Phonology and Morphology of Modern Sinhala

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A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

in the Department

of

Linguistics

ACCEPTED
FACULTY OF GRADUATE STUDIES

DEAN

DATE 1990-04-25

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ABSTRACT

This dissertation organizes the Modern Sinhala lexicon within the framework proposed by Lieber in *The Organization of The Lexicon*, 1981. Following Lieber, Sinhala verb, noun and affix morphemes are analysed descriptively and their lexical processes, both derivational and compounding, are examined within the theoretical parameters of that work.

This dissertation argues that tense marking in verb morphology and number in noun morphology (which also includes definite and indefinite marking) are best accounted for as derivational processes in contrast to the traditionally accepted inflectional processes. It is claimed that in noun and verb categories, allomorphy is a factor in the underlying representation of the lexicon. On the other hand, allomorphy in noun number marking affixes is due to a morphological rule sensitive to class membership of nouns. Going beyond *The Organization of The Lexicon* which is limited to morphological rules, this study includes phonological rules operating in the lexicon.

Finally, in accord with the results of this dissertation two suggestions are made: First, it is essential that a complete study of Modern Sinhala phonology include an extensive investigation of the syllable structure; Second, the concept of level ordering in the lexicon should be utilized to account for the hierarchical distribution of affixes. Support for the first suggestion rests on the

morpholexical rules, while the second rests on the hierarchical distribution of affixes described by subcategorization and X-bar indexing in this study.

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ACKNOWLEDGEMENTS

My sincere thanks go to Dr. B. F. Carlson, my supervisor who insightfully and metaculously guided me throughout my graduate programme.

I thank very sincerely the members of my dissertation committee, Dr. T. M. Hess, Dr. H. J. Warkentyne, Dr. S. Gunasinghe, and the external examiner Dr. G. D. Prideaux who are all resposible for raising the questions that led to many improvements in this work.

Dr. G. N. O'Grady, Dr. T. E. Hukari, and Dr. D. Bates discussed parts of this dissertation with me. To them all, I am grateful.

I wish to thank other members of the faculty of the Department of Linguistics and in particular, Dr. J. F. Kess, who as chairman and teacher always encouraged me; Dr. B. P. Harris for her concern and ready cooperation as Graduate Adivsor.

Thanks to Ms. Darlene Wallace and Mrs. Gretchen Moyer of the Departmental office for their consistant support.

A special word of thanks is owed the Gunasinghe family. Their company and friendship supported me greatly through these years. In their kitchen, Siri, Hemi and I discussed and argued the many points of Sinhala grammar as this dissertation took shape. I will never forget those times which always included delicious Sri Lankan meals which Hemi prepared!

I also wish to acknowledge the moral support given me by my fellow graduate students in the Department: Andrea, Suzanne, Michael, Chiharu, Sandra, Erica,

Evan, Hua, Hyong-Joong, Laura, Jennifer, Kimiko, Ping, Judy, Chu-Cheng, Kimary, Lydia, Nadia & Daniel, Lucie, and Barbara. They have been a close group of friends who added immeasurably to the pleasure of my graduate studies. Some of these people have continued to support and encourage me even after their leaving the University.

My friends in Victoria have always made me feel at home in Canada. I owe them a word of appreciation, especially Doubravka (Dee), Lorna & Auntie Margaret, Frank, Heather and Robert Gray.

Final thanks go to the Canadian Commonwealth Association for its continued financial assistance throughout my graduate programme.

DEDICATION

With due respect to my teacher

Ven. Mampe Wimalakeerthi Thero

and

with Love to

my mother and father

and

to the memory of

my grandmother

Chapter I

BACKGROUND

1.1 Brief History of Sinhala

Sinhala is spoken by over 12 million people in Sri Lanka. Investigations done in the past have attested to the fact that Sinhala belongs to the Indo-European Family of Languages. Geographically cut off from the mainland and confined to an island off the southern tip of India, Sinhala, however, has always been in touch with its sister languages - such as Sanskrit and Pali - in the northern India. In the course of its evolution, Sinhala has come in contact with not only Sanskrit and Pali but also with Tamil, Portuguese, Dutch and English. From the latter group, Tamil is the only Non-Indo-European language while the rest represent two branches - Germanic and Romance - of the Indo-European language family.

The history of the Sinhala Language has been traced back to the 3rd century B.C.. According to the classification of the Sinhala Dictionary, the evolution of the language has been divided into the following stages.

1. Sinhala Prakrit (3c. B.C. - 4c. A.D.)
2. Early Sinhala (4c. A.D. - 8c. A.D.)
3. Middle Sinhala (8c. A.D. - Mid 13c. A.D.)
4. Modern Sinhala (Mid 13c. A.D. - the present)

1.2 Early Grammatical Studies

Sinhala grammatical concepts are inherited from those which began millennia ago for describing Sanskrit and Pali. These ancient grammatical traditions characterize the most valued description of Sinhala yet written, *Sidat Sangarawa* (literally *manual of rules*), which was compiled in the 13th century. Essentially, all subsequent Sinhala grammars use the Sidat Sangarawa as their descriptive model, a model that is not as adequate for conveying the structure of Sinhala as are several 20th century theories of grammar. Furthermore, these Sinhala grammars attempt to describe Literary Sinhala, an archaic form of the language which no one speaks although it is still taught in schools and is the written medium of expression for many purposes. The living spoken language of the Sinhala people has generally been ignored by grammarians. As for example, the column B in the following shows the spoken Modern Sinhala as opposed to its written variety in column A.

A	B
minisa yay "The man goes"	miniha yanawa "The man goes"
minissu yati "The men go"	minissu yanawa "The men go"
oba yannehi "You(sg.) go"	oba yanawa "You(sg.) go"
obala yannahu "You(pl.) go"	obala yanawa "You(pl.) go"
mama yami "I go"	mama yanawa "I go"
api yamu "We go"	api yanawa "We go

1.3 Recent Studies about the Language and This Dissertation

In recent decades, however, there have appeared a few partial descriptions of this or that aspect of modern, spoken Sinhala. See, for example, the work of Abhayasinghe, (1972/73); De Silva, (1972); Dissanayake, (1969); Gair, (1970); Gunasinghe, (1978, 1985). This dissertation attempts to further this work on Modern Spoken Sinhala (hereafter Modern Sinhala) by describing in detail the phonological and morphological structure of its vocabulary. As it will be noticed, the demarcation for the Modern Sinhala era, according to the Sinhala Dictionary, is too vast a span. By the term Modern Sinhala, this study refers to the language of the past five decades. Furthermore, considering the dialectal variations in Modern Sinhala, the data provided in this belong to the standard dialect in Colombo, the capital city of the country.

1.4 Theoretical Approach

The theoretical framework adopted here is that set forth in *The Organzation of the Lexicon* (hereafter OL) by R. Lieber, 1981. This framework proposes a lexicon consisting of three subcomponents including morpholexical rules, binary branching lexical trees and conventions to percolate features up to the branching trees. (These theoretical concepts are described in Chapter II.)

1.5 Chapters to follow

Chapters II, III and IV respectively discuss the topics of verb morphology, noun morphology and word-compounding. Each of these chapters first introduces its topic according to the traditional method before proceeding to analyse the same

in the adopted framework. This is expected to give the prospective readers who are familiar with the traditional methods a little understanding in distinguishing the difference of the approach that this study has taken from that of the traditional. In accord with the premises presented in the OL theory, derivation and inflection, two well-known parameters of morphology, have been treated as a unitary lexical process. The major focus of Chapter II is on the four-way division of the verb. It is argued here that this division is a result of a derivational process rather than stem allomorphy (although such allomorphy does seem to be the major factor in stem variation of a small group of verbs discussed at the end of this chapter). Allomorphy also accounts for the stem variations of some nominals discussed in Chapter III. Where justified by the theoretical criteria, alternating stem shapes are treated as an existing stock in the permanent lexicon and morpholexical rules express the relations within sets of such alternating stem shapes.

In Chapter III where stem allomorphy is commonly observed, nominals are divided into classes with each class consisting of a morpholexical rule. The existence of nominal classes is, in turn, held to be the reason for having several allomorphs for the number marking affix. These alternative affix morphemes are, however, argued to be derived by morphological rules. It is shown that nominal class membership plays a major role in the formation of morphological rules.

Chapter IV addresses the controversial issue of word-compounding in Modern Sinhala. Despite the absence of strong phonological arguments to support the notion of Modern Sinhala word-compounding, Lieber's mechanism of feature percolation convention continues to bear the only morphological evidence that is

found in its favour. It is also shown briefly that traditional descriptions of compounding have relied on semantic derivations.

The last chapter contrasts the results of this study with other contemporary theories such as Lexical Phonology and Morphology. Here too are presented some of the problems encountered with Lieber's framework and some solutions are suggested. Morpholexical rules are indicated as being a strong argument for underlying syllable structure of language, while derivational processes such as verb stem formation are taken to suggest the existence of a level ordering in the lexicon. However, the interactions of phonology and morphology in the lexicon still need further studies.

The framework provided in the OL theory has, overall, proved to be a simple and effective mechanism for organizing the Modern Sinhala lexicon. It is believed that this description of Sinhala provides a useful contribution to the growing understanding of the word formation in human language.

Chapter II

VERB MORPHOLOGY

In a study of the verb morphology in Modern Sinhala, one main point that has to be addressed is the division of a verb into four stem shapes. Whether or not this stem variation is a phenomenon of stem allomorphy in the lexicon, as pointed out for some modern Indo-European languages by Lieber, has yet to be investigated. In what follows, the four-way division of the verb stem will be investigated as it appears in the three tenses together with the verb-noun derivations.

2.1 Preliminaries

The following are the present tense forms of the verb /bala/ "to see" in Modern Sinhala.[1]

2.1.1

a)	balə	-	-nə (-wa)		"look/read"
b)	bæle	-	-nə (-wa)		"see"
c)	balə	-wə	-nə (-wa)		"make (someone) look"
d)	bælə	-we	-nə (-wa)		"make (someone) see"

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[1] Unless otherwise noted or set off by slanted vertical lines (/), the examples given throughout this discussion are surface forms.

According to traditional grammars, the difference between (a) and (b) in 2.1.1 is that the former is a volitional act whereas the latter is involitional. In some ways this is similar to the difference between transitive and intransitive forms of the verb. For example,

2.1.2

(a) ari-nə(-wa) "open" (as in 'He opens the door')

(b) ære-nə(-wa) "open" (as in 'The door opens')

However, further studies reveal that there is something more than the transitive and the intransitive difference operating between these two types of verbs. Literary Sinhala utilizes these two types of verbs to denote the active and passive voices. Spoken Modern Sinhala, having lost the passive construction, now uses the stem of type (b) in 2.1.2 which denotes process together with lack of volition. Verbs of type (a) in 2.1.1 and 2.1.2 have been named Active, whereas those in (b) 2.1.1 and 2.1.2 are called Processive (cf. Gunasinghe 1976). The other two verb types shown in (c) and (d) of 2.1.1 are the Causative counterparts of Active and Processive verbs respectively. In this study, type (c) is named Active Causative and (d) is Processive Causative. Thus, a verb in Modern Sinhala consists of four structural shapes which represent four different aspects. These are Active (=A), Processive (=P), Active Causative (=AC), and Processive Causative (=PC).

2.2 The Three Tenses

2.2.1 Present

2

	1	2	3	4	
A=	balə	-	-nə	(-wa)	"look/read"
P=	bæle	-	-nə	(-wa)	"see"
AC=	balə	-wə	-nə	(-wa)	"make (someone) look"
PC=	bælə	-we	-nə	(-wa)	"make (someone) see"

The column 1 of 2.2.1 shows the stem shapes of the verb root /bala/. As can be observed, there are two main stem variations-bala ~ bæle. It is assumed here that the two suffixes in column 2 are stem forming morphemes and thus there are two more stem variants balәwa and bæləwe , making four the number of stem allomorphs a verb can have.

The -wə /-we suffix in column 2 has been described as a causative marker. Altogether, columns 1 and 2 provide enough information as to the stem variations among the four verb groups in question. Between A and P, the major difference is that the latter has front vowels as opposed to the back vowels in the former. The difference between A and AC is that the latter has the suffix -wa, and it is the front vowels again that make PC different from P. Traditional Sinhala grammars claim that the causative construction is built by affixation. However, nothing is said about the formation of involitive verbs. It is not explicitly mentioned in traditional grammars whether this affixation is inflectional or derivational, nor

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[2] This division of the verbs into columns are not based on any theoretical assumption. It was done to achieve two purposes: one, to clarify the current verbal system, and two, to help the reader grasp the Modern Sinhala verb variations by traditional descriptive methods.

has it been explained whether the vowel fronting is phonological or morphological. Nevertheless, it is evident from the current study that the stem variation in Modern Sinhala verbal system is a productive process. A few more examples are in 2.2.2.

2.2.2

	1	2	3	4	
A=	balə	-	-nə	(-wa)	"look/read"
P=	bæle	-	-nə	(-wa)	"see"*[3]
AC=	balə	-wə	-nə	(-wa)	"CAUS. look"
PC=	bælə	-we	-nə	(-wa)	"CAUS. see"*
A=	wapurə	-	-nə	(-wa)	"sow"
P=	wæpire	-	-nə	(-wa)	"sow"*
AC=	wapurə	-wə	-nə	(-wa)	"CAUS. sow"
PC=	wæpirə	-we	-nə	(-wa)	"CAUS. sow"*
A=	hadə	-	-nə	(-wa)	"make"
P=	hæde	-	-nə	(-wa)	"make"*
AC=	hadə	-wə	-nə	(-wa)	"Caus. make"
PC=	hædə	-we	-nə	(-wa)	"Caus. make"*
A=	hapə	-	-nə	(-wa)	"bite/chew"
P=	hæpe	-	-nə	(-wa)	"bite/chew"*
AC=	hapə	-wə	-nə	(-wa)	"CAUS. bite/chew"

[3] The asterisk (*) serves to warn the reader that the glosses so marked are particularly poor semantic equivalents. Nevertheless, they are the nearest approximations that English affords in a single word.

PC=	hæpə	-we	-nə	(-wa)	"CAUS. bite/chew"*
A=	paturə	-	-nə	(-wa)	"spread"
P=	pætire	-	-nə	(-wa)	"spread"*
AC	paturə	-wə	-nə	(-wa)	"CAUS. spread"
PC=	pætirə	-we	-nə	(-wa)	"CAUS. spread"*
A=	wikə	-	nə	(-wa)	"bite"
P=	wike	-	-nə	(-wa)	"bite"*
AC=	wikə	-wə	-nə	(-wa)	"CAUS. bite"
PC=	wikə	-we	-nə	(-wa)	"CAUS. bite"*

2.2.3 Past Tense

The following are the past tense stem shapes of the verb /bala/ "to see"

	1	2	3	
A=	bælu	-	-wa	"looked/read"
P=	bælu	-	-na	"saw"*
AC=	bæle	-wu	-wa	"CAUS. looked"
PC=	bælə	-wu	-na	"CAUS. saw"*

All the four stem shapes in 2.2.3 have front vowels plus the characteristic vowel u at the end of each stem. The vowel fronting in past tense forms remains unexplained in traditional grammars. Vowel fronting of P and PC in their present tense forms could be argued to have been phonologically conditioned by the stem final front vowel e; but there is no such phonological evidence to support a claim of vowel fronting in past tense stem variants such as in 2.2.3. It should also be

noted that in column 3 of 2.2.3, the -wa suffix associates with A and AC stems whereas the na suffix follows P and PC stems. All these variations require further investigation which is undertaken in section 2.6 after describing the rest of Sinhala stem variation.

2.2.4 Future Tense

The future tense forms of the verb /bala/ are illustrated below.

	1	2	3	
A=	balaa	-	-wi	"will look/read"
P=	bælee	-	-wi	"will see"*
AC=	balə	-waa	-wi	"will CAUS. look"
PC=	bælə	-wee	-wi	"will CAUS. see"*

In the future tense forms, the suffix -wi is added to stem finals which have a lengthened vowel. Traditional Sinhala grammar does not account for these formations in the language.

2.3 Verb-Nouns

Each of the four verb groups- A, P, AC and PC- has a corresponding nominal form as illustrated for the stem variants of the verb root /bala/ in 2.3.1.

2.3.1

A)	bala	->	bæl-iim
P)	bæle	->	bæl-um
AC)	balawa	->	bæləw-iim
PC)	bælawe	->	bæləw-um

(see point one in the last paragraph of 2.11)

Besides these, there are two more nominal forms that cannot be related to an exact stem form in terms of semantics. They are bæl-ili and bæləw-ili.

2.3.2

bæl-ili and bæləw-ili.

Traditional grammars describe these nominals as gerunds and have treated their formation as an inflectional process. As can be noticed from the examples above, there are three suffixes -iim ,-um and -ili occuring with the stem. In 2.3.1, the -um suffix is associated with P or PC stems. This distributional difference for the most part is identical with the semantic references of the particular stem. However, this is not always the case as there are instances where either of the verb-noun pairs - A, AC and P, PC- is used in the same context.

2.4 More allomorphs

The verb root /bala/ has still more stem shapes as illustrated in 2.4.1.

2.4.1

balәbalә	"see or look continuously (volitive)"
bælibæli	"see continuously (involitive)"
balәla	"having seen or looked (volitive)"
bæluu	"seen or looked (volitive Past Parti.)"
balәpu	"seen or looked at (volitive Past Parti.)"
balannә	"see or look (volit. Infinitive)"
balәwannә	"CAUS.see or look (volit.Infinitive)"
bælennә	"see (involit. Infinitive)"
bæləwennə	"CAUS. see (involit. Infinitive)"

So far, various stem variants of the verb root /bala/ were illustrated. It is not only for this particular verb root that there are so many different stem shapes, but also for the rest of the verb roots in Modern Sinhala with only a few exceptions. Current Sinhala grammar books, most of which have followed the traditional grammars, do not present a detailed explanation about the nature of all these stem shapes that exist in the verbal system of Modern Spoken Sinhala. One important point which is evident from overall discussions in traditional grammars is that Sinhala has undergone a great many changes especially in phonology and morphology since the 13th century; however, none of these grammars seems to admit this reality. The discussion about verbs in Sidat-Sangarawa is in fact a good discriptive analysis of that era that would also be helpful in understanding the nature of the current Sinhala verbal system. The discription in Sidat-Sangarawa, about a vast array of affixes occuring with several different verb-forms, speaks to the fact that even at that time the inflectional morphology of Sinhala had already started a process of change which simplified the declensional and conjugational paradigms to the current state. As a result of this, what one can find today is that a limited set of stem forms from the old inflectional system performs some very basic grammatical functions in the language. For example, the infinitive forms, such as in 2.4.1, were in fact dative forms in the old system of verb-noun declensions (Gunasekara,1962). The past tense form bælu was in fact past tense plural stem form whereas bæli was its singular counterpart. When the conjugational and declensional paradigms started to disappear from Sinhala, only a few remained taking over the different basic grammatical functions in Modern Sinhala. It is, therefore, important to pursue a descriptive study of the verbal

system of Modern Sinhala to understand its organization in the lexicon. This study, as mentioned at the beginning, attempts to investigate the concept of stem allomorphy in Modern Sinhala within the framework of OL and to study how far such a theory would be helpful in analyzing and accounting for the phonology and morphology of Modern Sinhala.

2.5 Compounds

It was observed in section 2.1 that each verb root has basically four stem shapes representing the four aspectual classes - A, P, AC, and PC. In section 2.3, it was mentioned that each of these stem shapes has a nominal form in addition to its finite verb form. It was also pointed out that according to the way the traditional grammars treated these stem variants, they were more likely to be the result of an inflectional process.

Following the theoretical background adopted in this study,[4] it is argued to be the case in Modern Sinhala that stem variation is a process that takes place within the lexicon. This assumption can be further supported by the fact that there are compound words as illustrated in 2.5.1 (b) of which one member is a verb-noun.

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[4] Theoretical discussion begins with section 2.6.

2.5.1

(a)

(1)	minis	+	gati	>	minisgati
	human		nature		human nature
(2)	balu	+	pæti	>	balupæti
	dog		small		puppy
(3)	pot	+	saappu	>	potsaappu
	book		shop		book shop

(b)

(1)	bæl-um	+	gal	>	bælumgal
	seeing		rock		watch tower
(2)	kiyəw-iim	+	saala	>	kiyəwiimsaala
	reading		hall		reading hall
(3)	wæw-ili	+	karmaantə	>	wæwilikarmaantə
	plantation		industry		plantation industry

The compounds in 2.5.1 (a) and (b) have a noun + noun combination. In 2.5.1 (a), compounding has taken place between regular nouns whereas in (b) the leftmost sister is a derived noun from a verb stem. The verbal roots of the three verb-nouns bælum, kiyəwiim, and wæwili are /bala/, /kiyawa/ and /wawa/ respectively. If the verb stems were not present in the lexicon, there would not have been reasonable grounds to account for the process such as nominal

derivation and compounding. This kind of evidence in the word-formation of Modern Sinhala supports the claim that the stem variation in Sinhala is a process to be treated in the lexicon. In what follows, this will be discussed in detail within the framework of OL.

2.6 The Word Formation Component according to OL

The Word Formation Component described in OL is composed of three subcomponents - Permanent Lexicon, Lexical Structure, and String Dependent Rule Component. The Permanent Lexicon contains lexical entries, morpholexical rules, and redundancy relations; the Lexical Structure Component consists of binary branching unlabelled trees, and general node labelling conventions; and the String Dependent Rule Component contains productive morphological rules sensitive to the segmental nature of the string on which they operate.

In organizing the Modern Sinhala verb morphology within the OL framework, one has to first consider the lexical items that need to be included in the permanent lexicon and then to account for the rest of the word formation processes with the help of information stored in the two other subcomponents. 2.6.1 illustrates the four classes of stem variants for each of a small set of illustrative verbs including their present, past and future tenses.

