembu, 1996; Malambe, 2006). In other Bantu languages such as Chichewa (Downing & Mtenje, 2017), isiXhosa (Braver & Bennett, 2016), isiZulu (Poulus & Msimang, 1998), and ChiShona (Mudzingwa & Kadenge, 2014) nouns use a similar classification gleaned from Meinhof (1932). Notably, Chichewa has a total of 18 noun classes while chiShona has 21 classes. Both languages have retained some of the locative and diminutive Proto-Bantu noun classes that are no longer present in siSwati.

Similarly, isiXhosa, which is a sister language to siSwati, has a total of 15 noun classes. In Table 3 below, I present the siSwati noun class system: (Sibanda & Mthembu, 1996, p. 23).

Table 3: SiSwati noun class prefixes

CLASS	**PREFIX**	**EXAMPLE**	**GLOSS**
1	[umu-]	[úmù-ntfú]	'person'
2	[ɓa-]	[ɓá-ntfù]	'people'
1a	-	[gògò]	'granny'
2a	[ɓo-]	[ɓó-gògò]	'grannies'
3	[umu-]	[úmù-t´í]	'homestead'
4	[imi-]	[**í**mi-t´í]	'homesteads'
5	[li-]	[lí-gálà]	'branch'
6	[ema-]	[émaá-gálà]	'branches'
7	[si-]	[sí-ɬàɬà]	'tree'

8	[ti-]	[t´i-ɬàɬà]	‘trees’
9	[iN-]	[íŋ-gùlùɓé]	‘pig’
10	[tiN-]	[t´íŋ-gùlùɓé]	‘pigs’
11	[lu-]	[lú-phó-ndvò]	‘horn’
10	[t´iN-]	[t´ím-phòndvò]	‘horns’
14	[ɓu-]	[ɓú-ɬálù]	‘bead(s)’
15	[ɠu-]	[kú-ɮà]	‘food’

The noun in siSwati consists of a /prefix + stem/ and sometimes, the noun appears with affixes that may appear either before or after the stem as /prefix + stem + affix/. The prefix in each noun class denotes class agreement, a phenomenon that is common in many Bantu languages. Moreover, the siSwati noun can optimally occur with other affixes in morphosyntactic constructions, such as the formation of diminutives and locatives which I discuss in chapter 6. In the formation of diminutives, the noun suffixes the diminutive morpheme /-ana/ to denote a smaller version of that particular noun as demonstrated by the following examples:

158. /úmùntf**ú-à**nà/ → [ú.m̩.**ntfwà.**nà]

CL1.person-Dim ‘child’

159. /lúsúk**ù-à**nà/ → [lú.sú.**kwà.**nà]

CL11.day-Dim ‘short day’

160. /sánɮ**à-à**nà/ → [sá.nɮ**à**.nà]

CL7.hand-Dim ‘small hand’

161. /síɬáɬ**à-à**nà/ → [sí.ɬá.ɬ**à.**nà]

CL7.tree-Dim ‘small tree’

162. /úmùt**í-à**nà/ → [ú.mù.t**à**.nà]

CL3.homestead-Dim ‘small homestead’

163. /úmùlént**é-à**nà/ → [ú.ṃ.lé.nt**à**.nà]

CL3.leg-Dim ‘small leg’

The examples on diminutive formation demonstrate how combining the noun and suffix /-ànà/ yields a sequence of vowels that is not permitted in the language and the strategies used to repair these structures are discussed in detail in chapter 5.

In locative formation, siSwati uses locative morphemes /e-/, /ku-/, /ka-/ and /e…ini/ each denoting a location of the noun under discussion (Ziervogel & Mabuza, 1976; Sibanda & Mthembu, 1996; Malambe, 2006). Of primary importance to this study is the locative morpheme /e...ini/ as it creates a suitable platform for phonological analysis. In the locative surface form, most of the noun prefixes are omitted as demonstrated by the following examples:

164. /é-úmùntf**ú-ínì**/ → [é.ṃ.ntfw**í.**nì]

CL1.person-Loc ‘on/ with the person’

165. /é-lúsùk**ù-í**nì/ → [é.su.**kwí.**nì]

CL11.day-Loc ‘on that day’

166. /é-sánɮ**à-í**nì/ → [é.sa.nɮé.nì]

CL7.hand-Loc ‘on the hand’

167. /é-síɬàɬ**à-í**nì/ → [é.sí.ɬà.ɬé**.**nì]

CL7.tree-Loc ‘on the tree’

168. /é-úmù**t-í**nì/ → [e.ṃ.t**í**.nì]

CL3.homestead-Loc ‘at the homestead’

169. /é-úmùlént**è-í**nì/ → [é.ṃ.lé.nt**è**.nì]

CL3.leg-Loc ‘on the leg’

Similar to the diminutive formation, the sequence of the noun and locative morpheme yields a sequence of vowels that siSwati grammar blocks. These dispreferred sequences are resolved through deletion, secondary articulation, or coalescence. For instance, the bolded sequence in (164) is resolved though secondary articulation, while (166) is resolved through coalescence. This attests to the argument that the phonological environment determines the repair strategy that the language selects.

The rationale for including diminutive and locative formation in the current discussion is to demonstrate how siSwati grammar eliminates illicit underlying VV sequences emanating from concatenated morphemes, thus ensuring that output vowel forms are monophthongal. In the study, I explore the phonological processes that occur to ensure that output syllable structures conform to the V and CV syllable restrictions in the language. A formal analysis is discussed in detail in Chapter 5. Following, I consider the morphological structure of the verb in siSwati.

3.3.2 The morphological structure of the siSwati verb

Bantu languages have a rich verbal morphology that is largely agglutinative, with the verb having the propensity to be segmented into a series of ordered and structured morphemes, and siSwati being no exception.

According to Kula (2002), Bantu verb consists of tense, aspect and mood (TAM) slots, negation, subject and object markers, derivational and inflectional suffixes. The last slot in the verb is filled by the final vowel (FV) which conspires to ensure that all syllables are open. The default FV is usually [a] but varies depending on TAM. Kula (2002) stipulates that these verbal elements cannot, however, co-occur.

Typical of the Bantu verb, the siSwati verb consists of the verb stem to which various prefixal and suffixal morphemes are added. In my analysis, I adopt the Inflectional Stem (henceforth INFL Stem) hypothesis that is used to represent the Bantu verb (See Kula, 2002; Mudzingwa, 2010; Mudzingwa & Kadenge, 2014; Downing & Mtenje, 2017) inter alia. These Bantuists present a hierarchical representation of the Bantu verb consisting of the Inflectional Stem (henceforth INFL Stem), Macro Stem (MStem) and the Inflected verb stem, each of which encompasses various elements of the verb. The INFL Stem is argued to consist of any derivational prefixes preceding the object marker (OM), while the MStem consists of the OM and other derivational markers up to and including the inflected verb stem, which is also part of the MStem. The inflected verb stem (IVS) comprises the verb root, verb extensions, and the final vowel.

According to Downing and Mtenje (2017, p. 19), the verb stem is the verb root "optionally followed by one or more derivational suffixes, which are then obligatorily followed by the final vowel". The verb root, on the other hand, is the bare stem of the verb with no derivative material

attached to it. Motivation for the verb constituent in Bantu is that the different aspects within the verb are domains for various phonological and morphological processes such as hiatus resolution, vowel harmony, tone patterning, reduplication among others (Downing & Mtenje, 2017).

Furthermore, siSwati verb roots are canonically CVC, with a limited set of monosyllabic and polysyllabic roots. Consider some of the verb roots found in siSwati presented below:

3.3.2.1 Monosyllabic (C-) verb roots

170. /f-a/ [fá] ‘die’

171. /ph-a/ [ph á] ‘give’

172. /v-a/ [và] ‘hear’

173. /ɮ-a/ [ɮá] ‘eat’

174. /w-a/ [wá] ‘fall’

175. /j-a/ [já] ‘go’

176. /t´-a/ [t´á] ‘come’

177. /lw-a/ [lw á] ‘fight’

178. /n-a/ [ná] ‘rain’

179. /ʃ-a/ [ʃá] ‘burn’

180. /ʃ-o/ [ʃò] ‘say’

The monosyllabic verb stems represented above characteristically appear with other morphemes since the siSwati grammar enforces a prohibition on monosyllabic prosodic words. This minimality restriction on the prosodic word is discussed in detail in Chapter 5 of the dissertation.

3.3.2.2 Disyllabic (CVC-) roots

181. /vum-a/ [vú.mà] 'agree'

182. /tsel-a/ [tsé.là] 'pour'

183. /tj´el-a/ [tʃ´e.là] 'tell'

184. /gez-a/ [gé.zà] 'bath'

185. /pheʤ-a/ [p^{h}é.ʤà] 'cook'

3.3.2.3 Roots longer than CVC-

186. /ɬoniph-a/ [ɬò.ní.p^{h} à] 'respect'

187. /giɓel-a/ [gí.ɓé.là] 'climb'

188. /huʃul-a/ [hú.ʃú.là] 'pour everything out'

189. /ɓukel-a/ [ɓú.ké.là] 'watch'

190. /ɓuket´-a/ [ɓú.ké.t´à] 'review/revise'

191. /ʃumajel-a/ [ʃú.mà.jé.là] 'preach'

192. /ɬukuɓet-a/ [ɬù.kù.ɓé.t´à] 'illtreat'

193. /guguɓul-a/ [gù.gù.ɓú.là] 'unearth'

194. /phakamis-a/ [ph á.ká.mí.sà] 'lift'

SiSwati has a limited set of vowel initial verb stems, as illustrated below:

3.3.2.4 Vowel initial verb stems

195. /akh-a/ [á.khà] ‘build’

196. /os-a/ [ó.sà] ‘roast’

197. /ong-a [ó.ŋgà] ‘save’

198. /oph-a/ [ó.phà] ‘bleed’

199. /om-a/ [ò.mà] ‘be dry/thirsty’

200. /on-a/ [ó.nà] ‘sin’

201. /at´-i/ [á.t´ì] ‘know’

202. /ats-i/ [á.tsì] ‘say’

203. /eɓ-a/ [é.ɓà] ‘steal’

204. /endz-a/ [é.ndzà] ‘marry’

205. /elus-a/ [é.lú.sà] ‘herd’

206. /ewel-a/ [é.wé.là] ‘cross’

207. /ent-a/ [é.ntà] ‘do’

3.3.2.5 SiSwati Subject Concords

Like many Bantu languages, siSwati uses subject markers to denote the entity being referred to. The subject marker (hereafter SM) obligatorily occurs with all verb forms except in infinitives and imperatives. As indicated previously, these markers fall under the INFL Stem and must precede

the MStem. Table 4 presents SMs for all noun classes in siSwati are presented in Table 4 below (Sibanda & Mthembu, 1996, p. 86)

Table 4: SiSwati Object Concords

Classes	Object concord	Example
1	-mu-	Ngiya-m-tsandza umuntfu 'I like a person'
2	-ba-	Ngiya-ba-tsandza bantfu 'I like people'
3	-wu-	Ngiya-wu-tsandza umuti 'I like a homestead'
4	-yi-	Ngiya-yi-tsandza imiti 'I like homesteads'
5	-li-	Ngiya-li-tsandza likhekhe 'I like a cake'
6	-wa-	Ngiya-wa-tsandza emakhekhe 'I like cakes'
7	-si-	Ngiya-si-tsandza sinkhwa 'I like bread'
8	-ti-	Ngiya-ti-tsandza tinkhwa 'I like slices of bread'
9	-yi-	Ngiya-yi-tsandza inkomishi' 'I like a cup'
10	-ti-	Ngiya-ti-tsandza tinkomishi 'I like cups'
11	-lu-	Ngiya-lu-tsandza luphondvo 'I like a horn'
12	-ti-	Ngiya-ti-tsandza timphondvo 'I like horns'
14	-bu	Ngiya-bu-tsandza buhlalu 'I like beads'
15	-ku	Ngiya-ku-tsandza kudla 'I like food'

3.4 Summary of Chapter

The chapter presented background information to siSwati; it details the sociolinguistic classification. It also presented the morphosyntactic structure of nominals and verbs, highlighting the various components in each grammatical category. These components play crucial roles as domains for the selection of varied repair strategies in phonological processes in the language which is discussed in chapter 5. In the next chapter, I discuss the methodology adopted by the dissertation. The chapter presents sources of data and the theoretical framework adopted for this study.

CHAPTER 4: METHODOLOGY

4.1. Introduction

This chapter presents sources of data and the theoretical framework adopted for this study. It further discusses the origins as well as tenets of the two theories that are employed in the analysis presented in Chapter 5.

4.2. Sources of Data

The primary source of data in this research is intuition since the researchers is a native speaker of siSwati. Intuition is the data gathering method that is used widely in generative grammar studies (Haegeman, 1991). This introspective approach where a writer, as in the present case uses oneself as an informant in the accumulation of data is what Newmeyer (1986:23) viewed as "the typical practice of generativists has been to use themselves as informants in collecting data about the acceptability and interpretation of grammatical constructions".

Data is further be obtained from studies relevant to the current research such as, but not limited to Herman (1996); Downing (1995, 1999); Lee (1999); Malambe (2006); Harford and Malambe (2015). Furthermore, material also comes from siSwati descriptive grammars (Zievorgel & Mabuza, 1952; Dlamini, 1979; Taljaard, Khumalo& Bosch ,1991; Sibanda & Mthembu, 1996; Kiyomi and Davis ,1992; Park ,1996; Chen, Su-I & Malambe ,1995; Downing and Kadenge ,2015; Mkochi, 2017; Kadenge and Mathangwane,2017; Mudzingwa and Kadenge, 2013; Mkoko,2021) among others. Together with native speaker intuition, these studies present a fertile source of information for this study.

4.3 Theoretical Framework

The study employs analytical insights drawn from Optimality Theory (Prince & Smolensky, 1993). Optimality Theory is used to account for the repair strategies of siSwati in this dissertation and the

interface between various morphosyntactic domains for prosodic well-formedness and word size binarity in siSwati.

4.3.1. Optimality Theory

Introduced in April of 1991 by Alan Prince and Paul Smolensky at the University of Arizona Phonology conference, Optimality Theory (OT) has rapidly become the preferred theoretical framework in the linguistic sub-discipline of phonology (Archangeli, 1997). The constraint-based theory revolutionised previous theories of Generative Grammar, and allows linguists to account for both intra- and inter-linguistic nuances by means of a constraint hierarchy.

OT is anchored in three main principles: firstly, constraints are universal and violable, but violation is minimal; secondly, constraints are ranked on a language-particular basis; and thirdly, the constraint hierarchy evaluates a set of candidate analyses that are admitted by verygeneral considerations of structural well-formedness (Park 1997; Kager, 1999; Prince and Smolensky, 2004). In OT terms, surface forms reflect resolutions of conflicts between competing constraints.

Thus, the grammars of specific languages are language-particular rankings of universal constraints (Kager, 1999; Prince and Smolensky, 2004). Two types of constraints are recognised in OT: faithfulness constraints and markedness constraints. Faithfulness constraints require that outputs preserve properties of their input forms; demanding some matching between the output and its input. Markedness constraints require output forms to meet some criterion of structural well-formedness (Kager, 1999). Thus, epenthetic and deletion processes violate faithfulness constraints while marked structures such as monosyllabic words, consonant clusters and onsetless syllables violate markedness constraints.

It is worth mentioning that each language has a unique ranking of constraints, which determines which constraints are allowed to be violated and which violations are fatal. This difference in

constraint ranking gives rise to cross-linguistic differences (Prince and Smolensky, 2004). Therefore, constraints do not function as binaries, but rather the notion of dominance is so important. Highly ranked constraints dominate those that are less highly ranked. Dominance is indicated by means of '>>', with the constraints to the left of the arrows dominating those to the right. Violations of high-ranking constraints are said to be fatal, or absolutely disallowed. Low-ranking constraints, on the other hand, can be legally violated.

According to Kager (1999), the functioning of an OT analysis can be summed up by three processes or stages namely: Lexicon, Generator, and Evaluator. The Lexicon refers to the input form that is ungoverned by constraints. The Generator acts to produce a number of possible output candidates by satisfying and/or violating a number of different combinations of constraints. Lastly, the Evaluator acts to determine that incurs the least fatal violation(s) which is called the Optimal Candidate.

An OT analysis is illustrated by means of a tableau, with the relevant constraints in the columns, and the possible output candidates indicated in the rows, often between square brackets. The input form is indicated between slash brackets in the top left cell of the tableau, with the relevant morphemes separated by means of a hyphen. Constraint violations are indicated by an asterisk (*), and those that are fatal violations are accompanied by an exclamation mark (!). The optimal candidate is the output candidate that incurs the least fatal violation(s) and is indicated with a pointer icon (☞). Solid lines are indicative of dominance, while dotted lines indicate that those constraints have the same ranking. In this study, each candidate is numbered for ease of reference. Tableau 1 provides an exemplar for the layout of a conventional OT tableau.

Tableau 1: Optimality Theory Exemplar

/ɪn-pʊt/	CONSTRAINT 1	CONSTRAINT 2	CONSTRAINT 3
a. [candidate a]	*!		
b. [candidate b]		*!	
c. ☞ [candidate c]			*

OT is best suited to handle the phonological conspiracies of the different repair strategies employed by siSwati in avoiding subminimality in the language as well as analysing the phonological asymmetries between nominal and verbal constructions in the siSwati language. Also, it is best suitable for the speculation of the direction of change among these languages in terms of markedness as it is a constraint-based theory.

The concatenation of morphemes in agglutinative languages, such as Bantu languages; siSwati in our case, usually gives rise to potentially impermissible surface forms that violate the syllabic requirements of individual grammars. Kisseberth (1970) and Kiparsky (1976) proposes that, the premise on which phonological conspiracies centre is the propensity for languages to eliminate illicit structures with the ultimate goal of attaining phonologically well-formed structures. In this study, I use Optimality Theory (Prince & Smolensky, 1993/2004), to account for the explanation on the adjustments of these conspiracies.