2.6.1

	Infinitive	Present	Past	Future	Nominal
			1. "see"		
A	bala-nnə	balənə-wa	bælu-wa	balaa-wi	bæl-iim
P	bæle-nnə	bælenə-wa	bælu-na	bælee-wi	bæl-um
AC	baləwa-nnə	baləwənə-wa	bælewu-wa	baləwaa-wi	bæləw-iim
PC	bæləwe-nnə	bæləwenə-wa	bæləwu-na	bæləwee-wi	bælæw-um
			2. "kill"		
	mara-nnə	marənə-wa	mæru-wa	maraa-wi	mær-iim
	mære-nnə	mærenə-wa	mæru-na	mæree-wi	mær-um
	marəwa-nnə	marəwənə-wa	mærewu-wa	marəwaa-wi	mærəw-iim
	mærəwe-nnə	mærəwenə-wa	mærəwu-na	mærəwee-wi	mæræw-um
			3. "sow"		
	wapura-nnə	wapurənə-wa	wæpiru-wa	wapuraa-wi	wæpir-iim
	wæpire-nnə	wæpirenə-wa	wæpiru-na	wæpiree-wi	wæpir-um
	wapurəwa-nnə	wapurəwənə-wa	wæpirewu-wa	wapurəwaa-wi	wæpirəw-iim
	wæpirəwe-nnə	wæpirəwenə-wa	wæpirəwu-na	wæpirəwee-wi	wæpiræw-um
			4."strike/hit"		
	happannə	happənəwa	hæppuwa	happaawi	happiim
	hæppennə	hæppenəwa	hæppuna	hæppeewi	hæppum
	happəwannə	happəwənəwa	hæppewuwa	happəwaawi	hæppəwiim
	hæppəwennə	hæppəwenəwa	hæppəwuna	hæppəweewi	hæppæwum
			5."bite/chew"		

hapannə	hapənəwa	hæpuwa	hapaawi	hæpiim
hæpennə	hæpenəwa	hæpuna	hæpeewi	hæpum
hapəwannə	hapəwənəwa	hæpewuwa	hapəwaawi	hæpəwiim
hæpəwenna	hæpəwenəwa	hæpəwuna	hæpəweewi	hæpæwum

(See appendix for more listings.)

In 2.6.1, it can be observed that the stem variations, either among the four verb groups or among present past and future tenses, follow a coherent morphological pattern. For example, the stem variation among A, P, AP, and PC in the present tense is roughly as follows:

2.6.2

C_oVC_oV ~ C_oVC_oe ~ C_oVC_oVwa ~ C_oVC_oVwe

Naturally, stem variations resulting from productive processes are excluded from the permanent lexicon in the OL model. Only the root from which each set of variants derives is entered here. One must, therefore, make explicit the relationship between front and back vowels for all stems derived from the same root.

In the past tense all four stems have front vowels, but in the present tense front vowels in P and PC stems oppose back vowels in the A and AC stems. Front vowels in the present tense can be argued to be conditioned by the e vowel in their accompanying suffixes; however, nothing in the phonological environment accounts for front vowels in stems of the past tense.

Similarly, consistant phonological evidence is lacking to predict the occurrence of front vowels in the stems of verbal nouns. There are three nominal

suffixes -iim, -ili, and -um. Observing the nominal stem forms, one could argue that the distribution of these suffixes is complementary in the sense that -iim and -ili suffixes are to be found with A and AC stem froms whereas the -um suffix always associates with the P and PC stem forms. According to this argument- **one,** back vowels in A and AC stem forms are fronted after the affixation of -iim or -ili, both of which have high front vowels; **two,** front vowels in -um nominals have already been there before the nominal suffixation. In the latter case, back vowels were fronted by the accompaying e in the -e and -we suffixation which precedes the nominal suffixation. The justification for such argument is, however, not based on phonological or morphological grounds, rather on semantic considerations.

Just as in German[5], so too in Sinhala the umlauting rule of the earlier language no longer operates[6], in spite of the fact that the results of its influence are so pervasive that a superficial look at Sinhala suggests that umlaut is still a predictable and productive process.

The next attempt to account for vowel fronting in Modern Sinhala is to consider morphological evidence. In the search of a morphological solution to the vowel fronting, the first step is to isolate the morphemes found in current Sinhala.

As stated in 2.1.1, a verb divides into four groups named Active, Processive, Active Causative, and Processive Causative. The nature of these four divisions can be expressed with two sets of binary value features [+/-Agent] and [+/-Volitive] (2.6.3). The feature [+/-Agent] indicates whether the action originated from the doer or not while [+/-Volitive] indicates whether that action

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5 Lieber, 1981.

6 Geiger, 1968, 19-23

does or does not involve the doer's will.

2.6.3

Active	[+Agent],[+Volit]
Processive	[+Agent],[-Volit]
Act.Causative	[-Agent],[+Volit]
Proc.Causative	[-Agent],[-Volit]

It is argued that each of these four stem patterns consists of [7] a root plus a suffix in the underlying form, and the suffixes carry the binary value features. See 2.6.4 and 2.6.5.

2.6.4

A = /bala/ + /a/

P = /bala/ + /e/

AC = /bala/ + /wa/

PC = /bala/ + /we/

---

[7] Within the theoretical definitions "The least element in a partial ordering of lexical terminals will be called the ROOT" (Lieber 1981, pg.43). In this analysis the term root is used to distinguish the underlying stem from its derived variants. Except for this deviation, the terms STEM and AFFIX will hold the same definitions as given within the OL framework:

1. STEM : a morpheme whose lexical entry does not subcategorize another morpheme.

2. AFFIX : a morpheme whose lexical entry specifies some sort of lexical terminal to which it can attach (Lieber 1981, pg.37).

2.6.5

+[a] = [+Agent],[+Volit]

+[e] = [+Agent],[-Volit]

+[wa] = [-Agent],[+Volit]

+[we] = [-Agent],[-Volit]

In this way, only the respective root verbs of any stem variants will be listed in the permanent lexicon together with the suffixes. Following the permanent lexicon is the lexical structure subcomponent which consists of binary branching unlabelled trees and feature percolation conventions as shown in 2.6.6.

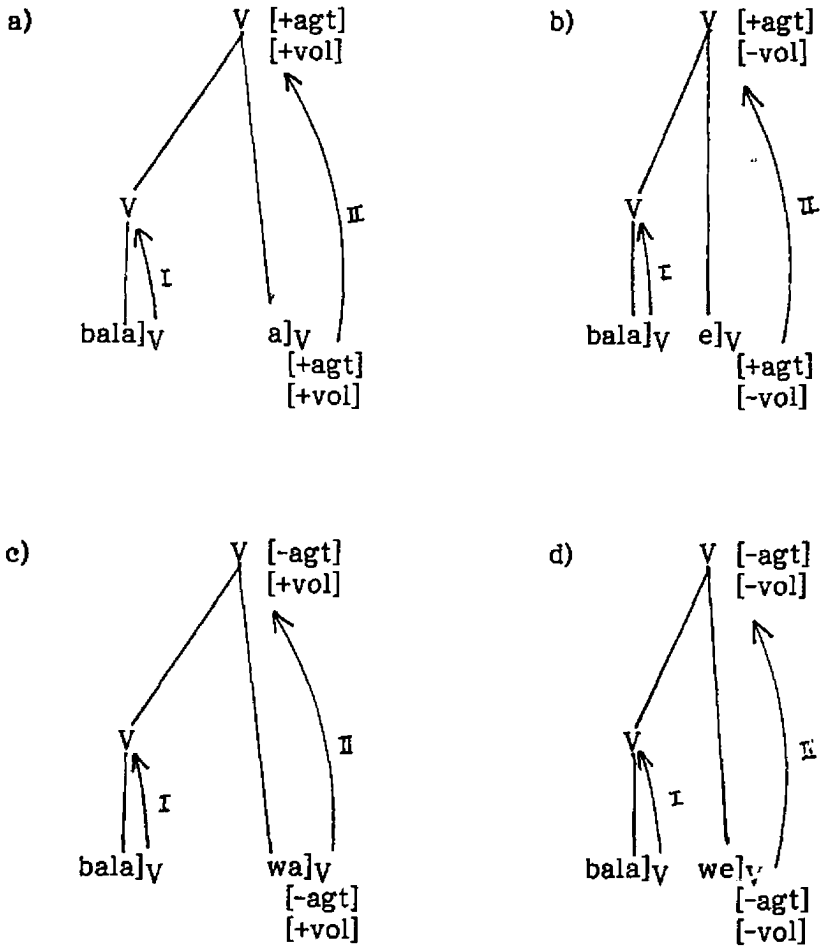
2.6.6

Feature Percolation Conventions:

1. Convention I: All features of a stem morpheme including category features percolate to the first non-branching node dominating that morpheme.
2. Convention II: All features of an affix morpheme including category features percolate to the first branching node dominating that morpheme.
3. Convention III: If a branching node fails to obtain features by convention II, features from the next lowest labelled node are automatically percolated up to the unlabelled branching node. (Lieber, 1981. 49-51.)

When affixation takes place in the lexical structure subcomponent, the resulting stem shapes receive their feature specifications from the suffixes. In 2.6.7, the derivation of the four stem shapes are illustrated along with the feature percolation principles which account for the feature specifications of each of the four stem shapes.

2.6.7



In 2.6.7, arrow I shows that the category feature of the root morpheme is percolated up to the first non-branching node dominating that morpheme by convention I. Arrow II demonstrates convention II whereby all features of the affix morpheme including the category feature are percolated up to the first branching node dominating that morpheme. The derived stems in each of the four examples have received all feature values of their outermost morphemes including the category feature. Significantly, both morphemes in each derivation have the same category feature. In this case, one could always argue that the suffixes

should carry no category features, for they could be percolated up to the higher node from the node dominating the root morpheme by convention III. However, so far, there is no evidence for or against such an argument. Therefore, in this description of Sinhala lexemes, the suffixes are marked for category features too.

If there were no further affixation, the derivations illustrated in 2.6.7 would end with the following surface forms.

2.6.8

A= balə

P= bæle

AC= balәwə

PC= bæləwe

These stem shapes show that there is a difference in the quality and the quantity of vowels between the underlying forms and the derived surface forms in 2.6.8. Moreover, some vowels have been deleted. These matters are discussed later (see 2.8.5).

2.7 Tense Formation and Stem Building

In sections 2.2.1, 2.2.4 and 2.2.5, it was explained that each of the four stem shapes had a corresponding form for present, past and future tenses. This section presents the morphological and phonological nature of these forms that distinguish these tenses.

2.7.1 (a) Present

A=	balə	-	nə
P=	bæle	-	nə
AC=	baləwə	-	nə
PC=	bæləwe	-	nə

(b) Past

A=	bæl	-	uwə
P=	bæl	-	unə
AC=	bælew	-	uwə
PC=	bæləw	-	unə

(c) Future

A=	balaa	-	wi
P=	bælee	-	wi
AC=	baləwaa	-	wi
PC=	bæləwee	-	wi

In (a),(b) and (c) of 2.7.1, the first column represents the stem shapes that have already been presented in 2.6.8. As can be observed in column two, suffixes -nə , -uwə/-unə and -wi are associated with (a), (b) and (c) respectively. In the present tense, only the P and PC stem shapes have front vowels, but in the past tense, all four stem shapes have front vowels. The final vowel of each future tense stem is lengthened. As mentioned earlier, these vowel changes will be addressed in detail later; this section considers how these present, past and future tense forms are derived.

Earlier in this discussion (2.6), it was mentioned that the stem shapes consist of Verb Root + Suffix. This argument was raised to account for the four-way division of the verb. Now this argument can be extended to say that a verb form marked for its tense has the structural analysis of Verb Root + $Suffix_1$ + $Suffix_2$. In this structure, the $Suffix_1$ stands for those affixes mentioned in 2.6.4 whereas $Suffix_2$ represents any of the tense marking affixes. It is, therefore, argued on the basis of this assumption that the suffixes -nə , -uwə/-unə and -wi are tense marking affixes[8] and should be listed in the permanent lexicon with relevant information such as the category and class to which these morphemes belong including diacritic features as in 2.7.2.

2.7.2

-nə	-uwə/-wə	-wi
[+pres]	[+past]	[+futr]

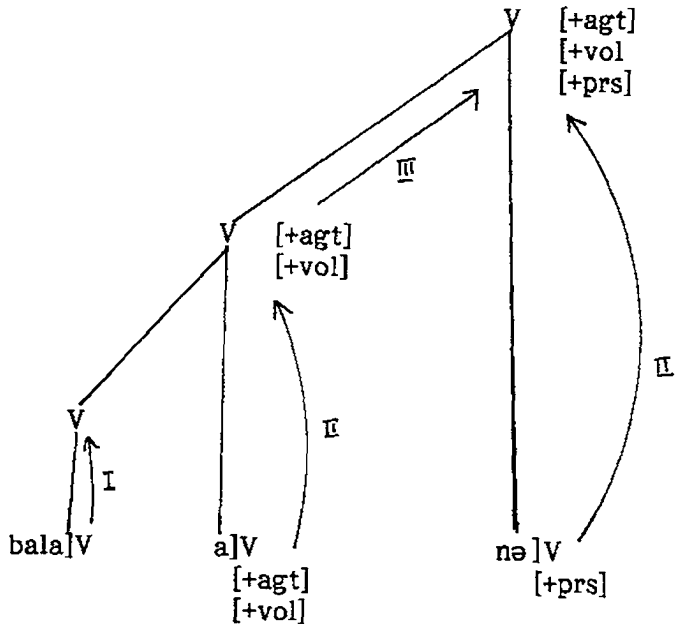
In the second subcomponent of the grammar, these affixes will be inserted into lexical trees following the information available for each lexical element and the feature percolation principles will percolate this information up to the higher node. What follows illustrates how the lexical structure subcomponent of the grammar would generate the present, past and future stem shapes.

---

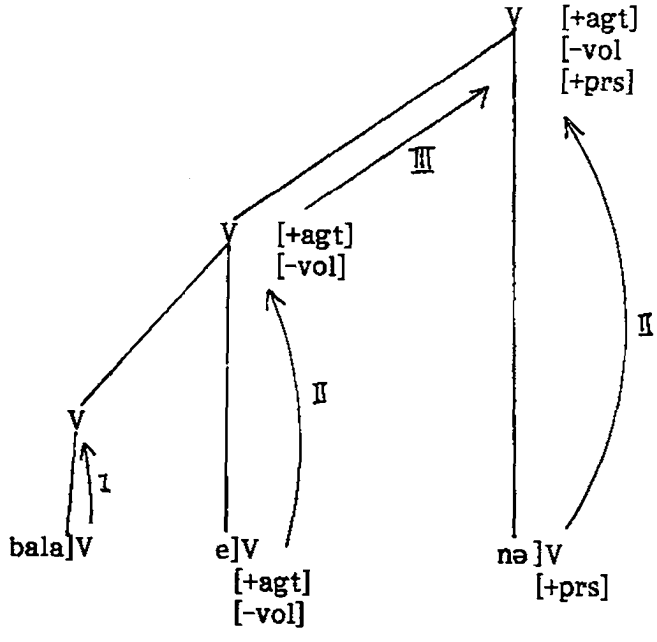
[8] $Suffix_2$ derivation will be called a Tense Building Process and the relevant affixes will, therefore, be named as Tense Building Affixes. $Suffix_1$ which is a Stem Building Process consists of Stem Building Affixes.

2.7.3 Present

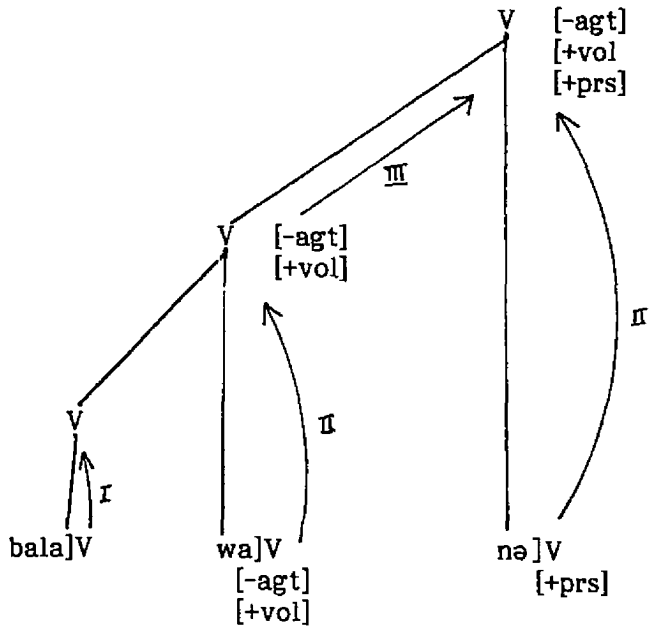
(a)



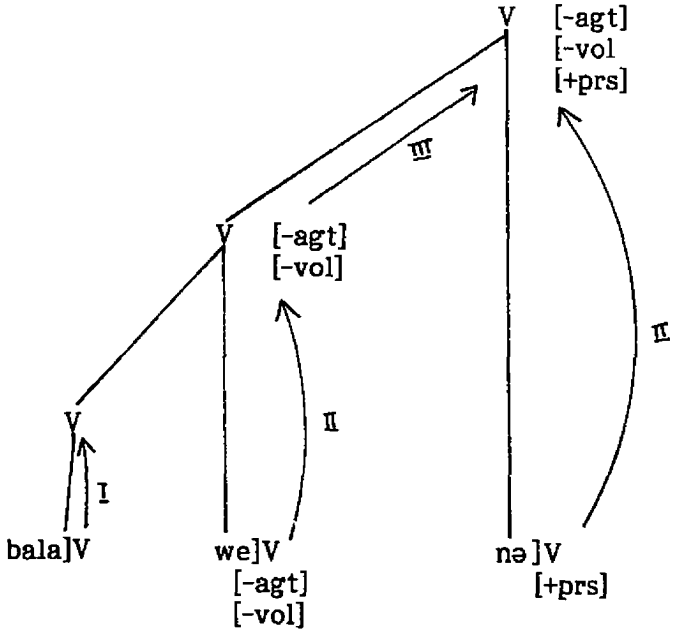
(b)



(c)

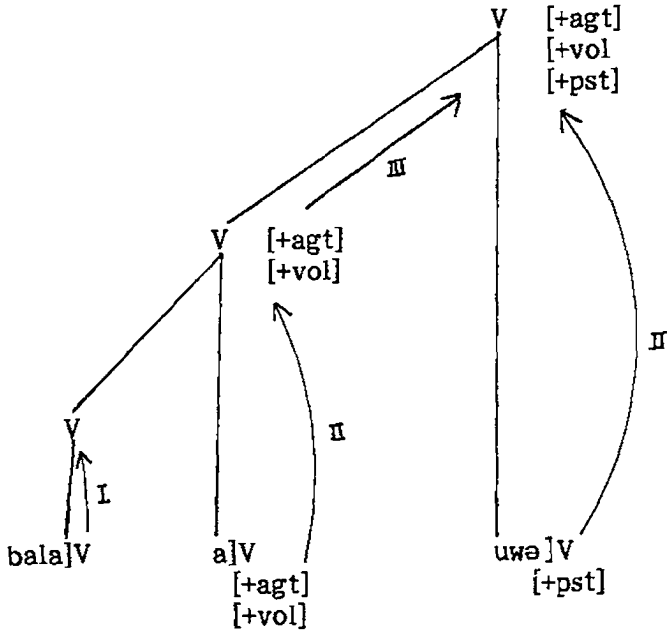

V
[-agt]
[+vol
[+prs]
III
V
[-agt]
[+vol]
II
II
V
I
bala]V
wa]V
[-agt]
[+vol]
nə]V
[+prs]

(d)

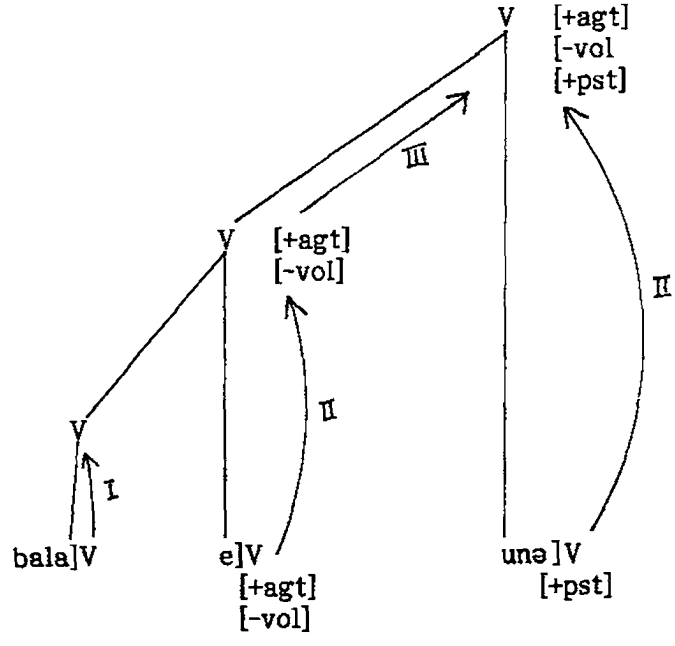

V
[-agt]
[-vol
[+prs]
III
V
[-agt]
[-vol]
II
II
V
I
bala]V
we]V
[-agt]
[-vol]
nə]V
[+prs]

2.7.4 Past

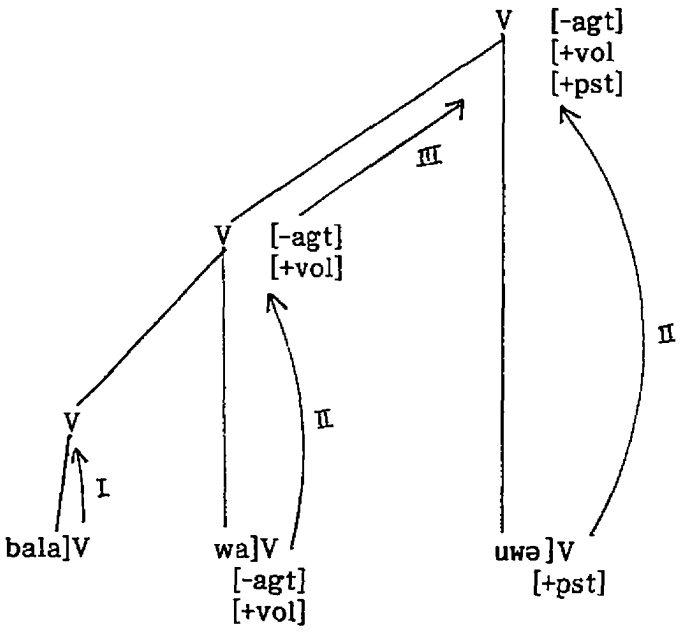
(a)


V
[+agt]
[+vol
[+pst]
III
V
[+agt]
[+vol]
II
II
V
I
bala]V
a]V
[+agt]
[+vol]
uwə]V
[+pst]

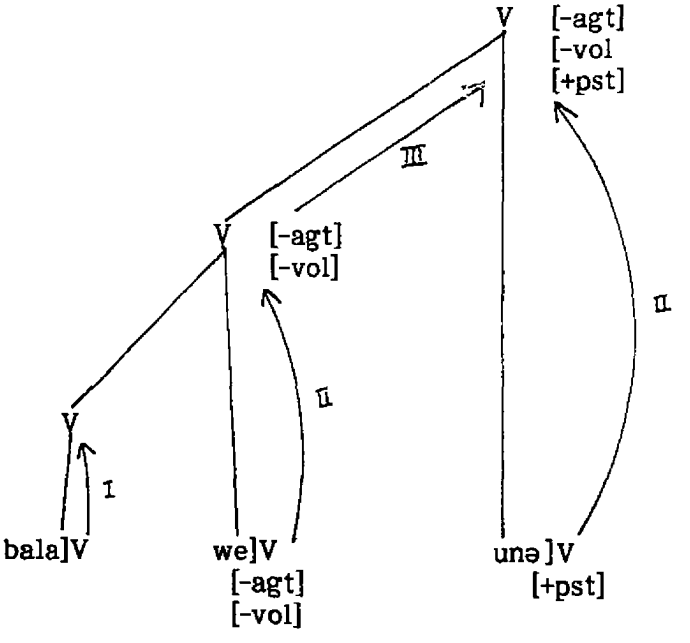
(b)


V
[+agt]
[-vol
[+pst]
III
V
[+agt]
[-vol]
II
II
V
I
bala]V
e]V
[+agt]
[-vol]
unə]V
[+pst]

(c)

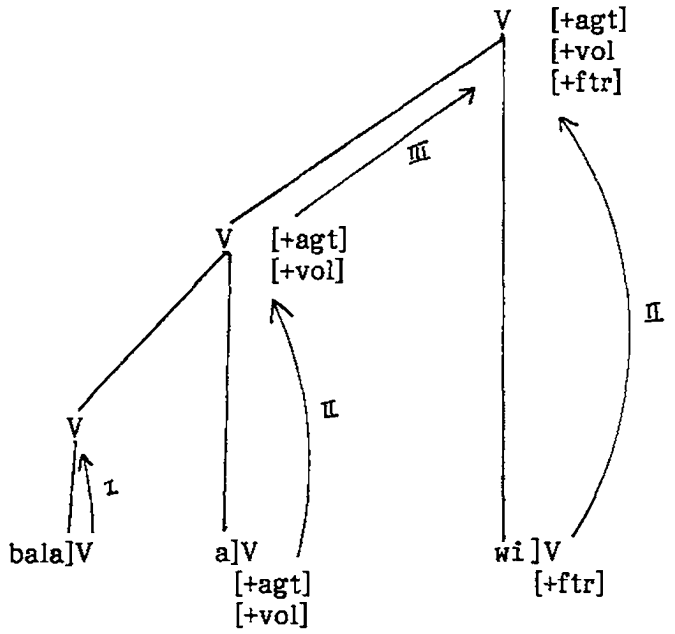

V
[-agt]
[+vol
[+pst]
III
V
[-agt]
[+vol]
II
II
V
I
bala]V
wa]V
[-agt]
[+vol]
uwə]V
[+pst]

(d)

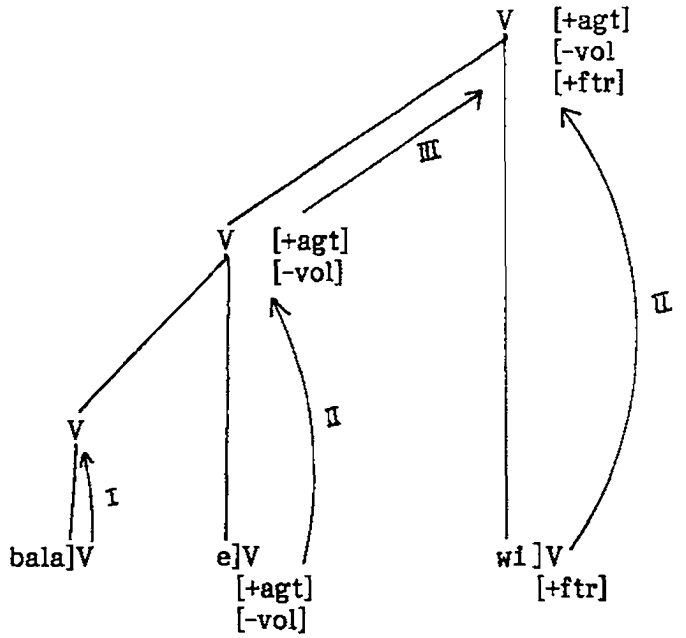

V
[-agt]
[-vol
[+pst]
III
V
[-agt]
[-vol]
II
II
V
I
bala]V
we]V
[-agt]
[-vol]
unə]V
[+pst]

2.7.5 Future

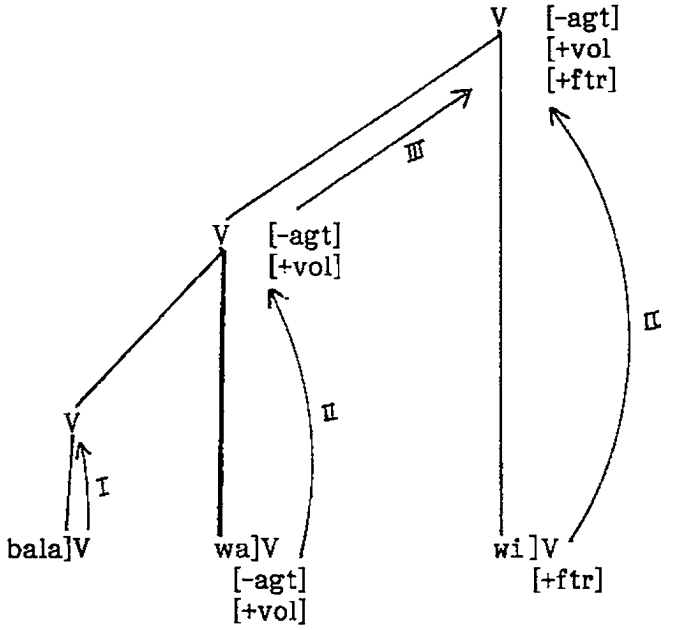
(a)



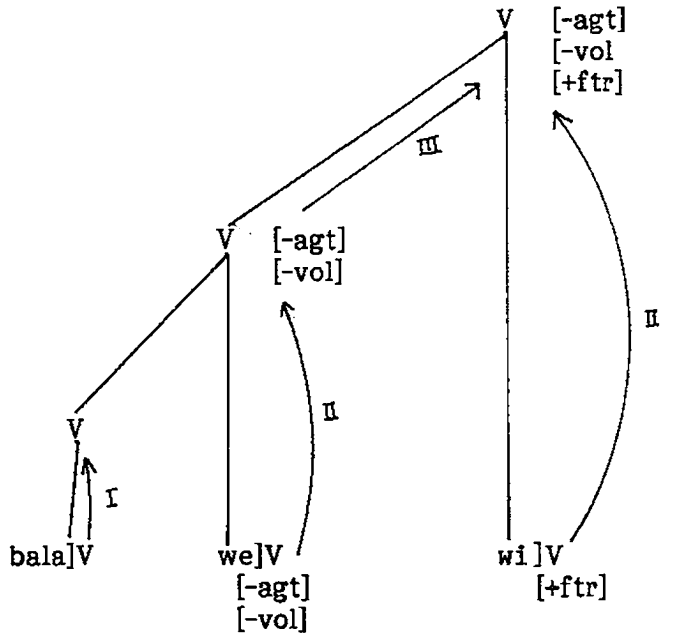
(b)



(c)



(d)



As in 2.6.7, so too here, the arrows I, II and III show how the features are percolated to higher nodes by the feature percolation conventions I, II and III

respectively. Any verb form derived by these diagrams has all the feature specifications necessary for its proper placement in the grammar.

The third subcomponent of OL is the string dependent rule component. Basically, this is where morphological rules are applied. The verbal derivations in Sinhala need further modifications in their segmental features so as to be able to appear in correct surface forms. As briefly pointed out earlier, most of these changes have to do with vowel quality or quantity of the verb root. In general verb roots have back vowels. The [+back] vowels in the verb root become [-back] on two occasions; (a) in the present tense of P and PC verb forms and (b) in the past tense forms of all the four verb groups. With regard to the former, the possibility of treating the vowel fronting as a phonological rule was considered above. The triggering factor in this rule would be the front vowel e, which in itself is a morpheme. However, there are problems with such a phonological treatment on two grounds. First, in the verbal system itself there is a case in the past tense forms where vowel fronting occurs with no phonological environment to account for it; this fronting has to be treated as a morphological process. Therefore, within the verbal system itself, two kinds of vowel fronting rules would be required, one which is phonological and the other morphological. Second, Modern Sinhala has no other known instances outside verb morphology where a phonological rule of vowel fronting results from the addition of -e. For example, the homonymous locative marker -e added to nominals as seen in 2.7.6 causes no vowel fronting.

2.7.6

/hatara/	hatər-e
"four"	"at four"
/gas/	gas-e
"tree"	"in the tree"
/meesa/	mees-e
"table"	"on the table"

In the examples in 2.7.6, the second column represents the surface nominal forms with the -e suffix added. However, the back vowels remain the same despite the front vowel -e. In the last example, the vowels are underlyingly [-back]. Considering the evidence thus available in Modern Sinhala in general and within the verb morphology in particular, the preferable solution seems to be a morphological one. In that case, the OL model requires that such a morphological rule operation be performed in the string dependent rule subcomponent of the grammar.

In order to arrive at a morphological solution for the vowel fronting in the Modern Sinhala verbal system, the feature [+umlaut] will be introduced. The affixes discussed so far in 2.6.5 and in 2.7.2 are repeated in 2.7.7.

2.7.7

-a	=	[+ag]	[+vo]	
-e	=	[+ag]	[-vo]	[+um]
-wa	=	[-ag]	[+vo]	
-we	=	[-ag]	[-vo]	
-nə	=	[+prs]		
-uwə/-unə	=	[+pst]	[+um]	

-wi = [+fut]

The feature [+um] invokes the following morphological rule:

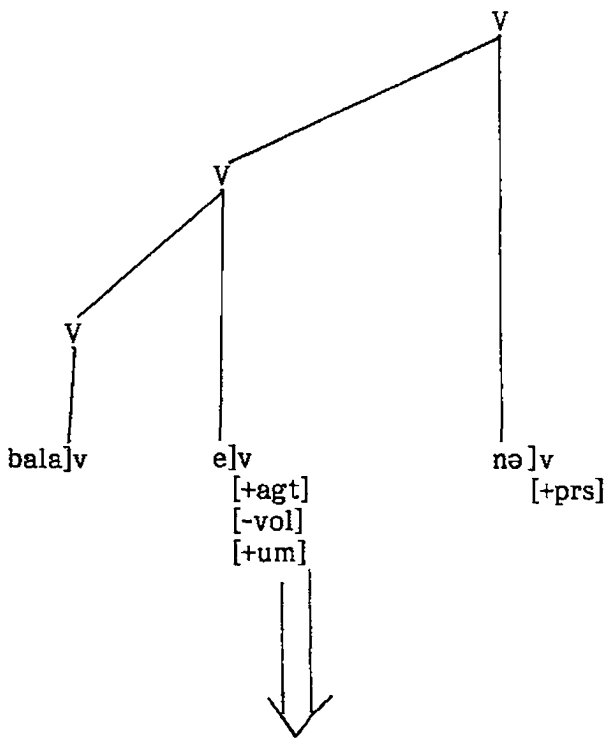
2.7.8

[+syl] --> [-bk] /---[+um]

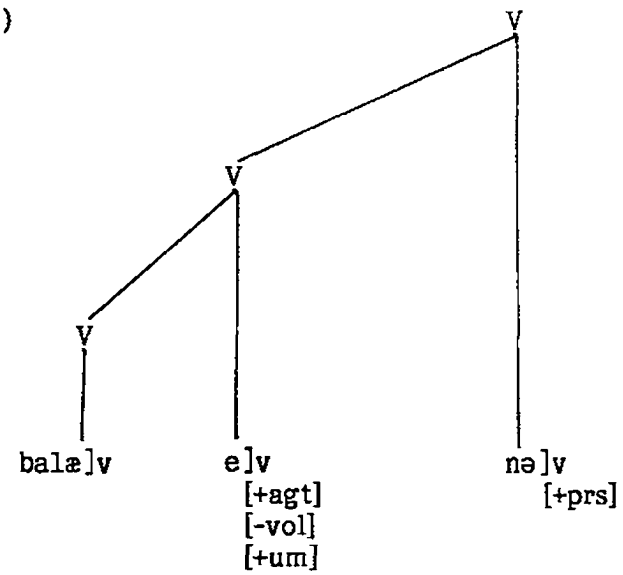
With the operation of the rule in 2.7.8 the following are derived:

2.7.9

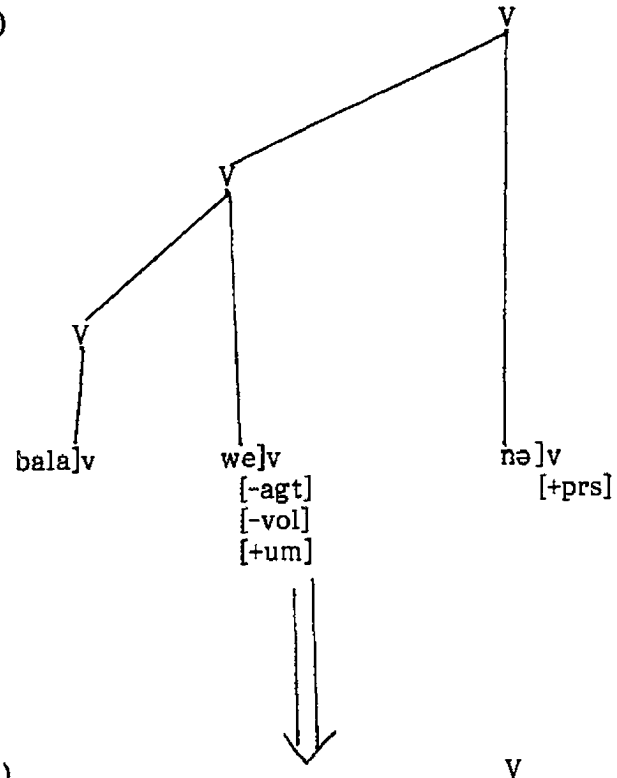
(a1)



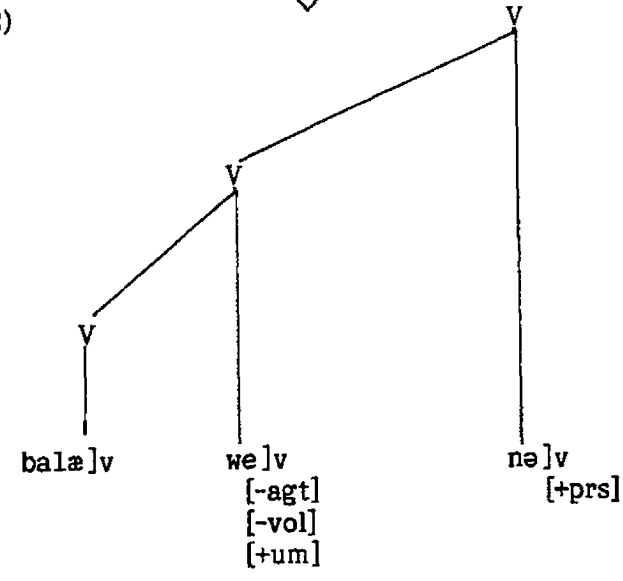
(a2)



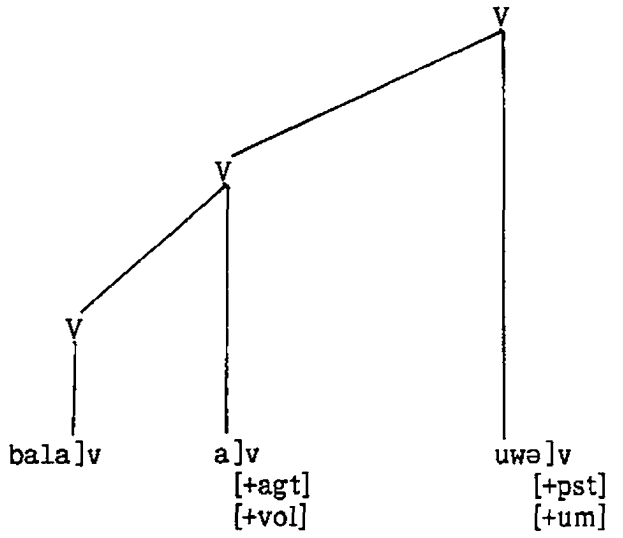
(b1)


V
V
V
bala]v
we]v
[-agt]
[-vol]
[+um]
nə]v
[+prs]

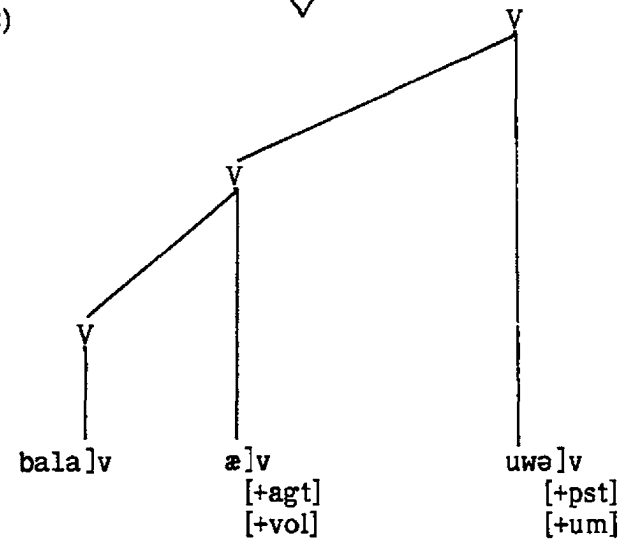
(b2)


V
V
V
balæ]v
we]v
[-agt]
[-vol]
[+um]
nə]v
[+prs]

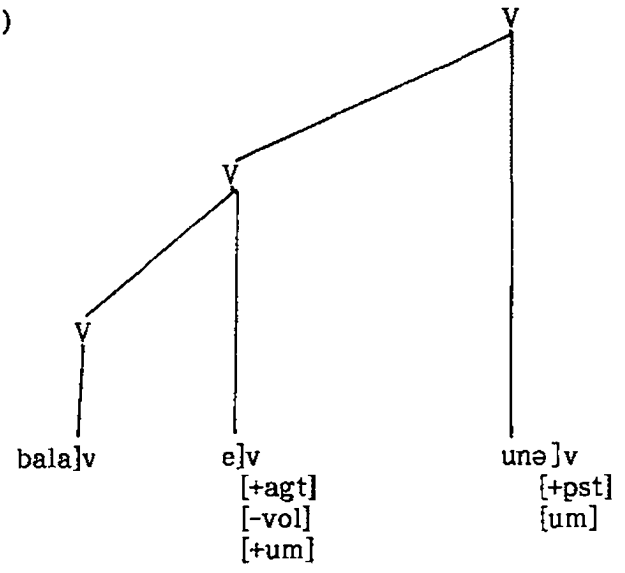
(c1)


V
V
V
bala]v
a]v
[+agt]
[+vol]
uwə]v
[+pst]
[+um]

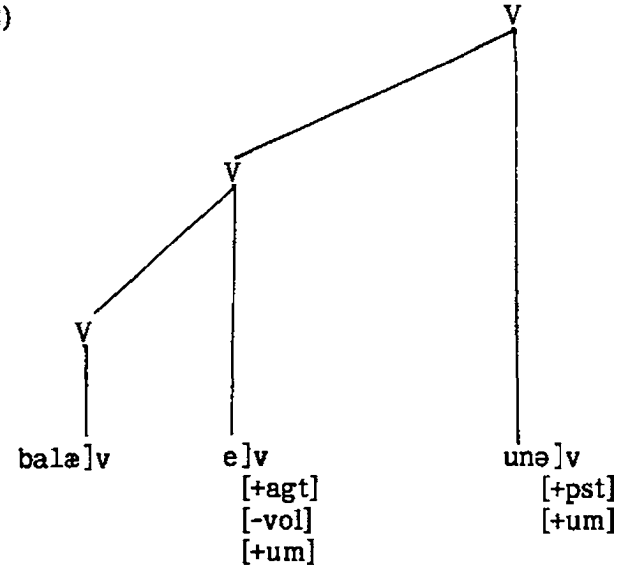
(c2)


V
V
V
bala]v
æ]v
[+agt]
[+vol]
uwə]v
[+pst]
[+um]