OT provides a useful tool to analyse repair strategies as it allows one to account for the use of one strategy over another as an effort to satisfy high-ranking constraints. An OT analysis adds another dimension to a descriptive analysis, thereby formalising it. We have seen numerous studies in

siSwati descriptive grammars (Zievorgel & Mabuza, 1952; Dlamini, 1979; Taljaard, Khumalo & Bosch, 1991; Sibanda & Mthembu, 1996; Kiyomi &Davis, 1992). This study employs OT as an analysis tool. This, by extension, allows a researcher to fulfil the goal of the linguist: to describe patterns in terms of rules that can be applied beyond the data presented. Some studies within the siSwati language utilized a similar OT approach which include Malambe (2006), Harford and Malambe (2015), Mkoko (2021), among others.

4.4 Summary of Chapter

This chapter has presented the methodology behind data collection and analysis that has been employed in this study. The sources of data have been explained, and the history and tenets of the two theories that act as a tool of analysis have been discussed. The following chapter presents the analysis.

CHAPTER 5: REPAIR STRATEGIES IN SISWATI PWORDS

5.1. Introduction

In this chapter, I examine several phonological phenomena within an Optimality Theoretical framework. In this section, I do not give a detailed discussion of OT as this provided in the classical work of Prince and Smolensky (1993), as well as the introductions by Archangeli and Langendoen, (1997), Kager, (1999) and McCarthy, (2002).

Prosodic Word minimality is vital in illustrating the processes at work at syllable level. This is achieved by illustrating how these syllables come together to create acceptable words. The analysis is this phenomenon at syllable level is principally valuable in the phonological study of siSwati as twhe syllable is domain of application for varied phonological processes (Mkoko, 2021).

On the subject of word minimality, the requirements relate directly to the syllable, dictating how many syllables must constitute a well-formed word. Languages exhibit constraints on the size of prosodic words, and these constraints require lexical categories to be able to meet certain minimal length requirements in the sense that words should be either bimoraic or disyllabic, depending on the prosodic typology of the language. As mentioned earlier, the minimal PWord in siSwatiis disyllabic. I demonstrate that the minimal word in siSwati triggers processes which expand potentially sub-minimal words and blocks processes which threaten to reduce a word to sub-minimality.

I further demonstrate that siSwati is typologically similar to languages where all monosyllabic PWords are subminimal constructions prohibited in the grammar. In my discussion, I display that subminimal constructions in siSwati are morphologically and sometimes phonologically augmented through the insertion of ‘morphologically empty segments’ (cf. Downing & Kadenge, 2015; 2020).

Typological variation shows that constraints can be reranked within one and the same language. The minimality effects are explained by invoking the markedness constraint that has been used to account for minimality effects in many languages of the world (Park, 1997; Kager ,1999; Prince and Smolensky, 2004), namely, MIN-W_D. Prosodic words are minimally disyllabic (Park 1997, p151), which implies that, in languages with minimality requirements, the M_{IN}-W_D constraint is high ranking and sometimes inviolable.

5.2. Minimality effects in siSwati Verbs

In this section, I discuss the various contexts where disyllabic word minimality effects are at play in siSwati Verbs. Under this header, I discuss each of these in detail, by exploring the imperative, infinitive, passive, and the reduplication template to illustrate the repair strategies that are employed in curbing subminimal surface representations in siSwati due to Minimality requirement in the grammar of the language.

5.2.1. The Imperative in siSwati

Scholars of word minimality often study imperatives, as the creation of imperative verb forms in Bantu languages frequently involves merely the use of the stem itself, with no affixes or inflections (see, for example, Downing &Kadenge, 2015). SiSwati is no exception, as imperatives provide sufficient morphosyntactic context for the minimality effects on the PWord in siSwati. Imperatives are the bare form of the verb that consists of the verb root (VR) and the final vowel (FV), with no prefixal or suffixal morphemes attached to it (Downing, 1999; 2001; Kula, 2002; Mudzingwa, 2008; Downing & Kadenge, 2015, 2020; Kadenge & Mathangwane, 2017; Mkoko, 2021). This study demonstrates that siSwati verbs that are more than one syllable long are well-formed, hence no augmentation is required. However, if the verb is monosyllabic, the grammar triggers

morphological augmentation to satisfy the minimum requirement on the PWord sizeas; demonstrated in Table 5 below;

Table 5: SiSwati Imperatives – Polysyllabic Verb Stems

Verb	**Gloss**	**Imperative**
Bona	see	[ɓó.nà]
Vala	close	[vá.là]
Pheka	cook	[pʰé.ɠà]
Hlala	sit	[ɬá.là]
hleka	laugh	[ɬé.ɠà]
hlonipha	respect	[ɬó.ní.pʰà]
shayela	drive	[ʃá.jé.là]
nyatsela	step on	[ɲá.tsé.là]
hlanganyela	meet with	[ɬá.ŋá.ɲé.là]
shumayela	preach	[ʃú.má.jé.là]
phakamisa	lift	[pʰá.ɠă.mí.sà]

Table 5 above illustrates that the imperative form of the verb in siSwati is identical to the original stem. Note that all of the verbs in the above table are polysyllabic (two, three and four syllables) already at the level of the stem, and are therefore polysyllabic in the imperative, and so they do not trigger augmentation since they are well-formed, that is, minimally disyllabic. However, the case is slightly different when the verbs in question are monosyllabic, as displayed by the following table:

Table 6: siSwati Imperatives – Monosyllabic Verb Stems

Verb	**Gloss**	**Imperative**
pha	give	[pʰ á-**nì**]
sha	burn	[ʃ á-**nì**]
Ya	Go	[já-**nì**]
Fa	die	[f á-**nì**]
dla	eat	[ɮá-**nì]**
Va	hear	[vá-**nì**]
Ma	wait	**[**má-**nì]**

Table 6 shows that monosyllabic verbs require augmentation through the epenthesis of [-ni], a morphologically empty morpheme (Downing & Kadenge, 2015; 2020], serving as a phonological augmentation function which is to satisfy siSwati's disyllabic requirement. It is important to clarify and distinguish the nature of this suffixal material for minimality and the form that is used to mark plurality in multisyllabic forms as show in examples (208) through (209).

208. [ɬá.là-ni] 'play!'

209. [pʰá-ní-nì] 'give!'

For instance, [ɬá.là-ni] 'play!' in (208) is the plural form of the imperative. The [-ni] here is not serving a phonological role. The monosyllabic imperatives, on the other hand, take both morphemes: the augmentative [-ni] and the imperative plural marker [-ni] to indicate plurality. The plural form of 'give' in (209) for example, would be [pʰá-ní-nì] where the first [-ni] is inserted for phonogical minimality reasons and the second [-ni] plays the morphosyntactic role of marking plurality. The fact that the second [-ni] is required shows that it plays the role of an enclitic, which

falls outside of the Prosodic Word domain. It suffixes a form that is phonologically adequate, that is, a form that is minimaly disyllabic.

Infinitive forms in siSwati provide a conducive context for demonstrating and explaining minimality effect in this language. The infinitive in siSwati is formed using the infinitive marker /kú-/; which is prefixed to verb stems. Consider the following examples in (210) through (214) shown below;

210. /kú-mà/ → [kú.mà] *kuma-**ni**

INF-stand

'to stand'

211. / kú -já/ → [kú.já] * kuja-**nì**]

INF-eat

'to go'

212. / kú -ʃá / → [kú.ʃá] * kuʃa-**nì**]

INF-burn

'to burn'

213. /kú-phà/ → [kú.phà] *kupha-ni

INF-give

'to give'

214. /kú-wà/ → [kú.wà] *kuwa-ni

INF-fall

'to fall'

Examples in (210) through (214) show that the grammar does not augment monosyllabic PStems. In each instance, siSwati grammar blocks /-ni/ epenthesis to augment the verb stems since only PWords and not the PStem, trigger augmentation rules. Unlike the plural marker, the infinitive marker contributes to minimality hence the blocking of any form of augmentation in this context.

Constraints on the permissible word size militate against the augmentation of minimally well-formed imperatives while triggering epenthesis in monosyllabic forms. The grammar achieves this through the interaction of several constraints, the essential of which is M_{IN}-W_D (Park, 1997) and IDENT-MORPH (Boersma and Levelt (2004). I define these constraints as follows:

215. M_{IN}-W_D:

Prosodic words must be minimally disyllabic.

(Park, 1997, p. 251)

This markedness constraint enforces minimality restrictions on the PWord, requiring that all surface realisations must be disyllabic. M_{IN}-W_D enforces the augmentation of subminimal constructions through phonological or morphological epenthesis, while blocking the same process in underlyingly well-formed constructions.

In siSwati, as already alluded earlier, we have the morphene [-ni] used in two different contexts. Firstly, Herman (1996) maintains that the augmentative [-ni,] in the imperative is only used if the word itself is less than two syllables long. Secondly, the plural marker in the imperative is also the syllable [ni]. This leads to another faithfulness constraint that militates against the

augmentation of minimally well-formed stems namely IDENT-MORPH, which is explained below gleaned from the constraint: IDENT (σ): every output correspondent of an accented syllable in the input must be accented (Boersma and Levelt, 2004, p11).

216. IDENT-MORPH

No augmentation of minimally well-formed forms.

DEP-IO militates against segment epenthesis.

217. DEP-IO

An output segment must have input correspondent. (No epenthesis)

(Kager, 1999, p. 101)

For augmentation processes such as /-ni/ epenthesis in the imperative, M_{IN}-W_D dominates IDENT (morph) and DEP-IO to allow the optimal candidate to epenthesise segments without incurring a fatal violation of indomitable constraints. The proposed ranking of the two constraints is, therefore, M_{IN}-W_D>> IDENT (morph)>>DEP-IO, where minimality restrictions on the PWord outrank segment epenthesis. This ranking is formaly demonstrated in Tableau 2 below:

Tableau 2: Resolving minimality through augmentation in monosyllabic imperatives

/ʃá /	M_{IN}-W_D	IDENT (Morph)	DEP-IO
a. [ʃá]	***!**		
☞b. [ʃá.nì]			*****

Tableau 2 illustrates that imperatives conform to the disyllabic template for the minimal word in siSwati. The monosyllabic verb in (b) triggers augmentation through morpheme /-ni/ epenthesis to

satisfy M_{IN}-W_D, a high-ranking constraint. However, the non-augmented candidate (a), which is fully faithful but monosyllabic, is in fatal violation of minimality restrictions in the grammar, hence its elimination. It also parses the subminimal PStem as an independent grammatical word, in violation of the minimality requirements of the language. PStems can be monosyllabic as long as they appear with affixes to form minimally disyllabic, well-formed PWords. Tableau 3 below illustrates that epenthesising /-ni/ to an already well-formed verb incurs a fatal violation of IDENT (Morph) wich militates against the augmentation of minimaly well-formed PWords. The identity morpheme is the imperative marker. The grammar should select the correct morpheme so that it augments as seen above, however if the selected morpheme serves another purpose, it fataly violates the faithfulness constraint IDENT (Morph) as shown in Tableau 3 below.

Tableau 3: Blocking augmentation in well-formed imperatives

/válà/	M_{IN}-W_D	IDENT (Morph)	DEP-IO
☞a.[vá.là]			
b.[vá.là.nì]		*!	*

Even though the disyllabic verb [vá.là] does not appear with any epenthetic morpheme, it still surfaces as the optimal candidate. It is disyllabic, which satisfies that high-ranking Min-WD constraint. IDENT (Morph) eliminates candidate (b) for suffixing [-ni] to a well-formed PWord, thus incurring a fatal violation. The grammar indicates that it is not optimal to insert a redundant syllable to a well-formed PWord. Inserting [-ni] to well-formed PWords in the imperative results in plurality. Next, I discuss the imperative in other Nguni languages, comparing the repair strategies with siSwati.

5.2.1.2 A comparison of the Imperative with otherBantu languages

The augmentation of monosyllabic verbs is a common phenomenon in Nguni languages. Like many Bantu languages, Xitsonga; a Southern Bantu language spoken in parts of South Africa, Mozambique and Zimbabwe (Lee & Burheni, 2014) prefers words to contain a minimum of two syllables. In the formation of the imperative, monosyllabic verb stems are consistently augmented by means of the addition of [–na] to the end of the stem. Consider the following examples in Table 7, adapted from Vratsanos (2018).

Table 7: Xitsonga Imperatives – Polysyllabic Verb Stems

Verb	**Gloss**	**Imperative**
Tirha	Work	[ti.ra]
Nwana	Drink	[ᵑ wa.na]
Baka	Bake	[ba.ka]
Hima	Hit	[hi.ma]

Khirhakhirha	work hard	[ki.ra.ki.ra]
Langa	choose	[la.ŋ ga]
Letela	teach	[le.te.la]
Nghena	enter	[ŋ ge.na]

The above table illustrates that the imperative form of the verb is identical to the original stem. Note that all of the verbs in the above table are polysyllabic already at the level of the stem, and are therefore polysyllabic in the imperative, and so augmentation is redundant. The case is slightly different when the verbs in question are monosyllabic, as evidenced by the following Table 8 adapted from Vratsanos (2018).

Table 8: Xitsonga Imperatives – Monosyllabic Verb Stems

Verb	**Gloss**	**Imperative**
-dya	eat	[d^j a-na]
-ba	beat	[ba-na]
-fa	die	[fa-na]
-ha	give	[ha-na]
-ka	draw water	[ka-na]
-kha	pick fruit	[k^h a-na]
-lwa	fight	[l^wa-na]
-ta	come	[ta-na]
-na	fall	[na-na]
-nya	defecate	[n^j a-na]
-pfa	come from	[pfa-na]

In the above table, the verb stems are all monosyllabic. In the imperative form, each verb receives an epenthetic [–na] onto the end of it, thus forming a disyllabic imperative form just like siSwati which receives an epenthetic syllable [-ni]. Xitsonga ranks Min-WD above DEP-IO just like siSwati.

Another language that imposes minimality effects differently from siSwati is isiNdebele. According to Downing (2001), isiNdebele imposes minimality restrictions on the imperative, passive, reduplication as well as the future and participial tenses. On the imperative, she notes that monosyllabic verb stems are augmented through prefixing /ji-/ to satisfy a minimality requirement

and the same is observed with isiZulu. This is illustrated in the examples in (218) through (221) below;

218. /lwa/ → [ji-lwa] 'fight!'

219. /pha/ → [ji-pha] 'give!'

220. /zwa/ → [ji-zwa] 'hear!'

221. /fa/ → [ji-fa] 'die!'

In each of the examples in the above data (218) through (221), the monosyllabic verb stems appear with augmented material to form a minimally well-formed PWord. However, If the same monosyllabic verb stems appear with the infinitive marker [úkú-], the grammar does not trigger augmentation. This is demonstrated in the following examples in (222) through (225) adapted from Downing, (2001, p. 36)

222. /úkú-lwa/ → [ú.kú.lwa] 'to fight'

223. /úkú-pha/ → [ú.kú.pha] 'to give'

224. /úkú-zwa/ → [ú.kú.zwa] 'to hear'

225. /úkú-fa/ → [ú.kú.fa] 'to die'

The data above shows that Ndebele assumes the same minimality restrictions and constraint ranking as siSwati, the only difference is that siSwati opts for augmentation of monostyllabic verb stems through suffixing while isiNdebele adopts prefixing the epenthetic syllable /yi-/ in the formation of the imperative. It is worth mentioning that augmentation is only triggered in monosyllabic PWords as seen in the imperative, and not the PStems, as seen in the infinitive just like siSwati. For instance, the grammar does not permit [ú.kú.pha] in (223) as *[ú.kú.ji.pha] 'to give', where the PStem is augmented even though it appears with the infinitive marker [ú.kú]. As highlighted earlier in siSwati grammar, the infinitive morpheme is there to account for minimality,

hence the grammar blocks augmentation in this case as that would be ungrammatical in the language.

On another note, Zezuru, a dialect of ChiShona also differs from siSwati as it requires mono syllabic words to be minimally disyllabic through the use of an epenthetic vowel [i] which is prefixal contrary to the suffixal epenthetic syllable /-ni/ in imperatives. Downing and Kadenge (2015) illustrate how this process of augmentation occurs in both nouns and verbs. The epenthetic vowel is prefixed to monosyllabic verbs in the formation of the imperative. Consider the following examples in (226) and (227) below.

226. /ɓ-á/ → [**i**.ɓá]

‘steal IMP’

‘steal’

227. /p-á/ → [**i**.pá]

‘give IMP’

‘give’

In Zezuru, Consonant-initial and vowel-initial disyllabic verbs have the same form in the infinitive and imperative. Monosyllabic verbs have different forms, when in the infinitive and imperative. This is illustrated in examples (228) through (229) below.

228. ku-tamb-a → [ta.m^{b}a]

INFV-play-FV ‘play IMP’

‘to play’

229. ku-d-a → [i.da]

INFV-love-FV ‘love IMP’

‘to love’

From the above examples we note that Zezuru ranks MIN-WD above DEP-IO just like siSwati. In Zezuru just like siSwati MIN-WD>>DEP-IO.

Verbs and the formation of imperatives present further evidence for minimality effects in Chichewa. Like other Bantu languages, the imperative form of the verb consists of the bare stem. Consider the following examples (Downing & Mtenje, 2017, p. 211):

230. /vi:na/ → [vi:na] 'dance' *i-vi:na

231. /gó:na/ → [gó:na] 'sleep' *i-gó:na

232. /lemé:la/ → [lemé:la] 'get heavy' *i-lemé:la

233. /jasamu:la/ → [jasamu:la] 'yawn' *i-jasamu:la

The polysyllabic stems above do not require any augmentation as they are minimally well-formed. The data in (234) to (237) below, however, consists of monosyllabic PWords. Note that these appear with epenthesised [i] to fulfil the minimality restriction on the Chichewa grammar.