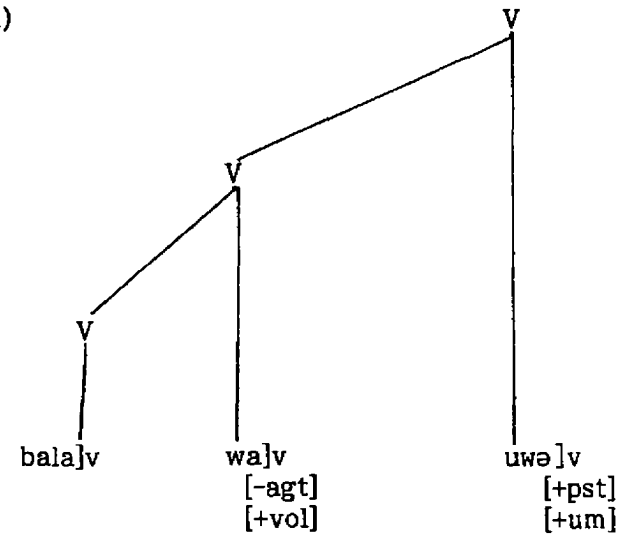
(d1)


V
V
V
bala]v
e]v
[+agt]
[-vol]
[+um]
unə]v
[+pst]
[um]

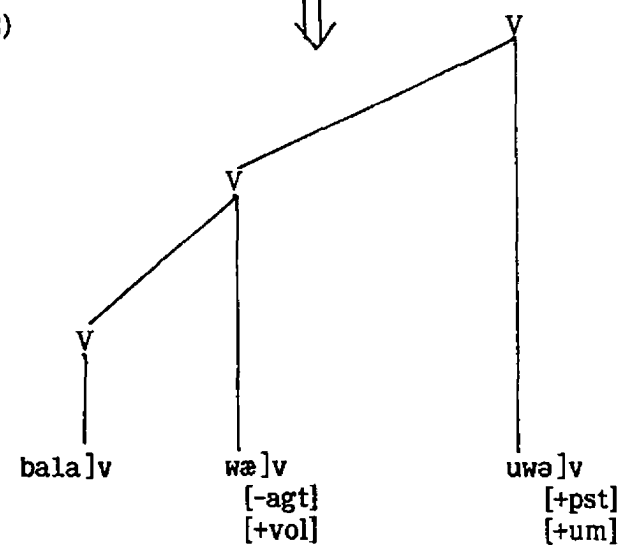
(d2)


V
V
V
balæ]v
e]v
[+agt]
[-vol]
[+um]
unə]v
[+pst]
[+um]

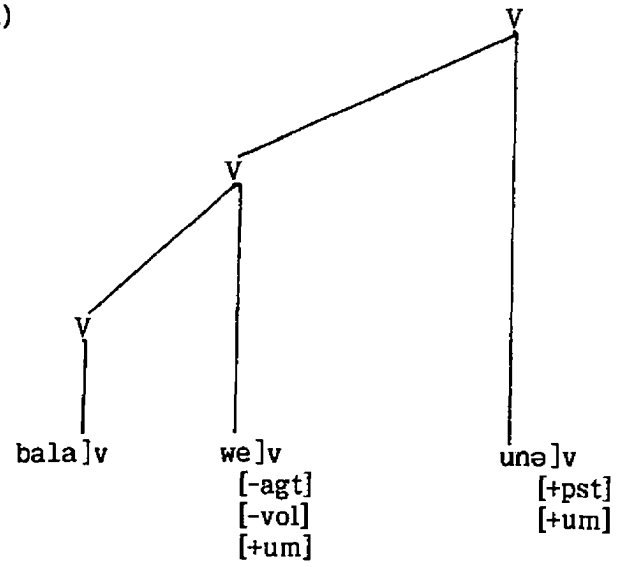
(e1)


V
V
V
bala]v
wa]v
[-agt]
[+vol]
uwə]v
[+pst]
[+um]

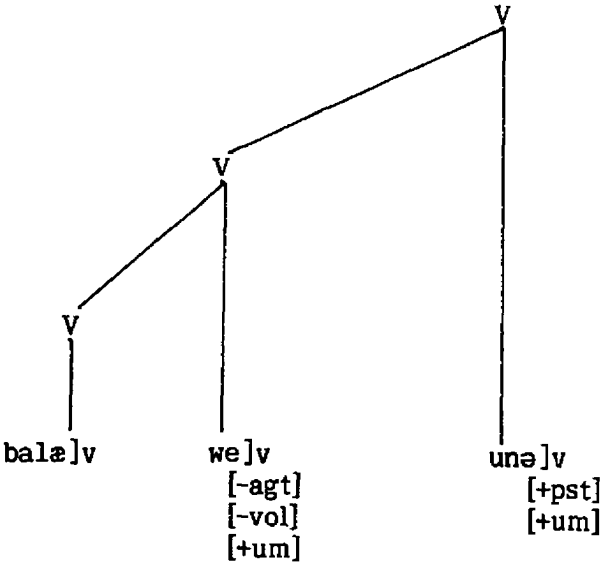
(e2)


V
V
V
bala]v
wæ]v
[-agt]
[+vol]
uwə]v
[+pst]
[+um]

(f1)


V
V
V
bala]v
we]v
[-agt]
[-vol]
[+um]
unə]v
[+pst]
[+um]

(f2)


V
V
V
balæ]v
we]v
[-agt]
[-vol]
[+um]
unə]v
[+pst]
[+um]

In the examples of 2.7.9, vowel fronting is triggered by the feature [+um] and the operative rule in it is a string dependent morphological rule. Therefore, string adjacency is required for this rule to operate. Thus, in examples (a) and (b) this requirement is satisfied, but in examples (c) and (e) the umlaut triggering feature is on the rightmost morpheme. It is assumed in such cases that the segment in the adjacent string is umlauted, and this is then spread across the other syllabic segments from right to left. However, umlaut spreading is a phonological factor which is specified later.

There is another way of looking at this vowel fronting. It could be assumed that the feature [+um] is percolated up to the higher node and any vocalic segments in a node that are dominated by the higher node with the [+um] feature will be umlauted. However, the validity of such a structure dependent rule has yet to be investigated in depth.

The former assumption is adopted here on the grounds that even in an example like (a) of 2.7.9 where the string adjacency is satisfied, it is only the rightmost vocalic segment that is umlauted first and the umlauting of the rest of the vocalic segments in the root is considered to be a result of an umlaut spreading rule.

A change in vowel quantity is found in future tense forms. In balaa-wi, for example, the stem final vowel is lengthened. This process takes place regularly in the future tense forms of all four groups. This lengthening process is also assumed to result from a morphological rule because there are no reasonably accountable grounds for a phonological solution. In Modern Sinhala, the only instance of phonologically conditioned vowel lengthening takes place between two [+low] vowels when there is a vowel coalescence as illustrated in 2.7.10.

2.7.10

/ata/ + /arinawa/ --> ataarinəwa

hand open

"give up/let go"

In this example the coalescence takes place between the two vowels [a] - the final vowel of /ata/ and [a] the initial vowel of /arinawa/.

Vowel lengthening in the future tense forms is, therefore, assumed to be triggered by the feature [+long] in the affix -wi. Thus, the affix bears the feature [+long] in addition to [+future], and the morphological rule that lengthens the stem final vowel looks like the following:

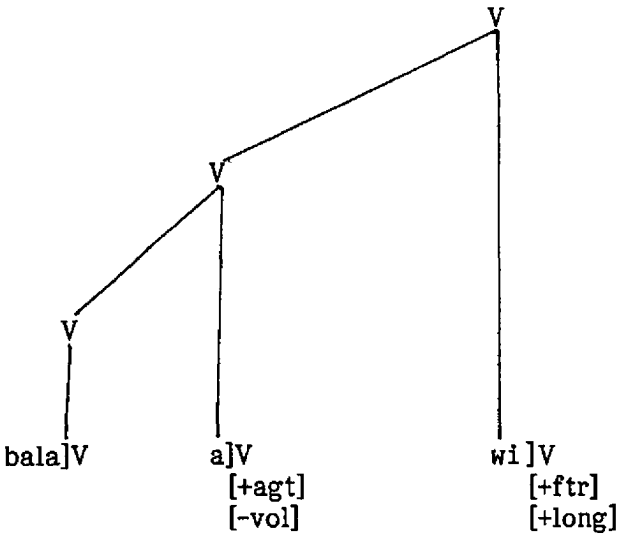
2.7.11

[+syl] --> [+long]/---[+long]

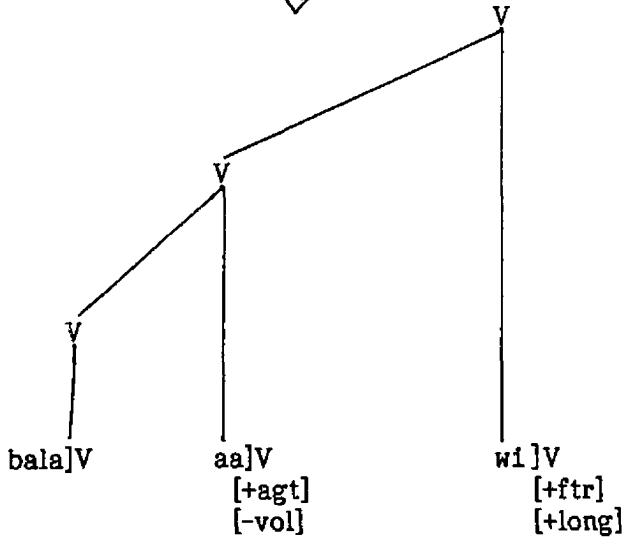
This rule is also string dependent taking place in the string dependent rule subcomponent of the grammar. 2.7.12 below illustrates the operation of this rule in deriving future tense forms.

2.7.12

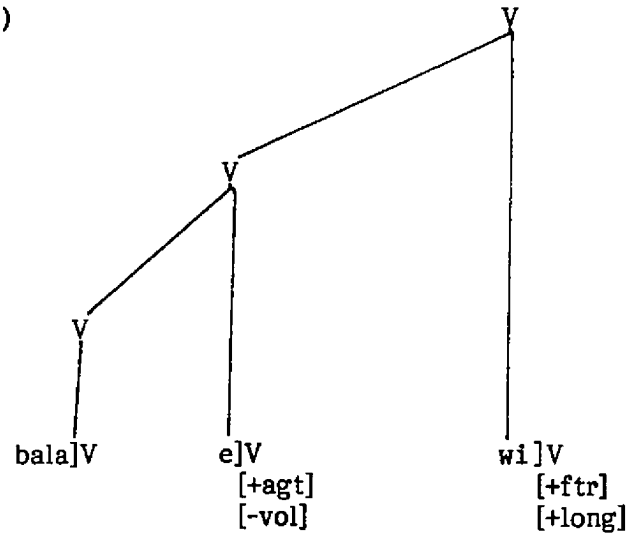
(a1)


V
V
V
bala]V
a]V
[+agt]
[-vol]
wi]V
[+ftr]
[+long]

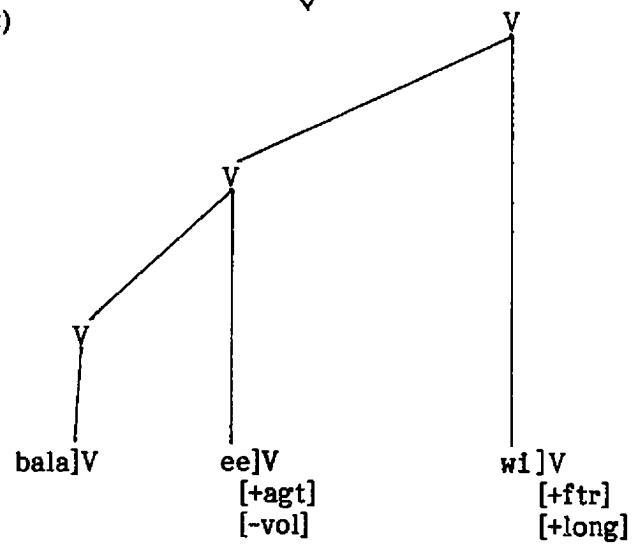
(a2)


V
V
V
bala]V
aa]V
[+agt]
[-vol]
wi]V
[+ftr]
[+long]

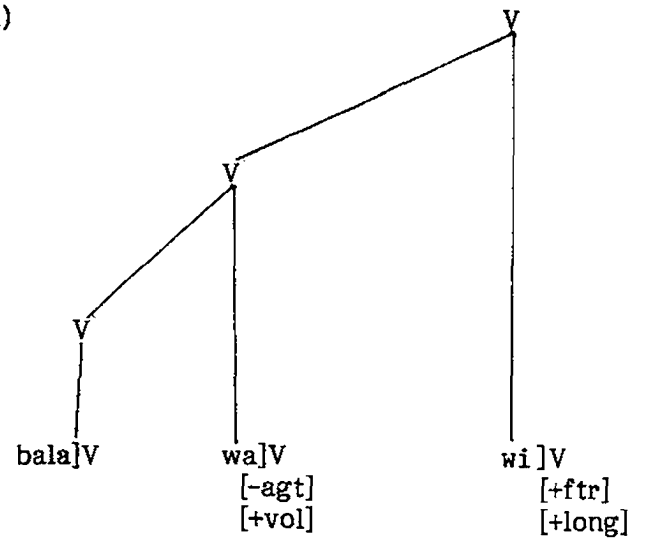
(b1)


V
V
V
bala]V
e]V
[+agt]
[-vol]
wi]V
[+ftr]
[+long]

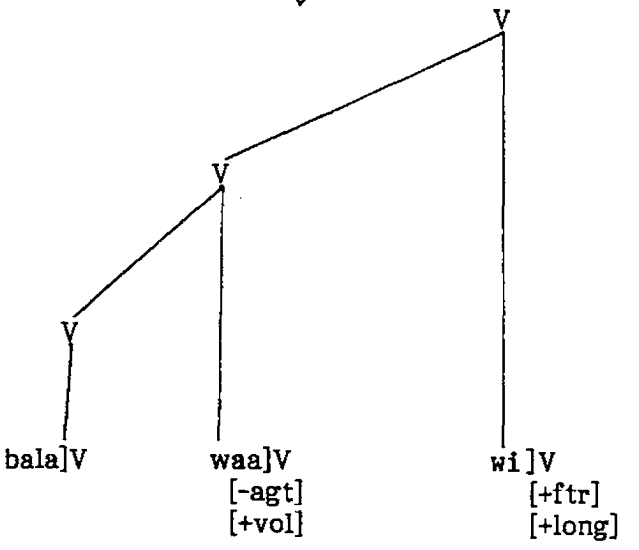
(b2)


V
V
V
bala]V
ee]V
[+agt]
[-vol]
wi]V
[+ftr]
[+long]

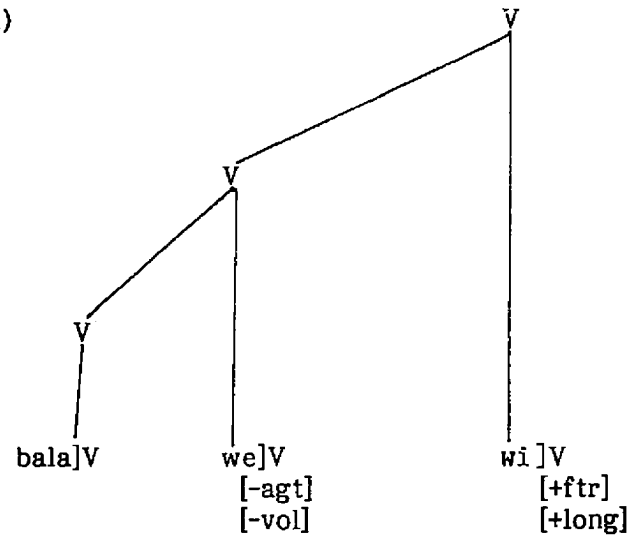
(c1)


V
V
V
bala]V
wa]V
[-agt]
[+vol]
wi]V
[+ftr]
[+long]

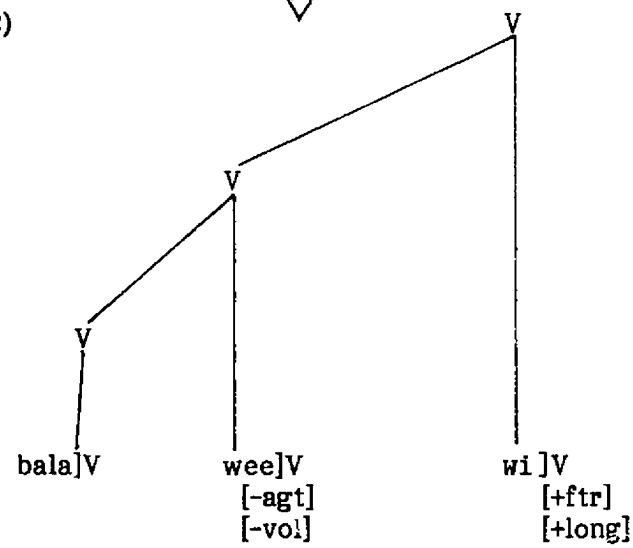
(c2)


V
V
V
bala]V
waa]V
[-agt]
[+vol]
wi]V
[+ftr]
[+long]

(d1)



(d2)



Following (a) of 2.7.12, one could argue, as noted above, that vowel length results from the coalescence of two identical vowels which would mean that vowel lengthening is a phonological process. However, (b), (c) and (d) of 2.7.12 illustrate cases of vowel lengthening where identical vowel sequences are lacking. (This

situation is reminiscent of umlauting part which could have been accounted for by a phonological rule but required a morphological rule to cover all cases.)

2.8 Subcategarization Restrictions

Thus, stem variations in Sinhala verbal paradigms can be accounted for, if the historical inflectional endings are treated as lexicalized affixes. These are brought together in 2.8.1.

2.8.1

I	II
-a	-nə
-e	-uwə/-unə
-wa	-wi
-we	

The affixes in column II always follow those in I indicating a hierarchical relationship between the two sets which the grammar must recognize. In the OL framework, this is done by means of subcategorization restrictions such that affixes of column I are added to verb root followed by those in column II. The output of both affixation processes is still a verb.

Stems created by adding column I suffixes are said to be V^1 derivations while V^2 derivations are those formed by the further addition of column II suffixes, the tense morphemes. It is now possible to draw up the following subcategorization restrictions. Affixes in column I are subcategorized as, $]V\text{---}]V^1$ and those in column II as, $]V^1\text{---}]V^2$, indicating that the column II affixes are attached to V^1 and the result is V^2.

Two suffixes -uwə and -unə, have the feature [+past]. For them a further subcategorization is necessary such that -uwə is added only to [+volit] stems and -unə only to [-volit] stems.

In summary, the following information about affixes is stored in the permanent lexicon of the grammar.

2.8.2

(a) **Stem Building Affixes**

Affix	Diacritic Features	Category	Subcategorization
-a	[+Agt],[+Vol]	V	$]_V$---$]_V{}^1$
-e	[+Agt],[-Vol],[+Um]	V	$]_V$---$]_V{}^1$
-wa	[-Agent],[+Volit]	V	$]_V$---$]_V{}^1$
-we	[-Agt],[-Vol],[+Um]	V	$]_V$---$]_V{}^1$

(b) **Tense Building Affixes**

Affix	Diacritic Features	Category	Subcategorization
-nə	[+Pres]	V	$]_V{}^1$---$]_V{}^2$
-uwə	[+Past],[+Um]	V	$]_V{}^1$---$]_V{}^2$
-unə	[+Past],[+Um]	V	$]_V{}^1$---$]_V{}^2$
-wi	[+Futr]	V	$]_V{}^1$---$]_V{}^2$

Verb stems are also stored in the lexicon with the information as given in the following example.

2.8.3

Category Class VERB

(bala) morpholexical rules (none)

phonological representation

semantic representation: 'see/read'

insertion frame: .....

In the second subcomponent of the grammar, derivations take place according to the illustrations shown in 2.7.3 - 2.7.5. Morphological rule applications take place in the third subcomponent. The present, past and future verb forms discussed so far will have the following output at the end of the third subcomponent of the grammar.

2.8.4

(a) Present

bala]	a]	nə]	[balənə]
balæ]	e]	nə]	[bælenə]
bala]	wa]	nə]	[baləwənə]
balæ]	we]	nə]	[bæləwenə]

(b) Past

bala]	æ]	uwə]	[bæluwə]
balæ]	e]	unə]	[bælunə]
bala]	wæ]	uwə]	[bæləwuwə]
balæ]	we]	unə]	[bæləwunə]

(c) Future

bala]	aa]	wi]	[balaawi]
balæ]	ee]	wi]	[bæleewi]
bala]	waa]	wi]	[baləwaawi]
balæ]	wee]	wi]	[bæləweewi]

However, to get the correct surface forms as illustrated on the right hand column of 2.8.4, a few more changes are necessary. These are phonological changes listed in 2.8.5.

2.8.5

1. Umlaut Spreading
2. Vowel Loss
3. Resyllabification
4. Vowel Reduction

No attempt is here made to describe these four phonological rules. However, see Chapter V for an explanation about phonological rule applications in Modern Sinhala.

2.9 Nominal Derivations

In 2.3.1 and 2.3.2, , repeated in 2.9.1, it was mentioned that there are nominal derivations that are related to the four verb groups.

2.9.1

A) bala -> bæl-iim

P) bæle -> bæl-um

AC) baləwa -> bæləw-iim

PC) bæləwe -> bæləw-um

-> bæl-ili

-> bæləw-ili.

Here it is argued that nominals are formed by adding the suffixes -iim, -um and -ili to the derived stems described in 2.6.8. These three suffixes are stored in the permanent lexicon along with category features, any diacritic features necessary and subcategorization restrictions. These suffixes belong to the nominal category and the the subcategorization restrictions must say that the environment for the nominal affixation follows V^1-verb stems. This information is presented in summary in 2.9.2.

2.9.2

(c) **Noun Forming Affixes**

Affix	Diacritic Features	Category	Subcategorization
-iim	[+Um]	N	$]_{V^1}$---$]_N$
-um	[+Um]	N	$]_{V^1}$---$]_N$
-ili	[+Um]	N	$]_{V^1}$---$]_N$

The other significant issue in this nominal derivation is the fronting of back vowels. Is this vowel change phonological or morphological? The front vowel i in the two suffixes -iim and -ili suggests that the vowel change is phonological.

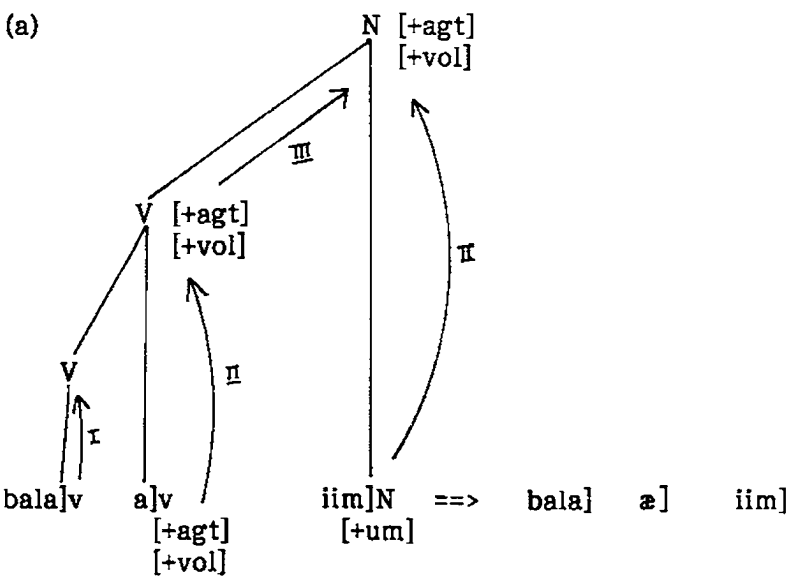
However, with -um there is no such phonologically conditioned environment for the vowel change. Once again there are two conditions one of which supports a phonological solution for the vowel fronting and the other which does not. In order to describe this fronting that is triggered by all three nominal suffixes by a single rule, this study suggests a morphological process. In doing so, it is assumed that the suffixes bear the diacritic feature [+umlaut] which causes vowel fronting in the verb's stem vowels. This morphological rule is similar to the one described in 2.7.8 which is repeated in 2.9.3.

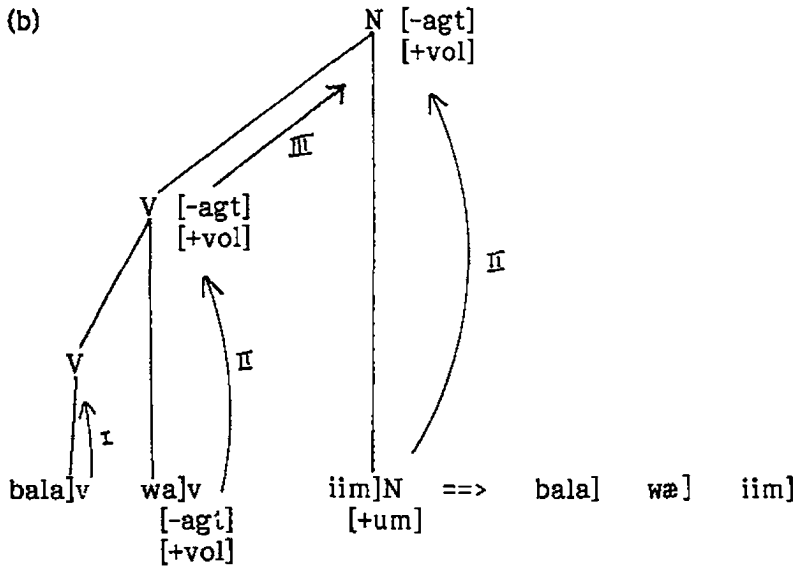
2.9.3

[+syl] --> [-bk] /---[+um]

The derivational processes for nominals through the second and the third subcomponents of the grammar are shown in 2.9.4.

2.3.4





In 2.9.4 the arrows I, II and III refer to the feature percolation conventions I, II and III respectively. The right directional arrow shows the output after the morphological rule applications in the third subcomponent. The feature [+um] is a string dependent morphological rule which triggers the back vowel to be fronted. (This procedure recalls that discussed regarding vowel fronting in past tense forms in 2.7.9.)

2.10 Exceptions

Consider the verbal paradigms of /adi/ "pull" and /wa^{n}di/ "genuflect" in 2.10.1:

2.10.1

	Present	Past	Future
(a)			
A	adi-nə	ædd-ə	adii-wii
P	æde-nə	æd-unə	ædee-wi
	ædde-nə	ædd-unə	æddee-wi
AC	adəwə-nə	----	----
	addəwə-nə	æddew-uwə	addəwaa-wi
PC	ædəwe-nə	----	----
	æddəwe-nə	æddəw-unə	æddəwee-wi
(b)			
A	wa^{n}di-nə	wænd-ə	wa^{n}dii-wi
P	wæ^{n}de-nə	wæ^{n}d-unə	wæ^{n}dee-wi
	wænde-nə	wænd-unə	wændee-wi
AC	wa^{n}dəwə-nə	----	----
	wandəwə-nə	wændew-uwə	wandəwaa-wi
PC	wæ^{n}dəwe-nə	----	----
	wændəwe-nə	wændəw-unə	wændəwee-wi

There is a limited number of verb roots in the Modern Sinhala lexicon that behave like those in 2.10.1. The final root vowel of this type of verb usually is a high front vowel, i. The past tense form of the A verb has only ə (instead of -uwə) at the end. The P verb has doublets in present, past and future forms. AC and PC verb forms have doublets in their present tense forms. The doublets are

formed by copying the consonant that immediately precedes the high front vowel, i.

The crucial point here is how to account for the occurrence of these allomorphs of which the only difference is that one of them has a consonant cluster as a result of copying the final consonant of the root. This consonant copying process is neither phonologically nor morphologically predictable. One way of addressing this situation is to list the variations in the permanent lexicon and have their relations expressed by morpholexical rules. The two verb roots /adi/ and /wa^{n}di/ have the following CV shapes.

2.10.2

adi = VCV

wa^{n}di = CVCV (initial C represents the semivowel w)

In 2.10.1, it is noted that stem forms have the shapes (C)VCV + Suffix or (C)VCCV + Suffix (i.e. ædenə ~ æddenə). A morpholexical rule like the one in 2.10.3 can be drawn to relate these two forms if they were to be listed in the permanent lexicon.

2.10.3

$(C_1)VC_2V \sim (C_1)VC_2C_2a$

However, there is still an important point to be addressed. In the paradigm of 2.10.1, the C_2 is a prenasalized stop. It is always the case in such situations that when copying a consonant segment which is a prenasalized stop the nasal sound

and the stop sound appear as two separate segments. According to the morpholexical rule in 2.10.3, it will be implied that the copied C_2 is again a prenasalized stop. Therefore in addition to 2.10.3, it is necessary to have another morpholexical rule that correctly predicts forms such as those in (b) of 2.10.1. The morpholexical rule in 2.10.4 captures the relation of forms that have a prenasalized stop consonant in C_2 position.

2.10.4

$(C_1)V^nC_2V \sim (C_1)VN_2C_2a$

The 2.10.4 rule states that a $^nC_2$ (which is prenasalized consonant) has a related form with a complete nasal segment preceding the C_2 which is now a non-prenasalized consonant. The capital N stands for any nasal sound which is always homorganic with the following C_2 stop sound.

Given these two additional morpholexical rules, the correct verbal variants are derived by the same procedure as described for the four verb stem groups and the present, past and future tense formations.

2.11 Conclusion

It is clear from this investigation that stem variation in Modern Sinhala verbal system is the result of a stem building process that each verb undergoes. This stem building process is followed either by a tense building process or by a noun formation process. Compounds are formed from verb-nouns that derived by the latter process.

During the discussion, however, the need of a component in the grammar for relevant phonological rule applications was pointed out. Vowel reduction, which is

fed by resyllabification rule and special verb forms like those in section 2.10 support the claim of underlying syllable structure as argued by Clement and Keyser (1983). In addition, the fact that stem building suffixes always precede the rest of the affixation process seems to support the claim of having level ordering in morphology as discussed in Lexical Phonology and Morphology (Kiparsky,1982b. ; Mohanan,1986). Except for these few points, Lieber's OL theory provides the essential mechanism for the organization of the lexicon, and it addresses the basic nature of the Modern Sinhala verbal system which has lexicalized a great deal of inflectional processes which need to be addressed synchronically as morphological precesses.

Two points need to be clarified here. First, Sinhala speakers alternate verb-nouns A with P on the one hand and AC with PC on the other. Thus one may use bæliim alternating with bælum and bæləwiim alternating with bæləwum. Second, the argument for the existence of PC verb froms was based on sentences and clauses like the following:

1. sinduwə æhenə koṭə maṭə nikammə næṭəwenə-wa / næṭenə-wa.
   song-hear-when-me-without effort-dance
   In me it starts to dance when I hear the song.

2. (a) gahe idenə keselgeḍi
   on the tree-ripen-plantains
   Plantains that ripen on the tree.

   (b) dum gahala idəwenə keselgeḍi
   smoked-repened-plantains
   Plantains that are being ripened by smoking

(c) dum gahala idenə keselgeḍi

smoked-ripen-plantains

Plantains that ripen because of smoking

3. rajəyen hædenə / hædəwenə paaləmə

by the government-being built-bridge

The bridge that is being built by the government

The examples show that PC verb forms exist in Sinhala. Frequently PC verbs alternate with P verb forms. However, the semantic differences are evident in examples like 2(b) and (c).

Chapter III

NOUN MORPHOLOGY

3.1 Preliminaries

The Sidat Sangarawa and derivative grammars describe Sinhala nouns as having nine cases, Nominative, Accusative, Instrumental, Auxiliary[9], Dative, Ablative, Genitive, Locative and Vocative. These are illustrated in 3.1.1 with minis 'man'.

3.1.1

		Singular	Plural
1.	Nom.	minis-a	miniss-u
2.	Acc.	minis-a	minis-un
3.	Instr.	minis-a-wisin	minis-un-wisin
4.	Aux.	minis-a-karənəkotə	minis-un-karənəkotə
5.	Dat.	minis-a-tə	minis-un-tə
6.	Ablat.	minis-a-gen	minis-un-gen
7.	Gen.	minis-a-ge	minis-un-ge
8.	Loc.	minis-a-kerehi	minis-un-kerehi
9.	Voc.	minis-a	minis-uni

---

[9] This is similar to Instrumental case in function.

Traditional grammars claim that these endings are still inflectional case markers in the modern language. However, it is demonstrated in this chapter that these suffixes have evolved into a part of the derivational system. Their function in contemporary Sinhala is described first (3.2), followed by consideration of the nature of underlying representation (3.3). These two sections in turn provide the background necessary to describe stem final consonant gemination in nouns. (An example of such gemination is the double ss of the nominative plural of minis in 3.1.1.)

3.2 Nominal Classes

It is assumed here that any investigation of the nominal system in Modern Sinhala must first concentrate on the formation of the singular and plural forms of the noun. It can be seen in the paradigm of 3.1.1 that all oblique cases are built on the nominative suffix in the singular and on the accusative suffix in the plural. In fact, in modern, spoken Sinhala, the nominative and accusative are not marked and the suffixes -a, -u and -un indicate number rather than case. For the entire inventory of nouns one of two suffixes -a and -ə designates the singular, while either -u or -o marks the plural.

3.2.1

Singular	Plural
-a,-ə	-u,-o

Of the singular suffixes, -a is used with masculine nouns and -ə with feminine and neuter nouns.[10] The neuter nouns have no overt marking in their plural forms

[10] It should be noted that the grammatical gender in Modern Sinhala is identical with the natural gender. Nouns that stand for inanimate objects are marked

while animate (=masculine and feminine) nouns take -u or -o or no suffix at all. In this last case, the suffix is said to be segmentally null. Some nouns in the animate category may have either the -u or the -o suffix to mark the plural. Examples below illustrate the distribution of these singular and plural suffixes.

3.2.2

(a)

i. a~o

nari-y-a	nari-y-o
"fox"	"foxes"
kawi-y-a	kawi-y-o
"poet"	"poets"

ii.

maalu-w-a	maalu-w-o
"fish"	"fish"
panu-w-a	panu-w-o
"worm"	"worms"

---

as neuter and the nouns of animate objects are divided into masculine and feminine gender on the same criterion as it would apply in biology to discriminate male from female. Apparently, masculine and feminine nouns are subsets of an animate noun class.

(b)

a˜o	
ib-b-a	ib-b-o
"tortoise"	"tortoises"
bal-l-a	bal-l-o
"dog"	"dogs"
kol-l-a	kol-l-o
"lad"	"lads"

(c)

a˜u	
gon-a	gon-n-u
"ox"	"oxen"
put-a	put-t-u
"son"	"sons"
kok-a	kok-k-u
"crane"	"cranes"

(d)

ə ~ ø	
gas-ə	gas
"tree"	"trees"
puṭu-w-ə	puṭu
"chair"	"chairs"
aḍi-y-ə	aḍi
"foot"	"feet"

(e)

ə ~ o[11]	
kikili-y-ə	kikili-y-o
"hen"	"hens"
bæləli-y-ə	bæləli-y-o
"tabby cat"	"tabby cats"

(More examples are to be found in Appendix B.)

From these examples it is seen that nominal stems ending in a vowel require glides before the number suffixes. This glide formation is totally predictable in phonological terms. Stems with a final high front vowel, i, or a mid central vowel, ə, take y before the suffix while those with a final high back vowel require w.

Number marking suffixation of consonant final stems is more involved. Those in class (d), the inanimates, take -ə in the singular but remain unmarked in the plural. This -ə syllabifies with the final consonant of the stem.

---

[11] See under 3.6.

Stems in class (c) require -a in the singular and -u in the plural. The former suffix, the -a, simply forms a syllable with the preceding consonant, but the plural requires gemination of the stem final consonant.

Members of class (b) require gemination of the final consonant in both the singular and the plural. Like stems in class (c), these in (b) take the singular suffix -a, but different from (c), they have -o for the plural.

In order to account for these differences among nominal stem classes, the underlying nature of the morphemes involved must be investigated. This deeper examination of the data will also require an explanation for other changes that occur between stem and suffix which are described below.

3.3 Underlying Forms of the Nominals

The first question to be addressed in this study of singular and plural formation is whether or not the nominal stems have other allomorphs. The answer is yes. Observe the leftmost NPs in the following compounds.

3.3.1

(a)

i.	nari	+	ha^{n}ḍə	>	nariha^{n}ḍə
	fox		sound		cry of fox
	kawi	+	maḍuwə	>	kawimaḍuwə
	poet		cottage		congregation of poets

ii.

maalu	+	kaḍəyə	>	maalukaḍəyə
fish		shop		fish market
panu	+	gaayə	>	panugaayə
worm		irritation		worming disease

(b)

ibi	+	kaṭṭə	>	ibikaṭṭə
tortoise		shell		tortoise shell
balu	+	kuuḍuwə	>	balukuuḍuwə
dog		cage		kennel
kolu	+	gatiyə	>	kolugatiyə
lad		nature		teen-age nature

(c)

gon	+	karattəyə	>	gonkarattəyə
ox		cart		bullock cart
put	+	ruwənə	>	putruwənə
son		gem		beloved son
kok	+	pæṭiya	>	kokpæṭiya
crane		small one		young crane

(d)

gas	+	ga^{n}də	>	gasga^{n}də
tree		smell		smell of trees
puṭu	+	kakulə	>	puṭukakulə
chair		leg		leg of the chair
aḍi	+	paarə	>	aḍipaarə
foot		path		foot path

Comparing the nominals in (a), (b), (c) and (d) of 3.2.2 with those in (a), (b), (c) and (d) of 3.3.1, the following observations can be made.

3.3.2

1. The nominals in (a) have a CVCV stem shape in compounds and in number formation they have the shape CVCV + GLIDE + SUFFIX.
2. Nominals in (b) have a (C)VCV form in compounds and in number formation the stem shapes change to (C)VC - C + SUFFIX.
3. In (c), nominals have the stem shape CVC in compounds while in number formation the singular forms have CVC + SUFFIX and the plural counterparts have the shape CVC - C + SUFFIX.
4. The stem shapes in the plural and in compounds are identical in (d). The only difference is in the singular forms which have either CVC + SUFFIX or CVCV + GLIDE + SUFFIX.

From these observations the four points can be made regarding the nominal groups (a), (b), (c) and (d) which will hereafter be named respectively CLASS 1, 2, 3, and 4 of the Category N (=Noun).

3.3.3

1. Nominals in (a) belong to class 1 whose underlying form is CVCV. The final V is always one or the other of the two high vowels.
2. Class 2 which is the (b) has the allomorphs CVCV ~ CVCC in the underlying form.
3. The underlying form of class 3 is CVC and it has the allomorphs CVC ~ CVCC.
4. The final class 4 has CVC(V) underlying structure.

Thus, as described in 3.3.3, the permanent lexicon in Modern Sinhala has four noun classes under the category N.

The next question to be answered concerns the nature of number marking affixes in the lexicon. As pointed out earlier (3.2.1), there are two suffixes for the singular and three suffixes (including the segmentally null affix) for the plural. One way to predict the correct suffixation is to simply list all affixes in the permanent lexicon and introduce subcategorization restrictions so that each suffix will be associated with the correct noun class in forming the number. However, within the theory espoused here such a listing of suffixes is not insightful for the reason that among the suffixes there is one which is segmentally null and yet bears feature specifications such as [+plural]. The next approach in accounting for the number marking suffixes is to introduce one singular morpheme and one plural morpheme and then the different affixes for each number marking to be treated as allomorphs of either of the two morphemes. Therefore, the following two affixes are introduced as the singular and the plural marking morphemes.

3.3.4

Singular	Plural
a	o

The two suffixes -a and -o are listed in the permanent lexicon. They carry the feature specifications [-plural] and [+plural] respectively. They bear subcategorization restrictions which limit them to nominals. These two suffixes with their feature specifications and subcategorization restrictions are given in 3.3.5.

3.3.5

Affix	Diacritic Features	Category	Subcategorization
-a	[-Plural]	N	$]_N$ ---$]_N$
-o	[+Plural]	N	$]_N$ ---$]_N$

When affixation takes place in the second subcomponent of the grammar, the affixes in 3.3.5 attach to nominals in any one of the four nominal classes. As described for the verbs in the previous chapter the features percolate up to the higher node by the operation of feature percolation conventions. The grammar must also account for the changes which number marking suffixes undergo in accord with nominal class.

3.4 Morphological Rule Applications

The variation that both number marking morphemes undergo is due to a morphological rule which is sensitive to the class membership of the noun to which these morphemes are suffixed. The morphological rules that are applicable in deriving the correct surface forms are illustrated in 3.4.1.

3.4.1

(a) a --> ə /]$_N$_____
[-pl] [-pl] /[class 4]

(b) o --> u /]$_N$_____
[+pl] [+pl] /[class 3]

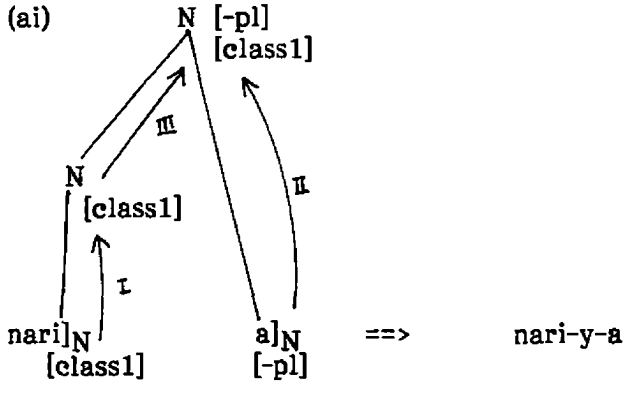
(c) o --> ø /]$_N$_____
[+pl] [+pl] /[class 4]

As can be seen in 3.4.1, the singular morpheme is reduced to ə when preceded by a noun whose class membership is [class 4]. The plural morpheme is changed into either u or ø when the adjacent noun belongs to either [class 3] or [class 4]. It is evident from this rule application that class membership of a category (in this case Noun) has a morphological value. Here it is not the category of the morpheme but the class membership of the morpheme that changes the quality of the suffix morpheme. If the category of a morpheme is specifically syntactic, its membership is the margin of overlap between syntax and morphology.

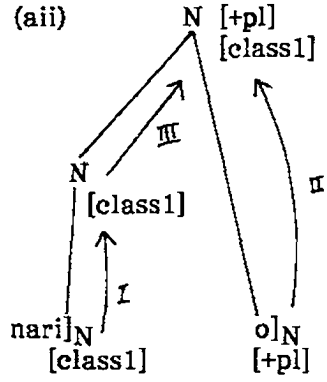
The examples in 3.4.2 illustrate the derivation of the singular and plural forms of the nouns /nari/ "fox", /gon/ "ox", and /gas/ "tree".