234. /ba/ → [i:ba] 'steal'

235. /gja/ → [i:gja] 'eat'

236. /gwa/ → [i:gwa] 'fall'

237. /mwa/ → [i:mwa] 'drink'

As illustrated above, the verbs are subminimal hence their augmentation through [i] epenthesis to ensure that they conform to the binarity requirement of PWords in Chichewa. MIN-WD >>DEP-IO in Chichewa.

Ndau, a language spokenin Chipinge and Chimanimani districts of Manicaland Province in Zimbabwe (Mutonga, Mabugu, Mukaro and Mugari, 2018) follows the general pattern with the

other Bantu languages already discussed above. The imperative form of most verbs consists of the bare verb stem and the monosyllabic stems are augmented by epenthesizing (semantically empty) a syllable in the imperative. Consider the following examples adapted from (Mutonga, Mabugu, Mukaro and Mugari, 2018);

238. [rʲa] → [í.rʲ á]‘eat’

/kù-rj -á /

INFV-eat-FV

‘To eat’

239. [ɗǎ] → [í. ɗǎ] ‘love’

/kù-ɗ-á/

INFV-love-FV

‘To love’

240. [pá] → [í. pá] ‘give’

/kù-p-á/

INFV-take-FV

‘To give’

241. [mʷá] → [í. mʷá] ‘drink

/ kù-mw-á/

INFV-drink-FV

‘To drink’

The above data illustrate that the verb roots made up of a single consonant which combines with the final vowel /a/ and surfaces as a monosyllable when in the imperative form, have different forms when in the infinitive and the imperative. There is no need for /i/ epenthesis in the infinitive because the infinitive /ku-/ (CV) and the monosyllabic stem (CV) constitute a well-formed

Prosodic Word (CV.CV) in Ndau. In other words, the epenthesis of the coronal vowel /i/ would be redundant because there is no sub-minimality to repair. Vowel epenthesis in the imperative shows that Ndau has a minimality restriction on the verb word and ranks MIN-WD above DEP-IO similarly to other Bantu languages advocating for words to be minimaly disyllabic. Hence, the epenthesis of the vowel /i/ in imperatives shows that Ndau imposes a disyllabic minimality requirement. Ndau has similar minimality requirements with siSwati in the imperative and only differs in the position of the epenthetic syllable. While siSwati suffixes its epenthetic syllable /-na/, Ndau augments subminimal forms through prefixing the coronal vowel /i/.

IKalanga minimally accepts monomoraic or monosyllabic nouns and adjectives, but prohibits the same in imperatives and pronouns. A case like iKalanga presents intralinguistic variation in constraint ranking, in that the same grammar imposes different prosodic minimality requirements. For instance, MIN-WD outranks DEP-IO in imperatives and pronouns, but DEP-IO trumps MIN-WD in nouns and adjectives. The iKalanga grammar therefore allows epenthetic [i] in imperatives and pronouns, but blocks augmentation in nouns and adjectives. Consider the following examples (Kadenge & Mathangwane, 2017, p. 133 &139):

Imperatives

242. /i- já/ ‘eat!’

243. /i- dwá/ ‘go out’

244. /i- dá/ ‘love’

Pronouns

245. /i-mí/ ‘I’

246. /i-wé/ ‘you’

247. /i-swí/ ‘we’

The following table summarises the creation of the imperative form of the verb ‘eat’ in ten (10) Bantu languages (Downing, 2015; Downing and Kadenge, 2015, Downing & Mtenje, 2017), including siSwati for comparison purposes. The verb root is in bold.

Table 9: The imperative of ‘eat’ in Bantu languages

Language	**Imperative Form of ‘eat’**
SiSwati	[ɮa-ni]
Xitsonga	[dʲa-na]
Tshivenda	[i-l̪a]
Southern Sotho	[i-dʒa]
Swahili	[ku-la]
IsiZulu	[ji- ɮa]
ChiZezuru	[i-dʲa]
Ndau	[í-rj à]
Ikalanga	[i- já]
Chichewa	[i:gʲa]

The above table illustrates how languages with the same (or similar) requirements deal with the problem differently. For example, Xitsonga and chiZezuru have the same verb stem [dja], but different strategies to solve it. Xitsonga adds a morpheme to the end of the word, while chiZezuru epenthesises a vowel [i] to the beginning of the word. SiSwati, on the other hand, is very reminiscent of Xitsonga, but for the morpheme itself siSwati suffixes [-ni] as opposed to Xitsonga’s [-na]. IsiZulu and siSwati also have the same verb stem [ɮa] but different strategies to solve it; with siSwati adding a morpheme to the end of the word, while isiZulu epenthesises a morpheme [ji] to the beginning of the word.

Nevertheless, the requirements evident from the table above are the same crosslinguistically, with siSwati and Xitsonga employing a suffixal morpheme as opposed to the prefixal morpheme employed by all the other languages. The structural requirements regarding word minimality are common for languages of its type, as is the strategy employed by this language in order to ensure the satisfaction of these requirements.

At this level, we need to consider the history of the augment in Bantu imperatives to speculate the direction of change among these Nguni languages. According to Maud and Van Olmen (2013, p8), the morphologically specialized imperative, i.e. the verbal base with a final suffix [-a], is widely attested in the Bantu languages. They reached such conclusion after conducting a study about the imperatival and prohibitival strategies in a geographically diversified sample of 100 Bantu languages. The following examples further demonstrates this augment in the Bantu imperative;

Proto Bantu (Meeussen 1962:74)

248. *dim-íd-á

cultivate-APPL-IMP

'Cultivate for ...!'

249. *túm-id-á

send-APPL-IMP

'Send for ...!'

Sango (Meinhof 1948:101)

250. vuχ-a

go-IMP

'Go!'

Plural imperatives typically include a plural addressee marker suffixed to the singular imperative.

This suffix, which is reconstructed as *Vni for Proto Bantu, could be the result of the grammaticalization of a second person plural pronoun (Van de Velde & Van der Auwera, 2010:137).

Languages use the morphologically specialized imperative for the singular, as illustrated by Shangaci in (263) below. In most cases, it is marked by the suffixed plural addressee marker, as in (251).

Shangaci

251. khol-á

grasp-IMP

'Grasp!'

252. khol-a-ní

grasp-IMP-PA

'Grasp (you people)!'

Babole (Leitch 2003:410)

253. la-á

put-IMP

'Put!'

254. bo-la-á

SM2PL-put-IMP

'Put (you people)!'

The imperative can thus be considered a well-established imperatival strategy in Bantu, even if it displays some slight formal variation in a number of languages. Another type of formal variation in imperatives is attested in Nyanja. In this language, the imperative marked by [-a] only is rare (Stevick & Hollander, 1965:16-17 and Harding, 1966:102-103). The form with the plural addressee marker [-ni] is used instead, as in (267). In other words: [-ni], in combination with [-a,]

appears to be grammaticalizing into a full-fledged imperative marker (Van de Velde & Van der Auwera 2010:122).

Nyanja (Stevick & Hollander 1965:17)

255. low-a-ni

enter-IMP-PA

'Enter!'

From the above examples we can coclude that the imperative marker in Proto-Bantu is suffixal as opposed to the prefixal morpheme used in most Bantu languages discussed earlier on to augment subminimal forms. This therefore, means that these Nguni languages are moving from suffixing to prefixing. Siswati and Xitsonga have retained the suffixal augment although with different variations.

5.2.2. Word Minimality effects on the siSwati passive

Monosyllabic verbs take the phonologically augmented form /-iw-/, while longer verb stems take the non-augmented /-w-/ form. In the siSwati passive, the size of the PStem determines the shape of the passive morpheme. This is inspired by Malambe (2006)'s investigation of the siSwati passive, and how the shape of the passive morpheme hinges on the size of the PStem as well as Herman (1996)'s MP study on Prosodic structure in siSwati. Consider the following examples:

Polysyllabic verb stems:

256.	/gámùl-w-á/	→	[gá.mù.l ^{w}à]	*gamul-iw-a
			break-PASS-FV	
			'be broken'	

257. /dzélél-w-à/ → [dzé.le.l ʷà] *dzelel-iw-a

undermine-PASS-FV

'be undermined'

258. /ph àkél-w-à/ → [ph à.ké.lʷ à] *phakel-iw-a

serve-PASS-FV

'be served'

259. /ɓùkél-w-à/ → [ɓù.ké.l ʷà] *ɓukel-iw-a

watch-PASS-FV

'be watched'

260. /dzìlít´-w-a/ → [dzì.lí.t´ʷà] *dzilit´-iw-a

destroy-PASS-FV

'be destroyed'

Monosyllabic verb stems:

261. /pʰ-w-a/ → [pʰ í.wà] *pʰwa

give.Pass.FV

'be given'

262. /v-w-a/ → [ví.wà] *vwa

hear.Pass.FV

'be heard'

263. /ɮ-w-a/ → [ɮí.wà] *ɮwa

eat.Pass.FV

'be eaten'

264.	/m-w-a/	→	[mí.wà]	*mwa
			deny-PASS-FV	
			'be denied'	
265.	/f-w-a/	→	[fí.wà]	*fwa
			die-PASS-FV	
			'die'	

The form of the passive morpheme illustrates that phonologically epenthesising [i] augments subminimal constructions as evident in the monosyllabic verb stems, while the same augmentation strategy is blocked in the polysyllabic stems since they are minimally well-formed. The above examples also indicate that using a mismatched shape of the passive yields an ungrammatical construction. The polysyllabic verbs in (257) to (260) take the passive morpheme /-w-/ without any phonological augmentation since they are minimally well-formed in the grammar. However, the siSwati grammar requires the monosyllabic verbs *p^{h}wa, *vwa, *ɮwa, *lwa, and *fwa to take the augmented /-iw-/ form. The motivation for the augmented form of the passive is the disyllabic minimality restriction that the siSwati grammar imposes on its PWords.

In this dissertation I therefore assert that subminimality of the monosyllabic verbs motivates their phonological augmentation to satisfy the siSwati disyllabic requirement and that the overall application and blocking of phonological augmentation of the passive form is conditioned by the size of the input PStem.

Similar to the imperative discussed earlier on, in the formation of the passives, M_{IN}-W_{D} is indomitable and ensures that the grammar selects the correct form. We can conclude that /-w-/ is used in disyllabic and polysyllabic stems, and the augmented /-iw-/ is employed in subminimal ones. MIN-WD outranks constraint called DEP-IO, which states that output elements should come from (be dependent on) input elements; any outside element is not allowed. Both candidates

observe the Min-Wd constraint in the formation of the passive in siSwati. I formalise this difference below in Tableau 4.

Tableau 4: Resolving word minimality through augmentation in siSwati passives

/f-w -a/	M_{IN}-W_D	DEP-IO
a. [f^{w}a]	*!	
☞b. [fí.wà]		*

From the above we note that the monosyllabic verb [fí] is considered subminimal hence siSwati opts for the extended shape of the passive that has epenthetic [i]. This results in the elimination of candidate (a) for its fatal violation of MIN-WD, a high ranking and indomitable constraint in the siSwati grammar. Candidate (b) satisfactorily appears with an inserted segment to satisfy minimality requirements in the grammar hence it is the optimal candidate. The DEP-IO violation is not fatal since minimality outranks epenthesis in this grammar.

We also note that the same ranking applies forwell-formed constructions in siSwati. The grammar blocks the augmentation of verbs that are already two syllables or more, as demonstrated in Tableau 5 below. I demonstrate that the disyllabic verb optimally selects /-w-/ rather than the extended form /-iw-/.

Tableau 5: Blocking augmentation in well-formed passives

/p^{h}àkél-w-à/	M_{IN}-W_D	DEP-IO
☞a. [p^{h}àkél-w-à]		
b. [p^{h}à.ké.li.w-à]		*!

From the above Tableau 5, Candidate (a) is the optimal candidate since it has employed the right form of the passive morpheme, as it is minimally well-formed in the siSwati grammar. On the other hand, candidate (b) fatally violates DEP-IO by using epenthesis as a repair strategy for a construction that does not require augmentation and therefore is eliminated.

5.2.2.1. A comparison of the passive to Other Bantu Languages

SiSwati behaves similarly to isiZulu and Ndebele. There are two forms of the passive in isiZulu and Ndebele namely; /-w-/ and /-iw-/ (Doke, 1954; Keet & Khumalo, 2017). It has been further noted that these two shapes are allomorphs of the same phoneme, with /-w-/ occuring with disyllabic and polysyllabic verb stems, while /-iw-/ occurs with monosyllabic ones. Ndebele and isiZulu adopt the same ranking as siSwati where MIN-WD outranks DEP-IO to allow surface representations that are minimally disyllabic. The same grammar where MIN-WD >> DEP-IO would optimally prohibit the augmentation of minimally well-formed configurations as demonstrated in the infinitive and polysyllabic verb stems.

Setswana passive depicts both similarities and differences with siSwati. The root-final labial surfaces with either, palatalization of the labial or suffixation of /-iw/, with no palatalization. The other segments surface with no palatalization but either suffixation of /-w/ or/-iw /. In monosyllabic roots, the [cor] always appears as [i]. When comparing Setswana and siSwati we note that /-iw/ is always acceptable in Setswana even on longer roots, but in siSwati it is only used to satisfy minimality as demonstrated ealier on. Consider the following examples displaying the disparity with Setswana adapted from (Malambe, 2006, p124);

266. Setswana /tɬ^{h}ab-a/ → [tɬ^{h}ab-iw-a]

stab-PASS-FV

‘stab’

267. siSwati /ɬaɓ-a/ → [ɬaʧʷ -a] *[ɬab-iw-a]

Stab-PASS-FV

‘stab’

From the above examples we note that in Setswana /-iw-/ is acceptable with the longer root in (266), however, siSwati grammar does not permit the use of /-iw-/ on longer roots as displayed in (267). Using /-iw-/ on longer roots yields to an ungrammatical form since in the language /-iw-/ plays a phonological role of satisfying minimality on monosyllabic stems.

Tshivenda presents a different case in the passive. Poulos (1975) suggests, the passive /-iw-/ in Tshivenda can occur in mono- and polysyllabic stems. This is also evident in Namibian Few, where the passive forms are in free variation (Gunnink, 2018, p. 205). However, /-w-/ cannot occur in monosyllabic stems just like in siSwati as seen above. This is also true for Ndau (Mutonga et al., 2018, p. 10) and isiXhosa (Potgieter, 2017, p. 45) where /-iw-/ is used with monosyllabic stems and /-w-/ with disyllabic stems. These are fixed environments, unlike Tshivenda.

While siSwati, isiNdebele, Xitsona, Zezuru, Ndau, isiZulu, ChiShona, and Chichewa enforce a disyllabic minimality requirement on their PWords in all morphosyntactic contexts, iKalanga is typologically different (Kadenge & Mathangwane, 2017). An analysis of minimality effects in iKalanga reveals disparity in what its grammar considers subminimal, with monosyllabic configurations in nouns and verbs perfectly well-formed while verbs and pronouns require augmentation to satisfy minimality restrictions on the PWord. Kadenge and Mathangwane (2017) attribute this variation to the existence of co-phonologies that permit different minimality conditions on its morphosyntactic categories. For example, the augmentation of monosyllabic and monomoraic forms is permitted in (268) to (271), while it is blocked in (272) to (277). Consider the examples below (Kadenge & Mathangwane, 2017, p. 144):

Verbs

268. /já/ → [i.já] ‘eat’

269. /dwá/ → [i.dwá] ‘go out’

270. /dá/ → [i.dá] ‘love’

271. /fá/ → [i.fá] ‘die’

Nouns

272. /go/ → [go] ‘wasp’ *i.go

273. /dzu/ → [dzu] ‘eagle’ *i.dzu

274. /ngwe/ → [ngwe] ‘tiger’ *i.ngwe

Adjectives

275. /psá/ → [psá] ‘new’ *i.psá

276. /bí/ → [bí] ‘ugly/bad’ *i.bí

277. /tshu/ → [tshu] ‘black male cattle’ *i.tshu

In addition to blocking the augmentation of disyllabic forms for their well-formedness, iKalanga grammar also blocks augmentation of monosyllabic nouns and adjectives. This aligns with Kadenge and Mathangwane’s (2017) argument wich states that form extension through epenthesis is restricted to verbs and pronouns. Phonological augmentation of the forms in (272) to (277) above would be ungrammatical since subminimality is optimal in nouns and adjectives. For instance, iKalanga grammar would rule out *i.psá, *i.bí and *i.tshu since iKalanga adjectives do not trigger augmentation. IKalanga places MIN-WD higher than DEP-IO to allow the surface realisation of [i] epenthesis in verbs and pronouns, while the ranking DEP-IO >> MIN-WD in nouns and adjectives to block epenthesis. I demonstrate this construction in Tableau 6 and 7 below:

Tableau 6: The augmentation of subminimal verbs and pronouns in iKalanga

/já/	MIN-WD	DEP-IO
a. [já]	*!	
☞b. [i.já]		*

The above tableau illustrates the augmentation of monosyllabic verbs in iKalanga. The augmented form in (b) is the optimal candidate, since it has epenthesised [i], in line with the minimality conditions expected in iKalanga verbs and pronouns. Note that the grammar eliminates candidate (a) for its violation of MIN-WD, which is an indomitable constraint in verbs and pronouns. The same grammar does not suffice for nouns and adjectives, as illustrated in Tableau 7 below:

Tableau 7: Blocking the augmentation of monosyllabic nouns and adjectives in iKalanga

/go/	DEP-IO	MIN-WD
☞a. [go]		*
b. [i.go]	*!	

As evident in Tableau 7, [i] epenthesis is blocked hence the grammar eliminates candidate (b) for its violation of the now indomitable DEP-IO that prohibits augmentation in nouns and adjectives. IKalanga adopts the same grammar for disyllabic forms such as lima ‘farm’ and baka ‘build’ that do not trigger [i] epenthesis (Kadenge & Mathangwane, 2017, p. 133). For this language, subminimality is well-formedness in nouns and adjectives, hence the surface realization and subsequent optimal representation of [go] in candidate (a), presenting cross-linguistic variation to the ongoing debate on minimality effects in Bantu.