3.4.2

(ai)

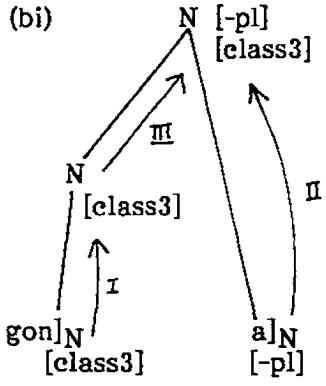


(aii)



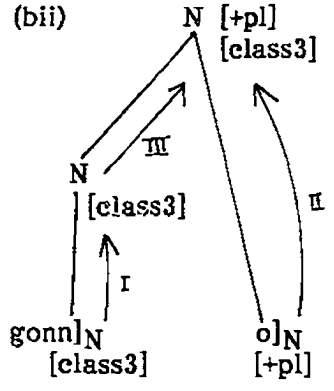
==> nari-y-o

(bi)



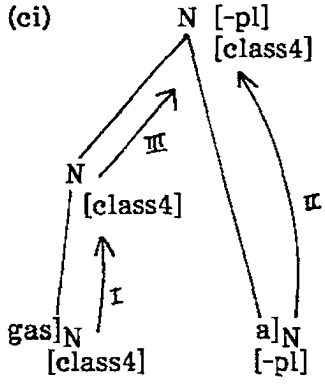
==> gon-a

(bii)



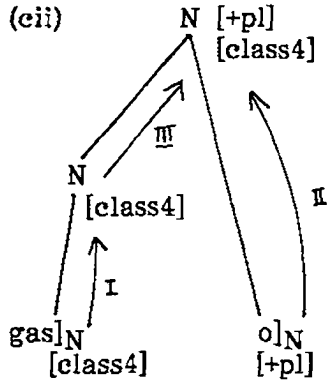
==> gonn-u

(ci)



==> gas-ə

(cii)



==> gas

The arrows I, II and III in the examples of 3.4.2 refer to the feature percolation conventions I, II and III respectively. The forms on the right hand side of each derivation are the respective surface forms. The surface forms of (ai) and (aii) in 3.4.2 are nari-y-a and nari-y-o. The glide between the nominal stem and the suffix is assumed to be due to a phonological rule application (See 3.5 below.) Among the others in 3.4.2, derivations (bii), (ci) and (cii) show examples for morphological rule applications discussed in 3.4.1. Morphological rules (b) and (c) of 3.4.1 have changed the plural suffix -o of the examples (bii) and (cii) in 3.4.2 into -u and -ø respectively. Singular suffix -a going to -ə in the example (ci) of 3.4.2 is a result of the morphological rule (a) of 3.4.1.

3.5 Phonological Rules

Glide formation between the nominal stem and the affix is argued to be a phonological rule within the noun morphology of Modern Sinhala. The phonological nature of this glide formation is highly predictable. If the nominal stem ends with a [+back] vowel, the glide w is inserted between the nominal stem and the suffix; if however the stem final vowel is [-back], the glide y is inserted. Note that the mid central vowel ə is also marked for the feature [-back]. The two glide formation rules are as follows.

3.5.1

(a) ø --> w/ $\begin{matrix}[+syl] \\ [+bk]\end{matrix}$_____[+syl]

(b) ø --> y/ $\begin{matrix}[+syl] \\ [-bk]\end{matrix}$_____[+syl]

However, within the framework of OL, there is not a domain for phonological rule applications. As mentioned in the previous chapter, it is assumed that such rules are applied after the third subcomponent of the grammar.

3.6 Derivation of Feminine Gender Nouns

In (e) of 3.2.2, mention was made of a class of nouns for which discussion was deferred. This class is now considered - first the formation of its members, then the membership itself. The two nominal stems kikili "hen" and bæləli "she cat" derive from kukul "rooster" and balal "cat" respectively. As can be seen, the feminine derivation applies before the number marking affixes are added. The suffix -i is added to many nominal stems in Modern Sinhala to derive the nominal counterpart that stands for the female gender. Therefore, it is assumed that the

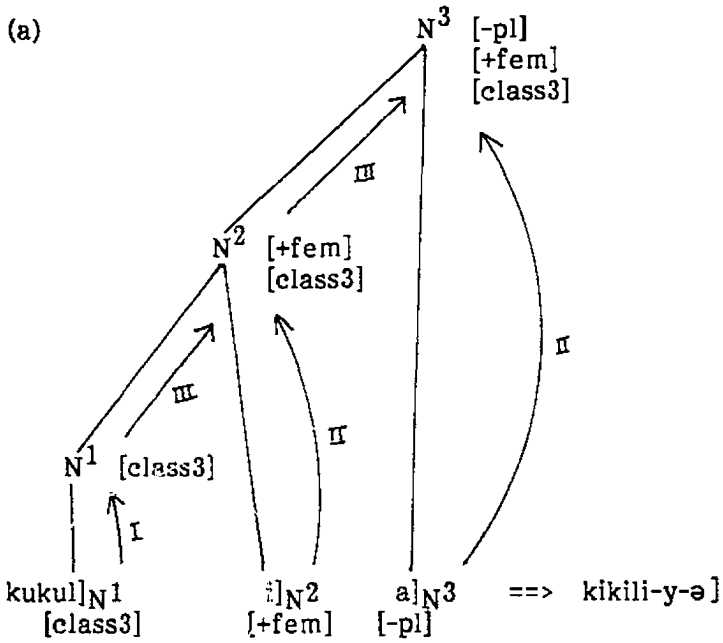
affix has the specific diacritic feature [+feminine]. After this affixation, the [+back] vowels of the noun stem are fronted. This vowel fronting is phonologically predictable thereby obviating any need of morphological rules for vowel fronting as was the case with the verbal system. This vowel fronting rule is again assumed to take place after morphological processes. The phonological rule of vowel fronting is as in 3.6.1.

3.6.1

[+syl] ---> [-bk]/____i

However, the problem to be resolved is how to determine the correct number marking suffixes for such derived nominal stems. Up to this point selection of the proper suffix for number marking was decided by a morphological rule that was sensitive to class membership of the relevant noun. In derived nouns, it is apparent that class membership has changed. For example, the nominal stem kukul which belongs to [class3] has its singular and plural forms kukul-a ~ kukul-l-u, but the singular and the plural forms of the derived noun are kikili-y-ə and kikili-y-o. It is immediately evident from the way the number is marked that the class membership of the latter pair has changed. In the process of its derivation from masculine noun form to feminine noun form, class membership of the original nominal stem has not percolated up to the higher node as one could have assumed in terms of the following illustration.

3.6.2



In the derivation 3.6.2, arrow I shows that the features of the first non-branching node are percolated up to the higher node. Arrow II percolates the features of any subsequent branching nodes, while arrow III takes care of percolating any features that were not covered by convention II (=arrow II) in this case, carrying the feature [class 3] along the path from N^1 to N^3 including the feature [+feminine] from the branching node N^2. If this were the case, the feature [class 3] should dominate the derived stem thus allowing it to have a ~ u variation in the number marking. However, the number marking of the derived nominal stem has the variation of ə ~ o. This reveals that between the singular and the plural marking affixes which are underlyingly /-a/ ~ /-o/, the singular suffix has changed to -ə in the surface form while the plural marker has the identical form in the surface form. According to the earlier analysis and discussion, the singular suffix /-a/ is changed to -ə in the context of nominal

stems whose class membership is [class 4]. However, the plural affix of such nominal stems is segmentally null in the surface form, i.e., the variation is ə ~ ø. Relying on this evidence, it is argued that the nominals derived by -i suffixation not only change their gender but also their class membership. Thus, suffix -i bears a diacritic feature [class 5] in addition to the feature [+ fem].

3.6.3

-i = [+feminine]
[class5]

The morphological rule applications in 3.4.1 are repeated here in 3.6.4 with some modifications to (a). Now the rule (a) of 3.6.4 says that the singular marking affix /-a/ changes to -ə in the contexts where the nominal stem is either [class4] or [class5].

3.6.4

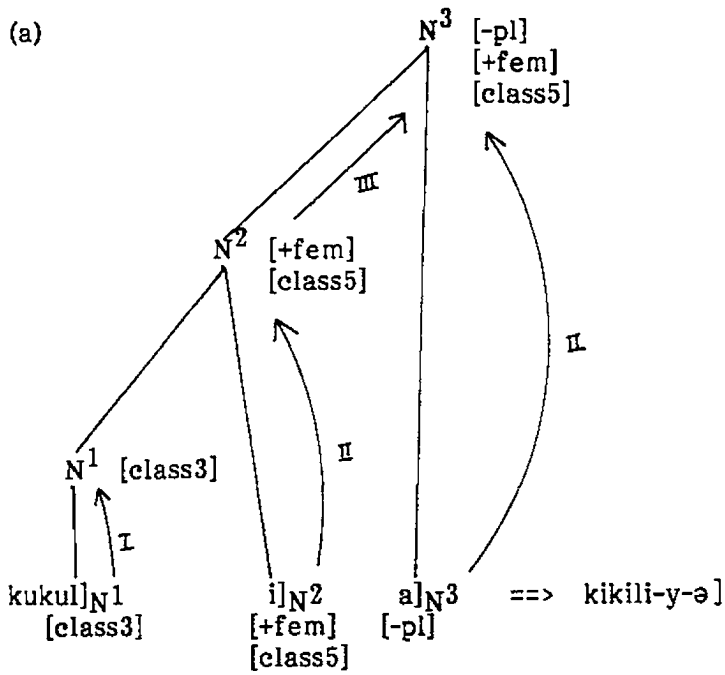
(a) a --> ə / $]_N$_____
[-pl] [-pl] /[class4 & 5]

(b) o --> u / $]_N$_____
[+pl] [+pl] /[class 3]

(c) o --> ø / $]_N$_____
[+pl] [+pl] /[class 4]

The lexical tree in 3.6.5 shows how class membership of the original nominal stem is changed following -i suffixation.

3.6.5



In diagram 3.6.5, the feature [class3] percolates up to the first nonbranching node by convention I. Branching node N^2, however, has received the feature [class5] from the suffix -i by convention II. This has blocked the operation of convention III which would have otherwise percolated the feature [class3] up to the higher node. Now the string adjacency is satisfied for the morphological rule application by which the singular suffix /-a/ is changed into -ə because it is preceded by a nominal stem of membership in [class 5].

3.7 Definite and Indefinite Markers

The next issue to be addressed in this study of noun morphology in Modern Sinhala is the marking of the definite- vs indefinite status of a given nominal stem. Observe the following examples.

3.7.1

		Definite	Indefinite
(a)	I	nari-y-a	nari-y-ek
		"the fox"	"a fox"
		kawi-y-a	kawi-y-ek
		"the poet"	"a poet"
	II	maalu-w-a	maalu-w-ek
		"the fish"	"a fish"
		panu-w-a	panu-w-ek
		"the worm"	"a worm"
(b)		ib-b-a	ib-b-ek
		"the tortoise"	"a tortoise"
		bal-l-a	bal-l-ek
		"the dog"	"a dog"
		kol-l-a	kol-l-ek
		"the lad"	"a lad"
(c)		gon-a	gon-ek
		"the ox"	"an ox"
		put-a	put-ek
		"the son"	"a son"
		kok-a	kok-ek
		"the crane"	"a crane"

(d)	gas-ə	gas-ak
	"the tree"	"a tree"
	puṭu-w-ə	puṭu-w-ak
	"the chair"	"a chair"
	aḍi-y-ə	aḍi-y-ak
	"the foot"	"a foot"
(e)	kikili-y-ə	kikili-y-ak
	"the hen"	"a hen"
	bæləli-y-ə	bæləli-y-ak
	"the she cat"	"a she cat"

The first member of each pair of examples in 3.7.1 is in the definite singular form as opposed to the indefinite singular represented by the second member of the same pair. The suffixes found on the first member of each pair have already been presented as deriving from the suffix /-a/. By now it is clear that this suffix /-a/ bears not only the diacritic feature [-plural] but also the feature [+definite]. Therefore, the new suffix is marked as [-plural],[+definite]. However, there are two suffixes -ek and -ak both of which have the features [-plural],[-definite]. As the examples show, nominals of the [class4] and [class5] take the suffix -ak while the rest of the nominal classes have -ek in the indefinite singular form. Here again is a case where two suffixes alternating with each other mark the same features and feature values namely, [-plural],[+definite]. This situation is handled by treating one suffix as the underlying morpheme and the other as an allomorph of it. A morphological rule selects the proper suffix for a nominal stem in any given situation. Here it is argued merely on the grounds of frequency of

occurrence, that /-ek/ is the underlying form; its alternate, -ak, is derived by morphological rule. 3.7.2 summarises how the definite and indefinite singular suffixes are stored in the permanent lexicon together with relevant information. Following it in 3.7.3 is the morphological rule that changes -ek to -ak in the proper environments.

3.7.2

Affix	Diacritic Features	Category	Subcategorization
-a	[-pl],[+def]	N	$]_N$ ---$]_N$
-ek	[-pl],[-def]	N	$]_N$ ---$]_N$

3.7.3

-ek --> -ak/ $]_N$----
[class4 & 5]

3.8 Definite- Indefiniteness in the Plural

The definite and the indefinite markings in the plural form of a noun involve two different processes. The plural marking suffix discussed earlier in this chapter also marks the definiteness of the noun. This situation is exactly the same as the definite singular marking where the singular suffix also indicates definiteness. However, the indefiniteness of a plural form is expressed in a very peculiar way as shown in 3.8.1.

3.8.1

		Definite	Indefinite
(a)	I	nari-y-o	nari-y-o wagə-y-ak
		fox + Def.PL.	fox + Def.PL. some + Indef.Sing.
		"foxes"	"(some) foxes"

In this example, the definite plural form is nari-y-o. The suffix -o was treated earlier as the underlying form of the plural marking affix, and as explained before, the y found between the nominal stem and the affix is due to glide formation. Earlier, the claim was made that -o bears the feature [+plural]. Now, this feature assignment is modified to add the feature [+definite] to -o. The derivation remains the same as described under section 3.6. The point of interest here, however, is the indefinite marking on plural forms. To the definite plural nari-y-o is added wagə-y-ak creating the indefinite plural. The sequence **wagə-y-ak** comprises a nominal morpheme wagə (from /waga/) meaning approximately 'some' and the suffix **-ak** (an allomorph of -ek) linked by the **y**-glide. This formation represents the typical indefinite plural formation in Modern Sinhala. Yet to be determined is whether this indefinite plural is the result of a derivational process in the lexicon or whether it occurs on the syntactic level by simply juxtaposing two nominals. An answer is proposed in section 4.4 of Chapter IV.

3.9 Conclusion

The basic discussion in this chapter has concerned singular and plural number marking in the nominal system of Modern Sinhala. It was pointed out that both nominal stems and number marking affixes have at least two alternating forms. Stem variation was handled by listing stem allomorphs in the lexicon and expressing their relations by means of morpholexical rules. Further, these nominals were divided into five classes on the basis of their singular and the plural forms. The latter were crucial in deriving a morphological solution to the allomorphy in the number marking affixes. It was further revealed that number marking affixes also played roles as definite and indefinite articles. Within the OL theory, the mechanism of attaching diacritic features to the morphemes managed to capture all this information through the feature percolation conventions. Contrary to the point of view expressed in traditional grammars, all the morphological processes were treated as lexical processes, a primary characteristic of OL theory.

Chapter IV

COMPOUNDS

4.1 Preliminaries

The phenomenon of compounding is a controversial issue in Modern Sinhala. However, certain morphological features do separate compounds from mere sequences of words. A theory like OL, which has been developed mainly for morphological investigations of the lexicon, is seen to adequately account for Sinhala compounding.

Traditional Sinhala grammars have addressed the issue of compounding but not successfully. The Sidat Sangarawa, for example, speaks of compounds as the "combining of several words into one unit" saying nothing about how the words are put together phonologically or morphologically. Instead, that grammar groups compounds into five classes partly on semantic and partly on superficial syntactic considerations. These five classes are as follows:

4.1.1

1. Case Compounds
2. Adjectival Compounds
3. Collective Compounds
4. Indeclinable Compounds
5. Relative Compounds (Gunasekara, 1962: 323-24.)

In a case compound, the first member is always believed to carry a meaning that can be expressed by one of the cases. An adjectival compound is one in which a first member modifies a second. These two classes seem to have been set up on the basis of syntactic relations holding between the combined words. In reality, however, these two classes turn out to be based more on ill-defined semantic criteria than on rigorously described syntactic features. The remaining three compound classes have been named solely on the basis of imprecisely stated semantics leaving students in confusion as to the real nature of this lexical process. What has been missing in descriptions of Sinhala is a mechanism for rigorously describing the process of compounding in Modern Sinhala and thereby to provide a descriptive analysis as to its current status.

Compounds in Modern Sinhala are combinations of N + N, N + V, and A + V as the examples in 4.1.2 show.

4.1.2

(a) N + N

/pot/	+	/saappu/	>	/potsaappu/
book		shop		book store
/gini/	+	/kuuru/	>	/ginikuuru/
fire		stick		match
/meesa/	+	/laampu/	>	/meesalaampu/
table		lamp		table lamp

(b) N + V

/paaṭa/	+	/kara/	>	/paaṭakara/
colour		do		(to) colour or paint
/wæḍa/	+	/kara/	>	/wæḍakara/
work		do		(to) work

(c) A + V

/dik/	+	/kara/	>	/dikkara/
long		do		(to) lengthen
/pahat/	+	/kara/	>	/pahatkara/
low		do		(to) lower

4.2 Nature of the Compounds

Sinhala has no phonological feature by which compounds can be distinguished from other sorts of word sequences. It is not a stress language thereby obviating the use of stress (which is so important in English. Contrast [blákbərd] and [blækbə́rd].) However, certain assimilatory processes do operate across morpheme boundaries in compounds. Consider [possaappu] 'bookstore' from [pot] 'book' and [saappu] 'store' where the final t of [pot] becomes s. In general, this assimilatory process can be stated as follows:

4.2.1

[αcon] ---> [βcon] /----+[βcon]

However, this assimilation occurs between any two words whether or not they are in compounds.

Indeed, the only criterion by which compounds can be recognized is a distributional one. Compounds behave as a unit not permitting any other morpheme to be inserted between its members. Usually, an adjective precedes the noun it modifies as in example 4.2.2.

4.2.2

$[[usa]_A$	+	$[gasa]_N]_{NP}$	>	$[[usagasa]]_N$
tall		tree		tall tree

However, in a phrase like "tall coconut tree" the adjective stands outside "coconut tree" as can be seen in the following example.

4.2.3

$[[usa]_A$	$[[pol]_N$	$[gasa]_N]_N]_{NP}$
tall	coconut	tree

In 4.2.3, the word [polgasa] is a compound and hence the adjective [usa] is outside the compounded word. There is no instance of the adjective being inserted in between the two stems of the compounded words as *pol usagasa. However, it is necessary to investigate this further to see if this that looks like compounding is merely a syntactic ordering similar to what is found in English where dimensions are always expressed before other sorts of descriptive words.

4.3 Theoretical Applications

Compounds shown in 4.1.2 belong to the class of primary compounds. Compounding in this class takes place between two stems. As usual the nominal stems remain stored in the permanent lexicon with the appropriate information. In the first subcomponent of the lexicon these stems are inserted into binary branching trees. However, it is a different node labelling convention that is responsible for the percolation of the features to the higher node. Conventions I - III discussed in Chapter II, have the effect of labelling the highest branching node in a word tree only if one morpheme is an affix. Because both morphemes are stems in a compound, the following convention, IV, comes into effect.

4.3.1

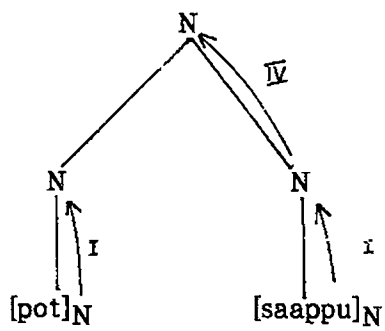
1. Convention IV: If two stems are sisters (i.e. if they form a compound), features from the righthand stem percolate up to the branching node dominating the stems. (Lieber, 1983. Linguistic Inquiry, 14, 253.)

Convention IV, which is a language specific rule, is, also, effective on Sinhala compounds. As in English, in primary compounds of Sinhala, the features of the right-most stem percolate up to the higher node of the compound word tree.

The derivation of the compounds in Modern Sinhala is illustrated in 4.3.2.

4.3.2

(a)



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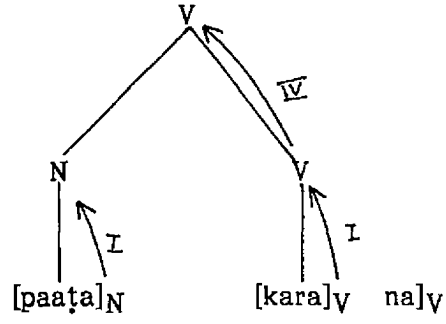
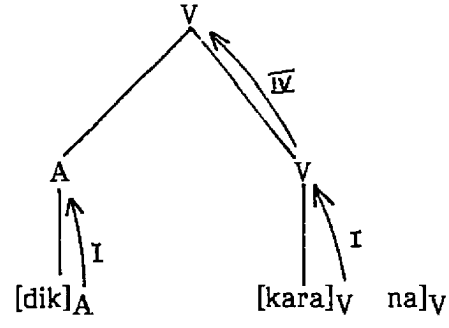


(c)



In 4.3.2, arrow I illsutrates the labelling of the nonbranching nodes by Convention I and arrow IV shows the percolation of the features to the branching nodes dominating the stems.

4.4 Indefinite Plural Marking of Nouns

The indefinite plural marking of the noun stems discussed in the previous chapter will be reconsidered here. The example mentioned in 3.8.1 under noun morphology is repeated in 4.4.1.

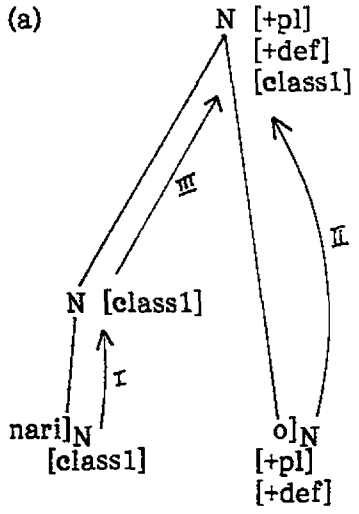
4.4.1

		Definite PL.	Indefinite PL.
(a)	I	nari-y-o	nari-y-o wagə-y-ak
		fox + Def.PL.	fox + Def.PL. some + Indef.Sing.