Languages such as Chitonga introduce a different minimality restriction on the PWord. Similar to Swahili, Mkochi (2009) notes that Chitonga considers bimoraicity as its unit of analysis to satisfy minimality requirements in the language. Even though the imperative form in monosyllabic PStems appears with an epenthetic [i], Mkochi argues that Chitonga permits both augmentation and vowel lengthening 'to satisfy a general structure of Foot Binarity' (p. 279), where both bimoraicity and disyllabicity account for word minimality in the grammar. Consider the following Chitonga examples (Mkochi, 2009, p. 279):

278.	/to/	→	[to:]	'take'
279.	/pe/	→	[pe:]	'get subdued'
280.	/ko/	→	[ko:]	'catch'
281.	/po/	→	[po:]	'get cold'
282.	/me/	→	[me:]	'grow

In each of the Chitonga examples, the output parses a lengthened vowel to account for minimality, ranking MIN-WD above dependency. This indicates that the word minimality constraint must account for both moraic and syllabic representation across Bantu languages.

The discussion has so far highlighted the importance of drawing the asymmetry between PWords and PStems, pointing out how this variation determines minimality effects in each grammar. I have indicated that monosyllabic PStems do not trigger augmentation while PWords do. I have also demonstrated the discrepancy in what languages consider subminimal: the syllable in siSwati and the other Nguni languages accounts for minimality, while Chitonga and Swahili use moraic representation. In each of the languages under investigation, MIN-WD outranks DEP-IOto allow the parsing of epenthetic material in surface forms that are underlyingly subminimal. Even with Swahili and Chitonga, the surface form must be bimoraic, and therefore vulnerable to the minimal

word constraint, ranking MIN-WD above dependency. I now discuss turn to the next piece of evidence for word minimality effects within the siSwati verb: the reduplication template.

5.2.3. Word minimality in siSwati verb reduplication templates

Reduplication is another phenomenon Bantuists use to investigate minimality requirements (see Downing, 1998, 2005; Mutonga, 2017). Reduplication is applied to verbs to indicate continuous or repetitive actions; it can also be used with nouns for emphasis in siSwati. Typically, reduplication illustrates the attested disyllabic nature of a well-formed PStem (Downing, 2005; Mutonga, 2017). This holds true in siSwati, as discussed in this subsection. SiSwati demonstrates its prohibition on subminimal constructions within the verb reduplication process. The reduplicant in SiSwati is prefixal and two syllables long (Downing, 1999). The effects of bisyllabic minimality comes from forms with shorter roots which have augmentative material in the reduplicant, since the root itself, without suffixes or final vowels, acts as the base for reduplication in SiSwati as displayed the examples (302) through (306) below in Table 10. I first demonstrate the reduplication of disyllabic verb stems:

Table 10: Reduplication of disyllabic verb stems

Stem	**Reduplicated**	**Gloss**
283. /lá mbà/	[**la^{m}ba**-la^{m}ba]	'be hungry a little bit'
284. /kálà/	[**kala**-kala]	'measure a little bit'
285. /fákà/	[**faka**-faka]	'put a little bit'
286. /p^{h}èɠà/	[**p^{h}eɠa** - p^{h}eɠa]	'cook a little bit'
287. / [ɮalà/	[**ɮala**- ɮala]	'play a little bit

The disyllabic verb forms in (283) to (287) above have copied the verb stems as they are, allowing both the reduplicant and the base to surface as disyllabic forms. SiSwati grammar stipulates that the reduplicant must be binary (Downing, 1999; Malambe, 2006). The OT grammar I assume for siSwati reduplication uses RED [σσ], which I define below, to enforce binarity of the reduplicant.

288. RED [σσ]

The reduplicant must be minimally disyllabic.

(Hyman, Inkelas & Sibanda, 1999, p. 280)

RED [σσ] ensures that the siSwati reduplicant is two syllables. In my OT analysis, RED [σσ] and M_{IN}-W_D have similar restrictions as they both enforce binarity, one on the PWord and the other on the reduplicant. However, these two constraints are not equally ranked to account for the output forms in polysyllabic and vowel-initial verb forms. The following Tableau 8 illustrates the ranking;

Tableau 8: Minimality effects in disyllabic verb reduplication templates

/łeʃa/	RED [σσ]	M_{IN}-W_D	DEP-IO
☞a. [**łeʃa**-łeʃa]			
b. [**łeʃa**-ji-łeʃa]	*!		*

The reduplicant has to be binary as illustrated in Candidate (a) where both syllables of the input are copied. Candidate (a) satisfies all constraints since it is well-formed, while Candidate (b) is eliminated for inserting the augmentative morpheme /-ji-/ to a minimally well-formed reduplicant. As displayed above, the augmentation of verb roots that are two or more syllables is illegal. The grammar therefore eliminates Candidate (b) for its fatal violation of RED [σσ].

Unlike disyllabic verb forms, polysyllabic stems display partial reduplication; they are not copied as they are. Downing (1999, 20001, and 2005) posits that partial reduplication demands that PWords are not copied as they are, but that only the first two syllables of each verb stem are copied, supporting her argument that reduplicants are not PWords. She mentions that reduplicants are not

PWords but require to be attached to the verb stem as INFL=RED + base (Downing, 2001, p. 46) to describe an optimal PWord. This is demonstrated in the following examples in Table 11, (289) through (293) respectively:

Table 11: Partial reduplication of polysyllabic verb stems

Stem	**Reduplicated**	**Gloss**
289. /kʰúmùlá/	[**kʰumu**-kʰumula]	'undress a little'
290. /ɬábèlá/	[**ɬabe**-ɬabela]	'sing a little'
291. /ɬáɲèlá/	[ɬaɲe- ɬaɲela]	'sow a little'
292. /pʰúmùlá/	[**pʰúmu**-pʰúmula]	'rest a little bit'
293. / fáɠàzá /	[**faɠa**- faɠaza]	'testify a little bit'

The above examples in (289) to (293) illustrate that RED [σσ] ensures that siSwati grammar copies part of the verb form in polysyllabic stems. I present a formalised discussion in Tableau 9 below:

Tableau 9: Partial reduplication and minimality effects in polysyllabic verb stems

/ faɠaza /	RED [σσ]	$M_{IN}W_D$	MAX-IO
a. [faɠaza- faɠaza]	***!**		
☞b. [faɠa-faɠaza]			*

The grammar blocks the polysyllabic stem in (a) from copying as is hence its fatal violation of RED [σσ]. Candidate (b) is our optimal candidate since has construed a disyllabic reduplicant, in line with the reduplication grammar in siSwati. As evident in the tableau, both canidates do not violate minimality or dependency. Even though candidate (b) elides a syllable in violation of

MAX-IO to satisfy a binary RED, the violation is non-fatal. RED [σσ] >> M_{IN}-W_D >> MAX-IO in siSwati grammar.

In monosyllabic verb stems, the grammar enforces morphological augmentation to satisfy the disyllabic word size on the PWord. Since the grammar prohibits subminimality, the reduplicant surfaces with an epenthetic syllable /-ji-/ to augment the monosyllabic, subminimal verb forms. This is illustrated in the examples in Table 12 below;

Table 12: Reduplication of monosyllabic verb stems

Stem	**Reduplicated**	**Gloss**
294. /fa/	[**fa-ji**-fa]	**‘**die a little bit’
295. /ma/	[m**a-ji**-ma]	‘stop a little bit’
296. /va/	[v**a-ji**-va]	‘hear a little bit ’
297. / ɮa/	[**ɮa-ji**-ɮa]	‘eat a little bit’
298. /t´a/	[**t´a-ji**-t´a]	‘come a little bit’
299. /ja/	[**ja-ji**-ja]	‘go a little bit’
300. /lʷa/	[**lʷa-ji**-lʷa]	‘fight a little bit’
301. /na/	[n**a-ji**-na]	‘rain a little bit’
302. /ʃa/	[**ʃa-ji**- ʃa]	‘burn a little bit’
303. /ʃo/	[**ʃo-ji**-ʃo]	‘say a little bit’
304. /pha/	[**pʰaji**-ɮa]	‘give a little bit’

From the above examples in Table 12, we note that forms such as /má/ ‘stand’ would optimally surface as [**maji**-ma] ‘stand a little’. Similarly, [**pʰaji**-ɮa] would suffice for /phá/ ‘give,’ indicating

that siSwati reduplicants morphologically augment subminimal forms using morpheme /-ji-/ to repair subminimality, in line with the prosodic word size requirements.

However, the grammar would not permit *fa-fa as an optimal reduplication candidate even though it is a minimally wellformed PWord. This points to RED [σσ] being indomitable and ranking higher than MIN-WD to block the occurrence of monosyllabic, therefore subminimal reduplicants. I present a formalised discussion in Tableau 10 below:

Tableau 10: Resolving word minimality in monosyllabic reduplicated verb forms

/fa/	RED [σσ]	$M_{IN}W_D$	DEP-IO
a. [**fa**-fa]	*!	*	
☞b. [**fa-ji**-fa]			*

Candidate (a) fatally violates RED [σσ], which is a high-ranking indomitable constraint in the grammar. The reason is that the reduplicant [fa] is monosyllabic when siSwati grammar stipulates that it has to be two syllables. Even though candidate (b) violates DEP-IO a low-ranking constraint by epenthesising the diagnostic morphologically empty morpheme [ji], the grammar does not consider this fatal, hence its realisation as our optimal candidate.

We have so far in the discussion highlighted how the siSwati grammar enforces binarity on the reduplicant regardless of the size of the input verb stem. I have pointed out how disyllabic verb stems are copied as they are since the reduplicant and the base are both disyllabic. Polysyllabic stems undergo partial reduplication where only the first two syllables are copied. With monosyllabic verb forms, the grammar augments the subminimal stems through [ji] epenthesis. All these processes ensure that the reduplicant is minimally well-formed.

In siSwati we also have reduplication of vowel-initial verb stems which demonstrates minimality effects in the grammar. Downing (1999) argues that the initial vowel in onsetless verb stems does not reduplicate in line with the reduplication template in siSwati and other Nguni languages. She argues that the reduplicant excludes the stem-initial vowel from reduplicating if the output form will be minimally disyllabic. I observe that the initial vowel in vowel-initial stems lies outside of the PStem, hence its inability to reduplicate in line with the specified reduplication principles in the grammar. This is demonstrated in the following examples in (305) through (308) adapted from Mkoko (2021, p199);

Table 13: Reduplication of vowel-initial verb stems

Stem	Reduplicated	Gloss
305. /élùsà/	[j-e-**lusa**-lusa]	'herd livestock a little bit'
306. /élàphá/	[j-e-**lap^{h}a**-lap^{h}a]	'drown a little bit'
307. /émùká/	[j-e-**muka**-muka]	'drown a little bit'
308. /é^{ŋ}gètá/	[j-e-**^{ŋ}geta**-^{ŋ}geta]	'add a little bit'

The above examples in Table 12 demonstrate that the initial vowels in vowel-initial verb stems are not copied in the reduplicant as mentioned earlier. We have to note that the reduplication template stipulates that only the first two syllables form part of the reduplicant. Contrary to this template, the above examples have excluded the vowel, affirming Downing (1999)'s argument on their status as extra-prosodic segments. The grammar therefore does not recognise the stem-initial vowels as part of the PStem. I further illustrate this representation in Tableau 11 below;

Tableau 11: Reduplication and minimality in well-formed vowel-initial verb forms

/élàphá/	RED [σσ]	M_{IN}-W_D	DEP-IO
a. [**ela**-lapha]	*!		
☞b. [e-**lapha**-lapha			
c. [**elapha**-elapha]	*!		

The grammar eliminates candidates (a) for being subminimal and candidate (c) for resolving using an extra-prosodic segment within the reduplicant. The indomitable high ranking constrainst RED [σσ], therefore eliminates both candidates for fataly violating minimality restrictions imposed on the reduplicant. Candidate (b) therefore becomes optimal, even though the reduplicant has not used the extra-prosodic [e].

The extra-prosodic segment in vowel initial stems is maintained if its exclusion threatens the subminimality of the reduplicant (Downing, 1999). This implies that phonological restrictions trump faithfulness to morphological conditions in this case. I demonstrate this in the following examples in Table 13, (309) through (312):

Table 14: Reduplication of monosyllabic vowel-initial verb stems

Stem	**Reduplicated**	**Gloss**
309. /ént´à/	[j-**ent´a**-j-ent´a]	'do a little bit'
310. / endzà/	[j-**e ^{n}dza**-j-e^{n}dza]	'marry a little bit'
311. /ébà/	[j-**eba**-j-eba]	'steal a little a bit'
312. /élà/	[j-**ela**-j-ela]	'sieve a little bit'

From the above examples we observe that in each case, all stem-initial vowels are parsed in the surface forms in line with what (Downing, 1999) observed in that the extra-prosodic segment in vowel initial stems is maintained if its exclusion threatens the subminimality of the reduplicant. The grammar maintains these extra-prosodic segments to satisfy minimality requirements enforced on the reduplicant. I present a formalised discussion in Tableau 12 below:

Tableau 12: Reduplication template in monosyllabic vowel-initial stems

/ela/	RED [σσ]	M_{IN}-W_D	DEP-IO
a. [e-**la-j**-ela]	*!		*
☞b. [**ela-j**-ela]			*

In Tableau 12, RED [σσ] eliminates candidate (a) for being subminimal, even though it has excluded the extra-prosodic vowel from the reduplicant. Candidate (b), on the other hand, has parsed a minimally well-formed reduplicant, hence its being the optimal, although it violates a low-ranking constraint DEP-IO through [ji] epenthesis. SiSwati nominals are also subject to reduplication. I now turn the discussion to minimality effects in the reduplication of siSwati nominals.

5.2.3.1. Word minimality in siSwati Noun reduplication templates

As mentioned above, siSwati nominals are also subject to reduplication, and in the case of ideophones, triplicated. In siSwati only nouns in plural form undergo reduplication of the stems to denote large quantities. In monosyllabic noun stems, the grammar enforces morphological augmentation to satisfy the disyllabic word size on the PWord. Since the grammar prohibits

subminimality, the reduplicant surfaces with an epenthetic syllable /-ji-/ just like verbs to augment the monosyllabic, subminimal noun forms. This is illustrated in the following examples;

313.	/imiti/	→	[imi-ti-yi-ti]
	CL4-homesteads		'many homesteads'
314.	/imitsi/	→	imi-tsi-yi-tsi]
	CL4-herbs		'many herbs'
315.	/imiʃi] /	→	[imi-ʃi-yi-ʃi]
	CL4-stripes		'many stripes'
316.	/emeło/	→	[eme-ło-yi- ło]
	CL4-eyes		'many eyes'
317.	/tifo/	→	[ti-fo-yi-fo]
	CL4- sicknesses		'many sicknesses'
318.	/timo/	→	[ti-mo-yi-mo]
	CL8- conditions		'many conditions'
319.	/tisu/	→	[ti-su-yi-su]
	CL8- stomaches		'many stomaches'
320.	/tive/	→	[ti-ve-yi-ve]
	CL8- nations		'many nations'

The reduplication of monosyllabic nouns in siSwati is formalised in Tableau 13 below;

Tableau 13: Resolving word minimality in monosyllabic reduplicated nouns

/ti-fo/	RED [σσ]	$M_{IN}W_D$	DEP-IO
a. [ti**fo**-fo	*!	*	
☞b. [tifo-**ji-fo**]		*	*

Candidate (a) fatally violates RED [σσ], which is a high-ranking indomitable constraint in the grammar. The reason is that the reduplicant [fo] is monosyllabic when siSwati grammar stipulates

that it has to be two syllables. Candidate (b) violates DEP-IO a low-ranking constraint by epenthesising the diagnostic morphologically empty morpheme [ji], which is a low-ranking constraint and the grammar does not consider this fatal, hence its realisation as our optimal candidate. Next, I discuss reduplication of disyllabic noun stems which undergo total reduplication in siSwati. This is demonstrated in Consider the following examples in (321) through (327);

321. /imiɬaɓa/ → [imi-**ɬaɓa**- ɬaɓa]
CL4-lands 'many lands'

322. /imifula/ → [imi-**fula**- fula]
CL4- rivers 'many rivers'

323. /imiʤovo/ → [imi-**ʤovo**-ʤovo]
CL4- vaccines 'many vaccines'

324. /imileⁿte/ → [imi-**leⁿte**-leⁿte]
CL4- legs 'many legs'

325. /imiⁿǀele/ → [imi-ⁿǀele- ⁿǀele]
CL4- boarders 'many boarders'

326. /emałoᵐbe/ → [ema-ł**oᵐbe**- łoᵐbe]
CL6- shoulder 'many shoulders'

327. /emaɓala/ → [ema-ɓala- ɓala]
CL6- yards 'many yards'

The reduplication of disyllabic nouns in siSwati is formalised in Tableau 14 below;

Tableau 14: Minimality effects in disyllabic Noun reduplication templates

/ imi-leⁿte /	RED [σσ]	M_{IN}-W_D	DEP-IO
☞a. [imi**leⁿte-l**eⁿte]			
b. [imi**leⁿte** -ji- leⁿte]	*!		*

From the above Tableau we observe that candidate (a) is our optimal candidate. The reduplicant has to be binary as illustrated in Candidate (a) where both syllables of the input, in this case the noun stem, are copied. Candidate (a) satisfies all constraints since it is well-formed and satisfies all the contraints, while Candidate (b) is eliminated for inserting the augmentative morpheme /-ji-/ to a minimally well-formed reduplicant. As displayed above, the augmentation of noun stems that are two or more syllables is illegal. The grammar therefore eliminates Candidate (b) for its fatal violation of RED [σσ] which is a high-ranking constraint in siSwati.

Interestingly, ideophones have a different minimality requirement. Sibanda & Mthembu, (1996) observe that when the stem is monosyllabic, it is triplicated. This shows that an ideophone is minimally trisyllabic (the analysis of which is outside the scope of this dissertation). Consider the following examples given below in (328) through (334) adapted from Sibanda & Mthembu, (1996, p 204);

Monosyllabic stems

328. [ŋ|e. ŋ|e. ŋ|e] 'the idea of intensive hiting'

329. [ŋ|o. ŋ|o. ŋ|o] 'the idea of knocking'

330. [gi.gi.gi] 'the idea of the heart throbbing'

331. [gu.gu.gu] 'banging'

332. [go.go. go] 'the idea of bursting'

Poly-syllabic stems

333. [bʰaku.bʰaku.bʰaku] 'idea of breathing slowly'

334. [jele.jele.jele] 'idea of disappearing hastily'

5.2.3.2 Comparison with other Bantu reduplication templates

SiSwati (Downing, 1999), IsiZulu and isiNdebele unsurprisingly share the process of inserting /-yi-/ to fill the second syllable required for minimality reasons. Downing (1999, 2001) notes that isiNdebele, isiZulu and other Bantu languages pattern with siSwati. She argues that all monosyllabic verb forms augment through /-ji-/ epenthesis to satisfy RED [σσ]. She further proposes that the target for reduplication is the PStem, not the PWord. This accounts for the surface realisation of the output forms in partial reduplicants where the reduplicants are disyllabic forms rather than a copy of the whole PStem. Aligning the epenthetic syllable with the reduplicant indicates that /-ji-/ augments the reduplicant, not the PWord which constitutes the reduplicant and the input verb stem.

In Kinande, Downing (1999) observes, doubles the root, while in Kikuyu, V1 in both the root and the reduplicated root gain a mora, making them long vowels. In Ndau, a vowel is inserted for the purposes of minimality. Tshivenda inserts the conjunctional suffix /-a-/ with monosyllabic verb roots, which makes it more like Ndau. Interestingly, in Tshivenda the minimal size of a root must be monosyllabic for reduplication to occur. This differentiates Tshivenda from siSwati and the other languages. Verb roots are required to have at least one syllable to qualify for reduplication, otherwise, an auxiliary verb is used. Nominals also have strict minimality requirements where monosyllabic roots are reduplicated with the prefix to ensure the reduplicative is minimally disyllabic – unlike di- or polysyllabic stems which omit the prefix. The differences seen in the reduplication processes in Tshivenda add support to the Co-Phonology Theory just like what we saw with ikalanga. Below I present Table 14 showing the asymety in reduplication templates in different Bantu languages. It presents reduplication in siSwati, Kinande, Kikuyu (Downing, 1999, p. 63- 64), isiZulu, isiNdebele (Downing, 2001, p. 46), and chiNdau (Mutonga et al., 2018, p. 9) monosyllabic verbs.

Table 15: Comparison of Reduplication in different Bantu languages

Language	Stem	Reduplicated	gloss
SiSwati	/-fa/	[**fayi**fa]	die
isiZulu	/-ma/	[**mayi**ma]	stand
IsiNdebele	/-lwa/	[**lwayi**ːlwa]	fight
Kikuyu	/-goa/	[**go**ː**a**goːa]	Fall
Tshivenda	/-sɛa/	[**sɛa**sɛa]	Laugh
Kinande	/-swa/	[**swaswa**swa]	Grind
ChiNdau	/-rʲa/	[**rʲaa**rʲa]	Eat

5.3. Minimality effects in siSwati Nominals

Similar to verbs, nouns enforce binarity requirements on the PWord. This means that subminimal constructions are not permitted across nominals in siSwati. To illustrate this, I discuss the blocking and application of augmentation repair strategies in nouns, pronouns, and hypocoristic names. I begin the analysis with nouns.

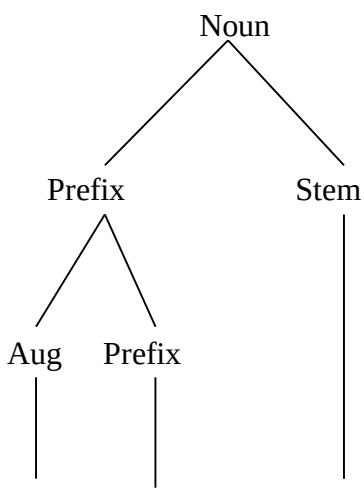
5.3.1 Word minimality in /mu/ truncation in siSwati

To begin with, /mu/ reduction is a phonological phenomenon attested in various Bantu languages (See Poulos & Msimang, 1998; Liphola, 2001; Harford & Malambe, 2015; Kadenge, 2015; Odden, 2015; Kadenge & Chebanne, 2017; Downing & Mtenje, 2017), amongst others. In these languages, the Class 1 and 3 prefix is obligatorily reduced in polysyllabic nominal and verbal stems, but is sometimes retained before monosyllabic ones. For instance, Cope (1984, p, 84) notes that isiZulu uses the full prefix with monosyllabic stems, while the shortened version is used with polysyllabic

stems. The application of this phonological phenomenon is conditioned by minimality restrictions imposed on the PWord.

As per the dictates of the siSwati grammar, the /mu/ class prefix is realised with the vowel in monosyllabic PStems but is truncated in PStems that are two or more syllables (see Mkoko, 2021). /mu/ reduction as a phenomenon occurring in Classes 1 and 3 points to the importance of the phonology and morphology interface in phonological analysis. The noun class system consists of an overt pre-prefix, an onsetless vowel occurring before the noun class prefix, a common phenomenon in Bantu and Nguni morphology (Sibanda, 2009; Mudzingwa, 2010; Harford & Malambe, 2011; Mudzingwa & Kadenge, 2013; Kadenge, 2015; Sabao, 2015). The Zulu, Ndebele, and Xhosa grammars have maintained the pre-prefix across all noun classes, even those in which siSwati has lost the initial vowel. Sibanda and Mabuza (1996), Harford and Malambe (2011), Mudzingwa and Kadenge (2013) as well as Kadenge (2015) note that the siSwati grammar has a mixed system of noun classes, where only classes 1, 3, 4, 6, and 9 appear with the pre-prefix. Below is a revised nominal structure of all the augment classes in siSwati (see Mkoko, 2021)

In Figure 1:



Class 1 /u	mu	ntfu/	[u.mu.ⁿtfu]	‘person’
Class 3 /u	mu	ti/	[u.mu.ti]	‘homestead’
Class 6 /e	ma	nti/	[e.ma.ⁿti]	‘water’
Class 9 /i	N	komo/	[i.ŋko.mo]	‘cow’

Figure 1: The augment in the siSwati noun class system

The size of the PStem determines the application and blocking of /mu/ reduction in Classes 1 and 3 nouns in siSwati. The obligatory /mu/ truncation is conditioned by the size of the noun stem whereupon the class prefix is realised with the vowel in monosyllabic PStems, but appears truncated when it appears with nouns that are two or more syllables, a minimality constraint in the language. Consider the examples below in (335) through (338);

335.	/úmù-^{n}tfù/	→	[ú.mù. ^{n}tfù]	*u.ṃ .tfu
			CL1-person	
			‘person’	
336.	/úmù-fí/	→	[ú.mù.fí]	*u.ṃ .fi
			CL1-deceased	
			‘the deceased’	
337.	/úmù-tí/	→	[ú.mù.tí]	*u.ṃ .ti
			CL3-homestead	
			‘homestead’	
338.	/úmù-tsí/	→	[ú.mù.tsí]	*u.ṃ .tsi
			CL3-herb/medicine	
			‘herb/medicine’	

In the monosyllabic nouns *[u.ṃ.tfu] in (335), *[u.ṃ.fi] in (336), *[u.ṃ.ti] in (337) as well as *[u.ṃ.tsi] in (338), are ungrammatical in siSwati. In these nouns Min-WD is fatally violated which is an indomitable high-ranking constraint hence /mu/ tuncation is blocked since it would lead to subminimality. The grammar permits that the prefix be reduced only when it appears before disyllabic and polysyllabic PStems as illustrated below:

339. /úmù-fáti/ → [ú.ṃ .fá.ti]

CL1-wife

‘wife’

340. /úmù-fánà/ → [ú.ṃ .fá.nà]

CL1-boy

‘boy’

341. /úmù-fu^{n}dzi/ → [u.ṃ.fu.^{n}dzi]

CL1-learner

‘learner’

342. /úmù- k^{h}atsi / → [ú.ṃ.k^{h}á.tsi]

CL3-division

‘division’

343. /úmù-tf^{w}álo/ → [ú.ṃ.tf^{w}á.lo]

CL3-load

‘load’

The above disyllabic and polysyllabic examples typically reduce /mu/ and the resultant nasal is syllabic, non-moraic [ṃ] since the input PStems are minimally well-formed. The /mu/ truncation process provides an ideal context on how siSwati grammar blocks or permits the occurrence of various phonological processes due to minimality conditions. We further observe that /mu/ reduction as a phenomenon occurring in Classes 1 and 3 points to the importance of the phonology and morphology boundary in phonological investigation. As alluded ealier on in Chapter 3, siSwati has a mixed noun class system, with noun classes that have an overt augment.

I further discuss the truncation of Classes 1 and 3 OM in adjectives which show minimality effects at play. Below, I look at how /mu/ is reduced as conditioned by the syllable size and I use adjectives to illustrate /mu/ truncation in Qualifiers: as shown in (344) through (352) below;

344. /ló-mù-dvúnà/ → [lo.ṃ .dvú.nà]

QUAL-CL1.OM-male

'the male one'

345. /lò-mù-síɠât´í/ → [lò.ṃ .sí.ɠâ.t´í]

QUAL-CL1.OM-female

'the female one'

346. /lò-mù-khùlù/ → [lò.ṃ .khù.lù]

QUAL-CL1/3.OM-big

'the big one'

347. /lò-mù-ŋ|ánè/ → [lò.ṃ .ŋ|á.nè]

QUAL-CL1/3.OM-small

'the small one'

348. /lò-mù-dzálà/ → [lò.ṃ .dzá.là]

QUAL-CL1/3.OM-old

'the old one'

349. /lò-mù-ɬe/ → *[lò.ṃ.ɬe]

QUAL-CL1/3.OM-beautiful

'the beautiful one'

350. /lò-mù-ɓí/ → *[lò.ṃ.ɓí]

QUAL-CL1/3.OM-ugly

'the ugly one'

351. /lò-mù-dzè]/ → *[lò.ṃ. dzè]

QUAL-CL1/3.OM-tall

'the tall one'

352. /lò-mù-ʃà/ → *[lò.ṃ. ʃà]

QUAL-CL1/3.OM-new

‘the new one’

The examples presented above demonstrate the truncation of OMs in the formation of adjectives. As indicated, these NCs display the same behaviour as the Classes 1 and 3 nominal prefixes where the resultant nasal is syllabified as syllabic and non-assimilatory, in line with the syllabification effects in /mu/ derived contexts. The size of the PStem determines the application and blocking of /mu/ reduction in Classes 1 and 3 OM in adjectives in siSwati. The obligatory /mu/ truncation is conditioned by the size of the adjectival stem whereupon the OM is realised with the vowel in monosyllabic adjectival stems, but appears truncated when it appears with adjectival stems that are two or more syllables, a minimality constraint in the language. The truncation process in monosyllabic adjectival stems results to ungrammartical representations as seen in (349) through (352).

Minimality requirements also play a crucial role in /mu/ reduction in Classes 1 and 3 loanwords. Loanwords usually undergo phonetic and phonological adaptation into the adoptive language (Batibo, 1996). ‘Personal’ and ‘impersonal’ nouns assigned into Classes 1 and 3 conform to the obligatory truncation of the class prefix /mu/ only in stems that are minimally two syllables. The examples in (353) to (357) below are an illustration of this truncation in polysyllabic loanwords. The exapmples are adapted from Mkoko (2021, p 127).

353. /úmù-bàbàt´ísí/ → [ú.m̩ .bà.bà.t´í.sí]

CL1-baptist

‘baptist’

354. /úmù-díkhónì/ → [ú.m̩ .díkhó.nì]

CL1-deacon

‘deacon’

355.	/úmù-bínì/	→	[ú.ṃ .bí.nì]
			CL3-bin
			‘bin’
356.	/úmù- dòlí/	→	[ú.ṃ .dò.lí]
			CL3-doll
			‘doll’
357.	/úmù-ʃínì/	→	[u.ṃ .ʃí.nì]
			CL3-machine
			‘machine’

The above examples demonstrate that loanwords behave similarly to Classes 1 and 3 indigenous nouns, whereby the application of the /mu/ reduction process gives rise to a non-assimilatory, syllabic nasal [ṃ].

There is a great debate on whether the augment should account for minimality in siSwati grammar. Pertaining this debate, I present two opinions on why we exclude pre-prefix from counting towards minimality. First, I note that the prosodic domain entails that in determining minimality rule application the size of the PStem, not the PWord, is the inspiration for the application and blocking of the /mu/ truncation process. To form minimally well-formed PWords in siSwati, the prefix before monosyllabic PStems is not vulnerable to truncation, while disyllabic and polysyllabic get truncated since they are minimally well-fomed. This means that disyllabic PStems should be considered minimally well-formed in the grammar, hence their vulnerability to /mu/ truncation, a phonological process contingent upon the size of the PStem. Secondly, I also postulate that the augment falls outside of the PWord but within the PStem in line with what Kadenge, (2015) observes.

On the retention of the augment in /mu/ truncation classes, Kadenge further observes that the pre-prefix in isiZulu and isiNdebele does not form part of the PWord, but that it is prefixed to an already well-formed PWord. I adopt the same analysis for siSwati, noting that the language retains the high labial vowel /u/ in monosyllabic stems to avoid having a subminimal PWord consisting of the syllabic nasal and the subminimal noun stem in the surface representation. Even though the output nasal in /mu/ truncation is syllabic and should therefore count towards minimality, deleting the labial vowel in subminimal PStems is not optimal since it fataly violates a high ranking indomitable minimality constraint in the grammar.

Kadenge (2015) further notes that the /mu/ truncation grammar employs HIGH VOWEL ELISION and MAX-IO. These two constraints necessitate /mu/ truncation in Classes 1 and 3 noun stems with two or more syllables in siSwati. I have alluded that /mu/ truncation is blocked in subminimal forms thus violating a high-ranking constraint, HIGH VOWEL ELISION.

However, since MIN-WD is an indomitable constraint in the grammar I assume for word minimality, HIGH VOWEL ELISION will be ranked lower, to create room the surface realisation of the class prefix /mu/ in subminimal forms. These two constraints can be presented thus; MIN-WD >> HIGH VOWEL ELISION >> MAX-IO to block deletion in monosyllabic PStems. These two constraints outranked by MIN-WD are formalised below:

358. HIGH VOWEL ELISION

Parsing of high rounded vowel is prohibited.

(Harford & Malambe, 2011, p. 7; Kadenge, 2015, p. 96)

359. MAX-IO

Elision of segments is prohibited.

(Kager, 1999, p. 67)

In /mu/ truncation MIN-WD outranks HIGH VOWEL ELISION and MAX-IO as seen demonstrated in Tableau 15 below.

Tableau 15: Blocking /mu/ reduction in subminimal PStems

/ú-mù-tí/	M_{IN}-W_D	$H_{IGH}V_{OWEL}E_{LISION}$	MAX-IO
a. [ú.ṃ .tí	*!		*
☞b. ú.mù.tí		*	

The grammar has eliminated candidate (a) for deleting the high labial vowel [u] thus fatally violating MIN-WD, an indomitable high-ranking constraint in the grammar and MAX-IO which is olow ranking. Candidate (b) parses the [u] but this is not considered a fatal violation since HIGH VOWE LELISION is low ranking. Note that the augment does not count towards minimality otherwise (a) would have been optimal in the grammar.

The same grammar blocks parsing [u] in the surface representation of minimally well-formed PStems, where the optimal candidate elides [u] and parses an output syllabic [ṃ], ranking MIN-WD and HIGH VOWEL ELISION over MAX-IO to allow /mu/ deletion in the optimal candidate.

Tableau 16: /mu/ reduction and minimality in well-formed PStems

/ú-mù-fá-nà/	M_{IN}-W_D	$H_{IGH}V_{OWEL}E_{LISION}$	MAX-IO
a. [ú.mu.fá.nà]	*!	*	
☞b. [ú.ṃ .fá.nà]			*

Even though minimally well-formed, candidate (a) is eliminated for parsing vowel [u] in the prefix, thus incurring a fatal violation of MIN-WD, which requires disyllabic PStems to truncate the prefix vowel. This deletion violates HIGH VOWEL ELISION. The optimal candidate (b) has truncated the prefix and the PStem is binary, and satisfies MIN-WD and HIGH VOWEL ELISION, both high-ranking constraints in the grammar. Candidate (b) only violates MAX-IO and such violation is not fatal since it is a low-ranking constraint in the grammar. Next, I discuss minimality effexts in siSwati pronouns.

5.3.2 Word minimality in Pronouns

In the formation of absolute pronouns in siSwati, the language juxtaposes the SM, formative [o] and stabiliser [-nà] (Ziervogel & Mabuza, 1976; Sibanda & Mthembu, 1996) to satisfy the disyllabic word minimality restriction to on the PWord. Consider the following examples:

360.	/ú-o-nà /	→	[wó.nà]
			CL3.it
			'it'
361.	/lí-o-nà /	→	[ló.nà]
			CL5.it
			'it'
362.	/sí-o-nà/	→	[só.nà]
			CL7.it
			'it'
363.	/tí-o-nà/	→	[kó.nà]
			CL.8.it
			'it'
364.	/í-o-nà/	→	[jó.nà]

CL9.SM-it

'it'

365. /ɓú-o- nà/ → [ɓó.nà]

CL14.SM-it

'it'

366. /kú-o-nà/ → [kó.nà]

CL15.SM-it

'it'

The above data illustrate the formation of the absolute pronoun in siSwati, highlighting how the addition of the stabiliser satisfies the minimality requirement in the grammar. Note that V1 in each configuration eliminates the dispreferred VV sequences. SiSwati grammar does not tolerate hiatus configurations and as such employs various repair strategies such as glide formation and vowel elision to eliminate output VV sequences.