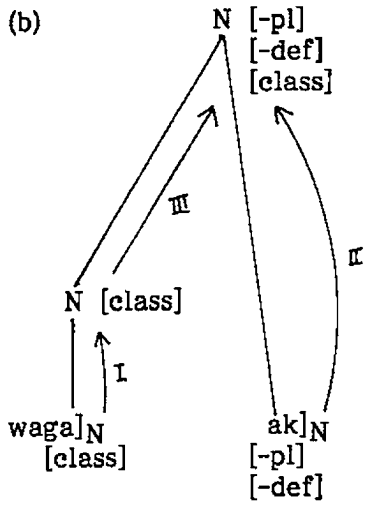
As described in the previous chapter, the suffix -o has two features [+ plural] and [+ definite]. In the indefinite plural form, one can see the regular plural noun form is followed by a nominal in the indefinite singular form. The structure of the indefinite singular and plural froms are respectively: N + Def.Pl.marker, N + Def.Pl.marker + N + Indef.Sing.marker. The second noun stem used is /waga/ meaning "a group". According to the derivations discussed in the previous chapter the two nominal forms would have the following derivations if they were taken separately.

4.4.2

(a)



(b)



The feature percolation procedures are similar to those illustrated before.

The question is whether the plural indefinite formation is a lexical or a syntactic process. If it is a lexical process, then the next question is whether it is derivational process or compounding.

The following points are made in ruling out the assumption that the plural indefinite marking is not derivational. First, theoretically, the difference between a stem and an affix is that the former does not subcategorize another morpheme. However, if the indefinite plural marking has to be derivational, then the second nominal stem waga would have to be subcategorized in order for it to follow the plural suffix. Second, the feature percolation convention does not correctly predict that the final output has the features [+plural] and [-definite] owing to the fact that the features of the final suffix are dominating the rest.

On the other hand, the plural indefinite marking cannot be a process of compounding. Compounding takes place between two stems. With regard to the example in discussion, the two sister nodes are N^1 rather than N. However, even

if N^1 nodes were allowed to be compounded, the feature percolation convention would fail to percolate the proper features up to the higher node. Therefore, the conclusion is that the indefinite plural marking is not a lexical process.

4.5 Conclusion

The phenomenon of compounding in Modern Sinhala is solely a morphological process and, therefore, easily described within a theory like OL which is basically intended for morphological derivations. The confused accounts of compounds in traditional grammars are caused by attempts to categorize compounds on the basis of semantics.

Chapter V

PHONOLOGY AND MORPHOLOGY OF MODERN SINHALA

This chapter will review the discussion carried through the last three chapters and, in particular, will reconsider some of the problems that were addressed in those chapters. Issues of morphology were relatively well handled within the framework of OL, while those of phonology were omitted. In what follows, some of such phonological problems will be discussed in light of later theories such as Lexical Phonology and Morphology (hereafter LPM), and CV-Phonology.

5.1 Stem Variation

A common factor in the morphology of Modern Sinhala is the stem variation. It has been shown that stem variation in the majority of the verbs results not from stem allomorphy in the lexicon but rather from a derivational process called the Stem Building Process. On the other hand, variation in nominals and a small class of verbs is best considered as stem allomorphy. In such cases, morpholexical rules are assigned to verify the relation between the alternating allomorphs which are stored in the permanent lexicon. Some sound changes, which are phonologically unpredictable, can be accounted for by morphological rules. In general, the theory of OL adequately accounts for the morphology of Sinhala. However, some phonological rules play an important role in deriving surface forms.

5.2 Phonological Rules

The following summarizes the phonological rules mentioned in the early discussions:

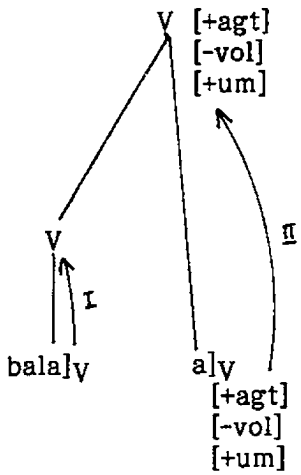
5.2.1

1. Umlaut Spreading (=US)
2. Vowel Loss (=VL)
3. Vowel Fronting (=VF)
4. Syllabification (=Syl)
5. Vowel Reduction (=VR)

It should be noted that the VF rule is a phonological rule of vowel fronting as opposed to a morphologically motivated umlauting rule. In accord with the framework of OL, it is assumed that the phonological rules in 5.2.1 have to be applied after the morphological rules. How these phonological rules are applied is illustrated with examples in 5.2.2.

5.2.2

1a)



= Affixation

1b) balæ]V e]]V [+um] = Morphological Rule(s)

1c) bælæ]V e]]V = US

1d) bæl]V e]]V = VL

1e) ----- = VF

1f) [bæle]V = Syl. (see below for the derived syllable structure).[12]

1g) ----- = VR

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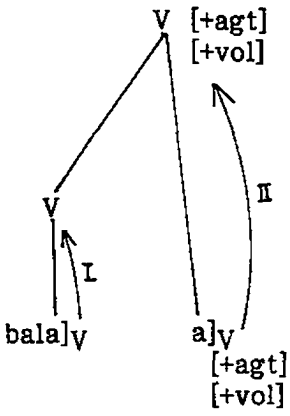
12 The derived syllable units are CV CV.

2a) 

= Affixation

2b) ----- = Morphological Rule(s)

2c) ----- = US

2d) bal]V a]]V = VL

2e) ----- = VF

2f) [bala]V = Syl.[13]

2g) [balə] = VR

Among the phonological rules in 5.2.1, the US rule has the effect of fronting vocalic segments that precede the umlauted vowel. When there is a sequence of two or more vocalic segments, all but the last vowel of that sequence are deleted by the VL rule as shown in (1d) and (2d) of 5.2.2. The Syl. rule reinforces the sound unit by syllabifying segments every time some change takes place. VR rule reduces [a] and [æ] to [ə] when they occur in open syllables other than initial syllables.

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[13] The derived syllable units are CV CV.

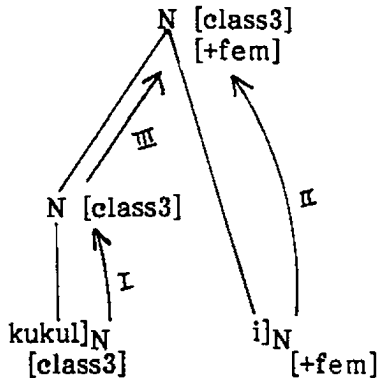
5.3 Rule Ordering

The phonological rules in 5.2.1 are stated in a specific order the validity of which is further discussed in this section. It is implied in 5.2.1 that the US rule has to be applied before the VL rule. The function of the US rule is to spread vowel fronting over the preceding vocalic segments of a word after the final vowel has been fronted by the morphologically motivated Umlauting Rule as shown in (1b) of 5.2.2. If the VL rule were applied before the US rule the fronted vocalic segment would be lost thus bleeding the effect of the US rule.

According to the rule ordering of 5.2.1, VF rule follows the VL rule. VF is the phonological rule of vowel fronting which derives feminine nominal stems from masculine stems. For example, the word kikili "hen" is derived from either of the allomorphs /kukul/ or /kukulu/ both of which are stored in the permanent lexicon. The derivations are illustrated in 5.3.1.

5.3.1

1a)



= Affixation

1b) ----- = Morphological Rule(s)

1c) ----- = US

1d) ----- = VL

1e) [[kukil] i]]$_N$ = VF

1f) [kikil] i] = US

1g) [kikili]$_N$ = Syl.[14]

1h) ----- = VR

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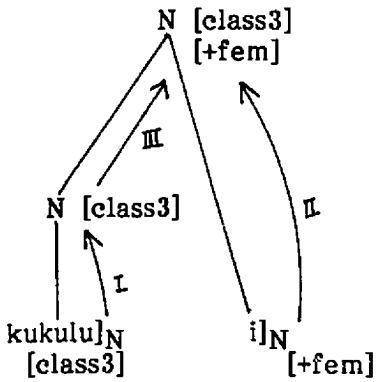
[14] The derived syllable units are CV CV CV.

2a) 

= Affixation

2b) ----- = Morphological Rule(s)

2c) ----- = US

2d) [[kukul] i]] = VL

2e) [[kukil] i]]$_N$ = VF

2f) [kikil] i] = US

2g) [kikili]$_N$ = Syl.[15]

2h) ------ = VR

Examples in 5.3.1 show that the VL rule is applied before the VF rule. If the ordering of these two rules were reversed, the VF rule would have to be applied recursively to get the next final [+back] vowel fronted as explained in 5.3.2. In other words, the reversing of the ordering of these two rules would create a counterbleeding situation.

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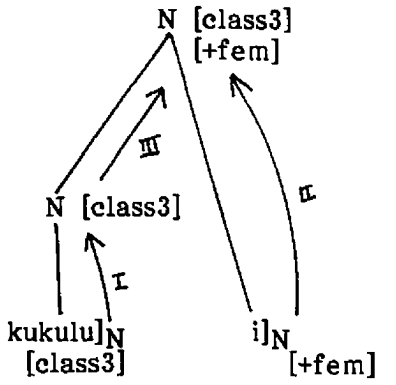
[15] The derived syllable shapes are CV CV CV.

5.3.2

1a) 

= Affixation

1b) ----- = Morphological Rule(s)

1c) ----- = US

1d) [[kukuli] i]] = VF

1e) [[kukul] i]]$_N$ = VL

1f) [[kukil] i]] = VF

1g) [[kikil] i]]$_N$ = US

1h) [kikili]$_N$ = Syl.[16]

1i) ----- = VR

The VL rule is applicable when there is a sequence of two or more vocalic segments. In the example 5.3.2, the operation of the VL rule after the VF rule, eliminates the already fronted final vowel. As a result the VF rule has to be reapplied. Meanwhile, it should be noted in the above example that the US rule has been applied recursively - first at the beginning of the phonological rule applications (see 1c) and next following the VF rule. If, however, the VF rule were to be ordered before the US rule, the recurrence of the US rule could be avoided.

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[16] The derived syllable units are CV CV CV.

In summary, the most practical ordering of the phonological rules is as follows:

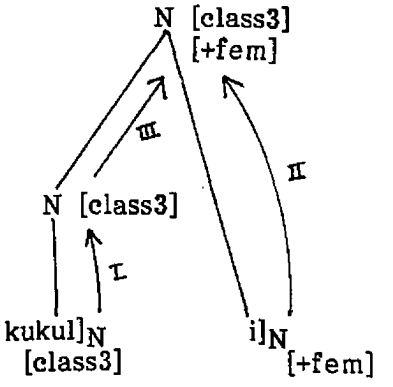
5.3.3

1. Vowel Fronting (=VF)
2. Umlaut Spreading (=US)
3. Vowel Loss (=VL)
4. Syllabification (=Syl)
5. Vowel Reduction (=VR)

The two examples in 5.3.1 are repeated in 5.3.4 in accordance with the revised rule ordering.

5.3.4

1a)



= Affixation

1b) ----- = Morphological Rule(s)

1c) [[kukil] i]] = VF

1d) [[kikil] i]] = US

1e) ----- = VL

1f) $[kikili]_N$ = Syl.[17]

1g) ----- = VR

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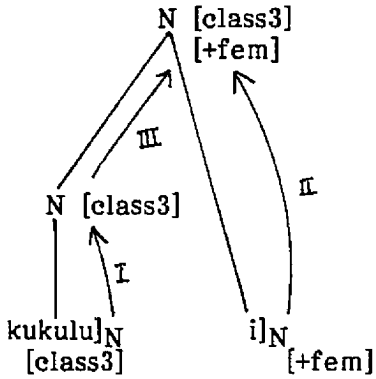
[17] The derived syllable units are CV CV CV.

2a)



= Affixation

2b) ----- = Morphological Rule(s)

2c) [[kukuli] i]] = VF

2d) [[kikili] i]] = US

2e) [[kikil] i]]$_N$ = VL

2f) [kikili]$_N$ = Syl[18]

2g) ----- = VR

5.4 Level Ordering and Cyclic Application of Rules

Recent developments in phonological theory have mainly dealt with the interaction of phonology and morphology within the lexicon which is assumed to consist of levels or strata. The theory followed in this study has three subcomponents in the lexicon. The OL theory, however, does not mention interactions between phonology and morphology nor does it specify a domain for phonological rule applications.

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[18] The derived syllable units are CV CV CV.

It would be interesting to discover whether or not there are any instances of phonological and morphological interactions in the Modern Sinhala lexicon. An important clue to this phenomenon is observed in Chapter II. There it was mentioned that the stem variation of the verb was due to a stem building process in the lexicon. Stems thus derived undergo further derivations such as tense building or noun-formation. Such evidence suggests that level ordering is a factor in the Modern Sinhala lexicon. It can be argued, for example, that the lexicon consists of two levels the first of which concerns stem building while the second deals with other derivations. In such a case, phonological rules like VL and Syl become cyclic rules. Examples discussed in chapter II would have the following derivations in 5.4.1 if the theoretical aspects of LPM were to be adopted.

5.4.1

Level 1

[bala]	[a]	[nə]	
[[bala]	[a]]		- Affixation
[[bal]	[a]]		- VL
[[bal]	[a]]		- Syl[19]
[[bal]	[ə]]		- VR
[balə]			

Level 2

[[balə]		[nə]]	- Affixation
-----		---	- VL
[[balə]		[nə]]	- Syl.[20]
-------		-----	- VR
[balənə]			

Example given in 5.4.1, according to the model of LPM, illustrates that the affixation takes place in two levels, each of which deals with a different set of affixation processes. The domains of the VL, Syl, and VR rules are both level I and II.

An advantage of a model that advocates phonology and morphology interaction can be seen with regard to the processive verb-stem derivations. For example, [bala] e] which becomes bæle, has undergone vowel fronting and this vowel change is treated as a morphological process. However, one could have

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19 The derived syllable units are CV CV

20 The derived syllable units are CV CV CV

treated this as a phonological change, if phonological and morphological rules can be applied alternatively as suggested by the LPM model.

One very effective mechanism in the OL model is the feature percolation conventions which keep track of information as the morphemes are put together in derivations. The OL model would be even more effective if it could be improved in such a way that phonological and morphological rule interactions could be allowed in the lexicon. Or one might elect to integrate feature percolation conventions into the LPM model and thereby enhance the productivity of the latter model.

5.5 Syllable Structure

Syllable structure remains an essential issue in Modern Sinhala phonology. In the current study, it is repeatedly mentioned that vowel reduction is conditioned by the syllable structure of a word unit. Syllabification was introduced as a rule that is repeatedly applied after every derivation or whenever there is vowel loss after a rule application. For example in [bala], the Syllabification Rule is applied after the VL rule as illustrated below.

5.5.1

[[bala]	[a]]	-
[[bal]	[a]]	- VL
[[bal]	[a]]	- Syl[21]
[[bal]	[ə]]	- VR

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[21] The derived syllable units are CV CV.

It can be seen in the example that the VR rule comes into operation following the Syl rule. As mentioned earlier (5.2), in Modern Sinhala [a] and [æ] are reduced to [ə] when they occur in an open syllable unless that syllable is word initial. However, vowel reduction is blocked whenever that particular syllable becomes a heavy syllable. In general, a heavy syllable is the one which contains a coda. Thus, in the following example vowel reduction in the medial syllable is blocked because the syllable is heavy.

5.5.2

bala]	a]	nna]	-
bal]	a]	nna]	- VL
bal]	a]	nna]	- Syl.[22]
bal]	a]	nnə]	- VR
[balannə]			

Whereas, the vowel in the following example is not reduced because it is long[23].

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22 The derived syllable shapes are CV CVC CV.

23 The vowel is lengthened by a morphological rule

5.5.3

bala]	a]	wi]	-
bala]	a:]	wi]	-
bal]	a:]	wi]	- VL
bal]	a:]	wi]	- Syl.[24]
---			- VR
[bala:wi]			

While it is clear that the vowel reduction rule is sensitive to syllable structure, the notions of heavy syllable and light syllable have to be "defined in terms of the category nucleus" as claimed in CV-Phonology by Clements and Keyser (1983). Accordingly, the structure of a heavy syllable is VC or VV. In 5.5.2, the heavy syllable is VC whereas in 5.5.3 it is VV.

Further revealing evidence about the underlying syllable structure in Modern Sinhala is found in noun number marking. As pointed out in Chapter III, the final consonant of certain nominal stems surfaces as if geminated when the number marking suffixes are added. Nouns such as /ibi/ "tortoise" and /balu/ "dog" have the following forms for singular and plural:

5.5.4

Singular	Plural
ib-b-a	ib-b-o
bal-l-a	bal-l-o

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[24] The derived syllable units are CV CVV CV.

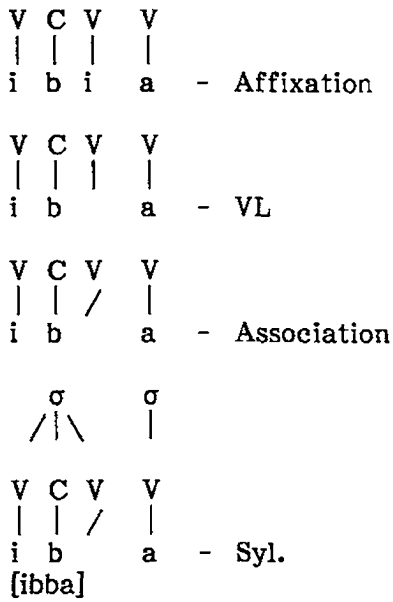
In compounds, the stem shapes are identical with the underlying forms.

5.5.5

ibi	+	kaṭṭə	>	ibikaṭṭə
"tortoise"		"shell"		"tortoise shell"
balu	+	kuuḍuwə	>	balukuuḍuwə
"dog"		"cage"		"kennel"

Within the framework followed here, this situation is addressed by having the two stem forms (C)VCV ~ (C)VCC stored in the permanent lexicon and having a morpholexical rule express the relation between these two alternating stems. Such alternations and similar situations (discussed earlier in Chapter III) strongly suggest the viability of undertaking an indepth study of underlying syllable structure in Modern Sinhala. As an example, consider final consonant gemination in number marking affixation of nominal stems. In terms of CV-Phonology, this gemination can be briefly illustrated as follows:

5.5.6



Here it is seen that the V element remains even after the vocalic segment is lost. By association, the empty V element forms a unit with the preceding C element. The result is a lengthened final consonant segment. Even though represented as a consonant gemination, phonetically the difference is short versus long consonant as illustrated in 5.5.7.

5.5.7

koka	[koka]	"the crane"
ibba	[ib:a]	"the tortoise"

A study of syllable structure might also be able to adequately account for instances where a prenasalized stop becomes a full nasal sound after affixation. In 2.10.4 of Chapter II, a morpholexical rule (repeated in 5.5.8) was drawn to account for this stem variation in verb morphology.

5.5.8

$(C_1)V^nC_2V$ ~ $(C_1)VN_2C_2a$

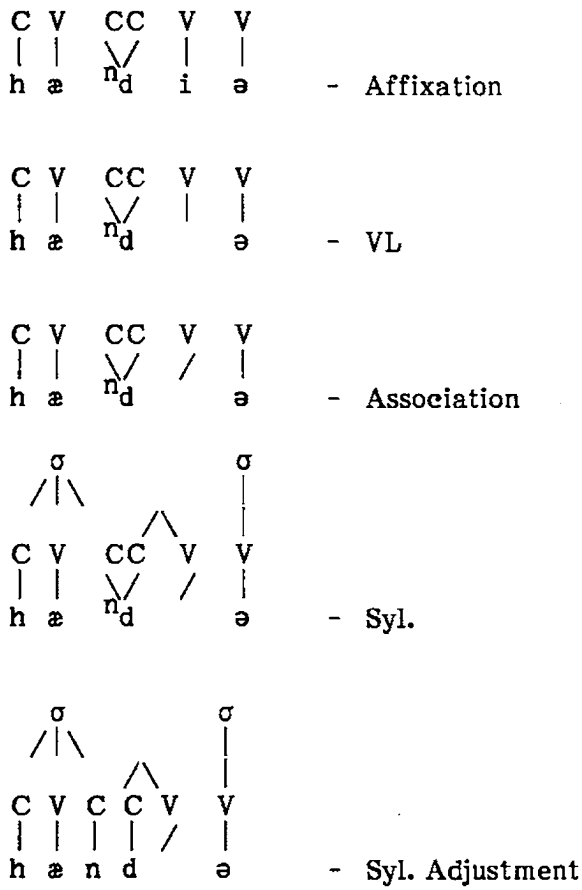
This variation is caused by the prenasalized stop $-^nC-$ which becomes NC (the 'N' here represents a full nasal consonant) in certain environments. This same situation can be found in certain nominal stems such as /hæ^{n}di/ "spoon" and /æ^{n}di/ "rails".

5.5.9

hændə	hæ^{n}di
"the spoon"	"spoons"
ændə	æ^{n}di
"the rail"	"rails"

In the above examples, the plural affix is segmentally null and -ə is added in the singular. The plural is identical with its underlying form whereas in the singular a prenasalized stop has become a full nasal sound following affixation. The question is how to account for a half nasal sound becoming a full nasal sound. The answer is by acknowledging the underlying syllable structure. See 5.5.10.