Ziervogel and Mabuza (1976) as well as Sibanda and Mthembu (1996) note that the stabiliser does not appear when the SM and formative /o/ occur with other affixes. This is evident in cases where the absolute pronoun denotes location. This analysis points to the phonologica role that /-nà/ plays in the formation of the pronoun in siSwati. It is there to make the promoun minimally disyllabic as shown by the examples below in (367) through (371);

367. /kú-li-o/ → [kú.lò] *ku.lo-na

LOC-CL5.SM-it

'to it'

368. /kú-si-o/ → [kú.sò] *ku.so-na

LOC-CL7.SM-it

‘to it’

369.	/kú-ti-o/	→	[kú.tò]	*ku.to-na
			LOC-CL8.SM-it	
			‘to them’	
370.	/kú-ɓu-o/	→	[kú.ɓò]	*ku.ɓo-na
			LOC-CL14.SM-it	
			‘to it’	
371.	/kú-ku-o/	→	[kú.kò]	*ku.ko-na
			LOC-CL15.SM-it	
			‘to it’	

Adding the stabilizer to well-formed pronouns is illegal in the grammar of siSwati as shown above in (367) through (371). The role of the stabilizer is phonological; to make the pronoun minimally two syllables, as per the dictates of the grammar.

Tableau 17: Resolving minimality through augmentation in monosyllabic pronouns

/lò/	M_{IN}-W_D	IDENT (Morph)	DEP-IO
a. [lò]	***!**		
☞b. [lò.nà]			*

Tableau 17 illustrates that demonstrative pronoun conforms to the disyllabic template for the minimal word in siSwati. The monosyllabic pronoun in (b) is our optimal candidate and it triggers augmentation through morpheme /-na/ epenthesis to satisfy M_{IN}-W_D, a high-ranking indomitable constraint. Candidate (b) only violates DEP-IO by suffixing the morpheme, a low-ranking constraint in the grammar. However, the non-augmented candidate (a) is in fatal violation of minimality restrictions in the grammar, hence its elimination. Candidate (a) fatally violates a high-

ranking constraint M_{IN}-W_D and also parses the subminimal PStem as an independent grammatical word, which is another phonological violation on minimality. PStems can be monosyllabic as long as they appear with affixes to form minimally disyllabic, well-formed PWords. Tableau 18 below illustrates that epenthesising /-na/ to an already well-formed pronoun incurs a fatal violation of IDENT (Morph).

Tableau 18: Blocking Augmentation in well-formed Pronouns

/lesi/	M_{IN}-W_D	IDENT (Morph)	DEP-IO
☞a. [le.si]			
b. [le.si.na]		***!**	*

From the above Tableau, the disyllabic demonstrative pronoun [le.si] does not appear with any epenthetic morpheme, it still surfaces as the optimal candidate as it is considered well-formed in siSwati. IDENT (Morph) eliminates candidate candidate (b) for adding /-na/ to a well-formed PWord, thus incurring a fatal violation. The grammar indicates that it is not optimal to insert a syllable to a well-formed PWord hence *le.si.na is illegal in the grammar.

In these pronouns, IDENT (Morph) blocks /-nà/ insertion when the absolute pronoun marker appears with other affixes such as the ones in (367) to (371), indicating that [kú-] counts for minimality. This patterns with the assumed grammar on the siSwati imperative where augmentation through /-ni] insertion is only allowed with the bare PStem in underlying monosyllabic forms such as [f á-nì] and not in [kú.fà], respectively. The grammar I assume for minimality conditions in siSwati pronouns therefore remains MIN-WD >>> IDENT (Morph) >>> DEP-IO to allow the augmentation of subminimal constructions while blocking epenthetic material in well-formed PWords.

5.3.3 Word minimality in hypocoristic nouns

Additional evidence for word minimality effects is presented in the shortening of given names. Malambe (2006) states that the common practice in forming nicknames or pet names in siSwati is to shorten the name to two syllables rather than one or three. This is in line with minimality conditions in the language in that monosyllabic names are submininal, while two or more syllables would defeat the purpose for shortening the hypochoristic names. Consider the following examples:

372.	/ɬeŋiwe/	→	[ɬe.ŋi]	* [ɬe]	
373.	/ɓusisiwa/	→	[ɓu.si]	* [ɓu.si.si]	*[ɓu]
374.	/ɬoɓisile/	→	[ɬo.ɓi]	*[ɬo]	* [ɬoɓisi]
375.	/temalaŋeni/	→	[te.ma]	*[te]	* [temala]

In the above examples, the polysyllabic hypocoristic names are reduced to minimally well-formed shortened PWords. Shortening these forms any further would yield minimally ungrammatical representations, violating minimality restrictions in the grammar.

5.3.4 Word minimality effects in siSwati loan word phonology

Siswati also exhibit evidence for minimality constraint through monosyllabic loan words. SiSwati has a disyllabic requirement on the PWord. This is evident in the truncation of extrasyllabic consonants. We note that if deleting the consonant will result in a subminimal construction, one where the stem would be less than one syllable, then deletion is blocked. Sometimes, consonants are deleted for ease of articulation and like vowels; consonants vulnerable to deletion are usually extrasyllabic. We note that if deleting the consonant will result in a subminimal construction, one

where the stem would be less than one syllable, then deletion is blocked. Consider the following examples:

376.	[plæŋk]	→	[lí.p´u.là.ŋò]	‘plank’
377.	[tæŋk]	→	[lí.th à.ŋé]	‘tank’
378.	[bæŋk]	→	[lí.bà.ŋé]	‘bank’
379.	[kəntrækt]	→	[í.gò.nthì.rá.kí]	‘contract’
380.	[ləʊkeɪʃn̩]	→	[lí.lò.gǐ.ʃì]	‘location’
381.	[steɪʃn̩]	→	[sí.t´è.ʃí]	‘station’
382.	[kɪ.tʃɪn]	→	[lí.kh ì.ʃí]	‘kitchen’
383.	[gɑdn̩]	→	[í.ŋ gà.dzé]	‘garden’
384.	[ʌvn̩]	→	[í.ʔà.ví.nì]	‘oven’
385.	[kɜtn̩]	→	[lí.kh é.th í.nì]	‘curtain’

In as much as consonant deletion is not a productive repair strategy in the nativisation of loanwords, there are a few instances in which the grammar allows such to occur. Note that the above data have deleted final consonants. However, deleting the final consonant in in (384) and (385) would yield a subminimal construction; hence the siSwati grammar protects the final consonant. However, it is worth noting that this is not a conclusive analysis of this repair strategy, hence the need for further research that would provide insights on the reason and target for consonant deletion over the much more prevalent consonant retention.

5.4 Summary of the chapter

The chapter has demonstrated that languages employ different phonological resolution strategies that conspire to enforce binarity on their PWords. The discussion also indicated that siSwati ranks MIN-WD high to enforce restrictions on subminimality across all grammatical categories. The

study has placed the syllable at the centre of the discussion, aligning minimality restrictions on the PWord with the goals of the dissertation. The chapter further indicated that Bantu languages are typologically different, as the unit for minimality measure can either be the syllable or the mora, as seen in some Swahili and Chitonga representations (Park, 1995; Mkochi, 2009). I also noted how other morphological processes such as reduplication enforce binarity on the PStem, and not the PWord.

Furthermore, I have revealed that resolution strategies for word minimality in siSwati can either utilise phonological or morphological augmentation independent of the category of the word under investigation. In this discussion, I presented that in verbs, epenthetic coronal vowel [i] is inserted in the passive form, while the same category inserts morphemes [-ni] in imperatives and [-ji-] in reduplicated forms.

SiSwati minimality effects pattern with the grammar of other languages such as isiNdebele, isiZulu, isiXhosa, and chiShona, amongst others, highlighting the typological similarities and differences in minimality effects across various Bantu languages. Lastly, Chichewa (Downing & Mtenje, 2017) demonstrated that even though the target for minimality effects is the same as in siSwati, the repair strategies are dissimilar. I noted how Chichewa grammar enforces phonological augmentation through [i] epenthesis across all grammatical categories. IKalanga, on the other hand, exhibited the existence of co-phonologies where the grammar selected depended on the word category. For instance, monosyllabic verbs and pronouns are subminimal and therefore repaired through augmentation, while monosyllabicity is optimal in nouns and adjectives. All the languages discussed herein demonstrate the importance of crosslinguistic analysis of phonological processes to map the level of similarities and differences in phonological analysis.

The study has illustrated how languages with the same (or similar) requirements deal with the problem differently. For example, Xitsonga and chiZezuru have the same verb stem [dja], 'eat' but different strategies to solve it. Xitsonga adds a morpheme to the end of the word, while chiZezuru epenthesises a vowel [i] to the beginning of the word. SiSwati, on the other hand, is very reminiscent of Xitsonga, but for the morpheme itself siSwati suffixes [-ni] as opposed to Xitsonga's [-na]. IsiZulu, isiNdebele and siSwati also have the same verb stem [ɮa] but different strategies to solve it; with siSwati adding a morpheme to the end of the word, while isiZulu and isiNdebele epenthesises a morpheme [ji] to the beginning of the word.

The requirements for minimality evident from this study are the same crosslinguistically, with siSwati and Xitsonga employing a suffixal morpheme as opposed to the prefixal morpheme employed by all the other Nguni languages. We may speculate that in these Bantu languages prefixing is unmarked while suffixing is marked. It seems like it is a universal tendency for the Nguni languages to resolve subminimalty through a prefixal augmentative morpheme which is a vowel in most cases than suffixing a morpheme.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS FOR FURTHER STUDY

6.1. Conclusion

The dissertation demonstrated how siSwati enforces minimality restrictions on the PWord through epenthesising phonological and morphological material to augment subminimal constructions. The study has demonstrated that the Prosodic Hierarchy and its domains determine whether the siSwati grammar triggers or blocks augmentation to satisfy minimality constraints. I have established that siSwati grammar blocks augmentation in minimally well-formed constructions. The grammar ranks MINIMALITY above DEPENDENCY to achieve minimally well-formed surface representations. This ranking suffices for all Nguni languages and other Bantu languages that enforce binarity on all surface forms, with the Nguni languages leaning on both phonological and morphological epenthesis to augment subminimal configurations.

Swahili and Luganda, on the other hand, consider bimoraicity and disyllabicity in word size restrictions. In these languages, there are morphosyntactic contexts that permit monomoraic PWords, while others are typologically similar to siSwati in that they augment subminimal forms through phonological or morphological epenthesis. To compensate for minimality requirements, Swahili and Luganda trigger vowel lengthening as an optimal augmentation strategy to ensure that surface forms are bimoraic. In Chitonga, monomoraicity is optimal, making it typologically different from siSwati. Chichewa and iKalanga have also proven to be typologically dissimilar in dealing with prosodic minimality. Chichewa, for instance, triggers [i] epenthesis across all contexts, while iKalanga minimality is context-dependent. Monosyllabic nouns and adjectives in iKalanga are well-formed, while verbs and pronouns require [i] epenthesis to satisfy minimality restrictions. While all languages discussed place MINIMALITY above DEPENDENCY in their grammar, iKalanga and Tshivenda permits co-phonologies in which MIN-WD outranks DEP-IO

in contexts that trigger augmentation, but DEP-IO outranks MIN-WD in contexts where monosyllabicity is not a minimality violation in the grammar. The discussion on the various minimality restrictions imposed on different grammars demonstrated that siSwati grammar is typologically similar to most Bantu languages that place a disyllabic requirement on their PWords, situating the study within the broader theoretical discussion on Bantu linguistics and minimality effects. Ranking MINIMALITY above DEPENDENCY also highlights the interaction between markedness and faithfulness in OT, indicating that siSwati grammar sometimes penalises subminimality by violating faithfulness to the input. In this case, markedness constraints trump faithfulness constraints to ensure conformity to the binarity restrictions on the PWord, in line with the goals the dissertation set out to attain.

In this thesis, I provided evidence for the distinct roles that the PWord and the PStem play in phonological analysis. The discussion noted how siSwati grammar places certain restrictions on the PWord that are not necessarily applicable within the PStem. /mu/ truncation, word minimality, and the reduplication process displayed this disparity in detail. Firstly, the argument highlighted how /mu/ truncation is contingent upon the size of the PStem and not the PWord. SiSwati grammar indicated that monosyllabic PStems do not undergo /mu/ reduction while stems longer than two syllables optimally truncate the prefix, parsing a syllabic nasal in the output. Secondly, the study indicated that minimality restrictions are enforced on the PWord and not the PStem, pointing out that siSwati minimality restrictions are applicable to the PWord and not the PStem. For instance, siSwati grammar places a disyllabic requirement on all surface representations of the PWord, while PStems can be optimally monosyllabic. However, subminimal PStems do not appear as independent morphemes but require augmentative material to form minimally well-formed PWords. Lastly, the reduplication process revealed how monosyllabic PStems require morphological augmentation to satisfy RED [σσ], while disyllabic and polysyllabic stems do not trigger epenthesis. The different PH domains play a pivotal role in highlighting the importance of

studying the intricate phonological and morphological domains in phonological analysis. The distinct roles that the PStem and PWord play in phonological analysis also support Downing and Kadenge's (2015, 2020) argument that the PStem ≠ the PWord.

Lastly and most importantly, the study has revealed that Nguni languages are taking the direction of prefixing as compared to suffixing. Prefixing is unmarked in most Nguni languages while suffixing is marked. This may be attributed to historical changes in these languges. By having siSwati ans Xitsonga only in this family that steel opt for suffixing in the imperative means that they are still faithful to the universals of change as they have retained the proto-Bantu imperative marker which is suffixal athough in difeerent formats of / -ni/ and /-na/ respectively.

This makes siSwati very unique and we may also predict that siSwati is moving from suffixing to prefixing. As a native speaker, I have observed that the current generation of siSwati speakers, especially in media platforms normaly inserts a pefixal morpheme when speaking. It is common for school going kids to say [ji-ma] instead of [ma-ni] "stop''. This is very reminiscent of isiZulu as it employs the pefixal morpheme [ji-] in the formation of the imperative. Siswati and IsiZulu are two cognate and mutually intelligible languages that share the characteristics of Nguni macro and micro linguistics. In the near future we may have siSwati grammar adopting prefixing as an unmarked feature just like the other Nguni languages.

6.2. Recommendations for Further Study

Although it is hoped that the research and analyses presented here are thorough and present a comprehensive account of siSwati repair strategies with regard to PWord minimality, there are still unanswered questions and areas of the language that are yet to be delved into.

The detailed analysis of minimal word effects in siSwati is a contribution to Bantu phonology in general. As discussed in Chapter 2, minimal word effects are known to occur in other Bantu

languages. This dissertation documents the pervasiveness of minimal word effects in one Nguni language, siSwati. It can then serve as a point of comparison with minimal word effects in other Bantu languages, encouraging both detailed studies of individual Bantu languages and diachronic and comparative studies of different subgroups of Bantu. One example of findings in comparative studies in Bantu could be that, in imperative verbs with monomoraic or monosyllabic verb stems, Chichewa, Sesotho and Shona, among others, adopt a prothetic vowel /i/ or /e/. Siswati takes the plural imperative marker /ni/, and Swahili takes the infinitive marker /ku/. Another example is that Chichewa, Luganda, Shona, Siswati, and Swahili equally adopt an epenthetic vowel in passive verb formation with undersized verb stems.

As a final point, this dissertation makes a contribution to phonology in general. The siSwati case exhibits one of the most dynamic cases of the minimal word effect among the world's languages, and it confirms the wide applicability of the phonological concept of the minimal word to languages. Previous work on minimal word effects has for the most part been based on a few phenomena in single languages and not on finding pervasive effects as in siSwati. Finally, the formal description of the minimal word condition as an optimality-theoretic constraint not only shows how the minimal word effect can be accounted for in an optimality- theoretic grammar, but it also provides a good example of how variation can be accounted for by reranking of constraints.

6.3. Summary of Chapter

The final chapter of this dissertation presented a conclusion, summarising the major findings of the research. It also presented some suggestions for further study as this study can serve as a point of comparison with minimal word effects in other Bantu languages, encouraging both detailed studies of individual Bantu languages and diachronic and comparative studies of different subgroups of Bantu.