5.5.10



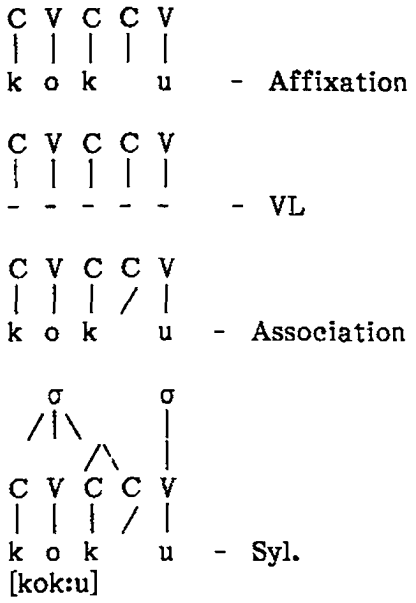
[hændə]

After Vowel Loss (=VL) the empty V element becomes associated with the preceding segment, a prenasalized stop. The final consonant becomes long as a result of the empty V now associated with it. However, at this point, the prenasalized stop splits into a nasal + a consonant, instead of lengthening. This situation needs further investigation before a conclusive statement as to the behaviour of the prenasalized stops can be made. Such investigations will have to look into the possibilities of permissible initial and final clusters which a nucleus

may consist of in a CV-tier. What is clear from the above illustration (5.5.10) is that the final consonant which is usually lengthened before an empty V element, and which also becomes ambisyllabic, has now split into two consonant segments. The first of the two becomes the coda of the preceding syllable while the second is the onset of the following syllable.

Modern Sinhala also has historical evidence to support this notion of underlying syllable structure. For example, the plural form of koka "the crane" (which is underlyingly /kok/ 5.5.7) is kok-k-u. Here again is an instance of stem final consonant gemination. To account for this gemination, a morpholexical rule that looked like CVC ~ CVCC was assigned in Chapter III. From the perspective of CV-Phonology, it could be argued that the stem final consonant is lengthened because of an empty V element that is associated with the consonant. However, there is no immediately perceivable empty V slots associated with the stems in question. In the earlier discussion, when this phenomenon was brought up to address the issue of stem final consonant lengthening, the empty V element was treated as the result of stem final vowel deletion. A word like kok-k-u does not have a final vowel in the underlying form. However, it is argued that the syllable structure involving the suffix /-u/ is /-CV/ of which the C is segmentally empty. This empty C element which becomes associated with the final consonant of the nominal stem causes that consonant to be lengthened. This is illustrated in 5.5.11 below.

5.5.11



Final consonant lengthening is, thus, caused by having two CV-elements dominating the consonant segment. In the earlier example, it was a CV domination whereas in the above example it is a CC. In summary, a long segment in Modern Sinhala is either **CV, CC** or **VV.**

Historically, the suffix -u was hu and even today this -hu suffix is used in documents written in the style of Ancient Sinhala. The disappearance of the velar fricative h began at the end of the Middle Sinhala era. Interestingly, however, it is only the segment that has disappeared while the underlying syllable structure is preserved; or, in other words, the C element has become extrasyllabic. A morpholexical rule such as CVC ~ CVCC according to the OL theory captures this underlying C element but on the wrong side. On the other hand, a theory like CV-Phonology manages to state the facts more accurately in the underlying form. This evidence points out the need for an indepth investigation of the structure of

syllable representation in Modern Sinhala and its essential role in organizing the Sinhala lexicon.

5.6 Conclusion

Like all natural languages, Modern Sinhala is complex and full of intricacies. From among the many descriptive models available in contemporary linguistics, some are better able to handle one aspect of a language while a different facet of the same language is more facilely described by a different model. This final chapter has shown that integrating several theoretical approaches such as CV-Phonology and Lexical Phonology and Morphology, addresses more efficiently certain complex issues in Sinhala phonology and morphology.

The intention of this study has been to describe the Modern Spoken Sinhala lexicon utilizing the insights of modern linguistic science. Hopefully, it has been sufficiently successful to stimulate others to explore further these and other aspects of the spoken language.

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APPENDIX A

VERBS

	Infinitive	Present	Past	Future	Nominal
			1. "see"		
A	bala-nnə	balənə-wa	bælu-wa	balaa-wi	bæl-iim
P	bæle-nnə	bælenə-wa	bælu-na	bælee-wi	bæl-um
AC	baləwa-nnə	baləwənə-wa	bælewu-wa	baləwaa-wi	bæləw-iim
PC	bæləwe-nnə	bæləwenə-wa	bæləwu-na	bæləwee-wi	bælæw-um
			2. "kill"		
	mara-nnə	marənə-wa	mæru-wa	maraa-wi	mær-iim
	mære-nnə	mærenə-wa	mæru-na	mæree-wi	mær-um
	marəwa-nnə	marəwənə-wa	mærewu-wa	marəwaa-wi	mærəw-iim
	mærəwe-nnə	mærəwenə-wa	mærəwu-na	mærəwee-wi	mæræw-um
			3. "sow"		
	wapura-nnə	wapurənə-wa	wæpiru-wa	wapuraa-wi	wæpir-iim
	wæpire-nnə	wæpirenə-wa	wæpiru-na	wæpiree-wi	wæpir-um
	wapurəwa-nnə	wapurəwənə-wa	wæpirewu-wa	wapurəwaa-wi	wæpirəw-iim
	wæpirəwe-nnə	wæpirəwenə-wa	wæpirəwu-na	wæpirəwee-wi	wæpiræw-um
			4."strike/hit"		
	happannə	happənəwa	hæppuwa	happaawi	happiim
	hæppennə	hæppenəwa	hæppuna	hæppeewi	hæppum
	happəwannə	happəwənəwa	hæppewuwa	happəwaawi	hæppəwiim
	hæppəwennə	hæppəwenəwa	hæppəwuna	hæppəweewi	hæppæwum
			5."bite/chew"		
	hapannə	hapənəwa	hæpuwa	hapaawi	hæpiim
	hæpennə	hæpenəwa	hæpuna	hæpeewi	hæpum
	hapəwannə	hapəwənəwa	hæpewuwa	hapəwaawi	hæpəwiim
	hæpəwenna	hæpəwenəwa	hæpəwuna	hæpəweewi	hæpæwum

6."drive"

dakkannə	dakkənəwa	dækkuwa	dakkaawi	dækkiim
dækkennə	dækkenəwa	dækkuna	dækkeewi	dækkum
dakkəwannə	dakkəwənəwa	dækkewuwa	dakkəwaawi	dækkəwiim
dækkəwennə	dækkəwenəwa	dækkəwuna	dækkəweewi	dækkæwum

7."show"

dakwannə	dakwənəwa	dækwuwa	dakwaawi	dækwiim
dækwennə	dækwenəwa	dækwuna	dækweewi	dækwum
dakwəwannə	dakwəwənəwa	dækwewuwa	dakwəwaawi	dækwəwiim
dækwəwennə	dækwəwenəwa	dækwəwuna	dækwəweewi	dækwæwum

8."make"

hadannə	hadənəwa	hæduwa	hadaawi	hædiim
hædennə	hædenəwa	hæduna	hædeewi	hædum
hadəwannə	hadəwənəwa	hædewuwa	hadəwaawi	hædəwiim
hædəwennə	hædəwenəwa	hædəwuna	hædəweewi	hædæwum

9."spread"

paturannə	paturənəwa	pætiruwa	paturəwaawi	pætiriim
pætirennə	pætirenəwa	pætiruna	pætireewi	pætirum
paturəwannə	paturəwənəwa	pætirewuwa	paturəwaawi	pætirəwiim
pætirəwennə	pætirəwenəwa	pætirəwuna	pætirəweewi	pætiræwum

10."cut"

kapannə	kapənəwa	kæpuwa	kapaawi	kæpiim
kæpennə	kæpenəwa	kæpuna	kæpeewi	kæpum
kapəwannə	kapəwənəwa	kæpewuwa	kapəwaawi	kæpəwiim
kæpəwennə	kæpəwenəwa	kæpəwuna	kæpəweewi	kæpæwum

11."open"

arinnə	arinəwa	æriya	ariiwi	æriim
ærennə	ærenəwa	æruna	areewi	ærum
arəwannə	arəwənəwa	ærewuwa	arəwaawi	ærəwiim
ærəwennə	ærəwenəwa	ærəwuna	ærəweewi	æræwum

12."iron"

madinnə	madinəwa	mædda	madiiwi	mædiim
mædennə	mædenəwa	mæduna	mædeewi	mædum
madəwannə	madəwənəwa	mædewuwa	madəwaawi	mædəwiim
mædəwennə	mædəwenəwa	mædəwuna	mædəweewi	mædæwum

13."genuflect"

wa^{n}dinnə	wa^{n}dinəwa	wænda	wa^{n}diiwi	wæ^{n}diim
wæ^{n}dennə	wæ^{n}denəwa	wæ^{n}duna	wæ^{n}deewi	wæ^{n}dum
wa^{n}dəwannə	wa^{n}dəwənəwa	wæ^{n}dewuwa	wa^{n}dəwaawi	wæ^{n}dəwiim
wæ^{n}dəwennə	wæ^{n}dəwenəwa	wæ^{n}dəwuna	wæ^{n}dəweewi	wæ^{n}dæwum

14."run"

duwannə	duwənəwa	diwuwa	duwaawi	diwiim
diwennə	diwenəwa	diwuna	diweewi	diwewum
duwəwannə	duwəwənəwa	diwewuwa	duwəwaawi	diwəwiim
diwəwennə	diwəwenəwa	diwəwuna	diwəwewi	diwæwum

15."eat"

kannə	kanəwa	kææwa	kaawi	kææm
kæwennə	kæwenəwa	kæwuna	kæweewi	kæwum
kawəwannə	kawəwənəwa	kæwewuwa	kawəwaawi	kæwəwiim
kæwəwennə	kæwəwenəwa	kæwəwuna	kæwəweewi	kæwæwum

16."drink"

bonnə	bonəwa	biwuwa	boowi	biim
pewennə	pewenəwa	pewuna	peweewi	pewum
powannə	powəwənəwa	pewewuwa	powəwaawi	pewəwiim
pewəwennə	pewəwenəwa	pewəwewuwa	pewəweewi	pewæwum

17."dress/draw"

a^{n}dannə	a^{n}dinəwa	ænda	a^{n}diiwi	æ^{n}diim
æ^{n}dennə	æ^{n}denəwa	æ^{n}duna	æ^{n}deewi	æ^{n}dum
a^{n}dəwannə	a^{n}dəwənəwa	æ^{n}dewuwa	a^{n}dəwaawi	æ^{n}dæwiim
æ^{n}dæwennə	æ^{n}dəwenəwa	æ^{n}dəwuna	æ^{n}dəweewi	æ^{n}dæwum

18."pull"

adinnə	adinəwa	ædda	adiiwi	ædiim
ædennə	ædenəwa	æduna	ædeewi	ædum
adəwannə	adəwənəwa	ædewuwa	adəwaawi	ædəwiim
ædəwennə	ædəwenəwa	ædəwuna	ædəweewi	ædæwum

19."climb up/go up/increase"

naginnə	naginəwa	nægga	nagiiwi	nægiim
nægennə	nægenəwa	næguna	nægeewi	nægum
nagəwannə	nagəwənəwa	nægewuwa	nagəwaawi	nægəwiim
nægəwennə	nægəwenəwa	nægəwuna	nægəweewi	nægæwum

20."climb down/go down/decrease"

basinnə	basinəwa	bæssa	basiiwi	bæsiim

bæsennə	bæsenəwa	bæsuna	bæseewi	bæsum
basəwannə	basəwənəwa	bæsewuwa	basəwaawi	bæsəwiim
bæsəwennə	bæsəwenəwa	bæsəwuna	bæsəweewi	bæsæwum

21."dance"

natannə	natənəwa	nætuwa	nataawi	nætiim
nætennə	nætenəwa	nætuna	næteewi	nætum
natəwannə	natəwənəwa	nætewuwa	natəwaawi	nætəwiim
nætəwennə	nætəwenəwa	nætəwuna	nætəweewi	nætæwum

22."cook"

uyannə	uyənəwa	iyuwa	uyaawi	iwiim
iweenə	iwenəwa	iwuna	iweewi	iwum
uyəwannə	uyəwənəwa	iyewuwa	uyəwaawi	uyæwiim
iwəwennə	iwəwenəwa	iwəwuna	iwəweewi	iwæwum

23."boil"

uturannə	uturənəwa	itiruwa	uturaawi	itiriim
itirennə	itirenəwa	itiruna	itireewi	itirum
uturəwannə	uturəwənəwa	itirewuwa	uturəwaawi	itirəwiim
itirəwennə	itirəwenəwa	itirəwuna	itirəweewi	itiræwum

24."send/open"

arinnə	arinəwa	æriya	ariiwi	æriim
ærennə	ærenəwa	æruna	æreewi	ærum
arəwannə	arəwənəwa	ærewuwa	arəwaawi	ærəwiim
ærəwennə	ærəwenəwa	ærəwuna	ærəweewi	æræwum

25."tear"

irannə	irənəwa	iruwa	iraawi	iriim
irennə	irenəwa	iruna	ireewi	irum
irəwannə	irəwənəwa	irewuwa	irəwaawi	irəwiim
irəwennə	irəwenəwa	irəwuna	irəweewi	iræwum

26."spray/sprinkle"

ihinnə	ihənəwa	ihuwa	ihaawi	ihiim
ihennə	ihenəwa	ihuna	iheewi	ihum
ihəwannə	ihəwənəwa	ihewuwa	ihəwaawi	ihəwiim
ihəwannə	ihəwenəwa	ihəwuna	ihəweewi	ihæwum

27."ripen"

-----	-----	-----	-----	-----
idennə	idenəwa	iduna	ideewi	idum

idəwannə	idəwənəwa	idewuwa	idəwaawi	idəwiim
idəwennə	idəwenəwa	idəwuna	idəweewi	idæwum

28."kiss"

i^{m}binnə	i^{m}binəwa	imba	i^{m}biiwi	i^{m}biim
i^{m}bennə	i^{m}benəwa	i^{m}buna	i^{m}beewi	i^{m}bum
i^{m}bəwannə	i^{m}bəwənəwa	i^{m}bewuwa	i^{m}bəwaawi	i^{m}bəwiim
i^{m}bəwennə	i^{m}bəwenəwa	i^{m}bəwuna	i^{m}bəweewi	i^{m}bæwum

29."take by force"

uduranna	udurənəwa	idiruwa	uduraawi	idiriim
idirennə	idirenəwa	idirunaa	idireewi	idirum
udurəwannə	udurəwənəwa	idirewuwa	udurəwaawi	idirəwiim
idirəwennə	idirəwenəwa	idirəwuna	idirəweewi	idiræwum

30."uproot/pull out"

ugulannə	ugulənəwa	igiluwa	ugulaawi	igiliim
igilennə	igilenəwa	igiluna	igileewi	igilum
uguləwannə	uguləwənəwa	igilewuwa	uguləwaawi	igiləwiim
igiləwennə	igiləwenəwa	igiləwuna	igiləweewi	igilewum

31."suck"

urannə	urənəwa	iruwa	uraawi	iriim
irennə	irenəwa	iruna	ireewi	irum
urəwannə	urəwənəwa	irewuwa	urəwaawi	irəwiim
irəwennə	irəwenəwa	irəwuna	irəweewi	iræwum

32."wrap"

otænnə	otənəwa	etuwa	otaawi	etiim
etennə	etenəwa	etuna	eteewi	etum
otəwannə	otəwənəwa	etewuwa	otəwaawi	etəwiim
etəwennə	etəwenəwa	etəwuna	etəweewi	etæwum

33."press"

obannə	obənəwa	ebuwa	obaawi	ebiim
ebennə	ebenəwa	ebuna	ebeewi	ebum
obəwannə	obəwənəwa	ebewuwa	obəwaawi	ebəwiim
ebəwennə	ebəwenəwa	ebəwuna	ebəweewi	ebæwum

34."do"

kəranna	kərənəwa	keruwa	kəraawi	kiriim
kerennə	kerenəwa	keruna	kereewi	kerum
kərəwannə	kərəwənəwa	kerewuwa	kerəwiim	

kerəwennə	kerəwenəwa	kerəwuna	kerəweewi	keræwum

35."happen/be"

-----	-----	-----	-----	-----
wennə	wenəwa	wuna	weewi	wiim
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----

36."be"(eg. He is at home)

innə	innəwa	unna	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----

37."be" (eg. He is at home)

i^ndinnə	i^ndinəwa	i^ndiya	i^ndiiwi	i^ndiim
i^ndennə	i^ndenəwa	i^nduna	i^ndeewi	i^ndum
i^ndəwannə	i^ndəwənəwa	i^ndəwewuwa	i^ndəwaawi	i^ndəwiim
i^ndəwennə	i^ndəwenəwa	i^ndəwewuna	i^ndəweewi	i^ndəwum

38."think"

hitannə	hitənəwa	hituwa	hitaawi	hitiim
hitennə	hitenəwa	hituna	hiteewi	hitum
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----

39."bite"

wikannə	wikənəwa	wikuwa	wikaawi	wikiim
wikennə	wikenəwa	wikuna	wikeewi	wikum
wikəwannə	wikəwənəwa	wikewuwa	wikəwaawi	wikəwiim
wikəwennə	wikəwenəwa	wikəwuna	wikəweewi	wikæwum

40."bark"

burannə	burənəwa	biruwa	buraawi	biriim
birennə	birenəwa	biruna	bireewi	birum
burəwannə	burəwənəwa	birewuwa	burəwaawi	birəwiim
birəwennə	birəwenəwa	birəwuna	birəweewi	biræwum

41."fill"

-----	-----	-----	-----	-----
pirennə	pirenəwa	piruna	pireewi	pirum
purəwannə	purəwənəwa	pirewuwa	purəwaawi	pirəwiim
-----	-----	-----	-----	-----

42."fill/begin"

puranna	purənəwa	piruwa	puraawi	piriim
pirenna	pirenəwa	piruna	pireewi	pirum
purəwannə	purəwənəwa	pirewuwa	purəwaawi	pirəwiim
pirəwennə	pirəwenəwa	pirəwuna	pirəweewi	piræwum

43."fill"

purəwannə	purəwənəwa	pirewuwa	purəwaawi	pirəwiim
pirəwennə	pirəwenəwa	pirəwuna	pirəweewi	piræwum
purəwəwannə	purəwəwənəwa	pirewewuwa	purəwəwaawi	purəwəwiim
-----	-----	-----	-----	-----

44."bloom"

-----	-----	-----	-----	-----
pipenna	pipenəwa	pipuna	pipeewi	pipum
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----

45."inflate"

puppannə	puppənəwa	pippuwa	puppaawi	pippiim
pippenə	pippenəwa	pippuna	pippeewi	pippum
puppəwannə	puppəwənəwa	pippəwewuwa	puppəwaawi	pippəwiim
pippəwennə	pippəwenəwa	pippəwuna	pippəweewi	pippæwum

46."swirl"

karəkannə	karəkənəwa	kærəkuwa	karəkaawi	kærəkiim
kærəkennə	kærəkenəwa	kærəkuna	kærəkeewi	kærəkum
karəkawənnə	karəkəwənəwa	kærəkewuwa	karəkəwaawi	kærəkəwiim
-----	-----	-----	-----	-----

47a."err"

warədinnə	warədinəwa	wærædduwa	warədiiwi	wærədiim
wærədennə	wærədenəwa	wærəduna	wærədeewi	wærədum
warədəwannə	warədəwənəwa	-----	warədəwaawi	wærədəwiim
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47b."err"

warədinnə	warədinəwa	wærædduwa	warədiiwi	wærədiim
wærəddennə	wærəddenəwa	wærədduna	wærəddeewi	wærəddum
warəddəwannə	waraddəwənəwa	wærəddewuwa	waraddəwaawi	wærəddəwiim
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48."Pay homage/bow"

namədinnə	namədinəwa	næməduwa	namədiiwi	næmədiim
næmədennə	næmədenəwa	næməduna	næmədeewi	næmədum
namədəwannə	namədəwənəwa	næmədəwuwa	namədəwaawi	næmədəwiim
næmədəwennə	næmədəwenəwa	næmədəwuna	næmədəweewi	næmədəwum

APPENDIX B

NOUNS

(a)

I a~o

Singular	Plural	
ali-y-a	ali-y-o	"elephant"
koṭi-y-a	koṭi-y-o	"tiger"
pæṭi-y-a	pæṭ.i-y-o	"little one"
mæḍi-y-a	mæḍi-y-o	"frog"
devi-y-a	devi-y-o	"god"

II

Singular	Plural	
elu-w-a	elu-w-o	"goat"
yaalu-w-a	yaalu-w-o	"friend"
kolu-w-a	kolu-w-o	"lad"
maduru-w-a	maduru-w-o	"mosquito"
kakulu-w-a	kakulu-w-o	"crab"
oṭu-w-a	oṭu-w-o	"camel"
uguḍu-w-a	uguḍu-w-o	"polecat"

daru-w-a	daru-w-o	"kid"

(b)

a~o

Singular	Plural	
pis-s-a	pis-s-o	"lunatic"
wæd-d-a	wæd-d-o	"aborginal man (in Sri Lanka)"
it-t-a	it-t-o	"draughts"
kurul-l-a	kurul-l-o	"bird"

(c)

a~u

Singular	Plural	
æt-a	æt-t-u	"elephant"
minis-a	minis-s-u	"man/human being"
balal-a	balal-l-u	"cat"
sat-a	sat-t-u	"creature"
yak-a	yak-k-u	"devil"
hiwal-a	hiwal-l-u	"fox"
bab-a	bab-b-u	"baby"

(d)

ə ~ø

Singular	Plural	
kaṭu-w-ə	kaṭu	"bone"

miṭi-y-ə	miṭi	"hammer"
mal-ə	mal	"flower"
pot-ə	pot	"book"
oru-w-ə	oru	"boat"
kantooru-w-ə	kantooru	"office"
kaḍu-w-ə	kaḍu	"sword"
maḍu-w-ə	maḍu	"tent"
sati-y-ə	sati	"week

(e)

ə ~o

Singular	Plural	
wæ^{n}diri-y-ə	wæ^{n}diri-y-o	"she monkey"
sætiri-y-ə	sætiri-y-o	"virago"
bæl-l-i-y-ə	bæl-l-i-y-o	"female dog"
kiril-l-i-y-ə	kiril-l-i-y-o	"female bird"
wæd-d-i-y-ə	wæd-d-i-y-o	"aboriginl woman (in Sri Lanka)"