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APPENDIX 1 SISWATI VERBS

Monosyllabic

1.	fa	[fa]	‘die’
2.	pha	[pa]	‘give ’
3.	va	[va]	‘hear’
4.	dla	[ɮa]	‘eat’
5.	wa	[wa]	‘fall’
6.	ya	[ja]	‘go’
7.	ta	[t´a]	‘come’
8.	lwa	[lwa]	‘fight’
9.	na	[na]	‘rain’
10.	sha	[ʃa]	‘burn’
11.	sho	[ʃo]	‘say’

Vowel initial

12.	akha	[akh a]	‘build’
1**3.**	osa	[osa]	‘roast’
14.	onga	[oŋga]	‘save’
15.	opha	[opha]	‘bleed’
16.	oma	[oma]	‘be dry/thirsty’
17.	ona	[ona]	‘sin’
18.	ati	[at´i]	‘know’
19.	atsi	[atsi]	‘say’
20.	eba	[eɓa]	‘steal’
21.	endza	[endᶻa]	‘marry’
22.	elusa	[elusa]	‘herd’

23. ewela [ewela] ‘cross’

24. enta [ent´a] ‘do ’

Disyllabic

25. pheka [pʰeɠa] ‘cook’

26. hleka [ɬeɠa] ‘laugh’

27. pompa [p´omp´a] ‘pump’

28. vuma [vuma] ‘agree’

29. tsela [tˢela] ‘pour’

30. tjela [tʃ´ela] ‘tell’

31. geza [geza] ‘bath’

32. hlanta [ɬant´a] ‘throw up’

33. lala [lala] ‘sleep’

34. hlala [ɬala] ‘sit’

35. bona [ɓona] ‘see’

36. buka [ɓuɠa] ‘look’

37. buya [ɓuja] ‘come back’

38. natsa [natˢa] ‘drink’

39. shaya [ʃaja] ‘beat’

40. cela [ǀela] ‘ask’

41. cala [ǀala] ‘begin’

42. cina [ǀina] ‘be strong’

43. china [ǀhina] ‘braid’

44. chuma [ǀhuma] ‘burst’

45. cuma [ǀuma] ‘grunt’

46. cumba [ǀumba] ‘swell in size’

47. ncwila [ŋ|ʷila] ‘drown’

48. bhala [bʰala] ‘write’

49. bala [ɓala] ‘count’

50. gana [gana] ‘fall in love’

51. tsandza [tsaⁿdza] ‘like/love’

52. nika [niɠa] ‘give’

53. nuka [nuɠa] ‘smell’

54. dvuma [dvuma] ‘sound of engine/thunder’

55. dvuba [dvuɓa] ‘pout’

56. bhodla [boɬa] ‘burp/roar’

57. bamba [ɓaᵐba] ‘hold’

58. ngena [ŋgena] ‘enter’

59. phuma [pʰuma] ‘exit’

60. hamba [haᵐba] ‘go’

61. bita [ɓit´a] ‘call’

62. bila [ɓila] ‘boil’

63. mbimba [ᵐbiᵐba] ‘run very fast’

64. mpimba [ᵐpiᵐba] ‘snitch’

65. mbatsa [ᵐbatsa] ‘cover oneself’

66. mbetsa [ᵐbetsa] ‘cover someone else’

67. mbonya [mboɲa] ‘cover’

68. mfimfa [ᵐfiᵐfa] ‘leak’

69. nyanya [ɲaɲa] ‘dislike’

70. basa [ɓasa] ‘light a fire’

71. landza [laⁿdza] ‘fetch’

72. hlala [ɬala] ‘sit’

73.	sala	[sala]	‘remain’
74.	senga	[seŋa]	‘milk’
75.	luma	[luma]	‘bite’
76.	lima	[lima]	‘cultivate’
77.	khala	[k^hala]	‘cry’
78.	kala	[k´ala]	‘measure’
79.	gala	[gala]	‘dig in preparing to sow’
80.	khula	[k^hula]	‘grow’
81.	khetsa	[k^hetsa]	‘choose’
82.	gcina	[ǀgina]	‘stop/keep’
83.	gcoka	[ǀgoɠa]	‘dressed up’
84.	phela	[p^hela]	‘finish’
85.	phila	[p^hila]	‘live’
86.	sika	[siɠa]	‘cut’
87.	goba	[go ɓa]	‘bend’
88.	juba	[ʤuɓa]	‘cut’
89.	gubha	[guba]	‘dig’
90.	gula	[gula]	‘fall sick’
91.	khipha	[k^hip^{h}a]	‘remove’
92.	hleba	[ɬeɓa]	‘gossip’
93.	hleka	[ɬeɠa]	‘laugh’
94.	bopha	[ɓop^{h}a]	‘tie/arrest’
95.	vuta	[vut´a]	‘leak’
96.	vela	[vela]	‘appear’
97.	veta	[vet´a]	‘reveal’
98.	tsetsa	[tsetsa]	‘scold’

99. faka [faɠa] ‘put’

100. vutsa [vutsa] ‘burn’

Three syllables

101. thandaza [tʰaⁿdaza] ‘pray’

102. fakaza [faɠaza] ‘testify’

103. hlakula [ɬaɠula] ‘weed’

104. hlonipha [ɬonipha] ‘respect’

105. gibela [giɓela] ‘climb’

106. hushula [huʃula] ‘pour everything out’

107. bukela [ɓuɠela] ‘watch’

108. buketa [ɓuɠet´a] ‘review/revise’

109. memeta [memet´a] ‘scream’

110. lalela [lalela] ‘listen’

111. gamula [gamula] ‘break’

112. tamula [t´amula] ‘yawn’

113. tayela [t´ajela] ‘get used to’

114. shayela [ʃajela] ‘drive’

115. nyatsela [ɲatsela] ‘step on’

116. khamisa [kʰamisa] ‘open your mouth’

117. nambitsa [naᵐbitsa] ‘savour’

118. tsanyela [tsaŋela] ‘sweep’

119. nyatsela [ɲatsela] ‘step on’

120. hlanyela [ɬaŋela] ‘sow’

121. hhakela [pʰaɠela] ‘serve’

122. fohlota [foɬot´a] ‘crush’

123. k^{h}anyisa [k^{h} aɲisa] ‘switch on’

124. chafata [|hafat´a] ‘press’

125. gicika [gi|iɠa] ‘roll’

126. gicita [gi|it´a] ‘roll something’

127. sebenta [seɓe^{n}ta] ‘work’

128. lingisa [liŋisa] ‘imitate’

129. lungisa [luŋisa] ‘fix’

130. sinata [sinat´a] ‘grin’

131. khumula [k^{h}umula] ‘undress’

132. khuluma [k^{h}uluma] ‘talk’

133. khombisa [k^{h}ombisa] ‘show’

Four syllables

134. hlanganyela [łaŋaɲela] ‘meet with’

135. hlangabeta [łaŋaɓet´a] ‘meet halfway’

136. shumayela [ʃumajela] ‘preach’

137. hlukumeta [łuɠumet´a] ‘illtreat’

138. gugubula [guguɓula] ‘unearth’

139. phakamisa [paɠamisa] ‘lift’

Five syllables

140. cacametela [|a|amet´ela] ‘struggle’

141. Pheleketela [p^{h}eleɠet´ela] ‘accompany’

142. gambalatela [ga^{m}balat´ela] ‘drink excesively’

APPENDIX 2 SISWATI NOUNS AND NOUN CLASSES

Classes	Nouns	Transcription	Gloss
1	1. Umuntfu	[umuntfu]	‘person’
	2. Umntfwana	[umntfwana]	‘child’
	3. Umtukulu	[umt´ukulu]	‘grandchild’
	4. Umshana	[umʃana]	‘niece/nephew’
	5. Umfati	[umfat´i]	‘wife’
	6. Umfana	[umfana]	‘boy’
	7. Umfundzi	[umfundzi]	‘learner’
	8. Umfundisi	[umfundisi]	‘pastor’
	9. Umufi	[umufi]	‘deceased’
	10. Umgijimi	[umgiʤimi]	‘runner’
	11. Umongi	[umoŋgi]	‘nurse’
	12. Umutfwa	[umutfwa]	‘dwarf’
	13. Umnaketfu	[umnaketfu]	‘brother’
	14. Umngani	[umŋgani]	‘friend’
2	15. bantfu	[bantfu]	‘people’
	16. bantfwana	[bantfwana]	‘children’
	17. batukulu	[bat´ukulu]	‘grandchildren’
	18. bashana	[baʃana]	‘nieces/nephews’
	19. bafati	[bafat´i]	‘wives’
	20. bafana	[bafana]	‘boys’
	21. bafundzi	[bafundzi]	‘learners’
	22. bafundisi	[bafundisi]	‘pastors’
	23. bafi	[bafi]	‘deceased people’

	24. bagijimi	[bagidʒimi]	‘runners’
	25. bongi	[boŋgi]	‘nurses’
	26. batfwa	[batfwa]	‘dwarfs’
	27. banaketfu	[banaketfu]	‘brothers’
	28. bangani	[baŋgani]	‘friends’
1a	29. Malume	[malume]	‘uncle’
	30. Gogo	[gogo]	‘grandmother’
	31. Mkhulu	[mkhulu]	‘grandfather’
	32. Make	[maɠe]	‘mother’
	33. Babe	[ɓaɓe]	‘father’
	34. Babekati	[ɓaɓeɠat´i]	‘aunt’
	35. Malumekati	[malumeɠat´i]	‘uncle’s wife’
	36. Thishela	[t^{h}iʃela]	‘teacher’
	37. Dzadzewetfu	[$d^{z}ad^{z}$ewetfu]	‘sister’
	38. Mzala	[mzala]	‘cousin’
	39. Lohheya	[loɦeja]	‘crow’
	40. Chamu	[ǀhamu]	‘mountain lizard’
	41. Logwaja	[logwadʒa]	‘hare’
	42. Ncedze	[ŋǀedze]	‘small bird
2a	43. boMalume	[malume]	‘uncle’
	44. boGogo	[gogo]	‘grandmother’
	45. boMkhulu	[mkhulu]	‘grandfather’
	46.boMake	[maɠe]	‘mother’
	47. boBabe	[ɓaɓe]	‘father’
	48. boBabekati	[ɓaɓeɠat´i]	‘aunt’

	49. boMalumekati	[bomalumeɠat´i]	‘uncle’s wives’
	50. boThishela	[bothiʃela]	‘teachers’
	51. bodzadzewetfu	[bodzadzewetfu]	‘sisters’
	52. boMzala	[bomzala]	‘cousins’
	53. boLohheya	[boloɦeja]	‘crows’
	54. boChamu	[bo|hamu]	‘mountain lizards’
	55. boLogwaja	[bologwadʒa]	‘hares’
	56. boNcedze	[boŋ|edze]	‘small birds’
3	57. Umuti	[umut´i]	‘homestead’
	58. Umutsi	[umutsi]	‘herb’
	59. Umkhatsi	[umkhatsi]	‘division’
	60. Umfula	[umfula]	‘river’
	61. Umtfwalo	[umtfwalo]	‘load’
	62. Umukhwa	[umukwa]	‘knife’
	63. Umbhidvo	[umbidvo]	‘green vegetable’
	64. Umbane	[umɓane]	‘lightning’
	65. Umshibo	[umʃiɓo]	‘relish’
	66. Umgewu	[umgewu]	‘vagabond’
	67. Umushi	[umuʃi]	‘stripe’
	68. Umoya	[umoja]	‘wind’
	69. Ummemo	[ummemo]	‘official invite’
	70. Umendvo	[umendvo]	‘marriage’
	71. Umhlaba	[umɬaɓa]	‘earth’
	72. Umtsetfo	[umtsetfo]	‘law’
	73. Umlente	[umlente]	‘leg’

	74. Umkhaba	[umkhaɓa]	‘potbelly’
	75. Umjovo	[umʤovo]	‘vaccine’
	76. Umgogodla	[umgogoɮa]	‘spine’
	77. Umtsanyelo	[umtsaɲelo]	‘broom’
	78. Umnyango	[umɲaŋo]	‘door’
	79. Umuno	[umuno]	‘finger’
	80. Umsebenti	[umseɓent´i]	‘work’
	81. Umsele	[umsele]	‘trench’
	82. Umgodzi	[umgodzi]	‘pit’
	83. Ummbila	[ummbila]	‘maize’
	84. Umlomo	[umlomo]	‘mouth’
	85. Umncele	[umn|ele]	‘border’
	86. Umtsambo	[umtsambo]	‘vein’
	87. Umgedze	[umgedze]	‘cave’
	88. Umbono	[umɓono]	‘idea’
4	89. imiti	[imit´i]	‘homesteads’
	90. imitsi	[imitsi]	‘herbs’
	91. imikhatsi	[imikhatsi]	‘divisions’
	92. imifula	[imifula]	‘rivers’
	93. imitfwalo	[imitfwalo]	‘loads’
	94. imikhwa	[imikwa]	‘knives’
	95. imibhidvo	[imibidvo]	‘green vegetables’
	96. imibane	[imiɓane]	‘lightnings’
	97. imishibo	[imiʃiɓo]	‘relishes’
	98. imigewu	[imigewu]	‘vagabonds’

	99. imishi	[imiʃi̪]	‘stripes’
	100. imimoya	[imimoja]	‘winds’
	101. imimmemo	[imimmemo]	‘tradional dance’
	102. imendvo	[imendvo]	‘marriages’
	103. imihlaba	[imiɬaɓa]	‘earth’
	104. imitsetfo	[imitsetfo]	‘laws’
	105. imilente	[imilente]	‘legs’
	106. imikhaba	[imik^{h}aɓa]	‘potbellies’
	107. imijovo	[imiʤovo]	‘vaccines’
	108. imigogodla	[imigogoɮa]	‘spines’
	109. imitsanyelo	[imitsaɲelo]	‘brooms’
	110. iminyango	[imiŋaŋo]	‘doors’
	111. imino	[imino]	‘fingers’
	112. imisebenti	[imiseɓent´i]	‘works’
	113. imisele	[imisele]	‘trenches’
	114. imigodzi	[imigodzi]	‘pits’
	115. imimmbila	[imimmbila]	‘numerous maize’
	116. imilomo	[imilomo]	‘mouths’
	117. imincele	[imin|ele]	‘borders’
	118. imitsambo	[imitsambo]	‘veins’
	119. imigedze	[imigedze]	‘caves’
	120. imibono	[imiɓono]	‘ideas’
5	121. libala	[liɓala]	‘yard’
	122. licandza	[li|andza]	‘egg’
	123. liso	[liso]	‘eye’

	124. litinyo	[lit´iɲo]	‘tooth’
	125. lihlombe	[liɬombe]	‘shoulder’
	126. likhala	[likhala]	‘nose’
	127. lidvolo	[lidvolo]	‘knee’
	128. ligundvwane	[ligundvʷane]	‘rat’
	129. ligagasi	[ligagasi]	‘wave’
	130. licala	[li|ala]	‘court case’
	131. libunti	[liɓunt´i]	‘forehead’
	132. libhande	[libande]	‘belt’
	133. libhuloho	[libuloho]	‘bridge’
	134. lihhashi	[liɲaʃì]	‘horse’
	135. licaca	[li|a|a]	‘skunk’
	136. likhaya	[likhaja]	‘home’
	137. likhasi	[likhasi]	‘page’
	138. libhala	[libala]	‘wheelbarrow’
	139. lidaladi	[lidaladi]	‘barbed wire’
	140. likamelo	[lik´amelo]	‘bedroom’
	141. libhayi	[libaji]	‘baby blanket’
	142. libele	[liɓele]	‘breast’
	143. libele	[liɓele]	‘sorghum’
	144. linyeva	[liɲeva]	‘thorn’
	145. lisondvo	[lisondvo]	‘wheel’
	146. Lisontfo	[lisontfo]	‘church’
	147. Litsanga	[litsaŋa]	‘thigh/pumpkin’
	148. Libutfo	[liɓutfo]	‘regiment’

	149. Libulo	[liɓulo]	‘swarm’
	150. Lilima	[lilima]	‘people who weed’
	151. Lizinyane	[liziɲane]	‘kid’
	152. Libhubesi	[libuɓesi]	‘lion’
	153. Litfole	[litfole]	‘calf’
	154. Lituba	[lit´uɓa]	‘dove’
	155. Litfuba	[litfuɓa]	‘chance’
	156. Liphela	[liphela]	‘cockroach’
	157. Liphupho	[liphupho]	‘dream’
	158. Lidvuba	[lidvuɓa]	‘zebra’
	159. Litubulo	[lit´uɓulo]	‘first born’
	160. Litfumbu	[litfumbu]	‘intestine’
	161. Liloko	[liloɠo]	‘dress’
	162. Licembe	[li|embe]	‘leaf’
	163. Licembu	[li|embu]	‘team’
	164. Lintjwele	[lintʃwele]	‘chick’
	165. Litulu	[lit´ulu]	‘rain’
	106. Libhontjisi	[libontʃisi]	‘bean’
	167. Lintongomane	[lintoŋomane]	‘peanut’
	168.Litsemba	[litsemba]	‘trust/hope’
	169. Libhodo	[libodo]	‘pot’
	170. Litje	[litʃ´e]	‘stone’
	171. Ligala	[ligala]	‘branch’
	172. Lihlatsi	[liɬatsi]	‘forest’’
	173. LiSwati	[liswati]	‘Swati’

	174. Lishiya	[liʃija]	‘eyebrow’
6	175. emabala	[emaɓala]	‘yards’
	176. emacandza	[ema|andza]	‘eggs’
	177. ematinyo	[emat´iɲo]	‘teeth’
	178. emahlombe	[emałombe]	‘shoulders’
	179. emakhala	[emak^{h}ala]	‘noses’
	180. emadvolo	[emad^{v}olo]	‘knees’
	181. emagundvwane	[emagundvwane]	‘rats’
	182. emagagasi	[emagagasi]	‘waves’
	183. emacala	[ema|ala]	‘court cases’
	184. emabunti	[emaɓunt´i]	‘foreheads’
	185. emabhande	[emabande]	‘belts’
	186. emabhuloho	[emabuloho]	‘bridges’
	187. emahhashi	[emaɦaʃi]	‘horses’
	188. emacaca	[ema|a|a]	‘skunks’
	189. emakhaya	[emak^{h}aja]	‘homesteads’
	190. emakhasi	[emak^{h}asi]	‘pages’
	191. emabhala	[emabala]	‘wheelbarrows’
	192. emadaladi	[emadaladi]	‘barbed wires’
	193. emakamelo	[emak´amelo]	‘bedrooms’
	194. emabhayi	[emabaji]	‘baby blankets’
	195. emabele	[emaɓele]	‘breasts’
	196. emabele	[emaɓele]	‘sorghums’
	197. emanyeva	[emaŋeva]	‘thorns’
	198. emasondvo	[emasond^{v}o]	‘wheels’

	199. emasontfo	[emasontfo]	‘churches’
	200. ematsanga	[ematsaŋa]	‘thigh/pumpkins’
	201. emabutfo	[emaɓutfo]	‘regiments’
	202. emabulo	[emaɓulo]	‘swarms’
	203. emazinyane	[emaziɲane]	‘kids’
	204. emabhubesi	[emabuɓesi]	‘lions’
	205. ematfole	[ematfole]	‘calves’
	206. ematuba	[emat´uɓa]	‘doves’
	207. ematfuba	[ematfuɓa]	‘chances’
	208. emaphela	[emap^{h}ela]	‘cockroaches’
	209. emaphupho	[emap^{h}up^{h}o]	‘dreams’
	210. emadvuba	[emad^{v}uɓa]	‘zebras’
	211. ematubulo	[emat´uɓulo]	‘first borns’
	212. ematfumbu	[ematfumbu]	‘intestines’
	213. emaloko	[emaloɠo]	‘dresses’
	214. emacembe	[ema|embe]	‘leaves’
	215. emacembu	[ema|embu]	‘teams’
	216. emantjwele	[emantʃwele]	‘chicks’
	217. emabhontjisi	[emabontʃisi]	‘beans’
	218. emantongomane	[emantoŋomane]	‘peanuts’
	219. ematsemba	[ematsemba]	‘hopes’
	220. emabhodo	[emabodo]	‘pots’
	221. ematje	[ematʃ´e]	‘stones’
	222. emagala	[emagala]	‘branches’
	223. emahlatsi	[emałatsi]	‘foresst’’

	224. emaSwati 225. emashiya	[emasʷati] [emaʃija]	‘Swatis’ ‘eyebrows’
7	226. Sisu 227. Sihlahla 228. Sibaya 229. Sitsendze 230. Sitsembu 231. Silwane 232. Sinkhwa 233. Sibunu 234. Silevu 235. Sihlatsi 236. Sibuko 237. Sigulane 238. Sihlakaniphi 239. Sintfu 240. Sandla 241. Sahhukulu 242.Sangcotfo 243. Sicatfulo 244. Sati 245. Sono 246. Sondlo 247. Sento 248. Sihlakala	[sisu] [siɬała] [siɓaja] [sitsendze] [sitsembu] [silwane] [siŋkwa] [siɓunu] [silevu] [siɬatsi] [siɓuko] [sigulane] [siɬaɠaniphi] [sintfu] [sanɮa] [saɦuɠulu] [saŋ|gotfo] [si|atfulo] [sat´i] [sono] [sonɮo] [sent´o] [siɬaɠala]	‘stomach’ ‘tree’ ‘kraal’ ‘heel’ ‘polygamy’ ‘animal’ ‘bread’ ‘buttock’ ‘beard/chin’ ‘cheek’ ‘mirror’ ‘sick person’ ‘smart person’ ‘vernacular’ ‘hand’ ‘owl’ ‘hailstorm’ ‘shoe’ ‘wise person’ ‘sin’ ‘child maintenance’ ‘deed’ ‘ankle’

	249. Sidalwa	[sidalwa]	‘crippled person’
	250. Silomo	[silomo]	‘beautiful person’
	251. Sichwe	[si|hwe]	‘dwarf’
	252. Sigwegwe	[sigwegwe]	‘bow leg’
	253. Sigwadzi	[sigwadzi]	‘single man’
	254. Sidzakwa	[sidzakwa]	‘drunkard’
	255. Sivalo	[sivalo]	‘door’
	256. Sipheko	[sipheɠo]	‘food contribution’
	257. Siphambano	[siphambano]	‘cross’
	258. Sililo	[sililo]	‘dirge’
	259. Sigulumba	[sigulumba]	‘tractor’
	260. Sihlantsi	[siɬantsi]	‘traditional mat’
	261. Sifo	[sifo]	‘disease’
	262. Sifuba	[sifuɓa]	‘chest’
	263. Simo	[simo]	‘condition’
	264. Sigwebo	[sigweɓo]	‘sentence’
	265. siphepho	[siphepho]	‘hailwind’
	266. Sive	[sive]	‘nation’
	267. Sihlutfu	[siɬutfu]	‘unkempt afro’
	268. Sikhehle	[sikheɬe]	‘nest of wasps’
	269. Siwekle	[siwekle]	‘ward of cash’
	270. Sidleke	[siɮeɠe]	‘bird nest’
	271. Sikipa	[sikˊipˊa]	‘T-shirt’
	272. Sicuku	[si|uɠu]	‘crowd’

8	273. tisu	[tisu]	‘stomaches’
	274. tihlahla	[tiɬaɬa]	‘trees’
	275. tibaya	[tiɓaja]	‘kraals’
	276. titsendze	[titsendze]	‘heels’
	277. titsembu	[titsembu]	‘polygamys’
	278. tilwane	[tilwane]	‘animals’
	279. tinkhwa	[tiŋkwa]	‘breads’
	280. tibunu	[tiɓunu]	‘buttocks’
	281. tilevu	[tilevu]	‘beards/chins’
	282. tihlatsi	[tiɬatsi]	‘cheeks’
	283. tibuko	[tiɓuko]	‘mirrors’
	284. tigulane	[tigulane]	‘sick people’
	285. tihlakaniphi	[tiɬaɠaniphi]	‘smart persons’
	286. tintfu	[tintfu]	‘vernacular’
	287. tandla	[tanɮa]	‘hands’
	288. tahhukulu	[taɦuɠulu]	‘owls’
	289.tangcotfo	[taŋ|gotfo]	‘hailstorms’
	290. ticatfulo	[ti|atfulo]	‘shoes’
	291. tati	[tat´i]	‘wise persons’
	292. tono	[tono]	‘sins’
	293. tondlo	[tonɮo]	‘child maintenance’
	294. tento	[tent´o]	‘deeds’
	294. tihlakala	[tiɬaɠala]	‘ankles’
	295. tidalwa	[tidalwa]	‘crippled people’
	296. tilomo	[tilomo]	‘wise people’

	297. tichwe	[ti|hwe]	‘dwarfs’
	298. tigwegwe	[tigwegwe]	‘bow legs’
	299. tigwadzi	[tigwadzi]	‘single men’
	300. tidzakwa	[tidzakwa]	‘drunkards’
	301. tivalo	[tivalo]	‘doors’
	302. tipheko	[tipheɠo]	‘food contributions’
	303. tiphambano	[tiphambano]	‘crosses’
	304. tililo	[tililo]	‘dirges’
	305. tigulumba	[tigulumba]	‘tractors’
	306. tihlantsi	[tiɬantsi]	‘traditional mats’
	307. tifo	[tifo]	‘diseases’
	308. tifuba	[tifuɓa]	‘chests’
	309. timo	[timo]	‘conditions’
	310. tigwebo	[tigweɓo]	‘sentence’
	311. siphepho	[siphepho]	‘hailwinds’
	312. tive	[tive]	‘nations’
	313. tihlutfu	[tiɬutfu]	‘unkempt afro’
	314. tikhehle	[tikheɬe]	‘nest of wasps’
	315. tiwekle	[tiwekle]	‘ward of cash’
	316. tidleke	[tiɮeɠe]	‘bird nests’
	317. tikipa	[tik´ip´a]	‘T-shirts’
	318. ticuku	[ti|uɠu]	‘crowds’
9	319. Inja	[indʒa]	‘dog’
	320. Intfo	[intfo]	‘thing’
	321. Intfulo	[intfulo]	‘blue-head’

	322. Indvodza	[indvodza]	‘man/husband’
	323. Indengane	[indeŋane]	‘soft porridge’
	324. Indlebe	[inɮɛɓe]	‘ear’
	325. Indlu	[inɮu]	‘house’
	326. Ingcosa	[iŋ|gosa]	‘elbow’
	327. Indlovu	[inɮovu]	‘elephant’
	328. Intsamo	[intsamo]	‘neck’
	329. Intsambo	[intsambo]	‘rope’
	330. Inhlanyelo	[inɬaɲelo]	‘seed’
	331. Indlulamitsi	[inɮulamitsi]	‘giraffe’
	332. Indlala	[inɮala]	‘hunger’
	333. Incwancwa	[iŋ|waŋ|wa]	sour porridge’
	334. Incenye	[iŋ|ɛɲe]	‘part of’
	335. Incence	[iŋ|eŋ|e]	‘breast milk’
	336. Inkhomo	[iŋkhomo]	‘cow’
	337. Inkhobe	[iŋkhoɓe]	‘boiled mealies’
	338. Inkhophe	[iŋkhope]	‘eyelash’
	339. Inkhundla	[iŋkhunɮa]	‘Traditional admin.’
	340. Inkhukhu	[iŋkhukhu]	‘chicken’
	341. Inkhosi	[iŋkhosi]	‘king’
	342. Inkhosikati	[iŋkhosiɠat´i]	‘queen’
	343. Inkhosatana	[iŋkhosat´ana]	‘eldest daughter’
	344. Inkhaba	[iŋkhaɓa]	‘belly button’
	345. Ingulube	[iŋguluɓe]	‘pig’
	346. Ingubo	[iŋguɓo]	‘blanket/dress’

	347. Inganekwane	[iŋganeɕwane]	‘folktale’
	348. Ingoma	[iŋgoma]	‘song’
	349. Ingobiyane	[iŋgobijane]	‘monkey’
	350. Inkomishi	[iŋk´omiʃi]	‘cup’
	351. Ingwembe	[iŋgwembe]	‘pin’
	352. Imbuti	[imbuti]	‘goat’
	353. Imvu	[imvu]	‘sheep’
	354. Imfene	[imfene]	‘baboon’
	355. Imbolwane	[imbolwane]	‘mongoose’
	356. Impompi	[imp´omp´i]	‘tap’
	357. Imphepho	[imphepho]	‘incense’
	358. Imphumulo	[impumulo]	‘nose’
	359. Inyoka	[iɲoɕa]	‘snake’
	360. Inyama	[iɲama]	‘meat’
	361. Inyalitsi	[iɲalitsi]	‘needle’
	362. Inyoni	[iɲoni]	‘bird’
	363. Inyosi	[iɲosi]	‘bee’
	364. Inyekevu	[iɲeɕevu]	‘cricket’
	365. Inyembeti	[iɲembet´i]	‘teardrop’
	366. Inyanga	[iɲaŋa]	‘traditional healer’
	367. Inyeti	[iɲet´i]	‘moon’
10	368. tinja	[tindʒa]	‘dogs’
	369. tintfo	[tintfo]	‘things’
	370. tintfulo	[tintfulo]	‘blue-heads’
	371. tindengane	[tindeŋane]	‘soft porridges’

	372. tindlebe	[tinɮeɓe]	‘ears’
	373. tindlu	[tinɮu]	‘houses’
	374. tingcosa	[tiŋ|gosa]	‘elbows’
	375. tindlovu	[tinɮovu]	‘elephants’
	376. tintsamo	[tintsamo]	‘necks’
	377. tintsambo	[tintsambo]	‘ropes’
	378. tinhlanyelo	[tinɬaɲelo]	‘seeds’
	379. tindlulamitsi	[tinɮulamitsi]	‘giraffes’
	380. tincwancwa	[tiŋ|waŋ|wa]	‘sour porridges’
	381. tincenye	[tiŋ|eɲe]	‘parts of’
	382. tincence	[tiŋ|eŋ|e]	‘breast milk’
	383. tinkhomo	[tiŋkhomo]	‘cows’
	384. tinkhobe	[tiŋkhoɓe]	‘boiled mealies’
	385. tinkhophe	[tiŋkhope]	‘eyelashes’
	386. tinkhundla	[tiŋkhunɮa]	‘Traditional admins.’
	387. tinkhukhu	[tiŋkhukhu]	‘chickens’
	388. tinkhaba	[tiŋkhaɓa]	‘belly buttons’
	389. tingulube	[tiŋguluɓe]	‘pigs’
	390. tingubo	[tiŋguɓo]	‘blankets/dresses’
	391. tinganekwane	[tiŋganeɕwane]	‘folktales’
	392. tingoma	[tiŋgoma]	‘songs’
	393. tingobiyane	[tiŋgobijane]	‘monkeys’
	394. tinkomishi	[tiŋk´omiʃi]	‘cups’
	395. tingwembe	[tiŋgwembe]	‘cooking pins’
	396. timbuti	[timbuti]	‘goats’

	397. timvu	[timvu]	‘sheeps’
	398. timfene	[timfene]	‘baboons’
	399. timbolwane	[timbolwane]	‘mongoose’
	400. timpompi	[timp´omp´i]	‘taps’
	401. timphepho	[timphepho]	‘incense’
	402. timphumulo	[timpumulo]	‘noses’
	403. tinyoka	[tiɲoɠa]	‘snakes’
	404. tinyama	[tiɲama]	‘meats’
	405. tinyalitsi	[tiɲalitsi]	‘needles’
	406. tinyoni	[tiɲoni]	‘birds’
	407. tinyosi	[tiɲosi]	‘bees’
	408. tinyekevu	[tiɲeɠevu]	‘crickets’
	409. tinyembeti	[tiɲembet´i]	‘teardrops’
	410. tinyanga	[tiɲaŋa]	‘traditional healers’
	411. tinyeti	[tiɲet´i]	‘moons’
11	412. Lunyawo	[luɲawo]	‘foot’
	413. Lunwele	[lunwele]	‘hair’
	414. lulwimi	[lulwimi]	‘tongue’
	415. luhlanya	[luɬaŋa]	‘lunatic’
	416. ludziwo	[ludziwo]	‘calabash’
	417. lugalo	[lugalo]	‘finger’
	418. lubondza	[luɓondza]	‘wall’
	419. luswane	[luswane]	‘infant’
	420. luswayi	[luswayi]	‘salt’
	421. lubisi	[luɓisi]	‘milk’

	422. luswati	[luswat´i]	‘stick for beating’
	423. lukhuni	[lukhuni]	‘firewood’
	424. lukhula	[lukhula]	‘weed’
	425. lukhalo	[lukhalo]	‘waist’
	426. lutsi	[lutsi]	‘stick’
	427. lutsango	[lutsaŋo]	‘traditional fence’
	428. lutwane	[lut´wane]	‘toe’
	429. lucetu	[lu|et´u]	‘piece’
	430. ludziwo	[ludziwo]	‘calabash’
	431. luphuya	[luphuja]	‘pauper’
12	432. tinyawo	[tiɲawo]	‘feet’
	433. tinwele	[tinwele]	‘hairs’
	434. tilwimi	[tilwimi]	‘tongues’
	435. tinhlanya	[tinɬaŋa]	‘lunatics’
	436. tindziwo	[tindziwo]	‘calabashes’
	437. tingalo	[tingalo]	‘fingers’
	438. tibondza	[tiɓondza]	‘walls’
	439. tinswane	[tinswane]	‘infants’
	440. tinswayi	[tinswayi]	‘salts’
	441. tinswati	[tinswat´i]	‘sticks for beating’
	442. tinkhuni	[tinkhuni]	‘firewoods’
	443. tinkhula	[tinkhula]	‘weeds’
	444. tinkhalo	[tinkhalo]	‘waists’
	445. tintsi	[tintsi]	‘sticks’
	446. tintsango	[tintsaŋo]	‘traditional fences’

	447. tintwane	[tint´wane]	‘toes’
	448. tincetu	[tin|et´u]	‘pieces’
	449. tindziwo	[tindziwo]	‘calabashes’
	450. timphuya	[timpʰuja]	‘paupers’
14	451. buhlalu	[ɓuɬalu]	‘beads’
	452. bubi	[ɓuɓi]	‘ugliness’
	453. buvila	[ɓuvila]	‘laziness’
	454. bulili	[ɓulili]	‘gender’
	455. bucili	[ɓu|ili]	‘slyness’
	456. buhle	[ɓuɬe]	‘beauty’
	457. bukhulu	[ɓukhulu]	‘size (big)’
	458. buncane	[ɓuŋ|ane]	‘size (small)’
	459. budze	[ɓudze]	‘height’
	460. buncane	[ɓuŋ|ane]	‘age/number(small)’
	461. bubanti	[ɓuɓant´i]	‘width’
	462. butfongo	[ɓutfoŋo]	‘sleep’
	463. bukhosi	[ɓukhosi]	‘royalty’
	464. buso	[ɓuso]	‘face’
	465. buntfu	[ɓuntfu]	‘humanity’
	466. budli	[ɓuɮi]	‘gluttony’
	467. bulwane	[ɓulwane]	‘‘bestiality’
	468. buve	[ɓuve]	‘nationality’
	469. boya	[ɓoja]	‘fur’
15	470. kudla	[ɠuɮa]	food’
	471. kufa	[ɠufa]	‘death’

	472. kulwa	[ɠulwa]	‘fight’
	473. kuhamba	[ɠuhamba]	‘departure’
	474. kubuka	[ɠuɓuɠa]	‘looking’
	475. kungena	[ɠuŋgena]	‘entrance’
	476. kuphuma	[ɠuphuma]	‘exiting’
	477. kwati	[ɠwat´i]	‘knowing’
	478. kosa	[ɠosa]	‘roasting’
	479. kona	[ɠona]	‘sinning’
	480. kopha	[ɠopha]	‘bleeding’
	481. koma	[ɠoma]	‘thirst’

Appendix 3: Ethics Clearance Waiver Letter

SCHOOL OF Literature, Language and Media ETHICS COMMITTEE
CONSTITUTED UNDER THE UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

CLEARANCE CERTIFICATE **PROTOCOL NUMBER: WSLLM-LING-1**

PROJECT TITLE MINIMALITY IN SISWATI

INVESTIGATOR VUSI MUSA MAGONGO

SCHOOL/DEPARTMENT	SLLM/Linguistics
DATE CONSIDERED	26 January 2024
DECISION OF THE COMMITTEE	Approved
RISK LEVEL	Minimal risk
EXPIRY DATE	26 January 2025

ISSUE DATE OF CERTIFICATE 30 January 2024 **CHAIRPERSON** Prof. Anette Horn

A. Horn

cc: Supervisor : Prof Maxwell Kadenge

DECLARATION OF INVESTIGATOR

To be completed in duplicate and **ONE COPY** returned to the Chairperson of the School/Department ethics committee.

I fully understand the conditions under which I am are authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

procedure as approved I/we undertake to resubmit the protocol to the Committee.

_____ _____/_____/_____

Signature **Date**

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES